

Adani: Remote Prospects

Carmichael Status Update 2017



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Executive Summary

Shareholders and financiers of Adani Enterprises face substantial risks due to the company's continuing development of the controversy-plagued Carmichael coal project in the face of major adverse structural shifts in market conditions.

The proposed mine, in Australia's remote Galilee Basin, remains a high-cost, high-risk project that is reliant on substantial public subsidies for it to be remotely financially viable. Even with concessional loans, IEEFA analysis shows the project is likely to be cash flow negative for the majority of its operating life.

Shifts in Indian energy policy and pricing have materially increased the risk of Carmichael becoming a stranded asset. Legal challenges and community opposition to the project persist and are likely to escalate if the project moves to construction.

With a market capitalisation of just US\$1.9bn and net debt of US\$2.5bn, Adani Enterprises Ltd will struggle to contribute equity for this A\$5bn project. The project risks over-extending the balance sheet of Adani Enterprises to an extreme degree, creating a high level of financial risk to both shareholders and potential financiers.

The complex ownership structures involved in the project create the ability for downside risks to be transferred from privately held family companies to the publicly listed Adani Enterprises Ltd and Australian creditors, creating further risk for shareholders and investors.

Often stated to be the first in a line of projects that will open up the Galilee Basin, there is little chance of any other projects moving forward (refer Annexure I).

IEEFA has concluded that the project is not in the interests of Adani shareholders and is effectively unbankable without extensive taxpayer subsidies.

Key issues include:

- **Adani Enterprises has a weak balance sheet, excessive debt.**

With a market capitalisation of just US\$1.9bn, net debt of US\$2.5bn and a wide range of expansion projects across multiple industry sectors, Adani Enterprises is not in a strong financial position. Without a major new equity raising for the project, Adani may attempt to finance the Carmichael mine entirely by debt; a high-risk option for shareholders and lenders alike. A further debt raising would seriously over-stretch the company's already leveraged balance sheet.

- **The Carmichael project is now at odds with Indian government energy strategy.**

In the years since Adani purchased the lease for the Carmichael mine, Indian government energy policy has shifted radically. Energy Minister Piyush Goyal has stated repeatedly that it is government policy to cease thermal coal imports—a policy that brings into question the very point of the proposed mine. Progress toward this goal is well underway with coal imports dropping 22-25% year on year in the last two reported months. Record breaking auctions in

India for both solar and wind energy have driven down renewables costs to new lows. Both are now cheaper than new coal in India, and the government's highly ambitious target to install 175GW of renewable energy by 2022 is now well underway.

- **Adani Power is an unbankable coal off-taker.**

A secure coal offtake agreement is critical to provide security for investors in the Carmichael project. Adani has stated that the mine is part of a "pit to plug" strategy implying that Adani Power will be the key offtake partner. However, Adani Power has an equity market capitalisation of just US\$2.0bn, which is dwarfed by an enormous net debt of US\$7.6bn as at September 2016. Its auditors qualified their audit opinion on the grounds of Adani having a material weakness in financial controls. Coal power station utilisation rates across India have now fallen below 60% and are forecast to fall to just 48% by 2022, far below the level needed for generators to recover operational costs. In its latest quarterly results, Adani Power reported another net loss of US\$48m for the three months ending 31 December 2016 and the company is well on track to record its fifth year of huge losses since FY2012. A recent Supreme Court tariff ruling saw a 25% decline in Adani Power's share price, and will result in a write down of US\$540m-US\$850m. This tariff ruling places the financial viability of Adani Power's imported coal-fired thermal plants in serious jeopardy.

- **Project economics remain poor, indicating a high risk of sustained loss making.**

Despite the recent spike in thermal coal prices in late 2016, the forward market is today back to pricing in a 2020 benchmark coal price of below US\$68/t, half the prevailing price when Adani Enterprises acquired the Carmichael proposal in 2010.

IEEFA estimates a cash cost of free-on-rail product coal of A\$33/t (A\$26/t for run-of-mine (ROM), yield 80%), such that the free-on-board cost including rail and port plus marketing charges would be A\$61/t. With first coal in 2020 at the earliest and reaching full capacity by 2022, the forward price of US\$67-68/t is in our view a more reliable financial market consensus of where prices would be by the time coal is available for sale. At the forward price, Carmichael would generate a A\$2-3/t gross cash loss before covering debt financing costs, not giving any return to the equity investment. Importantly, Carmichael coal will not achieve the benchmark Newcastle price: IEEFA estimates that its high ash content and low calorific value means that there will be around a 30% discount on Carmichael coal due to its lower quality (refer Annexure V).

- **The prospect of future carbon and air pollution regulation represents a financial risk to the project.**

The viability of a greenfield thermal coal project with a life of 30-60 years is dependent on the current and expected policies of both the Australian government (itself a signatory to the COP21) and of countries looking to import thermal coal. Given recent policy shifts around Asia, any risk analysis for this long-life project must evaluate carbon and pollution cost internalization, given that such moves dramatically reduce the cost competitiveness of imported coal fired power generation relative to alternatives.

- **Opaque corporate structure raises serious governance concerns.**

The corporate structure of the Adani group is complex, and IEEFA considers the company's use of multiple offshore tax havens as creating serious transparency, regulatory and financial issues for the Carmichael project. The company is likely to face an anti-money laundering issue that won't realistically be resolved until the Indian government's Director of Revenue Intelligence has resolved multi-billion dollar fraud investigations.

- **Adani has failed to secure social licence in Australia.**

The project continues to face a series of legal challenges by both environmentalists and the indigenous traditional owners of the Carmichael site. Despite the current government support for the Carmichael project, a high level of public anger and opposition to the project persists and a sustained campaign by an alliance of Australia's largest environmental organisations continues. Opposition is escalating and raises questions over the reliability of political support over the medium term.

- **Is the Adani group growing too fast with too much debt?**

IEEFA estimates that the Adani group has current capex proposals underway totalling US\$36bn in aggregate (refer Annexure II for a full list). New projects announced just in the last year include major port developments, a diversification into defence systems and aviation manufacturing, financial services, greenfield chemical, fertilizer and methanol manufacturing facilities, copper smelting, gold mining, airport construction, water desalination plants, edible-oil manufacturing, IT assembly facilities and five new coal fired power plants.

Project Overview

India's Adani Enterprises is one of four listed companies majority owned by the Adani family (the promoter). Alongside Adani Enterprises (74% owned by the Adani family) are Adani Power (56% owned), Adani Ports & SEZ (57% owned) and Adani Transmission (74% owned).

In August 2010, Adani Enterprises acquired the Galilee Basin Carmichael export thermal coal proposal for a total of A\$680m via its Australian subsidiary Adani Mining Pty Ltd. At the time, Adani Enterprises had a US\$10bn market capitalisation, making it one of the largest conglomerates in India. However, a major corporate restructuring in 2015¹ saw a de-merger into four independent, separately listed entities, albeit all still controlled by a single promoter. Entering 2017, Adani Enterprises is significantly down-sized, with a US\$1.9bn market capitalisation.

Adani Enterprises has indicated that one third of the proposed output of the Carmichael mine would be directed toward the higher-quality North Asia market. However, the majority of the output is targeted for importation into India. Adani Power is the main proposed off-taker of Carmichael coal, creating a "pit-to-plug" integrated strategy from the Adani family's perspective. Adani Power operates two coal-fired power stations—the 4.6GW Mundra and 1.2GW Udupi coastal plants—that currently rely primarily on imported coal.

Associated with the mine project is a proposed A\$3bn greenfield 388km standard gauge rail project to link the mine with port facilities at Abbot Point. The rail proponent was originally Adani Enterprises but looks to have been transferred to the Adani family via its private holding company Atulya Resources Ltd, based in the Cayman Islands tax haven.

The original project proposal dating from 2010 included plans to build a new 50Mtpa greenfields coal terminal (T0) at Abbot Point to ship Carmichael coal. The legal entity for the T0 proposal is also owned by the Adani family via Atulya Resources Ltd in the Cayman Islands.

Adani acquired a 99-year lease on the existing 50Mtpa Abbot Point Terminal 1 (T1) in 2011 from the state government for A\$2bn. The ownership of this facility is opaque, with Indian-listed entity Adani Ports & SEZ disclosing in its March 2013 annual report that it had sold its T1 holding to Abbot Point Port Holdings Pte Ltd, a private Adani family company in Singapore owned by Atulya Resources Ltd in the Cayman Islands. However, the financial statements of the Australian subsidiaries state that Adani Ports & SEZ is still the owner.

At the time of Adani's acquisition, the Carmichael project was one of ten globally material, proposed projects within the Galilee Basin in central Queensland. The originally stated peak output of all ten projects was 320Mtpa, an amount that would expand global supply in the seaborne thermal coal market by upwards of 30%. Such an expansion would have dire consequences for thermal coal price equilibrium, particularly given the structural headwinds of increasingly slowing global demand. GVK, owner of three Galilee projects, now faces the threat of having its assets auctioned off having defaulted on its debt repayments² whilst the other proposed projects show no sign of progressing (refer Annexure I).

¹ <http://ieefa.org/briefing-note-an-overview-of-adani-enterprises-corporate-restructuring/>

² http://economictimes.indiatimes.com/industry/indl-goods/svs/construction/auction-looms-large-over-debt-ridden-gvk-group/articleshow/57564981.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Seven years on, the Carmichael proposal is the last remaining Galilee Basin project still looking for financial close, and its struggle to attract financing has led to a scaled-down ambition.

What's Changed Since IEEFA's Last Carmichael Report?

This report follows on from IEEFA's last Carmichael project Briefing Note³, in September 2015.

Seven years on from the purchase of the project and 18 months since IEEFA's last update, the proposal has made no progress. In fact, it has gone backwards, as can be seen in several developments:

1. Toward the end of 2015, Adani Mining Australia retrenched the vast majority of its Australian employees—we estimate this move affected more than 80% of staff.⁴
2. IEEFA understands Adani terminated or placed on hold its four external Australian engineering consulting contracts.⁵
3. POSCO, the major proposed global EPC contractor, closed its Brisbane office and relocated its staff back to Korea.
4. Financial advisory mandates with Standard Chartered and Commonwealth Bank expired.⁶
5. Adani Australia has made a major strategic shift, announcing in February 2017 the appointment of Jennifer Purdie as CEO Australian Renewables with a mandate to invest A\$2bn to construct 1,500MW of solar projects across Australia in the near term.⁷
6. Legal challenges by Australian Conservation Foundation and traditional owners continue.

While the Carmichael project has failed to materially progress, developments relating to the Indian parent entities are even more telling about the rapidly shifting investment landscape.

Under the leadership of Prime Minister Narendra Modi, the Indian economy has moved to a more sustainable growth platform, with economic growth accelerating to 7-8% p.a. The Reserve Bank of India has cut interest rates five times on the back of a halving of the inflation rate to 5-6% p.a., leveraging infrastructure development.

For the Adani group, this has opened up a multitude of domestic Indian investment opportunities. IEEFA estimates the Adani group has current capex proposals underway that total US\$36bn in aggregate (refer Annexure II for a full list). New projects announced just in the last year include major port developments, a diversification into defence systems and

³ <http://ieefa.org/obstacles-to-adanis-project-in-australia-have-only-grown/>

⁴ <http://www.smh.com.au/business/mining-and-resources/conflicting-reports-on-adani-sacking-queensland-coal-workers-at-its-carmichael-mine-20150731-gjor8m.html>

⁵ <http://iminco.net/adani-carmichael-mine-engineers-stop-work-adani-says-mine-still-goes-ahead/>

⁶ <http://www.smh.com.au/business/mining-and-resources/adani-and-commonwealth-bank-part-ways-casting-further-doubt-on-carmichael-coal-project-20150805-gisd1l.html>

⁷ <http://cqnews.com.au/news/adani-australia-appoints-renewables-ceo/3140464/>

aviation manufacturing, financial services, greenfield chemical, fertilizer and methanol manufacturing facilities, copper smelting, gold mining, airport construction, water desalination plants, edible oil manufacturing, IT assembly facilities and five new coal-fired power plants.

For Adani Enterprises the shift has been even more pronounced. With the commissioning of Adani Enterprises' first 5Mtpa coal mine in India last year, the near-term target is for a multi-billion dollar investment in domestic coal mining to lift capacity six-fold to 31Mtpa. Likewise, Adani Enterprises entered 2015 with no presence in the renewables sector. It has commissioned India's largest solar manufacturing facility, and today it is one of India's largest solar and wind farm developers.

At the start of 2015, the Adani group had almost no presence in the electricity grid distribution sector. As of 2017, Adani Transmissions is the largest private listed grid company in India, and the company is reported to be close to a billion dollar grid asset acquisition.

However, in this same time frame, the Adani group has seen net debt rise by an estimated US\$3bn to US\$15.9bn, including off-balance-sheet debt associated with Abbot Point T1 and margin loans by the Adani family estimated at US\$1.5bn. Given existing financial leverage in many Adani subsidiaries well beyond the levels being targeted by the Reserve Bank of India, IEEFA would question the ability of the group to finance over US\$30bn of mostly greenfield projects in India and a A\$5bn greenfield coal and rail development at Carmichael in Australia. Clearly, projects that are no longer strategically aligned nor commercially robust will continue to be deferred. In this context, it is maybe not all that surprising that the commencement of the Carmichael proposal has been deferred multiple times.

The move by Adani into domestic coal mining, solar manufacturing, plus wind and solar project development and grid transmission, strongly aligns the Adani group perfectly with four major policies of the Modi government:

1. The "Make in India" policy, which promotes building India's manufacturing capacity for domestic and export markets through initiatives like Adani's new solar module manufacturing arm;
2. The National Electricity Plan, which looks to dramatically drive the transition of energy markets away from their excessive reliance on fossil fuel imports. Consistent with this shift, Energy Minister Piyush Goyal announced a target in 2015 to cease thermal coal imports this decade;
3. A major grid transmission and distribution capacity expansion and modernisation; and
4. Goyal's proposed fivefold lift in renewable energy capacity across India to 275GW by 2027. To this end, Adani has announced plans for US\$10bn of renewables investments.

Despite the recent spike in thermal coal prices in late 2016, the forward market is today back to pricing in a 2020 benchmark coal price of below US\$68/t, half the price prevailing when Adani Enterprises acquired the Carmichael proposal in 2010. From being the fastest-growing major thermal coal import market in the world at the time of acquisition, Indian coal imports peaked in 2014/15 at 212Mt, declined 6% in 2015/16 and are set for a double-digit decline in

2016/17 to around 180Mt. The rate of volume decline is accelerating, with January 2017 imports into India down 22% year on year.⁸

Beyond the COP21 Paris Climate Agreement ratification, a major blow to any commercial logic for the Carmichael project was the Rewa solar auction result of February 2017, in which Indian solar tariffs dropped 32% year on year to a record low US\$44/MWh. No new coal-fired power plant anywhere in the world can compete with Indian solar at this price, with real price declines contractually locked in for the next 25 years.

The Carmichael proposal is unviable and unbankable. The Australian government's recent move to offer a A\$1bn subsidy is a last-ditch attempt to resurrect a proposal long past its use-by date.

⁸ <http://www.deccanchronicle.com/business/economy/190217/coal-imports-decline-by-22-per-cent-to-14-mt-in-january.html>

Capital Expenditure: A\$5bn, Not A\$21bn

With the Carmichael coal proposal still well away from financial close seven years after Adani first acquiring the coal deposit in 2010 for a collective A\$680m,⁹ it is clear that the company is struggling to secure financing for the project. No progress is evident apart from a potential Australian taxpayer funded subsidy of A\$1 billion from the Northern Australia Infrastructure Facility (NAIF).

Reflecting both the increasingly adverse international trends against financing new thermal power projects in the wake of the COP21 Paris Climate Agreement, alongside the now highly questionable strategic merit of a new low-quality thermal export coal mine at a time in which India is now in power surplus with national coal stockpiles exceeding 80Mt, IEEFA understands that Adani is seeking now to start a yet-again scaled-back version of the project with a smaller mining operation of 25Mtpa, down from the original 60Mtpa. This strategy would do away with the need to build a new greenfield coal terminal (T0) at Abbot Point (refer to Is Abbot Point Coal Terminal T0 Still Needed? section on Page 21).

The result of scale-back, absent a new coal terminal, is that capital costs and funding requirements are greatly reduced. Beyond the estimated A\$1.4bn already sunk in the project, IEEFA estimates an additional A\$5.3bn of investment is still required to get a scaled-down project into operation (refer Annexure IV).

Adani Enterprises CEO of Australian Operations, Jeyakumar Janakaraj, confirmed in September 2016 that the project would initially be limited to 25Mtpa and suggested that the investment would be limited to US\$4bn (approximately A\$5.2bn).¹⁰ Likewise, in December 2016, Gautam Adani referenced a US\$4.5bn (A\$6bn) Carmichael proposal, with a US\$16bn life of mine capex reflecting both future yet-to-be-committed stages and maintenance capex over 60 years.¹¹

The Carmichael project continues nonetheless to be widely reported as a A\$21-22 billion project by much of the media, giving it an inflated importance in the minds of many readers, politicians and vested interests, and helping give credence to the improbable idea that the project can generate 10,000 jobs. The difference between A\$21 billion and A\$5 billion is obviously huge. It is important that the scale of the project be reported correctly in order to properly place the proposal in the context of the Queensland and Australian economies.

We note the IEA's "Coal Medium Term Market Report 2016" categorises the Carmichael coal project as still in the feasibility stage and does not assume any coal in the forecast period. It also cites the downsizing of the proposal from 60Mtpa to 20Mtpa and notes "there are considerable obstacles to the development of the Galilee Basin."¹²

⁹ Adani acquired the coal deposit from Linc Energy in August 2010 for \$500m, then subsequently in August 2014 paid A\$155m for the A\$2/t coal royalty rights that Linc Energy retained and paid \$25m for the adjacent EPC 1080 from Mineralogy Pty Ltd tenement. http://www.lincenergy.com/company_history.php

¹⁰ <http://www.afr.com/opinion/columnists/adani-prepares-for-an-end-to-lawfare-with-a-smaller-cheaper-carmichael-20160921-grla4o>

¹¹ <http://www.livemint.com/Companies/0v3GPxrwJA6gebFOMy7iN/We-aspire-to-be-world-leaders-with-our-integrated-pittoflu.html>

¹² IEA's "Coal Medium Term Market Report 2016" page 108, 109 and 129.

Adani Enterprises: Current Status of Debt and Equity

Adani Enterprises Ltd, which wholly-owns the Carmichael coal project via its Australian subsidiary Adani Mining Pty Ltd, has underperformed the Indian stock market since acquiring the Carmichael deposit seven years ago (refer Figure 1 below).

Figure 1: Relative Performance of Adani Enterprises Share Price (Orange) Against the S&P BSE Sensex (Purple) Since Carmichael Project Was Purchased in August 2010



Source: Thompson Reuters

Adani Enterprises is relatively small; its market capital stands at US\$1,945m at the time of writing (Figure 2). This number contrasts with the large net debt that Adani Enterprises holds, totaling US\$2,532m, as at September 2016.

Figure 2: Financials of Adani Enterprises Ltd

AEL share price 13/4/2017	114.40 Rs
Issued shares	1,100
Market capitalisation	125,817 Rs million
US\$ to Rs exchange rate	64.7
Market capitalisation	1,945 US\$m
Promotor Shareholding	811 m
Promotor Shareholding (%)	73.8%
Net Debt	2,532 US\$m

Source: BSE Corporate filings, IEEFA estimates

Adani Mining Pty Ltd (Australia): Net Debt of A\$1.4bn

Adani Enterprises' Australian subsidiary, Adani Mining Pty Ltd, is the proponent for the Carmichael Coal proposal. Figure 3 provides a summary of the financial statements, showing current debt of A\$1,421m (US\$1.1bn) secured against shareholder equity of a negative A\$236m as of the latest financial accounts. As such, the company remains solvent only due to the ongoing annual support of its Indian parent entity—a serious financial risk for any existing or prospective external creditor or supplier, particularly regional Queensland-based small businesses who have little recourse to Adani's Australian entity. In 2013 it was reported that at least 12 Mackay contracting companies had suffered from Adani failing to pay its bills¹³. With no material revenues, and with most expenses being capitalized into the balance sheet, we note net tangible assets are a negative A\$1,341m.

Notwithstanding net debts of A\$1,421m, this subsidiary of the listed Adani Enterprises company has found the financial capacity to extend A\$143m of non-interest bearing loans to Carmichael Rail Network Trust, another Australian corporate entity ultimately owned by the private Adani family via its parent entity, Carmichael Rail and Port Singapore Holdings Pte Ltd of Singapore, which in turn is ultimately owned by the parent entity, Atulya Resources Limited, a private company registered in the Cayman Islands. IEEFA notes that both the Singapore and Cayman Islands entities are registered in tax havens. Adani Enterprises has confirmed that these entities are the proponent for the 388km railway line whilst the listed entity itself is proposing to finance and construct the 25Mtpa coal mine.

Figure 3: Financials of Adani Mining Pty Ltd (Australia), A\$

As at 31 March	2015	2016
Long term Debt	0.0	0.0
Short Term Debt	1,345.4	1,423.5
Less Cash	-1.0	-2.7
Net Debt (A\$m)	1,344.4	1,420.8
US\$ to A\$	0.76	0.76
Net Debt (US\$m)	1,021.7	1,079.8
Net tangible assets *	-1,257.2	-1,340.8
Intercompany Loan to Carmichael Rail Network Trust	126.0	143.2
Shareholders Funds (A\$m)	-239.0	-235.6
Revenue	15.3	1.1
Net Profit (Loss)	-185.4	3.4

* Net tangible assets is defined as total assets less exploration costs capitalised less finance debts.

Source: ASIC regulatory filings, IEEFA estimates

¹³ <https://www.dailymercury.com.au/news/contractors-await-adani-payments/1877041/>

Adani Enterprises: Alignment with Indian Energy Policy?

In IEEFA's view, the stressed nature of Adani Enterprises balance sheet is compounded by Adani's intentions to expand its business interests in many directions at once. The major capital expenditure implications of these intentions increase the risk of Adani Enterprises overstressing itself and becoming unable to service its large debt - a corporate scenario already causing systemic, structural problems for the Indian banking system¹⁴. Aside from the Carmichael projects, announced capital expenditure plans not yet committed total US\$36bn across the whole Adani Group (refer Annexure II). Beyond its four core businesses (Adani Enterprises, Adani Power, Adani Ports & Special Economic Zone and Adani Transmission), the group has stated an intention to move into jet fighter and drone manufacturing and servicing; financial services; copper smelting; gold mining; fertilizer manufacturing; cement clinker manufacturing; and water desalination.

In the meantime, Adani Green Energy, a 51% owned subsidiary of Adani Enterprises, has rapidly become one of India's largest solar PV developers. Its projects include the 648MW Kamuthi project in Tamil Nadu which, upon commissioning in mid-2016, was the world's largest single-location solar power plant¹⁵ (now overtaken by an 850MW solar project in Northwest China in November 2016). Adani is also expanding wind-generation capacity and recently won a 50MW contract in India's first wind power reverse auction that saw wind energy costs plunge to a record low Rs3.46/kWh (US\$52/MWh)¹⁶.

Adani's strong move into solar PV and wind is aligned with the Indian government's energy strategy, which seeks to rapidly ramp up renewable energy, aiming to install 100GW of solar and 60GW of wind power by 2022. The recent record-breaking solar auction for the Rewa solar project in Madhya Pradesh achieved a new low Indian price of US\$44/MWh, well below the cost of new coal-fired power, and indicates the dramatic change occurring in India's energy landscape¹⁷. Wind is now also below new coal costs, with tariffs of just US\$52/MWh.

As part of its alignment with India's ambitious renewable energy strategy, Adani Enterprises has doubled down on solar PV by building its own solar PV manufacturing plant in Gujarat. Unfortunately for Adani, 2016 saw global solar module prices decline 26% such that, as Adani commissioned the first phase of its manufacturing project in December 2016, profit margins have been squeezed out. Bridge to India in March 2017 forecast solar module price declines of a further 20% over 2017.¹⁸ With no subsidies for solar available in India, and without the ongoing protection of subsidized tariff procurement for domestic content, Adani solar manufacturing will struggle to achieve a profitable profile, unfortunate but not surprising after Adani have sunk hundreds of millions of dollars of capital into the project.

In contrast to solar and wind initiatives, the Carmichael coal project is very poorly aligned with the Indian government's stated intention to largely cease thermal coal imports by the end of this decade¹⁹. State-owned Coal India is ramping up domestic coal production and intends to replace coal imports with domestic supply; Coal India's March 2017 coal

¹⁴ <http://energy.economictimes.indiatimes.com/news/power/reserve-bank-of-india-set-to-get-more-power-to-deal-with-stressed-assets/58000635>

¹⁵ <http://www.adanienterprises.com/businesses/renewable-energy/power-generation>

¹⁶ <https://www.bloomberg.com/news/articles/2017-02-24/wind-power-costs-plunge-in-asia-s-first-auction-for-contracts>

¹⁷ <http://www.bridgetoindia.com/rewa-project-glimpse-future-power-sector/>

¹⁸ <http://www.bridgetoindia.com/another-year-hell-module-suppliers/>

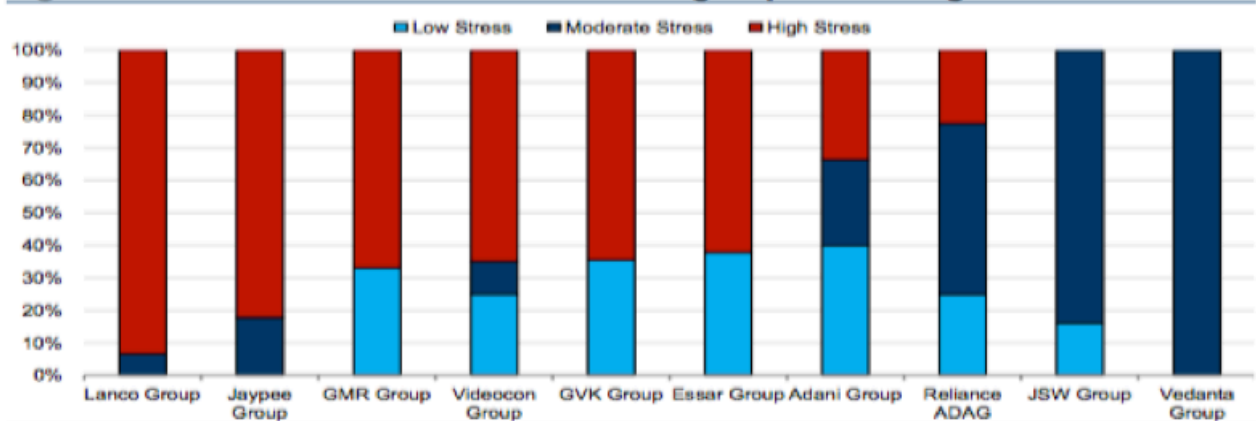
¹⁹ <http://reneweconomy.com.au/read-my-lips-indian-energy-minister-repeats-no-coal-imports-within-3-years-73239/>

production rose a record 11.6% year on year to 66Mt for the month, with the government targeting up to 10% annual volume growth²⁰.

With high net debt, plans for major capital expenditure into other business areas and difficulties brewing at its solar manufacturing project, Adani Enterprises today faces an uphill climb in raising equity and debt to fund the Carmichael project (more on this point below).

Figure 4: India's House of Debt Conglomerates – Financial Stress Still in the Woods

Figure 1: ~20-90% debt with House of Debt groups under high stress



Source: Credit Suisse "House of Debt", Ashish Gupta et al, 21 October 2015.

Does the Adani Group Have the Capacity to Fund an A\$5bn Greenfield Project?

Adani Enterprises' relatively small size and minimal free float results in a near total absence of major global investors on its share register. This, combined with its financial leverage and aggressive existing expansion plans across a multitude of diverse areas, presents the high risk that the company will be unable to raise the equity that would be a cornerstone or even pre-requisite for the Carmichael project financing.

Its ambitious plans in India, including its solar PV expansion, show an increased focus on domestic businesses and on aligning itself with Indian government strategy. The scale of Adani's diverse domestic plans, however, heightens the risk of worsening its already highly leveraged financial position.

Raising equity would be hard enough for a US\$1.9bn company saddled with US\$2.5bn of net debt. It is made more difficult by the fact that Adani Enterprises is 75% owned by the Adani

²⁰ <http://energy.economictimes.indiatimes.com/news/coal/coal-india-production-grows-6-5-per-cent-in-february-to-54-3-mt/57433591>

family: the family would need to fund 75% of the Carmichael equity raising themselves. Alternatives would include massively diluting the family shareholding in the company, which would likely scare off potential investors given the family would in effect be failing to endorse the purpose of the equity raising.

Adani could also attempt to fund the mine project entirely with debt. The company has stated an intention to look toward export credit agencies (ECAs) from Korea and China as well as commercial banks to secure funding²¹. This is much easier said than done, however. With a long list of banks having already ruled out investing in the project and the loss of potential contractors such as Korea's POSCO (which could potentially bring ECA support but has was told by Adani in 2015 that its services were no longer required²²), this route would prove difficult at best. A 100% debt funding attempt would face further difficulties given the increased risk of financing a project in this way, a reality that would make potential debt funders even more wary of an already highly questionable project.

Any examination of Adani Mining Pty Ltd's capacity to fund a A\$5bn stage I greenfield coal mine and dedicated single-purpose, single-user 388km railway line also requires an examination of the entire Adani family group, given the capacity and history of regular inter-company loans and transfers. Adani Mining's CEO has suggested this could be in part funded by the sale of 49% stake in Abbot Point Coal Terminal (T1), but we note this is already heavily debt funded itself, and that we understand Adani has been quietly sounding out the Australian market for a buyer of this 49% stake for the last 2-3 years without any evident interest to-date.

Figure 5 details IEEFA estimate of the net debt of the Adani family group: US\$14,443m in aggregate borrowed by the four listed entities as of 30th September 2016, plus an estimated US\$1,450m secured "off-balance sheet" against Adani Abbot Point Coal Terminal (AAPCT (T1)), plus an estimated US\$1,512m of margin lending by the private Adani family (refer Annexure III for details). Total group net debt is US\$15,893m.

Figure 5: Estimated Net Debt of the Adani Family Group

Net Debt (US\$m)	FY2015	FY2016	Chg yoy	30 Sept'16
Adani Enterprises	11,012	2,665	-76%	2,532
Adani Power	6,264	7,459	19%	7,636
Adani Ports	2,244	2,814	25%	2,915
Adani Transmission		1,214	n.a.	1,359
Net Debt (US\$m)		14,153		14,443
Add estimated debt in Adani Family Entities				
+AAPCT T1 A\$1,250				
AUD/USD 0.76				
US\$m debt 950	500			1,450
+ Margin lending (US\$m est)				1,512
Adani Group Net Debt (US\$m)				15,893

Source: BSE Corporate filings, IEEFA estimates

²¹ <http://www.thehindu.com/business/Industry/gautam-adani-hopes-to-start-australian-coal-mine-project-by-august/article17531691.ece>

²² <http://www.smh.com.au/business/mining-and-resources/adani-stands-down-major-contractors-20150721-gih7h3.html>

Figure 6 estimates the combined equity value of the four listed Adani entities at US\$15,705m, and the Adani family's combined equity share at a very substantial US\$9,435m. It is noteworthy that the listed entity with the lowest financial leverage and highest equity market value is Adani Ports (market capitalisation of US\$10,480m), representing an estimated 63% of the total Adani family equity exposure to listed companies. Adani Enterprises is a relative minnow by comparison, at just 15% of the Adani family listed wealth. If the Adani family were to fund their equity share of a hypothetical US\$1-2bn equity raising in Adani Enterprises, the family would need to find US\$0.7-1.5bn of cash. The existence of an estimated US\$1.5bn of expensive margin loans suggests idle cash is understandably not available.

Figure 6: Estimated Net Market Equity Value of the Adani Group

Market Capitalisation	Mar-17 Share Price Rs	Mar-17 Equity Cap. US\$m	Adani Share Holding	Mar-17 Adani Family Value US\$m	Mar-17 % of listed Adani wealth
Adani Enterprises	114	1,945	73.8%	1,435	15%
Adani Power	34	1,985	55.5%	1,101	12%
Adani Ports	328	10,480	56.7%	5,943	63%
Adani Transmission	76	1,295	73.8%	956	10%
Total Equity Holdings (US\$m)		15,705		9,435	100%

Source: BSE Corporate filings, IEEFA estimates

Adani's Convoluted Corporate Structure

IEEFA views the corporate structure of the Adani group as complex, and considers the use of multiple offshore tax havens as a source of serious transparency, regulatory and financing issues including anti-money laundering tests that can't realistically be resolved until the Indian government's Director of Revenue Intelligence has resolved two multi-billion-dollar fraud investigations.²³

While the Australian government has stated that the use of multiple tax havens is standard multinational mining company practice, the Adani Group is not a multinational company with worldwide operations. It is a domestic Indian conglomerate with international coal operations limited to Indonesia and Australia. This difference may read as semantics, but the US\$16bn of financial leverage across the entire family group is almost entirely sourced from Indian domestic banks. This raises serious constraints on the Adani group's ability to raise fresh debt capacity from its traditional Indian financiers, particularly given the relatively closed nature of the Indian financial markets and the lack of international collateral Adani can tender. IEEFA questions the prudence of the Australian government endorsing foreign companies using tax havens to begin with and is especially dubious of offering an Australian taxpayer-subsidized loan of A\$1,000m to the foreign private entities involved in the Carmichael project.

²³ <http://envirojustice.org.au/major-reports/the-adani-brief>

How Suitable Is Adani Power as an Off-taker for Carmichael Coal?

The recent collapse of the Adani Power share price by a combined 25% on April 11-12, 2017 is an indication that all is not well at the company.

An Indian Supreme Court finding on compensation for more-expensive-than-expected coal imports from Indonesia has gone against Adani Power, which will now need to write off hundreds of millions of U.S. dollars in previously booked revenue. Reports as to the size of the required write-off range from US\$541m²⁴ to US\$850m²⁵, representing 27%-43% of the current market valuation of the company. JP Morgan reportedly considers the legal outcome as implying a Rs23 downside impact on share valuation²⁶. Adani Power stock had reached Rs46.30 on April 11 just before the news broke. The booking of compensation into reported financial results before legal proceedings had been finalized was a major risk and, on the face of it, went against generally accepted accounting principles. This was a key reason why the auditors qualified their report in the FY2016 financial results (see below). Adani Power's strategy of relying on coal imports to supply its coastal coal-fired power plants is clearly proving too expensive and it risks stranding these assets, which will now find it very difficult if not impossible to be profitable.

Adani has maintained that, because the proposed Carmichael project would produce coal consumed within the Adani Group, the project would enjoy the benefits of being part of a vertically integrated "pit-to-plug" structure. It is worth noting that the "Adani Group" is in fact made up of four separate, listed entities (Adani Enterprises, Adani Power, Adani Ports & Special Economic Zone and Adani Transmission), each with an independent board, and separate shareholder base aside from the commonality of having the Adani family as the majority shareholder. Putting aside the financing issues specifically related to Adani Australia and the complex corporate structure involving multiple tax havens, the conglomerate structure defies the overly simplistic notion of a "pit-to-plug" strategy, suggesting it is actually a major transparency and fiduciary-duty challenge.

Further, Adani Enterprises' Carmichael coal project aims to rely financially on Adani Power as the signatory to a long-term off-take agreement. IEEFA would note that Adani Power is in a precarious and financially distressed position, being in a Reserve Bank of India directed debt workout across several subsidiaries. Adani Power has an equity market capitalisation of US\$2.0bn which is dwarfed by an enormous net debt of US\$7.6bn as at September 2016. The rumoured takeover of Jindal's Tamnar power plant by Adani Power could increase this debt by an additional US\$1.5bn²⁷. The combined new 5.3GW / US\$6.1bn capacity expansions planned across Jharkhand (1.6GW), Udipi (1.6GW), Kawai (1.6GW) and Sarguja (0.5GW) all

²⁴ <http://www.zeebiz.com/companies/news-adani-power-may-have-to-write-down-rs-3500-crore-after-sc-order-on-compensatory-tariff-report-14808>

²⁵ <http://economictimes.indiatimes.com/markets/stocks/news/sc-order-to-hit-adani-and-tata-power-hard/articleshow/58138689.cms>

²⁶ http://www.business-standard.com/article/companies/blow-for-tata-power-adani-power-earnings-under-threat-117041100584_1.html

²⁷ <https://www.bloomberg.com/news/articles/2017-02-03/jindal-said-in-talks-to-sell-power-plant-for-over-1-5-billion>

compound the existing financial distress of Adani Power. The company has significantly underperformed the Indian stock market over the past seven years (refer to Figure 8 below).

Figure 8: Relative Performance of Adani Power (Orange) Against the S&P BSE Sensex Index (Purple) Since the Carmichael Project was Purchased in August 2010



Source: Thompson Reuters

Adani Ports & Special Economic Zone, by far the strongest member of the listed Adani companies financially, issued debt in January 2017 at the lowest investment grade rating²⁸. Clearly, by comparison, Adani Power's much higher financial leverage means it is sub-investment grade.

Qualified Audit Report: Inadequate Financial Controls

Adani Power's 31 March 2016 financial statements were given a qualified audit opinion from independent auditor Deloitte, Haskins and Sells. Specifically, the auditors stated:

"According to the information and explanations given to us and based on our audit, a material weakness has been identified as at 31st March 2016 in the Company relating to inadequate internal financial controls over financial reporting in respect of revenue recognition on account of additional tariff claims pending determination by regulator, and final outcome of the litigations."

"A 'material weakness' is a deficiency, or a combination of deficiencies, in internal financial control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis."²⁹

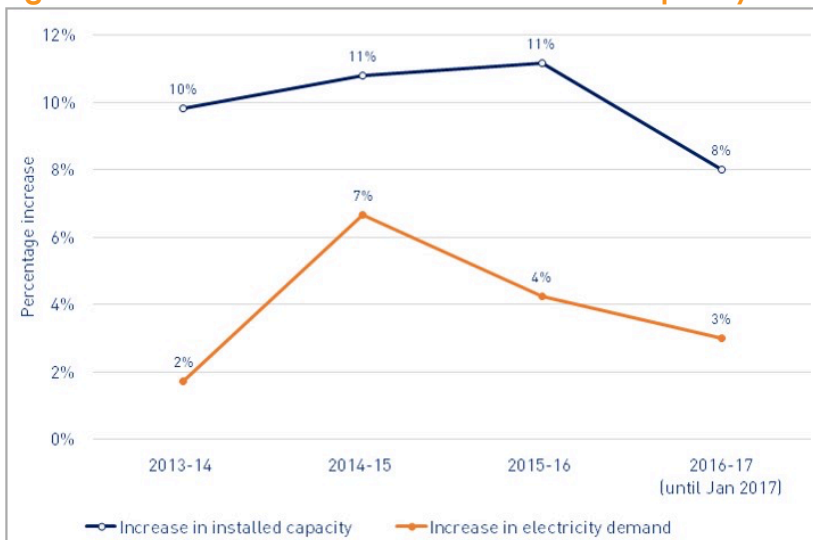
²⁸ <http://economictimes.indiatimes.com/markets/stocks/news/adani-port-raises-500-mn-via-dollar-bonds/articleshow/56497050.cms>

²⁹ Adani Power Ltd Annual Report 2015-16, p. 72

India's Energy Market Is in Transition

In its latest quarterly results, Adani Power reported another net loss of US\$48m for the three months ending Dec. 31, 2016, and the company is well on track to record its fifth year of huge losses since FY2012. These losses are occurring in the context of stalling coal-fired generation plant utilization rates across India. So far this fiscal year, coal plant utilization has dropped below 60% as a result of demand unexpectedly lagging new plant commissions (refer Figure 9 below) and the rise in renewable energy installations, which is set to continue at a greater pace than ever³⁰.

Figure 9: Increase in India's Installed Power Capacity Has Outpaced Demand



Source: Bridge to India, Central Electricity Authority

The impacts of this disparity between capacity and demand increases have been clear: Coal India, the state-owned coal miner, posted its worst-ever first half results this financial year whilst coal imports declined by 22% year on year in January 2017³¹. This decline followed a 25% decrease year on year in December 2016³². The Power Ministry has stated that most coal-fired power plants are operating below 60% utilisation, the minimum required to recover operational costs. In addition, with increasing renewable generation, it is possible that coal-fired plants operating at 48% utilisation by 2022 would be sufficient to satisfy demand³³, which would put enormous further pressure on coal-fired power generators like Adani Power.

India's Central Electricity Authority (CEA) has echoed the growing trend from coal toward renewables in its latest Draft National Electricity Plan which showed that, beyond the coal

³⁰ <http://indianexpress.com/article/business/business-others/demand-sputters-thermal-plant-load-at-10-year-low-4513162/>

³¹ <http://www.bridgetoindia.com/indias-problems-coal-sector-continue/>

³² <http://www.hellenicshippingnews.com/india-coal-imports-fell-by-25-to-14-31-mt-in-december/>

³³ http://m.miningweekly.com/article/despite-sharp-falls-in-power-plant-stocks-indian-oversupply-outlook-persists-2017-02-28/rep_id:3861

plants currently under construction, India will not need any new coal-fired power stations over the next two planning periods to 2027³⁴.

Adani Power's weak financial position, multiple court challenges on agreed tariffs and consistent losses highlights the strategic weakness of the sector.

In particular, financial and market competitiveness are major challenges facing all new import coal-fired power generation in the Indian market, particularly against the backdrop of declining real wholesale electricity tariffs becoming the norm. Imported coal is losing market share to lower-cost domestic coal and ever more cost-competitive renewable sources.

Record Low Solar and Wind Tariffs Are Below the Cost of New Coal

February 2017 will go down in the Indian energy markets as a historic date, with the US\$750m 750MW Rewa solar reverse auction in Madhya Pradesh delivering a 32% year-on-year decline in solar tariffs to a record low Rs2.97/kWh (US\$44/MWh)³⁵ with just 1.5% p.a. indexation allowed for inflation, which currently runs at 5-6% p.a. That builds on the 25% year-on-year decline achieved the prior year when Fortum of Finland bid a then-record low Rs4.34/kWh.

Another historic reverse auction tender result was announced in March 2017, this time for a 1,000MW wind farm investment program won at Rs3.46/kWh (US\$52/MWh), 20-30% below the previously ruling wind electricity tariff bands.³⁶

As foreshadowed in the draft National Electricity Plan in December 2016, the Indian government sees no new coal-fired power capacity needed across India in the next decade. With the record low solar and wind auctions coming in 20% below government and industry expectations, and domestic Indian coal production expected to grow 5-10% annually for the next five years, the financial and strategic case for building any new import coal-fired capacity in India is nonexistent.

And the strategic rationale for the low-quality (4,950kcal, 26% ash) Carmichael thermal coal proposal has been superseded by the dramatic and unexpected pace of technology-driven electricity sector transformation evident in India.

³⁴ <http://reneweconomy.com.au/no-new-coal-fired-power-plants-india-80026/>

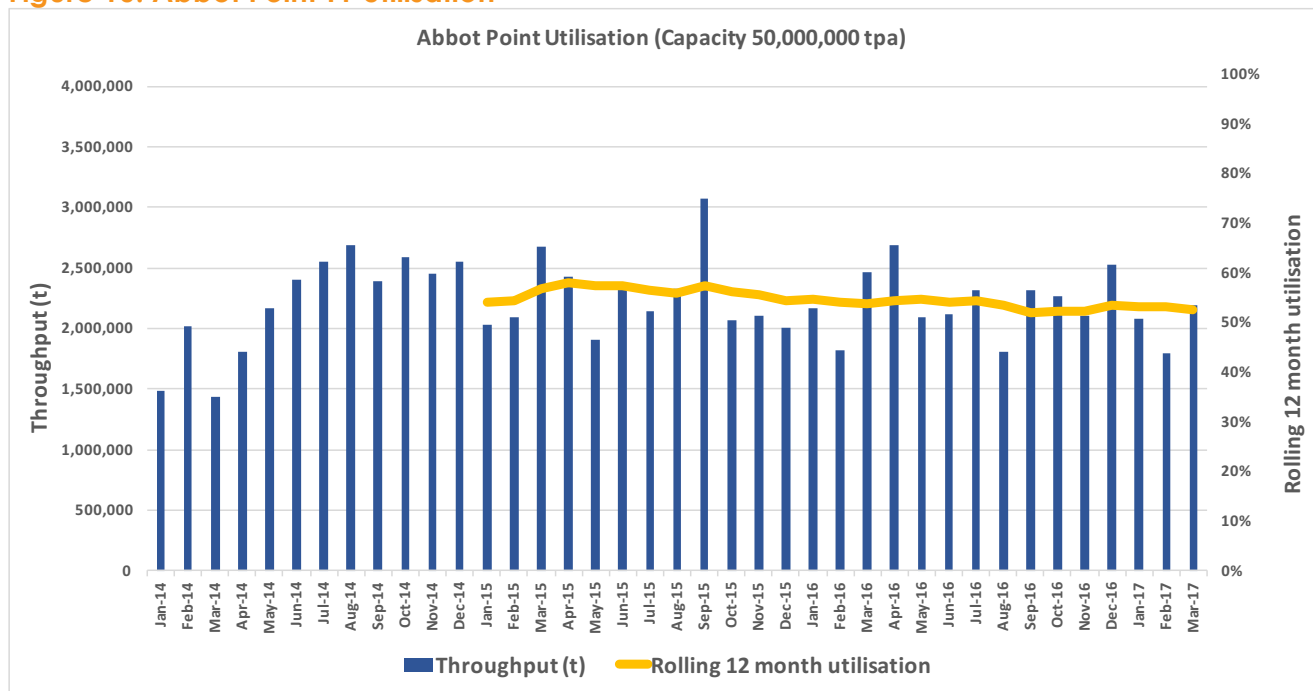
³⁵ <http://energy.economictimes.indiatimes.com/energy-speak/why-rewa-ultra-mega-solar-project-is-a-breakthrough-for-india-s-100-gw-renewables-ambition/2206>

³⁶ <http://energy.economictimes.indiatimes.com/news/renewable/wind-power-bidding-at-rs-3-46-per-unit-for-1000-mw-devansh-jain-director-inox-wind/57378004>

Is the Proposed Abbot Point Coal Terminal T0 Still Needed?

Adani's full plan includes the construction of a new coal terminal (T0) at its Abbot Point coal port because the existing Terminal 1 (T1) at one time had its full capacity of 50Mtpa entirely contracted out to other mining companies on long-term take-or-pay contracts, leaving no spare capacity for Carmichael coal. Much of T1's capacity today remains unutilized as throughput has averaged 50-60% since 2015 (refer figure 10 below).

Figure 10: Abbot Point T1 Utilisation



Source: North Queensland Bulk Ports

The port take-or-pay contracts were agreed at the height of the coal boom, but with demand growth proving to be significantly lower than that which was forecast, these now onerous contracts (both in terms of price per tonne and excess capacity beyond need) are being unwound, at significant cost. Rio Tinto recently announced that a review of its capacity requirements has confirmed it is likely that it will no longer use its contracted capacity at Abbot Point T1. As a result, it has relinquished this capacity and recognized a provision of US\$329m, representing the net present loss on expected future cash flows³⁷. Rio's contractual obligation has been taken on by Adani Mining Pty Ltd, a subsidiary of Adani Enterprises in exchange for a payment from Rio Tinto to Adani Enterprises that will total A\$138m³⁸. Adani Mining Pty Ltd is now contractually obliged to deliver 9Mtpa of coal to

³⁷ <http://www.riotinto.com/investors/results-and-reports-2146.aspx>

³⁸ Axis Capital Quarterly Update on Adani Enterprises, 14th February 2017.

Abbot Point T1 from 2023 to 2028 or pay for any shortfall³⁹.

The transfer of this contract is potentially very useful for Adani Enterprises, in that it frees Adani Mining to utilize 9 Mtpa of unused but previously contracted capacity at T1 from 2023. If it can add other unused capacity to this, Adani's downsized 25Mtpa Stage I would not need the multi-billion investment to build the 50Mtpa T0, with the consequent additional capital requirements and likely creation of significant excess capacity beyond North Queensland's needs. Such a T0 expansion would push down the price of existing coal port charges and undermine the value of the Adani family's \$2bn+ investment in T1.

Using T1 for Carmichael coal instead of constructing T0 would save Adani A\$4-5bn in capital costs, a sizeable amount of money for a project that is struggling to access the funding it needs, given the Adani Group's indebted status and unwillingness of so many banks to be involved.

That said, this new direction raises another strategic problem - no other Galilee Basin projects would have port capacity available to ship coal. One of the Australian government's justifications for providing Adani with A\$1bn of federal taxpayer's funds via NAIF for a rail line connecting the Carmichael mine to Abbot Point has been that the railway will be used by other mine projects in the Galilee Basin. This rationale is clearly flawed, there is no excess port capacity to allow any other Galilee coal mine proposals to proceed.

Further, if the plan is for Adani Enterprises to utilize the 9 Mtpa uncontracted capacity at T1 plus the contracted but unutilized capacity (around 14 Mtpa), then the Carmichael project is limited to a maximum stage I production of 23 Mtpa, even if T1 operates at 100% utilisation (Australian coal ports have averaged just 70-80% utilisation in the last four years). This is far less than the 60Mtpa originally envisaged and often repeated in the media (refer to the Capital Expenditure section on Page 9).

³⁹ IDFC Securities – Adani Enterprises Result Note, 15th February 2017

Northern Australia Infrastructure Facility: A\$1bn Taxpayer Subsidy to the Cayman Islands?

The Northern Australia Infrastructure Facility (NAIF) was set up with A\$5bn to encourage private sector investment in infrastructure projects in the north of the country. The federal government is considering handing over a fifth of the entire facility (A\$1bn) to just one project —the Carmichael rail proposal. The financially challenged outlook of the Carmichael project, particularly in the light of global policy action on climate change, means a high risk of this outlay never being repaid.

It's also unclear in the government proposal which entity the funding would be provided to. The rail project is held within a complicated structure of entities owned by the Adani family via a holding company in the tax haven of the Cayman Islands.

The Australian Prudential Regulation Authority (APRA) in February 2017 publicly announced that it is paying close attention to climate risks that are financial in nature. APRA executive board member Geoff Summerhayes stated that the ongoing transition away from carbon-emitting forms of energy could result in a “significant repricing of carbon-intensive resources and activities and a significant reallocation of capital”⁴⁰. In simple terms, this acknowledges the ever-increasing risk of fossil fuel assets (particularly with respect to thermal coal) becoming significantly impaired or stranded, a risk that should be at the forefront of the minds of members of the NAIF board when deciding how to allocate taxpayers funds. The statement also reflects why private banks are not interested in financing the Carmichael project.

APRA indicated its preference for Australian financial institutions to undertake a 2-degree global warming scenario analysis for longer-term credit assessments.⁴¹ The IEA World Energy Outlook 2016, published in October 2016, concluded there is no room for Adani's greenfield expansion under a 2 degree scenario.⁴² While IEEFA believes the IEA's conclusion is correct, the IEA modelling was based on conservative assumptions, being published before the release of India's Draft 10-Year Energy Plan that underline official Indian government plans to virtually cease thermal coal imports. Australian lawyers have written to NAIF's board advising that it must clearly give serious consideration to the implications of a two-degree scenario and that if the board is relying on the project proponent's financial models, those must at least align with authoritative IEA forecasts in order to meet legal standards. Lawyers told the board that if NAIF were to finance Carmichael's rail, NAIF officials could be out of compliance with their statutory duty of care and diligence.⁴³

NAIF's lack of internal processes is a concern. Australia's former Treasurer, Wayne Swan, has described NAIF as being “dodgy as Lehman brothers” and referred NAIF for investigation by

⁴⁰ <http://www.theage.com.au/business/banking-and-finance/climate-change-a-material-risk-for-the-financial-system-apra-20170217-guffhm.html>

⁴¹ As above, and http://parlinfo.aph.gov.au/parlInfo/download/committees/commsen/04cf6cef-9366-43c0-bf16-6359fb31c925/toc_pdf/Economics%20References%20Committee_2017_03_08_4830.pdf;fileType=application%2Fpdf#search=%22committees/commsen/04cf6cef-9366-43c0-bf16-6359fb31c925/0000%22

⁴² IEA WEO 2016 p. 208

⁴³ <http://www.afr.com/business/mining/coal/northern-australia-fund-board-risks-legal-action-over-adani-loan-20170411-gvipjp>

the Attorney General.⁴⁴ Lawyers have lodged a complaint to the government about breaches of Australia's competitive neutrality regime asking the complaints office under the auspices of Australia's Productivity Commission to recommend overhaul of NAIF's governing framework. The Commission's 2012 inquiry into concessional government loans for resource-related infrastructure in Australia concluded that a "market gap" mandate, which NAIF has, is not appropriate under the competitive neutrality regime and should be removed as it does not ensure a net benefit to the economy.⁴⁵ After an extensive inquiry through which evidence was given by commercial financiers, the Commission concluded there was no evidence to conclude that viable resource-related infrastructure projects could not access debt or equity in the private market.⁴⁶

With Adani showing an ongoing inability to obtain financing for the project and likely facing similar difficulties re-financing the project should it ever get off the ground, the future repayment of the A\$1bn is very unclear. In this circumstance, and with little protection for taxpayers from the risk of the project becoming stranded by the fast pace of change in global energy markets, the A\$1bn has the characteristics of a subsidy rather than a loan⁴⁷. Furthermore, the NAIF has the ability to grant loans on 30-year terms, a length unheard of in Australia which would raise further doubts over repayment; the energy landscape of the world will be dramatically different in 30 years, with coal's role greatly diminished.

With Adani Mining Pty Ltd taking on Rio Tinto's contracted Abbot Point port throughput from 2023, it seems increasingly clear that the proposed new coal terminal at the port (T0) will not be built. This reality undermines a key justification for the provision of funds from NAIF; it has been claimed by politicians that the railway will be a shared facility that other companies will use to rail coal from the Galilee Basin⁴⁸. With no new terminal, other proposals within the Galilee Basin will not have any port capacity. The greenfield, dedicated 388km rail option locks rail users into a single port at Abbot Point. The federal government is therefore considering handing over A\$1bn of taxpayer's money solely to assist a single company.

A further risk that the provision of NAIF funding to the project will not occur comes from the commitment of the Queensland government not to provide any taxpayer assistance to the project⁴⁹. While NAIF has been set up as a vehicle for the federal government to lend to states and territories, which would then on-lend to infrastructure projects, Clause 7 of the Explanatory Memorandum of the Northern Australia Infrastructure Facility Bill 2016 states:

"The intention of this clause is to enable the Facility to provide loans, guarantees and other financing mechanisms (as "grants of financial assistance") to the States and Territories for the construction of northern Australian economic infrastructure, in accordance with any Investment Mandate issued by the Minister. Agreements between the Facility and the States

⁴⁴ <http://www.afr.com/news/policy/budget/northern-australia-funds-governance-as-dodgy-as-lehman-brothers-20170327-gv7eo2#ixzz4cW6oYely>

⁴⁵ Productivity Commission, Inquiry into Australia's export credit arrangements, 2012, p 36: <http://www.pc.gov.au/inquiries/completed/export-credit/report/export-credit.pdf>

⁴⁶ Productivity Commission, Inquiry into Australia's export credit arrangements, 2012, p 214: <http://www.pc.gov.au/inquiries/completed/export-credit/report/export-credit.pdf>

⁴⁷ <https://www.business.unsw.edu.au/agsm/the-leader/articles/when-is-a-loan-not-a-loan>

⁴⁸ <https://www.theguardian.com/australia-news/2017/mar/02/infrastructure-fund-lacks-transparency-on-adani-plans-warns-thinktank>

⁴⁹ <http://statements.qld.gov.au/Statement/2017/2/25/premier-invites-regional-mayors-for-adani-meetings-in-india>

and Territories will prescribe the terms and conditions of these grants of financial assistance".⁵⁰

If the Queensland government remains true to its election commitment, there appears to be no way the federal government can provide taxpayer funds to the Carmichael project in accordance with the NAIF Act. The federal opposition has stated that it is not in favour of supplying taxpayer funds to Adani.

Aurizon's NAIF Application

Rail freight operator Aurizon has recently renewed its interest in the Galilee basin less than a year after writing off A\$30m of Galilee-related project costs⁵¹. The company's alternative Carmichael rail freight plan proposes a shorter railway build that links Carmichael to Aurizon's existing rail network and directly challenges Adani's rail proposal. This challenge extends to NAIF funding as Aurizon is also making an application for taxpayer funds.

As an ASX listed company that is far more transparent than Adani Enterprises and the private Adani companies, Aurizon may be a more attractive recipient of taxpayer funds from NAIF. Such an outcome would mean Adani would no longer require its own rail project and would significantly reduce the capital requirement to get the Carmichael project off the ground. On the downside, the existing Aurizon network is narrow gauge and would mean smaller and slower rail cargoes to port, baking in inefficiencies relative to Adani's own rail proposal. Adani has regularly expressed a preference for a more efficient, standard-gauge option. NAIF funding for Aurizon would also deny Australian taxpayer funding for Adani itself; Prime Minister Malcolm Turnbull has previously ruled out public funding for the mine project⁵².

Given the Aurizon application to NAIF seems to be entirely independent, Adani would be required to come to the negotiation table should Aurizon succeed in its bid. Currently, it seems that Adani is unconcerned by the Aurizon move and will continue to push its own rail project.

The NAIF investment mandate states that it can only provide funds to projects that would otherwise not receive sufficient funding. If a highly-respected company such as Aurizon is unable to attract finance for such a project from private sources and is reliant on taxpayer funding, this does not bode well for the viability of either the rail or mine projects. Regardless of whether it is the Adani or Aurizon rail proposals that receive a government subsidy, the project will be dependent on a taxpayer handout meant only for proposals that would otherwise have no chance of raising funding based on commercial merit.

⁵⁰ http://parlinfo.aph.gov.au/parlInfo/download/legislation/ems/r5631_ems_ec513a28-114a-4ce6-8e55-d89a4a61a299/upload_pdf/447098.pdf;fileType=application%2Fpdf

⁵¹ <http://www.afr.com/business/energy/aurizon-returns-to-the-galilee-basin-with-northern-infrastructure-fund-plan-20170315-guys3y>

⁵² <http://www.smh.com.au/federal-politics/political-news/turnbull-government-eyes-1-billion-adani-loan-backed-by-new-infrastructure-fund-20161204-gt3joz.html>

Leveraging Investment?

The federal government is considering a subsidy of A\$1bn in the hope that this will leverage the remaining A\$4bn required to start the project. The CEO of NAIF has stressed in Senate Estimates that NAIF's role is as a facilitator for private financiers to involve themselves in projects. However, the federal government already has mechanisms for leveraging private investment at a higher ratio than any potential NAIF handout for the Carmichael project.

In 2016 ARENA provided taxpayer funded grants across 12 large-scale solar projects around Australia that will triple the amount of electricity produced from utility-scale solar (refer to Figure 11 below).⁵³ Less than A\$92m in grants has been allocated for the projects totaling over A\$1bn in capital cost. The 12 projects will create many critically needed jobs in regional areas.

The Queensland government has underlined its support for renewables by signing support deeds for 98MW of solar for regional Queensland in March 2017,⁵⁴ at the same time that the Powering Australian Renewables Fund (PARF) – a joint venture between AGL Energy, QIC and the federal government's Future Fund – has announced the 460MW Coopers Gap wind farm. Queensland Premier Anastacia Palaszczuk stated that "These projects represent a \$700m investment in energy projects and in regional Queensland jobs."

ARENA's taxpayer-funded investment in the future of the Australian energy system is leveraging more than A\$10 of private investment for each public dollar. Meanwhile, with a total project capital cost of A\$5bn, and A\$1bn of taxpayer funds possibly coming via NAIF, the Carmichael project would leverage less than half this ratio.

Figure 11: ARENA \$A91.7m Funding for Large-Scale Solar

Applicant	Project name	Size (MW AC)	ARENA funding	Total project cost	Nearest town
Origin Energy	Darling Downs Solar Farm	110.0	\$20 m	\$216.7 m	Dalby, QLD
Edify Energy with Solar Choice	Whitsunday Solar Farm	58.1	\$9.5 m	\$122.4 m	Collinsville, QLD
Neoen Australia	Parkes Solar Farm	50.6	\$7.5 m	\$107.9 m	Parkes, NSW
Genex Power	Kidston Solar Farm	50.0	\$8.9 m	\$126.2 m	Kidston, QLD
Manildra Solar Farm	Manildra Solar Farm	42.5	\$10.9 m	\$109.3 m	Manildra, NSW
RATCH Australia Corporation	Collinsville Solar Power Station	42.0	\$9.5 m	\$95.9 m	Collinsville, QLD
Neoen Australia	Griffith Solar Farm	25.0	\$5.0 m	\$54.6 m	Griffith, NSW
Canadian Solar (Australia)	Oakey Solar Farm	25.0	\$2.2 m	\$47.5 m	Oakey, QLD
Neoen Australia	Dubbo Solar Farm	24.2	\$5.5 m	\$55.6 m	Dubbo, NSW
APT Pipeline (APA Group)	Emu Downs Solar Farm	20.0	\$5.5 m	\$47.2 m	Cervantes, WA
Goldwind Australia	White Rock Solar Farm	20.0	\$6.0 m	\$44.5 m	Glen Innes, NSW
Canadian Solar (Australia)	Longreach Solar Farm	15.0	\$1.3 m	\$28.7 m	Longreach, QLD
TOTAL		482.0	\$91.7 m	\$1,056.4 m	

Source: ARENA

⁵³ <https://arena.gov.au/media/historic-day-australian-solar-12-new-plants-get-support/>

⁵⁴ <http://reneweconomy.com.au/queensland-govt-underwrites-98mw-of-large-scale-solar-farms-13862/>

Carmichael Coal: A Gross Loss of A\$2-3/t

As discussed above, two major cost headwinds explain why the Galilee has remained underdeveloped for decades:

1. Its remote location; and
2. Its low-quality coal.

IEEFA estimates that at a stage I mine capacity of 25Mtpa, a lack of economies of scale and 388km distance combine to give a likely fully loaded rail cost of at least A\$18/t, upwards of three times the Australian coal export industry average, falling to A\$15/t if and when the project stage II were to be fully operational (unlikely until at least the middle of next decade).

This problem provides a major financial impediment to the viability of the greenfield \$3.3bn rail line, given its optimal financial performance can only be delivered when it runs at its full 50-60Mtpa capacity. Australia's existing coal export industry has the double benefit of utilizing existing depreciated rail networks where the average export coal travels less than 150km to the port—60% less than that required by Carmichael.

The very low value of Carmichael coal is the second operational and financial headwind. IEEFA estimates Carmichael coal would be valued at an estimated 30% discount to the thermal coal Newcastle benchmark, based on a thermal energy content averaging 4,950kcal and ash content of 26% (refer Annexure V).

With the Queensland government proposing to allow Adani Mining free use of unlimited water, subject to flooding in the relevant areas of the Carmichael & other nearby rivers, extensive coal washing is likely and would be required as a commercially necessary way to maximise value in light of limited port capacity. However, with coal washing likely to boost the cash cost of production by A\$5-10/t, this adds 15-30% to the total mining costs and with low forward coal prices, this is unlikely to materially enhance overall profitability.

IEEFA estimates a cash cost of product coal of A\$33/t (A\$26/t for run-of-mine (ROM), yield 80%), such that the free-on-board cost including rail and port plus marketing charges is A\$61/t.

At the current inflated post-Cyclone Debbie thermal coal spot price, the project would generate a A\$15/t margin if operational today. But with first coal in 2020 at the earliest and reaching full capacity by 2022, the forward price of US\$68/t is in our view a more reliable financial market consensus of where prices would be by the time coal is available for sale. At the forward price, Carmichael would generate a A\$2-3/t gross cash loss before covering debt financing costs, not giving any return to the equity investment.

We conclude that the Carmichael project at current forward pricing would be unable to cover its gross operating and transportation costs, let alone provide a return on capital employed.

Figure 12: Carmichael Coal – Revenue, Currency and Cost Assumptions

		Spot	Futures
Coal Spot - 6,000kcal NAR - 13 April 2017		US\$87.81	
Coal Futures - 6,000kcal NAR, 2022			US\$67.80 ⁽¹⁾
Discount for Carmichael Coal		30%	30%
Carmichael Coal price (US\$/t)		US\$61.47	US\$47.46
Currency USD / AUD		0.750	0.750
Carmichael coal price - A\$/t		81.96	63.28
Coal Royalty (A\$/t)	7.0%	5.74	4.43
Net revenue to Carmichael		76.22	58.85
Cash cost of production - ROM (A\$/t)	26.64		
ROM yield (%)	80%	33.30	33.30
Marketing / Transport costs			
Marketing & Admin	2.00		
Rail	18.00		
Port	6.00		
		26.00	26.00
SIB capex		2.00	2.00
Total cash costs (A\$/t)		61.30	61.30
Gross cash profit (Loss) (A\$ per tonne)		14.92	-2.45

(1) <http://quotes.eSignal.com/esignalprod/quote.action?symbol=NCFQ-ICE>

Source: IEEFA estimates

Are Banks on Board?

Financial markets globally are increasingly responding to the rapid change in global coal and electricity markets, acknowledging that, post Paris COP21, global policy action is only a question of when, no longer if.

Leading financial institutions are pricing in carbon emissions when evaluating long-life new investment decisions. Leading financial institutions are also accepting that stranded asset risks are real and rising, and that failure to address them could undermine global financial system stability.

Key events recently illustrate the rapid shift in global finance underway:

1. The Bank of England's Governor Mark Carney's "Breaking the tragedy of the horizon—climate change and financial stability" speech at Lloyds of London in 2015;⁵⁵
2. Blackrock—the largest equity investor globally with US\$4.9 trillion funds under management—in September 2016 releasing its global climate change policy position and calling for "a high and global price on carbon emissions";⁵⁶
3. the Norwegian Sovereign Wealth Fund's decision to divest from all holdings in the largest global coal mining and coal fired power companies;
4. Deutsche Bank's January 2017 policy decision to cease all structured finance lending to new thermal coal mines and coal-fired power plants globally;⁵⁷
5. APRA's February 2017 speech on financial system climate risk and the regulatory focus on ensuring all financial institutions and boards have fully incorporated climate change into their risk assessment program;⁵⁸
6. The Clean Energy Finance Corporation in March 2017 concluding that: "Investors perceive that new fossil-fuel generation capacity has carbon risk, which is the risk that a new asset would be stranded if a future government were to adopt tighter emissions constraints".⁵⁹

Even Japan's leading financial institutions are rapidly adapting their lending policies in acknowledgement of the changing global landscape with respect to investing in low emissions technologies. Kansai Electric announced it was cancelling plans to build a US\$3bn coal fired power plant at Hyogo in February 2017. In January 2017, it was reported that Mitsubishi UFJ Financial and Sumitomo Mitsui Financial were the two largest structured debt providers globally for renewables in 2016,⁶⁰ a remarkable internal policy shift for two of the largest private financial institutional debt providers to the fossil fuel industry in the last decade.

⁵⁵ <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>

⁵⁶ <https://www.ft.com/content/bde6859a-9ac2-11e6-8f9b-70e3cabccfae>

⁵⁷ https://www.db.com/newsroom_news/2017/medien/amended-guidelines-for-coal-financing-en-11466.htm

⁵⁸ <http://www.apra.gov.au/Speeches/Pages/Australias-new-horizon.aspx>

⁵⁹ <https://www.theguardian.com/environment/2017/mar/09/clean-coal-wont-be-commercially-viable-before-2030-energy-analysis-says>

⁶⁰ <http://www.bloomberg.com/news/articles/2016-10-31/japan-s-negative-rates-prod-megabanks-into-offshore-wind-loans>

Adani has to-date been unable to demonstrate the financial capacity to fund a \$5bn stage I greenfield mine and rail project in a foreign country. With almost no tangible assets or cash flow in Australia and A\$1.4bn of net debt, and with APCT T1 already fully financially leveraged, Adani Mining Australia Pty Ltd's borrowing collateral, in our view, is entirely absent.

Global Climate Policy: A Growing Risk

The Carmichael thermal coal proposal is a clear stranded asset risk as the COP21 Climate Agreement drives tighter emissions policy globally. There is currently little clarity over what type of policy action will occur in different countries, and the timing of implementation is still up in the air.

However, global financial institutions undertake risk analysis as a core evaluation of every project, and the tightening landscape is clear, as illustrated by:

1. In March 2016, India again doubled its coal tax to Rs400 or US\$6/t.⁶¹ In his budget speech, Finance Minister Arun Jaitley stated explicitly that this was to price in some of coal's externalities.
2. In January 2017, South Korea announced it was again increasing its coal tax by 22% to Won 33,000 or US\$29/t,⁶² and in April 2017 it was reported that the two leading candidates for South Korea's Presidential elections were both looking to scale back coal power expansion plans.⁶³
3. In March 2017, China's Premier Li Keqiang stated that the government will "work faster" to reduce coal pollution,⁶⁴ a signal that further restrictive coal policies are pending, including removing coal's grid priority in favour of zero-marginal cost renewables. Further, China is on track to implement a carbon trading scheme later in 2017, covering a number of major industries including power generation⁶⁵.

The viability of a greenfield thermal coal project with a life of 30-60 years is dependent on both the current and expected policies of the Australian government (itself a signatory to the COP21), and those countries looking to import thermal coal.

Given just the policies moves noted above, any risk analysis for this long-life project must evaluate carbon and pollution cost internalization, given such moves dramatically reduce the cost competitiveness of imported coal-fired power generation relative to alternatives. With renewables in India already costing less than new import-coal-fired power generation, the future demand profile and pricing of this project's product are likely to suffer adverse impacts.

⁶¹ <http://indianexpress.com/article/india/india-news-india/union-budget-2016-17-coal-cess-doubled-to-fund-ministries-green-drives/>

⁶² <http://www.platts.com/latest-news/coal/perth/south-korean-utilities-adopt-new-purchase-strategy-27752597>

⁶³ <http://www.reuters.com/article/southkorea-election-energy-idUSL3N1HI02P>

⁶⁴ <http://www.sfgate.com/news/science/article/China-premier-pledges-We-will-make-our-skies-10978080.php>

⁶⁵ <http://www.scmp.com/business/companies/article/2084151/chinas-national-carbon-trading-rollout-expected-have-major-impact>

First Coal by When?

The original target date for first coal production from Carmichael was 2014. Due to a series of delays, first coal production is now likely to be 2020 at the earliest, even if financial close is achieved late in 2017, with full production being achieved 2-3 years beyond close.

Adani is an exceptionally diverse conglomerate operating almost entirely in India. The group has strong political connections in India, and a domestic business structure that has been in place for almost three decades. As such, it is an experienced operator in Indian sectors, notwithstanding the exceptionally high financial leverage evident in most parts of the business model, even by Indian financial standards.

We note that Adani has only three material businesses outside of India. The Carmichael proposal is A\$1.4bn in debt and six years behind schedule. The two operating overseas business units, an Indonesian thermal coal export coal mine and Abbot Point Coal Export Terminal, are both operating at just 50-60% of planned capacity after six to eight years under Adani ownership. The Indonesian coal mine has consistently underperformed and failed to reach production targets. In its latest Q3FY2017 results, Adani Enterprises noted that the mine is again likely to fail to reach its production target in Q4⁶⁶, with the mine consistently running below half its original rated capacity of some 12Mtpa since Adani first commissioned it in 2009.

Financiers of the Carmichael coal proposal would do well to consider this lack of foreign expertise and capacity. The Adani Group is a very successful Indian-focused conglomerate—it is clearly yet to demonstrate it can perform to plan overseas however.⁶⁷

Given what has happened historically both with the Carmichael project and the issues in Indonesia, there is a high risk that Carmichael will continued to be put off. Delays in production are likely to mean the price received for produced coal is reduced further. Whilst the current spot coal price for benchmark Newcastle coal is US\$87.81, the 2020 futures prices is US\$67.90 (refer Figure 13 below). The latest Resources and Energy Quarterly report from the Office of the Chief Economist projects nominal spot and contract prices for thermal coal of US\$68 in 2020 and a real price in current U.S. dollars of US\$62-63⁶⁸.

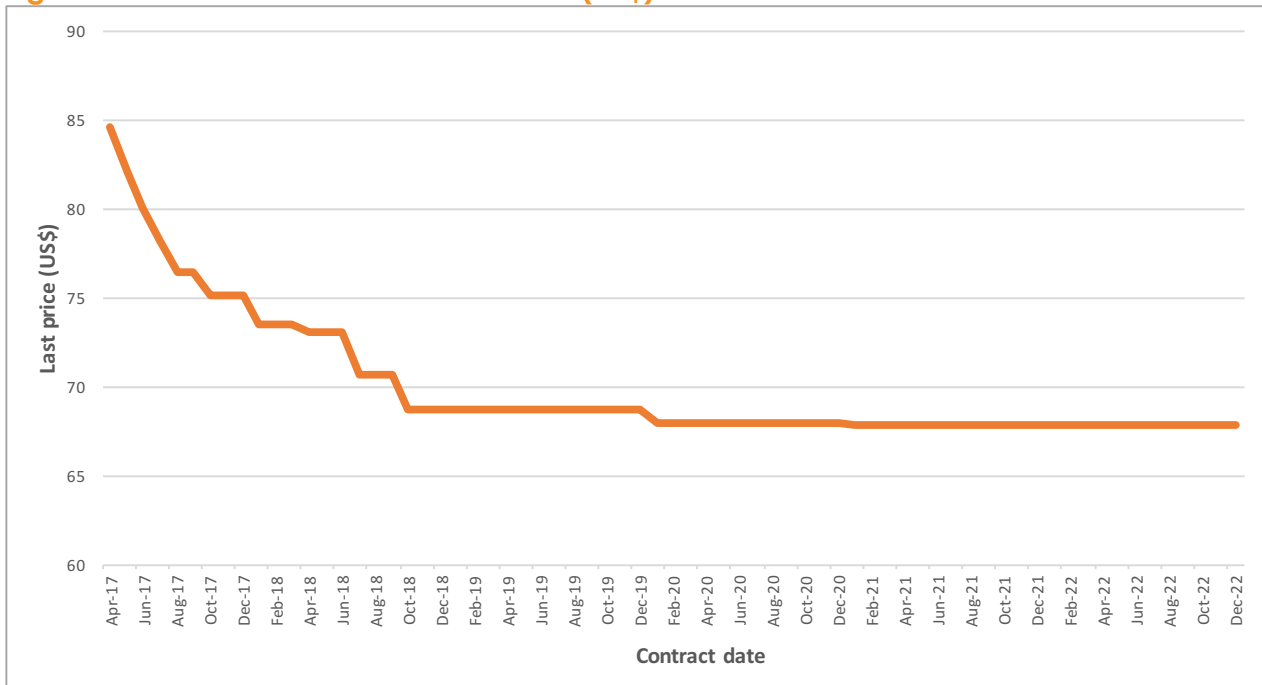
Importantly, Carmichael coal will not achieve the benchmark Newcastle price: IEEFA estimates that its high ash content and low calorific value means that there will be around a 30% discount on Carmichael coal due to its lower quality (refer Annexure V).

⁶⁶ Adani Enterprises Q3FY2017 quarterly financial results

⁶⁷ The author of this report has studied the successes and mostly failures of conglomerate businesses globally for three decades. From Elders IXL, Pacific Dunlop, Howard Smith, Southcorp, the Adsteam Group, Fletcher Challenge in Australasia to BTR Plc and Hanson Plc in Europe, the successful conglomerate going offshore is the exception, not the rule.

⁶⁸ Office of the Chief Economist, Resources and Energy Quarterly March 2017.

Figure 13: Newcastle Coal Futures Prices (US\$)



Source: barchart.com

Moray Power Plant: 45-50% Ash Content Reject Coal

The Carmichael proposal includes the Moray Power Plant, a coal-fired power station that would provide power for the mine. The power station would burn the lowest quality coal produced by the project with a very high (45-50%) ash content, whilst the 'better' quality coal would be earmarked for the export market where it would attract a large discount (IEEFA estimates 30% - refer Annexure V) relative to the higher quality thermal coal shipped out of Newcastle.

A coal-fired power station element to the overall project further heightens the financial risk as highlighted by recent statements from financial institutions and the Australian power generation industry, stating that they would have no interest in financing or constructing new coal-fired power plants.

AGL, Origin, EnergyAustralia⁶⁹ and CS Energy have all confirmed that they have no interest in building more coal-fired power stations, with CS Energy CEO stating that he considered it highly unlikely any new coal power stations will ever be built in Australia⁷⁰.

These statements came after the federal government floated the idea that the Clean Energy Finance Corporation (CEFC) could have its investment mandate changed to allow it to finance so-called "clean coal" projects; latest-technology coal-fired power stations whose carbon emissions are slightly lower than currently operating coal power stations, but significantly higher than gas-fired generators.

This led to the confirmation that Clive Palmer's Waratah Coal, which owns another paralysed coal project in the Galilee Basin (China First) has expressed an interest in obtaining A\$1.25bn funding from the CEFC if the corporation has its mandate changed to include the funding of carbon capture and storage (CCS)⁷¹. Currently, the CEFC Act prohibits the corporation from investing in CCS. Even if the Act were changed, there is no chance the CEFC will invest in CCS; the corporation is required to make a return on its investments and CCS has proven to be hopelessly unfeasible.

One of the most high-profile CCS pilot projects globally, Southern's Kemper power plant in Mississippi has recently been described as 'not economically viable' by Southern's CEO⁷². This is despite the US\$7.1bn that was spent on building the 582MW project which is still not yet operational despite being three years overdue. In addition, Mississippi taxpayers are now on the hook for billions of dollars of payments to the company to cover cost overruns.

⁶⁹ <http://www.afr.com/news/energy-industry-gives-malcolm-turnbulls-clean-coal-power-call-the-cold-shoulder-20170201-gu39hz>

⁷⁰ <http://www.abc.net.au/news/2017-02-16/coal-power-generator-says-new-plants-not-viable/8277210>

⁷¹ <http://www.afr.com/news/politics/clive-palmer-interested-in-loan-for-clean-coal-project-20170228-gumwwt>

⁷² http://www.climateinvestigations.org/southern_company_kemper_not_viable_as_coal_plant_and_it_s_the_psc_s_fault

Oliver Yates, CEO of the CEFC, stated at February 2017 appearance at the Senate committee on Australia's energy security that the latest technology ultra-super-critical coal-fired power stations are:

"not really a technology that would be likely to have a long-term path. Therefore, it would again be very risky for the taxpayer to invest in it".

A key element of this risk, in addition to the rapidly declining cost of renewable energy, is the prospect of a carbon price being initiated in the future. Although in Australia it would seem that such a prospect is currently very unlikely, it is highly likely that such a policy could be implemented within 10 to 15 years and almost certain within 20 to 25 years. With a coal-fired power station expected to have a life of 40 years in order to recoup investment, this represents the key threat that would leave any new coal-fired power stations stranded.

The proposed Moray power station would be used to supply power to the Carmichael project and could not supply the grid, given there is no industrial grid connectivity for almost 200km. However, it is still highly exposed to the risk of a future carbon price and the recent attempts by the federal government to favour new coal-fired generation have only succeeded in highlighting this risk. New Australian coal-fired generation capacity is unbankable.

Social-Licence Issues: Jobs, Taxes and Water

Public and therefore political support for the provision of NAIF funding to the rail project is likely to be dependent on Adani maintaining its social licence for the project. Ongoing community campaigns and legal challenges continue to raise questions about jobs, water and tax policy. In particular, serious doubts have surfaced about the economic benefit of the project in terms of jobs created.

A potential loss of social licence represents a real financial risk to the Carmichael project.

The figure put forth of 10,000 direct and indirect jobs created by the Carmichael project has been widely reported by the media and even in Adani's own TV advertisement⁷³. The number is also often repeated by state and federal politicians.

It is an inaccurate representation of the employment impact of the proposed project, however.

The 10,000 jobs figure emanates from a 2013 economic study for the Carmichael project commissioned by Adani. The number was contradicted by an expert witness for Adani appearing at the land court. The witness, an economic consultant commissioned by Adani to model the project using Adani's own figures, concluded in his report, and testified in court, that the project would provide fewer than 1,500 full-time jobs:

*"Over the life of the Project it is projected that on average around 1,464 employee years of full time equivalent direct and indirect jobs will be created."*⁷⁴

The report covered the mine and rail projects only, not the proposed expansion to Abbot Point T0, but any need for such an expansion—even if the project goes forward—now seems remote (see *Is Abbot Point T0 Still Needed?* on Page 21). Further, as an average number of jobs, the figure includes the construction phase of the project, when there would be more jobs, offsetting the true operational-phase employment impact, which would be limited by automation within the industry, which is resulting more and more in relatively few jobs. Clearly, the 1,464 figure includes both direct and indirect employment. Furthermore, the expert report assessed a proposal for a 40Mtpa mine rather than the 25Mtpa mine option that now seems to be on the table. Lawyers have lodged a complaint related to the purported job creation to the Australian Competition and Consumer Commission asking for an investigation into misleading or deceptive conduct under the Australian Consumer Law.

While the coal industry chronically plays up the importance of coal mining to the Australian economy, similar arguments can be equally applicable to other industries. In fact, coal mining has less impact than many other sectors of the economy due to the overwhelmingly foreign ownership of the coal industry.

The impact of coal mining on indirect jobs is further lessened by mining companies use of offshore marketing hubs to move profits outside of Australia, avoiding Australian taxes. Adani's Carmichael project has a complicated ownership structure across the mine, rail and

⁷³ <https://www.youtube.com/watch?v=hLIPwFUdR0w>

⁷⁴ http://www.abc.net.au/mediawatch/transcripts/1513_adanijobs.pdf

port elements of the proposal, however. Both the port and rail proposals are owned via corporations set up in the tax havens of Singapore, Mauritius and the Cayman Islands.

More below on job impacts and water issues.

Australian Jobs?

Part of the federal government's reasoning on a taxpayer-funded A\$1bn subsidy to Adani is that it would create jobs. However, there is great doubt around how many of the jobs would actually be Australian jobs. The project's Australian payroll—in the event the project proceeds would be subject to Adani's choice of suppliers.

As is the case across the Australian mining industry in general, much of the equipment used would be sourced from overseas. Adani in 2015 had a conditional order in place with Japanese firm Komatsu for a fleet of driverless trucks,⁷⁵ and it is likely the company would remain the supplier of choice. Komatsu's latest, next-generation driverless trucks were unveiled in late 2016.⁷⁶

The railway element of the Carmichael project is applying for A\$1bn of public funding. In 2014, Adani signed up South Korean firm POSCO E&C to act as EPC contractor for the construction of the railway (that contract was suspended after the Carmichael project was put on hold)⁷⁷. If the contract were to be revived in the event that taxpayers prop up the rail project, it's unclear whether any Australian-made steel would be involved in the railway. Arrium's troubled Whyalla steel works is the only Australian manufacturer of rail but is geographically remote from the site. The company, currently in administration, has reportedly had acquisition offers from three consortia, one of which includes POSCO⁷⁸.

Australia-listed railway wagon manufacturer Bradken has been suffering from the downturn in mining investment along with increased competition from Chinese wagon manufacturers now firmly established in the Australian market. A takeover from Japan's Hitachi Construction Machinery is on the cards⁷⁹. Bradken's strategy is to increasingly use its lower-cost overseas foundries. The company's new Indian foundry is to result in the closure of the Adelaide and Scunthorpe, U.K., foundries⁸⁰. Wagon and bogie manufacturing facilities are located in Australia and China⁸¹, but the last few years of the mining investment slump has seen the company move more and more jobs to the China foundry⁸².

Australian locomotive manufacturers have had similar problems during the mining investment slump, and have been visited by mergers and foreign takeovers. Downer has in the last few years ended more than a century of locomotive building in Australia by moving

⁷⁵ <http://www.constructionweekonline.com/article-34020-adani-orders-55-super-large-komatsu-dump-trucks/>

⁷⁶ <https://www.australianmining.com.au/news/komatsu-unveil-cableless-autonomous-trucks/>

⁷⁷ <http://www.smh.com.au/business/mining-and-resources/adani-stands-down-major-contractors-20150721-gih7h3.html>

⁷⁸ <http://www.afr.com/street-talk/threeway-go-for-arrium-but-plenty-of-conditions-20170219-gug8vd>

⁷⁹ <http://www.theaustralian.com.au/business/companies/bradken-posts-37m-first-half-loss-as-hitachi-takeover-looms/news-story/b82610549dd6ecf998de80d9259d0ead>

⁸⁰ <http://www.smh.com.au/business/mining-and-resources/bradken-swamped-by-rising-tide-of-red-ink-20160215-gmuzgc.html>

⁸¹ <http://bradken.com/our-business/transport-industrial-products/manufacturing>

⁸² <http://www.smh.com.au/business/mining-and-resources/bradken-to-axe-more-jobs-shift-more-production-offshore-20140812-1034i5.html>

manufacturing overseas in a deal with EMD⁸³. The only other established Australian locomotive manufacturer, UGL, was recently taken over by Spanish owned CIMIC⁸⁴. UGL now supplies, adapts and maintains GE locomotives in Australia rather than manufacturing them⁸⁵.

Australian federal and Queensland government support is contingent on the creation of Australian jobs. This is especially true of the rail project, where taxpayer funding is being considered. Clause 18 of the Northern Australia Infrastructure Facility (NAIF) Investment Mandate Direction requires that a project must comply with the Commonwealth's Australian Industry Participation (AIP) Plan policy before the NAIF board can make an investment decision. The Explanatory Note to the Direction makes it clear that the purpose of the clause is to maximize opportunities for Australian businesses in projects⁸⁶.

For a project reliant on being propped up by government intervention, any public disappointment regarding the number of Australian jobs likely to be created could prove terminal. Adani Mining's social licence to operate, already seriously contested and the company's consistent advertising of "10,000 Queensland jobs," could undermine essential community support if foreign sourcing becomes evident.

Regional Jobs?

In the event that taxpayer subsidies allow the Carmichael project to go forward Adani can expect the product of its mine to be worth around 30% less than the Newcastle benchmark. As a result, Adani would need to run the mine on a very high-efficiency/low-cost basis.

As part of this necessary efficiency, Adani has made clear its intention to utilize driverless trucks at the mine:

"We will be utilizing at least 45, 400-tonne driverless trucks. All vehicles will be capable of automation. When we ramp up the mine, everything will be autonomous from mine to port" – Adani Mining Australia CEO, Jeyakumar Janakaraj.⁸⁷

Coal mines in Queensland are increasingly employing workers on a FIFO basis out of the larger population centres such as Townsville⁸⁸. While the state government is intending to bring into force rules that ban 100% FIFO workforces and that require mining companies to seek at least some workers locally, this will not apply to the Carmichael project. The new law is intended to ensure projects create jobs for people from nearby communities, with the definition of what is considered to "nearby" left to the discretion of the coordinator general⁸⁹. However, the rule would not apply to projects that, like Carmichael, have already gone through the environmental impact assessment (EIA) process. As a result, the project may not have as beneficial an impact on Bowen Basin towns as many hope it will.

⁸³ <http://www.railjournal.com/index.php/australia-nz/downer-to-end-loco-production-in-australia.html>

⁸⁴ <http://www.theherald.com.au/story/4217515/broadmeadow-rail-company-ugl-in-takeover-bid/>

⁸⁵ <http://www.railwaygazette.com/news/business/single-view/view/railway-supply-industry-news-round-up-10.html>

⁸⁶ Explanatory Statement, Northern Australia Infrastructure Facility (NAIF) Investment Mandate Direction, 2016

⁸⁷ <http://www.miningglobal.com/operations/1843/Adani-Mining-CEO-explains-the-165B-Carmichael-coal-mine>

⁸⁸ <http://www.afr.com/business/mining/bhp-drives-the-next-tectonic-shift-in-australian-coal-20170206-gu6lrt>

⁸⁹ <https://www.dailymercury.com.au/news/adani-jobs-could-flow-to-the-regions-under-new-law/3152028/>

As a result of the project already being through the EIA process, the Queensland government sought and received a verbal guarantee that no foreign workers on 457 visas would be employed and that the project would prioritize employment from regional Queensland⁹⁰. However, although Adani has stated that regional towns such as Clermont, Moranbah and Emerald will host “project sourcing centres,” regional and remote operations centres will be in Townsville and the FIFO hub will be either in Townsville or Rockhampton⁹¹.

Placing further pressure on Adani is the recent wave of utility-scale solar investment that suggests it will be a far greater generator of regional jobs than an isolated Galilee Basin project. Of the 12 projects provided funding by ARENA in 2016, six are in Queensland⁹² and include locations that have been affected by the reduced number of coal-mining jobs available after the end of the mining boom and as the industry continues to automate. By being located close to towns, solar projects are better placed to provide local job opportunities. Adani itself has an intention to develop a A\$200m solar plant near Moranbah that may do more for the town in terms of jobs than the Carmichael project⁹³.

Adani will need to appear to be fulfilling its promise to the Premier of Queensland if it wants to maintain its social licence to operate in the eyes of the Queensland government and public. This is especially true given that any taxpayer funds distributed to a project need to come via the state government rather than directly from the federal government. As a result, Adani may not be able to operate the mine as efficiently as needed to make the project even close to viable.

Water Impacts: Further Political Risk

The proposed mine's water use has recently become a major issue⁹⁴. The Queensland government has granted Adani unlimited access to groundwater that some farmers believe may impact the Great Artesian Basin that many of them are dependent on. The licence extends to 2077 and contains no volumetric limits or independent monitoring. Further, there is no limit specified which would trigger a halt to mining operations⁹⁵. Adani has said it would draw about 355 billion litres of water over the mine's life. However, the mine's water needs would appear to be higher than that: Adani is seeking approval for a second flood-harvesting dam to meet its surface water requirements. The new dam proposal is double the size of the one mentioned in the project's environmental impact statement⁹⁶.

Unlike other new mine proposals, the proposed water usage of the Carmichael mine has not been subject to the usual public submissions and appeals process. The Queensland Water Act was amended in 2016 to allow the Carmichael mine to avoid court challenges to its

⁹⁰ <http://www.abc.net.au/news/2016-12-06/adani-carmichael-mine-queensland-first-workforce/8096402>

⁹¹ <http://statements.qld.gov.au/Statement/2017/2/25/premier-invites-regional-mayors-for-adani-meetings-in-india>

⁹² <http://www.brisbanetimes.com.au/queensland/queensland-solar-farms-to-be-built-with-50m-in-funding-20160908-grbiav.html>

⁹³ <http://www.couriermail.com.au/news/queensland/huge-moranbah-plant-to-create-up-to-1000-jobs/news-story/692d795b5dc3dca95cd0c39ecfe11846>

⁹⁴ <http://www.queenslandcountrylife.com.au/story/4577831/adani-mine-granted-unlimited-water-access/?cs=4733>

⁹⁵ <http://www.smh.com.au/environment/barbaric-adanis-giant-coal-mine-granted-unlimited-water-licence-for-60-years-20170404-gvd41y.html>

⁹⁶ <http://www.smh.com.au/environment/high-and-dry-adani-seeks-additional-surface-water-to-feed-giant-coal-mine-20170405-gve42a.html>

water licence. However, the exemption does not apply to another controversial mine project, the Acland coal mine expansion⁹⁷.

Meanwhile an apparently contaminated water flow from Adani's Abbot Point coal terminal into a neighbouring wetland is under investigation by the Queensland Department of Environment and Heritage Protection⁹⁸. The department is exploring reports of unauthorized releases into the Caley Valley Wetlands; the investigation outcome that could further erode public confidence in the protections that Adani has promised.

While the Queensland government has pledged not to use public funds to support Carmichael infrastructure, it is clearly disposed to helping Adani via special exemptions, through a "critical infrastructure" designation. This is a high-risk tactic in a dry, farming state dependent on the Great Artesian Basin, especially given that almost 90% of Queensland is officially in drought⁹⁹.

On the world's driest inhabited continent, few issues can erode social licence amongst the rural population as quickly as water impacts. The level of water use expected in the mine appears to be significantly more than advertised. If the mine were to start operations, this the issue could be hugely magnified as potential impacts of reduced water availability play out. Under such circumstances, Adani's social licence to operate could disappear in a matter of weeks and could pose serious public and political complications to the mine's operational viability.

⁹⁷ <http://www.smh.com.au/business/mining-and-resources/queensland-government-gives-adani-water-exemption-20161109-gslz4f.html>

⁹⁸ <https://www.ft.com/content/b6b76878-1da5-11e7-a454-ab04428977f9>

⁹⁹ <http://www.brisbanetimes.com.au/queensland/nearly-90-per-cent-of-queensland-in-drought-after-latest-declarations-20170312-guwai4.html>

Is Gautam Adani Really Still Committed to Carmichael?

Unsurprisingly, Adani Australia's chief, Jeyakumar Janakaraj, continues to talk very optimistically about the future of the Carmichael project. But IEEFA would question if Gautam Adani himself is still as committed to the proposal, notwithstanding A\$1.4bn in sunk costs.

Some of Adani Australia's attention has more recently turned toward solar PV with confirmation of its intention to build a solar plant near Moranbah and another near Whyalla, South Australia. The solar project proposals have been far more warmly received across all stakeholders than its coal proposal. The projects can become part of the wave of solar PV investment in Australia that was kicked off by ARENA's announced grant funding of 12 solar PV projects in 2016.

Adani's solar proposals can create regional jobs whilst adding to Australia's clean energy capacity and, in contrast to the stalled development of the Carmichael proposal (the project was originally intended to be operational in 2014), could be completed within 18 months once approved. Adani Australia recently announced the appointment of a CEO of its Australian renewable energy business as Australia CEO Jeyakumar Janakaraj stated the company's intention to become the largest renewable energy company in Australia with a near-term capacity target of 1.5GW¹⁰⁰.

Adani has an even larger ambition in India, where it intends to build over 10GW of solar by 2022, including 2GW in 2017 alone. Adani Enterprises subsidiary Adani Green Energy's Indian projects include the 648MW Kamuthi project in Tamil Nadu; until recently the world's largest single-location solar power plant¹⁰¹. Wind power is also in Adani's sights, and Adani Green Energy recently won a 50MW contract in India's first wind power reverse auction which saw wind energy costs plunge to record lows¹⁰².

Gautam Adani's son Karan, who runs the separate listed entity Adani Port and SEZ (APSEZ), appears to accept that the future of India's electricity production is renewable. In a recent interview, he stated plans to move APSEZ towards renewable energy:

"Whatever energy or electricity the port consumes would be through renewable sources — either solar or wind"¹⁰³

Karan Adani noted that a move into clean energy would save operating costs for the company by as much as 10%-15%. APSEZ claims that it is the first port operator in India to calculate its carbon footprint.

With Adani Enterprises increasingly focused on raising debt funding for solar and wind projects both in India and Australia, there is less and less capacity for the company's stretched balance sheet to take on the level of debt required to fund the Carmichael

¹⁰⁰ <https://www.dailymercury.com.au/news/adani-australia-appoints-renewables-ceo/3140464/>

¹⁰¹ <http://www.adanienterprises.com/businesses/renewable-energy/power-generation>

¹⁰² <https://www.bloomberg.com/news/articles/2017-02-24/wind-power-costs-plunge-in-asia-s-first-auction-for-contracts>

¹⁰³ <http://economictimes.indiatimes.com/industry/transportation/shipping-/transport/adani-ports-will-go-green-focus-on-logistics-business/articleshow/58017555.cms>

project. Furthermore, the company's overall focus appears to be becoming more aligned to Indian government's energy targets which include installation of 175GW of renewable energy by 2022 and ending thermal coal imports by 2020.

Another key area of focus for Gautam Adani is the continued build-up of Indian listed company Adani Transmission. It has been reported that Adani is in negotiations to acquire South East UP Power Transmission Company Ltd, one of the largest single-asset electricity transmission companies in India, in a deal that could be worth up to US\$1bn¹⁰⁴. In February 2017, Adani Transmission received clearance for the acquisition of the transmission business of Reliance Infrastructure which owns electricity transmission assets across four Indian states¹⁰⁵.

The Reliance deal includes its 74% stake in Parbati Koldam Transmission Company, a joint venture with Power Grid Corporation of India. Power Grid Corp recently announced a 24% increase in revenue and 20% rise in net profit in its Q3FY2017 results¹⁰⁶, demonstrating the growth and profitability of the sector. Adani Transmission is now the largest private competitor to Power Grid Corp. With India's economy growing at around 7% a year and electricity demand increasing, power transmission is a key strategic priority of the Indian government and an increasing area of focus for Adani.

In Australia, Adani has been frustrated by constant delays to the Carmichael project. Originally slated to start in 2014, the project suffered a further delay in 2017 when a federal court ruling on Indigenous Land Use Agreements (ILUAs) found that the Native Title Register does not have the jurisdiction to register an ILUA if it is not signed by all named applicants¹⁰⁷. Adani Enterprises has become used to starting and completing entire large-scale solar PV projects within the amount of time that has passed since the Carmichael project was originally supposed to begin.

Adani has found itself once again in court facing the Wangan and Jagalingou Family Council, indigenous owners who are opposed to the mine, where Adani was accused of withholding evidence concerning the economic impact of the mine during an earlier legal bid to halt the proposal¹⁰⁸. This, along with other ongoing legal challenges¹⁰⁹, will continue to delay the project as any possible financial close would be unlikely to be concluded until such uncertainties were resolved, or the Australian government changes the existing law to specifically benefit Adani over the stated interests of the traditional owners.

Aurizon's play to deny Adani NAIF funding may make the Carmichael project less attractive to Gautam Adani. Adani's proposed rail project is owned privately via the Cayman Islands by the Adani family itself rather than Adani Enterprises. Whilst the mine project and hence Adani Enterprises shareholders would be highly exposed to declining coal demand, the rail project would clip the ticket and make a steady infrastructure return for the family. If instead it is Aurizon making the return, the value of the overall project may well be diminished in Mr.

¹⁰⁴ <http://economictimes.indiatimes.com/industry/energy/power/adani-group-eyeing-big-bang-acquisition-in-power-transmission-segment/articleshow/56734701.cms>

¹⁰⁵ <http://economictimes.indiatimes.com/industry/energy/power/cci-clears-reliance-infra-adani-transmission-deal/articleshow/57045116.cms>

¹⁰⁶ http://www.indiaonline.com/article/equity-earnings-result-commentary/power-grid-corporation-of-india-ltd-s-q3fy17-standalone-net-profit-rises-20-2-yoy-to-rs-1-930-crore-beats-estimates-117020900824_1.html

¹⁰⁷ <http://www.abc.net.au/news/2017-02-08/turmoil-over-indigenous-land-use-ruling/8250952>

¹⁰⁸ <http://www.smh.com.au/business/mining-and-resources/adani-accused-of-withholding-evidence-20170227-gum5ya.html>

¹⁰⁹ [http://www.couriermail.com.au/subscribe/news/1/index.html?sourceCode=CMWEB_WRE170_a&mode=premium&dest=ht tp:%2F%2Fwww.couriermail.com.au%2Fnews%2Fqueensland%2Faustralian-conservation-foundation-to-appeal-adani-carmichael-mine-approval%2Fnews-story%](http://www.couriermail.com.au/subscribe/news/1/index.html?sourceCode=CMWEB_WRE170_a&mode=premium&dest=ht tp:%2F%2Fwww.couriermail.com.au%2Fnews%2Fqueensland%2Faustralian-conservation-foundation-to-appeal-adani-carmichael-mine-approval%2Fnews-story%2F)

Adani's eyes.

There is no doubt that the recent publicity generated by the visit of Gautam Adani to Queensland, the Adani regional roadshow and the visit of the Queensland Premier and Australian Prime Minister to India have given the impression that the project is building momentum. However, there is an alternate reason for why the Adani would want to make the project seem viable. When and if the Carmichael proposal is deemed unviable, Adani Mining Pty Ltd would need to write down its investment. As at March 2016, Adani Mining has a A\$969 million capitalized exploration valuation sitting on its balance sheet¹¹⁰, amounting to almost half of the market capital of its parent company Adani Enterprises Ltd. A write-down of this valuation would be crippling to Adani Enterprises' book value of equity and may help explain much of the purported optimism about the project's prospects.

Whilst Adani battles with more court proceedings for its much delayed and strategically misaligned Carmichael project, it is making rapid progress in continuing to ramp up its renewables and transmission businesses in India. With new solar projects now cheaper than new coal-fired generation projects¹¹¹ and auctions now pushing down wind energy prices, Adani's focus on these fronts is well aligned with both the economics of the rapidly changing Indian energy landscape and with the Indian government's oft-stated renewable energy targets.

With the Carmichael project heading back to court, Adani's attention in Australia may pivot toward faster solar projects. Notwithstanding the public enthusiasm of Adani's Australia-based employees, it would come as no surprise if Adani were to seek an exit strategy on its bogged-down coal project.

¹¹⁰ <https://www.bloomberg.com/gadfly/articles/2017-04-02/coal-s-dirty-australian-secret-it-s-not-coming-back>

¹¹¹ <http://www.bridgetoindia.com/rewa-project-glimpse-future-power-sector/>

Conclusions

Changes in the Indian government's energy strategy appear to leave no room for development of the proposed Carmichael project. A government commitment to ending thermal coal imports by the end of the decade and an ambitious target of 175GW of renewable energy installations by 2022 and 275GW by 2027 is eating away at the rationale for the project from both ends. The government seems on track for both of its targets with significant drops in coal imports over the last two months and new record low prices for both wind and solar projects likely to support high installation rates.

Adani's reasoning that a separately listed member of the group, Adani Power, is the off-taker of the coal makes the project seem less viable, not more. Adani Power has an enormous net debt of US\$7.6bn and there are questions over the adequacy of its internal financial controls. The company's weak financial position and consistent losses add to the strategic weakness of new import coal-fired power generation in the Indian market, where declining real wholesale electricity tariffs are increasingly the norm and imported coal is losing market share to lower-cost domestic coal and ever more cost-competitive renewable energy sources.

In the end, the future of the project comes down to financing. Adani Enterprises, the owner of the Carmichael mine project, is a relatively small company that will struggle to raise the equity and/or debt needed to underpin the financing of the project. The prospect of closing on the necessary funding is made even less likely by Adani Enterprises' stretched balance sheet; its debt situation not helped by the company's plans to simultaneously move into many new business areas at the same time. Its already delayed, multi-billion dollar solar PV manufacturing project is likely to be a source of further financial pressure in 2017 as module prices decline even further¹¹².

As a result of all of the above, the project's last chance of getting off the ground is if it can be propped up by taxpayer funds distributed via the NAIF facility. The strategic direction of the Indian government and the overall direction of energy systems globally calls into question whether taxpayers would ever see their A\$1bn again. Adani's need to down-scale the project and not build the new terminal at Abbot Point, removes any doubt as to whether the proposed railway would be a common user facility. Without more port capacity, other Galilee projects can't export coal; taxpayers would be financing a railway purely for an as-yet unnamed Adani company ultimately owned in the tax haven of the Cayman Islands.

With private investors apparently not interested in the project, the only thing keeping its slim chances alive is political backing with public money. In addition to public doubts over repayment, opposition may materialize from potential taxpayer disappointment over the tax status of the recipient and of the limited number of jobs created.

Making a convincing case for the provision of taxpayer funds to Adani is proving difficult. Ultimately, even A\$1bn of taxpayer's money is unlikely to be enough to change private investors opinion of the project.

¹¹² <http://www.bridgetoindia.com/another-year-hell-module-suppliers/>

Annexure I

Galilee Project Proposals – All but Stalled

The Adani Carmichael Mine and Rail project could act as a potential enabler long term for the development of up to 320Mtpa of new thermal export coal capacity, a long-term prospect that would expand global export supply by 30% and dramatically depress the global price received for Australia's third largest export source.

However, beyond the establishment of a major new 388km greenfield railway line from the Galilee to Abbot Point, a new Galilee export project in addition to Adani's again-downsized 25Mtpa proposal would be entirely dependent on the construction of an entirely new coal terminal port facility. The \$1bn taxpayer subsidy from NAIF is being justified on the grounds that it will enable a multi-user rail facility to open up multiple new mine developments. However, the current Carmichael coal mine and rail proposal has done away with the original proposal of an associated new 50-70Mtpa coal terminal at Abbot Point (T0). With the existing T1 port running at 50-60% utilisation already, there is only 20-25Mtpa of unutilized export capacity. As such, the current plan means that even with the NAIF loan, there is no scope for any other project beyond Carmichael to proceed. To say this loan is providing a multi-user rail facility is misleading, no other mine is likely to be exporting coal in the coming decade.

Owner	Project	EIS Status	Original targeted output (Mtpa)	Status update
Adani Group (India)	Carmichael Coal (1)	Approved with conditions	60	In need of finance, viable rail link and port capacity
GVK Coal (India)	Alpha	Approved with conditions	30	Having defaulted on debt repayments, GVK faces threat of assets being auctioned off. Aurizon has written-off associated rail costs
	Alpha West	Pre EIS	24	
	Kevin's Corner	Approved with conditions	30	
Waratah Coal (Clive Palmer)	China First	Approved with conditions	40	Attempt to offload to Adani in January 2016 failed
	Alpha North	Pre EIS	40	Timing of EIS preparation not indicated
AMCI Group & Bandanna Energy (2)	South Galilee Coal	Approved with conditions	14	Dependent on rail and port developments. Bandanna now in administration
Macmines Austasia (3)	China Stone	Additional information for the EIS being prepared by proponent	45	3/2/17: new project declaration lapse date of 10 July 2017
Vale	Degulla	Pre EIS	30	For sale since June 2013
Resolve Coal Ltd	Hyde Park Coal	Pre EIS	7	Pre-feasibility study due by Q1 2017
Total for Galilee Basin			320	

(1) Initially targetted as 60Mtpa, now likely to initially be 25Mtpa

(2) An initial phase, Epsilon, is a small scale open cut mine (3 Mtpa) which would utilise the existing Port of Gladstone via the existing Aurizon railway network

(3) Owned by the private Chinese family business, the Meijin Energy Group

It is very telling that the only proponent even remotely talking about progressing their Galilee tenement is Adani Mining.

Waratah Coal: A wholly owned subsidiary of Mineralogy Pty Ltd, Waratah Coal has made little noticeable advance in the last decade. Waratah Coal was subject to a very ambitious and high profile initial public offering proposal for a US\$3.6bn Hong Kong listing, but this was pulled in mid-2011. The Environmental Impact Statement (EIS) was lodged in 2011 and approved in 2013, but with no subsequent development evident following the collapse in thermal coal prices.

In the last year the proponent of this proposal has otherwise focused on a range of issues, including: the liquidation of Queensland Nickel in April 2016; the April 2017 announcement of the disbanding of the Palmer United Party (PUP) and cancellation of its registration as a federal political party with the Australian Electoral Commission¹¹³; the extreme volatility / generally downward trend in iron ore prices; and royalty disputes and legal battles with its West Australian iron ore project partner CITIC.¹¹⁴ While a Supplementary Environmental Impact Statement (SEIS) was released in April 2013 and a draft Environmental Authority for the Galilee Coal Project was awarded at the end of 2015, IEEFA has seen little if any material progress on this project.

Alpha Coal: Likewise, the GVK Reddy family of India and its 54% owned listed GVK Power & Infrastructure Limited are the joint proponents behind the Alpha, Alpha West and Kevin's Corner proposals. However, GVK Power remains mired in financial distress in India, with ongoing losses being reported since 2012 and a bank syndicate trying to undertake a forced auction of its core assets after repayment defaults.¹¹⁵ With a market capitalisation of equity of just US\$138m against net debts of US\$3.5bn as of March 2016 (consolidated accounts have not been disclosed on the firm's website post this date), in IEEFA's view this group has zero capacity to invest in long dated greenfield, speculative coal mine developments. The latest Auditor statement from the 14 February 2017 states:

"... regarding losses being incurred by the Company, defaults in loan and interest payments and material uncertainties faced by various projects in which the company has made investments or provided guarantees ... cast significant doubt about the Company's ability to continue as a going concern."¹¹⁶

Degulla: Vale SA of Brazil's Degulla deposit (to the north of Waratah Coal and Carmichael) was reported as being put on the market in 2013, with no market interest disclosed since. The project is not listed by the Queensland Government's Department of State Development.

Hyde Park: Resolve Coal Pty Ltd (Managing Director and Principal Geologist, Gordon Saul) has proposed a 7Mtpa coal project at Hyde Park in the north of the Galilee. The corporate website¹¹⁷ references a rail and port Memorandum of Understanding with Adani Mining, and an application to the NAIF in September 2016 for infrastructure funding assistance, and had previously reported a plan to lodge a pre-feasibility study by June 2014, then deferred to 1Q2017. However, as of April 2017 the website has been updated to suggest this is still in preparation. IEEFA would note the Hyde Park resource is reported to have a materially higher energy and lower ash content (at 5,600cal NAR, 11% ash) and lower strip ratio than the Carmichael proposal. However, with Adani's downsized project removing any medium term plans for T0, this project would appear to be entirely contingent on Adani undertaking a stage II expansion at some future date.

¹¹³ <http://www.abc.net.au/news/2017-04-19/clive-palmer-disbands-palmer-united-party/8452760>

¹¹⁴ <http://www.theaustralian.com.au/business/companies/billionaire-clive-palmer-down-to-his-last-2m/news-story/6c89cec79c8a22f8d434280b00fa9044>

¹¹⁵ http://economictimes.indiatimes.com/industry/indl-goods/svs/construction/auction-looms-large-over-debt-ridden-gvk-group/articleshow/57564981.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

¹¹⁶ http://www.gvk.com/files/investorrelations/financialinformation/quarterlyreport/Q3_ead1c4d6ed7b4ccbaec5f2a55cbd975.pdf

¹¹⁷ <https://www.hydeparkcoal.com.au/project>

South Galilee Coal Project: The AMCI Group was founded in 1986 by Hans J. Mende and Fritz R. Kundrun, who equally share 100% of AMCI's equity.¹¹⁸ Initially a coal and metals sourcing and trading company, AMCI has expanded to embrace a wide range of natural resources and service offerings to secure the raw material needs of global steel and power industries, including a strategic 12% stake in ASX-listed Whitehaven Coal Ltd. AMCI has long held a stake in the South Galilee Coal Project (SGCP).

AMCI's joint venture partner in the SGCP proposal was previously ASX listed Bandanna Energy Ltd, which went into administration in September 2014.

In July 2015, the SGCP received Commonwealth approval under the Environmental Protection and Biodiversity Act 1999 approval following the approval of its EIS in December 2014. The SGCP corporate website reports that an initial phase (Epsilon - a small scale open cut mine (3 Mtpa)) could utilise the existing Port of Gladstone via the existing small scale Aurizon railway network, but that the full development plan will be undertaken if and when infrastructure is clarified.¹¹⁹ SGCP is located more than 150km south of Carmichael. Absent a strong and sustained thermal coal price recovery and development of the GVK or Waratah tenements near the town of Alpha, this proposal is most likely to remain stranded.

China Stone: MacMines Austasia Pty Ltd was registered and established in Queensland, in July 1999 and holds the potentially huge 38Mtpa China Stone coal proposal in the north of the Galilee basin.¹²⁰ In July 2011 MacMines announced a long term coal offtake agreement for 30Mtpa with China Huaneng Group (one of largest Chinese state owned enterprises operating in the power generation sector). MacMines submitted a draft EIS in September 2015, but the corporate website provides no subsequent updates. First coal was expected by 2014, but progress appears to have been stalled for almost a decade. In February 2017 the Queensland Coordinator-General (CG) stated a new project declaration lapse date of 10 July 2017 (albeit this is the third lapse date announced by the Queensland CG).¹²¹

MacMines was acquired in 2007 by Meijin Energy Group of Shanxi Province, China – a business that reportedly owned by Chinese billionaire Yao Junliang.¹²² Founded in 1984, Meijin reports coking coal capacity of 6Mtpa.¹²³ Little has been reported on this private Chinese company, although ASIC reports Australia Meijin Energy Group P/L was voluntarily deregistered.¹²⁴

¹¹⁸ <http://amcigroup.com>

¹¹⁹ <http://www.southgalilee.com.au/ProjectUpdates.aspx>

¹²⁰ <http://www.macmines.com/>

¹²¹ <http://www.statedevelopment.qld.gov.au/assessments-and-approvals/china-stone-coal-project.html>

¹²² <http://www.macmines.com/english/news/Shownews.asp?ID=651>

¹²³ <http://www.macmines.com/english/overview/overview.asp?ID=637>

¹²⁴ <https://insolvencynotices.asic.gov.au/browsesearch-notices/notice-details/AUSTRALIA-MEIJIN-ENERGY-GROUP-PTY-LTD-152816432/42d2a9bb-9e92-485e-b7c7-5c3527285206>

Annexure II

The Adani Group's US\$36bn Capex & M&A Pipeline

The Adani group has a total capex pipeline of US\$36bn across Adani Enterprises, Adani Green Energy, Adani Power, Adani Ports and Adani Transmission. All up the Adani group has 13 projects underway that are at least US\$1 billion of investment. Given a collective group net debt IEEFA estimates at over US\$15bn, signs of financial distress are already evident, with most entities rated sub investment grade by credit rating agencies. The Carmichael proposal is one of the group's most deferred and hard to finance proposals in a group planning to expand in multiple directions concurrently, using mostly more debt finance.

In addition to a raft of multi-billion dollar greenfield expansion plans, the Adani group continues to do billion dollar acquisitions on a regular basis, having acquired Avantha group's Korba West 600MW domestic coal power plant (first reported in November 2014,¹²⁵ this acquisition was reported as delayed a year later¹²⁶ and still yet to be finalized). In April 2015 Adani Power paid Lanco Infratech US\$1bn for the 1.2GW Udupi import coal-fired power plant. Adani Transmissions in December 2016 acquired Reliance Infrastructure Limited for a reported US\$147m¹²⁷ and then in January 2017 was reported as "in advanced discussions to buy out South East UP Power Transmission Company Ltd, which is a holding company of Spanish infrastructure group Isolux Corsan Concesiones" for US\$800-1,000m.¹²⁸ In a period when many financially distressed Indian power conglomerates are working to deleverage, the Adani group is going in the opposite direction, taking on even more financial leverage.

The strategically challenged Carmichael low quality export thermal coal mine has to compete with other new greenfield endeavors for the Adani group to expand into defense hardware manufacturing such as jet fighters, methanol plants, coal-to-fertilizer plants, chemical plants, water infrastructure, coal fired power plants for electricity export to Bangladesh,¹²⁹ plus a range of expansions of the five core businesses. Not the least of these expansion plans is the multi-billion dollar annual investment in renewables underway at Adani Green Energy, a business commenced as recently as 2015 but which is already one of India's largest renewable energy companies with plans to spend US\$10bn to build 10GW of new solar projects, plus stage II of its billion dollar greenfield solar cell / module manufacturing plant at Gujarat as part of Prime Minister Modi's "Make in India", "Electricity for All" and COP21 Climate Agreement campaign focus. The alignment of Adani's investment plans with the Indian government's draft National Electricity Plan to 2027 is clear and consistent, with the Carmichael coal proposal the distinct exception, one might even call it a legacy stranded asset, with the A\$1.4bn sunk cost yet to be written off.

¹²⁵ <http://economictimes.indiatimes.com/industry/energy/power/adani-power-to-acquire-avantha-groups-korba-project-for-rs-4200-crore/articleshow/45249125.cms>

¹²⁶ <http://www.livemint.com/Home-Page/L4GCf0yVXojqgzlqgPtbgN/Adanis-deal-with-Avantha-for-Korba-may-fall-through.html>

¹²⁷ http://www.business-standard.com/article/companies/adani-transmission-executes-spa-for-acquiring-100-of-reliance-infrastructure-assets-116120701089_1.html

¹²⁸ <http://economictimes.indiatimes.com/industry/energy/power/adani-group-eyeing-big-bang-acquisition-in-power-transmission-segment/articleshow/56734701.cms>

¹²⁹ <http://www.livemint.com/Companies/EqJVj5MfTi5FOk8L9e5wtO/Gautam-Adani-says-debt-level-not-a-concern-eyes-new-sectors.html>

Adani's Proposed Expansion Investments (US\$m)

Entity	Target or Project	Date	Cost	Status
Adani Ports & SEZ	Bhavanapadu Port in AP	Oct-16	US\$bn	0.60 Adani Group now the sole bidder to develop the port in AP. The bid is currently being evaluated, estimated cost is Rs 3,725 crore
Adani Ports & SEZ	Vizhinjam Port, Kerala	Jul-16	US\$bn	0.60 The Kerala government in July 2015 handed over an offer letter to Adani Ports. The Rs.4,000-crore (US\$0.6bn) first phase of the Rs 7,525 crore Vizhinjam deep sea transshipment port project is due to be ready by 2019.
Adani Ports & SEZ	Kattupalli Port development, Tamil Nadu	Jul-16	US\$bn	0.60 Adani expressed interest in developing Kattupalli port in north Chennai on a par with Krishnapatnam port in Andhra Pradesh. Krishnapatnam's second phase expansion has been undertaken to increase the capacity to 4.8TEUs at an investment of Rs 4,000 crore.
Adani Ports & SEZ	LNG terminal at Dhamra, in Odisha	Aug-16	US\$bn	0.38 Aug16, Dhamra terminal will be built when construction of a 350km pipeline to take the LNG to Bengal starts. Cost of the project Rs. 6,000 crore. Indian Oil Corp and GAIL India Ltd will take a 49% stake.
Adani Ports & SEZ	Dhamra Port in Odisha	Jan-17	US\$bn	1.60 Acquired Dhamra port on the east coast in Odisha acquired from Tata / L&T, with the aim to spend US\$1.6bn expanding this port capacity to 100Mtpa by 2020.
Adani Ports & SEZ	Dahej Port expansion	Oct-16	US\$bn	0.03 A JV of Adani Enterprises and Petronet LNG, has developed Dahej in phases, and phase III expansion involves raising the cargo-handling capacity to 23Mtpa from 11.7Mtpa, and developing other supporting infrastructure. The cost of the expansion is estimated to be Rs4.64bn (US\$70m). The Dahej port handles multi-cargo such as coal, de-oil cake, cement, steel, wheat, rice and others.
Adani Ports & SEZ	Gujarat port capacity expansion (Mundra, Dahej, Hazira, Ajira, Tuna)	Jan-17	US\$bn	2.49 Adani Ports, India's largest private port and logistics company, in the next five years will invest Rs 16,700 crore to expand capacity of all its Gujarat ports at Mundra, Dahej, Hazira and Ajira and Tuna
Adani Ports & SEZ	Construction and operation of a new coal port at Cuddalore, Tamil Nadu	Aug-16	rumour	0.00 IL&FS are planning to set up a new captive port to be developed and run by Adani Ports. Will supply coal to IL&FS's Tamil Nadu thermal power project. Estimate cost to Adani Rs 300 crore (US\$45m).
Adani Ports & SEZ	Industrial Port for timber products at Mundra Port, Ahmedabad, Gujarat.	Oct-16	US\$bn	0.10 Jacob Mannothra, Managing Director, Zindia Limited (and Managing Director, Indian Newslink), signed here this evening a Memorandum of Understanding (MoU) with Karan Adani, Chief Executive of Adani Port and SEZ Limited to develop an industrial port for wood products processing and remanufacturing at Mundra Port in Ahmedabad, Gujarat.
Adani Green Energy	Renewables in Gujarat	Jan-17	US\$bn	3.43 Adani said the group is also accelerating its investment in renewable space in Gujarat. "In the year 2021, our new investments in solar as well as wind development will exceed Rs 23,000 crore," he added.
Adani Green Energy	Solar Project development	Sep-15	US\$bn	1.00 Adani Group has proposed a 1 GW solar project in Jharkhand.
Adani Green Energy	Solar Project development, Rajasthan	Jun-15	US\$bn	1.00 Adani signed a MoU with Rajasthan Renewable Energy Corp to develop a new solar park facility JV with a target to warehouse up to 10GW of solar with a potential investment totaling Rs60,000 crore (US\$10bn) by 2022. Adani itself will develop 5GW within the park.
Adani Green Energy	Solar Project, Pavagada, Karnataka	Sep-16	US\$bn	0.15 World's largest solar power plant to be set up (2GW) with Adani Power having secured 100MW at US\$79/MWh. Adani has since won another 50MW contract at the Pavagada Park at Rs4.86/kWh.
Adani Green Energy	Renewables investment in Jharkhand	Feb-17	US\$bn	0.45 ₹3,000 crore will be towards increasing its solar portfolio by 500 MW.

Adani Green Energy	Solar Project development, Uttar Pradesh	Sep-15	US\$bn	0.10	Adani won a 50MW solar park tender in Uttar Pradesh as the first step in a 1GW solar park proposal from Feb'2015.
Adani Enterprises	Solar Module Manufacturing	Aug-16	US\$bn	3.00	Indian infrastructure company Adani Enterprises Ltd expects to commission a 1.2-GW solar cell and module factory in the state of Gujarat. Phase 1A (commissioned Dec 2016, capacity 1.2GW) to cost USD300m and Phase 1B by 2018 (capacity 3GW). Phase 2 by 2020 (capacity 2GW). Plus polysilicon as a Phase 3.
Adani Enterprises	Solar Power in Australia	Aug-16	US\$bn	1.00	Adani intends to construct 1000MW of solar in Australia by 2021.
Adani Enterprises	Adani Solar USA	Sep-16	US\$bn	0.00	Adani is actively seeking potential partners in the USA for both solar module supply and ventures in utility scale projects.
Adani Enterprises	Copper Smelter	Jul-16	US\$bn	1.50	Adani Enterprises plans to build a copper smelter as a key input into solar module manufacturing.
Adani Group	Indian Fertilizer manufacturing	Jul-15	US\$bn	4.00	Adani is carrying out due diligence of at least three defunct urea manufacturing units, including Sindri in Jharkhand, on the premise India imports 30% of its 30Mtpa of urea needs.
Adani Enterprises	Chhattisgarh coal-to-ammonia	Aug-15	US\$bn	0.00	Adani will invest Rs 25,200 crore in Chhattisgarh to develop a coal to poly-generation facility that consists of ammonia/urea and substitute natural gas (SNG) complex via gasification of Indian high ash domestic coal. The project includes coal to urea, coal to SNG plant and coal-based thermal power plant.
Adani Group	JV with Foxconn in electronics manufacturing assembly	Aug-15	US\$bn	0.00	Adani and Foxconn are planning a JV to assemble electronics in India in a bid to promote the government's 'Make In India' program.
Adani Group	Adani Defence Systems & Technologies	Sep-15	US\$bn	0.00	Adani is evaluating setting up a greenfield Gujarat warship yard.
Adani Group	Adani Defence Systems & Technologies	Jul-15	US\$bn	0.00	Adani is evaluating options to manufacture military helicopters.
Adani Enterprises	Adani Bunkering bidding for Hambantota Bunkering project	Aug-16	US\$bn	0.00	Bids were submitted for bunkering by the Ceylon Petroleum Corporation (CPC) and Ceylon Petroleum Storage Terminals Ltd (CPSTL) as well as Adani Bunkering and the John Keells Holdings-World Fuel Services joint venture.
Adani Group	Adani Finserv	Sep-16	US\$bn	0.08	Adani Finserv is set to launch as a non-banking finance company (NBFC), possibly through a partnership with Macquarie. Adani will finance Rs. 500 crore.
Adani Enterprises	Gold mining, Jharkhand	Oct-16	US\$bn	0.00	India's second gold mine auction in Jharkhand is set to take place on 26 October with four firms—Adani, Rungta Mines Ltd, Maithan Ispat Ltd and Ramgad Minerals and Mining Ltd—qualifying for bidding
Adani Enterprises	JV with Elbit Systems Ltd of Israel to make drones. Adani-Elbit Advanced Systems India Ltd incorporated in India.	Nov-16	US\$bn	0.00	Adani Enterprises said that it has formed a joint venture firm with Israel-based defence electronics company Elbit Systems to manufacture drones in India.
Adani Enterprises	AP Airport project	Nov-16	US\$bn	0.00	Infrastructure majors GMR, GVK, Adani Ports, Essel Infra, Tata and Airports Authority of India are among a few bidders who have shown interest in developing the international greenfield airport at Bhogapuram in Vizianagaram district of Andhra Pradesh.
Adani Enterprises	Adani bidding for small oil fields	Nov-16	US\$bn	0.00	The government has received 134 bids for 34 of the 46 contract areas in an oilfield auction with billionaire Dilip Shanghvi's Sun Group and Adani Group bidding for some of the fields, a response the oil ministry described as "overwhelming".
Adani Group	Increased investment in Odisha	Dec-16	US\$bn	0.00	Adani Group will increase investment in Odisha by Rs. 3,000 crore said Gautam Adani without providing a timeline.
Adani Group	Adani Enterprises to enter the cement business	Jan-17	US\$bn	0.82	Adani Group will set up a 10m tonne cement clinker plant in Gujarat at an investment of Rs5,500 crore
Adani Group	Desalination plant	Jan-17	US\$bn	0.30	Rs2,000 crore desalination plant in Gujarat
Adani Group	Adani Wilmar expansion	Jan-17	US\$bn	0.18	Adani Wilmar is India's largest edible oil business and recognised as undisputed market leader that sells under brand name Fortune, the group will invest Rs 1,200 crore in expanding edible oil manufacturing capacity at Mundra and Ajira.

Adani Group	Adani jet fighter manufacture/servicing hub	Feb-17	US\$bn	0.00	The Adani group's foray into India's military industrial complex will concentrate primarily on aeronautics and the group is drawing up a plan for the manufacture of jet fighters and unmanned aerial vehicles (UAV) besides setting up a maintenance, repair and overhaul (MRO) hub for aircraft at its 200-acre land bank in Mundra
Adani Enterprises	Jharkhand coal block development	Feb-17	US\$bn	0.10	The group will invest Rs 700 crore in coal block mining
Adani Enterprises	Parsa East and Kete Basan coal blocks expansion	Sep-16	US\$bn	0.50	Adani Mining is developer and operator for what was to be 10Mtpa mine, now attempting to expand the mine to 15Mtpa, with plans for 31Mtpa of Indian coal production. Adani to bid to become developer/operator of 15 mines in 3 years.
Adani Enterprises	Carmichael Coal and Rail	Dec-16	US\$bn	3.85	25Mtpa coal mine, 300km plus 90km rail. A \$2.2bn railway, but that is the SEIS value for 300km, the extra leg of 89km (or 92km) will cost another \$800m, so the railway is \$3bn, plus \$500m for the train sets. the power station, the water infrastructure, the airport, the rehab bonds, the trucking and heavy equipment fleet et al are all on top, hence the value in total stacks up to around A\$5bn for the stage I 25Mtpa mine - rail proposal.
Adani Power	1.6GW new coal fired power plant at Udupi	Sep-16	US\$bn	1.80	Udupi Power Corporation Ltd (UPCL), a subsidiary of Adani Power Ltd, will produce an additional 1,600 MW of power at its thermal plant in Udupi by 2020. 11,500 crore plus 500 crore jetty expansion.
Adani Power	Additional capacity of 1600MW at Kawai	Sep-16	US\$bn	1.50	Per the Adani Power 2015-16 Annual Report, this capacity expansion is planned (p. 34)
Adani Power	Additional capacity of 540MW at Sarguja	Sep-16	US\$bn	0.60	Per the Adani Power 2015-16 Annual Report, this capacity expansion is planned (p. 34)
Adani Power	Nabha Power Project	Aug-16	US\$bn	0.00	L&T is reportedly in talks with the Adani group to sell the project at an estimated value of around Rs 3,000 crore (US\$450m).
Adani Power	Power exports to Bangladesh	Aug-16	US\$bn	0.00	3,000MW power plant planned for Orissa for export of power to Bangladesh
Adani Power	1,600 MW thermal power station, Jharkhand	Feb-17	US\$bn	2.24	1,600 MW Godda thermal power plant to be built with entire output transmitted to Bangladesh after agreement between Adani Power and Bangladesh Power Development Board. UPDATE: 17 Feb 2017 - Construction to begin later in 2017.
Adani Transmission	Power transmission acquisition	Jan-17	US\$bn	0.80	Adani in advanced discussions to buy out South East UP Power Transmission Company Ltd, which is a holding company of Spanish infrastructure group Isolux Corsan Concesiones. It is one of the largest single asset power transmission targets in the country and the enterprise value of the proposed transaction of \$800m to \$1,000m.
Adani Transmission	1900 Ckt kms under construction	Sep-16	US\$bn (est).	0.75	CEO Statement within the Adani Transmission Annual Report 2015-16: Adani won three projects tendered by Power Finance Corporation - Sipat, Chhattisgarh A and B.
		Total	US\$bn	35.53	

Annexure III

Adani Family – Margin Lending Against Listed Stocks

The Adani family (the “Promoter” in Indian parlance) has margin loans registered against its shareholdings in all four listed Adani group entities. The margin loans range from nearly a fifth (19%) of the Adani family's 73.8% shareholding in Adani Enterprises, to 39.2% of the family's 56.7% holding in Adani Ports, and nearly half (43.7%) of its 55.5% shareholding in Adani Power. The equity collateral held by the banks is worth a combined US\$3,359m (as of 6 March 2017). Assuming a loan-to-value-ratio (LVR) of a very conservative 45% implies that the Adani family has loans outstanding of US\$1,512m collectively secured by their shareholdings in the listed entities.

IEEFA would note that margin lending is an added financial risk for the underlying companies. Not only does each have extensive multi-billion-dollar financial leverage within the listed entity group, but the major shareholder has borrowed against the equity value of their shares. If the market value of any of these four stocks were to unexpectedly deteriorate, the banks would legally be entitled to the underlying security if the Adani family couldn't rapidly raise alternative finance. The banks would most likely sell on market their equity collateral to protect their loan exposure, thereby worsening any market selloff (as was a major contributing factor to the global financial crisis that hit the US and Europe in 2007).

	Margin Lending fpo M	Margin Lending % of Adani Holding	Collateral Held US\$m	LVR	Margin Lending US\$m
Adani Enterprises	154.1	19.0%	272	45%	123
Adani Power	918.8	43.7%	481	45%	216
Adani Ports	459.9	39.2%	2,328	45%	1,048
Adani Transmission	235.8	29.1%	278	45%	125
Total Equity Holdings (US\$m)			3,359		1,512

Source: BSE Corporate filings, IEEFA estimates

Annexure IV

Capex Program for Carmichael Coal, Rail & Port

IEEFA estimates that the entire Carmichael 40Mtpa 60-year thermal export coal project has a capital expenditure cost totaling A\$16.6bn (US\$12.6bn), split over the initial investment in both the Carmichael coal deposit and the purchase of Adani Abbot Point Coal Terminal (T1), plus a likely 2-3 stage development due principally to financial constraints on the proponent.

The Carmichael proposal has been downsized multiple times, starting at a 60Mtpa, 90-year proposal back in 2010 to now most likely be a 25Mtpa 30-year mine and rail proposal for stage I, as outlined by Australian CEO Jeyakumar Janakaraj in September 2016, and subsequently confirmed by Gautam Adani in December 2016.

	A\$m	
Purchase of Carmichael Coal from Linc Energy		500
Purchase of EPC 1080 from Mineralogy Pty Ltd		25
Purchase of Carmichael royalty rights from Linc Energy		155
Additional expenditure on Exploration and evaluation		443
Option to Purchase of Moray Downs	60	
Purchase of Moray Downs	50	110
Moray Power Station - 150MW multi-fuel	400	
Mine rehabilitation bond	250	
Mine development	3,430	4,080
Rail development	388	2,736
Train sets	1,120	3,856
Purchase of Abbot Point Coal Terminal - T1	1,829	
Estimated T1 Port Capex post purchase	302	2,131
Adani Abbot Point Coal Terminal - T0 stage II	3,000	
Adani Abbot Point Coal Terminal - T0 stage III	2,100	
Dredging	200	
T0		5,300
Total proposed investment (A\$m)		16,600
USD / AUD		0.76
Total Proposed Investment (US\$m)		US\$12,616
<u>Invested to-date</u>		
Purchase of Carmichael Coal from Linc Energy		500
Purchase of Carmichael royalty rights from Linc Energy		155
Purchase of EPC 1080 from Mineralogy Pty Ltd		25
Additional expenditure on Exploration and evaluation		443
Estimated Mine Capex, Admin & Interest post purchase		186
Option to purchase of Moray Downs		60
Purchase of Abbot Point Coal Terminal - T1		1,829
Estimated T1 Port Capex post purchase		302
Total To-Date (A\$m)		3,500

Source: IEEFA estimates

To-date the Adani family has spent an estimated A\$3,500m on the T1 and Carmichael proposal, including a staged \$680m to acquire the coal deposit.

IEEFA estimates a stage I, 25Mtpa coal and rail project would require another A\$5.3bn (US\$4bn) investment, that being A\$2,050m for the coal mine and associated airport, road access, water, sewage and power infrastructure, plus A\$3,300m for the greenfield 388km railway line.

Total Mine investment still required - Stage I 25Mtpa		
Purchase of Moray Downs		50
Moray Power Station - 150MW multi-fuel	60%	240
Mine rehabilitation bond	50%	125
Mine development	50%	1,635
Total Mine investment still required - Stage I (A\$m)		2,050
USD / AUD		0.76
Total Mine investment still required - Stage I (US\$m)		1,558
Total Rail investment still required - Stage I		
Rail development		2,740
Train sets	50%	560
Total Rail investment still required - Stage I (A\$m)		3,300
USD / AUD		0.76
Total Rail investment still required - Stage I (US\$m)		2,508
Mine & Rail - Stage I - still to go (A\$m)		5,350

Source: IEEFA estimates

Annexure V

Carmichael Coal Quality – a 30% Discount to Benchmark

In IEEFA's view, there is one additional insurmountable operational / financial hurdle for the Galilee beyond India's energy market transformation that clearly delineates that this project is no longer strategically relevant and the geographic isolation of the project site in central Queensland 388km from the nearest coal export facility (Abbot Point), with no existing industrial scale power, water, sealed roads, airports and railway infrastructure.

There is very little that Adani Mining can do about the extremely low quality of the thermal coal deposit. Australia's benchmark thermal coal exports are high quality – as defined by the two parameters that set the pricing of export thermal coal – energy and ash content. The benchmark Newcastle thermal coal is 6,000kcal energy, and 12-14% ash. By comparison, the Carmichael coal deposit is estimated to be 4,950kcal energy and 26% average ash content. Adani Mining is likely to invest in a huge coal handling and preparation plant in order to improve the energy and ash content of the coal prior to shipping, but this is an expensive manufacturing process and it requires very significant volumes of water, which being contaminated in the process, subsequently needs to be disposed of. The Carmichael proposal is located in a drought prone, water stressed area, making this coal washing process at risk of prolonged disruption.

6,000kcal price was US\$79.00/t, while the Newcastle 5,500kcal was US\$69.00/t.			
Source: S&P Global Platts price sheet			
			Ash
Newcastle Benchmark (12-14% ash)	6,000	79.00	13%
Newcastle Benchmark	5,500	69.00	20%
Price discount (%)		-12.7%	
Price discount (US\$)		-10.00	
Carmichael Coal	4,950		26%
Discount vs 5,500kcal	-10.0%		
Discount 5,500kcal vs 6,000kcal		-12.7%	
Discount vs 5,500kcal		-10.0%	
Discount 26% vs 20% ash		-7.3%	
Total Discount		-30.0%	

Source: Adani Mining Pty Ltd Supplementary Environmental Impact Statement (SEIS), S&P Platts, IEEFA Estimates.

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