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# Seismic reflections

## Gas to liquids could gain traction

The economics of gas-to-liquids (GTL) plants is looking increasingly interesting, driven by the widening gap between oil and natural gas prices, particularly in North America. Currently, on a heat-equivalent basis, WTI is selling for 7x Henry Hub against 2x as recently as 2008. GTL facilities are, of course, costly and the process is energy intensive but at anything like current US oil and gas prices, GTL projects are arguably viable. Interestingly, Chesapeake, the second-largest US gas producer, believes GTL could become a reality in the US later this decade.


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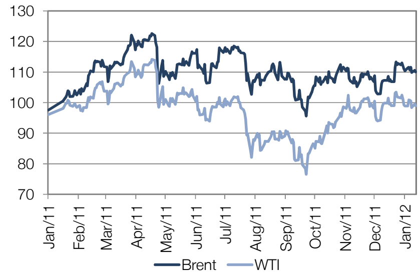


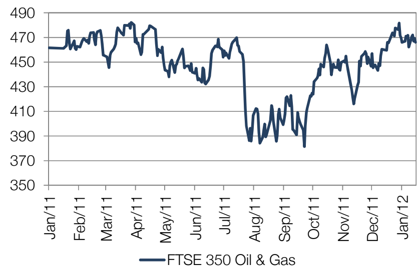


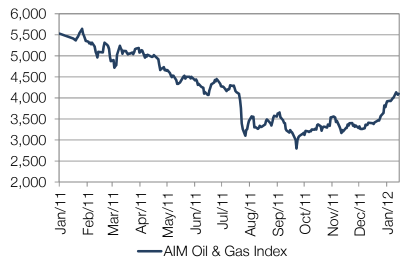


### Technology

GTL is the process where natural gas is converted to liquid fuels and chemical feedstock. Processing comprises four stages: removing water and impurities from the gas, reforming methane to produce synthetic gas, Fischer-Tropsch catalytic conversion to produce synthetic crude, and hydrocracking to produce refined product. The process typically requires about 10mcf of natural gas per barrel of liquid output. Approximately 6mcf is required as feedstock and the balance to operate the plant. The output mix is typically 70% diesel, 25% naptha and 5% other products such as LPG and lubricants. Significantly, by virtue of the process, the liquids contain ultra low contaminants, including sulphur.

### Economics

The key areas of cost relating to a GTL plant are capital, natural gas feedstock, natural gas as a heat and energy source and non-energy related cash operating cost including maintenance. Based on a cursory scoping analysis, we would put costs at about $62/barrel currently assuming a large scale plant and Henry Hub benchmarked natural gas. This reflects $22 for capital, $25 for natural gas ($2.5/mcf) and $15 for general operating cost. Capital costs are based on Shell's $19bn Pearl plant in Qatar commissioned in 2011, which has a capacity of 260,000b/d of diesel/kerosene and natural gas liquids. We have assumed here a 90% utilisation rate and, conservatively, a 10-year life. At first glance there appears to be plenty of headroom in the current WTI price of around $100/barrel and even more so if we allow a further $10/barrel for a conventional refining margin.

### North American projects

Johannesburg-based Sasol is the world's most experienced operator of GTL plants and currently produces about 160,000b/d of fuel at Secunda in South Africa. Sasol currently has two North American GTL projects at the feasibility study stage in Louisiana and Alberta. According to Chesapeake, the Louisiana plant would have output of 80,000b/d. Interestingly, Sasol in 2011 acquired a 50% stake in two large shale gas projects in the Montney Basin of Alberta/BC in partnership with Talisman.


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Exhibit 1: Best and worst performers

| 1 week | | | | | |
|---|---|---|---|---|---|
| No. | Best performers | % change | No. | Worst performers | % change |
| 1 | LENI GAS AND OIL | 112.0% | 1 | SALAMANDER ENERGY | (7.9%) |
| 2 | BPC LIMITED | 35.3% | 2 | MEDITERRANEAN OIL AND GAS | (7.0%) |
| 3 | AMINEX PLC | 25.5% | 3 | GULFSANDS PETROLEUM | (5.4%) |
| 4 | PETREL RESOURCES | 24.2% | 4 | GASOL PLC | (5.3%) |
| 5 | ITHACA ENERGY | 20.5% | 5 | PROVIDENCE RESOURCES | (4.8%) |

| 1 month | | | | | |
|---|---|---|---|---|---|
| No. | Best performers | % change | No. | Worst performers | % change |
| 1 | LENI GAS AND OIL | 167.7% | 1 | MEDITERRANEAN OIL AND GAS | (16.7%) |
| 2 | ENEGI OIL | 51.4% | 2 | GULFSANDS PETROLEUM | (16.0%) |
| 3 | BPC LIMITED | 48.3% | 3 | GLOBAL ENERGY DEVELOPMENT | (12.2%) |
| 4 | TOWER RESOURCES | 48.2% | 4 | PETRONEFT RESOURCES | (12.2%) |
| 5 | GULF KEYSTONE PETROLEUM | 47.2% | 5 | EGDON RESOURCES | (12.0%) |

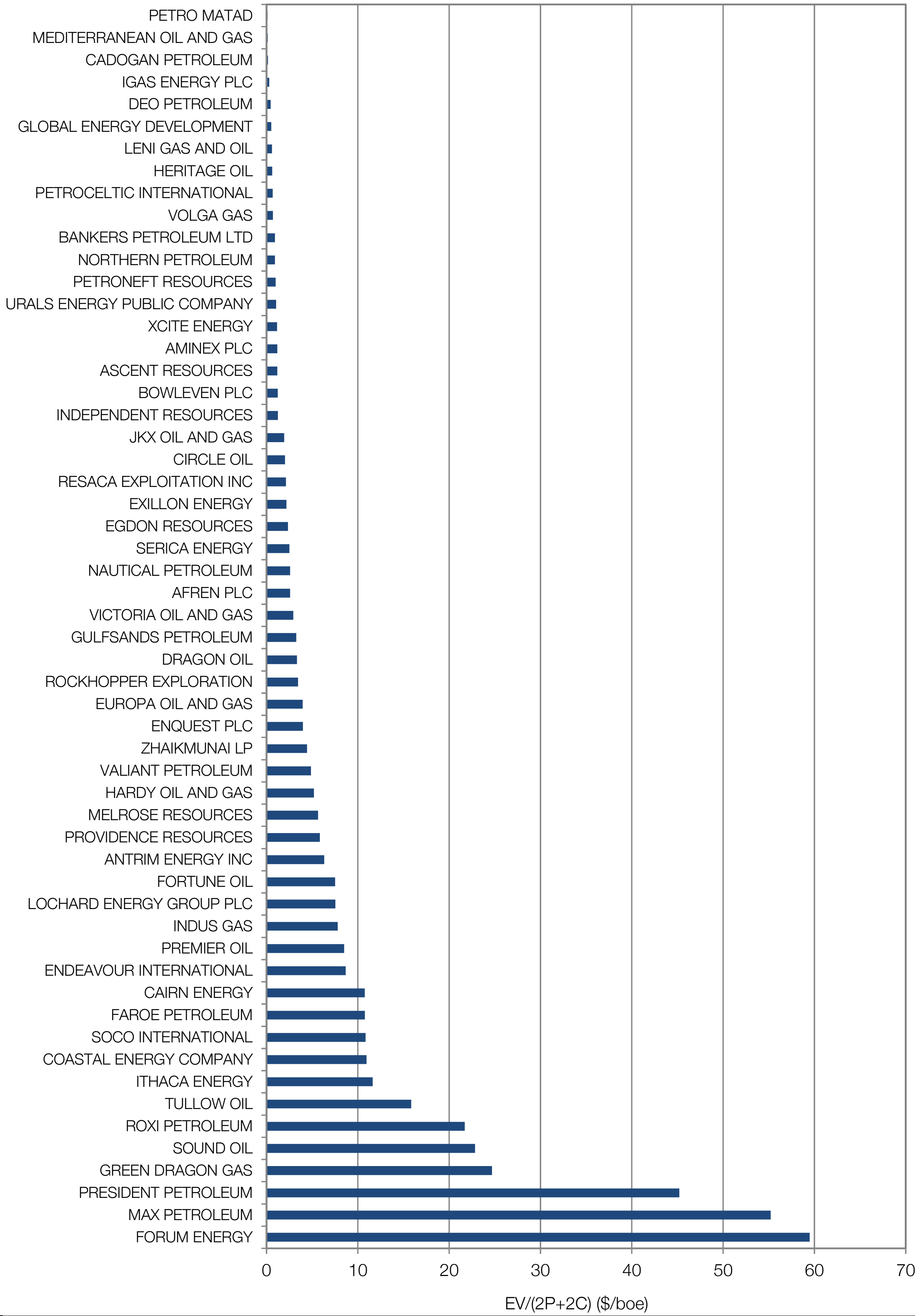
| 3 months | | | | | |
|---|---|---|---|---|---|
| No. | Best performers | % change | No. | Worst performers | % change |
| 1 | GULF KEYSTONE PETROLEUM | 98.4% | 1 | SOUND OIL | (48.0%) |
| 2 | ROXI PETROLEUM | 87.0% | 2 | MEDITERRANEAN OIL AND GAS | (38.5%) |
| 3 | AMINEX PLC | 64.2% | 3 | LOCHARD ENERGY GROUP PLC | (36.3%) |
| 4 | PROVIDENCE RESOURCES | 55.5% | 4 | PETRONEFT RESOURCES | (33.7%) |
| 5 | PETRO MATAD | 54.5% | 5 | MAX PETROLEUM | (29.3%) |

| 6 months | | | | | |
|---|---|---|---|---|---|
| No. | Best performers | % change | No. | Worst performers | % change |
| 1 | GULF KEYSTONE PETROLEUM | 93.9% | 1 | AURELIAN OIL AND GAS | (76.2%) |
| 2 | COASTAL ENERGY COMPANY | 79.3% | 2 | BOWLEVEN PLC | (71.5%) |
| 3 | DOMINION PETROLEUM | 0.5% | 3 | PETRO MATAD | (64.2%) |
| 4 | DESIRE PETROLEUM | 62.7% | 4 | FRONTERA RESOURCES CORPORATION | (62.2%) |
| 5 | COVE ENERGY PLC | 46.1% | 5 | MEDITERRANEAN OIL AND GAS | (57.0%) |

| 1 year | | | | | |
|---|---|---|---|---|---|
| No. | Best performers | % change | No. | Worst performers | % change |
| 1 | COASTAL ENERGY COMPANY | 137.7% | 1 | AURELIAN OIL AND GAS | (79.8%) |
| 2 | GULF KEYSTONE PETROLEUM | 67.2% | 2 | BOWLEVEN PLC | (77.4%) |
| 3 | CADOGAN PETROLEUM | 40.9% | 3 | PETRONEFT RESOURCES | (75.4%) |
| 4 | COVE ENERGY PLC | 38.0% | 4 | MEDITERRANEAN OIL AND GAS | (74.0%) |
| 5 | ANTRIM ENERGY INC | 32.9% | 5 | FRONTERA RESOURCES CORPORATION | (73.9%) |

Source: Bloomberg

Exhibit 2: EV/2P + 2C rankings




Source: Bloomberg, company releases, Edison Investment Research

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