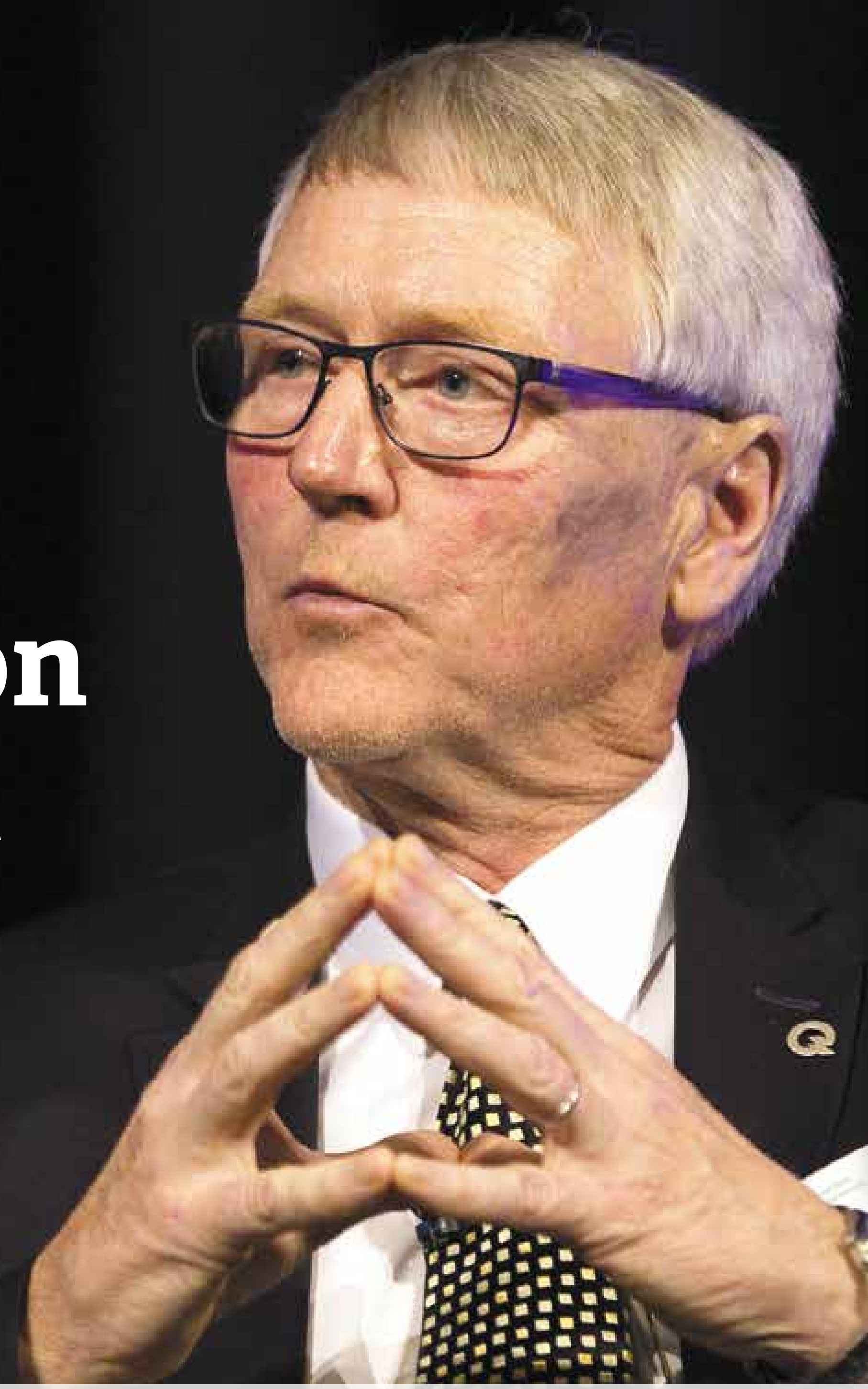
BUSINESS NEWS
WESTERN AUSTRALIA

Oil & Gas
SPECIAL REPORT

Oil & Gas

BN FEATURE

Expansion plans get energy sector pumping



Key takeaways

- 15 projects under way or under consideration
- Steps forward on the Browse project
- Wheatstone, Gorgon ramping up; Ichthys, Prelude not yet pumping gas
- Chevron awarding numerous operational contracts
- Considered capital allocation towards exploration key for long-term pipeline

HIDE AND SEEK: Fred Wehr is confident Quadrant's recent find at Dorado-1 will be a big deal. **Photo: Tom Rovis**

Chevron's $5 billion Gorgon phase two project announced in April might be the first in a wave of new oil and gas investments.

Matt Mckenzie
matthew.mckenzie@businessnews.com.au
@Matt_Mckenzie_

WOODSIDE Petroleum's recent announcement it is considering a 4 million tonne to 5mt per annum LNG processing train at the Pluto plant near Karratha, up from 1.2mtpa, is instructive in showing the resurgence of optimism in the oil and gas space.

When the oil price was plunging depths below $US30 per barrel in early 2016, some analysts speculated there would be no new natural gas liquefaction trains in Western Australia for a decade or more.

In April last year, Woodside engaged contractors to assess a mini-train at Pluto, boosting capacity by around 20 per cent from 4.9mtpa.

That could now become a more ambitious expansion that would roughly double capacity, using gas from the offshore Scarborough LNG field in which Woodside upped its stake from 25 per cent to 75 per cent in a $US444 million deal with Exxon earlier this year.

Technical studies are already under way for the project, and the company has requested pricing proposals from major suppliers for onshore engineering and execution planning.

The decision to investigate an even bigger expansion of Pluto is one of numerous moves that will have oil and gas contractors breathing a sigh of relief.

For example, Woodside has begun concept definition for the Pyxis and Pluto North infill wells with a targeted start-up in 2021, about the same time a proposed interconnector between the Pluto plant and neighbouring Woodside-operated Karratha LNG facility might be finished.

> **"There was tremendous value destruction during this time in exploration because people were pushing too hard** - Fred Wehr

Additional work includes a final investment decision on an infill well at the Pluto field, expected for completion next year, and a $US130 million water handling project at the Pluto platform for wet gas production from 2021.

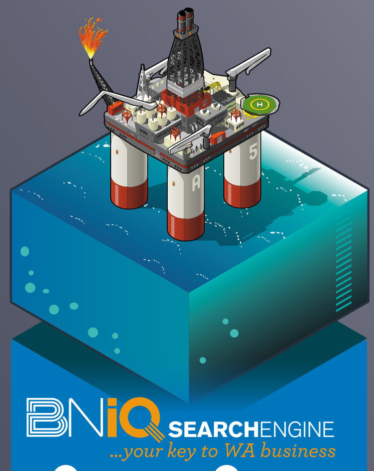
Contracts for concept definition engineering at the Scarborough project have been awarded, while discussions are under way with potential offshore engineering, procurement and construction contractors.

Start-up for the subsea work is targeted for 2023, a year earlier than previously, with a 2024 deadline for the onshore processing (Pluto train two) component.

OIL AND GAS CONTRACTS JUL 18

Proponent/contractor	What	When
CHEVRON		
Score Perth	Valve maintenance	April
Callidus Process Solutions	Valve maintenance	April
Omega Security Services	Security	May
ERGT Australia	Safety training	April
Saferight	Safety training	April
Applus+	Non destructive testing	April
Sonic Healthcare Plus	Medical services	May
Chemcentre	Lab services	June
Maclean Electrical	Industrial batteries	April
Heat Exchangers WA	Heat exchanges services	June
Seperation Technology & Metals	Fixed bed media	June
NTC Contractors	Wheatstone- civil services	February
Ertech	Barrow- civil services	July
Fugro Spatial Solutions	Aerial & terrestrial surveying	June
WorleyParsons	Gorgon, Wheatstone & Thevenard extension	June
Baker Hughes GE	Gorgon 2 subsea equipment	June
Transocean	Gorgon 2, drilling 11 wells	July
SUBSEA 7		
MMA Offshore	Vessel charter	May
CONOCO PHILLIPS		
Intecsea (Worley Parsons)	Barossa- subsea infrastructure	June
Technip Oceania	Barossa- front end engineering and design	June
Modec	Barossa- front end engineering and design	June
SHELL		
Out to tender	Crux- front end engineering and design	
AWE		
Quanta Suez; Atco Australia; SNC Lavalin; Clough - competition	Waitisia- front end engineering and design	Dec
iPIPE SERVICES		
Southern Cross Electrical Engineering	Arrow Energy Qld expansion-electrical installation	July

Source: ProjectConnect, ICN Gateway, company announcements



An even bigger jackpot would be a development decision for the Browse gas fields, located around 400 kilometres north of Broome and controlled by a consortium of Woodside (30.6 per cent), Shell (27 per cent), BP (17.3 per cent), Mimi (14.4 per cent) and PetroChina (10.7 per cent).

Previous iterations of the concept included an onshore facility at James Price Point and a floating liquefaction plant, both of which were knocked back.

The most recent plan, fleshed out last year, will be a roughly 800km pipeline from Browse's Torosa, Brecknock and Calliance fields to the Karratha LNG plant, which will have excess capacity from the middle of next decade.

But a big impediment is getting agreement between the Browse partners and North West Shelf Venture members, the latter of which own the Karratha plant.

Analysts had expected securing a deal between the seven different partners would be a tough ask, and Woodside chief executive Peter Coleman had gone as far as speculating in August 2017 that an ownership change may be needed.

Big news on this front was released earlier this month, when Mr Coleman said the two ventures had reached alignment on pricing and commercial terms to process Browse gas through Karratha.

"A preliminary tolling agreement is expected between the North West Shelf project participants and Browse joint venture in the September quarter 2018," Mr Coleman said.

The company already has two projects under way – the Greater Western Flank-2 extension at North West Shelf, and the Greater Enfield oil project.

GWF-2 was 91 per cent completed at the end of June, Woodside told markets in its recent quarterly update, with pipeline construction complete and subsea construction continuing.

Enfield was 63 per cent complete, with offshore work continuing.

Woodside is not the only proponent with a strong project pipeline (see map, page 19).

US-based Chevron is planning to spend $5 billion to drill new wells in the Gorgon and Janz-Io fields to replenish production as existing wells gradually deplete over their lifetimes.

At Chevron's other major operation, Wheatstone, front end engineering and design (FEED) work has started for the Julimar-Brunello phase two tieback project, with an investment decision targeted in the June quarter of 2019.

Construction of the Wheatstone domestic gas plant was 90 per cent complete as of June 30 this year, with start-up expected before September.

Production commenced at the project's second LNG train in June

$US8/boe
GORGON 2017 OPEX
Source: Chevron

of this year.

To put some perspective on how operations are ramping up across the two projects, consultancy EnergyQuest estimates Wheatstone produced 2.1mt in the past financial year, after first gas at train one in October.

Capacity at Wheatstone is 8.9mtpa.

At the three train Gorgon project, ramp-up is mostly complete, with 12.7mt of production in the year to June, compared with capacity of 15.6mtpa.

Financial reports by Woodside, which has a 13 per cent stake in Wheatstone, and those for Chevron, can give an idea of the financial performance of the two projects.

At Wheatstone, LNG sale prices were about $US51 per barrel of oil equivalent in the first six months of the year, while at Gorgon, Chevron reported operating expenditure of $US8 per barrel of oil equivalent, depreciation, depletion and amortisation of $22/boe and a cash margin of $32/boe for 2017.

That implies Chevron's operating cost at Gorgon was about $800 million for the calendar year.

As part of that ongoing operational requirement, Chevron has let a series of contracts in the past few months (see table, page 18), including to Wangara-based Ertech for civil services at Barrow Island and WorleyParsons for extension work across three assets.

Wangara-based Score Perth and Balcatta-based Callidus Process Solutions both won valve maintenance contracts, while Spanish headquartered Applus+ won an engagement for non-destructive testing.

Applus+ Oceania regional managing director Cameron Waters told *Business News* that, although it had been a tough market for the past four years, the business had grown market share.

Mr Waters said the company's work was generally more focused on inspection of operational facilities, although it had also been busy during the construction phase.

ConocoPhillips was active in June contracting for its proposed Barossa development, which would backfill an expected supply shortfall at the Darwin LNG facility it operates.

That shortfall will be created by the depletion of the Bayu-Undan field in 2022-23.

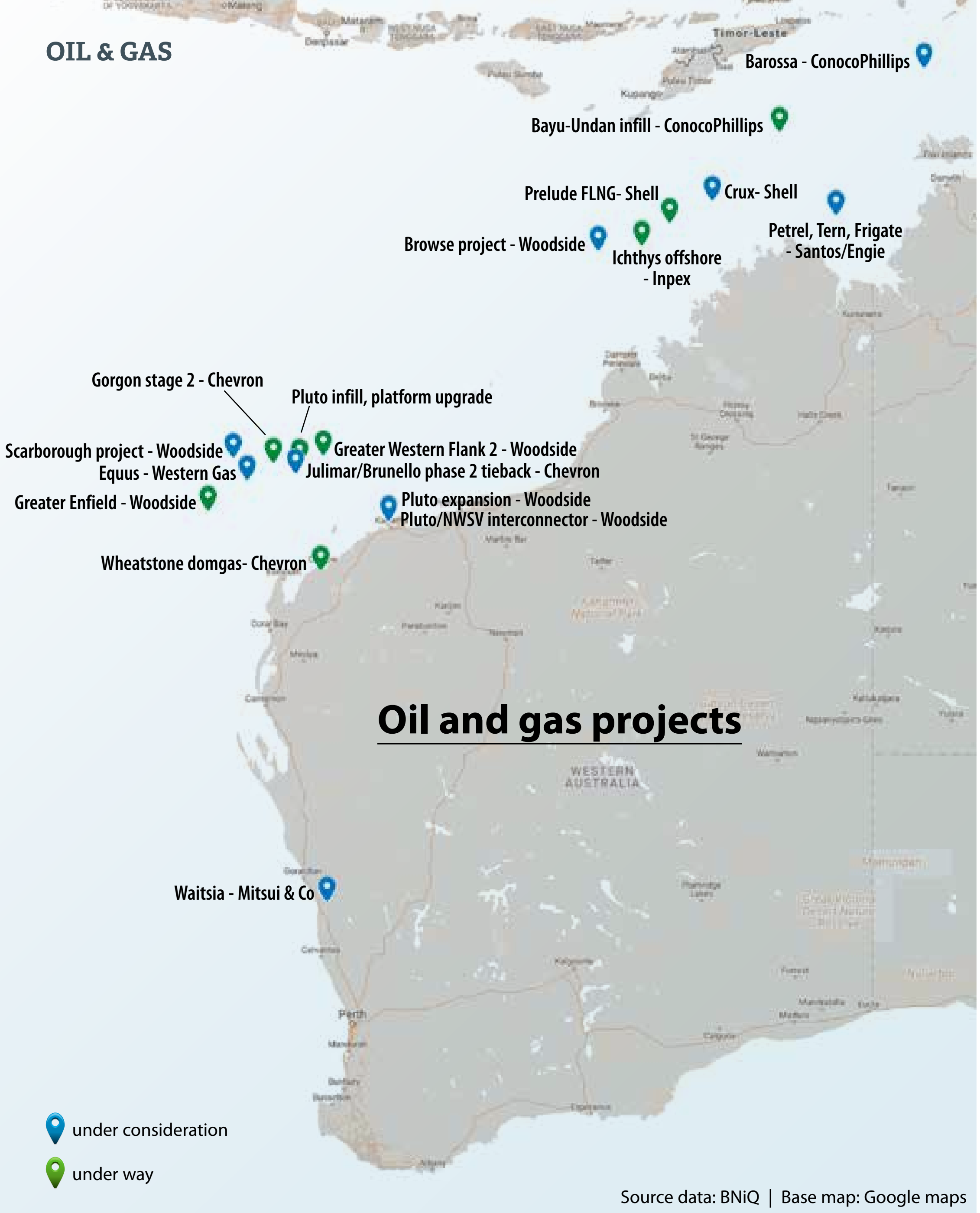
The US-based supermajor anticipates a final investment decision on Barossa by the end of 2019, after the national offshore regulator gave it the tick in March.

In the interim, the company has tapped WorleyParsons subsidiary Intecsea for Barossa subsea work, and has set up a FEED competition between Modec and a consortium of Technip and Samsung.

Similarly, Shell has opened tenders for FEED work on the Crux field, which is intended as a tieback to the Prelude floating LNG vessel.

Prelude is one of only two LNG projects still under commissioning from the past big commodity boom.

A test gas cargo was introduced to the vessel last month, although



Source data: BNiQ | Base map: Google maps

JUDGEMENT: Frank Krieger says ConocoPhillips has reflected on capital allocation during the recent downturn. **Photo: Tom Rovis**

it is not clear exactly when shipments will begin.

At the Ichthys LNG plant, contractor JKC handed over the first LNG train to operator Inpex in May.

It has not yet shipped gas.

Exploring

Energy players spoke about their exploration plans at a recent Petroleum Club industry dinner.

Quadrant Energy group executive subsurface Fred Wehr touted a recent oil find in the Carnarvon Basin at the Dorado-1 well, where the company has an 80 per cent stake.

"We see this as going to be a big deal, Mr Wehr said.

"I hope I'm not overstating this or overselling it but this is something I've never seen in a 35-year career.

"It's just staggering what we've got here."

More broadly, he said the company had one of the top three acreage positions in the North Carnarvon basin.

Quadrant and its predecessor, Apache, had been the most active explorers on the North West Shelf in the past 25 years, Mr Wehr said, with 259 wells drilled at a cost of less than $2 billion.

About 688mmboe was discovered in net terms, he said.

Mr Wehr said when Brookfield and Macquarie Bank bought Apache's assets, there had been strong internal discussion about capital allocation into exploration.

"I would point back a few years to the LNG boom between 2005 and 2014; there was a lot of money left on the table, we left some of it ... just spending a lot of money on exploration is not a guarantee of good investment," he said.

"Most of the oil was discovered before 2005; this was driven by the shallow water program around Varanus Island.

"In 2006 we moved into deeper water (and) made the Julimar discovery.

"We were told by Houston to find enough for a third train; we were 20 per cent partners in Wheatstone (at the time).

"The whole mission was to go out and find some more LNG. Trouble is, everybody else was doing the same thing.

"There was tremendous value destruction during this time in exploration because people were pushing too hard.

"And they were all chasing the same things, the volumes were going down, costs were through the roof."

ConocoPhillips vice-president of exploration and development Frank Krieger said the company spent about $300 million on exploration every year.

"We fight for capital when we're doing exploration," Mr Krieger told *Business News*.

"For us, exploration is not a matter of urgency; generally we have a large portfolio."

He agreed that companies had pushed too far in the LNG boom.

> **ConocoPhillips really took a hard look at ourselves in the last downturn and recognised... you can destroy a lot of value in exploration as well as create it** - Frank Krieger

"ConocoPhillips really took a hard look at ourselves in the last downturn and recognised you can destroy a lot of value in exploration as well as create it," Mr Krieger said.

The Australian exploration program had been targeted, with a portfolio built within reach of the Darwin infrastructure, he said.

"Having built an LNG plant, you want to keep that running for decades and decades," Mr Krieger said.

"You can create a lot of value in an ongoing way if you can do smart and targeted exploration."

After Barossa comes onstream, Mr Krieger suggested that the Greater Poseidon fields in the Browse Basin which include the Kronos discovery, could be next in line.

Cha play buoyant FLNG role

With shipments at Shell's Prelude FLNG facility still to get under way, one Perth businessman is hoping to reignite use of the technology for stranded gas fields.

Matt Mckenzie
matthew.mckenzie@businessnews.com.au
@Matt_Mckenzie_

WHEN Shell approved what was then to be the world's first floating gas liquefaction plant, Prelude, in 2011, it helped build speculation that up to a dozen such facilities could end up moored off the Australian coast.

In addition to Prelude were the likes of Bonaparte FLNG proposal by Engie (then GDF Suez) and Santos, the three-vessel Browse FLNG project planned by Woodside Petroleum and partners, and the Scarborough FLNG development by BHP and Exxon Mobil.

In the years since, each of those proponents has dropped or heavily refined their plans as the oil price tanked, while production at Prelude is already at least a year behind schedule.

The Browse partners, for example, knocked back the idea of a floating development for the project in 2016, while Scarborough FLNG, always considered a marginal project, will now be progressed via a brownfields expansion at the onshore Pluto gas plant near Karratha.

The Engie and Santos JV announced it would consider other options for the Bonaparte development in late 2014 because it did not meet commercial requirements.

A further proposal emerged the following year, with Santos flagging a plan to pipe the Bonaparte gas close to shore, at which point a contractor would run a floating processing facility.

That development would comprise the Petrel, Tern and Frigate fields, with about 1.5 trillion cubic feet of gas available.

Such a project has attracted the attention of Daein Cha, managing director of Transborders Energy, a company planning to develop a reduced size FLNG vessel that would extract gas from numerous smaller fields over a 25-year lifespan.

Mr Cha estimates there are about 40 fields in Australia with reasonable gas reserves that are either orphaned, or too remote, isolated or costly to be commercially viable.

Between them, they hold around 65tcf of gas, he estimates.

Transborders' plan would use a vessel with capacity of around 1.2 million tonnes per annum to extract gas from a number of otherwise-stranded fields.

"The wells have to be already drilled and gas in place confirmed," Mr Cha told *Business News*.

"We don't take exploration risk and there's a fair few resources out there in offshore Australia that meet that criteria.

"It's predicated on us achieving an LNG breakeven price of $US6.50/mmbtu (million British Thermal Units).

"At that level we compete favourably to new LNG projects coming out of the US."

In context, Woodside's gas sold at up to $US9.40 in the June quarter.

Mr Cha said he had set up a consortium with contractors Modec for operations and maintenance, Technip for engineering, construction and procurement, Add Energy as a consultant, and an unnamed major LNG buyer for offtake.

Technip in particular has form in floating LNG plants, having signed a 15-year master agreement with Shell for front-end engineering and design work on a general FLNG concept in 2009, and an agreement for Prelude in 2010.

In the period since, Technip has undertaken FLNG work for Brazilian producer Petrobas and Malaysian business Petronas.

Mr Cha said the Transborders facility would likely cost about $US1.2 billion, with a further $400 million expected for subsea work.

SETTING SAIL: Transborders chief financial officer Anna Sudlow, chairman Jack Sato and managing director Daein Cha (front). **Photo: Gabriel Oliveira**

> **(At $US6.50) we compete favourably to new LNG projects coming out of the US** - Daein Cha

About $2 million of cash and in-kind investment has been received so far, he said, with fundraising under way for further technical work.

"We're just about to enter what we call phase two from mid year this year, where together with (our partners) we're going to embark on conducting pre-FEED based on an FLNG design that caters to a series of gas resources in our region," Mr Cha said.

A deployment would be FEED ready next year and final investment decision could be made as early as 2021, with Transborders either buying gas from resource owners at the wellhead or acting as a contractor for production.

Other businesses have also created concepts for smaller scale FLNG platforms, although those companies intended to sell the vessel rather than operate.

Netherlands-based Bluewater Energy Services, which specialises in floating oil production storage and offloading platforms, has previously released plans for a 2mtpa floating facility, while Norwegian business DNV GL released an unmanned floating LNG concept in May 2015.

Either way, Mr Cha said the Transborders concept would be a major value creator.

Stranded offshore resources were usually valued at up to 10 cents per million cubic feet, he said.

Investment ready offshore resources were valued at 80 cents to $1.60 per million cubic feet.

Staff cuts add to red tape concerns

Despite a host of deals in the Perth Basin during the past year, proponents are battling issues with red tape.

Matt Mckenzie
matthew.mckenzie@businessnews.com.au
@Matt_Mckenzie_

STAFF cuts at the Department of Mines, Industry Regulation and Safety could exacerbate the already sluggish approvals process facing local onshore energy hopefuls.

Data from the state's Public Sector Commission shows the headcount at the department, which was formed last year by an amalgamation of the Department of Mines and Petroleum and part of the Department of Commerce, fell by 133 people in the six months to March 2018, leaving 1,471 staff.

One oil and gas executive told *Business News* the cutback was likely to make an already protracted process for approvals even more difficult.

"You can imagine what (the staff reduction) does to the resource and experience level of (the) key regulator," he said.

"And therefore anything that you're trying to get done in any timeframe you'd be comfortable with has been delayed."

He said there was a lack of consistency and standardisation in approvals that existed in more mature regulatory environments.

"At the moment you may have two wells that are quite similar being drilled in the Perth Basin and you'll have two companies potentially submitting quite different documents," he said.

The department did not respond to a request for comment, but publishes quarterly data on approvals. Exploration permits, for example, are to be approved in 120 days. The department received one and approved one application in the quarter, hiking its time target. However, it had 22 pending permits carried from the previous quarter, all of which were carried into the following quarter.

Strike Energy managing director Stuart Nicholls told a recent WA Petroleum Club dinner the state's onshore regulator was an impediment to local competitiveness.

Mr Nicholls said Adelaide-based Strike was in a unique position to compare regulation as it had a project in Western Australia at West Erregulla, and another in South Australia's Cooper Basin.

"(It's) really surprising in a state which is the homeland of oil and gas for Australia," he said.

"If you look at some of the incentivisations South Australian regulators have, the reduction of barriers to entry for new, young entrepreneurs to come into a basin and take up new positions and look at things slightly differently is there."

Environmental permits spanned across the Cooper Basin, he said, regardless of whether for drilling or operations or other activities.

"As long as you comply with the existing environmental permits over the entire basin, you're fine," Mr Nicholls said.

"Whereas in WA, it's a 12-month exercise to put an environmental permit together for a single well in an onshore basin that might be right next door to the well you drilled the year before."

PAUSE: David Messina says further work at the Warro field will get under way when there is clarity over the fracking inquiry. **Photo: Gabriel Oliveira.**

PERTH BASIN ACTIVITY - A SELECTION
Mitsui & Co buys AWE, including Waitsia field
Origin Energy sells Lattice Energy to Beach Energy
Strike Energy buys stake in West Eregulla
Empire Oil & Gas insolvency, assets bought by Mineral Resources
Key Petroleum buys Rey Resources share of EP437
Alcoa sells Warro stake to Whitebark Energy

Opportunities

Activity appears set to intensify in the Perth Basin despite the regulatory pressure, particularly given significant recent deal flow.

"About 60 per cent of the basin has changed hands in the past 12 months," Mr Nicholls said.

"There has been a huge amount of upheaval in the basin."

Transactions included Mitsui & Co's purchase of AWE earlier this year, giving it control of the Waitsia field, and Origin Energy's Lattice Energy spin-off, which was finalised in January.

Mineral Resources also secured assets following the receivership of Empire Oil & Gas at the end of last year.

120
BUSINESS DAYS TARGET TIMELINE FOR EXPLORATION PERMIT APPROVAL
Source: DMIRS

Meanwhile, Strike bought a 50 per cent interest in the West Erregulla project from Warrego Energy (which holds the remainder) last month, with the two planning to drill early next year.

West Perth-based Whitebark Energy is one Perth Basin player that has maintained an exposure in the basin, through its 15 per cent share of the Xanadu prospect and control of the Warro unconventional field.

The company secured the 43 per cent of Warro it did not already own from Alcoa in late June.

Whitebark managing director David Messina told *Business News* the company's main focus was on production at Point Loma in Canada, but there was potential in the Perth Basin.

At Xanadu, which is operated by Norwest Energy, the next step will be 3D seismic work.

"What got everybody excited with Xanadu, pre-drill, was the material potential resource in place," Mr Messina said.

"Combined with the fact you can develop the field from onshore, means your cost base is going to be much lower than, say, Cliff Head."

Xanadu is an offshore field, but close enough to the coast that it can be drilled from land.

Further work at Warro would depend on the state government's fracking inquiry, he said.

"Warro has had a lot of work done to it over many years; it's an enormous resource there," Mr Messina said.

"There's no question it is technically challenging, as we've seen from the results of the wells that were drilled."