GOING THE DISTANCE

In less than a year first gas will flow at Jemena’s Northern Gas Pipeline, linking the Northern Territory gas fields to east coast end users.

FEATURE p13

Image: Jemena.
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THE AUSTRALIAN ENERGY REVIEW

What stories matter to you?

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Franck Woitiez
NEOEN AUSTRALIA MANAGING DIRECTOR

the interview p.22

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**China boom drives LNG growth**

**ELIZABETH FABRI**

**NATIONAL**

AUSTRALIA’s liquefied natural gas (LNG) industry is riding high on increased demand from China, with total exports to the nation increasing by 40.5 per cent in 2017 to 17.5 million tonnes, EnergyQuest’s latest report has found.

Behind-Japan, China was now Australia’s second-largest LNG market, making up 36.8 per cent of Australia’s total LNG exports of 56.8mt in the 2017 year.

In December alone, Australian projects delivered 31 cargoes to China, up from 21 in November.

“Increased Chinese demand is not only good for Australian LNG producers and our export revenue, but has an emerging positive impact for China’s environment,” EnergyQuest chief executive Dr Graeme Bethune said.

“China is making a massive switch from coal to gas to reduce air pollution in major cities such as Beijing – and now Australian LNG is playing a significant role in achieving this goal.”

Dr Bethune said LNG exports had risen by 26.3 per cent in 2017, jumping from Australia’s fifth largest export in 2016 to its third largest export in 2017, overtaking gold and education.

EnergyQuest said the high export volumes coupled with higher oil prices were estimated to have increased total 2017 LNG export revenue by 44.1 per cent to $25.8 billion.

“To put $25.8 billion of export revenue in perspective, this is more than the cost of Australia’s imports of passenger vehicles, which was $21.8bn in 2016-17,” Dr Bethune said.

EnergyQuest chief executive Dr Graeme Bethune.

“Passenger vehicles are Australia’s second biggest import cost.”

The increase in exports was primarily attributed to higher shipments from the Gorgon and APLNG projects.

However, the North West Shelf (NWS) still remains the largest producer, with Gorgon taking second place.

EnergyQuest said there would be further increases in 2018, as QCLNG, Gorgon and Wheatstone ramp-up to full capacity and Ichthys and Prelude begin operations.

**Origin lifts revenue 40pc, slashes 650 jobs**

**CAMERON DRUMMOND**

**QLD**

A DAY after it axed a third of its workforce, Origin announced it had lifted revenue 40 per cent to $5.37 billion and slashed 650 jobs from its previously-owned conventional oil and gas arm Lattice Energy’s operations in Otway, Victoria.

Origin said Lattice to Beach Energy on 1 February for $1.6 billion.

“This represents a significant milestone in delivering on our commitments to simplify the business, reduce debt and improve returns,” Origin chief executive Frank Calabria said.

Mr Calabria said APLNG continued to perform well, delivering reliable upstream and downstream production in the December quarter.

“This is demonstrated by a total of 35 LNG cargoes loaded and shipped from Curtis Island, with the milestone of our 200th LNG cargo successfully loaded on 1 January 2018,” Mr Calabria said.

On 30 January, Origin announced it planned to sack more than a third of its 1600 strong workforce in QLJ, with most of the cuts at its Brisbane head office.

Staff were informed by email that about 650 jobs would be lost this year, with 500 of those to lose their jobs by April.

Origin said the cuts were necessary to protect against swings in commodity prices.
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**Local LNG powers Dalgaranga**

**REUBEN ADAMS**

WESTFARMERS subsidiary EVOL LNG has entered into a long-term agreement with Gascoyne Resources to supply LNG to the Dalgaranga gold project in the Murchison region of WA.

In December, Zenith Energy executed the PPAs to build, own and operate a 15MW gas-fired power station and the 2.5mtpa Dalgaranga gold processing facility, with supply planned to commence in the second quarter of 2018.

EVOL LNG business manager Nick Rea said the project emphasised that tracked LNG could support a gas-powered microgrid at a remote mine site without requiring full diesel redundancy.

“Mining and industry are increasingly seeking viable, low emission alternatives for their operations, so supplying cleaner LNG that’s produced 100 per cent in WA makes economic sense and supports local jobs.”

EVOL LNG will build, own and operate a one million litre on-site LNG storage and vaporisation facility, which will keep the mine operational for up to two weeks if road access to the remote site is interrupted.

**Po Valley in 3-way M&A deal**

**CAMERON DRUMMOND**

GAS explorer Vintage Energy has raised $5.5 million in a pre-initial public offering (IPO) capital raising to acquire equity in Comet Ridge’s ‘Deepa Areas’, within three highly prospective permits in the Galilee Basin, QLD.

Funds will also be utilised to continue preparations for drilling the PRL 156, Nangwarry-1 gas exploration well in the South Australian portion of the onshore Otway Basin in Victoria.

The South Australian Government recently announced that Vintage Energy and its joint venture partner Rawon Oil and Gas would be awarded a $4.95m gas grant to assist in drilling Nangwarry-1 later this year.

The completion of its capital raise has set the stage for the launch of the Vintage’s planned IPO, which is expected to result in the company joining the Australian Securities Exchange in April/May this year.

Vintage managing director Neil Gibbins said the response by investors was tremendous, and would allow the company to develop its strategy of becoming an active player in helping to resolve the crisis currently facing Australia’s east coast natural gas market.

“With cash in the bank and our upcoming IPO, vintage aims to take full advantage of the opportunities currently presented in the Australian energy market,” Mr Gibbins said.

The Dalgaranga project is one of the highest margin undeveloped gold projects in Australia. With pre-production CAPEX for processing plant and associated infrastructure of $86 million, the company expects payback within 18 months of first production.

Po Valley shareholders will gain greater exposure into the European oil and gas sector under the deals.
IN BRIEF

Solar thermal plant approved

SOUTH AUSTRALIA

THE South Australian Government has greenlit construction to begin at SolarReserve’s $650 million Aurora solar thermal power plant in Port Augusta.

The project, which will use mirrors to heat molten salt and store energy, will supply 100 per cent of the State Government electricity lead from 2020, and supply energy to the broader market to put downward pressure on prices.

“It’s fantastic that SolarReserve has received development approval to move forward with this world-leading project that will deliver clean, dispatchable renewable energy,” South Australia Acting Energy minister Chris Picton said.

The project will begin construction this year and create about 700 construction and ongoing jobs.

Floating solar farm opened

NSW

AUSTRALIA’S largest floating solar farm has officially opened in northern NSW.

The 100 kilowatt (kW) project, in collaboration between the Lismore City Council and Farming the Sun, sits on the surface of an overflow pond at the East Lismore Sewage Treatment Plant and will generate about 180,000kWh of energy annually, about 12 per cent of the treatment plant’s power needs.

The project comprises 120 floats, 280 solar PV modules, and 15 onshore and in water anchors and restraining systems.

It is one of the key elements of the council’s Renewable Energy Master Plan to self-generate electricity from renewable sources by 2023.

Lincoln Gap breaks ground

SOUTH AUSTRALIA

INDEPENDENT power producer Nexif Energy has begun construction on its $450 million Lincoln Gap wind farm, west of Port Augusta.

The 212 megawatt (MW) project is scheduled to generate between 110 and 130 jobs during construction.

Nexif Energy Australia chief executive Zeki Akbas said the wind farm will operate for more than 25 years to provide green, clean energy for the State.

The project comprises up to 59 Senvion wind turbines and allowances for battery storage of power, and is expected to begin commissioning in late 2018.

Australia will meet 2020 target

ELIZABETH FABRI

NATIONAL

A RECORD investment year for renewable energy in 2017 has Australia well-placed to meet its Renewable Energy Target of 23.5 per cent by 2020.

The target, originally set in 2008 and amended in 2015, requires Australia to have 33,000 gigawatt hours (GWh) of capacity by 2020, meaning an additional 6000 megawatts of capacity has to be added to the national energy mix between 2016 and 2019.

Federal energy minister Josh Frydenberg said construction of the “firmly announced projects” would lead to an investment of more than $12 billion.

Clean Energy Regulator chair David Parker said the country has reached a level that he believes will be sufficient to meet the target, with 4924 megawatts (MW) of the 652MW of new generation announced since 2016, fully financed and either under construction or already operating.

The remaining 1600 megawatts of projects have a power purchase agreement in place which the CER expects will progress to financial close.

“In 2017, more than 1000 megawatts of renewable projects were completed and began generation, the biggest year ever for new build coming online,” Mr Parker said.

“We expect 2018 and 2019 to be even bigger, with each year having more than double the new build completed compared to 2017.

“There is still a long way to go on the journey to reach the 2020 target, but we believe it will be met due to the hard work and tenacity of the electricity sector, the renewables industry and those that have financed these projects.”

Federal energy minister Josh Frydenberg said construction of the “firmly announced projects” would lead to an investment of more than $12 billion.

“QLD has the largest share of this new build with more than 2000 megawatts of capacity, followed by Victoria with around 1600 megawatts and NSW with 1400 megawatts,” Mr Frydenberg said.

“One of the major shifts in the market, is the huge increase in share of large-scale solar.

“In the first 6000 megawatts committed under the scheme, solar contributed only four per cent of the total.

“In the firmly announced projects since 2016, solar now makes up 46 per cent.”

World-first biofuel flight launch

ELIZABETH FABRI

NATIONAL

QANTAS has completed a world-first dedicated biofuel flight between the United States and Australia using thousands of kilograms of a non-food industrial type of mustard seed.

The 15-hour Dreamliner 787-9 flight between Los Angeles and Melbourne was powered using 24,000kg of blended biofuel, proving there is a huge increase in share of large-scale solar.

The 10 per cent biofuel blend resulted in a reduction in carbon emissions.

The project is part of a partnership between Qantas, Agrisoma Biosciences and Australian farmers formed in late 2017 to produce the country’s first aviation biofuel seed crop by 2020.

Qantas International chief executive Alison Webster said the partnership marked a big step in the development of a sustainable jetfuel industry in Australia.

“It is a project we are really proud to be part of as we look at ways to reduce carbon emissions across our operations,” Ms Webster said.

“Agrisoma chief executive Steve Fabijanski said biofuel produced from Carinata provides both oil for biofuel and protein for animal nutrition while also enhancing the soil it’s grown in,” Mr Fabijanski said.

“We are excited about the potential of the crop in Australia and look forward to working with local farmers and Qantas to develop a clean energy source for the local aviation industry.”

The project follows Qantas and Jetstar biofuel trial flights in 2012 between Sydney and Adelaide, and Melbourne and Hobart respectively, using a combination of cooking oil and conventional jet fuel.

Virgin Australia has also been involved in biofuel initiatives, announcing in October last year that it will trial a sustainable aviation fuel through Brisbane Airport’s fuel supply system.
AUSTRALIA’s oil and gas industry is set for steady growth over the next 12 months, according to Chief Economist Mark Cully’s latest Resources and Energy Quarterly report.

“2018 marks the end of the remarkable resources and energy investment boom of the past decade,” Mr Cully said.

The three remaining large LNG projects – Wheatstone, Ichthys and Prelude – are expected to complete construction.

“Beyond that, a slight uptick in projects that have been publicly announced or under feasibility points to a bottoming in the investment cycle.”

With the end of the construction boom looming, rising export earnings were imminent, with income forecast to reach a record $214 billion in 2017-18, driven largely by growing LNG and iron ore production.

Looking closer, LNG export earnings were forecast to increase from $22 billion in 2016–17 to $36 billion in 2018–19, while LNG export volumes were expected to reach 77 million tonnes (mt) in 2018–19, up from 52mt in 2016–17.

The outlook for crude oil and condensate export earnings was optimistic too, with an increase from $5.5 billion in 2016–17 to $6 billion in 2017–18 as an outcome of higher oil prices, with further increases through 2018-19.

On the backdrop of this changing energy landscape, AOG 2018 running from 14-16 March at Perth Convention and Exhibition Centre, comes at an opportune time for the industry.

After becoming a free-to-attend event for the first time last year, AOG will again feature a series of free industry forums staged on the exhibition floor over the three days covering the topics of Collaboration, Subsea, and Knowledge.

AOG event director Bill Hare said just like the oil and gas industry, 2018 was set to be a positive year for the conference.

“The industry has undergone a massive tightening over the last few years that’s effected pretty much every player in the game,” Mr Hare said.

“Companies have tightened their belts; they’ve reduced their marketing budgets, there has been big redundancies, mergers and acquisitions; a lot of disruptions happening in the industry and this has been reflected in AOG, absolutely.”
The best minds, innovations and opportunities in Australian oil and gas, together in one exciting event.

Celebrating advances in every area with new exhibitor zones, a free 3-day conference program and major industry support, AOG 2018 offers dynamic networking and learning opportunities at every level. For the core insights, innovations and opportunities, AOG 2018 is essential.

14–16 March 2018
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Subsea Welcome Drinks
Diversity & Inclusion Breakfast
Expo Floor Networking Zones

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WITH third-party certification for use in hazardous locations, the intrinsically safe FLIR GFx320 represents ground-breaking optical gas imaging technology for detecting methane, other hydrocarbons, and volatile organic compound (VOC) emissions in areas such as natural gas well sites, liquid natural gas terminals and offshore platforms.

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More gas camera information can be found at www.flir.com.au/ogi/ or by calling 1300 729 987 to speak to a FLIR expert.

The GFx320 is designed for tough working environments.
“It’s a shrinking marketplace and unfortunately AOG has also reduced in size over that journey along with the rest of the industry.”

This year was shaping up to be better though with more exhibitors than 2017, and a total attendance of between 8500 and 9000 people was expected.

There would also be an increased focus throughout the conference on the operational phase of projects.

“The construction era is essentially over, and we’re certainly hopeful there will be some big greenfields projects approved over the next few years, but really Australia has grown to become such an enormous producer, particularly LNG, so now it’s all about the opportunities for the service and supply industry,” Mr Hare said.

“AOG wants to reflect that, our exhibitors are the supply chain and we want to make sure that we are helping them understand the opportunities that are available at the moment.”

One of the key events on the agenda included a greenfields session on emerging projects and how to operate them efficiently and reliably.

There would also be a focus on clean energy throughout discussions, with companies such as Woodside leading the way through its battery storage test project on one of its platforms.

Decommissioning was also in the mix, and while a long way off for many companies, it was still a hot topic among attendees.

“Decommissioning is really on the far side of the industry but it’s also becoming more interesting to industry; it’s inevitable,” Mr Hare said.

“The talk of life extension is probably more prevalent than decommissioning at the moment but there is debate on decommissioning; for example do we have the right legislation, and do we really understand what it means here.”

“Workforce of the future is also a key element of the conference sessions.”

There will also be a host of new technologies on show, and while the exhibitor content was still yet to be finalised, Mr Hare could confirm Oceaneering was bringing in a remotely operated vehicle (ROV) simulator.
“People will be able to sit in and drive it, so essentially they are driving an ROV on the ocean floor,” he said.

Industry support

Mr Hare said the conference was fortunate to receive strong support from the Government and industry groups from around the globe.

Its principal sponsors included Woodside Energy, National Energy Resources Australia (NERA), the City of Perth and the WA Department of Jobs, Tourism, Science and Innovation.

“Woodside have been very supportive the last couple of years and keep increasing that level of support for AOG,” he said.

“Part of that reason is they really like that it is an inclusive event and free to attend and staged in Perth their hometown.

“In addition to that principal sponsorship, they are also sponsoring our diversity and inclusion breakfast with their chief operating officer Mike Utsler as MC.

“They are also a key part of our collaboration forum committee and are curating the session on brownfields, and curating the workforce of the future panel with Shell.

“We’ve also got speakers in our subsea forum from Woodside and they are also for the first time in a number of years taking a stand at the show, which is a really great sign of support.”

NERA was also launching a new Technology and Skills Hub that will be a platform for 40 innovative businesses to demonstrate and exhibit technologies in the fields of data and digitisation, automation and robotics, and artificial intelligence and machine learning.

“We’ve got an extra half a pavilion for the show and that will be where the NERA Technology and Skills Hub will be staged,” Mr Hare said.

“Each day we will have a different showcase of companies who have got something really smart and cutting-edge.

“A lot of small and medium sized enterprises (SMEs) and start-ups will be engaged with that.

“You will be able to talk to these people and get hands on with whatever kit they might have with them.”

In addition, NERA will be running an SME connector event, to work one-on-one with registered companies to help them prepare a pitch they will then be able to make during a sit down discussion with a group of operators and contractors.

“I think this is a really nice addition to the show,” Mr Hare said.

“It’s what AOG really attempts to do, to get the buyers and sellers together, and get the operators and contractors to talk to the service and suppliers.”

To register for AOG, visit www.aogexpo.com.au

(CONTINUED FROM PAGE 11)
CONSTRUCTION of the 622km Northern Gas Pipeline connecting the Northern Territory’s gas fields to QLD end users is fast advancing.

Beginning in 2017, the development program has been relatively smooth sailing, despite a land access dispute between the Wakaya traditional land owners and the Northern and Central Land Councils that pushed the project start date from April to July.

But challenges were always foreseen when planning a project of this scale, Jemena Northern Gas Pipeline project director Jonathan Spink told The Australian Energy Review.

“We knew when we submitted our bid that the schedule was aggressive and securing approvals across so many jurisdictions would be a challenge,” Mr Spink said.

“We never expected it to be easy as we realised we had a diverse range of stakeholders to work with.

“As a result of all of the hard work, and the considerable support from project stakeholders, we secured all the requisite approvals, without impacting on the overall project timeframe.”

As of December 2017, all of the line pipe had been delivered; construction had begun on the Tennant Creek and Mount Isa compressor stations; and 403km of the pipeline welding (262km in the Northern Territory and 141km in QLD) had been completed ahead of schedule.

Welding of the pipeline is completed by hand and later inspected using x-ray radiography to ensure the work complies with the Australian standards.

Once complete, the pipeline will play a crucial role in driving the exploration and development of untapped gas resources in the Northern Territory and relieve domestic shortages on the east coast of Australia.

**Finishing touches**

Construction resumed after a brief break over Christmas.

“Work has recommenced on the Phillip Creek Compressor Station (PCCS) and, in QLD, on the Mount Isa Compressor Station (MICs) and pipeline,” Mr Spink said.

“At the Phillip Creek Compressor Station, Jemena has overseen the completion of engineering and design activities, as well as the procurement and delivery of major equipment and materials.

“With construction contractor Civmec, works are well underway on the civil and structural, mechanical, piping, electrical and instrumentation (SMPEI) elements of the project.

“In QLD, Jemena has engaged Valmec to perform the concreting and civil works scope at the Mount Isa Compressor Station.

“Valmec was also awarded the remaining SMPEI construction works which have now commenced.”

(CONTINUED OVER)
Mr Spink said construction will continue into the second half of 2018 with commissioning to follow in late 2018.

“The Northern Gas Pipeline is underpinned by existing offshore gas sources, with all gas that is currently contracted across the pipeline coming from the Blacktip Gas Field off the coast of the Northern Territory,” he said.

Future options

Jemena has continued to evaluate growth options for the NGP.

The company currently had its sights set on a potential expansion and extension of the pipeline to the Wallumbilla Gas Hub in QLD, to deliver more than 700 TJ of gas per day to the east-coast market.

“Jemena is keen to scale up the NGP and extend it further east to link in with the Wallumbilla gas hub, in Queensland, freeing up large amounts of gas to flow to gas consumers across eastern Australia.”

NGP IN A NUTSHELL:

• 622km pipeline running from Tennant Creek in the Northern Territory to Mount Isa, QLD with two compressor stations.
• Construction due to be complete mid-2018, with the first gas to flow late 2018.
• Jointly owned by the State Grid Corporation of China and Singapore Power, and energy infrastructure group Jemena.
• McConnell Dowell is contracted to build the Northern Territory portion of the pipeline (481km), while the remaining 141km of pipeline in QLD is contracted to Spiecapag Australia.
• Capital cost of $800 million
• Created more than 900 jobs

Development of the PCSS as of December 2017.

Mr Spink said the inquiry into hydraulic fracturing to date “has been a robust and independent process”.

“The final draft report highlights the very real economic and broader community benefits that will stem from the development of an onshore gas industry in the Territory,” he said.

“Jemena supports the Inquiry’s finding that the risk associated with an onshore gas industry can be safely managed by a balanced regulatory regime, while delivering these benefits to Territorians.”

“We look forward to the release of the Final Report in March.”
Contract win for local provider

LOCAL Tennant Creek contractor Phillips Earthmoving has gone from strength to strength after winning two lucrative contracts at Jemena’s Northern Gas Pipeline, currently under construction.

In 2017, the earthmoving services company secured a contract with Jemena to provide labour resources and machinery to support Jemena’s execution of the early civil works (topsoil stripping, levelling and placement of granular material) at the Phillip Creek Compressor Station (PCCS), also part of the project.

Phillips Earthmoving general manager Angela Phillips said the contracts were a big win for the company, and a proud moment for her and her sister Elizabeth Phillips after commencing the succession of Phillips Earthmoving from their father Jim Phillips in 2016.

“It’s been exciting to be a part of such a high-profile project,” Ms Phillips said.

“We expect the flow-on effect from this project to benefit not just Tennant Creek but the NT as a whole.”

The scope of the contract included the start of a line export compression facility with gas processing at Warrego (PCCS).

Phillips Earthmoving were tasked with fire breaks; vegetation clearing and grubbing of the site to the clearance limits; strip and stockpile of all topsoil from the site; prepare, rip, condition, compact and proof roll subgrade; undertaking dust suppression activities; load and haul; access roads for transport; supplied material had to meet the project quality requirements including regular testing per client’s requirements.

Angela Phillips said the Jemena contract was another example of the company’s ability to source locally to achieve on large NT based projects.

“We have a number of large projects under our belt now,” Ms Phillips said.

“Some of our biggest clients include government departments and mining and pastoral companies.”

And while the company has serviced the Territory since its 1999 inception, the sister duo said they are looking to expand their services interstate.

“We have the equipment and can go anywhere,” she said.
2018 will be the year of oil and gas revival, as prices kick higher and major Australian projects – including Prelude FLNG – finally come online.

2018 will be the year that Australia finally takes the LNG crown from Qatar. Exports are forecast to reach $35 billion, driven by Chevron’s second Wheatstone LNG train coming online in Q2, Inpex’s Ichthys project ramping up production, and Shell’s Prelude approaching full operation.

The timing is good – 2017’s cautious positivity has evolved into growing industry confidence in 2018, according to a new study by DNV GL.

DNV GL’s latest industry outlook report, which surveyed 813 senior industry professionals and executives globally, found that 63 per cent of poll participants were confident about growth in the industry this year. This figure stood at 32 per cent a year ago.

Shell has laid the groundwork for sustainability, delivering 11 major projects starting production since early 2016 which have added an average of 500,000 barrels of oil equivalent per day of peak production.

The company also completed $23 billion in divestments at headline level, including its share in Woodside, the Motiva split, and the exit from Showa Shell, just to name a few.

In a late November investor briefing chief executive Ben van Beurden said four quarters rolling free cash flow at Q3 2017 was $27 billion, at an average $51 per barrel.

“There is still a significant amount of work ahead of us, and the priority is to complete this work safely and bring a reliable asset online.”

The company also partnered with South Metropolitan TAFE in WA to develop specific training for Prelude technicians.

In November, Shell announced that it had recently completed the installation of the thrusters, allowing Prelude to weathervane around its turret.

This is a key feature in Prelude’s design, to ensure she can withstand wind and sea conditions, including a one-in-10,000-year storm.
Continued excellence

FOR nearly 40 years, Ebara International Corporation’s Cryodynamics business (Ebara Cryodynamics) has been designing custom-engineered products for the liquefied gas industry for a variety of marine and land-based applications.

Through years of experience and continuous design improvements, Ebara Cryodynamics established itself as the premier manufacturer of cryogenic pumps and expanders worldwide.

In early 2012, the company was awarded a contract to supply 10 units (nine pumps and one expander) for the Shell Prelude project in the Browse Basin, Australia; the largest offshore facility and a groundbreaking achievement in the world of floating LNG.

Recently exceeding 6500 units installed aboard LNG carriers and land-based installations, Ebara Cryodynamics is represented at the vast majority of LNG operations in liquefaction, marine transport, and re-gasification applications.

Cryodynamics’ submerged motor-generators are designed to operate in non-conductive liquefied gases, eliminating rotating seals and all associated concerns.

Its cryogenic pumps serve aboard most of the world’s LNG carriers as cargo, spray, and emergency pumps.

Suction vessel mounted pumps are used as single-stage transfer pumps or multi-stage for vaporiser feed and send-out service.

Ebara Cryodynamics’ expanders exemplify the drive for advancing LNG process technology and productivity.

They directly produce approximately 5 percent increased plant output while generating substantial electricity as a peripheral benefit.

With significant experience in single-phase (liquid) expander applications and with a two-phase (gas/liquid) variant in development, these innovative variable speed machines are becoming the specified standard in LNG production trains around the world.

The October 2017 integration of Ebara Cryodynamics, based in Sparks, Nevada (USA), into Elliott Group operations in Jeannette, PA (USA) recognizes shared synergies in markets, product lines, and customer base, with the goal of improving efficiency and providing a simplified customer experience.

Founded in 1918, Elliott Group is a premier supplier of custom-engineered refrigeration compressors for baseload LNG plants, as well as a full line of rotating equipment for refining and petrochemical applications.

Elliott is a wholly owned subsidiary of Ebara Corporation.
We’ve Joined Forces. Elliott Group and Ebara Cryodynamics

We turned to each other to provide enhanced capabilities and a superior customer experience in liquified gas applications.

From reliable refrigeration compressors to submersible cryogenic pumps and expanders, Elliott Group and Ebara Cryodynamics have supported the LNG industry for decades with proven experience and matchless expertise. Integrating the two businesses will provide a key advantage for our liquefied gas customers. Who will you turn to?
INDUSTRY SPOTLIGHT
COMPANIES GEARING UP

What’s best, tube and clip or system?

PEOPLE have always found themselves in a quandary about this issue. Angry arguments ensue. Who’s right and who’s wrong? What if they both were right and after decades of indecision whether to utilise either tube and clip or system scaffolding? Now there is a product that keeps everyone happy.

MONZON Asia Pacific (MAP) is proudly introducing to the market its MonZon NO LIMIT® - a new concept in the scaffolding industry.

NO LIMIT® in both aluminium and steel was developed as a result of many years of research by Swedish manufacturer MonZon and an Australian scaffold end-user with vast experience in all applications of scaffold access systems.

They collaborated with main contractors, scaffolders and end-users from all around the world, in all facets of the construction, oil, gas, (downstream, midstream, upstream) remedial and protective coatings, coal, nuclear, wind, solar, electricity, marine, aviation, cement plants, government and infrastructure sectors for shutdowns and maintenance globally.

MAP did this in order to find out the problem areas that needed to be solved, as well as its clients’ requirements for a scaffolding system for the future.

The requirements were clear – they all wanted the same thing, one system that could be built faster, one system that is flexible as tube and coupler, and at the same time is as easy to assemble as system scaffold; as well as be cost effective when it comes to storage and transport.

The system should be light and strong to improve ergonomic and safety aspects with no compromises on safety.

NO LIMIT® concept addresses these issues and more.

The system is light and strong, to improve ergonomic and environmental aspects with no compromises on safety, and cost-effective when it comes to storage and transport.

MAP has also introduced its Building Information Modelling (BIM) for shutdowns and maintenance to the Australian market.

BIM is a digital representation of physical and functional characteristics of a facility or plant.

It can bridge the information loss associated with handling a project through design, construction, maintenance and shutdown.

This is done by allowing each group to add and reference all information they acquire during their period of contribution to the BIM model.

The model provides the specific scaffold or access type, manufacturer, part number and any other information ever researched in the past, and only needs to be modified when additional plant is installed.

MAP solutions provide real-time analytics of shutdowns, instantaneous outage planning execution readiness, productivity metrics, man hours, expenditure, emerging work, which work types / trades are ahead or behind program, and measures current maintenance performance against company benchmarks.

MAP has an experienced team with the capability to assist in shutdown execution by allowing maintenance planners to “virtually” execute the shut through the 3D model prior to actual execution.

This mitigates work-front and resource clashes, identifies work orders that are incomplete, as well as evaluates spares, resources, permits, support and equipment availability work order components at a granular level.

What this all means to clients is more speed, efficiency, safety and profit.

More information can be found at: www.monzonasiapacific.com.
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FEATURES FOR MARCH 2018

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BRAD FRANCIS
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It’s been more than two months since US tech giant Tesla flipped the switch on the 100 MW mega battery, which has allowed wind energy to be delivered to the grid at any time – whether the wind is blowing or not – and provide emergency back-up power when shortfalls are predicted.

Elizabeth Fabri spoke with Neoen Australia managing director Franck Woitiez about the world-first project and their next big collaboration with the global tech giant.

Q. How does the new Hornsdale Power Reserve work?

Hornsdale Power Reserve is the world’s largest lithium-ion battery.

In conjunction with the Hornsdale Wind Farm, it provides reliable power into the South Australian electricity network during peak times, with frequency control services to maintain stability, acting as a lifeguard for our power network.

It is designed to enhance network security and keep the lights on during unexpected events.

The battery instantly reacts whenever there are unexpected line outages or generator failures.

This provides the network operator with valuable time to rebalance the system and return to normal operation without any disruption to electricity users.

As well as breaking records for its size, Hornsdale Power Reserve has set a new Australian record for the construction and connection time of a large generator, and is the fastest generator in Australia in terms of response times.

Following the Twitter exchange, the South Australian Government launched a competitive tender to supply up to 100MW of batteries across the South Australian power network.

The procurement process attracted around 90 responses from battery storage manufacturers, including LG Chem, AES and Kokam, and developers such as Zen Energy, Carnegie Clean Energy, and AGL Energy.

Hornsdale Power Reserve was selected as the most competitive commercial offer with the best value for money.

The biggest challenge we faced during the project was the very tight timeline. It was essential to have the battery operational by December, when the electricity network was expected to encounter substantial strain due to summer heat.

Q. The idea for the battery first started during a Twitter exchange between Tesla’s Elon Musk, and software billionaire Mike Cannon-Brookes. How did this idea become a reality?

Q. In December when Loy Yang power plant tripped and went offline, the battery delivered 100MW into the national energy grid in 140 milliseconds. How does this response time compare to energy storage options previously relied on?

In its first month of operation, the Hornsdale Power Reserve has already responded to four coal generator trips.

The battery has a proportional response depending on how bad the frequency deviation is. So, it is ready to provide 100 MW during catastrophic events but will only deliver smaller amounts during smaller frequency deviations.

The battery’s response time is significantly faster than that of a typical generator, which will usually respond in a meaningful way within a few seconds.

That might not sound like much, but every millisecond counts in a network that operates at fifty cycles per second.
**Q.** Why did the Tesla battery respond to the power plant trip when not contracted?

The battery is contracted by the South Australian Government to correct frequency deviations in the South Australian network.

Because the National Electricity Market is connected, large interstate plant trips affect the South Australian network frequency.

The very fast response time of the battery means that it instantly steps in when it's needed. It essentially fills the gap (for a few seconds, or minutes) while the traditional back-up generators in the network ramp up their power output.

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**Q.** Energy generation makes up approximately one third of your average electricity bill.

Other charges such as transmission and distribution costs, and many other costs are passed through to electricity consumers.

There are eight markets for Frequency Control and Ancillary Services (FCAS) and it would appear that the battery is already having a big effect on those—and of course benefits are already flowing to the network beyond South Australia.

Hydro power in Australia, including the Snowy scheme, has a proud history of innovation and engineering achievement, and it would be great to see these systems developed further.

It is also very clear that grid scale batteries have a role to play in the Australian network in order to reduce costs for electricity consumers and improve system security.

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**Q.** Will the battery also reduce the estimated $52 million South Australia pays for services to keep the grid in balance?

While we can't fully attribute the savings to Hornsdale Power Reserve alone, South Australia's regulation FCAS bill was reduced by 80 per cent in December 2017 when compared to the same month in 2016.

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**Q.** Are Neoen and Tesla planning another project of this scale elsewhere in Australia or abroad?

Yes, the Victorian Government has recently announced a 15-year support agreement for the Bulgana Green Power Hub, which combines a large smart-glasshouse facility with a 200MW wind farm and 34MWh battery.

We are also considering large batteries on all our new renewable projects under development across Australia—hopefully there will be some further announcements over the coming year.

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**Q.** What does the 2018 year hold for Neoen Australia?

2017 was a big year for Neoen Australia. Alongside the Hornsdale Power Reserve we also completed two wind farms (Hornsdale stages 2 and 3) and three solar farms (Parkes, Griffith and Dubbo).

In 2018 we will start construction on Bulgana Green Power Hub and at least two other solar farms, the Coleambally Solar Farm in NSW and the Numurkah Solar Farm in VIC. We are also looking at new technology for hydrogen production from renewable energy and expanding the network service capability of large scale battery technologies.

We are looking forward to another big year of growth in the Australian electricity sector, and will continue to do our best to supply affordable and reliable power to Australian consumers.