

**ASX:EEG**



# Quarterly Report

For the period ending 30<sup>th</sup> September 2021

Level 19, 20 Bond Street  
Sydney NSW 2000

## Highlights of a Successful Quarter

- Empire completed the acquisition of Pangaea and EMG's 100% interests in EP167, EP168, EP169, EP198 and EP305, in the Beetaloo Sub-basin
- The Board welcomed Mr Paul Fudge as a Non-Executive Director and Ms Jacqui Clarke as his Alternate Director
- In the first ten days following recommencement of Extended Production Testing at the Carpentaria-1 vertical well a ~45% increase in production rate to 0.364 mmcf / day was observed compared to the average flow rate in the first phase of Extended Production Testing
- \$19.3 million grant agreements executed with the Australian Government to offset 25% of the cost of seismic acquisition and the drilling, fracture stimulation and flow testing of three horizontal appraisal wells in EP187
- Empire received a tax offset refund in the amount of \$5.37 million under the Federal Government's Research and Development Tax Incentive Scheme
- Global gas prices are trading at multi-year highs even ahead of the forthcoming Northern Hemisphere winter demand peak
- The Carpentaria-2H horizontal appraisal drilling program in EP187 has been initiated since the end of Quarter
- Infill 2D seismic to further delineate and map the Velkerri Shales in EP187 is scheduled to start in November 2021
- Gas transportation services MoU signed with APA Group since the end of the quarter
- Cash at the end of the quarter was \$31.8 million

### Comments from Managing Director Alex Underwood:

This Quarter the Empire team has had further success executing our strategy focused on the Northern Territory's Beetaloo Sub-basin.

The acquisition of the Pangaea / EMG properties on the Western side of the basin has transformed our company with a materially increased footprint in the basin.

The upcoming drilling of our first horizontal appraisal well, Carpentaria-2H, builds on our momentum as we focus on de-risking our assets then entering production in a timely manner. Regulatory approval for the drilling of Carpentaria-2H comes with approvals for several more wells over the years ahead.

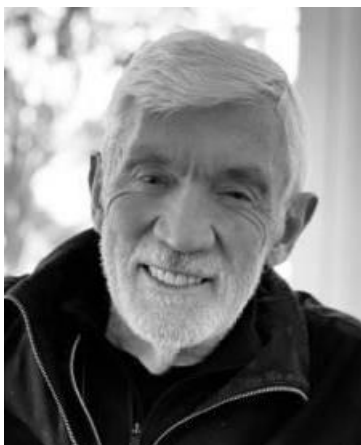
The MOU we have just announced with APA Group, a leading Australian energy infrastructure business, demonstrates clear pathways to market for our Beetaloo gas and liquids resources, both to the north through Darwin and to Australia's increasingly supply constrained East Coast.

Severe gas shortages that are developing across Europe and Asia demonstrate the need for secure, long-term sources of gas supply as the world transitions to cleaner energy sources. Appraisal results emerging from all operators across the basin give us increasing confidence that the Beetaloo can play a critical role in securing gas supplies for Australia and the broader region in the decades ahead.

## Pangaea / EMG NT Assets Acquisition Completion

On 16<sup>th</sup> August 2021, Empire announced that it had completed acquisition of Pangaea (NT) Pty Limited's ("Pangaea") and EMG Northern Territory Holdings Pty Limited's ("EMG NT") 100% interests in five Exploration Permits - EP167, EP168, EP169, EP198 and EP305. These well-explored acreages are located on the western side of the Northern Territory's Beetaloo Sub-basin and roughly double the Company's Northern Territory land position. These new areas offer access to the Amadeus Gas Pipeline operated by APA Group with whom Empire has signed a transportation MOU. Both Empire's eastern and western areas now share the opportunity for gas delivery through existing pipelines.

In conjunction with the completion of the acquisition, Empire welcomed Mr Paul Fudge as a new Non-Executive Director and Ms Jacqui Clarke as his Alternate Director. Mr Fudge is a prominent investor in Australian gas and resources projects and brings significant experience to the Empire Board. Ms Clarke is a chartered accountant, professional director, and former Deloitte partner.



Non-Executive Director, Paul Fudge



Alternate Director, Jacqui Clarke

In consideration for the acquisition of the Tenements, Pangaea and EMG NT have been paid:

- **Pangaea:** \$5.0 million in cash, 140,000,000 shares<sup>1</sup> in Empire and 8,000,000 unlisted options exercisable at \$0.70 per share on or before 13<sup>th</sup> August 2024.
- **EMG NT:** ~\$1.06 million in cash, 29,696,970 shares in Empire and 1,696,970 unlisted options exercisable at \$0.70 per share on or before 13<sup>th</sup> August 2024.

Empire incurred completion payments comprising North Territory stamp duty (\$3.4 million) and professional services and other transaction costs (\$1.4 million).

Empire's technical team has started an engagement program with landholders across the newly acquired tenements including with pastoralists and Traditional Owners ahead of seeking Environment Management Plan approvals in readiness for on-ground activities in 2022.

<sup>1</sup> At the date of this announcement, 119,894,868 issued shares are held by Pangaea, with 20,105,132 being unissued. Additional shares will be issued subject to Pangaea not holding an interest of more than 20% in the Company at any point in time.

## Acquisitions Deliver a Substantial Lift in Resources

Following the completion of the transaction, Empire's total Contingent and Prospective Resource estimate is set out below.<sup>2</sup>

Zone	Unrisked Net Contingent Resources Liquids (MMBBL)			Unrisked Net Contingent Resources Sales Gas (BCF)			Unrisked Net Prospective Resources Liquids (MMBBL)			Unrisked Net Prospective Resources Gas (BCF)		
	Estimate			Estimate			Estimate			Estimate		
	Low (1C)	Best (2C)	High (3C)	Low (1C)	Best (2C)	High (3C)	Low (1U)	Best (2U)	High (3U)	Low (1U)	Best (2U)	High (3U)
Kyalla*	0.8	3.0	11.1	0.8	4.5	27.7	88	378	1,571	184	857	4,891
Mid Velkerri*	0.1	0.5	3.0	57.2	194.0	474.1	80	413	2,037	10,163	30,214	87,735
Barney Creek*	-	-	-	-	-	-	-	-	-	1,633	11,053	45,380
<b>Total*</b>	<b>0.9</b>	<b>3.5</b>	<b>14.1</b>	<b>58.0</b>	<b>198.5</b>	<b>501.8</b>	<b>168</b>	<b>791</b>	<b>3,608</b>	<b>11,980</b>	<b>42,124</b>	<b>138,006</b>

\*Empire derived arithmetic summation of NSAI probabilistic resource estimations

## Gas Infrastructure MOU with APA Group

On 27<sup>th</sup> October 2021, Empire announced it had executed a transportation services memorandum of understanding ("MOU") with APA Transmission Pty Ltd, a wholly owned subsidiary of APA Group Limited ("APA"). APA is a leading Australian energy infrastructure business and its continuous network of gas pipelines on the east coast accesses all the principal east coast markets including Gladstone, Brisbane, Mount Isa, Wallumbilla, Sydney, and Melbourne. APA owns the Amadeus Gas Pipeline in the Northern Territory.

APA and Empire will explore opportunities to enter appropriate development and commercial agreements for APA to build, own and operate gathering, production, processing, and transportation infrastructure for the movement of gas and liquids from Empire's Northern Territory assets. APA and Empire will also promote a 'common user' model for development of the Beetaloo Sub-basin infrastructure to drive economies of scale benefits and lower cost per unit charges.

APA's "Northern Strategy" envisages expansion of its Amadeus Gas Pipeline connecting to Darwin to support development of a gas-fed manufacturing industry, while its "Eastern Strategy" includes development of a new Beetaloo gas pipeline connecting to eastern markets and LNG at Gladstone via APA's continuous gas distribution network.

<sup>2</sup> Detailed Contingent and Prospective Resource tables are set out in the Empire ASX release dated 27th May 2021, 2021, AGM Managing Director's Presentation. Shareholders should also refer to the Notice of General Meeting released to ASX on 2nd July 2021.



Map highlighting existing APA pipeline infrastructure network and proposed "Northern" and "Eastern" strategies pursuant to MOU with Empire

## Northern Territory Work Program Continuing

On 28<sup>th</sup> September 2021, Empire's sub-surface team restarted an Extended Production Test ("EPT") at the vertical Carpentaria-1 well in EP187. The well was shut in on 16<sup>th</sup> July 2021 when COVID-19 related travel restrictions prevented crew change outs. After pumping off fluid stored in the wellbore, gas production was restarted on 5<sup>th</sup> October 2021 and over the first ten days averaged 0.364 mmcf / day. Pre-shut-in a 17-day EPT ran at 0.25 mmcf / day.

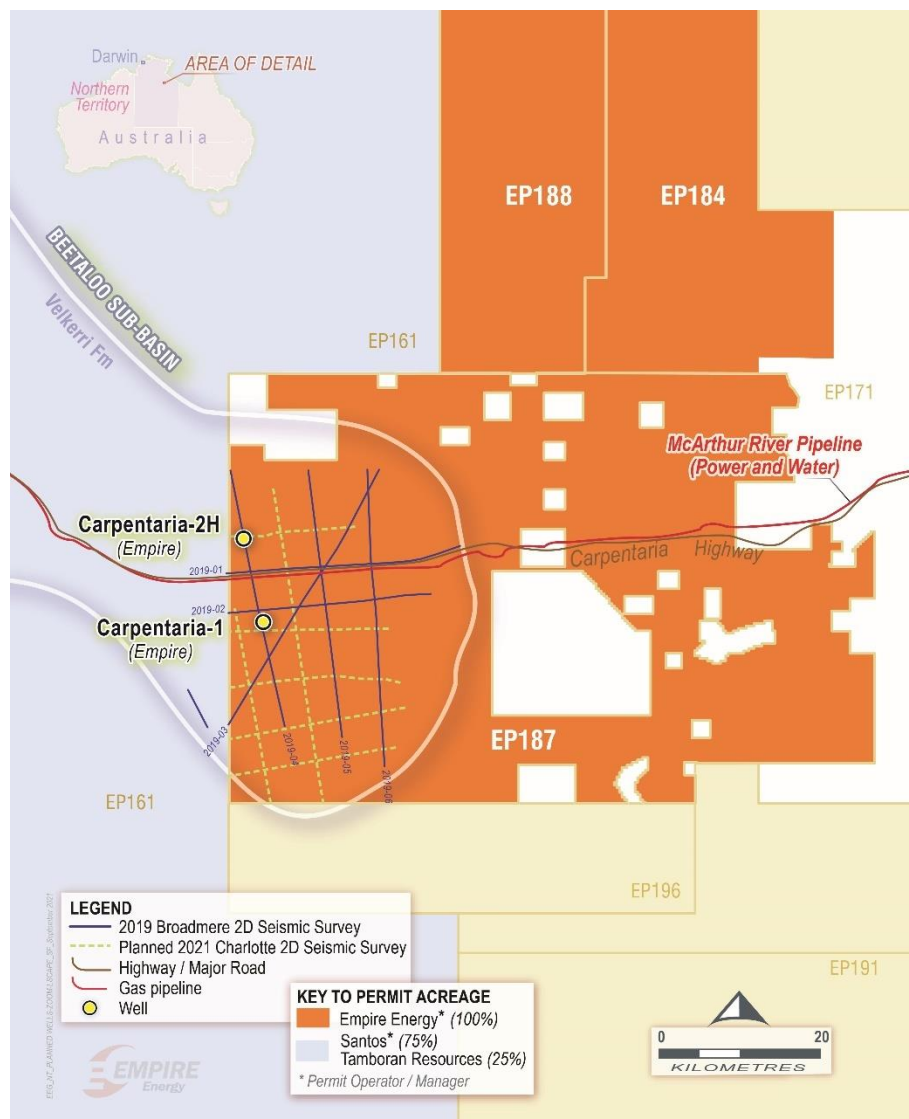
This 45% increase in production from a coincidental shut-in is a positive development for potentially enhancing gas flows in future wells in the Velkerri formation. Improved production rates following extended shut-ins between hydraulic stimulation and flowback have been observed in the major US shale plays. Such observations at Carpentaria-1 have positive implications for the innovative stimulation and completion methodologies. Empire is applying these observations to the appraisal and potential future development of its properties in the Beetaloo Sub-basin.

Sampling of gas and flowback fluid at surface has also continued and the returned hydrocarbons will be used to determine which of the four shale targets the Carpentaria-2H lateral will be drilled into.

Civil works at the Carpentaria-2H well site have commenced. Other works include the upgrade of the Carpentaria Highway intersection to the Carpentaria-2H well pad, construction of site access roads and the completion of the well pad itself are underway. Water source and monitoring bores are being drilled within the well pad area and baseline water sampling for aquifer protection will commence soon.

Empire has engaged Northern Territory based businesses and crew for Carpentaria-2H civil works and 2D seismic line preparation as part of our commitment to support the growth of the Northern Territory economy.

The Carpentaria-2H well pad is ~11km north of Carpentaria-1, with the Carpentaria Highway and McArthur River Pipeline located midway between the two wells, both within EP187.



EP187 map showing existing Carpentaria-1 well location, new Carpentaria-2H well location, and existing and upcoming seismic surveys



The first phase of the Carpentaria-2H drilling campaign will be the drilling of a vertical pilot hole through the same Velkerri Formation shales (A, B, Intra A/B and C) as those encountered at Empire's Carpentaria-1 vertical well and based on seismic data are expected at a 200m greater depth with commensurately higher pressure.

Following extensive formation evaluation across the entire Velkerri formation stratigraphic column the vertical hole section will be plugged back to a kick-off point above the Velkerri. The horizontal Carpentaria-2H hole section will then be kicked off from that point and drilled horizontally into the selected Velkerri shale unit, most likely the Velkerri B which has shown strong results during Carpentaria-1 flow testing.

The horizontal section is then planned to be drilled for at least 1,000 metres within the target formation, and the hole will then be cased and suspended, and the rig released. Following the end of the wet season in early Q2 2022, hydraulic fracture stimulation and an EPT will be conducted giving Empire its first measure of the commercial production potential of that well, the selected target zone, and of the Velkerri Formation within EP187.

Results from the vertical Carpentaria-2H pilot hole will also inform an updated independent resource assessment with updated Contingent and Prospective Resources estimates expected to be released in Q1 2022.

The acquisition phase of the Charlotte 2D Seismic Survey program is expected to commence in the first week of November 2021. The seismic program is designed to further delineate and map the Velkerri Formation across EP187, data vital to Empire's appraisal strategy and selection of future drilling locations. Seismic line rehabilitation will be carried out immediately following acquisition consistent with Empire's goal of minimising the environmental impact of our operations.



L-R: Sonia Harvey (Empire's VP Community and Government Relations) and John Anderson (KD Machinery Hire) pegging the location of Carpentaria-2 well head



L-R: Jed Farley from Empire's InGauge operations team meets with civil works contractor John Anderson from KD Machinery to work on initial phase of civil construction at Carpentaria-2H

### **Northern Territory Government Drilling Approvals Received**

After Quarter-end, Empire received approval from the Northern Territory Government for its Environment Management Plan ("EMP") for up to seven horizontal wells in EP187 and seismic acquisition.

The EMP covers all key activities for Carpentaria-2H operations and the work programs for which Empire has executed grant agreements with the Australian Government under the *Beetaloo Cooperative Drilling Program*.

### **Australian Government's *Beetaloo Cooperative Drilling Program***

During the quarter, Empire's wholly owned subsidiary, Imperial Oil & Gas Pty Limited ("Imperial"), entered into grant agreements with the Australian Government which will offset 25% of the cost of seismic acquisition and the drilling, fracture stimulation and flow testing of three horizontal appraisal wells in EP187 ("Grant Contracts"). The total funding available under the Grants Contracts is \$19.3 million.

Grant 1 will be applied to Empire's forthcoming work program in EP187, funding 25% of the cost of (i) 2D seismic acquisition; (ii) the drilling, fracture stimulation and flow testing of the Carpentaria-2H horizontal appraisal well (excluding the cost of the first 12 fracture stimulation stages and associated cost of horizontal section drilling); and (iii) well design, fracture stimulation design, procurement, consumables, access track construction, well pad construction, evaporation pond construction, rig mobilisation and fracture stimulation spread mobilisation (collectively "associated activities"), capped at a total grant amount of \$6.5 million. Under the terms of the Grant 1 agreement the grant monies are expected to be received in two instalments in December 2021 and June 2022.

On 28<sup>th</sup> July 2021, an activist organisation called Environment Centre NT Inc ("ENT") commenced proceedings in the Federal Court against the Commonwealth Minister for Resources and Water and the Commonwealth seeking judicial review of various government decisions relating to the *Beetaloo Cooperative Drilling Program*, including the decision to grant funding to Empire. On 23<sup>rd</sup> September 2021, the Federal Court granted leave to ENT to join

Imperial to the proceedings due to its interest in the proceedings as a party to the Grant Contracts. The relief sought by ENT, if upheld, would include a declaration that the Grant Contracts are void. Federal Court hearings to consider the proceedings are confirmed for 2<sup>nd</sup> and 3<sup>rd</sup> November 2021 and will be defended by the Minister, the Commonwealth and Imperial. Empire will advise shareholders once a decision is handed down by the Court.

### **On-Country Meeting in Borroloola, Northern Territory**

On 14<sup>th</sup> September 2021, Empire attended an on-country meeting in Borroloola, Northern Territory. The on-country meeting was attended by representatives from Empire, the Northern Land Council and the Traditional Owners of EP187. At the meeting Empire detailed our work program plans, answered questions, and addressed any concerns raised to the satisfaction of the Traditional Owners. Empire continues to ensure, and fully appreciates, the active participation of Traditional Owners in the meeting.



Jon Bennett (inGauge's Project & Construction Manager) presenting a work program update at the On Country Meeting held in Borroloola on 14<sup>th</sup> September. Restricted entry into the NT during COVID-19 precluded Empire MD Alex Underwood from travelling the NT. He did however participate in the meeting by videoconference.



## Other Corporate News

### Empire General Meeting

Empire held a General Meeting of the Company on 3<sup>rd</sup> August 2021 to consider the acquisition of the Pangaea / EMG Tenements. The resolutions put before shareholders were carried by a strong majority.

### Refundable Research and Development Tax Offset

On 21<sup>st</sup> September 2021, Empire received a refundable tax offset in the amount of \$5.37 million under the Federal Government's Research and Development ("R&D") Tax Incentive Scheme in relation to eligible R&D activities undertaken during the financial year ended 31 December 2020.

### Broker Research Coverage

Blue Ocean Equities, Morgans, Research as a Service (RaaS) and Taylor Collison all generate research on Empire.

Research reports can be found on Empire's website <https://empireenergygroup.net/research-analyst-reports/>

### Empire Tenements

Empire has today released to the ASX a list of its petroleum tenements which includes the newly acquired Pangaea / EMG NT Tenements.



L-R: Cassy Schmidt (APPEA NT Director) and Sonia Harvey (Empire's VP Community and Government Relations) engaging with community at the APPEA and Beetaloo Operator stand at the Darwin Royal Show held 23<sup>rd</sup> July

## Increasing Activity Across the NT Petroleum Sector

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- **On 12<sup>th</sup> August 2021, Falcon Oil & Gas Ltd (TSXV: FO, AIM: FOG) announced the spudding of the Velkerri-76 well in the Beetaloo Sub-basin with joint venture partner Origin Energy.** Velkerri-76 is targeting the Velkerri play along the south-eastern flank of the Beetaloo Sub-basin, which is predicted to be in the liquids rich window.<sup>3</sup>
- **On 17<sup>th</sup> August 2021, Tamboran Resources Limited (ASX: TBN) announced that the Tanumbirini-2H well in EP161 (adjoining Empire's EP187), operated by Santos (ASX: STO) had been drilled to a total depth of 4,598 metres after successfully completing the horizontal section in over 1,000 metres of the Mid-Velkerri B Shale.** Tanumbirini-2H drilling had encouraging strong gas shows and pressures.<sup>4</sup>
- **On 2<sup>nd</sup> September 2021, Tamboran Resources announced that the Tanumbirini-3H well, operated by Santos had been spudded on 23<sup>rd</sup> August 2021.** Following the drilling of the Tanumbirini-3H horizontal section, both the Tanumbirini-2H and Tanumbirini-3H wells will be fracture stimulated and flow tested, with results anticipated prior to the end of 2021.<sup>5</sup>
- **On 15<sup>th</sup> September 2021, an independent report released by leading economics firm ACIL Allen, outlined the social and economic benefits to flow up to 2030 to the Northern Territory from the INPEX operated Ichthys LNG.** ACIL Allen considered business indicators such as operational and capital expenditure, employment and local contract values to assess Ichthys LNG's contribution to Gross Territory Product, wages and salaries paid to Territory workers, population growth, social services and the valuable contribution of volunteers in the community.

Minister for Mining and Industry, Hon Nicole Manison MLA said "It's because of developments like this we have world-class jobs right here and the future is bright for this industry, meaning even more jobs for Territorians and benefits to local businesses".

INPEX General Manager Northern Territory Roland Houareau commented that for every full-time job created by Ichthys LNG, a further two jobs are created at another business in Darwin and that "Many more people benefit from Ichthys LNG than we

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<sup>3</sup> Falcon Oil & Gas announcement entitled "Spudding of the Velkerri 76 S2-1 well – Beetaloo Sub-basin"

<sup>4</sup> Tamboran Resources ASX release entitled "Operational Update – EP161 Tanumbirini 2H Well Successfully Drilled"

<sup>5</sup> Tamboran Resources ASX release entitled "Operational Update – EP161 Tanumbirini 3H Well spudded ahead of schedule"

initially anticipated, and the social and economic benefits will continue to flow to local businesses and the community for decades to come”.<sup>6</sup>

- **On 6<sup>th</sup> September 2021, Origin Energy Ltd (ASX: ORG) announced impressive results from an Extended Production Test at the Amungee NW-1H horizontal appraisal well with strong implications for the potential of the Velkerri Formation shales across the Basin.** Average gas rates of 1.1 mmcf / day were observed over a three-week EPT in December 2016, however new testing by Origin Energy concluded 85% to 95% of this measured gas flow was determined to be coming from the first 200 metres of the horizontal section of the well. This result provides a new demonstration of the Velkerri’s deliverability across a full production zone. **Origin stated that the result suggests a normalised gas flow rate equivalent of between 5.2 and 5.8 mmcf / day per 1,000 metre of lateral. Given typical production wells are ~3,000 metres long this Velkerri result aligns with the production rates achieved in the premier US shale plays.**

Origin General Manager Beetaloo and Growth Assets, Mr Chris White, said, “These results significantly increase our assessment of potential deliverability and commerciality of future wells in this area”.<sup>7</sup>

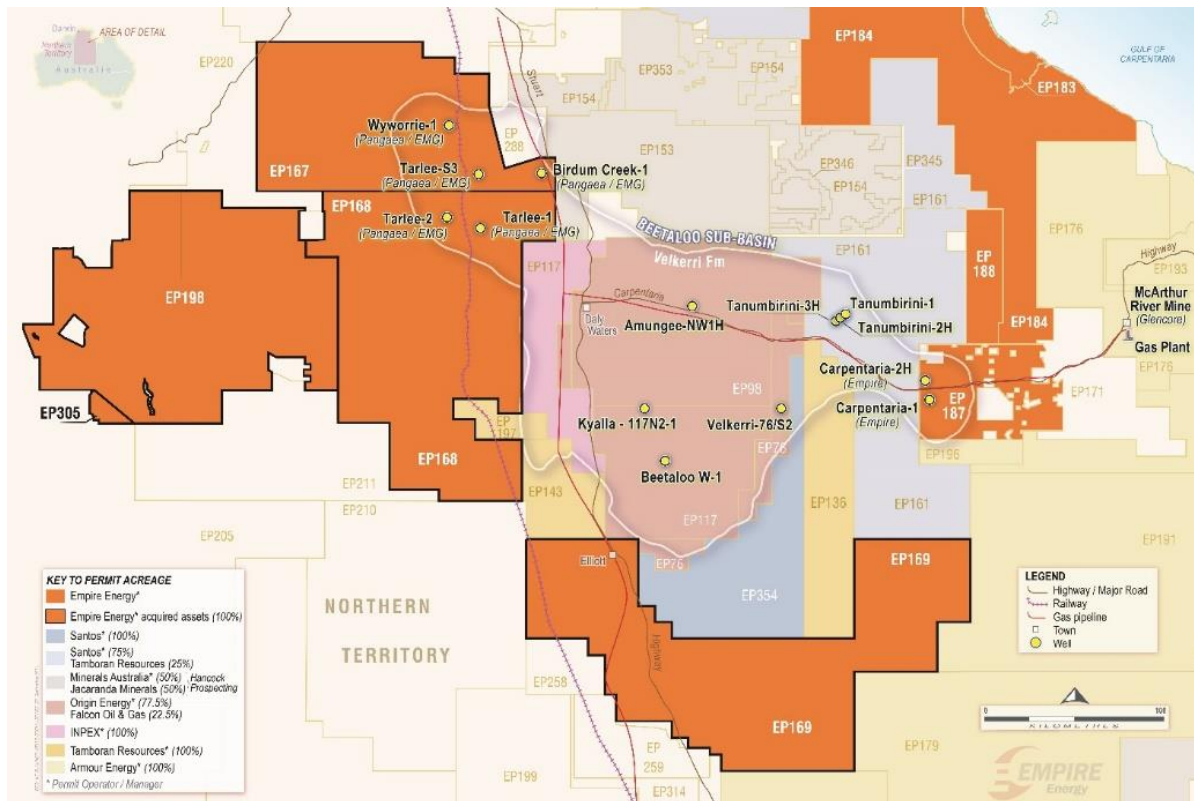
- **On 6<sup>th</sup> October 2021, Tamboran Resources announced that the Tanumbirini-3H vertical section had been completed and drilling of the horizontal section was expected to commence shortly thereafter.** Tamboran indicated that the drilling time in the Tanumbirini-3H vertical and build section was reduced by 20% due to learnings from the Tanumbirini-2H well.<sup>8</sup>
- **On 15<sup>th</sup> October 2021, Falcon Oil & Gas announced that the drilling of the Velkerri-76 vertical appraisal well had been completed.** Preliminary evaluation of the well confirmed the presence of the Velkerri Formation A, Intra A/B, B and C shales and likely within the wet gas maturity window as evidenced by mud gas data during drilling.<sup>9</sup>

<sup>6</sup> <https://www.inpex.com.au/news-and-updates/media-centre/media-releases/independent-study-highlights-ichthys-Ing-benefits-to-the-northern-territory/>

<sup>7</sup> <https://originbeetaloo.com.au/positive-results-in-beetaloo-basin-well-testing/>

<sup>8</sup> Tamboran Resources ASX release entitled “Operational Update – EP161 Tanumbirini 3H vertical section completed and drilling of the horizontal section to commence shortly”

<sup>9</sup> <https://falconoilandgas.com/2021/10/15/2783/>



Beetaloo Sub-basin map highlighting key existing and upcoming petroleum wells

## US Operations Update

Empire's US operations reported a positive EBITDA for Q3 2021 of US\$217k (Q2 2021: US\$16k), reflecting a rising gas price environment and increased gas production.

The average daily production for Q3 2021 was 4,585 Mcfe / day vs. Q3 2020 4,555 Mcfe / day, representing an increase 0.6% year-on-year. The weighted average sales price for gas after hedging was US\$3.51 / Mcf (Q2 2021: US\$2.47 / Mcf).

During the Quarter, a connection to a local gas utility was completed allowing 25 previously shut-in wells to produce as soon as cooler weather arrives in the north-east region. Miscellaneous pipeline repairs and upgrades were also completed to allow previously uneconomic wells to recommence production.

Empire's renewable energy leasing initiative continued during the Quarter with US\$45,000 received in new payments. Empire remains focused on concluding further renewable leasing transactions.



Description	3 months to 30 Sept 2021	3 months to 30 Sept 2020	YTD FY 2021	YTD FY 2020
<b>Net Oil Production (Bbls)</b>				
Appalachia	567	865	1,829	1,306
<b>Net Natural Gas Production (Mcf)</b>				
Appalachia	418,378	413,906	1,231,649	1,289,074
<b>Net Gas Equivalent (Mcf):</b>				
Appalachia	421,780	419,096	1,242,623	1,296,910
<b>Mcf/d</b>	<b>4,585</b>	<b>4,555</b>	<b>4,552</b>	<b>4,751</b>
<b>Weighted Avg Sales Price (US\$/Mcf)</b>				
Before Hedge	3.51	1.62	2.88	1.78
After Hedge	3.51	1.94	2.91	2.30
<b>Lifting Costs (incl. taxes):</b>				
Total Natural Gas Equivalent (US\$/Mcf)	1.25	1.35	1.20	1.20

Revenue estimates have been made for the last 2 production months of the quarter under review due to customer payment/invoice cycles. As such, there may be changes to production, revenues and operating ratios for the previous quarter as final production statements are received.

## Balance Sheet & Liquidity

Empire's cash balance as at 30<sup>th</sup> September 2021, was \$31.8 million, of which \$30.4 million was held in Australian dollars, and US\$1.0 million was held in United States dollars.

During the Quarter, Empire made a debt repayment of US\$137,500 to the Macquarie Bank Credit Facility. The total outstanding balance at Quarter-end was US\$5,987,520. Empire also holds a second tranche PPP loan of US\$343,602. Empire expects to progress the process to have the PPP loan forgiven during the Quarter. The PPP loan is unsecured and subordinated to the Macquarie Bank facility.

Empire's prudent gas hedging policy as set out in the table below is weighted towards put options to provide for upside gas price exposure while ensuring downside price protection and a level of cash flow stability:

Period	Volume mmbtu/month	Hedge Type	Strike Price US\$/mmbtu	Premium US\$/mmbtu
Oct 21 to Dec 21	25,000	Put Options	\$2.50	\$0.23
Oct 21 to Dec 21	25,000	Put Options	\$2.50	\$0.37
Oct 21 to Dec 21	25,000	Put Options	\$2.50	\$0.41
Oct 21 to Dec 21	50,000	Swap	\$3.10	N/A
Jan 22 to Dec 22	70,000	Put Options	\$3.25	\$0.29
Jan 22 to Dec 22	25,000	Put Options	\$2.50	\$0.35
Jan 22 to Dec 22	50,000	Put Options	\$2.50	\$0.41
Jan 23 to Dec 23	25,000	Put Options	\$2.50	\$0.27
Jan 23 to Dec 23	25,000	Put Options	\$2.50	\$0.41

During the Quarter, the Company made payments to related parties of \$105,294. These payments comprised the Managing Director's salary and Non-Executive Directors' fees paid in cash.

## Liquidity

Quarter Ended	30/09/2021	30/06/2021	31/03/2021	31/12/2020
Cash (A\$)	\$31,752,274	\$41,899,250	\$11,353,728	\$14,425,435
Debt (A\$) <sup>10</sup>	\$(8,785,959)	\$(8,604,233)	\$(9,051,670)	\$(8,500,909)
<b>Net Cash /(Debt)<sup>11</sup></b>	<b>\$22,966,315</b>	<b>\$33,295,017</b>	<b>\$2,302,058</b>	<b>\$5,924,526</b>

## Production and Development Expenditure (ASX Listing Rule 5.2.1)

Asset	Nature of Expenditure	Amount
New York and Pennsylvania		
	Production costs (infield operations, gas processing, and transportation)	\$468,766
	Production costs (wages, consultants, and other overheads)	\$244,919
	Other production costs	\$29,601
<b>Total</b>		<b>\$743,286</b>

Empire did not incur production and development expenditure on its other assets during the Quarter.

## Exploration Expenditure (ASX Listing Rule 5.2.2)

Asset	Nature of Expenditure	Amount
EP187 – Capitalised		
	Consulting fees (Operations and Technical)	\$883,658
	Carpentaria-2 long-lead items	\$115,201
	Carpentaria-1 hydraulic fracture stimulation	\$2,699,460
<b>Total</b>		<b>\$3,698,319</b>
EP187 - Expensed		
	Aboriginal Areas Protection Authority (AAPA) Authority Certificate fees	\$76,203
	Northern Land Council (NLC) administration fees	\$6,150
	Other overheads (accommodation, mapping etc)	\$45,693
EP184 - Expensed		
	NLC administration and exploration fees	\$58,180

<sup>10</sup> Note: Debt is comprised of US\$5,987,520 owing under the Senior Secured Facility with Macquarie Bank Limited and US\$343,602 under the PPP with PNC Bank

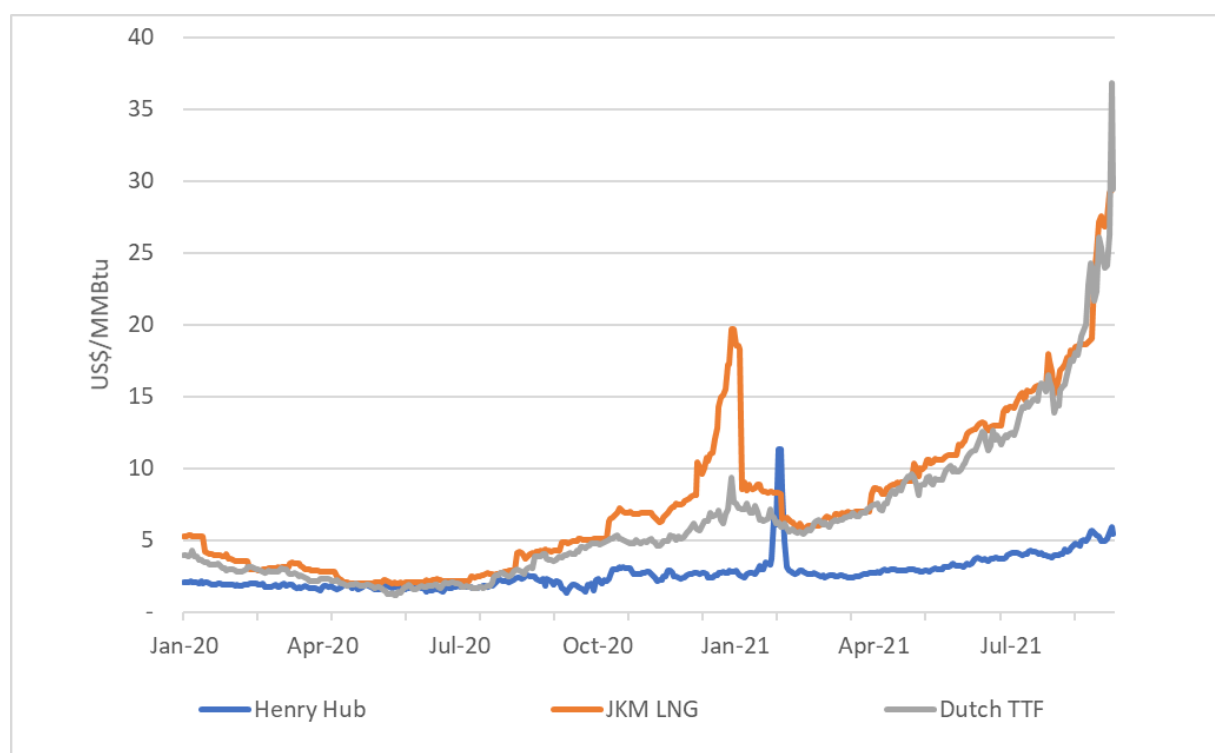
<sup>11</sup> Note: Net Cash / (Debt) is defined as AUD equivalent cash minus AUD debt for the purposes of this calculation

	Northern Territory Government (NTG) annual and licensing fees	\$94,190
EP305 - Expensed		
	NTG licensing fees	\$2,695
<b>Total</b>		<b>\$283,111</b>

Empire did not incur exploration expenditure on its other assets during the Quarter.

## Energy Markets Update

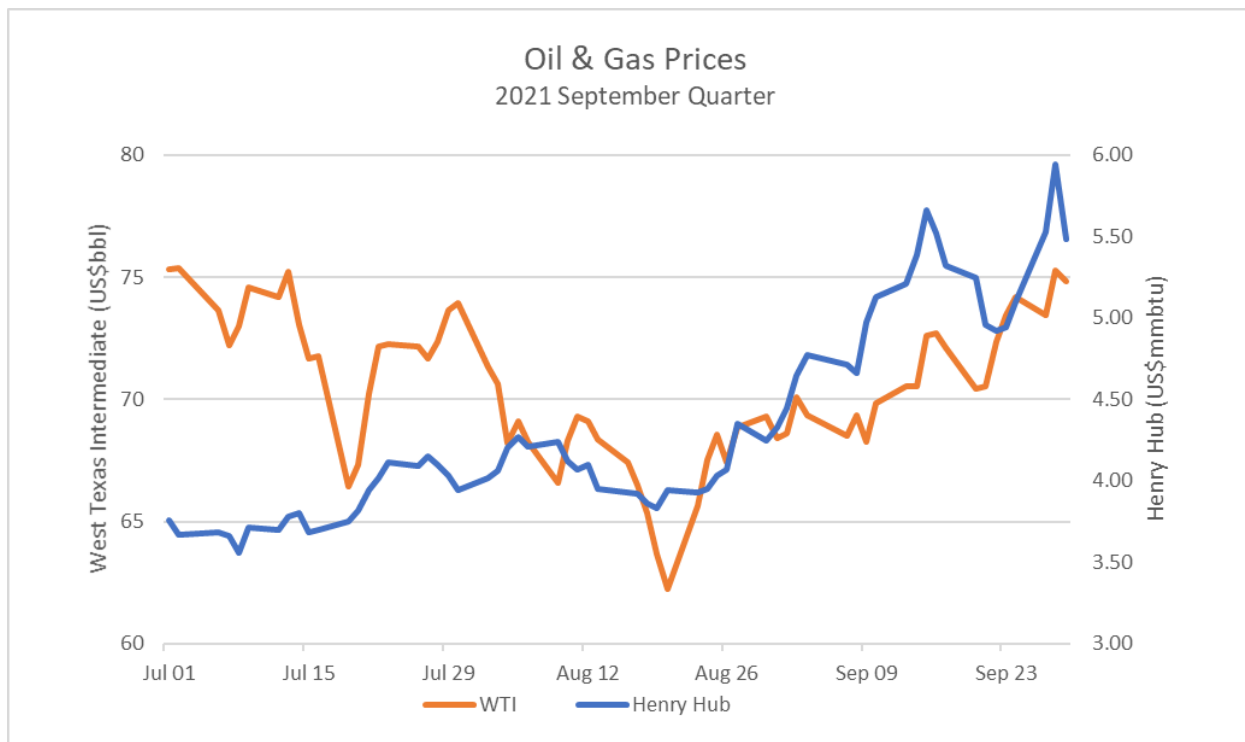
**Global gas prices have enjoyed strong appreciation over the Quarter. The tightening in LNG markets has been pronounced as customers scramble to secure supply ahead of the coming northern winter following a hot summer and economic recovery**



S&P Global Platts Analytics forecasts that average annual US LNG feedgas demand will increase from 10.9 Bcf/d in 2021 to 14.9 Bcf/d in 2026. During the Quarter, Williams Partners LP (NYSE: WPZ), a gas transmission company which handles about 30% of US natural gas volumes indicated that it will keep annual growth project spending steady at ~US\$1.2 billion through 2026 as it seeks to benefit from an expected rise in LNG feedgas demand. CEO Alan Armstrong commented "The rest of the world is continuing to utilize natural gas as a low cost and clean fuel, and so we think the export business is going to continue to grow pretty dramatically".<sup>12</sup>

<sup>12</sup> <https://www.spglobal.com/platts/en/market-insights/latest-news/lng/090821-bullish-us-lng-export-activity-buoys-pipeline-operator-williams-growth-forecast>

The Oxford Institute for Energy Studies (“OIES”) noted that Europe is the effective swing or balancing market for global gas, importing what is left over once other markets are satisfied. Most LNG import markets particularly in Asia often have few alternatives to LNG in the form of domestic production or pipeline imports, and limited gas storage capacity – all of this is in sharp contrast to Europe. OIES analysis of global LNG imports – excluding Europe – shows in the first eight months of 2021 LNG imports were 12% higher than in 2019 and extrapolating to the end of 2021, the rise in LNG imports outside Europe is likely to be 10% above 2019. Key drivers of global LNG demand during 2021 have included: (i) a cold 2020/21 winter increasing gas demand for heating; (ii) continued rapid growth in LNG demand in China (Chinese LNG imports for the first eight months of 2021 have been 30% higher in 2021 compared to 2019); (iii) traditional LNG markets, Japan, South Korea and Taiwan continuing to grow, particularly over the northern summer as utilities restock storage facilities ahead of winter; and (iv) low hydroelectricity output and a slump in domestic gas production in South America, resulting in strong LNG demand from that region. OIES estimates that while global LNG export capacity has risen 5% in 2021, the global supply side has been impacted by certain LNG export terminal outages and feed gas issues at numerous plants. As a result, the global LNG market has tightened considerably, and less LNG is being left available for import into Europe.<sup>13</sup>



Domestically, the latest Australian Competition and Consumer Commission (“ACCC”) Gas Inquiry highlighted the present tightness and emerging demand / supply imbalance in the local market. The ACCC noted that in previous years, potential shortfalls in the southern states could largely be met by flows from Queensland (whether through swaps or transportation on key southern haul pipelines). However, Queensland producers are currently forecasting to supply only just enough gas into the domestic Queensland market to meet Australian Energy Market Operator’s (“AEMO”) forecast demand for Queensland. ACCC also indicates that unless more gas is supplied into the domestic market by Queensland producers there may not be enough gas to meet any shortfall that could arise in southern states.<sup>14</sup> Comments following the release included:

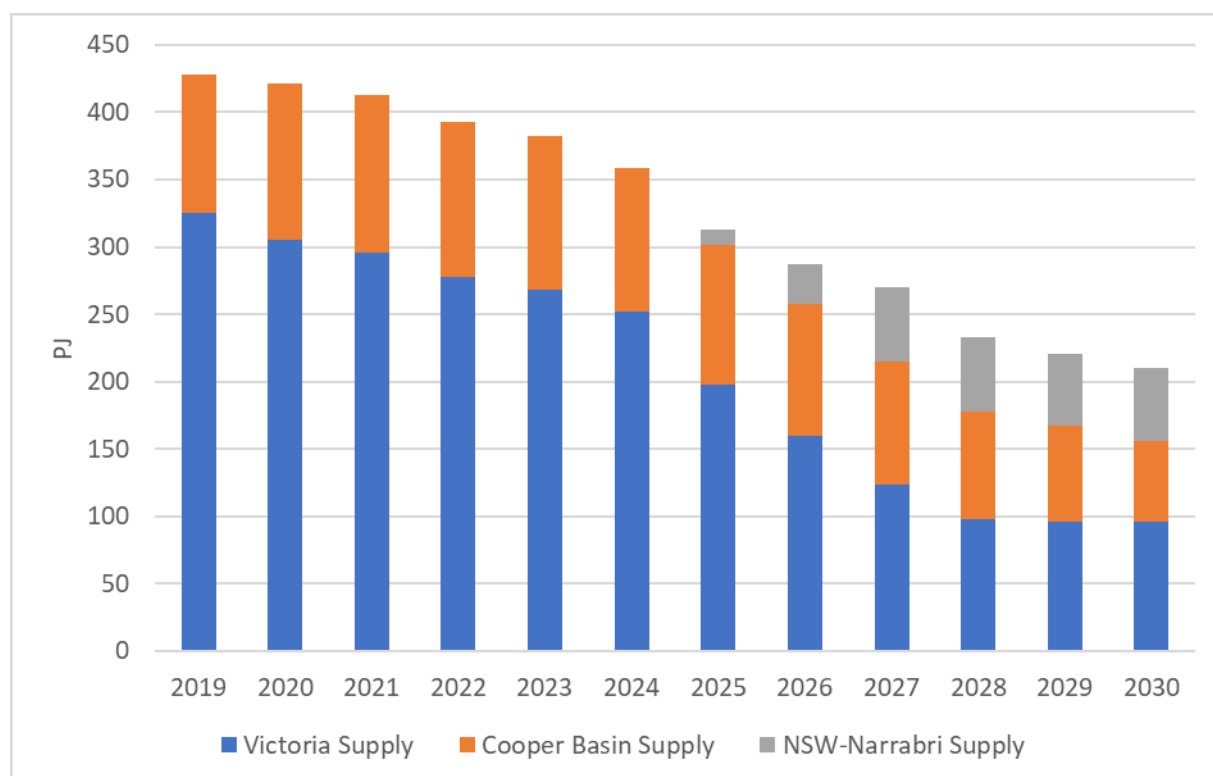
<sup>13</sup> The Oxford Institute for Energy Studies, “Why Are Gas Prices So High?”, September 2021

<sup>14</sup> ACCC Gas Inquiry, July 2021



- “The only way we can make sure domestic prices come down below international prices is if there is a surplus of gas domestically and that means more production of gas”, Rod Sims, ACCC Chair; and
- “The latest ACCC report, along with more recent gas market activity, demonstrates the importance of the gas-fired recovery to ensure the best outcomes for Australian households and businesses”, Treasurer Josh Frydenberg.<sup>15</sup>

The need for new gas supply such as the Beetaloo Sub-basin is highlighted by EnergyQuest’s recent forecast for southern gas production in Australia to 2030. The EnergyQuest chart below demonstrates the emerging problem for southern Australian states to continue to meet gas demand as Bass Strait gas fields diminish even with the addition of the proposed Narrabri project in New South Wales.



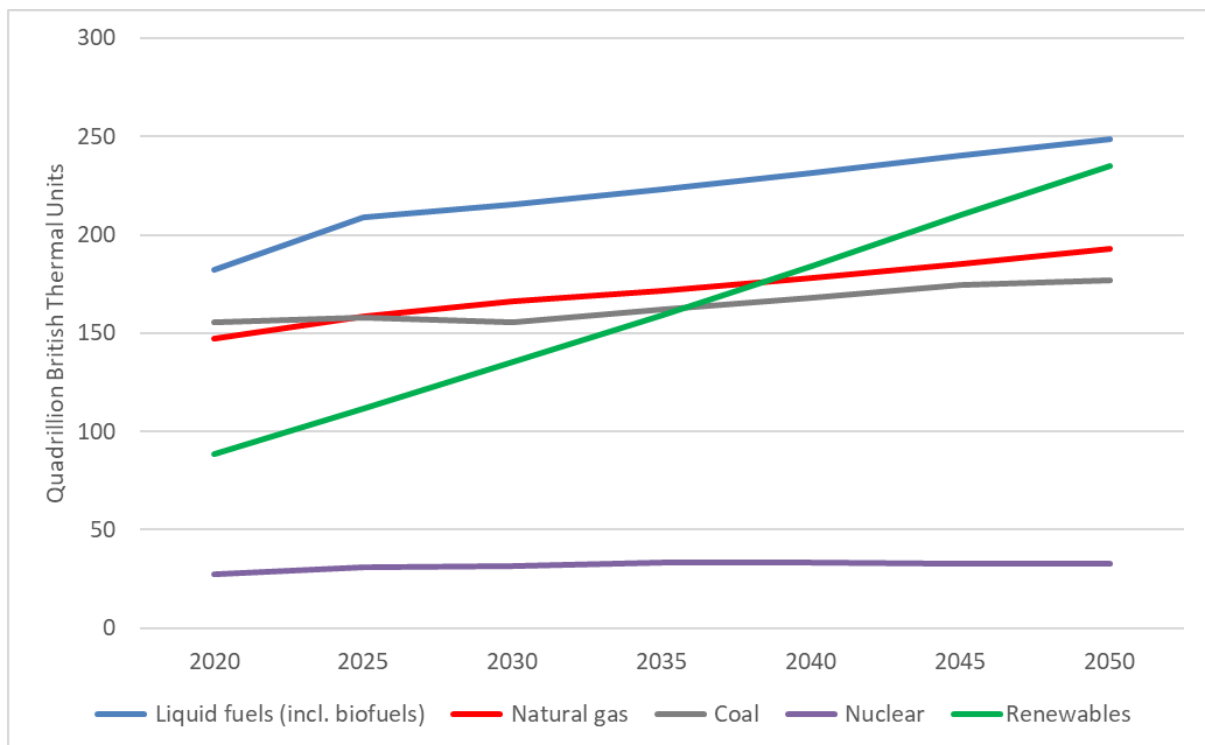
### The role of Natural Gas in an Energy Transition World

The Reserve Bank of Australia (“RBA”) September 2021 *Bulletin* provided research on the outlook for Australia’s fossil fuel exports under a range of climate scenarios. The RBA noted the resilience for the outlook for LNG as developing countries in particular substitute from coal to gas to reduce emissions. Under the *Current Policies* scenario, LNG exports are expected to increase by around 80% from 2020 levels, while under the *Below 2°C* scenario exports also increase in the near to medium term, reflecting the interim global transition from coal to gas, but decline from 2040 onwards to be around 2020 levels by 2050. The research also highlighted Japan and South Korea’s limited capacity to build onshore renewables projects

<sup>15</sup> Australian Financial Review, “Looming gas shortage for eastern states next year”, Mark Ludlow, 17 August 2021

due to high population density, scarcity of land, difficult terrain and high costs of building and running renewable projects.<sup>16</sup>

On 6<sup>th</sup> October 2021, the US Energy Information Agency (“EIA”) released its annual *International Energy Outlook 2021* providing energy projections to 2050. Under the *Reference Case* forecasts global gas consumption is expected to rise from 142TCF to 186TCF over the period 2020 to 2050 with non-OECD Asia providing much of this expected growth. Gas will play an important role in ensuring electricity load and grid reliability and supporting growing industrial sectors in these markets. As evidenced in the chart below showing primary energy consumption by energy source, renewables are expected to grow significantly. However, the EIA indicates that renewables will require technology breakthroughs and significant government policy changes for further substitution.<sup>17</sup>



Source: EIA International Energy Outlook 2021, October 2021

<sup>16</sup> <https://www.rba.gov.au/publications/bulletin/2021/sep/pdf/bulletin-2021-09.pdf>

<sup>17</sup> [https://www.eia.gov/outlooks/ieo/pdf/IEO2021\\_Narrative.pdf](https://www.eia.gov/outlooks/ieo/pdf/IEO2021_Narrative.pdf)

This ASX release has been authorised by the Empire Board of Directors.

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## About Empire Energy

Empire Energy holds 28.9 million acres of highly prospective exploration tenements in the McArthur Basin and Beetaloo Sub-basins, Northern Territory. Work undertaken by the Company since 2010 demonstrates that the Eastern depositional Trough of the McArthur Basin, of which the Company holds around 80%, has enormous conventional and unconventional hydrocarbon potential. The Beetaloo Sub-basin, in which Empire holds a substantial position, has world-class hydrocarbon volumes in place and a ramp up in industry activity to appraise substantial discoveries already made by major Australian oil and gas operators is ongoing.

Empire announced the transformational acquisition of Pangaea Resources on 14<sup>th</sup> April 2021, further cementing Empire's position as a leading onshore Northern Territory oil and gas explorer and developer focused on the Beetaloo Sub-basin.

Empire Energy is an experienced conventional oil and natural gas producer with operations in the Appalachia region of the USA (New York and Pennsylvania). Empire has been successfully developing and producing oil and gas since 2006.



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