26 May 2014 │ 18 pages

Diversified Utilities
Australia/NZ │ Australia

Origin Energy Ltd (ORG.AX)

Origin the Winner from Gas out of Generation Arbitrage

- **A Changing Demand Landscape Create Opportunities** — The sharp increase in future East Coast gas demand from QLD LNG is placing significant upwards price pressure on gas, reducing the attraction for utilities companies to utilise gas-fired generation in the National Energy Market (NEM). We see an opportunity for utilities companies to take advantage of this arbitrage and re-direct gas out of generation into the domestic market.
- **We Estimate 225TJ/d of Gas can be Redirected out of Generation** — Citi estimates that 225TJ/d (82PJpa) is available to be redirected out of generation into the domestic market of which 97TJ/d (35PJpa) is from ORG (below ORG's est of ~45PJpa). We see an opportunity for coal-fired generation to make up any shortfall.
- **ORG to Win the Most from Gas out of Generation** — We see ORG as the standout company in the changing gas landscape given its optionality for monetising gas via either the domestic market or gas-fired power generation depending on which provides the highest margins. We forecast the gas business in Energy Markets adding ~A$300m EBIT from FY13 (A$95m) to FY17 (~A$400m), given the increased margin in its gas business, as discussed in our initiation: Initiate with a Buy – Gas Business Upside, APLNG to be OK.
- **Gas Supply to Domestic Market Still Short over the Medium Term** — Despite the opportunity for 225TJ/d gain in gas supply from gas-out of generation, we think the market will still be short gas. This shortfall is caused by undersupply of CSM gas to the LNG projects, we estimate ~470TJ/d in 4Q15, and 264TJ/d of gas being redirected out of the domestic market and into LNG on a medium-term basis.
- **Buy ORG, TP A$16.86/shr** — We think ORG has the most to gain from a tight gas supply in the East Coast given flexibility in gas portfolio and it has locked in cost of supply with c.40% priced at legacy contracts of A$3-4/GJ. Our FY14 earnings estimates are 9% below consensus, we think largely due to our lower production expectation from E&P business unit. We expect the market will likely see through any short-term weakness on earnings, with a focus on earnings in FY16 post APLNG-start up.

Buy	**1**
Price (26 May 14)	A$15.28
Target price	A$16.86
Expected share price return	10.3%
Expected dividend yield	3.3%
Expected total return	**13.6%**
Market Cap	A$16,864M
	US$15,567M

Price Performance
(RIC: ORG.AX, BB: ORG AU)

ORG.AU revisions (Y/E Jun)	2012A	2013A	2014E	2015E	2016E
Sales (A$m)	12,935.0	14,619.0	14,532.5	15,790.4	15,654.1
% revision	0.0%	0.0%	0.0%	0.0%	0.0%
EBIT (A$m)	1,598.0	1,438.0	1,354.7	1,821.8	2,395.4
% revision	0.0%	0.0%	0.0%	0.0%	0.0%
Core Net Profit (A$m)	893.0	760.0	683.8	958.4	1,351.8
% revision	0.0%	0.0%	0.0%	0.0%	0.0%
Core EPS (A¢)	82.6	69.3	61.8	86.5	122.1
% revision	0.0%	0.0%	0.0%	0.0%	0.0%
EPS Growth (%)	14.3	-16.1	-10.9	40.0	41.1
PE Ratio (x)	18.5	22.0	24.7	17.7	12.5
Dividend Yield (%)	3.3	3.3	3.3	3.3	3.9

Source: Company Reports and dataCentral, Citi Research.

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ORG.AX: Fiscal year end 30-Jun — Price:$15.28; TP:$16.86; # Shares: 1104m; Market Cap: A$16864m; Recomm: Buy

Profit & Loss (A$m)	2012	2013	2014E	2015E	2016E
Sales revenue	12,935	14,619	14,533	15,790	15,654
Prodn costs, royalties/excise	-10,629	-12,420	-12,353	-13,041	-11,519
Other	-49	-18	-53	-60	-60
EBITDAX	**2,257**	**2,181**	**2,127**	**2,689**	**4,075**
Exploration Expense	na	na	na	na	na
Depn & Amort	-659	-743	-773	-867	-1,679
EBIT	**1,598**	**1,438**	**1,355**	**1,822**	**2,395**
Net interest	-217	-255	-249	-345	-561
Earnings before tax	**1,381**	**1,183**	**1,106**	**1,477**	**1,834**
Tax expense	-415	-339	-322	-396	-383
Exceptional items post tax	87	-382	-163	-171	-53
Minority interests	-73	-84	-100	-122	-99
Associates	0	0	0	0	0
Reported net profit	**980**	**378**	**521**	**788**	**1,299**
Core NPAT	893	760	684	958	1,352

Half year data (A$m)	1H13	2H13	1H14	2H14E	1H15E
Sales revenue	7,379	7,240	7,238	7,295	7,717
EBIT	698	740	694	661	854
Core NPAT	362	398	381	303	435
Core EPS (¢)	33.1	36.2	34.5	27.3	39.2

Balance Sheet (A$m)	2012	2013	2014E	2015E	2016E
Cash & cash equiv.	357	307	819	582	740
Accounts receivables	2,306	2,705	2,397	2,652	2,603
Inventory	186	231	204	224	215
Net fixed & other tangibles	11,850	12,299	13,099	13,241	13,335
Goodwill & intangibles	5,966	6,113	6,117	6,117	6,117
Financial & other assets	7,316	7,931	8,774	9,622	9,008
Total assets	**27,981**	**29,586**	**31,411**	**32,439**	**32,018**
Accounts payable	2,063	2,120	2,331	2,249	2,002
Short-term debt	145	741	789	789	789
Long-term debt	5,734	6,375	8,994	9,994	9,594
Provisions & other liab	5,581	5,556	4,142	3,951	3,423
Total liabilities	**13,523**	**14,792**	**16,256**	**16,983**	**15,807**
Shareholders' equity	13,094	13,283	13,474	13,711	14,411
Minority interests	1,364	1,511	1,681	1,746	1,799
Total equity	**14,458**	**14,794**	**15,155**	**15,457**	**16,210**
Net debt	**5,522**	**6,809**	**8,964**	**10,201**	**9,643**

Cashflow (A$m)	2012	2013	2014E	2015E	2016E
EBITDA	2,257	2,181	2,127	2,689	4,075
Working capital	0	0	0	0	0
Net interest paid	-366	-436	-254	0	0
Tax paid	0	-167	-322	-396	-383
Other	-435	-372	187	-848	-1,139
Operating cashflow	**1,456**	**1,206**	**1,738**	**1,446**	**2,553**
Capex	-1,330	-855	-777	-834	-840
Net acq/disposals	-166	-111	-39	0	0
Other	-1,167	-561	-2,067	-1,241	-319
Investing cashflow	**-2,663**	**-1,527**	**-2,883**	**-2,075**	**-1,159**
Dividends paid	-377	-459	-506	-551	-651
Financing cashflow	**837**	**260**	**1,647**	**392**	**-1,236**
Net change in cash	**-367**	**-50**	**511**	**-237**	**158**
Free cashflow to s/holders	**126**	**351**	**961**	**612**	**1,713**

Per share data	2012	2013	2014E	2015E	2016E
Reported EPS (¢)	90.7	34.5	47.1	71.1	117.3
Core EPS (¢)	82.6	69.3	61.8	86.5	122.1
DPS (¢)	50.0	50.0	50.0	50.0	59.1
CFPS (¢)	134.7	110.0	157.1	130.5	230.5
BVPS (¢)	1201.8	1206.2	1223.5	1245.0	1308.7
Wtd avg ord shares (m)	1,079	1,093	1,100	1,101	1,101
Wtd avg diluted shares (m)	1,081	1,096	1,107	1,107	1,107

Valuation ratios	2012	2013	2014E	2015E	2016E
PE (x)	18.5	22.0	24.7	17.7	12.5
EV/EBIT (x)	10.7	12.5	14.2	11.1	8.5
EV/EBITDA (x)	7.6	8.3	9.0	7.5	5.0
FCF yield (%)	0.8	2.1	5.7	3.6	10.1
Dividend yield (%)	3.3	3.3	3.3	3.3	3.9
Payout ratio (%)	61	72	81	58	48

Production and Sales	2012	2013	2014E	2015E	2016E
Gas Prod. ex APLNG (Pje)	83.2	81.9	95.2	92.1	97.5
APLNG (Pje)	na	na	na	31.5	403.3
Liquids Production (Pje)	12.1	11.3	11.9	11.1	11.8
Electricty Generation (TWh)	16.6	18.0	17.9	18.0	16.1
Energy Mkt Gas sales (Pje)	130.0	127.0	101.5	92.9	148.2
Energy Mkt Elec Sales (TWh)	42.7	42.3	39.6	40.1	40.5

Commodity&FX	2012	2013	2014E	2015E	2016E
Brent Oil price (US$/bbl)	113.2	109.9	109.1	107.0	102.3
AUDUSD	1.0	1.0	0.9	0.9	0.9
AUDNZD	1.3	1.2	1.1	1.1	1.1

NPV Valuation	unriske A$/shr	risk factor	risked A$/shr
E&P Total	3.83	93%	3.55
APLNG Total	3.36	100%	3.36
Energy Markets	8.97	100%	8.97
Contact Energy	1.80	100%	1.80
Corporate Costs	-1.15	100%	-1.15
Total	**16.81**		**16.53**

Powered by: dataCentral

Figure 1. ORG Detailed P&L and SOTP Valuation

ORG : detailed P&L, inclusive of growth projects (unrisked)								
(A$m)	**FY11A**	**FY12A**	**FY13A**	**FY14E**	**FY15E**	**FY16E**	**FY17E**	**FY18E**
Total revenue	**10,344**	**12,935**	**14,619**	**14,533**	**15,790**	**15,654**	**16,373**	**16,931**
COGS & operating cost	(8,507)	(10,676)	(12,480)	(12,406)	(13,347)	(13,010)	(13,458)	(14,127)
Exploration writeoffs (A$m)	(118)	(49)	(18)	(53)	(60)	(60)	(60)	(60)
EBITDA	**1,782**	**2,257**	**2,181**	**2,127**	**2,689**	**4,075**	**4,949**	**4,998**
Depreciation & amortisation	(588)	(659)	(743)	(773)	(867)	(1,679)	(2,171)	(2,209)
EBIT	**1,194**	**1,598**	**1,438**	**1,355**	**1,822**	**2,395**	**2,778**	**2,789**
Net Interest Expense	(143)	(217)	(255)	(249)	(345)	(561)	(583)	(503)
Pre-Tax Profit	**1,051**	**1,381**	**1,183**	**1,106**	**1,477**	**1,834**	**2,195**	**2,286**
Corporate Tax	(316)	(415)	(339)	(322)	(396)	(383)	(447)	(439)
PRRT	-	-	-	-	-	-	-	-
Sig-items (after tax)	(487)	87	(382)	(163)	(171)	(53)	-	-
Non-controlling Interest	(62)	(73)	(84)	(100)	(122)	(99)	(100)	(102)
Reported NPAT	**186**	**980**	**378**	**521**	**788**	**1,299**	**1,648**	**1,745**
Core NPAT	**673**	**893**	**760**	**684**	**958**	**1,352**	**1,648**	**1,745**
EPS core (Acps)	72	83	69	62	87	122	149	158
DPS (Acps)	50	50	50	50	50	59	75	79
Commodity Prices	**FY11A**	**FY12A**	**FY13A**	**FY14E**	**FY15E**	**FY16E**	**FY17E**	**FY18E**
Brent Oil (U$/bbl)	97	113	110	109	107	102	101	105
Aust dollar (A$)	0.990	1.032	1.027	0.920	0.947	0.942	0.936	0.916
Key investment ratios	**FY11A**	**FY12A**	**FY13A**	**FY14E**	**FY15E**	**FY16E**	**FY17E**	**FY18E**
PE normalised (x)	20.5	18.0	21.4	24.0	17.1	12.1	10.0	9.4
EV/EBITDAX (x)	9.2	7.2	7.5	7.7	6.1	4.0	3.3	3.3
Dividend yield (%)	3.4%	3.4%	3.4%	3.4%	3.4%	4.0%	5.0%	5.3%
ROIC (%)	3.8%	4.5%	3.5%	2.8%	3.7%	5.2%	6.6%	7.0%
Gearing (ND/(ND+E), %)	23.1%	27.6%	31.5%	37.2%	39.8%	37.3%	31.8%	27.3%
Key Operating assumptions	**FY11A**	**FY12A**	**FY13A**	**FY14E**	**FY15E**	**FY16E**	**FY17E**	**FY18E**
Gas Production ex APLNG (Pje)	74	71	71	83	81	86	88	88
APLNG (Pje)					32	403	541	541
Liquids Production (Pje)	13	12	11	12	11	12	12	12
Electricity Generation (TWh)	9.4	16.6	18.0	17.9	18.0	16.1	16.0	16.0
Energy Market Gas sales (Pje)	142	130	127	102	93	148	185	191
Energy Market Electricity Sales (TWh)	35.1	42.7	42.3	39.6	40.1	40.5	40.9	41.4
Energy Market Electricity Revenues (A$m)	5,410	7,566	8,528	8,150	8,632	8,111	8,394	8,688
Energy Market Gas Revenues (A$m)	1,180	1,203	1,396	1,337	1,522	2,209	2,682	2,730
EBIT margin of Energy Market Electricity business (%)	15%	16%	10%	8%	11%	11%	11%	10%
EBIT margin of Energy Market Gas business (%)	8%	6%	7%	7%	10%	18%	18%	13%
Total Energy Market Revenues (A$m)	8,109	10,250	12,018	11,619	12,222	11,835	12,387	12,768
Total Energy Market EBIT margin (%)	12%	13%	9%	7%	9%	11%	11%	10%
Contact Energy Revenues (A$m)	1,708	2,102	2,019	2,101	2,199	2,270	2,295	2,315
Contact Energy EBIT margin (%)	13%	12%	14%	16%	18%	16%	16%	15%

ORG SOTP valuation

	Unrisked DCF (A$/shr)	Risk	Risked valuation (A$/shr)	TP method	Risked Valuation A$m	TP(A$/shr)
E&P Total	**3.83**	**93%**	**3.55**	**DCF**	**3,914**	
Producing assets	2.89	100%	2.89	DCF	3,186	
Ironbark, 50% risk weighting	0.82	75%	0.62	DCF	681	
Halladale, 50% risk weighting	0.06	50%	0.03	DCF	34	
Petrel, 25% risk weighting	0.05	25%	0.01	DCF	13	
APLNG Total	**3.36**	**100%**	**3.36**	**DCF**	**3,702**	
2 Train LNG project	8.93	100%	8.93	DCF	9,838	
Project Finance Debt	-2.70	100%	-2.70	DCF	-2,970	
Citi est. Corp Debt	-2.87	100%	-2.87	DCF	-3,166	
Energy Markets	**8.97**	**-**	**8.97**		**9,877**	
Gas	3.15	-	3.15	12x EV/EBIT	3,466	
Electricity	5.58	-	5.58	12x EV/EBIT	6,141	
LPG	0.25	-	0.25	12x EV/EBIT	270	
Contact Energy	**1.80**	**-**	1.80	**0x P/E (FY16**	**1,984**	
Corporate Costs	**-0.67**	-	-0.67	-	**-732**	
Fwd Sale of Condensate/Oil	**-0.49**	**-**	**-0.49**	**DCF**	**-537**	
Total	**16.81**	**-**	**16.53**	**-**	**18,208**	**16.86**

Source: Company reports, Citi Research

LNG Supply Shortfall Causing Gas Price Pressure

We have previously built well-by-well models to define likely gas production ramp-up for the CSM LNG projects: GLNG, APLNG and QCLNG. We think the CSM-LNG industry as a whole will be short gas for 12 months from 4Q15 (up to 473TJ/d or a run rate ~173PJpa), when all 6 LNG Trains are operational (see our note Ramp-up of the CSM-LNG industry, now looks short gas for more detail).

We expect CSM-LNG projects will remain interested in short-term gas volumes, if available below short-run marginal cost (we est. ~A$12/GJ at A$100/bbl), to provide greater certainty/flexibility of supply, if not to fill short-term ullage in capacity. Longer term we think higher wholesale gas prices will be underpinned by LNG projects looking to maximise capital efficiency by buying gas on market if available below the cost of developing its own resources (we estimate A$7-8/GJ cost of supply).

We think any supply response will be too little too late. Current producing assets have limited spare capacity (Cooper ramping up to meet peak contractual obligations in CY15, GBJV focused on extending not growing production although seasonal supply may exist), and new developments will take too long to get to market. We also expect new supply opportunities (NSW CSM, Ironbark, Cooper unconventional) to have a higher cost of supply (A$6-8/GJ), and need higher prices to justify development. However we see an opportunity for some gas to be taken out of generation, and redirected into the domestic gas market, which we explore in this report. Ultimately while we see the opportunity for ~225TJ/d (~82PJpa) of gas to be redirected out of generation, we do not think it will be sufficient to fill the short term demand shortfall in CY15/CY16 thereby placing downward pressure on pricing.

The increased demand from LNG is already becoming apparent given a tightening of available un-contracted supply and we note that recent domestic contracts in Eastern Australia are significantly above historic gas prices with many linked to international oil prices:

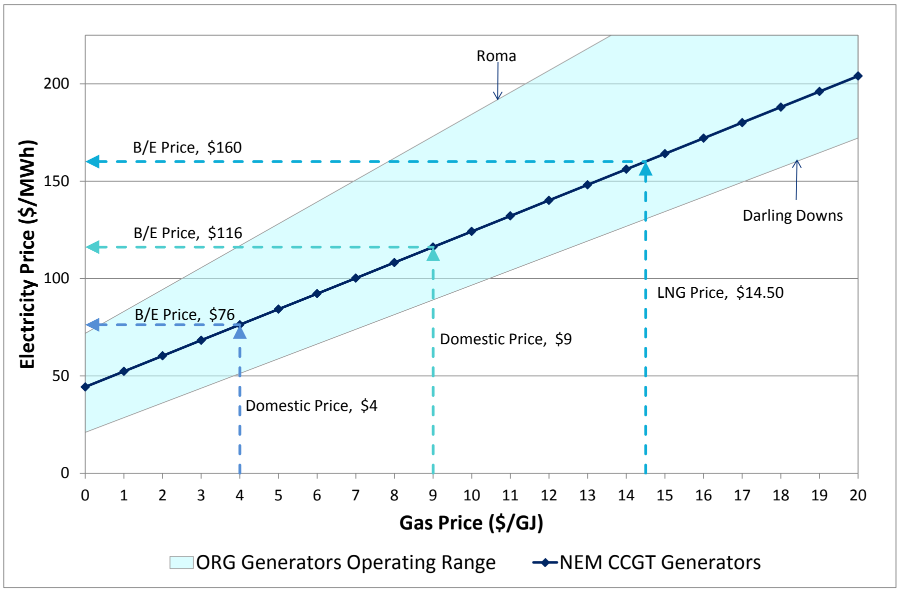
- In December 2012, Origin Energy announced it will supply 22 PJ over 7 years from 2013 to MMG Group which The Australian reported as being priced at $9/GJ.
- In February 2013, The Australian quoted Santos CEO David Knox as saying recent contracts Santos has signed have been at the upper end of the $6-9 range.
- In May 2013, Infratil Ltd announced that BHPB-Esso will supply 22PJ over 3 years from 2015 to Lumo Energy, incorporating an oil linkage mechanism.
- In April 2013, Beach Petroleum announced the sale of 139PJ over 8 years from FY15 onwards and includes oil-linkage pricing for most of the volume. We estimate A$8/GJ ex-Moomba assuming A$100/bbl.
- WestSide Corporation announced in March 2014 the supply up to 65TJ/d over 20 years from 2015 to GLNG. WCL recently announced that the price in the GSA as at 14th May's JCC Oil Price of US$110.09/bbl would give a price of A$9.28/GJ.
- AGL announced in its FY14 interim result recent contracts for the sale of 9PJ from its portfolio to QLD LNG projects were signed at ~$10/GJ.

Opportunity from Gas-Spark Spread

An increase of gas prices reduces the economic attraction of utilizing gas for generation in the NEM, which is already long base load generation. We provide a simple comparison between gas sales and monetizing gas via electricity generation below in Figure 2. Based on our analysis, we think that at current gas prices of ~A$4/GJ, it is more attractive to monetize gas via electricity generation only when electricity prices exceed A$76/MWh for generators in the NEM, or A$51/MWh for efficient CCGT facilities like Darling Downs. However wholesale gas prices are increasing and we have already seen long-term gas supply contracts signed at A$8+/GJ. If domestic gas prices were to increase to A$9/GJ then we think electricity prices need to be >A$90-116/MWh (CCGT - NEM) to provide greater profitability than selling gas to the domestic market.

We think that gas-fired power generators are therefore set to benefit from redirecting gas that is currently being used for base or intermediate load electricity generation into the domestic gas market. We expect gas that is being used for peaking generation will most likely continue given electricity peak prices of >A$100/MWh would still provide a more attractive avenue for monetizing over an A$8/GJ gas price.

Figure 2. Gas-Spark Arbitrage for NEM CCGT Power Plants & ORG Generation Portfolio



Source: Australian Energy Market Operator (AEMO), Citi Research

How Much Gas can Come Out?

We have undertaken a bottoms-up review of gas-fired power generation in the NEM as shown below in Figure 4. Based on our estimates, we think there could be perhaps 225TJ/d (82PJpa) on flat supply that is likely to come out of generation. This volume assumes that gas-fired power stations return to a 5% utilization rate typical of peaking plants (excluding co-generation facilities, facilities isolated from the market, or using waste/biomass gas).

The majority of this gas is to come out from 1) Darling Downs and Condamine in SE QLD which are presently running at >50% and >90% utilisation rates respectively as

a means of managing ramp up gas prior to LNG startup and 2) NSW gas-fired generation (Tallawarra and Smithfield) which can be effectively replaced by coal-fired generation, particularly those in the Hunter Valley. Of this 225 TJ/d, Citi calculate that 97 TJ/d (~45PJpa) of this is from generators owned by ORG.

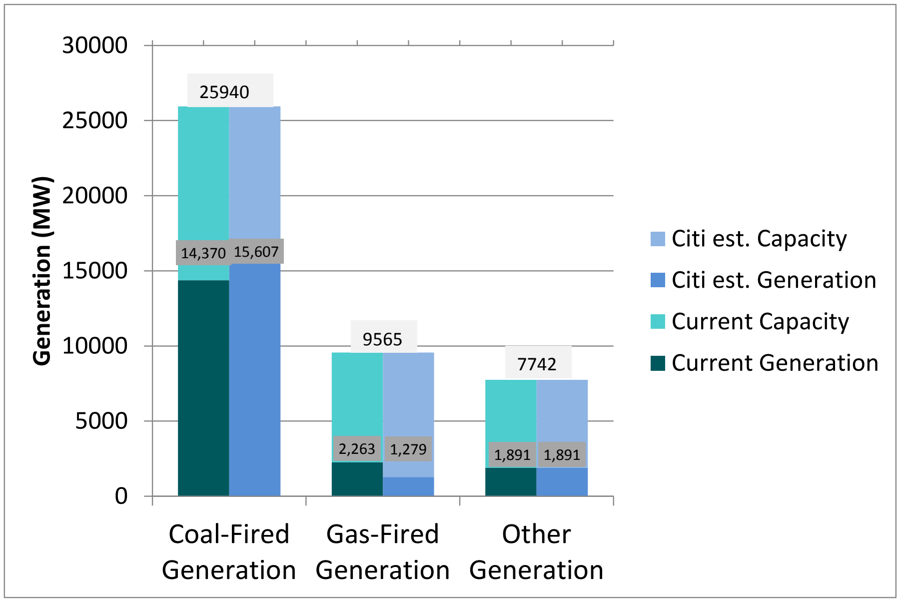
Figure 3. List of NEM Gas-fired Power Stations

Power Station	State	Type	Owner	Gross Capacity (MW)	Current Utilisation (%)	Gas-out Opportunity (TJ/d)
Colongra	NSW	OCGT	Delta Electricity	664	0%	0
Smithfield	NSW	CCGT	Sithe Energies	176	83%	0
Tallawarra	NSW	CCGT	EnergyAustralia	430	90%	60
Uranquinty	NSW	OCGT	Origin Energy	664	4%	0
Barcaldine	QLD	CCGT	Ergon Energy	55	4%	0
Braemar 1	QLD	OCGT	Alinta Energy	504	12%	10
Braemar 2	QLD	OCGT	Arrow Energy	459	12%	9
Condamine	QLD	CCGT	BG Group	140	92%	21
Darling Downs	QLD	CCGT	Origin Energy	630	57%	57
Oakey	QLD	OCGT	ERM Group	282	2%	0
Roma	QLD	OCGT	Origin Energy	80	3%	0
Swanbank E	QLD	CCGT	CS Energy	385	0%	0
Townsville	QLD	CCGT	Ratch Australia	240	53%	0
Yarwun	QLD	Co-gen	Rio Tinto Alcan	168	88%	0
Dry Creek	SA	OCGT	International Power	156	0%	0
Hallett	SA	OCGT	EnergyAustralia	200	0%	0
Ladbroke Grove	SA	OCGT	Origin Energy	80	21%	1
Mintaro	SA	OCGT	International Power	90	0%	0
Osborne	SA	CCGT	ATCO 50%; ORG 50%	180	86%	0
Pelican Point	SA	CCGT	International Power	485	70%	0
Quarantine	SA	OCGT	Origin Energy	216	12%	0
Torrens Island A	SA	OCGT	AGL Energy	480	16%	0
Torrens Island B	SA	OCGT	AGL Energy	800	16%	0
Bairnsdale	VIC	OCGT	Hydro Tasmania	92	6%	0
Jeeralang A	VIC	OCGT	EnergyAustralia	228	0%	0
Jeeralang B	VIC	OCGT	EnergyAustralia	255	0%	0
Laverton North	VIC	OCGT	Snowy Hydro	312	4%	0
Mortlake	VIC	OCGT	Origin Energy	566	31%	39
Newport	VIC	OCGT	Ecogen	500	0%	0
Somerton	VIC	OCGT	AGL Energy	160	1%	0
Valley Power	VIC	OCGT	Snowy Hydro	300	0%	0
Total						**225**

Source: Australian Energy Market Operator (AEMO), Citi Research

We note that Stanwell Power Corporation (QLD government owned) has already shut down its 385MW Swanbank E facility in SE QLD in order to sell the gas. The shortfall in generation will be made up from its coal-fired Tarong power station. A sizeable 60TJ/d is now being redirected out of generation as a result and is not reflected in our estimate above given it has already occurred.

Figure 4. Distribution of Generation Source Before and After Gas-Out

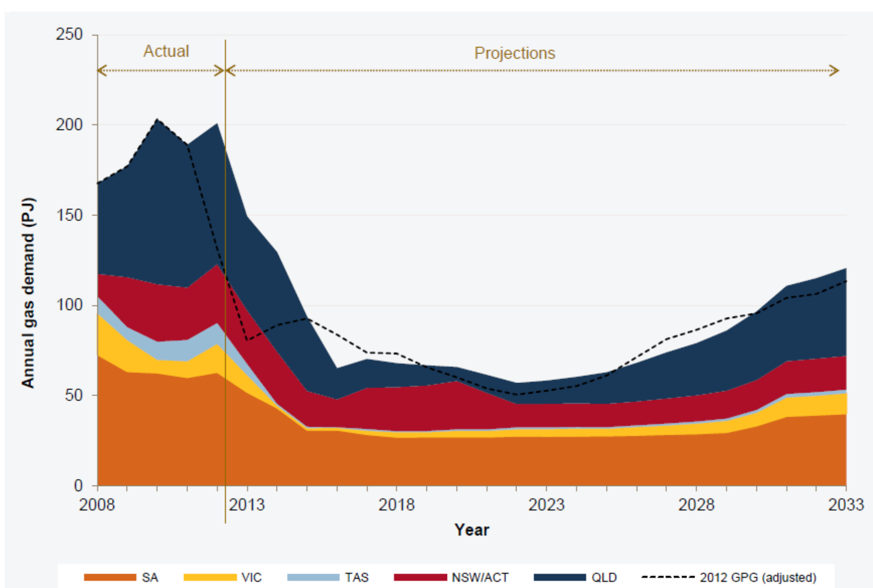


Note: Current and Citi est. Generation is an annualized average. Other Generation includes hydro, solar, wind and liquid fuel generation.

Source: Input data derived from Australian Energy Market Operator (AEMO), Citi Research

Below in Figure 5 we show AEMO forecast gas use for power generation on the East Coast of Australia, from its 2013 Gas Statement of Opportunities report. This data suggests a ~80PJpa (~220TJ/d flat supply) reduction in gas use by power generation on the East Coast, from CY13 to CY16, or ~140PJpa (~384TJ/d) from CY12 to CY16. We think this difference in our forecasts versus AEMO is due to a higher starting point for gas used in generation in CY14.

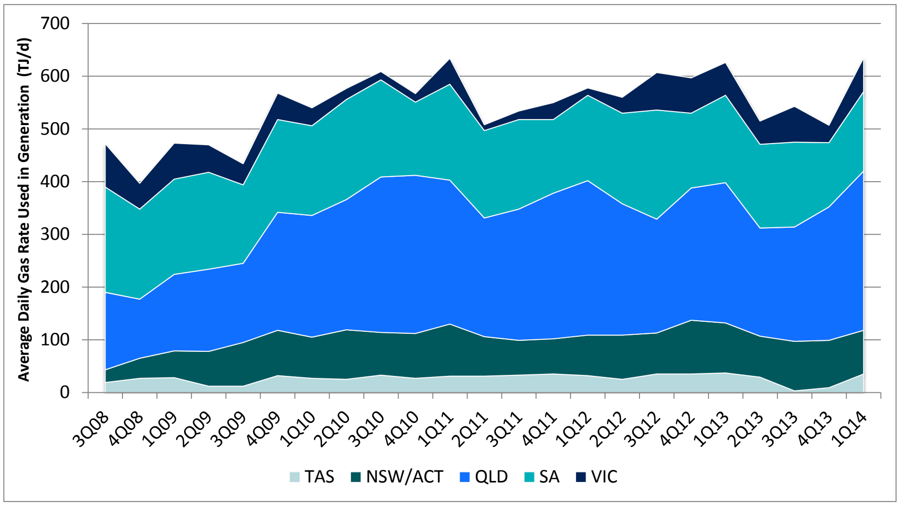
Figure 5. Annual GPG Gas Demand by Demand Group



Source: Australian Energy Market Operator (AEMO), Citi Research

We estimate that this reduction in gas supply to generation is equal to the generation of ~9TWh of annual electricity supply, or ~6% of annual EC generation. Below in Figure 6 we have reviewed the timing of gas fired power generation in the NEM. We think it is clear that gas fired generation is somewhat cyclical with higher demand typically observed in summer (1Q of each year). However, QLD rates have begun to increase with facilities such as Condamine and Darling Downs using more gas for generation as the CSM fields begin dewatering on a large scale. We expect this to continue to increase in the next 12 months followed by a sharp decline as the gas is redirected into LNG projects once they begin production.

Figure 6. Average Daily Gas Rate Used in Generation



Source: Australian Energy Regulator

Who Wins from Gas-Out Story: We think that ORG has the most to benefit from the gas-out story given it has invested the most in gas-fired power generation. ORG is also currently operating Darling Downs at a 57% utilization rate (base-load levels) in 1H FY14 to use ramp-up gas from APLNG, and both Mortlake (31%) and Ladbroke Grove (20%) at higher utilization rates given lower gas demand and benefits from higher liquids production in E&P business. ORG has stated to the market that gas supply to these facilities will likely reduce when LNG starts up, and we expect facility utilization to return to more typical peaking-demand levels (~5%). In a May-14 presentation ORG quantified the opportunity as 40-50PJpa of gas supply out of generation. ORG expects reduced gas-fired generation to be offset by higher utilization in black coal.

Furthermore, we believe that ORG is the only utility to have contracted a portion of supply at lower prices. While we question if this decision was strategic foresight or benefits from a failed gas-generation strategy, either way ORG is in a very strong position.

In the instance that prices were to increase by $4/GJ, the choice for those companies with the option of redirecting gas out of generation can either do so, realizing the higher price, or sell electricity at a higher price. For ORG this would mean redirecting 50PJpa from generation and realising the additional $4/GJ, equating to $200m in additional EBITDA. This assumes that a) costs of production are already accounted for given those same costs would be incurred if the gas goes to generation, and b) there are no significant midstream costs.

We think the EBIT increase for other generators will be smaller. Based on an A$4/GJ EBIT margin increase, we think the benefit for Energy Australia will be ~A$88m.

We forecast the gas business in energy Markets adding ~A$300m EBIT from FY13 (A$95m) to FY17 (~A$400m) for ORG, given the increased margin in its gas business with less gas to generation more to LNG. We think the upside in the gas business is underestimated by consensus as we discussed in our initiation: Initiate with a Buy – Gas Business Upside, APLNG to be OK.

Impact to Electricity Prices as Gas-Generation Exits

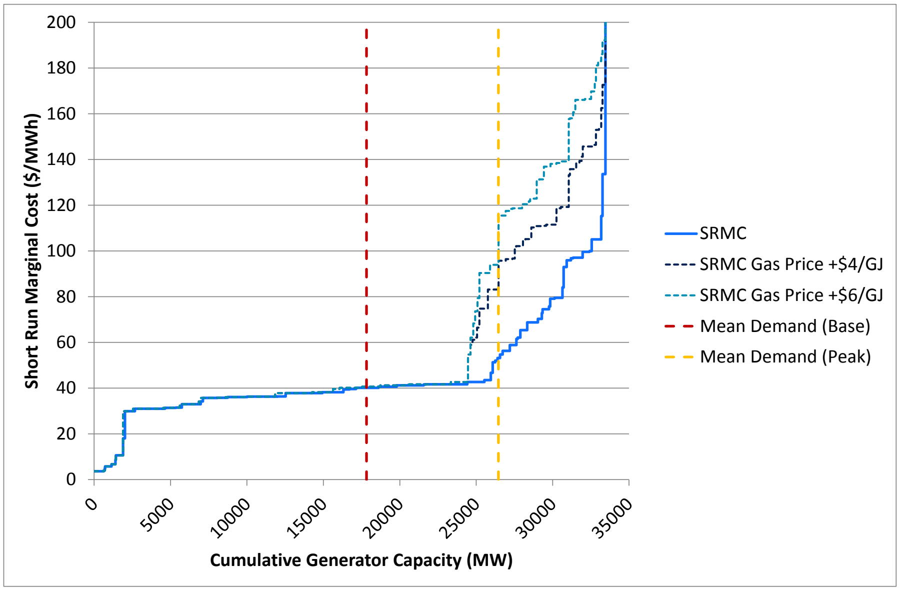
We believe that the reduction in gas fired power generation will have little impact to off-peak electricity prices, given the excess of base load generation capacity, penetration of roof-top solar, energy efficiency focus and reduced industry demand (i.e. ~360MW lost demand from Pt. Henry closure). We think the current gas generation for base-load requirements is ~2000MW, largely from Darling Downs (~330MW), Pelican Point (~310MW), Tallawarra (~370MW), Osborne (~150MW), Condamine (~120MW) Smithfield (~120MW) and Yarwun (~140MW). We think there is significant spare capacity in black-coal generation with Erraring running at ~40% capacity, Bayswater at ~50%, Liddel at ~40%, Stanwell at 60% and Tarong at 60%. At this point in time we question if generators (i.e. ORG) are bidding lower volume from coal-generation, to make acceptable returns on gas-fired generation and monetize excess gas.

Electricity supply during periods of peak demand is also unlikely to be impacted given electricity prices of >A$150/MWh will still provide the greatest value for monetizing gas. We expect generators will look to maintain generation optionality to access higher margins from spikes in electricity prices if available. We think this is highlighted by ORG's option contracts with GLNG. ORG has announced two gas supply deals to GLNG; 100PJ over five years with an ORG option to supply an extra 94PJ, and 365PJ over 10 years with the option to pull back 1.025PJpa during periods of high gas/electricity prices. These details provide optionality for ORG to direct the gas as it suits them – whether this is in generation, domgas, or to GLNG for ~$9/GJ.

The area we see risk for electricity pricing is in intermediate demand. Citi believe that intermediate pricing is less likely to attract gas-fired generation given higher expectations of gas prices going forward. Historic prices during intermediate demand have been A$50-75/MWh but with higher gas costs for the SRMC for the majority of gas-fired generators will be above the electricity price. Gas-fired power stations will continue to be the best suited to provide intermediate generation given their faster generation ramp-up rates. Hence we think that intermediate prices will incur upwards pressure from CY15 to meet SRMC of gas-fired power plants, circa A$75-A$100/MWh, an increase of ~A$25/MWh.

This issue is illustrated in Figure 7 where we show our forecast NEM bid stack for pool supply. We run scenarios at current gas prices, an increment of $4/GJ and an increment of $8/GJ whereby the upwards movement in gas price increases the short-run marginal cost of gas-fired generators. We observe that base-load generation remains unaffected as a result of unutilised coal generation capacity being able to make up for any shortfall in based-load gas-fired generation. However, we note a step-up in intermediate SRMC, which is to be expected given this region is dominated by gas-fired generation. The effect is exacerbated once peaking prices begin and is a reflection of increased fuel costs to run these peaking stations.

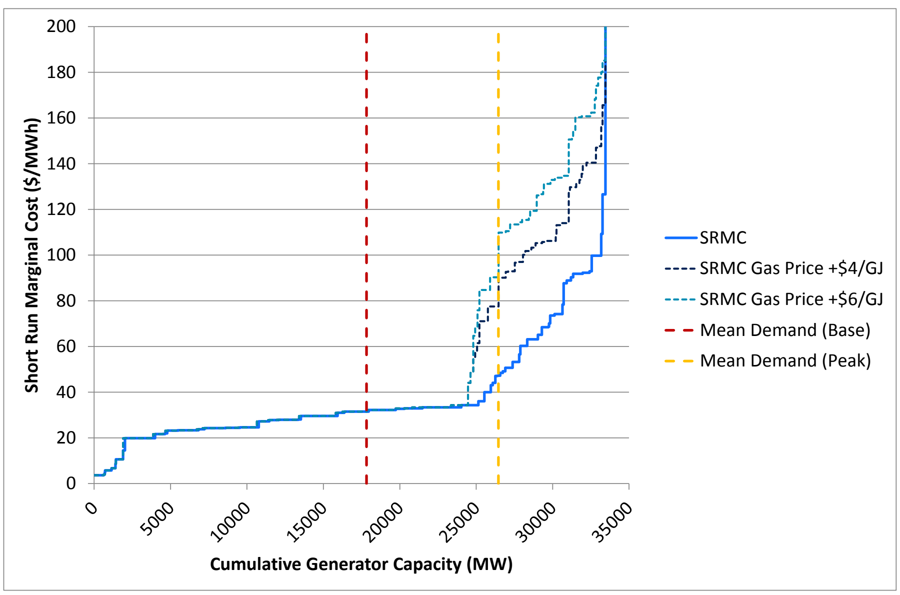
Figure 7. NEM SRMC Curve (A$23.6/t carbon costs) with Varying Gas Prices



Source: Citi Research

Similarly, we have investigated the same scenario whereby we use a carbon price of A$8/t which is broadly in line with current European prices (see Figure 8). Our observations from our previous scenarios are still applicable and we note that SRMC's will reduce by an average $5-10/MWh given that higher emission intensive coal-fired generation makes up the majority of generation, but a similar story as above for peak/intermediate demand.

Figure 8. NEM SRMC Curve (A$8/t carbon costs) with Varying Gas Prices



Source: Citi Research

Does this Balance Gas Markets?

We expect gas demand to exceed supply over the medium term given up to ~470TJ/d shortfall of gas supply into the LNG projects from 4Q15 onwards for 12 months (see Ramp-up of the CSM-LNG industry, now looks short gas), and a ~264TJ/d reduction in gas supply to the domestic market with volumes instead being sold to LNG. While we think that ~225TJ/d can come out of generation (and potentially some seasonally low demand periods in Victoria), we still see a shortfall of gas supply vs. demand until CSM production ramps up and LNG projects become self-sufficient. We think ORG should have little problem finding demand for any gas it can free up in its portfolio.

Figure 9. Impact of LNG Projects on Medium Term Outlook for Domestic Supply

Gas Sales Agreement	Gas Supply (TJ/d)
ORG to GLNG 1	-100
ORG to GLNG 2	-95
Horizon to GLNG	-147
Meridian to GLNG	-36
Fairview	-60
Cooper Basin Production Growth	150
Meridian Production Growth	24
Total Change to Domestic Supply	**-264**
Gas Supply out of Generation	225
Shortfall from CSM-LNG	0 to -473
Grand Total	**-39 to -512**

Source: Company Reports, Citi Research

Gas out of Generation – a Review of Generators

With the increase of gas prices, both industry bodies and generators have started discussing the probability for reduced gas-fired generation contributions to base load electricity supply. Specifically we note:

- The Australian Energy Regulator's 2013 State of the Energy Market report suggested a 135PJpa reduction in gas fired generation over 5 years from FY13.
- In Feb-14 Stanwell announced it would shut the gas-fired Swanbank E power station for 3 years, given it was more lucrative to sell the gas to the domestic market than burn it for electricity. Lost generation will be offset by restarting the Tarong coal-fired power facility which was mothballed in CY12.
- In May-14 ORG stated the opportunity of redirecting 40-50PJpa of gas supply from generation to LNG, C&I customers or to grow mass market share.

In preparation of this research, we met or spoke with representatives of the following companies: Origin Energy, Energy Australia, International Power, Simply Energy, Red Energy, Snowy Hydro, Alinta Energy, BG Group and. From our discussions with and observations of gas-fired generator operators we note the following:

- **Slow reaction to rising gas prices:** Most companies appear to only just be beginning to actively develop a strategy to respond to the expectation of rising gas prices in order to maximize profits. Energy Australia is in the process of reviewing their position, with Tallawarra potentially reducing generation once contracts roll off in 2017. International Power is focused on value for gas provided it has the means to do so. Alinta has stated that they continue to assess prevailing market conditions on an ongoing basis and sees value in both the

domestic and generation markets to which they have exposure. While Alinta would not provide specifics, they did acknowledge that the excess generation capacity in the NEM would mean that if gas were to come out of generation that it would not lead to generation supply shortfalls. Rio had stated in the media it could cut gas-fired power generation in CY15 if it does not continue to get gas at a reasonable price, since increasing gas prices will erode the viability of Yarwun alumina plant. We think this is unlikely given APLNG supply 22.8PJpa for 20yrs is most likely fixed at prices of low legacy prices of A$3-4/GJ, unless operations are marginal and Rio is looking to sell gas back to the market at A$8-10/GJ, generating ~A$100m pa margin.

- **ORG has a head start:** We believe that ORG is the only utility to have long dated contracted supply at lower legacy prices. This flexibility has been created by sourcing lower prices gas in the medium term (albeit largely from gas-fired generation) which will place it in a very strong position.

- **An opportunity for black coal exists:** Our understanding is that generators expect a reduction in gas-fired generation will be offset by higher utilization in black coal. International Power believes that it is strategically advantageous to buy coal in anticipation of this potential outcome and because carbon prices are likely to come down (see below).

- **QLD generators fed by CSM gas will significantly reduce utilization rates:** Based on AEMO data, we understand the Condamine power plant (140MW) is currently operating at >90% capacity utilization, presumably as a means of monetizing ramp-up gas from the QCLNG project. BG has stated that QCLNG will source 10-15% of gas requirements from third parties. We understand Condamine has no electricity offtake requirements to meet and as such we don't think it makes sense for QCLNG to push gas through power generation while LNG is short. ORG has stated to the market that gas supply to Darling Downs, Mortlake and Ladbroke Grove power stations will likely reduce when LNG starts up. We expect facility utilization to return to more typical peaking-demand levels (~5%).

- **An anticipation of no carbon price has been priced into the market:** International Power stated that they believe the market is currently absorbing into its pricing the expectation that the current Coalition Government will abolish the carbon price from 1 July. They expect the short-run marginal costs of generation will therefore reduce and for brown coal they think that a reduction of $5-10/MWh will be realized. Citi estimates the following weighted averages of SRMC's for different generation types in the NEM with and without carbon pricing:

Figure 10. Cost Savings from an Abolishment of Carbon Pricing

Thermal Generator	SRMC,$26.3/t carbon ($/MWh)	SRMC, no carbon ($/MWh)	Cost Saving ($/MWh)
Black Coal	38	26	12
Brown Coal	35	19	16
Gas	389	378	11
Liquid Fuel	47	42	6

Source: Citi Research

Origin Energy Ltd

Company description

Origin Energy Ltd (ORG) is an integrated utility, with substantial interests in Upstream gas, particularly through its 37.5% interest in the APLNG JV with ConocoPhillips and Sinopec. APLNG currently has over 16,157PJ of 3P reserves. In its underlying utilities business, ORG has around 4.5m electricity, gas and LPG customers in eastern Australia and c.5,310MW of generation capacity. ORG also has a 52.6% stake in Contact Energy.

Investment strategy

We rate Origin Energy as Buy. The Energy Markets business represents A$8.97/shr and we are very positive in the return of gas margins and also expect to see partially improved electricity margins. APLNG has a DCF valuation of A$3.36/shr and we are confident in the project execution and the gas supply underpinning the project.

Valuation

Our target price of A$16.86/shr is based on a weighted average of our A$16.53/shr SOTP valuation and a 14x P/E multiple on FY16 earnings, based on comparable companies. For the SOTP valuations, we use the following methodologies: our E&P and APLNG segments uses a DCF valuation, Energy Markets uses a 12x EV/EBITDA valuation and we value Contact Energy on current listed price. Our DCF is calculated using Citi's commodity price outlook (long-term US$90/bbl real Brent from 2016, 0.90A$/US$) and a discount rate of 9.5%.

Risks

The Energy Markets business is susceptible to increased competition and regulatory interference which are notoriously difficult to forecast and could have a material impact to earnings. In addition, due to higher cost of electricity and gas in Australia, this has increased energy efficiency initiatives thereby reducing demand.

We see some earnings risk in FY14 due to short-term weakness in E&P production, and lower customer nominations. While we forecast higher earnings longer term, we think consensus numbers underestimate APLNG interest costs which are currently treated as significant items.

APLNG is still subject to risks such as drilling delays, well rates vs. planning assumptions and upstream infrastructure delays, all potentially leading to insufficient gas supply at 1st LNG; and also possible complications during commissioning. Both APLNG and the E&P business are susceptible to price changes of oil and gas. Upgrades/downgrades to Citi Research Commodities long-term oil price forecasts would subsequently increase/decrease our target price, all else being equal.

If the impact on the company from these factors proves greater or less than we anticipate, the stock could outperform or underperform our target price.

Appendix A-1

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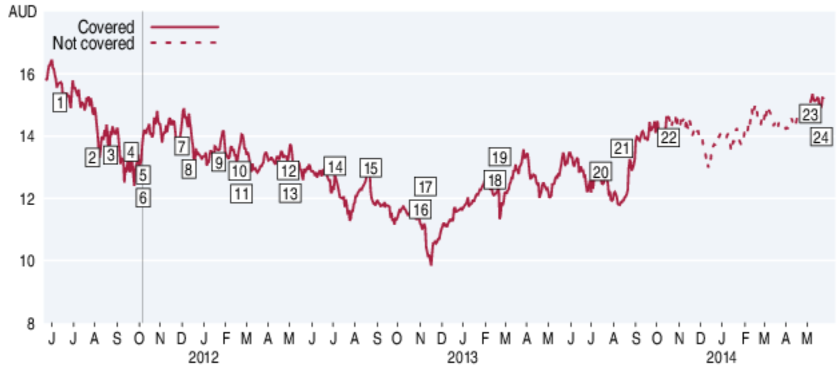
IMPORTANT DISCLOSURES

Origin Energy Ltd (ORG.AX)

Ratings and Target Price History
Fundamental Research

Analyst: Dale Koenders
Covered since May 6 2014



Date	Rating	Target Price	Closing Price
1 13-Jun-11	1M	*18.90	15.69
2 28-Jul-11	1M	*18.40	14.77
3 23-Aug-11	1M	*18.10	14.16
4 21-Sep-11	1M	*17.90	13.49
5 7-Oct-11	Stock rating system changed		
6 7-Oct-11	*1	17.90	14.02
7 1-Dec-11	1	*17.30	14.45
8 12-Dec-11	1	*18.20	14.72
9 23-Jan-12	1	*18.00	13.55
10 21-Feb-12	1	*17.70	13.66
11 23-Feb-12	1	*17.50	14.05
12 30-Apr-12	1	*17.60	13.26
13 2-May-12	1	*18.20	13.74
14 4-Jul-12	1	*16.00	12.75
15 23-Aug-12	1	*15.70	12.24
16 1-Nov-12	1	*15.75	11.18
17 8-Nov-12	1	*15.30	11.05
18 14-Feb-13	1	*14.20	12.12
19 21-Feb-13	1	*14.00	11.33
20 15-Jul-13	*2	*13.10	12.61
21 13-Aug-13	2	*13.00	11.87
22 17-Oct-13	Coverage terminated		
23 6-May-14	*1	*16.79	15.10
24 21-May-14	1	*16.86	14.95

* Indicates change

Rating/target price changes above reflect Eastern Standard Time

Origin Energy Ltd (ORG.AX)

Ratings and Target Price History
Best Ideas Research
Relative Call (3 Month)

Analyst: Dale Koenders
Covered since May 6 2014

Date	Rating	Target Price	Closing Price
1 6-Feb-12	*REM MP	-	13.27
2 31-May-12	*ADD LP	-	12.88
3 12-Sep-12	*ADD MP	-	11.88
4 18-Dec-12	*REM MP	-	11.27

* Indicates change

Rating/target price changes above reflect Eastern Standard Time

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