Colts
A research initiative by Canaccord Genuity

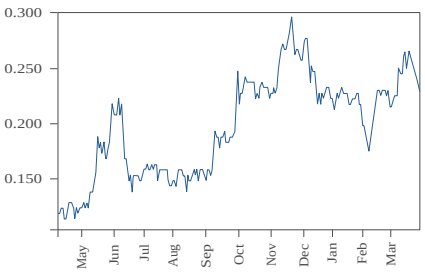
Genex Power (ASX:GNX)

Growing recognition that more energy storage is needed

Key Facts	
Company Code	GNX
Closing Price (28/3/17)	0.23
Price Target	0.48
Date of Report	29/3/17
Company Website	www.genexpower.com.au
Analyst	Johan Hedstrom

Company Statistics	
12-Month Range	A$0.11 - A$0.31
Market Cap (A$Mil)	A$63m
Issued Shares	277
Issued Options	47
Cash (A$Mil)	A$25m
Major Shareholders	%
Zhefu Hydropower (China)	11.0%
Rivonia Pty Ltd	9.9%
Acorn Capital	8.7%
KFT Capital	7.3%

Share Price Performance



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Solar farm under construction, pumped hydro feasibility

Genex is a small company seeking to develop a renewable energy hub at Kidston, north Queensland. The first 50MW stage of a solar farm is under construction, and before the end of the year, the company hopes to complete a bankable feasibility study for a 250MW pumped hydro project, integrated with a solar expansion. Following the recent capital raising, we value the company at $0.48/share, and recommend the stock as a Buy.

Stage 1 Solar project underway, and looking solid

Genex has commenced the construction of the 50MW solar farm at Kidston, which should commence electricity generation in the 4Q 2017. The company has also illustrated EBITDA between $12.2-15.2m by back-testing for power prices over the last three years.

Funding secured

Genex has received strong funding support for the $126m capex of Stage 1 Solar at Kidston. SocGen and CEFC has agreed a loan of about $100m, with Genex locking in low interest rates. ARENA has provided a Federal grant of $8.85m and shareholders have put in close to $18m over the last few months. The remaining working capital should be enough to complete the bankable feasibility study for the 250MW pumped hydro project, and the 270MW solar expansion before the end of this year.

More renewable energy requires more storage

As the world's electricity supply continues shifting to wind and solar, their intermittency will require more storage. While batteries in households and key network locations will assist, pumped hydro offers the only storage of the scale needed to ensure a reliable grid. Pumped hydro also offers much longer life expectancy of 100 years or more, unlike batteries. A growing recognition of this need can be seen through examples such as the Australian PM's pumped hydro proposal for the Snowy Hydro, and some European countries issuing guidelines that for every additional 1GW of renewable capacity, about 300MW of storage should also be constructed. Australia currently has over 9GW of wind and solar capacity installed, with no new storage built since Queensland's Wivenhoe Dam in 1984. Apart from the recent black-outs in South Australia, the grid has coped due to over-capacity in coal fired plants. With proposals for another 20GW of renewables by 2040, the market conditions for pumped hydro schemes at Kidston, Snowy Hydro and elsewhere look good. This note looks at some case studies for pumped hydro.

Financial Summary
Genex Power
Price: A$0.23
Market Cap: A$63m

PROFIT AND LOSS						
Year ending June	Unit	2016A	2017E	2018E	2019E	2020E
Revenue	$m	0.7	-	13.4	14.1	102.8
Operating Expenses	$m	-	-	(1.6)	(1.6)	(37.3)
Admin and Other Expenses	$m	(7.7)	(5.1)	(4.1)	(4.2)	(4.3)
EBITDA	$m	(7.0)	(5.1)	7.7	8.3	61.2
Depreciation	$m	-	-	(10.0)	(10.0)	(35.0)
EBIT	$m	(7.0)	(5.1)	(2.3)	(1.7)	26.2
Net interest (expense)	$m	(0.1)	0.2	-	(5.0)	(5.0)
PBT	$m	(7.1)	(4.9)	(2.3)	(6.7)	21.2
Tax expense	$m	-	-	0.6	1.7	(5.3)
NPAT (pre-abnormal)	$m	(7.1)	(4.9)	(1.7)	(5.0)	15.9
Abnormal items	$m	-	-	-	-	-
NPAT (reported)	$m	(7.1)	(4.9)	(1.7)	(5.0)	15.9

CASH FLOW						
Year ending June	Unit	2016A	2017E	2018E	2019E	2020E
OPERATING CASHFLOW						
NPAT	$m	(7.1)	(4.9)	(1.7)	(5.0)	15.9
Add: non-cash items	$m	4.7	2.0	11.0	11.0	36.0
Change in working capital	$m	(7.3)	2.7	(2.0)	(0.1)	(13.3)
Operating cash flow	$m	(9.7)	(0.2)	7.3	5.9	38.6
INVESTING CASHFLOW						
Net PP&E	$m	(0.4)	(11.2)	(120.0)	(120.0)	(60.0)
Evaluation	$m	(0.2)	(4.0)	(2.0)	(2.0)	(2.0)
Other	$m	(3.8)	-	-	-	-
Investing cash flow	$m	(4.4)	(15.2)	(122.0)	(122.0)	(62.0)
FINANCING CASHFLOW						
Share capital	$m	3.3	18.5	-	-	-
Interest bearing debt	$m	4.3	-	105.0	116.2	32.3
Financing cash flow	$m	7.7	18.5	105.0	116.2	32.3
Change in cash	$m	(6.5)	3.1	(9.8)	0.1	8.9

BALANCE SHEET						
Year ending June	Unit	2016A	2017E	2018E	2019E	2020E
ASSETS						
Cash	$m	8.0	11.1	1.3	1.4	10.3
Accounts receivable	$m	3.1	-	3.4	3.5	25.7
Property Plant & Equipment	$m	0.6	11.8	121.8	231.8	256.8
Inventory	$m	-	2.0	3.0	4.0	5.0
Other	$m	3.8	3.8	3.8	3.8	3.8
Total assets	$m	15.5	28.7	133.3	244.6	301.6
LIABILITIES						
Accounts payable	$m	0.4	-	1.3	1.4	10.3
Deferred tax liablities	$m	-	-	-	-	-
Borrowings	$m	3.4	3.4	108.3	224.5	256.8
Provisions	$m	4.2	4.2	4.2	4.2	4.2
Total liabilities	$m	8.0	7.6	113.9	230.2	271.3
SHAREHOLDER'S EQUITY						
Share capital	$m	15.8	34.3	34.3	34.3	34.3
Retained earnings	$m	(10.5)	(15.4)	(17.1)	(22.1)	(6.2)
Reserves & outside equity	$m	2.2	2.2	2.2	2.2	2.2
Total equity	$m	7.5	21.1	19.4	14.4	30.3
Weighted average NoSh	m	169.3	228.8	277.4	277.4	277.4

FINANCIAL RATIOS						
Year ending June	Unit	2016A	2017E	2018E	2019E	2020E
VALUATION						
NPAT (adjusted)	$m	(7.1)	(4.9)	(1.7)	(5.0)	15.9
EPS (adjusted)	c/sh	(4.2)	(2.1)	(0.6)	(1.8)	5.7
EPS growth	%		-49%	-71%	193%	-416%
PER	x	-5.9x	-11.7x	-40.4x	-13.8x	4.4x
DPS	c/sh	-	-	-	-	-
Yield	%					
EV/EBITDA	x	-9.3x	-12.2x	22.9x	35.3x	5.2x
PROFITABILITY RATIOS						
EBITDA margin	%			57%	59%	60%
EBIT margin	%			-17%	-12%	25%
Return on assets	%	-32%	-22%	-2%	-3%	6%
Return on equity	%	-50%	-34%	-8%	-30%	71%
LIQUIDITY & LEVERAGE						
(Net debt) / cash	$m	5	8	(107)	(223)	(247)
ND / E	%	45%	16%	558%	1561%	848%
ND / (ND + E)	%	31%	14%	85%	94%	89%

ASSUMPTIONS						
Year ending June	Unit	2016A	2017E	2018E	2019E	2020E
PRICES						
PPA for Solar Stage 1	$/MW		88.0	88.0	88.0	88.0
Off Peak Power Cost	$/MW	10.0	15.0	30.0	30.8	31.5
Peak Power Price	$/MW	150.0	130.0	133.3	136.6	140.0
LGC's (only on Solar)	$/MW	75.0	75.0	75.0	80.0	75.0
CURRENCY						
USD/AUD		0.75	0.74	0.73	0.72	0.72

POWER GENERATION F'CAST						
	Unit	2016A	2017E	2018E	2019E	2020E
Solar Stage 1 (50MW)	MWh	-	-	144,540	144,251	143,962
Solar Stage 2 (270MW)	MWh	-	-	-	-	-
Pumped Hydro (250MW)	MWh	-	-	-	-	638,750
Total	MWh			144,540	144,251	782,712

SOTP VALUATION AT WACC						
8.1%	Risked					Unrisked
	Net MW	NPV ($m)	$/sh	Risking	NPV($m)	$/sh
Solar Stage 1 (50MW)	50	42	0.15	100%	42	0.15
Solar Stage 2 (270MW)	270	9	0.03	10%	90	0.32
Pumped Hydro (250MW)	250	66	0.24	50%	133	0.48
Net asset value	550	116	0.42		265	0.95
(Net debt) / cash		16			16	0.06
Equity value		132			280	
No Sh diluted for placement + SPP		277			277	
Value per share ($/sh)		0.48			1.01	

The outlook for Genex improves

Genex's corporate objectives are progressing well, with the first stage of the solar project at Kidston under construction, and growing recognition that the company's pumped hydro scheme is ideally suited for the electricity grid of tomorrow.

Prime Minister talks up pumped hydro

We think the most interesting aspect of Genex is the pumped hydro project, and this view was reinforced earlier this month, when the Prime Minister's initiative for the Snowy Hydro Scheme was announced. Mr Turnbull is keen to expand the Snowy Hydro Scheme by 2,000MW or a 50% increase on the current capacity. The expansion would be entirely based on pumped hydro, rather than any new dam building, to minimise environmental concerns. While the proposal needs an extensive feasibility study, and will take many years to build, the fact that the concept of pumped hydro has been brought to the attention of the general public, and a de facto recognition for the need of storage is a very good thing in our view.

"We think the most interesting aspect of Genex is the pumped hydro project, and this view was reinforced earlier this month, when the Prime Minister's initiative for the Snowy Hydro Scheme was announced."

Kidston pumped hydro proposal revisited

Genex was formed to develop a pumped hydro project utilising the Kidston gold mine, which ceased operations in 2001. The company identified the site as an excellent project for a number of reasons:

- 220m difference in elevation between the lower pit and a proposed "turkey nest" in very close proximity to each other, ie avoidance of any lengthy tunnel;
- Existing connection to the grid;
- Existing accommodation camp;
- Significant water rights in case of prolonged droughts;
- Excellent solar resource, indicating a strong case to use solar for the pumping stage;
- Access to cheap land as alternative land use is very limited;
- Government support (Local, State and Federal), including an initial grant of $4m from ARENA;
- Queensland has higher peak prices and more volatility than other States;
- Technical feasibility study completed for a 250MW project, to generate for 6-8 hours /day;
- Bankable feasibility study to be completed in 2017;
- Preliminary capex estimate of $300m, indicative 70% debt funding and potential equity sell-down.

Figure 1. Kidston proposed renewable energy hub

1. Upper Reservoir (Turkey's Nest)
2. Head Pond & Intake Outlet
3. Powerhouse
4. Lower Reservoir (Elgridge Pit)
5. Balancing Storage (Wises Pit)
6. Solar Panels (Tailing's Storage)

Water would be pumped to the upper reservoir using cheap off-peak power during the night, and from solar power during the day. This will allow selling into both the morning and evening peak demand periods at higher prices. As a pumped hydro scheme is a net user of energy with efficiency of 70-85%, the price received at peak times needs to be about 4x the price paid for pumping to generate commercial returns. Our assumptions include pumping costs of $32/MWh and peak prices of $$140/MWh when the project starts in 2020. Current off-peak pricing is around $10/MWh and peak prices have averaged $160/MWh in Queensland over the last year, suggesting that our numbers could be conservative. However, long term power prices are unpredictable, and Genex would probably seek to lock in a high proportion of its prices for the first 10 years, which would also maximise debt funding.

Background and case studies of pumped hydro projects

Pumped hydro schemes have existed for over 100 years, and currently represent more than 95% of electricity storage around the world. To get a better understanding of pumped hydro operations, we have had a look at three different groups of pumped hydro schemes around the world, namely the Australian projects, some recent international ones, and planned projects.

Australian Projects

> “Pumped hydro schemes have existed for over 100 years, and currently represent more than 95% of electricity storage around the world.”

The following table shows the three Australian pumped hydro schemes, all of which were constructed more than 30 years ago.

Australian Projects	Location	Start-up	Capacity (MW)	Owner	GWh/year	Output/ Capacity
Wivenhoe	Queensland	1984	500	CS Energy	114	0.2
Shoalhaven	Kangaroo Valley, NSW	1977	240	Origin Energy	148	0.6
Tumut 3	Snowy Mnts, NSW	1973	1500	Snowy Hydro	1,000	0.7

Source: Company and Industry Data

Wivenhoe, Queensland

The Wivenhoe Dam in Queensland is owned by the State Government through CS Energy, and also acts to prevent floods of the Brisbane River. The power plant appears to be severely under utilised to meet peak power demand according to an article on reneweconomy.com.au on the 23 February 2017 (“Wivenhoe pumped hydro: The big little plant that didn’t”). Of the 250 highest priced 30 minute periods in the NEM this year, Wivenhoe has only operated on 59 occasions, and then only at 50% capacity. The reason for this is that CS Energy also owns significant coal and gas fired power generation assets. If the Wivenhoe pumped hydro runs hard every time there is a price spike, this would depress the pool price, and CS Energy would make less money from its other power generation assets. This portfolio decision makes perfect sense for CS Energy, but leads to Queensland consumers paying more than they should. The above Table shows a value for Output/Capacity calculated as GWh/MW, which is a function of many parameters, and should not be taken in isolation. However, it does show the low output for Wivenhoe relative to the other Australian projects, which all are lower than more typical, recent projects discussed later.

Shoalhaven, Kangaroo Valley NSW

The smaller 240MW Shoalhaven pumped hydro project south of Sydney is owned by Origin Energy, and is also generating power erratically and below capacity. In the FY15 Year, the plant only generated 9GWh, but rising to 148GWh in FY16. We calculate capacity to be about 600GWh per annum, indicating less than 25% capacity factor in FY16. As Origin Energy is also a large power generator and retailer, we believe that this low capacity utilisation is also explained by the portfolio effect, to enhance the overall profitability of the business. While the Shoalhaven plant is less than half the size of Wivenhoe, and would therefore have less impact on the market, its low utilisation is also likely to maintain prices higher than otherwise would be the case.

Source: Snowy Hydro Corporation

Tumut 3, Snowy Mountains NSW

The first pumped hydro scheme in Australia is at Tumut 3, and part of the flagship Snowy Hydro scheme. It is jointly owned between the Federal, Victorian and NSW Governments. Snowy Hydro is primarily a peak power generating company, but is also responsible for some irrigation requirements, and flood mitigation. We are unable to get specific generation data for the Tumut 3 (1500MW capacity) pumped hydro project, but understand that average annual generation approximates 1,000GWh, out of the 4,500GWh total output.

The recent announcement from the Prime Minister Malcolm Turnbull that the Federal Government would like to increase the capacity of the Snowy Hydro Scheme by 2,000MW, or 50% through pumped hydro, appears to be a good idea, but requires significant consultation and feasibility studies. A timetable of 5-10 years is likely, if the project goes ahead.

Recent Projects	Location	Start-up	Capacity (MW)	CAPEX (A$m)	CAPEX/ MW	Efficiency	GWh/ year	Output/ Capacity
Reisseck II	Austria	2015	430	615	1.4	N/A	1,000	2.3
La Muela	Spain	2013	1700	2,462	1.4	N/A	5,000	2.9
Olivenhain-Hodges	San Diego, USA	2012	40	187	4.7	N/A	N/A	N/A
Pont Ventoux-Susa	Italy	2005	150	133	0.9	N/A	350	2.3
Tianhuangping	Zhejiang, China	2004	1836	1,662	0.9	73.1%	3,000	1.6
Goldisthal	Thuringia, Germany	2003	1060	1,038	1.0	70.0%	2-2,700	2.4

Source: Company and Industry Data

Pumped hydro – a proven storage technology with renewed interest

There are over 150 pumped hydro schemes in the world, with the first one built in Switzerland in 1909. The majority were built during the 1960-1990 period, but renewed interest in pumped hydro has become evident in recent years as renewable energy becomes a growing proportion of many countries source of power, due to its intermittency. Pumped hydro is the back-up storage of choice for all electricity grids around the world, representing over 95% of global grid storage. China has been particularly active at expanding its pumped hydro capacity, but Europe is also building capacity to manage its transition from fossil fuel power to renewable sources of energy.

The above Table shows some of the recently constructed pumped hydro schemes, with one column measuring the capital cost per MW of capacity. This shows that costs can be below $1m/MW although those projects were built more than a decade ago, and that smaller projects such as Olivenhain-Hodges are less capital efficient (party due to flood mitigation reasons). The last column also shows the output/capacity for each project, and we note that all these projects have much higher utilisation than the three Australian projects discussed above.

Planned projects

Finally, we take a look at three planned developments, including Genex's Kidston project to see how it compares with other new builds, as well as the perspective of other pumped hydro projects, discussed above.

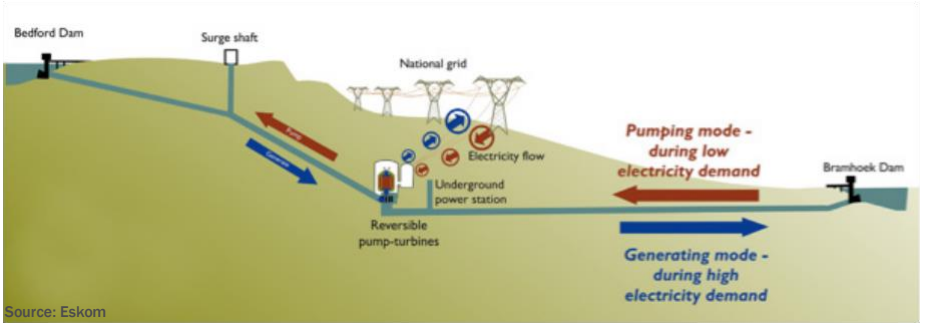
Planned Projects	Location	Start-up	Capacity (MW)	CAPEX (A$m)	CAPEX/ MW	Efficiency (%)	GWh/ year	Output/ Capacity
Ingula	South Africa	2017	1332	4,375	3.3	78.0%	N/A	N/A
Glyn Rhonwy	Llanberis, Wales	2021	100	261	2.6	77.0%	600	6.0
Kidston	Queensland, Australia	2021	250	300	1.2	81.0%	640	2.1

Source: Company and Industry Data

Ingula, South Africa

The South African Ingula project has been in construction since 2005, and the fourth and final 333MW generator/pump will be commissioned this year. Eskom, the State power company has not released the final cost (estimated at US$3.5B), or the expected output but the plant is going to play a very important role in meeting peak demand periods in the South African grid system which is well known for its brown-outs.

Figure 2. Ingula Project Pumped Hydro Schematic



Glyn Rhonwy, UK

In the UK, like Australia, no new pumped hydro scheme has been built for over 30 years. And just like Australia, the expansion of wind and solar is creating more variability in the supply of electricity. The UK Government's response so far has been to pay wind-farms to shut down when they generate too much, and to compensate fossil fuel power stations for being on standby for when the wind drops.

The relatively modest 100MW Glyn Rhonwy proposal in Wales could be the first of many new pumped hydro projects now being looked at in the UK. It has some similarities with Kidston, as it plans to use old slate quarries for its reservoirs. Two 50MW units will be installed at the bottom of a 1.5km long tunnel, with a height difference of 300m. The project is said to have a break-even price comparable to gas generation of £40-50/MWh. The advantages of rapid start-up for pumped hydro (measured in seconds), and its ability to aid frequency regulation and grid stability are additional ancillary services that are expected to generate revenues. The project has received all planning approvals, but is yet to reach financial close. A three year construction period is anticipated, with a capex of £160m (A$261m).

The Glyn Rhonwy project is actually located close to an old, existing pumped hydro project named Denorwig, which has an informative video clip at: https://www.youtube.com/watch?v=SkIzKGot0Ss

Summary and Recommendation

Genex provides an interesting and exciting investment opportunity in our view. As the cost of solar PV reduces, and electricity prices increase, Stage 1 of the Solar project is set to provide a solid earnings base, with exposure to the upside if prices go higher. The solar project is expected to commission in 4Q 2017. This project alone has an indicative EBITDA of $12-15m pa, representing an EV/EBITDA multiple of 10-13x.

The larger, pumped hydro project at Kidston is exactly the sort of asset that the grid needs, and it is making good progress towards an investment decision, subject to funding and PPA's. It is likely that the company will build this 250MW project with an integrated 270MW Stage 2 Solar farm, to maximise cost control, and enhance the green credentials of the project. Genex is aiming for financial close before the end of this year. The Federal Government's support for an expansion to pumped hydro at the Snowy Hydro scheme is a positive for Genex in our view, and we would expect some additional grants from ARENA to facilitate the Kidston project, considering the stated enthusiasm for pumped hydro.

Our valuation and TP for Genex has decreased from $0.58/share to $0.48/share as a result of the February equity placement and rights issue at $0.16/share. We maintain a 50% risking of the pumped hydro project, and a very low 10% risking for the associated Stage 2 Solar project. A commitment to proceed with an integrated project would significantly de-risk the company, and could lead to a valuation around $1/share.

> "As the cost of solar PV reduces, and electricity prices increase, Stage 1 of the Solar project is set to provide a solid earnings base, with exposure to the upside if prices go higher."

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