



Australian Government

Australian Trade and Investment Commission

Australian Clean Energy Equipment, Technology and Services

Go green with Australia



AUSTRALIA

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We help companies around the world to source Australian goods and services for their global supply chains as well as identify and take up investment opportunities in Australia.

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Acknowledgement of country

In the spirit of reconciliation we acknowledge the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

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The Australian Trade and Investment Commission (Austrade) promotes Australia on the global stage, grows and diversifies trade and helps build Australia's economic security and prosperity. With over 100 offices at home and worldwide, Austrade helps Australian businesses achieve diverse export outcomes and win investment needed to grow.

Austrade has the expertise, the contacts and the market intelligence to help grow Australian businesses and build Australia's economic prosperity.

Australian clean energy equipment, technology and services businesses offer leading technology and expertise across solar, wind, wave, energy storage, grids and behind the meter, carbon capture, utilisation and storage and bioenergy.

For more information about how Austrade can help you, contact us on 13 28 78.

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Australia's Clean Energy Capability



With record investment of \$US1.8 trillion in 2023 the global clean energy transformation is underway¹.

Australia is well-positioned to capitalise on these opportunities, with abundant and high-quality renewable energy potential, a highly skilled workforce, innovative research and development, strong trading relationships, a stable investment environment, and extensive mineral resources.

Now is the time to partner with Australia to achieve your clean energy ambitions. Global recognition of the value of building diverse and resilient clean energy supply chains means Australia's energy partners are increasingly looking globally, and Australia has an opportunity to step up in response.

The Australian Government is investing in a Future Made in Australia, and make Australia a renewable energy superpower. Cheap renewable energy will underpin new, internationally competitive, clean industries, which will help to secure Australia's long-term prosperity in a decarbonising world. New industries – such as renewable hydrogen, green metals, critical minerals processing, and clean energy manufacturing, including solar and batteries – offer major economic opportunities and will significantly reduce domestic and global emissions.

Developing these industries in Australia will also boost national resilience, help diversify global clean energy supply chains, and support the strategic objectives of our global partners².

Rapidly decarbonising our electricity system will provide the foundations of realising this ambition and is fundamental to Australia reaching net zero. Recognising this, Australia is transforming its energy systems to be powered by 82% renewable electricity by 2030.

To drive the growth of these industries, the Australian Government is providing significant financial incentives, regulatory changes, and other enablers to help crowd in private investment, and is reforming its investment settings, institutions, and regulatory processes, to attract and enable the investment Australia needs. The Australian Government is also investing in broader enablers, such as skills and training, research and education, infrastructure and clean energy, and advanced manufacturing.

Globally, Australia enjoys an enviable reputation as a trusted and reliable energy partner. Australia is working to maintain international trade relationships and continuously strengthen our clean energy capabilities as we, and the world, transition from unabated fossil fuels to clean energy sources.

This *Clean Energy Equipment, Technology and Services Capability Directory* offers an overview of Australian innovation, products, and services across solar, wind, wave, energy storage, grids and behind the meter, carbon capture, utilisation and storage as well as bioenergy and waste from energy sectors.

It showcases Australia's capabilities for progressing the global energy transformation, including in renewable energy and other clean energy solutions.

The *Clean Energy Equipment, Technology and Services Capability Directory* joins other Austrade publications, namely the *Green Economy Prospectus*, *Accelerating Sustainable Mining (Mining Equipment, Technology and Services)*, *Critical Minerals Prospectus* and *Hydrogen Equipment, Technology and Services* in demonstrating Australia's abilities to export clean energy solutions.

Australia's success in addressing the challenge of adapting the world's highest penetration of variable renewable energy into the national electricity grid, as well as our experience in supplying electricity to remote locations, shows our ingenuity. Australian companies can provide valuable input to overseas partners as they also seek to increase the penetration of renewable energy into their grids.

Australia is emerging as a leader in deploying battery and utility scale energy storage, driving further innovation in network design and operations. Australia's Battery Breakthrough Initiative will help transform Australia's battery industry and help manufacturers move up the battery value chain².

Australian researchers and entrepreneurial companies are developing new carbon capture, utilisation and storage technologies that will play a crucial role in mitigating carbon emissions and promoting environmental sustainability.

Australia is also working to leverage its extensive agricultural and forestry resources to advance bioenergy production, to reduce waste and secure cleaner energy sources for aviation.

The future of Australia's clean energy sector is promising, with globally competitive industries backed by strong government support for trade and investment, as well as world leading research and development programs and robust environmental, social and governance (ESG) standards.

Now is the time to partner with Australia to achieve your clean energy ambitions.



This *Clean Energy Equipment, Technology and Services Capability Directory* offers an overview of Australian innovation, products and services across the following sectors:

- Solar
- Wave
- Wind
- Energy storage, grids and behind the meter
- Carbon capture, utilisation and storage
- Bioenergy and energy from waste.

It showcases Australia's capabilities for progressing global energy transformation, including renewable energy and other clean energy solutions.

Bioenergy and energy from waste



As global action towards net zero emissions intensifies, bioenergy and energy from waste offer exciting opportunities for a clean energy future.

Renewable bioenergy is generated from the conversion of organic matter or biomass into heat, electricity, biogas, and low carbon liquid fuels. This biomass can be derived from renewable waste streams, including forestry and agriculture³.

With an abundance of biomass and feedstock to support production Australian researchers, governments and industry are partnering to build a biofuels industry in Australia, with a focus on low carbon liquid fuels such as sustainable aviation fuel, renewable diesel, and bioethanol⁴.

To deliver a Future Made in Australia, the Australian Government will support the development of a low carbon liquid fuel industry, with an initial focus on sustainable aviation fuel and renewable diesel to support emissions reduction in the aviation, heavy vehicle, rail, and maritime sectors.

Actions include the development of a certification scheme for low-carbon liquid fuels, including sustainable aviation fuels and renewable diesel in the transport sector through an expansion of the Australian Government's Guarantee of Origin scheme. Support will also be available through the Future Made in Australia Innovation Fund, which supports innovation, commercialisation, pilot program and early-stage development of innovative technologies and facilities in priority industries, including low-carbon liquid fuels².

Australia's national science agency CSIRO has developed a roadmap for a local sustainable aviation fuel (SAF) industry⁵, with the Australian Renewable Energy Agency (ARENA) investing in domestic SAF production from agricultural feedstocks⁶.

While the global air transport industry is committed to net-zero by 2050, low SAF production and high prices remain key challenges.

Australia's strong agricultural sector means we could be a global leader by scaling up domestic production of low carbon fuel for export, which could help reduce global aviation emissions significantly⁷.

Australian bioenergy companies have also developed processes that can be applied in other hard-to-abate sectors where there is currently a lack of low emission alternatives. This includes renewable industrial heat and renewable gas injection into the grid.

Bioenergy solutions can also complement low emission alternatives in the electricity and road transport markets.

Energy from waste can come from a variety of waste sources, such as the combustible components of municipal solid waste.

Some waste to energy conversion processes create useful byproducts that can be used to produce renewable bitumen and biomass-based concrete⁸.

Australian bioenergy and waste to energy projects provide a strong foundation for future developments in this sector for the benefit to Australia and its clean energy partners.

Gaia EnviroTech



Capability

Gaia's focus is on solving two critical challenges that our partners face; the cost of managing organic waste sustainably, and sourcing on demand renewable energy to offset fossil fuel use and reduce carbon footprint.

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Technology and demonstrated capabilities

Gaia EnviroTech are an organic waste management and bioenergy company that supports businesses in managing their organic waste streams sustainably, whilst also reducing their carbon emissions through the generation of a renewable energy source. Gaia's proprietary anaerobic biodigester system is modular by design, and provides a flexible approach to onsite energy from waste and can treat a range of organic waste streams including:

- Food waste
- Milk & Dairy processing waste
- Animal effluent
- Abattoir waste
- Brewery / Distillery waste
- Wastewater / DAF waste
- Horticulture waste
- Beverage manufacturing waste.

With engineering, manufacturing and operational expertise that spans over 25 years, Gaia designs systems to suit each application, and provides an end to end solution for organic waste management. Gaia's automated system treats the organic waste stream in an anaerobic environment, capturing the biogas that is generated and converting it to a dispatchable and renewable energy source in the form of electricity, gas or heat. This energy source can be utilised behind the meter, and significantly reduce a business's reliance on fossil fuels. By treating organic waste close to the source of generation, whilst also utilising the systems outputs locally (i.e. energy and fertiliser) Gaia's biodigester system creates a localised circular economy that is both sustainable and economical.

Current export market and key customers

Exploring opportunities in New Zealand, Singapore and the Philippines for Gaia's modular and easily scalable systems.

GEI Mekong



Capability

GEI Mekong is a waste management and renewable energy company that uses Advanced Pyrolysis Technology to convert waste and plastics into energy.

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Technology and demonstrated capabilities

GEI Mekong has the expertise and experience to deliver low-risk turnkey waste-to-energy projects using our proven Advanced Pyrolysis Technology, and has a vision to contribute to the conversion of the world's vast quantities of solid waste generated each year into clean and renewable energy.

This is made possible through formal licensing and technical information alliances established with leading original equipment manufacturers, including GGII, Mitsubishi Heavy Industries, Hitachi, Turmec, GE Power, Metso Outec and supported by EPC contractors Black & Veatch and Clarke Energy. These unique alliances provide GEI Mekong with access to GGII's proprietary and confidential Advanced Pyrolysis technical information.

GEI Mekong's waste-to-energy technology surpasses all other Pyrolysis processes previously developed, efficiently converting waste into electricity, Hydrogen, EN 590 grade diesel, biochar and carbon black.

Current export market and key customers

GEI Mekong's project focus is Southeast Asia, with 2 projects currently earmarked for Cambodia. GEI Mekong has offices located in Melbourne and Cambodia, and works with government and private landfill operators.

H2 4U



Capability

H24U specialises in High Temperature Waste Gasification (HTGW) Plants that convert almost 100% of waste materials, such as Municipal Solid Waste (MSW), into energy and valuable by-products utilising H24U's proven and commercially ready technology.

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Technology and demonstrated capabilities

H24U's specific IP-protected gasification technology has been in development for over 20 years and is at commercialisation stage. This technology used parts of the steel foundry process and was then developed further for processing waste. H24U's POC plant operated for 3 years and was audited by the Danish Energy Authority; and then an independently verified 25 TPD Pilot plant for 2 years.

The key points of differentiation and market leading capabilities:

- Operating at 1650°C; almost double traditional temperature levels of gasification and incineration and produce no harmful emissions or toxins in the process.
- Capturing the highest energy output levels (up to 50% more than competitors) from all technologies on the market (as audited by the Danish Energy Authority).
- Combining 3 processes previously done in separate vessels, reduces capital and maintenance costs while enhancing reliability and production levels with a 24/7/365 waste feed process.
- H24U can take almost all types of waste destined for landfill with minimal processing or sorting.
- Producing the highest volume of Syngas, the output itself has little to no carbon dioxide, depending on feedstocks.

The benefit of pure, high-quality Syngas gives maximum flexibility and diversification opportunities in SAF, Hydrogen and other offtakes.

Current export market and key customers

Implementation of this gasification technology can be executed worldwide. H2 4U's target markets include wholesale Syngas, Hydrogen, Electricity, Sustainable Aviation Fuel, Biofuels, and Waste Processing.

Pyrocal



PYROCAL

Capability

Pyrocal stands out as an industrial-scale biochar production system designer and manufacturer, playing a pivotal role in harnessing biochar's potential as a Negative Emissions Technology (NETs).

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Technology and demonstrated capabilities

Pyrocal is an Australian-owned engineering company designing and manufacturing industrial-scale biochar production systems using continuous carbonisation technology. Founded in 2014, Pyrocal has invested heavily in research and development to optimise its system to recover energy and capture and store carbon by transforming waste biomass and biosolids into biochar.

Manufactured in Queensland, Pyrocal's system is one of the most advanced biochar production systems available globally. Pyrocal's multi-disciplinary team collaborate with clients worldwide to understand their specific requirements and deliver tailored solutions to achieve their objectives.

Pyrocal's system is capable of operating 24/7 and the thermal energy recovered can be used to provide process heat or be converted to electrical energy.

Pyrocal's most significant project to-date has been delivering Australia's first biosolids gasification facility for the City of Logan, which opened in 2022. This multi award winning project resulted in operational cost savings of \$1M per annum and a reduction in carbon emissions of 6,000 tonnes per annum. Pyrocal conducts full-scale trials at its demonstration plant in South East Queensland, Australia.

Current export market and key customers

Pyrocal, a leading player in agricultural and forestry biomass and biosolids, has found its niche in key global markets. With export potential in North America, Asia, Europe, and Africa, Pyrocal serves as a vital partner to customers in these regions, enabling sustainable practices and innovative solutions for a greener future.

Renewable.bio



Capability

Certified and renewable biomass and biofuels producer with current capacity of 500,000 tonnes per annum.

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Technology and demonstrated capabilities

Renewable Bio specialises in the development, management and production of plant based feedstock for use in power, energy and biofuels.

Renewable Bio uses proven technology to collect and process biomass into value-added products such as wood chips, ethanol, renewable diesel and sustainable aviation fuel (SAF).

Current export market and key customers

Europe, major energy producers and buyers.

Carbon capture, utilisation and storage (CCUS)



Practically, reaching net zero will not be possible without the use of carbon capture, utilisation and storage (CCUS) technologies.

In a new global green economy, whilst renewable energy technologies can prevent the creation of emissions, there will still be a need for CCUS, particularly to address emissions in hard to abate sectors, such as steel and cement manufacturing and fertiliser production.

Globally around 40 commercial facilities are using CCUS to capture emissions from industrial processes, fuel transformation and power generation with another 500 projects in development⁹.

Direct air capture (DAC) systems to extract CO₂ directly from the atmosphere (resulting in negative emissions if the CO₂ is permanently stored underground), and other new CO₂ removal techniques are also gaining support.

In Australia CCUS proponents are trialling innovative processes on pilot and pre-commercial projects. Australian engineering companies are involved in multiple CCUS projects, and Australian technology companies are developing solutions to improve the efficiency and cost of CCUS processes.

This work is backed by strong technical and research capacity and experience in CCUS through Australian universities, the national science agency CSIRO¹⁰, and Geoscience Australia¹¹.

Australian innovations under development include methods to capture high concentration CO₂ streams from the production of cement and lime, pyrolysis techniques to split methane into solid carbon and hydrogen to make it easier to sequester the carbon, and floating CCS hubs with the potential to inject liquid carbon dioxide into offshore underground geological formations.

The CCUS industry in Australia is governed by a strong framework of laws and regulations for onshore and offshore projects, with the Australian Government also supporting research and development in CCUS technology through the Carbon Capture Technologies Program¹².

1414 Degrees



Capability

1414 Degrees is a leading clean energy company specialising in thermal energy solutions. We help businesses and industrial companies transition to lower or zero carbon, focusing on decarbonising high-temperature industries and power generation.

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Technology and demonstrated capabilities

1414 Degrees is at the forefront of industrial decarbonisation with its advanced silicon-based solutions. 1414 Degree's key technologies include:

- **SiBrick®:** This thermal energy storage technology safely and efficiently stores renewable electricity as latent heat for use on demand.
- **SiBox®:** Supporting the transition to sustainable industrial processes, SiBox® delivers consistent, high-temperature heat. It can be retrofitted into heavy industry processes, offering a viable alternative to conventional energy sources.
- **SiPHyR™:** A methane pyrolysis reactor with integrated storage, SiPHyR™ will produce low-emission hydrogen and solid carbon using renewable energy sources.

1414 Degrees has demonstrated its capabilities through successful pilot projects that highlight the reliability and effectiveness of our solutions. The SiBox® technology, for example, has proven its ability to deliver high-temperature air or steam on demand, making it an essential component for industries looking to reduce their carbon footprint. Additionally, the development of SiPHyR™ underscores our commitment to innovation and sustainability.

These technologies collectively enable the matching of energy supply with demand, facilitating the widespread adoption of renewable energy and contributing significantly to industrial decarbonisation and grid stability. For more detailed information, visit 1414 Degrees.

Current export market and key customers

1414 Degrees products are designed for heat-reliant industrial sectors, focusing on decarbonising processes and stabilising the energy grid. Woodside Energy partnering in the development of our products.

Calix



Capability

Calix Limited is an environmental technology company solving global challenges in industrial decarbonisation and sustainability, including decarbonisation solutions for cement, iron & steel, alumina and sustainable critical minerals.

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Technology and demonstrated capabilities

Calix's patented technology delivers efficient indirect heating of raw materials to enable electrification of industries, efficient capture of unavoidable emissions, and green industrial processing solutions.

Calix's renewably powered Zero Emissions Steel Technology (ZESTY) combines efficient electric heating with minimal green hydrogen use to produce green iron and steel. ZESTY processes fines, eliminates additional processing steps and is compatible with lower grade ores. Following successful pilot-scale testing, ZESTY is now moving to commercial demonstration.

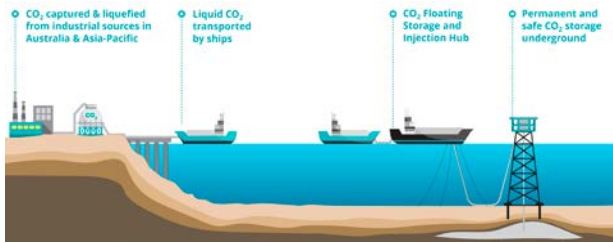
In a joint venture with Pilbara Minerals, Calix is developing the electric processing of spodumene into a concentrated lithium salt. A demonstration plant at Pilbara Minerals' mine site aims to show enhanced ore recovery, near-zero waste products and lower costs of the mid-stream process.

Calix's subsidiary, Leilac captures unavoidable emissions from cement and lime production, with no additional chemicals or processes, and is compatible with electricity and alternative fuels. The Leilac technology has been successfully demonstrated through its pilot plant, Leilac-1 and is being developed into a replicable and retrofittable module through the Leilac-2 project. Studies for applications at full commercial scale are underway with cement, lime and Direct Air Capture companies.

Current export market and key customers

Operating across Europe, the Americas and Asia Pacific, Calix's patented platform technology is being developed for applications in global cement and lime, iron and steel, alumina and critical minerals. Calix's key partners include Heidelberg Materials, Cemex, Heirloom, Pilbara Minerals and members of the HILT-CRC.

deepC Store



Capability

deepC Store is a commercial scale Carbon Capture and Storage (CCS) project developer, operator and technology provider.

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Technology and demonstrated capabilities

deepC Store (dCS) is a commercial scale Carbon Capture & Storage (CCS) project developer, operator and technology provider. dCS realises step changes in value creation by (1) offtaking CO₂ from industrial emitters in Australia and Asia Pacific, and obtaining CO₂ storage acreage in Australia and other jurisdictions; and (2) originating, providing technology, and developing a series of commercial scale CCS projects.

dCS has first mover position in the Asia Pacific for developing its floating CCS hub “CStore1” technology. CStore1 covers the entire value chain of CCS, that is, (1) capture and liquefaction of CO₂ in Australia and overseas; (2) transport by ships to a floater hub facility; and (3) injection from the floater hub facility to geological formations in Australia and overseas. A single CStore1 project has the capacity to store up to 7.5 million tonnes per year.

CStore1 is unique for several reasons. It is multi-user based and receives CO₂ from any industrial source, there is minimal pipeline distance, there is reduced residual value risk by reusing ship & floating hub facility, and it is replicable and scalable as it can be deployed globally. To achieve the goal of the Paris Agreement, the equivalent of 500+ CStore1 would be required by 2050.

Current export market and key customers

deepC Store (dCS) offtakes CO₂ from industrial emitters in Asia Pacific and obtains CO₂ storage acreages for developing CCS projects.

dCS’s “CStore1” (floating CCS hub) technology covers the entire CCS value chain.

Gas Capture Technologies



Capability

Gas Capture Technologies provides gas separation technologies using novel, patented technologies with their unique PSA (Pressure Swing Adsorption) and ILZ (ionic liquidic zeolite), to cut costs, improve profits and lower carbon emissions.

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Technology and demonstrated capabilities

Gas Capture Technologies provides gas separation technologies using novel, patented technologies with their unique PSA (Pressure Swing Adsorption) and ILZ (ionic liquidic zeolite), to cut costs, improve profits and lower carbon emissions. Gas Capture Technologies is a spin out company developed between Oilfield Technologies and the University of Western Australia (UWA). UWA & University of Melbourne are where the original technologies were created; they have since been commercialised with the vast industry & business experience of Oilfield Technologies. Gas Capture Technologies Australia (GCT) has successfully completed their first stage of technology demonstration with China's Shanxi Mingshi Coal Seam Gas Group Company.

GCT Australia has developed and installed a prototype skid-mounted PSA facility to undertake the enrichment of low concentration methane. GCT Australia has successfully achieved the CH₄ enrichment target from 8% to 35%, from 12% to 44% and from 15% to 50%, while maintaining the exhaust stream to be below 3% or recovery higher than 85%, through GCT's revolutionary single step PSA and ILZ technologies. Comparing GCT's novel ILZ with the activated charcoal adsorbents using similar operational conditions, the enrichment of CH₄ using ILZ is 30% higher than using activated charcoal.

Current export market and key customers

Gas Capture Technologies currently serves clients such as Pyro Green Gas, Archaea Energy, Greenthesiis, Rudarpa, and Air Science. GCT is exporting its technology to China, the US, Europe, Canada, France and South Africa.

Glaciem Cooling Technologies Pty Ltd



Capability

Glaciem provides large-scale commercial and industrial users of heating, cooling and drying/dehumidification to decarbonise using CO₂ heat pumps, thermal energy and smart software.

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Technology and demonstrated capabilities

Glaciem is a world leader in hybrid energy systems utilising natural refrigerants (particularly CO₂), thermal energy storage and energy usage optimisation software. Glaciem's technology enables commercial and industrial users of heating and cooling to effectively decarbonise, supporting the fossil fuel transition by maximising the use of renewables & optimising energy efficiency. Glaciem's capabilities are distinctive because the heat pumps can address a range of applications including the built environment (HVAC), protected cropping, the meat sector, fresh food production.

They are bespoke systems designed to suit the demands of each application. Glaciem's CO₂ heat pumps and refrigeration systems are optimised for customer loads, support combined heating and cooling for optimal efficiency.

Glaciem's Thermcold Thermal energy storage systems:

- Use high density phase change materials protected by exclusive licenses.
- Have a long life with no degradation from cycling.

Glaciem's ACFA smart software provides forecasting, optimisation and control of an operation's thermal assets, including exploiting demand management dollars and price arbitrage, load shifting and peak shaving, and automated control for optimal operations.

Current export market and key customers

Glaciem is currently exporting its products to New Zealand and Singapore, with opportunities identified in North America, South Asia and Europe. Glaciem's technology is applicable in industries with HVAC and cold storage needs, and current customers include Coles and Woolworths, Montague Apples, Woolworks, VanLier Nurseries, and Pernod-Ricard Winemakers.

KC8 Capture Technologies



Capability

KC8 is a process licensing company, commercialising its carbon capture technology that provides an affordable pathway to reduce greenhouse gas emissions from the use of fossil fuels and heavy industries around the world.

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Technology and demonstrated capabilities

KC8 is commercialising its carbon capture technology, focused on its patented suite of capture processes utilising potassium carbonate solvents. These processes are at the heart of KC8 and provide major capital and operating cost reductions, making it the superior capture process. The implementation of this technology is made commercial through its ability to:

- Lower overall cost (up to 50% less than the best amines).
- Lower energy use (up to 15% less than the best amine-based technology).
- Multi-impurity capture and production of valuable by-products (no degradation of products).
- Low energy of regeneration ~ 2.5 GJ/tCO₂.
- Low volatility and environmental impact (SO_x and NO_x converted to fertiliser products).
- Solvent sourced within current global potassium market (readily available).
- Plant design is scalable from 10,000s to 1,000,000s tpa of CO₂ capture.

KC8 is currently developing two pilot projects. The first will demonstrate its ability to capture carbon from a cement plant in Gladstone (QLD) and is supported by Cement Australia and Low Emissions Technology Australia. The second will demonstrate its application on flue gases from natural gas combustion at the National Carbon Capture Center in Alabama (AL, USA), supported by a grant from the USA's Department of Energy.

Current export market and key customers

KC8 are proud to be working with a number of global organisations including the United States Department of Energy, Low Emission Technology Australia (LETA), Santos Ltd, Cement Australia, Pilot Energy & TECforLime a member of Carmeuse Group.

Long Pipes



Capability

Long Pipes manufactures Fluid Highways® high pressure, thermoplastic lined composite pipes for potable water, wastewater, irrigation, industrial, produced water and low-pressure gas.

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Technology and demonstrated capabilities

Long Pipes manufactures the Fluid Highway® which is lined with a range of thermoplastic materials that can be tailored to suit the materials being transported.

The Fluid Highway® can accommodate extreme temperatures as well as large and rapid temperature variations during production and operation.

Large diameter thermoplastic lined pipe of 12" to 24" are currently in test today with larger diameters planned to be made available in the future.

Due to its liners the Fluid Highway® is resistant to internal corrosion that can be caused by saline water, hot brine, hydrogen sulphide and other chemicals.

The pipe can be manufactured in long lengths, up to 2 km in the field or is standard lengths up to 20 metres in the factory.

Current export market and key customers

Long Pipes currently has a plant in the US for wastewater (produced water) from shale oil and gas industry, and there are a number of projects in discussion in the Middle East, Indonesia, and South Africa for the transportation of water, produced water and low-pressure gas.

MCi Carbon



Capability

MCi Carbon is transforming industrial emissions into carbonate and silicate materials for use in the circular economy and to achieve negative emissions.

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Technology and demonstrated capabilities

MCi uniquely offers decarbonisation pathways for hard-to-abate sectors including steel, cement, mining, chemicals, and manufacturing. These heavy industries currently face decarbonisation challenges due to high emissions intensive processes and supply chains.

MCi technology combines captured CO₂ with a mineral feedstock, usually an industrial waste like steel slag, mine tailings or raw quarried minerals, to produce new materials, primarily magnesium carbonate, calcium carbonate and silica. These output materials have a low carbon footprint, or even carbon negative, and can significantly reduce supply chain emissions, as well as create a profit centre out of CO₂. The process is low temperature, low pressure and does not rely on chemicals. Third parties formulate these new products into cements, concretes, plasterboards, papers, glass, and other industrial products. MCi can capture direct flue gases, meaning the CO₂ used in the process does not need to be high purity.

As the world transitions to net zero and beyond, and governments and pioneers of the built environment will search for methods to reduce embodied carbon in new infrastructure developments, MCi's materials offer new pathways for building materials manufacturers to decarbonise their offering to developers.

Current export market and key customers

Global customer pipeline spans EU, Japan, Australia, USA, Asia, Middle East, and South America. Key partners include industrial CO₂ emitters or companies aiming for low-carbon materials in their supply chains. Notable partners are Japan's ITOCHU and Taisei Corporations, with Austria's RHI Magnesita as the first global commercial customer.

Synergen Met



Capability

Synergen Met, a responsible cleantech company, demonstrates its commitment to sustainability by creating responsible innovation solutions for real-world environmental issues.

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Technology and demonstrated capabilities

Synergen Met Ltd is an Australian cleantech company that specialises in proprietary thermal plasma technology for a variety of applications; creating hydrogen and carbon, and including complete destruction of harmful PFAS in the environment.

Through a pyrolysis process, Synergen Met can efficiently ionise natural gas into valuable pure hydrogen and solid carbon, for use in various renewable industries. Synergen Met's PFAS solution is the first in the world that remediates the recombination of toxic PFAS molecules after treatment.

The technology can be powered by both renewable and traditional energy sources and, being modular, it is easily transportable, meaning Synergen Met can facilitate work on almost any existing site internationally.

Current export market and key customers

Synergen Met partners with CSG Operators, Gas Transmission pipeline entities, mining and chemical producers; CO₂ hard to abate sectors.

Synergen Met's environmental group works with water utility groups, hazardous waste and water treatment companies towards the complete destruction of PFAS.

Energy storage, grids and behind the meter



A global green economy requires new developments in energy management and distribution.

With a target of 82 per cent renewable electricity by 2030, Australia is transforming its electricity grid to support the country's growth in clean energy generation and storage¹³ and is at the cutting edge of this work.

Australia's global leadership in residential rooftop solar is driving the development of innovative solutions to address the challenge of integrating variable renewable power into the grid while meeting peak loads, reducing fuel costs and emissions, and maintaining reliability. As more variable renewable energy enters the grid, storage becomes even more important to ensure renewables are complemented by technologies to enable a stable and consistent energy supply (also called 'firming' technologies).

Australian companies have developed a range of software platforms that perform energy modelling, forecasting, monitoring, and trading to allow electricity grids to support higher renewable penetration.

New approaches to interacting with the grid have also been developed, including behind-the-meter systems that generate and consume renewable electricity largely without transmitting it on the grid.

More advanced solutions include microgrids with multiple generators, allowing consumers to operate partly or even fully independently off the grid.

Energy storage will also play a key role. Australia is already home to the world's first 100 MW scale battery at the Hornsdale Power Reserve¹⁴ and even larger batteries are continuing to be built¹.

New Australian storage technologies are also emerging with the potential to improve access to electricity supply in remote communities and support cost effective decarbonisation in manufacturing.

Australia's *National Battery Strategy*¹⁵ will guide governments and industry towards a shared vision of a diverse and competitive battery industry. The Strategy draws on Australia's strengths, matched to our mineral availability, manufacturing capacity and local and global demand for products. The Battery Breakthrough Initiative, a key deliverable under the *National Battery Strategy* will further grow Australia's battery manufacturing capabilities.

Australian companies and research institutions are working to develop and manufacture new battery technologies, and explore thermal energy storage, hydrogen energy storage and other technologies that promise to offer longer duration, lower degradation, and better sustainability. Australia is trialling several alternative battery chemistries and is working on large scale pumped hydro projects¹⁶.

5B Holdings Pty Ltd



Capability

The 5B Maverick solar solution is factory prefabricated and rapidly deployed onsite, making it safer, faster, and more land, labour, and cost efficient to deploy solar, from off-grid to gigawatt-scale projects.

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Technology and demonstrated capabilities

5B's proprietary technology, the 5B Maverick, is a world-first game-changing product – a modular, plug-and-play East-West solar array that is prefabricated in a factory and rolled out on-site. In comparison to traditional single-axis tracker technology, the 5B Maverick can:

- Generate double the amount of energy per land unit as a result of the Maverick's energy density which eliminates the row spacing required by single-axis trackers.
- Shrink project deployment timelines by deploying 5-10x faster.
- Use ~70% less labour and ~50% less plant (eg. heavy equipment like pile driving machines, etc) on site.

Together, these benefits deliver our customers up to 20% lower levelized cost of energy and up to 20% higher Internal rate of return, respectively compared to other solutions. The 5B Maverick is also redeployable, unlocking decarbonisation opportunities for industrial customers with shorter-term electricity purchase agreement tenors, and for asset owners (and their financiers) in markets where corporate power purchase agreements trend towards shorter tenors. Its minimal-ground-penetrating design also enables it to repurpose landfill, mine tailings, waste deposits, and other contaminated land into solar energy hubs – an emerging market for the product – including in the US where such sites benefit from additional tax credits under the Inflation Reduction Act.

Current export market and key customers

5B sells to developers and independent power producers supplying renewables to commercial & industrial users, and their EPCs. The Maverick has been deployed in on- and off-grid projects across Australia, the US, Europe, Singapore, India, Chile, and Panama. In 2024, 5B will deliver a 69MW grid-connected, externally-financed project in the US.

Allegro Energy



Capability

Allegro Energy produces redox flow batteries (for long-duration large-scale energy storage) and supercapacitors (for high power applications like e-trucks, e-buses and light rail) using our unique, patented, water-based electrolyte.

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Technology and demonstrated capabilities

Allegro's Redox Flow Batteries (RFBs) offer a compelling value proposition by providing a cost-effective, high-performance long-duration energy storage solution. Our RFBs are cheaper than competing technologies, deliver superior performance, and are non-flammable. They are not dependent on scarce resources. Allegro's RFBs address multiple large-scale energy storage challenges, offering customers a robust and scalable solution for their energy needs.

Where lithium-ion batteries are only cost-effective up to around 4 hour durations, our RFBs are ideally suited to long duration (4-24 hour) storage applications. They can provide 24/7 clean energy when paired with wind or solar generation. Unlike lithium-ion batteries, they have negligible degradation and a lifetime of over 20 years with regular maintenance.

Allegro supercapacitors match the performance of competing products while being >50% cheaper. Unlike competing supercapacitors, they don't use expensive, flammable electrolytes.

Both Allegro's RFBs and supercapacitors are non-flammable, sourced from readily available, common materials with no complex supply chains. Both products are also fully recyclable.

Current export market and key customers

Allegro's RFBs target major energy companies, renewable energy developers and large industrial and commercial electricity consumers such as data centres. We're currently working on a 60MWh battery for Australia's largest electricity generation/retail company, Origin Energy. Origin is both an investor in Allegro and a customer.

Allegro's supercapacitors target power systems companies like Bosch and Siemens, and car, bus and light rail OEMs like Mercedes, Volvo, GM, Bombardier and CAF.

Allume Energy



Capability

Allume's world-first technology, SolShare, unlocks rooftop solar for apartments.

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Technology and demonstrated capabilities

Millions of people live in low and medium rise apartment buildings with the roof space for solar but no way of accessing it.

Allume's world-first solar sharing technology, SolShare™, offers a solution, by enabling the sharing of solar energy from a single rooftop solar system between multiple apartments.

This breaks down the technical and ownership barriers that have historically prevented apartment residents from accessing cheaper and cleaner energy from the sun.

This behind-the-meter 'smart hardware' splits the electricity from the solar system and allocates it fairly to residents over the course of a billing period, which is typically one month.

SolShare leverages the fact that people use electricity at different times to maximise the total amount of solar energy delivered to residents.

This results in 20-60% more solar being consumed, when compared to each apartment having their own individual solar system.

With SolShare, a typical apartment building can avoid 28 tonnes of CO₂ emissions annually and can reduce the average apartment's electricity bills by 40-60%.

Current export market and key customers

Allume Energy is headquartered in Melbourne, Australia with overseas offices located in Paris and California. The company is currently exporting its SolShare™ technology to the US, UK, and Europe. Allume Energy's customers include social housing providers, property developers and apartment residents.

Ardexa



ARDEXA

Capability

Ardexa is a global software company revolutionising data capture, management and control. The Ardexa digital control platform is a cloud-enabled solution for managing diverse machines across various industries including renewable energy, water management and others.

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Technology and demonstrated capabilities

Ardexa puts you in complete control of your operational technology (OT) data. Our Digital Control Platform (DCP) establishes vendor independence and enables rapid scaling of diversified energy portfolios by accelerating on-boarding of new plants and equipment. It facilitates new energy models (VPPs, energy trading, microgrids, aggregation etc.) and enables plant control capabilities at significantly lower cost and greater simplicity than legacy systems.

Ardexa simplifies the creation of a clean, centralised, and normalised data lake that its customers fully control. It connects every widely adopted industrial data and control protocol and is built atop a resilient, highly cybersecure architecture from the edge to the cloud. Cloud-native architecture enables secure remote access to plants, unified remote plant control and automated curtailment.

Ardexa addresses the biggest barriers to realising the benefits of digital transformation and industry 4.0. The greatest challenge to extract actionable insights from OT data is securely collecting, consolidating and preparing data. Ardexa collects all data securely, in real-time at the source, and published to a centralised, normalised, vendor-independent data cloud that you control, setting the foundation for AI and machine learning technology to deliver greater return on investment at any scale.

Current export market and key customers

Since its inception in 2013, Ardexa has expanded globally with established operations in Europe, USA and Singapore. In addition to its Australian clients, Ardexa exports its products and services to leading renewable energy, water management and industrial companies in the UK, Switzerland, France, Austria, Germany, Spain, Italy, Portugal and the USA.

Arnowa



Capability

Arnowa revolutionises businesses by empowering them with IoT, AI, and real-time analytics, seamlessly integrating with smart infrastructure to enable transformative Industry 4.0 revolution.

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Technology and demonstrated capabilities

Arnowa is a leading Australian Smart technology developer specialising in Smart City and Industry 4.0 infrastructure. Their cutting-edge ecosystems seamlessly integrate with existing infrastructure to support efficient planning, management, operations, and decisions making. Arnowa's integrated smart technology ecosystem uses advanced IOT devices for data acquisition from any device, Cloud-based data analytics and data correlations to improve asset management, reducing cost, energy, water, and environment. Powered by their unique Multi-Protocol Edge Device and fuelled by IoT, Big Data, and AI technologies, they offer unmatched flexibility and agility.

As an end-to-end solution provider, together with their customizable data visualization and analytics application, Arnowa empowers businesses with unparalleled opportunities for enhanced management, risk reduction, and informed decision-making. Using AI-based models, Arnowa's AI, advanced analytics and multi-parameter features drive seamless business processes. Their expertise, capabilities, and comprehensive knowledge enable them to exceed performance indicators and deliver exceptional outcomes in commercial projects. Through their holistic approach, Arnowa is shaping a future where collaboration, innovation, sustainability, and efficiency converge through smart technology.

Current export market and key customers

Arnowa, a global leader in Smart technology, drives impactful initiatives worldwide. Partnering with leading companies, Arnowa enhances efficiency and innovation across industries through government and private projects. With diverse clients and robust partnerships, Arnowa cements its position as an industry 4.0 revolution powerhouse.

Blue Diamond Machinery Pty Ltd



Capability

The region market leader in clean off grid power solutions through innovative hybrid products including powering leading mining, construction and commercial sites into an emission-free future.

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Technology and demonstrated capabilities

Blue Diamond Machinery (BDM)'s Net Zero Equipment is supporting customers on the journey to Net Zero with a dedicated off-grid clean power offering including hydrogen generators, lithium battery generators, hybrid power systems and solar light towers. BDM's focus is to provide the best solution for our customers wanting to reduce emissions now and in the future.

BDM have a unique value proposition offer:

1) Vertically integrated business catering for bespoke customer requirements:

BDM's integrated clean energy hub, including fabrication workshop, allows for flexibility and bespoke offgrid power system solutions to meet client demands or applications.

2) Forefront of green power generation: As exclusive distributor of market leading clean power products including EV, hydrogen and solar power options, BDM are powering a cleaner future.

3) Global reach and exclusive agreements:

BDM's exclusive agreements with leading renewable products suppliers offer significant advantage through reduced lead times and cost to our customers.

4) Disruptive commercial offers:

Outside a standard capital sale of product BDM also offer customers the option to rent, both short term or long term or pay by KW/Hr used annually.

Current export market and key customers

Blue Diamond Machinery is currently exporting its products to New Zealand and Indonesia, with opportunities identified in the wider South Asia region. BDM provide off grid and mobile power solutions to some of the biggest players in mining, oil & gas, agriculture, rental and construction.

Climate Change Response



Capability

Climate Change Response partners with clients on their sustainability journey, implementing innovative strategies, frameworks, and cutting-edge technologies to drive towards low carbon future, achieving net-zero ambitions.

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Technology and demonstrated capabilities

Climate Change Response (CCR) is a leading company empowering businesses in their journey towards achieving net-zero emissions. With expertise in Energy, Environment, ESG, Carbon, Nature Intelligence, Agriculture, Building and Climate Adaptation Intelligence.

CCR offers comprehensive and sustainable solutions across diverse industry sectors. CCR's services enable companies to enhance capabilities, align with the global ESG movement, strengthen reporting and communication, and drive operational efficiency to maximize overall business value.

Through their cutting-edge AI-driven platform, CCR transforms raw data into actionable insights, equipping organizations with necessary tools to gain a competitive edge in the race towards decarbonisation and net-zero emissions.

With a proven track record, CCR's portfolio encompasses a wide range of services, including energy management, net-zero pathways, cloud-based monitoring systems, sustainability reviews, greenhouse gas abatement, renewable energy systems, compliance reporting, training, and capacity building.

Leveraging extensive industry experience and comprehensive suite of services, CCR will support your entire sustainability journey.

Current export market and key customers

CCR is actively driving sustainability initiatives in Australia, New Zealand, India, USA, Europe, UAE, and Indonesia. With a diverse client base, CCR aims to strengthen its global footprint as a leading force in sustainability.

Endua



ENDUA

Capability

Endua enables energy independence for decentralised industrial and commercial operations by providing onsite hydrogen supply, eliminating the need for long-distance transportation and storage, and reducing associated costs and environmental impacts.

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Technology and demonstrated capabilities

We are rapidly transitioning to renewable energy to power our homes and businesses. But there are places where solar, hydro and wind don't work. We need power that is renewable and available whenever we need it.

Endua is an Australian company developing advanced hydrogen electrolysis technologies. Combining 15 years of research and development by the CSIRO in Polymer Electrolyte Membrane (PEM) electrolysis and their teams' extensive experience in hydrogen innovation, Endua is engineering a suite of technologies that enable the distributed on-site production of green hydrogen.

Their approach is uniquely focused on enabling hydrogen production where and when it is needed, even at smaller scales, thus eliminating the need for long-distance transportation and reducing associated costs and environmental impacts. Endua's solutions are engineered and built at their South East Queensland premises, facilitating the rapid deployment of safe hydrogen technologies.

Current export market and key customers

Endua's technologies straddle multiple rapidly expanding global markets including diesel generator replacement, microgrids/ standalone power systems, hydrogen refuelling stations- with applications in telecoms, utilities, industrial loads, digital infrastructure and community-level power. Our partner, Ampol, is enabling early customer engagement and speed-to-market through access to their B2B customer database.

Energy Exemplar



Capability

PLEXOS® is the world's most powerful energy market simulation engine providing analytics and decision-support to modelers, generators, and market analysts—offering flexible and precise simulations across energy markets.

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Technology and demonstrated capabilities

Energy Exemplar's world-leading technology and unwavering obsession to provide best-in-class customer experience enable our clients to revolutionize the energy ecosystem. From molecule to meter, seconds to decades, neighbourhoods to continents, our solutions simplify complexity to empower clear decisions.

What Does PLEXOS® Do?

It's easy to be overwhelmed with the volume of data available and rate of change the energy industry is currently experiencing. PLEXOS® gives you the power to unify all your data streams – in any granularity – into a single, unified energy modelling and forecasting platform. Its powerful simulation engine analyses zonal and nodal energy models ranging from long-term investment planning to medium-term operational planning and down to short-term, hourly, and intra-hourly market simulations. While other simulation software only models energy markets separately, PLEXOS® allows you to understand the market variations across the entire energy landscape. The result: a co-optimised, interdependent energy market simulation that enables you to uncover hidden value.

Who Uses PLEXOS®?

PLEXOS® is built to serve the entire energy industry ecosystem. Trusted globally by governments, regulators, system operators, researchers, utilities, power producers, developers, retailers and traders.

Current export market and key customers

Energy Exemplar serves a number of industries including academic institutions, consultants, financial services, government organisations, renewables, research and laboratories, OEMs, oil and gas, power producers, traders, transmission system operators, and utilities.

Energy Renaissance Pty Ltd



Capability

Energy Renaissance produce Australian-engineered, locally-crafted lithium-ion batteries. Energy Renaissance is Australia's clean-tech battery manufacturer, creating and making safe, hot-climate and cyber-secure batteries for commercial, industrial, transport and defence applications from Australia's first battery Gigafactory in the Hunter Region of NSW.

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Technology and demonstrated capabilities

Australia's high value commercial battery solution

Lowest total cost: our unique advantages result in lowest total cost of ownership - purchase, ship, install, operate, maintain and retire.

Most complete solution: our integrated and scalable superStorage™ platform includes packs, racks, BMS and EMS all made by Energy Renaissance here in Australia.

Unique CSIRO technology: five years in development with CSIRO to deliver safe, secure, hyper-efficient hot climate operation in tough conditions with defence-grade cybersecurity.

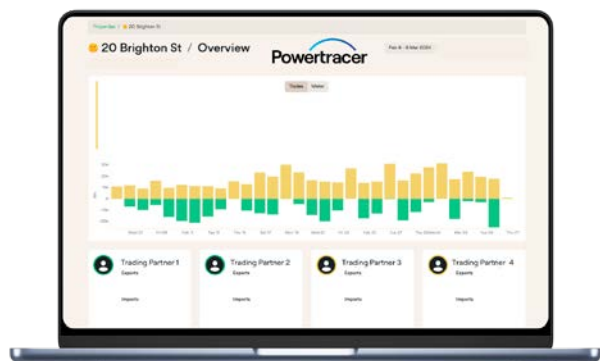
Truly Australian: all Australian team, ownership, service and support and designed by Australia's science agency. With 92% Australian battery content and growing.

Recycling and second life: Designed for recyclability and reuse with rapid non-destructive disassembly and supports cell-level non-destructive refurbishment.

Current export market and key customers

Energy Renaissance's technology is optimised for hot climatic conditions which have attracted attention from customers in South East Asia, Pacific, Africa and the Middle East regions.

Enosi Australia



Capability

Enosi is the developer of Powertracer Software as a Service providing traceability services for electricity supply from source to socket, matching energy consumption with production sources in every 30 minute period of the day.

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Technology and demonstrated capabilities

The climate emergency makes the headlines on a daily basis, yet Net Zero solutions allow corporates to purchase certificates and offsets to continue to use dirty power. This is why Google, Microsoft, IBM and ESG leaders are seeking to power their operations with clean energy around the clock. This means using carbon-free energy supplied on the same grid and at the same time to reach True Zero.

The Enosi Powertracer software platform integrates with smart metering and billing systems of licensed electricity retailers enabling them to sell clean energy traced and priced to the source of supply. Powertracer matches the kWh used, price paid and carbon emissions for each 30 minute timeslot.

Powertracer is not on the blockchain which allows Enosi to deliver low cost many to many trading points across the grid, at scale. Wind and solar farms can match their energy to customer loads, large corporates can oversize solar on their warehouse site and match it to their other sites, at prices they set on Powertracer. For the first time electricity consumers can measure and manage their clean energy with confidence knowing the source, time and price of their energy and take action to save money and reduce carbon. Powertracer makes carbon free energy possible, as electricity consumers raise their ambitions and commit to True Zero.

Current export market and key customers

The Powertracer Software as a Service has been deployed in Australia, Singapore and soon to be deployed in Europe, specifically Italy and the UK. Key retail channels include BPG (UK), Plenitude (Italy), Senoko (Singapore), Energy Locals, Momentum Energy, Next Business Energy, and Simply Energy (AUS). Enosi's current major end users include Google, UNSW and Mirvac.

Evergen



Capability

Evergen has created an advanced energy management software platform that uses machine learning algorithms to optimise and digitise the use of renewable energy assets across the entire energy chain.

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Technology and demonstrated capabilities

Evergen offers a comprehensive SaaS platform for managing mixed distributed energy resources (DER). Companies can orchestrate, monitor, control, and report on all DER in one place. The platform provides market integrations, autonomous co-optimised bidding, rebidding services, and compliance reporting. Key features include:

Behind-the-Meter Optimisation: Machine learning delivers advanced, individualised electricity cost-minimisation via batteries and controllable loads. As markets and technology evolve, Evergen's adaptable technology adjusts to complex electricity bills and sites. The optimisation considers weather conditions, load profiles, preferences, and VPP participation, refining a personalised plan every 5 minutes.

Front-of-Meter Optimisation: Enables dispatchable assets to be monetised in volatile energy markets, ancillary/balancing services markets, network/grid support programmes, and emerging markets. Our solution maximises the return on investment of DERs, utility-scale solar farms, standalone batteries, and hybrid sites.

Evergen serves as a hub for overseeing battery energy storage systems (BESS) of any size or location, aiding energy retailers and project owners. The platform automates AI optimisation algorithms, optimising BESS performance while allowing manual intervention. It also facilitates participation in ancillary services, tailoring solutions for small behind-the-meter assets (<5MW) to large-scale (>5MW) multi-market projects, enhancing BESS optimisation for maximum asset value and benefits.

Current export market and key customers

Whether you're an energy consumer, energy producer, utility or project developer, Evergen has the tools and expertise to help optimise your energy management and maximise the benefits of your renewable assets.

Future Grid



Capability

Future Grid provides real-time monitoring of low voltage distribution networks.

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Technology and demonstrated capabilities

Future Grid's Compass™ is the world's first and most deployed Low Voltage Management System. Our Compass™ software integrates with existing enterprise Utility systems and has become popular to support the transition to renewable grids using smart meter data and advanced analytics.

Compass™ serves 10M+ smart meters, processes trillions of data points, serves 1000+ daily active users, offers 85+ analytics to choose from, and securely deploys over the cloud as well as on-prem environments.

Future Grid signed an agreement with PEA, Thailand in 2020 to support their digital utility strategy. The demonstrated outcomes of the two-year technology pilot include: network fault detection, voltage issue detection, transformer utilisation and hosting capacity, EV detection, DER / solar detection and meter-to-transformer issue detection.

To learn more about the solution Future Grid offers and the results we produced, download the case study from our website: <https://future-grid.com>

Current export market and key customers

Future Grid current serves 95% of the Australian Utility Market has offices in North America, Australia and Thailand. International Utility customers who have deployed their product include Penlight from North America; Wellington Electricity, Powerco and WEL from New Zealand; and PEA from Thailand.

Gelion Technologies



Capability

Gelion develop lithium-sulfur batteries- lighter, higher safety, lower cost, and lower carbon lifecycle than lithium-ion batteries - for mobile energy storage.

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Technology and demonstrated capabilities

Lithium-sulfur batteries replace rare metals, nickel, and cobalt in battery cathodes with Earth abundant sulfur.

Lithium sulfur batteries are a safer, cheaper, lighter, and greener battery technology than incumbent lithium-ion, and are widely regarded as the next generation of battery technology.

Gelion's approach uses a proprietary electrolyte and cathode technology, combined with partner's silicon and lithium-based anodes. Gelion's platform is inherently scalable and uses commercially available inputs, leveraging world leading research from its Australian and UK teams.

Research was started at Sydney University in 2019, and in 2023 the company strategically acquired a technology portfolio from Johnson Matthey (formerly developed by world-leading Li-S developer OXIS Energy) and expanded into the UK by acquiring Li-S developer OXLiD.

Gelion also engaged in a joint development agreement with leading US-based silicon anode producer Ionblox, to accelerate development of silicon-sulfur cells toward automotive applications. The technology is progressing rapidly toward validation, and the company is keen to engage with partners.

Current export market and key customers

Gelion export lithium sulfur for global electric vehicle, heavy vehicle, marine, and aviation markets.

GenOffGrid Pty Ltd



Capability

GenOffGrid specialises in solar and battery microgrid solutions, offering renewable power generation systems to support those living and working in the toughest environments of Northern Australia and the Pacific.

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Technology and demonstrated capabilities

GenOffGrid have design and engineering facilities spanning northern Australia and Papua New Guinea (PNG).

The team at GenOffGrid has proven experience in delivering commercial and utility-scale solar PV and lithium battery integration on a megawatt scale in remote and tropical locations.

The business is underpinned by its third-party ISO accreditation for its OHS, Environmental, and Quality Management Systems which are upheld across all our regions of operations.

GenOffGrid's strategy is to have a local presence, which means all our teams are locally employed, offering career paths in the renewable energy industry. They procure within their local business communities and take an active role in our community organisations and supporting events.

GenOffGrid offers a pathway to employment that enables local communities to stay regional, with most of our apprentices being sourced from local Indigenous communities.

The company's Northern Australia and PNG bases will enable GenOffGrid to deliver and enhance the region's capability in the decarbonisation effort and transition to net zero throughout the Pacific Islands and beyond, while reducing the use of fossil fuels to generate electricity will have a positive impact on combating global warming. This is crucial as rising sea levels pose a significant threat to our Pacific neighbours.

Current export market and key customers

GenOffGrid is developing and delivering energy infrastructure projects in the Pacific Indo regions following the completion of a major government-funded project in Papua New Guinea.

Green Gravity



Capability

Green Gravity is an Australian based company that develops, installs and operates innovative gravitational energy storage technology, aimed to lead the world in creating the future of energy from the legacy of mining.

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Technology and demonstrated capabilities

Green Gravity's energy storage system uses heavy weights moved vertically in legacy mine shafts to capture and release gravitational energy. Utilizing proven mechanical parts and disused shafts, this technology is low-cost, long-life, and environmentally compelling, uses no processed chemicals and has no performance degradation. High round-trip efficiency and the reuse of existing structures support the circular economy.

The system is modular and adaptable to various locations. Mid-sized shafts offer 5MW/25MWh capacity, while deeper shafts can provide 60-80+MWh for extended durations. Installed costs and levelised cost of storage (LCOS) are competitive with lithium-ion BESS, benefiting from the use of simple components and an operational life up to 50 years. Green Gravity's solution offers efficient storage and dispatchable power, promoting grid stability, reducing costs, and supporting emissions reduction. It also aids local community energy schemes by firming distributed energy resources.

Current export market and key customers

Green Gravity has offices across Australia, in New South Wales, Queensland, and Victoria. Green Gravity has an active demonstration program underway for its Gravity Energy Storage System (GESS) in the Hunter Valley Renewable Energy Zone (REZ) and a 13m high scaled test facility in operation in the Illawarra REZ to validate design and optimise performance. There are estimated to be 1 million legacy mines globally. Green Gravity's technology provides an alternative economic use for these assets and helps deliver enhanced sovereign capacity and capability in energy storage. Active discussions are underway with governments, mining companies and project partners in India, EU, South America and the US.

Magellan Power



Capability

Magellan Power manufactures reliable Australian made AC and DC backup power solutions, energy storage systems, stand alone power systems and EV charging solutions.

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Technology and demonstrated capabilities

Magellan Power manufactures customised high-reliability AC and DC backup power systems, energy storage systems, lithium battery modules and EV charging solutions, all seamlessly integrated through its Energy Storage, UPS Systems and EV Charging divisions.

Committed to providing top-notch service, the company also offers specialised service and commissioning through its dedicated Pilbara Operations division. Dedicated to sustainable energy solutions, Magellan launched its 4R Lithium Battery Life Cycle Management Initiative, showcasing a holistic approach to lithium battery management to ensure maximum life cycles and value extraction.

Magellan brings together hardware, software, power electronics and deep knowledge of industrial batteries to ensure continuous power to critical industrial equipment making sure that our customers' vital equipment is powered continuously and reliably. Our core value of "steadfast support of our customers" was formed by decades of service to our clients located in the most remote parts of Australia, and our deep practical knowledge of harsh environmental conditions ensures that our service technicians are the industry's leading experts in the provision of support through preventative and on-site repair services.

With over 32 years of industry experience, Magellan continues to develop cutting-edge solutions in-house, supporting Australian made local manufacturing and contributing to the local workforce and knowledge base leading to a more sustainable future.

Current export market and key customers

Magellan Power is currently exporting its range of products to Papua New Guinea, Egypt, and New Zealand.

MGA Thermal



Capability

MGA Thermal specialises in thermal energy storage, with the production of clean steam or clean steam and electricity (co-generation) for industrial decarbonisation between 150°C and 600°C, and can scale to GWh thermal.

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Technology and demonstrated capabilities

MGA Thermal's breakthrough technology is an entirely new form of long-duration thermal energy storage (TES) that is making 24/7 renewable energy a reality through clean steam. The company's technology is a recently invented type of thermal storage material, Miscibility Gap Alloys (MGA) Blocks, which store and deliver thermal energy while remaining outwardly solid.

MGA Thermal TES offers a scalable means of firming variable renewable generation into a highly reliable and versatile supply of process heat, heat & power (cogeneration) or steam for electricity generation. The system has minimal need for expensive capital equipment such as heat pumps, and maximises utilisation of pre-existing equipment and proven steam technologies.

MGA TES can charge and discharge simultaneously, charging from intermittent renewables and discharging continuously, enabling 24/7 clean steam and power for industry. Targeted at industrial scale, MGA addresses large-scale long-duration energy storage needs, providing systems from 5MWhs to GWhs.

Ideal for both brownfield and greenfield sites, MGA Thermal offer a low-carbon and sustainable energy storage. MGA Thermal achieve an electricity-to-steam round trip efficiency as high as 93%. Any heat not delivered into steam via our heat recovery steam generators is re-circulated. Their 5MWh Demonstration Unit is due to come online Q3 2024.

Current export market and key customers

MGA Thermal's customers are large industrial heat users between 150°C and 600°C; including alumina (digestion), oil and gas processing, building material such as wood product and Autoclaved Aerated Concrete, chemical processing, petroleum refining, textiles, and food and beverage. Our export focus is global.

Onetide



Capability

Onetide transforms and enhances ways of working with our Maritime Logistics and Alternate Energy products; providing faster, lower cost, lower emissions, safer solutions with demonstrated productivity enhancement and return on investment.

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Technology and demonstrated capabilities

Onetide is a national award winning Australian owned and operated engineering SME. Our Products; RAPID REEL: Faster-Safer-Cost effective-Reduced emissions shore-power management. MISSION DECK: vessel of opportunity no weld seafastening; MOBILE MICROGRID hybrid renewable power and water. Point of difference is the ability to consider a multitude of challenges and draw upon their technical limit expertise in modern and additive manufacturing capability to provide practical, time optimised, efficient, novel, and safe solutions. Championing Australian industry content through support of local SME's, we deliver our proprietary innovations in remote energy, logistics and maritime infrastructure to Defence, Resources, Marine Logistics, and HADR sectors. Onetide takes pride in demonstrating the measurable Safety-Time-Cost-ROI benefits of our solutions. Capabilities include:

- Advisory and Engineering services
- Novel concept design, prototyping, and production
- Efficient, on time & budget as low as reasonably practicable risk engineering solutions
- 3D concept modelling
- Additive manufacturing
- Remote site operations optimization.

Current export market and key customers

Onetide is currently undertaking a strategic evaluation of the Asia-Pacific shore-power market and Mobile Microgrid market. USN-NAVFAC evaluating RAPIDREEL (shore-power management system) for Faster-Safer-Cost effective shore-power connection. Key customers include: Chevron, Downer, Exodus, Franmarine, Haliburton, Orica, OzMinerals, RandD-Solutions, Royal Australian Navy, Ventia.

Opturion Pty Ltd



OPTURIION

Capability

In the dynamic renewable energy landscape, Opturion's decision-support technology helps make informed investment decisions and operate assets efficiently, maximising returns and navigating modern energy complexities.

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Technology and demonstrated capabilities

Decarbonisation presents both opportunities and challenges for investors and operators in new energy generation and distribution. Generators must decide where to invest, which technology to select, and how to operate assets in a volatile environment. Electricity distributors need to adapt networks built without consideration for rooftop solar or Electric Vehicles (EVs).

Opturion offers advanced decision support technology based on artificial intelligence (AI), transforming these challenges into opportunities. Their Strategic Optimisation tool aids in making strategic decisions by comparing economic and physical performance of investment options over extended periods.

Demand Forecasting addresses the complex problem of forecasting domestic, commercial, and industrial demands, factoring in influences like season, holidays, weather, and recent history.

Operations Optimisation handles rapid changes in generation capacity from wind and solar, calculating new settings quickly to meet contract requirements, renewable energy output, input costs, and current market prices. Unlike traditional approaches, Opturion's technology is faster, easier to apply, and scalable, making it suitable for both strategic and operational decision-making.

Opturion operates in Australia, Europe, and Latin America, serving energy customers like Origin Energy, AEMO, and Woodside Energy.

Current export market and key customers

Opturion is active in Australia, Europe and Latin America. Energy customers include Origin Energy, AEMO and Woodside Energy.

Powerledger



Capability

Powerledger is a software company that uses blockchain, AI and Web3 to solve pressing energy challenges and enables businesses and utilities to track, trace and trade every kilowatt hour of energy.

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Technology and demonstrated capabilities

Powerledger's software is blockchain-enabled and allows people to track the generation of renewable energy, trace the source of that generation (to ensure it is green), as well as trade energy and track its use.

Powerledger offers the following products:

- uGrid – a software that enables buildings or tenants to trade energy between each other behind a single master-meter (gate meter) in an embedded network or microgrid.
- xGrid – a software that allows renewable energy to be traded across the grid, with retailer consent.
- Local Energy Market (LEM) – a peer-to-peer trading platform that enables consumers and prosumers to democratically buy and sell their local energy.
- Vision – proves energy provenance and enables traceability, particularly for trading renewable energy between households or businesses.
- TraceX – a digital marketplace that can efficiently handle the trading of renewable energy certificates, carbon credits and other environmental instruments.

Current export market and key customers

Powerledger has over 30 projects across 14 countries. Powerledger's software is currently deployed in Europe, the US, India, South East Asia, and Japan.

Proa



Capability

Proa provides services and products for utility scale solar, wind and BESS in the areas of operational energy forecasting (nowcasting or intra-hour, intra-day and intra-week forecasts), plant performance data analytics, and energy management systems.

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Technology and demonstrated capabilities

Established in 2016, Proa has been developing, producing and deploying innovative products and services to manage, monitor and improve the technical and financial performance of solar and wind assets, summing +5GW track-record (as of January 2024) and with +100 systems installed globally. We divide our core business into three main areas:

Performance Monitoring

Proa has developed utility-scale solar weather stations – The MetCube - with unique features such as automatic cleaning of sensors needless of civil works, independent data quality checks and soiling stations with automatic cleaning, securing accurate input data to plant performance assessment.

Energy Forecasting

Renewable Energy (RE) sources are intermittent by nature. Solar irradiance and wind speed or direction cannot be controlled. The introduction of more RE can bring instability to the grids. Accurate weather forecasts (foreseeing the weather from 1 minute to several hours ahead, days and weeks ahead) mitigates the grid instability.

Energy Management Systems

Proa's Energy Management System orchestrates the operations of hybrid systems (PV + BESS) to maximize returns and tackle the variability and uncertainty of renewable energy sources.

Current export market and key customers

Proa has already provided services in LATAM, Europe and The Middle East, having also found opportunities in ASEAN Countries, where Proa's intelligent systems are used to monitor and optimize operations of renewable energy assets. Clients include ENEL, NEOEN, RES, Total Energies, Vena Energy and Foresight.

Redflow



Capability

Redflow is leading the energy transition by developing and manufacturing one of the world's safest most scalable and commercially available zinc-bromine flow battery energy storage solutions.

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Technology and demonstrated capabilities

Redflow has pioneered the development and commercial deployment of zinc-bromine flow battery technology. Our battery solution provides long duration energy storage in a modular, scalable design that is simple to deploy and reliable in operation. Redflow's unique chemistry offers the highest energy density among flow batteries. The battery's unique design provides a long life with minimal battery degradation and the ability to fully discharge in daily cycles. Ideal for high temperature applications, the battery has no risk of thermal runaway explosions or fires making it very safe across a range of applications. The battery is made from readily available, sustainable materials and is certified as 100% recyclable.

Redflow deploys their battery technology using modular enclosures designed to operate in numerous configurations and across multiple applications. These pod designs allow for factory built and tested systems to be deployed rapidly and efficiently integrated with a range of inverter options that are suitable for the project connection requirements.

Current export market and key customers

Redflow has over 270 active deployments globally which have delivered a total of 3.2 GWh of energy to date, with a particular focus on Australia, the US and South Africa. In January 2022, Redflow commissioned a 2 MWh energy storage system for Anaergia's Rialto Bioenergy Facility in California. In 2023 Redflow announced over 60 MWh of projects including a 20 MWh project providing energy storage for the Paskenta Band of Nomlaki Indians in California, a 4 MWh energy storage system for Energy Queensland, a 1.2 MWh microgrid contract to provide clean energy storage at a military base for the Department of Defence and a 34.4 MWh resiliency microgrid for Valley Children's Hospital in California.

Redx Technology



Redx

Capability

Redx delivers renewable energy solutions with our talented local R&D team, world-leading innovative patented inverter technologies, cutting-edge AI algorithms, and scalable cross-platform energy management software.

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Technology and demonstrated capabilities

Redx Technology stands at the vanguard of innovative power and storage solutions, using cutting-edge technological advancements. Specializing in inverter technology, Redx has made remarkable strides since its inception, solidifying its position as a leader in the research and development of DC-DC and DC-AC inverters. With number of worldwide technology patents, Redx demonstrates an unwavering commitment to innovation and excellence in inverter topologies, establishing itself as a trusted partner in the Australian energy sector.

Redx's offerings extend beyond hardware solutions, as the company also provides a cutting-edge cloud energy management platform. This platform enables real-time monitoring and control of energy consumption across multiple sites, facilitated by centralised data storage and advanced analytics. By leveraging machine learning algorithms, the platform optimizes energy utilization and delivers substantial cost savings.

Beyond its practical applications, through enabling complex energy consumption simulations and modelling, the company aids in exploring new pathways towards achieving net-zero emissions. From predicting grid spot price patterns to adjusting the behaviours of energy storage systems and loads, Redx's advanced capabilities maximize potential savings for its customers.

Current export market and key customers

We work closely with Redx's strategic global industry-leading partners to supply our energy solutions which include Energy storage systems, Inverter hardware, energy management software, and smart load control devices in Europe, north America, south America, and Oceania regions.

Regen Power Pty Ltd



Capability

Regen Power delivers efficient renewable energy solutions, focusing on residential and commercial off-grid solar systems, with a strong commitment to global energy sustainability.

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Technology and demonstrated capabilities

Regen Power is renowned for its innovative approach in the renewable energy sector, particularly in solar energy solutions. The company stands out due to our comprehensive range of services and products designed to promote sustainability and energy independence.

Regen Power's unique selling points include our extensive experience with over 40,000 installations worldwide, demonstrating our capability to deliver high-quality, reliable, and sustainable energy solutions. The Company's projects not only contribute significantly to reducing carbon footprints but also demonstrate our commitment to innovation and quality, underscored by our ISO 9001:2015 certification and winner of ProductReview Awards in 2021, 2022, 2023 & 2024.

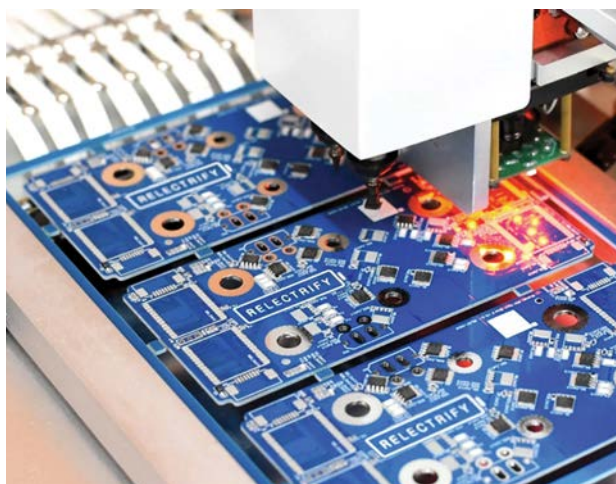
Regen Power collaborate closely with industry leaders such as Tesla, Qcells, Huawei, Trina and Risen, ensuring that our systems incorporate the latest in energy technology. This partnership not only enhances our product offerings, but also ensures that our customers receive the most advanced and efficient energy solutions available.

Regen Power's commitment to renewable energy extends beyond our product offerings. Regen Power engages in continuous research and development to improve existing technologies and innovate new solutions that meet the evolving needs of their customers and the planet. For more detailed information on Regen Power's technologies and capabilities visit the website.

Current export market and key customers

Regen Power operates primarily in Australia, with expanding markets in Malaysia, Vietnam, and India, serving industry leaders such as BC Iron and BHP Billiton.

Relectrify



Capability

Relectrify develops and supplies industry-leading cell-level battery control technology that makes battery energy storage systems cost less to buy and to operate, and last significantly longer.

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Technology and demonstrated capabilities

CellSwitch™ is Relectrify's game-changing power electronics that replaces the Battery Management System (BMS) and the bi-directional inverter in a conventional battery storage system. CellSwitch is an integrated system that delivers Alternating Current directly from the battery by individually controlling each cell. This cell-level control solves the weakest cell problem, which limits the performance of the system. Eliminating the inverter and BMS, combined with solving the weakest cell problem, means that CellSwitch delivers improvements in longevity, throughput, performance and safety, as well as reducing upfront and operating costs. It is applicable to new/second-life lithium chemistries and alternative battery types. Relectrify has proven its technology in its ReVolve® that combines CellSwitch with second-life EV batteries to store 120kWh+ for C&I applications. Its certification marked the first time that a C&I storage product using cell-level control gained IEC certification.

CellSwitch Benefits:

- Extends battery life/delivers greater financial returns
- Enables higher throughput by <30%
- Achieves greater system uptime
- Ability to manage capacity of system over decades
- Enhances safety by bypassing faulty cells"

Current export market and key customers

Relectrify is headquartered in Melbourne, with staff in Singapore, Thailand, Taiwan, the UK, and the US. In 2023, Nissan (Australia), Chubu Electric Power (Japan), Counties Energy (New Zealand), Dynamic Engineering (US), and American Electric Power (US) are among Relectrify's key customers. Investors in Relectrify include Clean Energy Finance Corporation, Energy Innovation Capital and Toyota Ventures.

Sicona Battery Technologies



Capability

Sicona develops next-generation high-value battery materials technology used in lithium-ion (“Li-ion”) batteries that enable electric mobility and the storage of electrical renewable energy.

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Technology and demonstrated capabilities

Sicona’s mission is to deliver enabling technologies that persistently challenge the standards of battery and battery materials performance and innovation. Sicona does this by producing innovative materials in a scalable, cost-effective way to power a sustainable future. The core product increases the energy density, or the capacity, of modern Li-ion batteries by 50% without requiring any changes in their design or the way they are manufactured, increasing the speed of transition to a sustainable future through electrification at a global scale.

This significantly lowers the cost of battery energy storage, and with a special focus on mobility applications, Sicona helps drive an increase of Electric Vehicle (EV) adoption globally through increased affordability or range.

Conservative calculations estimate over 15Mt of CO₂ savings are attributable to the use of 20ktpa of core product in EV batteries by 2030. That is for just one commercial plant currently in planning. Additionally, a target has been set to reduce the CO₂ footprint of our anode materials production by ~85%.

Specific SDG outcomes are:

- Increased battery energy density (7.3).
- More sustainable use of natural resources (12.2).
- Promoting innovation, scientific research and upgrade of technological capabilities and increasing the number of R&D workers (9.5).

Current export market and key customers

Cell manufacturers focusing on the EV market and Automobil OEMs gain the most benefits from our technology given our distinct cost and scalability advantages for producing silicon-carbon and silicon-carbon-graphite battery anode materials using silicon metal as a key raw material.

SwitchDin



Capability

SwitchDin provides technology to coordinate Distributed Energy Resources (DERs) such as rooftop solar, batteries, EV chargers, and other smart loads, empowering customers to decarbonize at scale and meet net-zero targets.

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Technology and demonstrated capabilities

SwitchDin, a renewable energy SaaS provider, offers a suite of cloud and edge software functions that provide control plane, data plane, and adjunct services to support the growing demands for managing DER (solar, battery, and EV chargers) at scale.

Based on the state-of-the-art Energy-Active Middleware (EAM) reference architecture, SwitchDin offer provides:

- Scalable DER management for network, market, and site applications.
- Integrated control plane (Cloud-Edge Device IoT architecture).
- Efficient data plane at scale. Adjunct services for enhanced functionality.
- Seamless integration with other enterprise systems.
- Enhanced end-to-end reliability and security.
- Compliance with industry standards (for example: IEEE 2030.5).

SwitchDin solutions store excess solar energy for economical use, reducing carbon footprints and energy costs.

They support the decarbonization of large-scale operations and the mass electrification of transportation.

Current export market and key customers

SwitchDin is currently targeting the US, Asia, Central Europe and the UK market, with the main focus on DSOs, Market Participants and Green Enterprises.

Thorion Energy Ltd.



Capability

Thorion Energy specialises in manufacturing cyclone-rated Stand Alone Power Systems (SAPS) and scalable Chloride Vased Vanadium Redox Flow batteries, providing an alternative solution for electricity storage engineered for larger scale applications.

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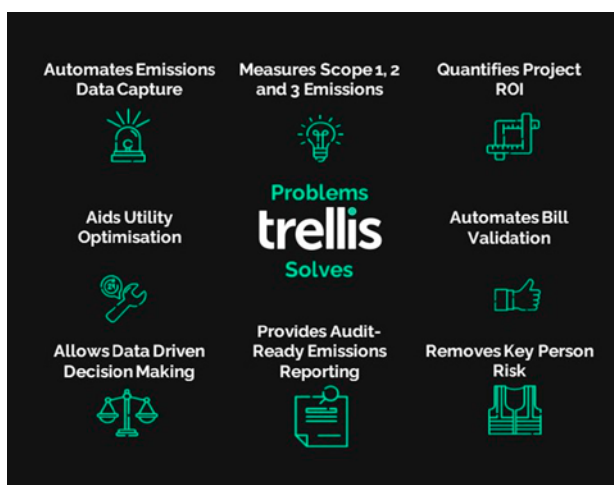
Technology and demonstrated capabilities

Thorion Energy Ltd is an IP development company with licences for the manufacturing and sales of Vanadium Redox Flow Batteries and Chloride Based Electrolyte (GEN III). Thorion Energy designs and builds Stand[1] Alone Power Systems and Battery Energy Storage Systems (BESS). Thorion Energy's Stand-alone Power Systems, fitted with V40 redox flow battery modules, deliver a complete "turn-key" solution for generating and storing electricity off the grid. They are manufactured in Australia and can be customised to suit the operating environment or application. Thorion Energy's V40Vadium Flow Battery Models have a higher energy density than regular Vanadium Redox Flow Batteries on the market. They can hold up to 70% more energy, are more chemically stable, and are noncombustible. This battery technology operates in temperatures between 0oC and 55oC, and the modular design allows clients to integrate additional storage capacity as required. Thorion Energy's Vadium Flow Batteries have a longer operating lifespan than other battery chemistries of up to 20 years with no loss of capacity and can provide an infinite number of charge/discharge cycles. The batteries also offer higher levels of safety because they contain a patented chloride-based aqueous electrolyte that is non-flammable.

Current export market and key customers

Thorion Energy's technology caters to many off-grid applications in the mining sector: bore pumps; exploration camps; mining villages; and ultimately full mine electrification. Vanadium Redox Flow batteries are ideal for remote communities, offshore applications, residential microgrids, community batteries, and to meet specific charging demands of the electric vehicle sector. Thorion Energy is currently establishing export and co-production facilities in India and Vietnam.

Trellis Technologies Pty Ltd



Capability

Trellis uses machine learning to simplify and automate the audit-ready data capture of Scope 1, 2 and 3 emissions.

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Technology and demonstrated capabilities

Trellis Technologies builds environmental software solutions based on customer feedback and legislative developments. Carbon accounting and utilities optimisation are at the core of our software services, which assist organisations to process, validate and interpret mixed format data.

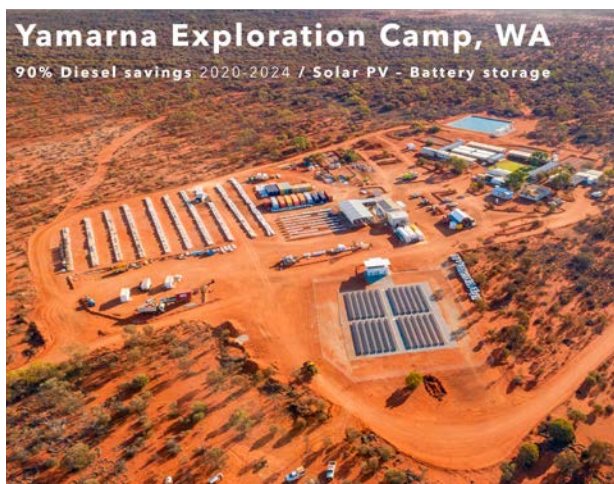
Trellis offers:

- A streamlined and audit ready way to measure and report on organisational greenhouse gas emissions.
- An innovative, software platform, Trellis, which utilises machine learning to process and interpret data.
- A proven track record of scalability with the ability to manage large data volumes across complex organisations.
- An intimate understanding of environmental and sustainability legislation and standards. Trellis retains former technical NGER Act auditors with the Clean Energy Regulator (CER) and currently registered Technical Consultants under the Commonwealth Government's Climate Active program on staff.
- An Australian company with data securely stored and encrypted within Australia.
- A customer driven support team with extensive experience in supporting organisations covering more than 14 industries.

Current export market and key customers

Trellis is currently serving organisations in and across Australia and New Zealand. As a software service, Trellis' product is easy to adapt to different jurisdictions. Trellis welcome any and all conversations regarding an expansion to our geographical reach.

Unlimited Energy Australia



Capability

Unlimited Energy are industry leaders in the design and delivery of renewable energy systems and decarbonisation solutions. Their award-winning solutions deliver cost-effectiveness, energy efficiency, reliability, and the highest safety standards.

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Technology and demonstrated capabilities

Unlimited Energy (UE) have extensive experience in renewable energy technology, design, and implementation. With award winning projects and a proven record of innovative and cost-effective results, we provide reliable turn-key solutions to meet each projects unique energy requirements. The Company's areas of expertise include:

- Renewable energy project scoping.
- Business case development.
- Decarbonisation modelling and strategy facilitating the realisation of net zero emissions targets.
- Energy monitoring and analysis.
- Design and deployment of off-grid/remote/hybrid energy systems.
- Turn-key design, procurement, and project management.
- Smart energy management.
- Feasibility studies detailing return on investment (ROI).

Unlimited Energy supports their clients in their transition to clean energy to meet decarbonisation and net zero targets. Below is a small selection of their projects which have achieved exceptional outcomes:

Mining Camp – Finalist in the international Smarter E Award Outstanding Projects category

Agricultural Farm – Winner of the international Smarter E Award Outstanding Projects category

Brewery – First in Australia certified fully sustainable and carbon neutral.

Current export market and key customers

Unlimited Energy specialises in the design and delivery of renewable energy solutions for off-grid remote locations in all industries, within Australia and overseas. Their clients include: Gold Road Resources Limited, Monash University, Rocky Ridge Brewery and Rio Tinto.

Vaulta (Vaulta Operations Pty Ltd)



Capability

Vaulta's leading capability lies in innovative battery solutions, sustainability and efficiency. With patented technology eliminating battery waste, they excel in renewable energy and stationary storage.

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Technology and demonstrated capabilities

Vaulta was founded by Dominic Spooner with the vision to make an impact and change in renewable energy and battery technology, with patented solutions that aim to eradicate waste, make stationary storage and commercial battery use more efficient, cost-friendly and sustainable. Serving residential, commercial, and industrial sectors, our tailored solutions merge cutting-edge technology with environmental responsibility.

What truly sets Vaulta apart is our dedication to sustainability. By offering eco-friendly reusable and recyclable energy storage solutions, Vaulta empowers empower customers to embrace green practices while benefiting from advanced technology. Whether you're a homeowner looking to trim energy costs or a business aiming to bolster sustainability efforts, Vaulta has the solution.

Vaulta's customer-centric approach ensures each solution meets unique needs and specifications.

Explore their product range to discover how Vaulta's innovative battery technology can transform your energy storage experience, driving efficiency and contributing to a greener, more sustainable future.

Current export market and key customers

Vaulta's envisioned export market includes regions embracing renewable energy and sustainability, with a focus on neighbouring countries such as New Zealand and countries in Oceania, and soon South Africa, UK, Europe and North America. The Company's key customers are residential and commercial sectors seeking eco-friendly energy storage solutions.

Village Energy



Capability

Village Energy provides leading technology to create visibility, control and optimisation of behind-the-meter energy assets.

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Technology and demonstrated capabilities

Village Energy delivers the cheapest energy capacity to utilities through world-class technology that provides visibility, control, and optimization of behind-the-meter energy assets such as rooftop solar, batteries, air conditioners, hot water, and EVs.

Village Energy is unique because they optimize multiple energy assets and create a digital engagement platform that reduces soft costs of acquiring, onboarding, engaging, and supporting end consumers and their assets. The company automates sustainability and energy savings using artificial intelligence to help consumers adapt their behaviour and optimize their assets.

Village Energy provides a platform that enables utilities and commercial customers to gain granular control of energy assets. Our mobile app enrolls local energy resources, unlocking a richer relationship with utilities while maintaining control and empowerment. Their smart IoT devices connect to local energy resources, battery inverters, and smart home appliances, integrating with Village Energy's cloud platform and mobile app for remote monitoring and control.

Village Energy also integrate with third-party devices like smart plugs and thermostats. They offer a platform to optimize distributed energy resources, leveraging data and customer choices to lower costs and improve system performance.

Current export market and key customers

Village Energy operates in South and Southeast Asia, including India, Indonesia, and Vietnam. Key customers include tier 1 state-owned electricity utilities, government-owned and private gentailers and retailers, and commercial customers. The company works with implementation partners and installers in different regions.

VSUN Energy



Capability

VSUN Energy provides expertise in vanadium flow battery technology. The company designs, installs and maintains fully-integrated solutions for long duration energy storage based on vanadium flow batteries, and provide local content through an Australian source of vanadium electrolyte.

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Technology and demonstrated capabilities

VSUN Energy has unrivalled expertise in vanadium flow battery technology in Australia.

The company provides a fully-integrated renewable energy solution utilising vanadium flow batteries at its core.

Systems range from kWh to MWh sizing.

The company is also able to supply vanadium electrolyte from its manufacturing facility in Western Australia.

The high purity electrolyte is able to be used in vanadium flow battery (VFB) products from a variety of international OEMs.

Vanadium flow batteries provide long-duration, stable energy storage. They have a 20+ year lifespan with minimal degradation in performance over virtually unlimited cycles and are non-flammable.

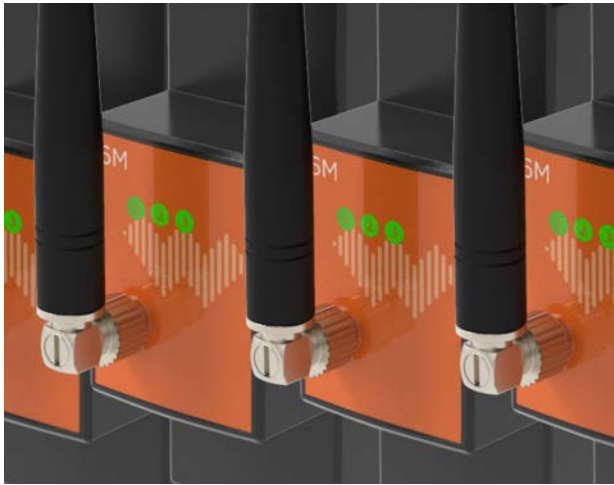
Warranty constraints in operation, as is seen in other storage technologies, are not an issue with VFBs.

At the end of the battery's life, the vanadium electrolyte can either be reused, or the vanadium can be recovered for use in a different application.

Current export market and key customers

VSUN Energy is able to supply vanadium electrolyte to customers across the Asia-Pacific region. Key customers are in the mining and utility industry.

Wattwatchers Digital Energy



Capability

Wattwatchers enables real-time and scalable solutions - to monitor, analyse and control energy circuits. Maximising the economic, social and environmental benefits from renewable electricity, sustainable buildings, and energy & carbon management.

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Technology and demonstrated capabilities

Wattwatchers' digital energy solutions are highly flexible, crossing over for residential, commercial and industrial, and utility use cases, including: demand flexibility; consumer (distributed) energy resources (CER/DER); home energy management systems (HEMS); Net Zero/decarbonisation; sustainability/ESG; energy-as-a-service; electrification and EV charging management.

Wattwatcher's achievements include: My Energy Marketplace, a world-leading secure and ethical customer data platform with 5100 + highly-granular household, small business, strata, community facility and school datasets; MyTown Microgrid, an innovative data-driven model for local energy solutions in communities now being adapted as an engagement and solution development model for network businesses.

Highly secure real-time energy IoT device stack including hardware, communication, dashboards and apps.

Examples of current and emerging use cases include supporting Net Zero decarbonisation for Scope 2 and Scope 3 emission reductions; monitoring for sustainable building ratings such as GRESB, internationally, and NABERS and Green Star in Australia; energy efficiency, load control and demand management; solar performance, export control and power purchase agreement billing; and augmenting built environment electrification and EV charging installations.

Current export market and key customers

Wattwatchers is currently exporting to EU, UK, Africa, Asia. The company's solutions are essential parts of the global energy transition to a net zero future.

ZekiTek Pty Ltd



Capability

ZekiTek specialises in pioneering green energy solutions, offering localized energy infrastructure and systems engineered to generate and store clean, affordable, accessible, and dependable electricity.

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Technology and demonstrated capabilities

ZekiTek's innovative clean power generation technology ensures that green energy is within reach for all, regardless of location. Urgency surrounds the global need for clean energy, and our world-leading integrated renewable energy generation and charging system is poised to meet this demand. By offering affordable, accessible, and reliable power solutions, they facilitate the transition to a net-zero emissions future by 2050.

Zekitek's technology is highly scalable, capable of providing power solutions. In remote areas, our adaptable generators autonomously produce and store energy, while in urban settings, they seamlessly integrate with existing grids or operate independently. Engineered for durability, our generators and batteries demonstrate exceptional longevity even in the harshest environmental conditions, ensuring sustained performance over extended periods.

ZekiTek's unique advantage stems from its emphasis on high mobility, scalability, and stable energy storage solutions. Additionally, the incorporation of swappable electrical components and a cloud-based remote access system facilitates streamlined maintenance processes, enhancing efficiency and ease of use for operators.

Current export market and key customers

ZekiTek's market and customers primarily include electricity retailers, telecommunications companies, local council and government departments seeking reliable and sustainable energy solutions in Australia and Fiji.

Solar



Using the power of the sun's rays to produce electricity is an Australian led clean energy innovation.

Australian experts invented the photovoltaic technology (PV) used in more than 90 percent of the world's solar panels¹⁷, and we have an established record as global leaders in solar innovation, with nearly 10,000 new solar patents registered between 2000 and 2021¹⁸. Today Australian governments, researchers and industry continue to work in partnership to develop and bring to market new technologies to advance solar applications and efficiencies, with Future Made in Australia supporting the Solar Sunshot program to build domestic solar PV manufacturing capabilities¹⁹.

The Australian Government is backing Australia's solar PV manufacturing industry through its Solar Sunshot program. The Solar Sunshot program will support manufacturers to establish and grow facilities in Australia across the solar PV supply chain²⁰.

Australia's national science agency CSIRO²¹ and the Australian Centre for Advanced Photovoltaics are also working with Australian companies to advance cutting edge solar innovations. This work is being complemented by funding through ARENA, which is supporting research and development projects for ultra low-cost solar²², with an ambition to produce solar energy at one quarter of the current price.

As a nation with more sunshine than any other continent (around 58 million petajoules a year) Australians are also world leaders in the use of rooftop solar energy.

More than one in three Australian households have rooftop solar PV panels, with a combined capacity exceeding 11 GW and contributing around 10 per cent of the nation's electricity.

Large scale solar farms are also on the rise in Australia, with almost 7 GW of generation connected to Australia's electricity grid²³.

This immense capacity to produce renewable energy from the sun provides a strong base to support the development of other clean energy industries, including battery storage and hydrogen production, as Australia works to realise its renewable energy superpower ambition²⁴.

Australia's leadership in research and development in solar PV technology is making a bright future for this versatile and scalable form of renewable energy.

Alpha Solar Technologies Pty Ltd



Capability

Alpha Solar Tech's groundbreaking technologies produce the most efficient and aesthetic Building Integrated Photovoltaic (BIPV) modules in the world, and can turn highrises and urban structures to vertical solar farms.

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Technology and demonstrated capabilities

Alpha Solar Tech (AST)'s Building-Integrated Photovoltaic (BIPV) technology, driven by patented microprinting processes, effortlessly integrates into structures.

Beyond aesthetics, these modules can replace or cover existing materials while delivering an impressive electrical output of up to 200W/m².

Explore the possibilities of seamless solar integration with our innovative microprinted technology, allowing you to achieve any desired finish on the solar surface.

Explore the future of solar integration with our Building Integrated Photovoltaics (BIPV) – solar panels ingeniously concealed as building materials. Powered by our advanced Nano-Layered Micro-Patterned (NLMP) technology, BIPV modules emulate textures such as limestone or wood.

Whether as replacements for traditional materials or seamless additions to existing structures, AST's microprinted ceramic surfaces allow 80% to 95% sunlight transmission, optimizing energy conversion with unmatched efficiency.

Current export market and key customers

AST is targeting expansion into Japan, North America (USA and Canada), Europe, the Middle East, and European markets. Current key clients include Nippon Steel Trading (Japan), White Aluminium (Abu Dhabi-UAE), Jazzah Aluminum Factory Co. (Riyadh-KSA), Eco Solar Tiles (Western Australia), Kuwait College of Science and Technology (Kuwait), and Fang Da Group (China).

Arche Energy



ARCHÉ

Capability

Since 2017, we have been providing technical-commercial advisory services to the investment community as it develops and executes clean energy, power generation and infrastructure projects.

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Technology and demonstrated capabilities

Arche has experience with most energy and related technologies: renewable and traditional generation, batteries, gas turbines, pyrolysis, hydrogen and ammonia, waste to energy, transmission, gasfields and pipelines, and carbon capture use and storage.

Arche's services span the whole of the energy business – from the fundamental physics that drives value creation, through the value chain and cashflow cycles, and ultimately to the payment of dividends to investors.

Arche provides clients with fearless advice from physics to dividend on:

- entry into the Australian market for their services or technologies
- technical and economic advice on using or investing in new or complex technologies
- energy and decarbonisation solutions for their business
- connections with projects to invest in or investors for their projects
- pre-investment due diligence reviews on projects or technologies.
- experienced project development professionals.

Arche also advise on other infrastructure such as transport and water, and logistics, contracting strategies and major project execution.

Current export market and key customers

Arche operate throughout Australia with some presence in New Zealand. Arche have a strong vision to enter the Latin American market. Key customers are project developers to whom we provide ongoing services, including managing development approvals.

ClearVue Technologies



Capability

ClearVue Technologies is a global supplier of building integrated photovoltaics including unique energy-generating clear solar glass, used in building and construction, agriculture, and other sectors.

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Technology and demonstrated capabilities

ClearVue Technologies Limited is an Australian technology company that operates in the Building Integrated Photovoltaic sector which integrates solar technology into building surfaces, specifically glass and building façades, to provide renewable energy. ClearVue has developed a unique advanced glass technology that preserves glass transparency whilst generating electricity. Solar PV cells are incorporated around the edges of an Insulated Glass Unit, and the lamination interlayer between the glass incorporates ClearVue's patented proprietary nano and micro particles.

ClearVue's solar glass units have a variety of applications in the building and construction industry, agriculture, and public infrastructure. Our product line includes energy-generating IGUs, integrated solar façade solutions, greenhouse solar glass, and autonomous self-illuminating signage and public infrastructure products. All these solutions are commercially available and are in the process of obtaining certifications and approvals.

Some of the projects utilising ClearVue solar glass include Murdoch University Greenhouse, Australia (2021), Aqua Ignis Sendai Greenhouse, Japan (2021), and the Warwick Grove Shopping Centre, Australia (2019), CFMEU Training Centre, Australia (2024).

Current export market and key customers

ClearVue Technologies has a geographic presence in the US, European and UK markets, with the company experiencing elevated levels of interest from the ASEAN and MENA regions. ClearVue Technologies has expressions of interest from a broad range of industry verticals including public infrastructure, government facilities, agriculture, residential and façade markets.

ITP Renewables



Capability

ITP Renewables is Australia's longest running clean energy consultancy, with over 40 years advising clients across the government, not-for-profit and private sectors – from concept design to project implementation.

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Technology and demonstrated capabilities

ITP Renewables works with our partners and clients through all stages of a project, at any scale. For private-sector energy users, we help our clients lower their energy costs and emissions, delivering clear advice on the financial viability of their project plans. In our work with the public sector, we help government agencies reduce their emissions, implement new policies, and achieve their renewable energy targets. For builders and investors, ITP identifies opportunities and understand investment risks others may have missed.

ITP's two decades of experience, insight, rigour, and speed of delivery on projects across Australia and the Pacific are industry-leading, and we understand the unique constraints of operating in remote environments.

Services offered:

- Providing policy or project recommendations to deliver cost-saving pathways to reaching emissions targets.
- Advising governments and corporate clients on ensuring their policies result in implementing best practice programs and projects.
- Client-side project engineering support: feasibility studies, technical specifications, procurement support, construction supervision.
- Detailed design engineering and network modelling.
- Technical due diligence.

Current export market and key customers

With a special focus on bringing affordable renewable energy infrastructure to island nations, ITP Renewables has delivered over 2500 projects in more than 150 countries, with partners including the World Bank, DFAT and the New Zealand Ministry of Foreign Affairs and Trade.

Kardinia Energy



Capability

Kardinia Energy is a sustainable solar energy company that manufactures Printed Solar, a breakthrough energy disruptor technology that is non-silicon based, delivering a low-cost, fully recyclable, renewable energy solution.

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Technology and demonstrated capabilities

Low cost of energy generation

- Printed Solar generates energy sufficient to payback capital cost within 1 - 2 years.
- Printed Solar will have expected cost of generation (LCOE) <AUD\$0.10/kWh.
- Energy is consumed where installed, no need for expensive distribution network.

Lightweight, flexible & robust

- Printed Solar is lightweight - 300 grams m² versus silicon solar panel 15 – 20 kg m².
- Has specific energy generation to weight ratio of 133W/kg Vs Silicon PV 17W/kg – 60W/kg (lite).
- Inexpensive to install without ancillary structural support.
- Balance of system includes industry standard cabling, inverter and battery (only if required).

100% Recyclable

- All materials are recyclable at low cost using our proprietary recycling technology.
- Printed Solar is the epitome of energy generation within the circular economy.

Current export market and key customers

Having successfully conducted 4 separate real-world trials that confirm Printed Solar exceeds minimum commercial performance standards, Kardinia Energy is building the first large scale manufacturing plant in Newcastle, NSW, Australia with production of our first generation (1G) Printed Solar product to commence in 2025. Kardinia Energy will explore global manufacturing and distribution arrangements in 2024.

Soltaro



Capability

Starting in Australia back in 2016, Soltaro has been focussed on developing software and technology that will transform the way we use and store energy with intelligent and innovative solutions.

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Technology and demonstrated capabilities

Soltaro aims to revolutionise the energy storage market through innovation, design, smart software and flexibility. Their evolving technology gives home and businesses the best in sustainable energy saving and storage with an affordable price tag, providing smart energy storage solutions.

Soltaro designs all the components & software ourselves to work seamlessly alongside our intelligent software which encourages you to adopt energy saving habits - ultimately getting more from your battery and lowering energy bills.

Battery Storage

The AIO2 is a combination of battery, inverter, BMS and intelligent software. DC or AC coupled, on or off grid. Blackout protection or expandable storage.

ASHP

The all-in-one design has no secondary exterior unit. Integral smart software allows you to use excess solar to power the unit ensuring efficiency.

EV Charger

The Soltaro EV charger powers your electric vehicle and the charge rate increases when you use excess solar.

Air Conditioning

Split Air Conditioning with smart software allowing you to use excess solar for super low energy bills.

Current export market and key customers

In addition to our base in Australia, Soltaro exports to the Netherlands, Spain, New Zealand, UK and Ireland. Other markets have been identified within mainland Europe and South Africa. Soltaro's key customers are a mix of retailers, energy companies and installers, in addition to end users.

Specialised Solutions



SPECIALISED SOLUTIONS

Capability

Specialised Solutions designs, fabricates, and installs innovative renewable energy infrastructure, including solar furniture, canopies, switchrooms, and battery enclosures, paving the way for comprehensive energy solutions.

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Technology and demonstrated capabilities

Specialised Solutions stands out in renewable energy, excelling in the design, construction, and installation of sustainable infrastructure.

Their renowned patented solar canopies, from small-scale to utility-grade projects, generate clean energy and optimise space for diverse applications like parking lots and industrial facilities. A unique selling point is their expertise in fabricating switchrooms and battery enclosures, providing tailored, robust solutions.

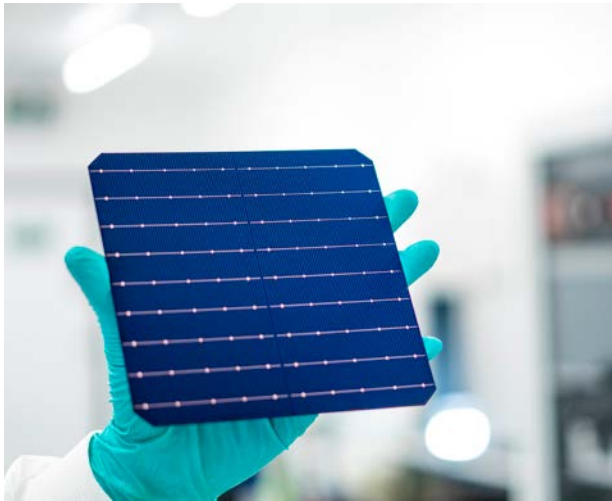
Committed to innovation and sustainability, they continuously push the boundaries of renewable energy infrastructure. They have developed Smart Solar Furniture for smart city strategies and remote connectivity.

Their comprehensive services, from project management to installation, ensure end-to-end solutions that deliver lasting value. With a proven track record of successful projects and a forward-thinking approach, Specialised Solutions is a trusted partner for reliable, efficient, and sustainable energy solutions.

Current export market and key customers

Specialised Solutions is currently exporting limited products to New Zealand and USA, with opportunities identified in Europe and the Middle East across a range of public realm authorities and developers. Specialised Solutions is looking to grow its manufacture under license opportunities.

SunDrive Solar



Capability

SunDrive's world-record breaking technology reduces the cost and enhances the performance and sustainability of high-efficiency solar cells by replacing silver with copper, a more abundant, cheaper and efficient material.

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Technology and demonstrated capabilities

SunDrive's breakthrough solar cell technology replaces the silver paste used in solar cells with copper – a more abundant, cheaper, and efficient material.

SunDrive was founded in 2015 and the company has rapidly grown from a University of New South Wales PhD project to producing the world's most efficient commercial-sized solar cell.

About 1% of the world's energy today comes from solar. To meet net zero, that's expected to grow to more than 50%. However, the scarcity and cost of silver poses an existential threat to this growth, and as solar cells get more efficient, they typically consume even more silver. SunDrive's breakthrough technology solves for this with our pure copper cells.

Compared to silver, copper is 1000 times more abundant, 100 times cheaper, higher performing, 90% less emissions intensive, and more easily recyclable.

SunDrive's technology advantages include:

- High cell efficiency for maximised power conversion
- Superior temperature coefficient, delivering resilient performance in varied climates
- Bi-facial technology harnesses more sunlight to enhance power output
- Long-lasting power and low degradation for prolonged performance, increased lifespan and reduced maintenance costs.

Current export market and key customers

SunDrive will sell modules to customers in limited quantities from Q3 2024, with greater capacity coming online from mid-2025. SunDrive's technology will deliver more energy to customers across rooftop (residential, commercial & industrial) and utility installations.

Sunrise CSP Pty Ltd



Capability

Sunrise CSP is a change maker in the domain of concentrated solar thermal solutions. We deliver solutions that achieve a superior return-on-investment, operational excellence and sustainability.

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Technology and demonstrated capabilities

Sunrise CSP creates solar thermal solutions that provide our customers with a superior return on investment. We help our customers cost-effectively decarbonise their business by eliminating greenhouse gases and other harmful emissions.

Our unique concentrated solar energy technology can supply the heat of the sun for a diverse range of low to ultra-high temperature industrial applications including power generation, hydrogen and fuel production, materials manufacture, district heating & cooling and the processing of food, materials, waste or water purification.

Our core technology is the world's highest performance solar concentrator – the Big Dish, which can produce heat at temperatures from 150°C to more than 1,700°C. The Big Dish can be deployed with our heat storage & transfer system, SUMO, or hybridised with a customer's existing boilers, to deliver cost efficient industrial heat on-demand and at any time of day.

Current export market and key customers

India - Sunrise CSP India delivers thermal energy solutions throughout the Indian subcontinental region.

Cyprus - Sunrise CSP International, focussing on business development in the Mediterranean, Middle East & North Africa regions.

Developing opportunities in Brazil, China, Cyprus, Saudi Arabia and South Africa.

Tindo Operations Co Pty Ltd



Capability

Tindo designs, engineers and manufactures premium solar photovoltaic modules with a commitment to zero-defect advanced manufacturing processes, integrating cutting-edge robotics, artificial intelligence, and human expertise.

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Technology and demonstrated capabilities

Tindo designs, engineers and manufactures premium quality solar photovoltaic modules from its advanced manufacturing facility in South Australia with automated control at every stage of manufacture. With a focus on zero-defect and waste reduction, the company uniquely combines robotics, AI and human capabilities to produce a quality product that competes with the world's best panels on price and performance. Each Tindo Panel is subjected to robust quality assurance testing, passing through multiple quality check-points before being approved for sale.

Founded in 2010, the company was born from a desire to craft a high quality solar panel, purpose built to conquer the challenging variety of conditions the Australian climate is known for. Today, Tindo directly employs over 65 staff in its Adelaide head office and factory and indirectly supports employment in other industries with its national and international distribution channels.

Tindo has built a reputation for exceptional quality and unwavering performance. Tindo's product is a testament to their relentless commitment to excellence. Independently tested, Tindo panels are consistent frontrunners in the market, producing high energy outputs and maintaining this peak performance throughout their lifespan.

Current export market and key customers

Tindo is currently exporting products to countries in Oceania and South-East Asia, with further opportunities in North America. Tindo products are distributed through an extensive network of trusted partners, and collaborations with corporations and government entities on a range of projects from residential to large-scale commercial projects and solar farms.

Vast Energy



Capability

Vast is a world leader in concentrated solar thermal power - capturing the sun's energy and using thermal energy storage to deliver clean, dispatchable energy for utility-scale electricity generation, green fuels and industrial heat processes.

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Technology and demonstrated capabilities

The International Energy Agency has forecast Concentrating Solar Thermal Power (CSP) installations to grow by up to 62 times by 2050 as a core technology to deliver long duration storage required to meet emissions reduction targets globally. Vast's modular CSP v3.0 technology is the next generation of CSP, with core learnings from the reliability and modularity of parabolic trough and the efficiencies of monolithic tower brought together to provide a cost effective and efficient renewable technology.

Vast's modular CSP has been proven at its 1.1MW grid synchronised demonstration plant in western NSW. VS1, a utility-scale project in Port Augusta SA, will provide low-cost dispatchable renewable electricity and heat. SM1, a co-located solar methanol plant, will capitalise on the industrial heat generated by VS1 to produce green methanol, demonstrating an alternate green fuel source for sectors such as shipping.

Vast has a pipeline of demonstration and commercial scale plants secured and in development across sunbelt countries internationally, including Australia, the United States, the Middle East, Africa and South America. These projects cover applications ranging from off-grid continuous renewable electricity supply, hydrogen and green fuels production, and industrial heat.

Current export market and key customers

Vast's CSP v3.0 technology offers a long duration, fully dispatchable, low-cost and zero-carbon energy source. The pioneering technology can provide round the clock energy as both electricity and industrial heat into on- and off-grid decarbonisation, next generation hydrogen and green fuels production, and hard to abate industrial process heat applications.

Worley



Capability

Worley is a professional services company of energy, chemicals and resources experts helping our customers shift their operations towards a more sustainable future.

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Technology and demonstrated capabilities

To make sustainable transformation a reality, Worley is transitioning from an engineering partner in energy, chemicals, and resources to a solutions provider, leading partners and societies to a more sustainable future. To do this, we're using our experience to help accelerate our customers' transitions by delivering integrated solutions across our traditional, transitional, and sustainable pathways. Worley work closely with our customers at every stage of their project: from initial concepts to sustaining and enhancing their assets through the integration of new technologies. We turn concepts into realities, blueprints into assets, and ideas into energy. We understand the complexities of the energy transition and have been involved in thousands of low-carbon energy projects around the world.

Worley's expertise covers decarbonisation opportunities, such as renewable energy, nuclear power, and hydrogen, low-carbon fuels and carbon capture, storage and sequestration. Worley focus on the end-use application of our clients in the mineral, mining and metals sector, but also chemicals and power industries. Worley embrace the underlying change of our energy systems, fundamental and unavoidable for a sustainable future. The Company focus on providing low carbon solutions that optimize assets and make operations as reliable and cost-effective as possible.

Current export market and key customers

Worley employs over 50,000 people, all driven by a common purpose, delivering a more sustainable world. The Company's past plays an important role in our future. Worley uses their experience to accelerate their customers' transitions by delivering integrated solutions across energy, chemicals and resources markets through traditional, transitional and sustainable pathways.

Wave



Energy from the ocean – wave, tidal and ocean thermal – has the potential to play a pivotal role in the future global energy landscape.

This form of clean energy production is unrelenting and regular, delivered 24 hours a day, seven days a week.

While still at an early stage of commercialisation²⁵, there is significant international interest in the power of waves, swells and tides, with the 2023 IEA-OES international ocean energy roadmap forecasting a potential global capacity of 300GW by 2050²⁶. Australia's national science agency CSIRO predicts that wave energy generation could contribute as much as 11% of Australia's national power supply by 2050.

Globally more than 200 wave energy devices are in various stages of testing and demonstration²⁷.

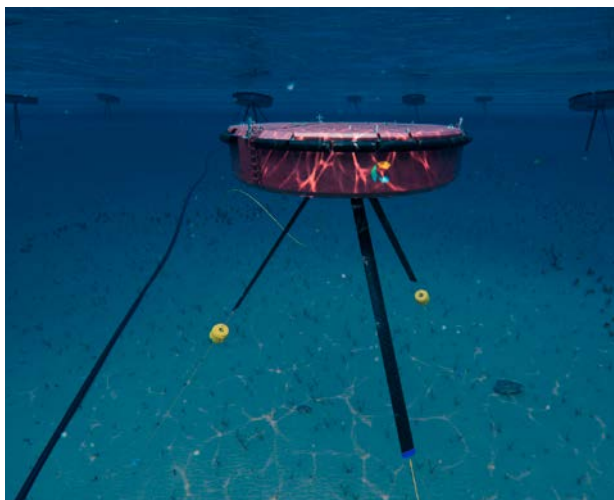
These technologies are spread across various stages of technology development, ranging from concepts to grid-connected pilot plants.

In Australia coastal scientists and engineers are working together to advance wave energy. Australian companies are developing and testing wave conversion technologies, including point absorbers, attenuators, and terminators.

They have developed platform agnostic technologies which foster complementary applications, allowing wave energy devices to be deployed at different locations and depths offshore.

This work can support Australia in taking advantage of the immense power of strong winds and large ocean swells along its vast southern and western coastlines²⁸.

Carnegie Clean Energy



Capability

Carnegie Clean Energy (ASX:CCE) is a wave energy technology company providing CETO and MoorPower wave energy products to support global clean renewable energy requirements and enable a Just Transition to a clean economy.

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Technology and demonstrated capabilities

Carnegie is a leader in wave energy with over 10 years of wave energy product development including tank testing, rapid small-scale prototyping and large commercial scale prototypes and arrays. Carnegie is the owner and developer of the CETO and MoorPower technologies, which capture energy from ocean waves and convert it into electricity. The latest advances in artificial intelligence and electric machines are used to optimally control the devices and efficiently generate electricity.

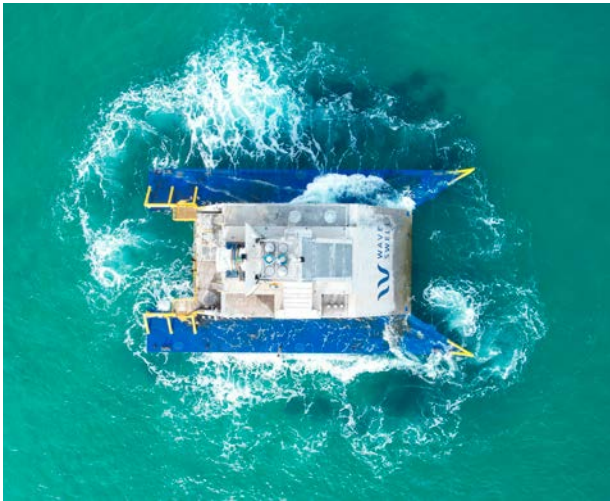
Named after a Greek sea goddess, CETO offers the potential to revolutionise renewable power production globally. CETO harnesses the enormous untapped energy present in ocean waves and converts it into grid-ready electricity. CETO is a unique, fully submerged, point absorber type wave energy technology. A submerged buoy sits a few metres below the surface of the ocean and moves with the ocean's waves. This orbital motion drives a power take-off (PTO) system that converts this motion into electricity.

MoorPower incorporates core aspects of Carnegie's CETO technology and know-how into a novel wave converter system for offshore energy demand applications. The first market for this product is aquaculture barges and vessels that require energy for electrical loads operating offshore and replaces the diesel generation that would otherwise be required.

Current export market and key customers

The CETO and MoorPower export markets are distributed across the world in locations with sufficient wave energy resources; current target markets include Europe, the US and remote islands. Key customers for CETO and MoorPower include large grid connected utilities, remote and island microgrids and offshore demand markets such as aquaculture.

Wave Swell Energy



Capability

Wave Swell Energy has developed a unique technology to convert energy in ocean waves into electricity in a commercially viable manner. The technology has demonstrated an industry high wave-to-electricity conversion efficiency of 50%.

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www.waveswell.com

Technology and demonstrated capabilities

Wave Swell Energy (WSE) has demonstrated its technology in ocean conditions for over two years at King Island in Bass Strait. The project demonstrated an industry-high wave-to-electricity conversion efficiency of 50%. WSE's technology has no moving parts in or below the water, ensuring safe access, low operating costs, high reliability, and no negative impact on the marine environment.

WSE's core technology is platform agnostic, meaning the technology can be deployed in fixed and floating platforms, both near and offshore. It can also be deployed in breakwaters and seawalls, not only generating clean and emissions free electricity, but also providing an annuity revenue stream to help offset an otherwise significant sunk cost.

Energy generated by the WSE technology is uncorrelated with wind and solar, allowing it to fill in the intermittent gaps in generation, thereby significantly reducing the requirement for energy storage. CSIRO has independently confirmed WSE's technology can significantly reduce the requirement for energy storage when incorporated in a hybrid renewable mix.

WSE collaborated with the US Department of Energy (DoE) during the King Island demonstration. Both the DoE and Australian Maritime College have independently validated the conversion efficiency of the technology. WSE continues to collaborate with the DoE regarding the potential deployment of its technology on US coastlines.

Current export market and key customers

Wave energy is abundant globally, and WSE's technology is suitable for electricity generation both near and offshore, and for both main and autonomous grids. WSE engages partners globally to identify opportunities for its technology to serve utilities, onshore and offshore industrial enterprises, and small island nations.

Wind



Wind is at the heart of Australia's energy transformation.

Australia's abundant and high-quality onshore and offshore wind resources hold the promise of a new source of reliable, affordable, renewable energy to power a global net zero future.

At over 10 GW of capacity, Australia is already among the top 15 wind energy producers in the world²⁹, and the future potential for further onshore and offshore wind development is vast.

More than 10 per cent of Australia's electricity generation comes from onshore wind³⁰, with capabilities ranging from single turbines to farms of up to 1300 MW under construction³¹.

A network of developers, technical specialists and advisory firms is focused on wind energy production, innovation, and engineering. Australian technology and service firms are specialists in the onshore installation, early fault detection, and maintenance of wind energy infrastructure.

Australia's expertise in the design, monitoring, and modelling of onshore wind farm projects, including comprehensive community engagement processes, will continue to see strong growth in the onshore wind industry.

Excellent wind resources close to population centres along Australia's coastal regions also offer exciting opportunities for offshore wind production³². To take advantage of this opportunity, the Australian Government is assessing 6 priority geographical areas for development.

Australian engineering and service organisations are looking to transfer their extensive experience and expertise in large-scale subsea oil and gas projects, and their long, successful history in marine construction, to support building this new offshore wind industry and to capture future global wind opportunities.

These specialised services include seabed survey and geological analysis, environmental impact assessment, marine construction, subsea cable installation, substations, and vessel supply.

The Australian Government's emphasis on consultation with community and industry, as well as robust environmental assessments and approvals, will ensure that future development of Australia's wind industry will deliver strong economic, environmental, and social benefits. It will also ensure our companies adhere to strong standards and adopt best practice approaches, which others can draw on internationally³³.

Camco Engineering



Capability

Large, vertically integrated Australian manufacturing facility with proven experience in the manufacture of Tower Anchor Cages. Experienced wind turbine maintenance fitters providing mechanical support and gearbox rebuilds. Rope access (Irata).

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Technology and demonstrated capabilities

Camco Engineering provide manufacturing, maintenance and refurbishment services to key industrial businesses in the Energy, Mining, Defence and Power generation industries.

Camco is a key service provider and manufacturer to OEM's and end users alike. Camco delivers quality reliable manufacturing to specification to the most demanding clients. Demonstrated strengths are physical size of operations (100 tonne overhead cranes) and the capacity to deliver quality assured works on time.

Camco Engineering is one of Australia's most comprehensive vertically integrated mechanical engineering facilities comprised of a huge machine-shop, heavy fabrication, corrosion resistant alloy welding facility, mechanical fitting and assembly facilities. Painting facilities and engineering support teams. All disciplines and more are provided within one reliable business out of Western Australia.

Current export market and key customers

Camco facilities service - Mining, Oil & Gas, Defence, Power generation, Renewable industries both end users and associated OEM's. Camco service the Australasian market and have the capacity to export products.

Entura



Capability

Entura is one of the world's most experienced specialist power and water consulting firms, working with asset owners and developers to achieve renewable energy outcomes.

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Technology and demonstrated capabilities

From strategy, planning, design and construction through to operation, maintenance, risk management and training, Entura creates safe and sustainable power and water solutions that make a positive and enduring contribution to our clients and communities. Due to Entura's unique asset-owner heritage, their technical expertise is grounded in more than 100 years of experience contributing to the development, operation and maintenance of renewable energy and water infrastructure.

Entura has first-hand insights and a deep understanding of the real-life pressures that asset owners face. Their clients trust them to deliver practical and commercially sound solutions across the whole lifecycle of their assets, helping them to manage risks and achieve valuable outcomes. Entura does this with integrity in an environmentally and socially responsible manner, and with one purpose: to empower people and communities with clean energy.

Entura shares our expertise through the Entura clean energy and water institute (ECEWI), which offers short courses and customised training programs to build skills and capacity in clean energy and water infrastructure throughout our regions.

Entura has a wealth of experience in other renewable energy technologies, such as wind, solar and hybrid systems, on- and off-grid. Entura is also one of the leaders in storage solutions including pumped hydro and large-scale battery energy storage.

Current export market and key customers

Entura has offices in Hobart, Melbourne, Adelaide and Delhi (India) and focuses on South-East Asia, South Asia, the Pacific and Australia. Their power experience spans the Indo-Pacific region – and the diversity and expertise of our people ensure that our solutions are always fit for purpose.

eologix-ping



Capability

eologix-ping specializes in continuous blade health monitoring, offering operators versatile sensor technology for accurate, permanent monitoring to enhance turbine performance and make data-driven decisions globally.

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Technology and demonstrated capabilities

At eologix-ping, their commitment to revolutionizing wind energy is evident through their continuous blade health monitoring solutions.

Dedicated to ensuring the optimal performance of wind turbines, their advanced sensor systems, driven by cutting-edge technology, detect issues such as icing, blade damage, and lightning strikes. This empowers wind turbine operators with the data they need for informed decisions, ensuring their turbines operate at their best.

Whether customers are setting up new turbines or upgrading existing ones, their solutions seamlessly integrate, maximizing turbine performance and providing operators with peace of mind.

As they actively contribute to the global shift towards clean energy, their mission remains clear: Together, they keep wind turbines turning with blade health monitoring.

Looking forward, their vision is to unlock the full potential of every wind turbine, continuously innovating and embracing technological advancements while remaining steadfast in their commitment to sustainability.

At eologix-ping, they envision a future where they are recognized not just for technology but as a service company revolutionizing wind energy.

Current export market and key customers

With 100+ years of in the wind industry and a global team, eologix-ping develops sensor solutions for wind turbine operators, installed on over 2,000 turbines across 25+ countries.

Hofmann Engineering Pty Ltd



Capability

Hofmann Engineering offers precision manufacturing, design and service. With a history of supporting the wind, tidal, wave, hydro and solar energy industries; and actively supporting the emerging hydrogen energy sector.

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Technology and demonstrated capabilities

Hofmann Engineering have supported the clean and renewable energy sector, in Australia and globally, for many years. Since 2008 Hofmann Engineering has been extensively involved in repairing and improving the life expectancy of various wind turbine gearbox models for local and overseas markets. Each repair and modification of wind turbine gearboxes is a complex project due to the required precision machining. Hofmann Engineering has carried out repair and modification projects on numerous models ranging from 500kW to 3MW all of which are tested in-house to full load capacity prior to installation. Hofmann Engineering was involved in the design and manufacture of a prototype tidal turbine gearbox that was capable of operating in extreme sub-sea conditions in the North Atlantic.

Hofmann Engineering was also involved in the bioWAVE Ocean Pilot project, manufacturing custom pitching bearings to allow the structure to extract energy from ocean waves and convert it into electricity. Hofmann Engineering have supported the manufacture, refurbishment and reverse engineering of a wide range of hydroelectric turbine components.

Renowned for solving complex engineering problems, the involvement in these pioneering projects demonstrate Hofmann Engineering's keen interest in supporting new technologies in the clean and renewable energy sector.

Current export market and key customers

Hofmann Engineering exports its products and provides services globally. Key customers are BHP, Rio Tinto, FMG, Alstom Key. Customers in the clean and renewable energy sector are Snowy Hydro, Flender, Renk, Valmet, Hansen, L&S, Metso, Clipper, Gamesa, Eickhoff and Zollern.

MMA Offshore Ltd



Capability

MMA Offshore is a global provider of modern offshore vessels combined with subsea and project logistics expertise. MMA delivers solutions for offshore energy and renewables, defence and coastal infrastructure.

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Technology and demonstrated capabilities

MMA Offshore owns 20 offshore vessels, including MPSVs, AHTs, AHTSs, and PSVs.

MMA's MPSVs support light construction in up to 3000m and are equipped with active heave-compensated cranes ranging from 50 to 150 tonnes, accommodation for up to 230 people, helidecks, work-class ROVs and optional motion-compensated gangways.

The Taiwanese-flagged MMA Crystal, is specifically designed for Offshore Wind support.

MMA's Subsea Services business is at the forefront of subsea technology, offering a comprehensive range of solutions including geotechnical investigation, site characterization, hydrographic survey, inspection, maintenance, repair, subsea installation and construction, decommissioning, diving and specialist subsea engineering. MMA's capabilities also extend to the manufacture and refurbishment of subsea structures and intervention equipment, as well as the creation of integrated artificial reefs, habitat enhancement solutions and coastal erosion mitigation.

Current export market and key customers

From MMA's head office located in Perth, Western Australia and their regional offices in Singapore, Taiwan and Aberdeen, MMA Offshore serves a range of diverse markets, including Offshore Wind, Government and Defence, Coasts, Ports and Reefs, and Oil and Gas. With a proven track record in each sector, MMA provides tailored and comprehensive support, showcasing our adaptability and commitment to meeting the unique requirements of our clients. In 2023, MMA has delivered solutions to asset owners and major contractors across Offshore Wind, Ports, Coastal Governments, Defence and Offshore Energy.

Professional Wind Services



Capability

Cranes and Installation of
Wind Turbine Generators.

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Technology and demonstrated capabilities

Professional Wind Services was established in 2016 after recognising the growing demand for a nationwide provider of professional services to the Wind Industry in Australia. Australian owned and operated, Professional Wind Services has a passion for further developing local expertise, creating a long term and sustainable business model.

Cranage and Installation

Delivering the full Cranage and Installation scope of work prioritising safety, quality, and efficiency, Professional Wind Services work side by side with clients to deliver projects within time and budget constraints.

Blade Inspections & Repair

Managing Blade condition and performance through their full life cycle performing inspections, repairs, and reporting.

O&M

A leading Independent Service Provider with the necessary team to ensure asset performance and optimisation whilst ensuring trust and transparency to our clients.

Specialised Services

Main Component Exchanges. Commissioning. Oil Exchange. Statutory Inspections.

Current export market and key customers

Current Export Market:

Australia and New Zealand, Asia Pacific, Europe and North America.

Key Customers:

Vestas, General Electric, Siemens Gamesa, Goldwind, Acciona Windpower, BMS Heavy Cranes.

SRG Global



Capability

SRG Global provides complete wind farm solutions including BOP delivery, anchor installation and maintenance. Their specialist expertise extends to engineering, construction and maintenance for hydro energy infrastructure.

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Technology and demonstrated capabilities

Dam Upgrades: SRG Global are world leaders in the design, engineering and installation of ground anchors that improve the stability of dams. Their large-scale anchors secure water reservoirs globally with a proud history in Australia, New Zealand, South Africa, and Sudan.

Windfarm Construction: SRG Global offers complete wind farm solutions, including foundation redesign, cost-effective anchor installation, electrical work, road construction, logistics management, and commissioning support.

Windfarm Maintenance: SRG Global's specialist windfarm maintenance workforce perform painting / coatings, rope access, engineering, general asset maintenance and repair services for wind assets across Australia and New Zealand.

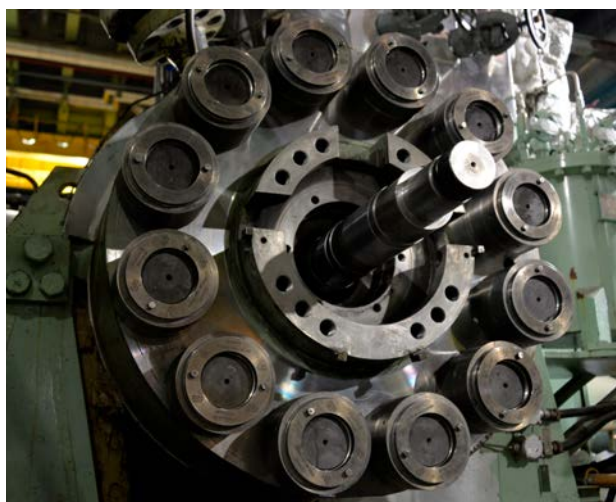
Asset Integrity and Reliability: SRG Global is one of Australia's leading providers of asset reliability and integrity services. Their team of experienced NDT, Advanced NDT, Condition Monitoring and other specialist inspection technicians bring an engineering mindset to mechanical testing, structural integrity services or our corrosion investigation solutions.

Engineered Products: SRG Global design, manufacture and supply advanced construction and ground support products for improved productivity, cost, safety and better structural integrity.

Current export market and key customers

SRG Global primarily operates across Australia and New Zealand, and our teams have recently delivered Dam anchoring projects in South Africa and Sudan. The Company has also delivered a range of specialist projects in the Middle East.

Technofast Industries



Capability

Technofast Industries bring three decades of service to domestic and international industries, specialising in engineered solutions to critical bolting applications leading to minimised downtime, mitigated risk, and enhanced effectiveness.

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Technology and demonstrated capabilities

Technofast Industries Pty Ltd. (Technofast) is committed to transforming industrial and commercial operations towards renewable energy.

Specialising in wind energy technology, Technofast provide tailored solutions to meet clients' critical bolting needs. Their patented bolting, sealing, and high-temperature technologies streamline wind energy installation maintenance, reducing downtime.

For over three decades, Technofast has pioneered cost-effective hydraulic bolt tensioning solutions for wind turbines, ensuring structural integrity and operator safety. Utilising advanced digital tools, their engineering team designs bespoke solutions, guaranteeing reliability and efficiency for each site installation.

Technofast drives operational excellence in the wind energy sector by offering reliable, cost-effective solutions that enhance productivity and environmental stewardship.

Technofast's commitment to sustainability and cutting-edge technology empowers businesses to achieve greater efficiency, profitability, and reduced carbon footprint.

Current export market and key customers

Technofast Industries exports its wind energy solutions to markets across Australasia, North America, South Korea, and Europe. Their esteemed clientele includes leading companies and organisations in the renewable energy sector, such as Suzlon, Siemens Gamesa and GE Renewable Energy.

Capability Matrix

● Primary capability • Other capability

	Page number	Bioenergy	CCUS	Energy Storage, Grids and Behind the Meter	Solar	Wave	Wind
1414 Degrees	13		●				
5B Holdings Pty Ltd	23			●	●		
Allegro Energy	24			●			
Allume Energy	25			●			
Alpha Solar Technologies Pty Ltd	60				●		
Arche Energy	61	•	•	•	●		•
Ardexa	26			●			
Arnova	27			●			
Blue Diamond Machinery Pty Ltd	28			●	•		
Calix	14		●				
Camco Engineering	76						●
Carnegie Clean Energy	73					●	
ClearVue Technologies	62				●		
Climate Change Response	29			●			
DeepC Store	15		●				
Endua	30			●			
Energy Exemplar	31			●			
Energy Renaissance Pty Ltd	32			●			
Enosi Australia	33			●			
Entura	77			•	•		●
eologix-ping	78						●
Evergen	34			●			
Future Grid	35			●			
Gaia EnviroTech	7	●					
Gas Capture Technologies	16		●				
GEI Mekong	8	●					
Gelion Technologies	36			●			
GenOffGrid Pty Ltd	37			●			
Glaciem Cooling Technologies Pty Ltd	17		●	•			
Green Gravity	38			●			
H2 4U	9	●					
Hofmann Engineering Pty Ltd	79				•	•	●
ITP Renewables	63			•	●		•
Kardinia Energy	64				●		
KC8 Capture Technologies	18		●				
Long Pipes	19		●				

	Page number	Bioenergy	CCUS	Energy Storage, Grids and Behind the Meter	Solar	Wave	Wind
Magellan Power	39			●			
MCi Carbon	20		●				
MGA Thermal	40			●			
MMA Offshore Ltd	80						●
Onetide	41			●			
Opturion Pty Ltd	42			●			
Powerledger	43			●			
Proa	44			●			
Professional Wind Services	81						●
Pyrocal	10	●					
Redflow	45			●			
Redx Technology	46			●			
Regen Power Pty Ltd	47			●	●		
Relectrify	48			●			
Renewable.bio	11	●					
Sicona Battery Technologies	49			●			
Soltaro	65			●	●		
Specialised Solutions	66			●	●		
SRG Global	82						●
SunDrive Solar	67				●		
Sunrise CSP Pty Ltd	68				●		
SwitchDin	50			●			
Synergen Met	21		●				
Technofast Industries	83						●
Tindo Operations Co Pty Ltd	69				●		
Thorion Energy Ltd.	51			●			
Trellis Technologies Pty Ltd	52			●			
Unlimited Energy Australia	53			●	●		
Vast Energy	70			●	●		
Vaulta (Vaulta Operations Pty Ltd)	54			●			
Village Energy	55			●			
VSUN Energy	56			●			
Wattwatchers Digital Energy	57			●			
Wave Swell Energy	74					●	
Worley	71	●	●	●	●		●
ZekiTek Pty Ltd	58			●			

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