The Economic (non)viability of the Adani Galilee Basin Project

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Background

On 6 June 2017, the chairman of the Adani Group, Gautam Adani announced that the board of the group had given final investment approval for the $5.3 billion first stage of the Carmichael mine project in the Galilee Basin and for the associated project of constructing a rail line from the Basin to the Abbot Point coal terminal, also owned by Adani. However, it was indicated that the project remained contingent on finance.

Approximately $900 million of the required finance would be derived from a loan requested from the Australian government's Northern Australia Infrastructure Facility (NAIF). In addition, the Queensland government has agreed to defer the payment of royalties, under the condition that the amount deferred would be repaid with interest at a later date.

This is a brief analysis showing that the Adani mine-rail project is highly unlikely to be economically viable, and that any public money lent to the project, whether through the NAIF or through a deferral of royalties is unlikely to be recovered.

I draw heavily on the work of the Institute of Energy Economics and Financial Analysis (IEEFA) including

* The expert witness report by Tim Buckley of provided to the Land Court of Queensland in 2015

* The updated report Adani: Remote Prospects Carmichael Status Update 2017

The note covers the following items

(i) Movements in coal prices and exchange rates since 2015

(ii) India's shift away from coal

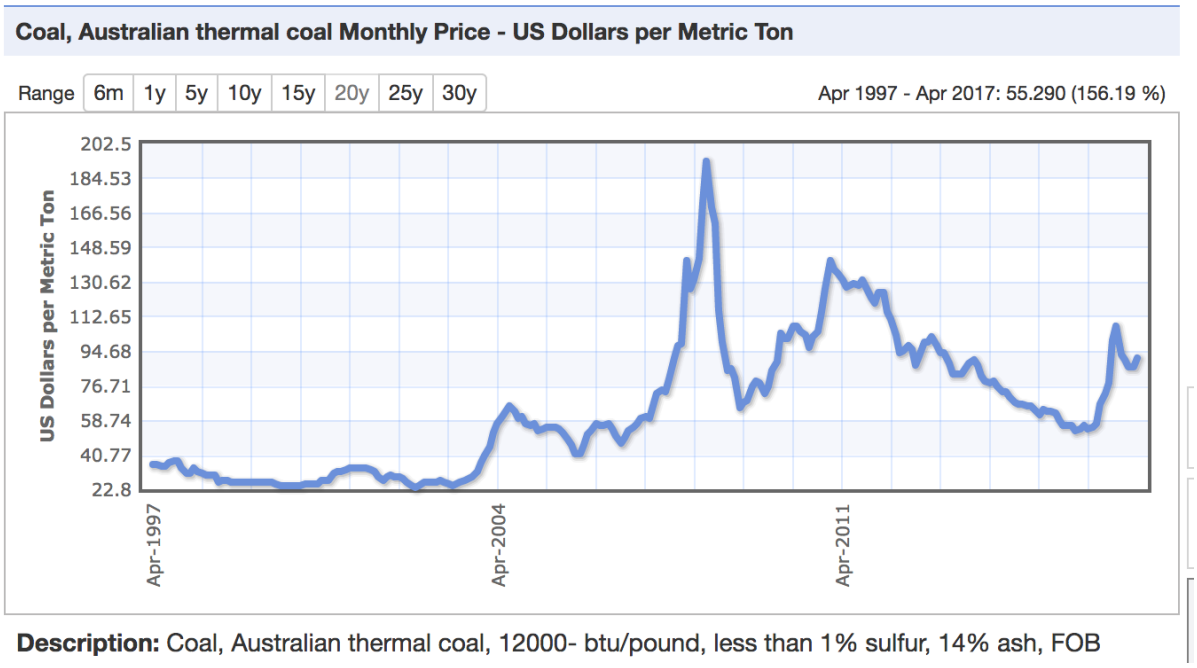
(ii) The adoption by Adani of a scaled down 'Stage 1' proposal

(iii) The possibility of a loan from the Northern Australia Infrastructure Fund and a deferral of royalty payments to the Queensland government

The main conclusion is that, even if the decline in coal prices anticipated in futures markets fails to occur, the Adani project is unlikely to deliver returns sufficient to allow a return to lenders and investors.

Coal prices and global coal markets

Between 2005 and 2011 world coal prices rose from around $US50/tonne to $US130/tonne. By 2011, when Adani purchased the Carmichael mine lease, there was an expectation of further increases, as a result of rapid growth in demand, particularly from India and China. However, rapid reductions in the use of coal-fired power in Europe and North America, combined with a slowdown and then a decline in Chinese coal consumption, produced a steady decline in seaborne coal prices.



Description: Coal, Australian thermal coal, 12000- btu/pound, less than 1% sulfur, 14% ash, FOB

Prices recovered in the second half of 2016. This was primarily the result of Chinese government policy, which encouraged the closure of more than 1000 coal mines in that year. China has a total of 10,760 mines, and 5,600 of them will eventually be required to close under a policy banning those with an annual output capacity of less than 90,000 tonnes, the China National Coal Association has estimated.

http://www.reuters.com/article/us-china-energy-coal-idUSKCN0VV0U5

The aim of the policy is partly to close smaller, more dangerous mines

http://www.rfa.org/english/commentaries/energy_watch/china-coal-08152016150446.html

and partly to maintain the economic viability of the remaining large mines.

The rate of closure of small mines in 2016 was insufficient to achieve the latter goal, as coal prices continued their decline. As a result, the government issued an order limiting mines to 276 days of operation per year. This turned out to be a severe overcorrection, and the price of coal tripled in a matter of months. The order was relaxed late in 2016, and prices fell back, though they are still well above the levels of early 2016. It appears that the Chinese government aims to reduce coal output gradually, seeking to maintain prices around $US 75/ tonne.

Meanwhile China's consumption of coal, which peaked in 2014 has continued to decline.

https://www.nrdc.org/experts/alvin-lin/understanding-chinas-new-mandatory-58-coal-cap-target

There was a further brief recovery in coal prices following disruptions to Australian supply caused by Cyclone Debbie in March 2017. It appears that prices have now resumed their decline.

http://www.reuters.com/article/us-china-energy-coal-idUSKCN0VV0U5

India's shift away from coal

Adani representatives have stated that the world price of coal is irrelevant to the viability of the project, since the coal will be sold to other listed enterprises within the Adani group. This suggestion raises a number of difficulties, discussed below.

However, it suggests the importance of developments within India. The importance of the Indian market is enhanced by political rhetoric suggesting that the availability of coal imports will be crucial in providing access to electricity to hundreds of people who currently lack it.

This rhetoric is contradicted by the reality of developments in India. The Indian government has pursued a policy of import replacement in energy, with particularly strong support from Energy Minister Piyush Goyal. Key elements include:

* Expanding domestic coal production

* Ending thermal coal imports by 2020

* Building 275 GW of renewable electricity capacity by 2027

* Shifting to an all electric car fleet by 2030 and thereby eliminating reliance on imported oil for transport

* Building 10 Indian-designed nuclear plants, thereby ending reliance on Russian suppliers.

The policy of ending coal imports has focused primarily on publicly owned generators. It now appears possible that imports by public generators will fall to zero in 2018.

http://economictimes.indiatimes.com/industry/indl-goods/svs/metals-mining/government-power-companies-may-not-import-coal-in-fy18/articleshow/58618223.cms

At the same time, numerous proposed coal plants, including some proposed by Adani, have been cancelled. This largely reflects the rapid reduction in the cost of solar photovoltaic (PV) power in India, which has rendered new coal-fired power stations uneconomic in most cases, and led to a decline in capacity utilisation for existing plants.

https://www.pv-tech.org/news/solar-becomes-cheapest-new-power-source-in-india-as-auction-winners-reveale

Adani's strategy

As a private company, Adani is not directl subject to the Indian government policy of ending coal imports. However, the company's announced strategy of vertical integration, in which Adani Mining would supply coal to Adani Power at a price that would be unaffected by changes in global markets has been undermined by decisions by India's Supreme Court on compensatory power tariffs. The Court made it clear that electricity suppliers would not, in general, be allowed to pass on increased costs of imported coal outside the terms of their power purchase agreement (PPA) contract.

http://www.business-standard.com/article/companies/rough-road-ahead-for-adani-group-over-paring-debt-117042601276_1.html

Most strikingly, the day after the announcement that the Carmichael project would proceed, Adani Power announced that its largest power station, the 4.6 GW Mundra Ultra Mega Power Plant would be spun off into a subsidiary to be called Adani Power (Mundra). It is understood that Adani seeks to dilute its stake in this subsidiary to permit a reduction in the unsustainable debt levels of the enterprise. This is the most significant in a series of corporate restructures that have had the effect of insulated the core Adani Enterprises business from the Adani coal interests. Assuming that the Mundra power station passes out of the control of the Adani group, the remaining coal fired power stations in Adani Power would not provide sufficient imported coal demand to sustain a strategy of vertical integration.

The original Adani proposal and the revised Stage 1

The original Adani proposal involved production of 60 million tonnes of coal by 2022, with an expected life of 90 years. This was subsequently downgraded to 40 million tonnes of coal by 2022, with an expected life of 60 years, and then to 25 Mtpa. Given the remoteness of the possibility that coal will be in demand for electricity generation beyond 2050, the difference in duration is immaterial but the reductions in scale had important implications for the viability of the rail line, the capital cost of which is essentially independent of the freight volume.

Capital investment for the life of the Mine (onsite infrastructure) was expected to total $21.5 billion. This total figure is still regularly cited when the project is described as a $22 billion project.

The revised Stage 1 project involves deferring the expansion of the Abbot Point terminal and a smaller initial mine. IEEFA provides estimates of the required capital expenditure, which are presented in Appendix 1.

Finance

Adani has so far invested approximately $3.5 billion in the project, of which approximately $2.1 billion financed the purchase and subsequent of the Abbot Point T1 coal terminal, while

the reminder was associated with the acquisition of the Carmichael mine site and associated rights. It has been suggested that part or all of the Abbot Point terminal might be sold, and that the proceeds could finance investment in the mine-rail component of the project

http://www.theaustralian.com.au/business/dataroom/adani-group-may-sell-down-abbot-point-coal-port/news-story/46005607243ea9244dc48957dbe6fad9

The remaining investment is 'sunk' and would be written off if the Carmichael mine project failed to proceed, unless Adani could find a buyer for this asset. It seems likely that unwillingness to write off such a large investment is one reason why Adani has persisted with the project.

Report suggest a funding requirement of $3.3 billion, implying that Adani's equity contribution would be $3.3 billion in addition to the amount already invested.

The Economics of the Adani mine-rail-port project

Estimating the sale price for Carmichael coal

As of late May 2017, the price of Australian thermal coal was approximately $US84/tonne

Futures markets predict a decline in the price over coming years. The futures price for delivery in February 2020, the likely starting date for shipments form the project, is $US63.65/tonne.

The standard price is quoted for Newcastle coal, FOB, 6,300 kcal per Kilogram (11,340 btu/lb), less than 0.8%, sulfur 13% ash. By contrast, as noted by Tim Buckley of IEEFA, the coal from the Carmichael mine's energy content of ~5,200kcal Gross as Received (4,950kcal NAR) is 17% lower than the benchmark. The 26% average ash content (as disclosed in the Supplementary Environmental Impact Statement (SEIS)[8]) is double the 6,000kcal index. Buckley estimates that the lower quality of the Carmichael mine's output will result in a 30 per cent discount in revenue per tonne.

https://tradingeconomics.com/commodity/coal

Based on the discussion above, the price of coal from the Carmichael mine, assuming exports began immediately, can be estimated on the basis of

* Newcastle coal price $US 84/tonne

* Exchange rate $1.00 US = $A1.34

* Quality discount 30 per cent

$A price = $84*1.34*0.7 = $A78.40 tonne

This is an upper bound estimate, since it reflects the unsustainable spike associated with the supply restriction policy imposed by China in 2016.

Costs and net returns

The costs of a project of this kind may be classified as

(a) Operational costs of mining and shipping, expressed in $/tonne

(b) Corporate overhead costs

(c) Depreciation and amortization

(d) Interest on debt

(e) Tax and royalty payments

Profit net of all costs provides the return to equity investors

In its original analysis, Adani provided a letter from McCullough Robertson, dated January 2015 estimating costs of $US38.70/tonne (although other analyses suggest the cost may be higher). Based on the exchange rates prevailing at the time, this suggests a cost of $A50/ tonne in 2015. Updating for inflation at an annual rate of 2 per cent, the implied cost is $A55.

These costs do not include the costs of rail transport and ship loading costs, needed to make a comparison with FOB costs from Newcastle

http://generalcargoship.com/sales-contract-FOB.html

Standard estimates for loading costs vary, but average around $5/tonne. For operational rail costs, I assume 1 cent per tonne mile, or approximately $4/tonne for a 388 Km line.

The sum of operational costs for mining, rail and ship is therefore estimated at $64/tonne.

The standard royalty rate is 7 per cent of value up to $100 or approximately $5.50/tonne based on the assumed price of $78.40.

Based on these assumptions the FOB price for Carmichael coal, net of operational costs would be approximately $14.50/tonne. If royalties were paid at the standard rate, the net return would be $9/tonne.

Assuming output of 25 million tonnes per year, the surplus of revenue over operating costs would be approximately $225 million per year if full royalties were paid, and approximately $360 million per year if royalties were reduced to $5 million per year.

To obtain earnings before interest, tax, depreciation and amortization (EBITDA) it is necessary to deduct corporate overhead costs. Adani proposes a head office staff of 500. Assuming an average salary of $60 000 and on-costs of 66 per cent, this would imply annual overheads of $50 million.

Deducting these costs yields EBITDA of $175 million per year (royalties paid) or $310 million per year (royalties deferred).

Relative to a $6.6 billion project, this is an EBITDA rate of under 3 per cent (royalties paid) or 5 per cent (royalties deferred). The standard 'hurdle rate' for new projects is 15 per cent.

https://www.pwc.com.au/pdf/pwcs-mine-2016.pdf

Interest on debt

Adani Abbot Point Terminal is rated a sub-investment grade bond issuer by Moody's while S&P has the company's investment grade on negative watch.

http://thewire.fiig.com.au/article/commentary/trade%20opportunities/2017/05/30/top-picks-30may2017

The Carmichael project involves considerably greater risk than Abbot Point, which is protected, in the medium term, by 'take or pay' contracts with shippers such as Glencore, running until 2020

http://thewire.fiig.com.au/article/research/company%20updates/2016/03/15/adani-abbot-point-downgraded

The most recent bond issue by AAPT had an indicative yield to maturity of 6.82%

Hence, the rate of interest required on commercial debt finance for the project appears likely to be at least 7 per cent. Applied to a financing requirement of $3.3 billion, this implies an interest cost of $230 million, which exceeds the project EBITDA (royalties paid) of $175 million. If royalty payments are deferred, annual income before depreciation and amortization would be around $80 million.

The viability of the project in cash flow terms therefore depends either on an indefinite deferment of royalties or on the willingness of government institutions to provide high risk loans at low interest rates.

Depreciation and amortization

Operation of a capital intensive project such as a mine or railway requires an allowance for depreciation and amortization in order that capital assets can be maintained and that capital investments can be returned at the end of the project's life. The analysis above indicates that the Adani Carmichael project has no capacity to generate sufficient returns, after operating costs and interest payments, to cover depreciation and amortization. This suggests that the project is highly unlikely to repay lenders and investors, and that it may be abandoned at some point

Public lending to Adani

Commercial banks have been reluctant to offer finance to the Adani project. A large number including twelve major global banks and three of the four main Australian banks have taken the unusual step of announcing that they will not lend to the project. These announcements reflect a combination of several judgements

(a) the project cannot be expected to generate returns sufficient to service its borrowings

(b) in view of the warnings by financial regulators about the risks of stranded fossil fuel assets, a failed loan to a project of this kind could result in a judgement that the banks concerned had violated prudential requirements

(c) given the political toxicity of the project, the reputational risks facing banks were best managed by an explicit announcement that the project would not be funded

Given the difficulties of attracting commercial loans, the Adani project has relied heavily on the prospect of support from governments, or government-backed financial institutions. The major contenders include:

(a) Export-import banks. The proposal originally involved Korean steel firm POSCO, which raised the possibility of support from Korea's Eximbank. There was also a possibility of support from China, based on finance for supplies of machinery. The relationship with POSCO may have broken down, with Adani now announcing steel will be sourced from Arrium in Whyalla. This apparently reflects the abandonment of efforts to secure Eximbank funding, and a focus on Australian government support through the Export Finance and Insurance Corporation (EFIC).

(b) The State Bank of India. A loan of $1 billion was announced in 2014, but turned out to be a non-binding memorndum of understanding. SBI finance remains a possibility, but the likelihood has declined, particularly because SBI is increasingly burdened with non-performing loans.

(c) The NAIF. The responsible minister, Senator Canavan has given strong indications that the requested loan of $900 million will go ahead.

(d) The Queensland government has already committed to a royalty deferral, which is, in effect, a loan. In addition, Adani received an unlimited water licence, apparently free of charge However, it seems likely that more concessions will be sought in the future.

Why is the project proceeding

The analysis above shows that, even under highly favorable assumptions, the Adani Carmichael project will be unable to generate sufficient returns to cover interest at commercial rates and repay capital to lenders and investors. This analysis raises the question of why the Adani corporation would choose to proceed with such a project. Two possible answers present themselves.

The first is that Adani does not in fact intend to proceed with the project in the near future. Rather, the project is being kept alive with relatively modest expenditure to avoid writing off the large amounts already invested and to maintain an option value in the hope that 'something will turn up', such as an unexpected and sustained increase in the price Adani can realize for coal.

In support of this hypothesis, it may be noted that the final government approval for the project was obtained over a year ago, in February 2016. While some legal action continued after that date, there was nothing to stop Adani from commencing construction in the (correct) expectation that objections would be unsuccessful. This pattern of delay has continued. Whereas earlier announcements suggested that construction would begin in the September quarter of 2017, it now appears that only pre-construction works, such as land clearing, will take place. Financial close for the project, which was previously supposed to be reached in June 2017, now appears unlikely to take place until March 2018 at the earliest.

A second hypothesis is that the complexity of the Adani corporate structure is such that Adani could construct the proposed rail line almost entirely with public funds provided on concessional terms, then hope that other coal mines in the Basin would render it profitable. The apparent transfer of ownership of the rail project to an Adani-controlled company in the Cayman Islands supports this idea.

A third possibility is that by making continuous new demands on governments for concessions of various kinds, Adani will eventually be able to blame government policy for the failure of the project and extract compensation. If this is the strategy, it has so far been foiled by the abject compliance of governments at all levels.

Conclusion

The Adani mine-rail-port project is not commercially viable even under optimistic assumptions. While much remains obscure, it is clear that any public funds advanced to the project will be at high risk of loss.

Appendix: Capital requirements of the original Adani project and the revised Stage 1 (IEEFA)

Appendix: Capex Program for Carmichael Coal, Rail & Port (Source IEEFA)

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 25 Mtpa 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.

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.

Table 1: Expenditure already committed ($Am)

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$12,616
Invested to-date
Purchase of Carmichael Coal from Linc Energy 500
Purchase of Carmichael royalty rights from Linc Energy 155
Purchase of EPC 1080 from Mineralogy Pty Ltd 25
Additional expenditure on Exploration and evaluation 443
Estimated Mine Capex, Admin & Interest post purchase 186
Option to purchase of Moray Downs 60
Purchase of Abbot Point Coal Terminal - T1 1,829
Estimated T1 Port Capex post purchase 302
Total To-Date (A$m) 3,500

Source: IEEFA estimates

Table 2: Total Mine investment still required - Stage I 25Mtpa uc

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