EASTERN AUSTRALIA
Upstream Gas Report

JAN 2014

CORPORATE ACTIVITY

AJ Lucas

28 JAN: AJ Lucas announced the resignation of CEO Allan Campbell. Mr Campbell had led the company since 1995, including into successful CSG investments in the Gloucester, Sydney and Surat Basins. He also oversaw the purchase of Mitchell Drilling, making Lucas one of the largest drilling companies in coal and CSG in Australia. The company now has substantial investments in shale gas in the United Kingdom where its 44% owned Cuadrilla Resources holds large positions in the Bowland Shale. Lucas' Chairman Phil Arnall will serve as the company's interim CEO until a permanent replacement for Mr Campbell is found.

AWE

28 JAN: AWE reported that it had sold an 11.25% interest in the BassGas project to Hindustan Petroleum. The sale also includes a 9.75% interest in the Trefoil Field and is for an initial $80m with up to two further $2.5m contingency payments if the current BassGas mid life enhancement project is completed below a certain cost. AWE, which retains a 35% interest in both BassGas and Trefoil, has a number of growth projects to fund including the proposed Ande Ande Lumut oil project in Indonesia and the Sugarloaf project in the Eagle Ford shale.

Galilee Energy

21 JAN: Galilee Energy shareholders voted against allowing a proportional takeover offer by Olympus Funds Management to be accepted by any shareholders. Olympus had offered to purchase half of each shareholders stake for $0.15 per share however under Galilee's constitution a vote to allow the offer to proceed was required. Olympus, a subsidiary of Mercantile Investment Company, has now withdrawn the offer. Galilee shares closed at $0.145 on the 31st of January.

ERM Power

8 JAN: Red Sky Energy announced that it would sell a 20% interest in two Clarence-Moreton Basin tenements to ERM Power for a total of $1.7m. PELs 457 and 479 hold reserves of 17 PJ of 2P, 380 PJ of 3P and 2C contingent resources of 629 PJ. ERM originally farmed-in to the tenements in July 2012 under an agreement that could have seen the company earn a 60% interest in both tenements by drilling up to three wells in each. However, due to the New South Wales' governments regulatory stance on CSG ERM has not been able to undertake that exploration. The original farm-in agreement gave ERM a three-year option to purchase Red Sky's remaining 20% interests in the two tenements for $5m per permit; that option has now been superseded by the sale of both of the interests for the total of $1.7m. Completion of the sale is subject to approval by the shareholders of Red Sky and by Clarence Moreton Resources which retains a 20% interest in each of the tenements.

LNG

APLNG

31 JAN: APLNG upstream operator Origin Energy reported that it drilled 108 production wells during the December Quarter. This took the total number of wells drilled for supply of the two-train ALPNG development to 564 at the end of 2013, of which 91 have been commissioned. The wells have been drilled at Spring Gully and new fields being developed as part of the APLNG project, Combabula, Condabri and Orana. Origin assesses the upstream portion of the APLNG project as 58% complete with the downstream part 62% complete.

Arrow LNG

30 JAN: Shell, half owner of the Arrow Energy JV with PetroChina, reported that it did not expect to make any major FIDs for Asia Pacific LNG projects during 2014. Shell already slowed the Arrow LNG Project's progress towards FID more than a year ago due to unbeneficial economic returns and the risk of cost inflation. Shell's comments followed significant job losses at Arrow during January. Some 400 of the companies 1,200 staff were reportedly made redundant.

Shell and PetroChina have made significant investments in Arrow since they acquired the company in 2010 for $3.5b. This included the further purchase of Bow Energy in 2011 for more than $500m and the costs of designing and permitting the proposed four train Arrow LNG Project.

Shell may provide more detail on its plans for Arrow at its annual briefing day in March; to be led by the company's newly appointed CEO Ben van Beurden. Options for the assets could include collaboration with one or more of the currently under construction LNG projects at Gladstone, perhaps allayed with supply into the domestic market or warehousing the project's reserves until economic returns improve.

QCLNG

27 JAN: BG Group reported that it expected to export the first LNG from its QCLNG project in the fourth quarter of 2014. This will be followed six months later by the first export from the second train of the project. BG had previously flagged first export from the project to occur sometime in the second half of this year.

GLNG

23 JAN: GLNG operator Santos reported that it had drilled 38 development wells in the project's upstream acreage during the December Quarter. This took the total number of development wells drilled during 2013 to 237 with a further 29 appraisal wells. Santos drilled 75 of the development wells at the Fairview CSG Field with the remaining 133 drilled at the Roma Field. Santos assesses the GLNG Project as being 72% complete and on schedule for first LNG during 2015.

GAS SALES

WestSide Corporation

31 JAN: WestSide Corporation reported that it expected to sign a new Gas Sales Agreement for its Meridian CSG Field within the next few months. To this end the company is currently conducting negotiations with its existing gas contracts due to expire in 2015. WestSide has stabilised production at Meridian at around 12 TJ/day and plans to commence new development drilling during the June Quarter. The field has an installed processing capacity of 30 TJ/day and a pipeline linkage to the Queensland Gas Pipeline with a capacity of 60 TJ/day.

GOVERNMENT AND REGULATION

New South Wales

28 JAN: The New South Wales Government implemented its policy of banning any new CSG activity in and around future residential growth areas throughout the state and within Critical Industry Clusters. This followed the ban on CSG activity within the state's residential areas or villages and a surrounding two-kilometre exclusion zone introduced last October. The Liberal and National Government's CSG exclusion zones now cover a total area of 2.7 million hectares with the equine and viticultural land within the Hunter Valley defined as Critical Industry Clusters making up 0.29 million hectares of this. A further 2.8 million hectares of land within the state has been mapped as Biophysical Strategic Agricultural Land where any new state significant CSG or mining project are subject to a more rigorous Gateway approvals process. Under the Gateway system these projects must clear a Gateway assessment before they can proceed to the normal development application process conducted by the Division of Resources and Energy.

Link to map of New South Wales CSG Exclusion Zones

EASTERN AUSTRALIAN DOMESTIC GAS MARKET STUDY

During the first week of January the Federal Department of Industry released its 'Eastern Australian Domestic Gas Market Study.' The report was prepared in conjunction with the Bureau of Resources and Energy Economics after being commissioned by the previous Labour Government early last year. It is the latest in a number of studies that seek to describe the evolution of the Eastern Australian gas market but its analysis of the current state of the gas market is particularly cogent.

The report is underpinned by gas reserve and resource compilations, gas pricing estimations and subsequent modelling undertaken for the Government Agencies by Intelligent Energy Systems and RLMS.

The report characterises the current growth of the gas market as positive for Australia. Modelling shows that the country has sufficient gas reserves and resources to supply both the domestic and export markets, with the LNG developments bringing benefits through employment and new revenue. Previous deregulation by governments and regulatory agencies has allowed the gas market to evolve in a relatively free manner as LNG investment has begun to transform it. Governments should resist calls to intervene in the market by introducing gas reservation or other anti-competitive policies. In the medium and longer term the market should move to a stable and efficient equilibrium however in the short term there may be some market issues such as a lack of price transparency.

These issues have arisen as the form of the market has changed dramatically. Historically gas reserve development in Eastern Australia occurred through capital investment underpinned by relatively large bankable long-term supply contracts. These bilateral contracts provided financing and investment certainty to both producers and buyers and saw returns to producers on a cost of production plus basis. As the market was relatively stable the lack of a known gas market price due to the confidentiality of the contracts was not a big issue. However, once investment commitments for the three Gladstone LNG projects were made the market began to change substantially and the lack of market price visibility became an issue.

Suddenly gas consumers were facing a market that would triple in size and have some linkage to global oil prices for the first time. Inevitably gas prices through this period have increased as supply has tightened, although some of the increase is also due to general Australian resources industry cost inflation. Because this ongoing market transition is coinciding with the rolling off of many long-term gas contracts consumers are now being forced to secure new supplies during this period of flux. Previously these consumers have not required extensive expertise in gas market analysis as many contracts were signed through relatively simple negotiation processes. However now that gas prices have spiked consumers are left with the choice of signing new long-term gas contracts locking in these higher prices or using less familiar shorter term contracts. Using short-term contracts to bridge part or all of the crucial 2015 – 2020 period when the six LNG trains now under construction will come online could allow access to lower prices if supply loosens after that time.

A further complication arises as the three export projects at Gladstone are the first anywhere to attempt to produce LNG from CSG or indeed from any unconventional gas resource. As such the upstream gas field dynamics for each of the projects (time required to develop fields, number of wells required, gas production rates from wells, production decline rates etc) cannot be known with particular certainty. In actual fact the estimates made by at least some of the project proponents now appear to have been more optimistic than currently being experienced. Thus we see both the GLNG project securing both CSG from other producers and conventional gas supplies and QCLNG plans to secure part of its required gas supply from other producers, at least initially.

This is where the Department of Industry study identifies an area of concern in the gas market transition. As the LNG proponents inevitably have more information about the performance of their gas fields they may have the opportunity to exercise market power and potentially even push domestic gas prices above LNG netback prices until the market stabilises. To counter this potential issue the study recommends implementing a voluntary process for the proponents to disclose CSG production and well performance data. If a voluntary process fails governments should consider compelling the reporting of the information, suitably aggregated to protect commercial sensitive data.

Apart from this particular short term issue of price transparency and possible market power the Department of Industry study assesses the Eastern Australian Gas Market as being admirably healthy. Modelling shows that the market has sufficient reserves to supply projected production requirements for at least the next twenty years. Beyond that time period the higher gas prices should ensure the development of both existing contingent gas resources and new resources such as shale and tight gas.

The study recommends that Australian regulators should seek to continue to allow the Eastern Australian market to develop with a minimum of intervention. To this end policy should be aimed at increasing gas market transparency and efficiency with these moves to be undertaken through existing intergovernmental forums such as the Standing Council on Energy and Resources. Protectionist policies such as domestic gas reservation that will harm market efficiency should be resisted while initiatives that will deepen the market such as trading hubs should continue to be progressed. The changes in the Eastern Australian gas market will bring Australia significant benefits as it becomes a globally significant energy exporter and should also continue to satisfy the demands of domestic customers, albeit at higher gas prices.

Australia Shale Gas Report

CORPORATE ACTIVITY

Blue Energy

31 JAN: Blue Energy reported that it would pay Beach Petroleum $2.5m to acquire 100% ownership of three Maryborough Basin tenements. The transaction replaces a farm-in agreement that allowed Blue to earn a 75% interest in the tenements, acquired by Beach in its takeover of Adelaide Energy. ATPs 613P, 674P and 733P cover an area of some 2,984 km^2 with the acreage considered prospective for unconventional hydrocarbons in the Cretaceous-aged shales of the Maryborough Formation.

New Standard Energy

20 JAN: New Standard Energy shareholders approved a series of transactions that will see the company acquire producing acreage in the Eagle Ford Shale play in Texas and farm-in to tight gas acreage in the Cooper Basin. New Standard will now pay US shale company Magnum Hunter Resources US$15m ($17.2m) and US$9.5m worth of shares for 5,182 net acres in the Eagle Ford, where five wells are currently producing at some 400 BOEPD. The company will also fund up to $42.5m of exploration to earn a 52.5% interest in Ambassador Oil and Gas's Cooper Basin tenement PEL 570, targeting tight gas within the Patchawarra Formation. The owners of Australian private company Outback Energy Hunter will receive $4m and 15m New Standard shares for facilitating the Cooper farm-in and may also receive a further $9.5m of cash and shares depending on the performance of future Eagle Ford wells. As a result of the transactions Magnum Hunter will become New Standard's largest shareholder.

Buru Energy

14 JAN: Buru Energy announced that Eric Streitberg had moved from an Executive Director role at the company to become a non-executive Director. Mr Streitberg was a founder of Buru and remains its largest shareholder with a 9.6% stake. The company is now led my MD Keiran Wulff with Graham Riley in the role of non-executive Chairman.

EXPLORATION AND APPRAISAL

Beach Energy

13 JAN: Cooper Energy reported that Beach Energy had spudded the Jolly-1 well in the South Australian section of the Otway Basin. Jolly-1 is part of a two well program targeting the Casterton shales within the Penola Trough, thought to be the source formation for the nearby Katnook conventional gas field. Cooper expects the well to take 57 days to reach its target total depth of 4,000 m. The company has a 30% interest in the containing tenement PEL 495; Beach holds 70%.

Baraka Energy and Resources

6 JAN: Baraka Energy and Resources reported that it was disputing the validity of Statoil's proposed 2014 work program for two Southern Georgina Basin tenements where it holds a 25% interest. During 2014 Statoil intends to drill three vertical wells in EP 127 and EP 128 as part of an up to five well program across four Southern Georgina tenements. The Norwegian major also plans to plug and abandon three horizontal wells previously drilled and fracced by farm-in partner PetroFrontier including two where hydrogen sulphide was found in recovered formation water and one where the casing failed; one of these wells is in a Baraka tenement.

Baraka is disputing both what it considers the excessive $26.6m cost of the work program as well as the targeting of the Arthur Creek Hot Shale. The company wants a more measured exploration approach and has also been urging Statoil to test conventional hydrocarbon targets in the Hagen Member in EP 127. Baraka's claim that the work program is not valid will now be resolved by arbitration as per the tenements' Joint Operating Agreements potentially resulting in dilution for the Australian company if its claim is dismissed. The dispute shows the potential conflicts when a large oil and gas company is in a tenement with a junior, particularly as unconventional exploration in remote areas of Australia requires so much investment. Statoil has committed to spend up to US$160m in its farm-in to the four Southern Georgina tenements while an interest in two of the tenements is Baraka's only asset and it has a market cap of $9m and less than $2m cash on hand.

GAS SALES

Strike Energy

15 JAN: Strike Energy advised that it had signed an option agreement for the supply of 30 PJ of gas to ASX-listed paper and packaging company Orora. Under the deal Strike will be paid an option fee if it proceeds with a pilot production test at its Southern Cooper Basin deep CSG project. Orora would then have the right to exercise the option and secure a 3 PJ/year of gas supply for ten years from 2017, Strike's planned start-up date for the project. The deal is the second innovative funding deal Strike has signed, following its much larger pre-sale of gas to Orica. Strike recently completed a two well appraisal program at the Southern Cooper Project, intersecting more than 100 m of net coal in both of the wells.

EASTERN AUSTRALIA CSG:

Reserves at 31 December 2012, production second half 2012 Averages

Field	Ownership	State	Basin	Reserves (PJ) 1P	2P	3P	Production (TJ/day)	Tenure
AGL ENERGY								
Camden Gas Project	AGL Energy* 100%	NSW	Sydney	44	50	50	16	PPLs 1, 2, 4, 5; PELs 2, 4, 5, 267
Gloucester Basin Project	AGL Energy* 100%	NSW	Gloucester	50	454	565		PEL 285
Hunter Gas Project	AGL Energy* 100%	NSW	Sydney					PELs 4,267
Total for AGL Energy including projects operated by others				**182**	**1,829**	**3,452**	**32**	
ARROW ENERGY								
100% ownership of Arrow Energy LNG project								
Total for Arrow Energy				**669**	**9,494**	**13,970**	**71**	
BG GROUP								
94% ownership of QCLNG project operator								
Total for BG Group including projects operated by others				**3,096**	**10,326**	**18,876**	**121**	
BLUE ENERGY								
Sapphire Field	Blue Energy* 100%	Qld	Bowen		50	180		ATP 814P
Total for Blue Energy					**50**	**180**		
ERM POWER								
Clarence-Moreton	ERM Power *50% CMR 30%, Red Sky 20%	NSW	Clarence-Moreton		17	159		PEL 457
Total for ERM Power					**9**	**190**		
HARCOURT PETROLEUM								
Mungi/Harcourt Lilyvale	Harcourt*72% Mitsui 28%	QLD	Bowen	36	448	1,064	3	PL 94, ATP 56 4P
Timmy	Harcourt*62.9% Mitsui 37.1%	QLD	Bowen		67	175		ATP 602P
Total for Harcout Petroleum				**36**	**515**	**1,239**	**3**	
METGASCO								
Casino Gas Project	Metgasco 100%	NSW	Clarence-Moreton	3	428	2,542		PEL 13, 16
Total for Metgasco				**3**	**338**	**2,055**		
ORIGIN ENERGY								
37.5% ownership of APLNG and project upstream operator								
Ironbark Project	Origin 100%				165	881		ATP 788P
Total for Origin Energy including projects operated by others					**5,165**	**6,919**	**135**	
SANTOS								
30% ownership of GLNG and project operator								
Narrabri CSG Project	Santos* 80% EnergyAustralia 20%	NSW	Gunnedah		1,141			PEL 238
Total for Santos including projects operated by others					**3,061**		**33**	
SENEX ENERGY								
Don Juan CSG Project	Senex Energy* 45%, Arrow Energy 55%	Qld	Surat		101	197		ATP 771P
Total for Senex Energy including projects operated by others					**157**	**358**		
WESTSIDE CORPORATION								
Meridan	Westside* 51% Mitsui 49%	QLD	Bowen	93	680	1,524	8	PL 94, Coal Mining Leases
Paranui	Westside* 25.5% Mitsui 24.5% BG 50%	QLD	Bowen			270		ATP 769 W
Tibrook	Westside* 25.5% Mitsui 24.5% BG 50%	QLD	Bowen			152		ATP 688P W
Total for Westside				**47**	**347**	**885**	**4**	

QUEENSLAND CSG-TO-LNG PROJECTS:

APLNG (AUSTRALIA PACIFIC LNG PROJECT)

Ownership:	Origin Energy 37.5% / ConocoPhillips 37.5% / Sinopec 25%	**Site:**	Laird Point, Curtis Island
Operatorship:	Upstream and pipelines: Origin / LNG: ConocoPhillips	**Customers:**	Sinopec 7.6 MTPA for 20 years, Kansai 1.0 MTPA for 20 years
Status:	Train 1 first LNG mid-2015 Train 2 first LNG Q4-2015	**Reserves:**	2P: 13,334 PJ 3P 16,101 PJ 2C: 3,644 PJ
Size:	2 x 4.5 MTPA LNG trains (four-train 18 MTPA ultimate potential)	**Production:**	333 TJ/day (121.8 PJ/year)

Major Fields	Ownership	State	Basin	Reserves (PJ)			Production (TJ/day)
				1P	2P	3P	
Spring Gully	APLNG* 96.6% Santos 3.4%	Qld	Bowen	162	2,318	5,104	129
Peat	APLNG* 100%	Qld	Bowen				9
Talinga/Orana	APLNG* 100%	Qld	Surat				115

ARROW ENERGY (ARROW ENERGY LNG PROJECT)

Ownership:	Shell 50% / PetroChina 50%	**Site:**	Boatshed Point, Curtis Island
Operatorship:	Arrow Energy	**Customers:**	None announced
Status:	EIS currently being undertaken	**Reserves:**	1P: 669 PJ 2P: 9,594 PJ 3P: 14,096 PJ
Size:	2 x 4 MTPA LNG trains (four-train 16 MTPA ultimate potential)	**Production:**	71 TJ/day (25.9 PJ/year)

Major Fields	Ownership	State	Basin	Reserves (PJ)			Production (TJ/day)
				1P	2P	3P	
Moranbah Gas Project	Arrow Energy* 50% AGL Energy 50%	Qld	Bowen	160	2,516	5,354	31
Blackwater	Arrow Energy* 100%	Qld	Bowen				
Comet	Arrow Energy* 100%	Qld	Bowen				
Norwich Park	Arrow Energy* 100%	Qld	Bowen				
Surat Basin Fields	Arrow Energy* 50%-100%	Qld	Surat				
Tipton West JV	Arrow Energy* 100%	Qld	Surat				25
Kogan North	Arrow Energy* CS Energy 50%	Qld	Surat				7
Daandine	Arrow Energy* 100%	Qld	Surat				27

GLNG (GLADSTONE LNG PROJECT)

Ownership:	Santos 30% / PETRONAS 27.5% / Total 27.5% / KOGAS 15%	**Site:**	Hamilton Point West, Curtis Island
Operatorship:	Santos	**Customers:**	PETRONAS and KOGAS both to take 3.5 MTPA for 20 years
Status:	FID taken January 2011, first LNG 2015	**Reserves:**	1P: 1,797 PJ 2P: 5,376 PJ 2C: 1,638 PJ
Size:	2 x 3.9 MTPA LNG trains (three-train 10 MTPA ultimate potential)	**Production:**	111 TJ/day (40.5 PJ/year)

Major Fields	Ownership	State	Basin	Reserves (PJ)			Production (TJ/day)
				1P	2P	3P	
Fairview	GLNG* 76.07% APLNG 23.93%	Qld	Bowen				105
Scotia	GLNG* 100%	Qld	Bowen				21
Arcadia	GLNG* 100%	Qld	Bowen				
Roma Shelf	GLNG* 100%	Qld	Surat				

QCLNG (QUEENSLAND CURTIS LNG PROJECT)

Ownership:	BG Group 90% Train 1 and 97.5% Train 2 / CNOOC 10% Train 1 / Tokyo Gas 2.5% Train 2	**Site:**	North China Bay, Curtis Island
Operatorship:	QGC (100%-owned subsidiary of BG Group)	**Customers:**	CNOOC 3.6 MTPA from Train 1 for 20 years, Tokyo Gas 1.2 MTPA from Train 2 for 20 years, Chubu Electric up to 20 cargoes over 20 years, BG portfolio supply: up to 1.7 MTPA to Quintero LNG in Chile to 2030, up to 3.0 MTPA to Singapore for 20 years
Status:	FID taken October 2010, first LNG 2014, second train to start-up a year later	**Reserves:**	1P: 3,096 PJ 2P: 10,326 PJ 3P: 18,876 PJ 2C: 13,700 PJ
Size:	2 x 4.25 MTPA LNG trains (three-train 12.75 MTPA ultimate potential)	**Production:**	121 TJ/day (44.2 PJ/year)

Major Fields	Ownership	State	Basin	Reserves (PJ)			Production (TJ/day)
				1P	2P	3P	
QGC Central Walloons	BG* 59.4%-100%	Qld	Surat				204
Berwyndale South	BG* 100%	Qld	Surat				67
Kenya-Argyle	BG* 59.4% APLNG 40.6%	Qld	Surat				126
Woleebee Creek	BG* 80% Toyota 15% CNOOC 4% Tokyo Gas 1%	Qld	Surat				
Lacerta	BG* 100%	Qld	Surat				
Bellevue	BG* 70.6% APLNG 30.4%	Qld	Surat				7
Paradise Downs	BG* 80% VicPet 20%	Qld	Surat				
Lawton	BG* 70% VicPet 30%	Qld	Surat				