Pre Publication draft version. To appear in *Energy Policy*
Online version: http://www.sciencedirect.com/science/article/pii/S0301421516302518

Beyond the market: the transnationalisation of Indian coal economy and the Australian political economy

Stuart Rosewarne
Department of Political Economy
The University of Sydney

http://dx.doi.org/10.1016/j.enpol.2016.05.022

Expanding national energy-generating capacity is a critical element in the Indian state's ambitions to drive the sustained industrial development of the nation. With coal-fired power stations accounting for 70 per cent of electricity in India, boosting coal production has been pivotal to this industrial development agenda. Responsibility for increasing the electricity generating capacity has largely fallen to the state enterprise, Coal India Limited (CIL), which possesses a near monopoly over the nation's coal reserves through the extraction of coal from established mines and the development of untapped coal deposits. Over the past decade, CIL has moved to increase coal production by expanding production at existing mines and, through engaging the private sector, through a tendering process allocating new coal blocks to expand mining.

Yet, a range of institutional, political and infrastructural obstacles have frustrated efforts to increase the magnitude and reliability of national coal production and supply, and this has engendered a seismic reorientation in the organisation of the energy-production and energy-use industry. The state monopoly over coal production has been partially relaxed, which is in line with the longstanding economic liberalisation program, and there is now greater reliance on importing coal to meet industry needs. This turn to global sourcing, in fact, marks a dramatic reorientation in the structure of India's energy-intensive and energy-use industries because, from 2010, the global sourcing of coal has been linked to a surge in investment in overseas coal mines and yet-to-be-developed coal deposits. Prominent Indian energy and

industrial corporations have secured control over substantial coal deposits in Australia, Indonesia and Mozambique. In investing in coal mines and related transport infrastructure, including rail and port facilities, the companies have sought to ensure a reliable and expanding source of imports. In the process, the companies have established a global production chain that is characterised by varying degrees of corporate control of each stage of the chain, from mine, to rail, to port and loading, and shipping through to the destination port and burning of the coal in the electricity generation plants and steel manufacturing. The investments, in effect, amount to the transnationalisation of India's coal industry, and the extent of this is underscored by the extent to which the Indian state has become actively involved in the process.

This transnationalisation of India's coal industry has quite significant implications for the trajectory of the Australian economy insofar as the investments will maintain the momentum of the resources sector expansion. It is also shaping national resource and energy policy as well as having serious implications for environmental policy and management. The most striking manifestation of how Australia has been drawn into this Indian-orchestrated global production chain is the planned development of the Galilee Basin coal deposits in Central Queensland. The considerable investments by Indian energy and infrastructure giants Adani PvT Ltd and GVK raise critical concerns about the extent to which the dynamics of the Australian economy, and the resource sector more particularly, is being tied to the transnational arrangements geared to driving Indian economic development, on the one hand. On the other hand, with the combustion of coal such a significant contributor to greenhouse gas emissions, the reinvigoration of an India-focused accumulation dynamic founded on these global production chains, will likely contribute to reframing, if not compromise, Australia's climate change policy and the part Australia plays in international ambitions to contain the increase in global emissions more generally.

This paper explores these concerns in light of recent evaluations which call into question the economic viability of the Galilee projects on the presumption that international political pressure will surely prevail to restrict the mining and combustion of fossil fuels in order to avoid runaway climate change (Buckley and Sanzillo, 2013; Carbon Tracker and The Climate Institute 2013; Greenpeace, 2013). The paper will firstly examine the Indian government's policy commitment to hastening economic development by increasing the production of energy and how the frustration of this ambition has prompted greater reliance on importing

coal and investing in offshore deposits. In considering the construction of the fossil fuel commodity production chain, the paper will then proceed to analyse the nature and economic calculus of the Indian offshore investments before considering Australia's positioning in this commodity chain and the complementary role of Australian government resource and environmental policies in framing this.

India's development ambitions

India's industrial development is heavily reliant on electricity generated by coal-fired power plants, with 68 per cent of the nation's electricity generated from the combustion of coal (World Coal Institute, 2013). However, the expansion of the economy is being frustrated by the shortage of electricity generation capacity. Demand far outstrips supply, and boosting the exploitation of Indian coal reserves has become a key element in the national development policy agenda. An ambitious plan to increase electricity supply was launched in the middle of the 2000s, and considerable resources have been invested in expanding generating capacity by increasing the number of nuclear power plants and drawing more power from renewable energy technologies, such as wind and solar. However, much of the increased capacity will come principally from thermal power plants, by refurbishing existing power stations and constructing additional coal-fired power plants (ET Bureau, 2013).[1] There has been a veritable rush of building new coal-fired power stations since 2007, doubling capacity, and many more are in the pipeline (Coal Swarm, 2013). A key element in this program has been the approval of 'ultra mega power projects', the construction of coal-fired power stations able to deliver 4,000 MW or more. Investment in these projects has been underscored by the decision to reduce duties on imported equipment, and this relief was subsequently extended to 106 mega power projects (*The Hindu Business Line*, 2013).

At present, the great bulk of electricity generated in India is produced by state-owned enterprises, with most capacity controlled by the National Thermal Power Corporation, separately and in partnership with other state-owned enterprises. But this near monopoly is being surrendered because, in line with the liberalisation program that has been transforming the structure of the Indian economy over the past decade, approvals for the planned power

1. The World Bank is investing in the National Programme on Coal Rehabilitation contributing to the cost of three old thermal power plants in Maharashtra and West Bengal. The Bank is also providing finance for Ultra Mega Power Projects, which have been subject to challenges by community groups concerned about the environmental impacts of the proposed power stations (Source Watch, 2012)

stations will result in private corporations – and most notably Reliance Power and Tata Power – generating a greater proportion of electricity. Approval for some 200 thermal power plants since 2006 should result in more than a doubling of the nation's generating capacity

The program to expand generating capacity has necessarily meant more concerted endeavours to lift India's coal production. As with electricity generation, coal mining has historically been monopolised by national and state-owned corporations with Coal India Ltd (CIL) the principal state producer, either mining in its own right or in partnership with state-owned coal mining entities such as the Andhra Pradesh based Singareni Colleries Company. CIL accounts for 86 per cent of all coal produced (CoalSwarm, 2013).[2] CIL has increased coal output quite substantially in the last few years, with a 33 per cent expansion to some 400 million tonnes in the ten years to 2005 and almost a further 20 per cent through to 2012-13, although still falling short of the targeted increase.

To further hasten the increase in coal production, the Coal Ministry has allowed production to expand beyond established boundaries at existing mine sites (Lahiri, 2011). The Ministry has also sought to open up more coal reserves for exploitation. Commencing in 2004, the Ministry broke with the tradition of preserving coal exploitation for state corporations by inviting the private sector to tender for the allocations. The private sector had all-but been excluded from mining, the exception being those coal deposits designated as captive and reserved for particular industrial purposes, such as the deposits mined by companies like Tata Iron & Steel Company Limited and Indian Iron & Steel Company Limited, to feed their steel furnaces. However, in line with the economic liberalisation program, the government resolved that engaging the private sector in mining could make an important contribution to meeting the increased demand for coal. CIL, in partnership with foreign mining companies and the NTPC Ltd, is also exploring the introduction of technologies that would permit underground mining and obviate the need for land acquisition (Mitra, 2011; International Mining, 2012). Reliance Power, Jindal Steel & Power Ltd, GVK and Tata were among some of the companies that secured blocks. The privately-owned Essel Mining is seeking to establish the company as the largest developer of coal mines by producing coal from mines owned by CIL (Sabarinath, 2013). The liberalisation program has also seen the relaxation of

2. Following independence, the Indian state assumed control over most of the nation's coal deposits and this was consolidated with the nationalisation of privately-owned mines in the early 1970s.

restrictions on the involvement of foreign-owned companies in increasing the extraction of coal (Burke, 2011)

1. *Obstacles to increasing domestic coal supply*

Notwithstanding the sustained increase in domestic production of coal over the last few years, with production increasing from 428.4 million tonnes in 2005 to 588.5 million tonnes in 2011, domestic coal production has fallen considerably short of planned output (International Mining 2012). This failure is the consequence of several intractable obstacles which have prompted, indeed necessitated, still further reorganisation of coal supply arrangements.

The industry is generally quite backward and inefficient by world standards. Most coal is mined from open-cut mines, and the small proportion of coal exploited from underground mines is considerably more expensive than open-pit mines (International Mining, 2012). Coal mining is extremely labour-intensive. The considerable reliance on child labour in mining and carting coal is one reflection of this (Doherty, 2013a; Harris, 2013). A further measure of this inefficiency is the extent of coal theft, with up to 7.5 tonnes of coal are estimated to be stolen every day – and the problems this presents for the reliability of supply is mirrored in the distribution of electricity which is also subject to illegal tapping of distribution infrastructure (Singh, 2013).

The government has impressed upon CIL the need to conclude coal supply agreements with electricity generation companies that commit to ensuring the delivery of more coal. But such investments will not necessarily resolve some challenges, such as the lack of adequate transport infrastructure, and especially the reliance on rail infrastructure to transport coal from ports to central India (DNA Correspondent, 2013; Saha, 2013). There are attempts to address these problems with the national government approving various projects. CIL is investing in updating and expanding rail transport and is collaborating with Indian Railways, the Environment Ministry and State governments to improve the rail network connections with coal reserves (coal guru nd). Private companies are also contributing to this, and the removal of obstacles to foreign-owned engineering companies' involvement in coal handling and processing is further evidence of the shifts in the organisation of the industry (Burke 2011).

Relaxing restrictions on the allocation of coal rights to private corporations and removing barriers to private involvement in coal exploitation in the endeavour to increase electricity generation have been notable policy shifts. Indeed private industrial and energy corporations are being relied upon to lead industrial development, but this has merely shifted the locus of the problem. Jindal Power, for instance, was awarded additional captive coal reserves to meet its present needs at its Chhattisgarth plant, but the reserves will not be sufficient to meet the needs of its expanding capacity, and it will have to make recourse to the market in order to secure extra supplies (Saha, 2013).

Moreover, the liberalisation initiatives that foster greater private sector involvement have, needless to say, proved politically contentious and have aroused intense opposition. The All-India Coal Workers Federation, for example, launched a campaign to protest any further 'denationalisation' of India's coal mining industry (Aditi, 2012)

These structural problems present a major barrier to expediting the increase in production, but they are compounded by systemic governance failings. In many respects, this simply reflects the organisation of the state. The coal bureaucracy has proved ineffectual in coalescing different arms of the state to support the targeted expansion of coal production (Doherty, 2012; Mehudia, 2012; Sreenivas, 2012). One striking illustration of this has been the relative failure of Coal Ministry's program launched in 2004 to increase coal production by releasing undeveloped coal deposits for exploitation. The Ministry released 70 coal blocks and invited state and private corporations to tender for right to exploit the deposits (Dutta and Thakur, 2012). A decade later, very few of the blocks have actually been developed. In some instances national and State regulations have held up environmental approvals, and the Coal Minister accepts that these restrictions will continue to prevent some coal deposits being exploited into the immediate future (Siddartha, 2012; Source Watch, 2012). In others, mining has been successfully blocked by the opposition of local communities and tribal peoples (Mehudia, 2012; Raghaven, 2012).[3]

A more controversial aspect of the implications of governance failings having resulted in the coal block release program falling materially short of expectations has been revealed following allegations that the tendering process lacked integrity. The inquiry set up to

3. The national government has moved to exempt major infrastructure projects from having to obtain development consent for forest clearance from tribal communities (Newsome, 2013).

investigate the tender process, dubbed the 'Coalgate' affair, has highlighted a lack of transparency in the tender process involving former top bureaucrats assisting private companies to facilitate successful bids, evidence of some State administrations allocating blocks without going to tender, and a corrupted process that has cost the state substantial revenue (Mehudia, 2012; Nagia, 2012).[4] And, with some allocations being awarded to companies with no experience in mining or to companies that had no intention of proceeding to exploit the deposits, the consequence has been that the coal block allocation program delivered only limited increases in actual mining capacity.

The significance of these obstacles to increasing domestic coal production is underscored by the fact that the reliance on coal as the principal source of energy source is unlikely to change soon. India's natural gas production is falling (Katakey, 2013). There are plans to construct several new nuclear power plants, but progress on construction is being fiercely resisted by local communities (Byerly, 2011). An increasing proportion of energy is being generated from renewable sources, and especially solar energy, although the pace of this is not sufficient to meet the growing demand.

2. Advancing coal supply security: from imports to overseas investment

The solution to this systemic shortage and the uncertainty in supplies has been increased recourse to importing coal. At present, India imports 20 per cent of coal requirements, and there has been a threefold increase in coal imports since the mid-2000s (World Coal Institute, 2013), and it is predicted that imports will continue to increase to a quarter of all requirements by 2017 at which time overseas investments will drive even more substantial increases (Katakey, 2013; World Coal Institute, 2013). The expansion in coal-fired electricity generating capacity will drive this increased reliance, although steel production, in particular, is already heavily reliant on imported coal because of the poor quality of domestic coal and this should also increase (International Mining, 2012).

The increasing recourse to imports is one further manifestation of the liberalisation of the Indian economy. Changes in government policy, such as reductions in import duties, have

4. In fact, the investigations into corruption within the Coal Ministry, in examining records of meetings between Ministry officials and private company executives as far back as 1993, suggest that the corruption could have been well entrenched before the release of coal blocks in 2004 (Chauhan, 2013).

facilitated this (Katakey, 2013). The government has also sought to afford some protection to the domestic mining industry by putting in place measures to insulate local supply from import competition while simultaneously securing market share for imports by mandating the blending of imported coal with local coal (International Mining 2012).

State corporations have played a direct role in this liberalisation process as they have turned to the global market to import coal. CIL and the NTPC Ltd are key state figures in this process, separately and in partnership, endeavouring to meet industry fuel needs by negotiating imports. The other important actors in the transformation of the fossil fuel market are the private industrial corporations and power companies. Tata Power Co. and Adani Power Ltd., for instance, have become significant importers, and their role as importers is destined to become more substantial especially as their ultra mega power plants come on line (Shanker and Alexander, 2013). Another major electricity generating company, Jindal Power, announced that it would have to resort to importing coal if it was going to meet the expanded capacity requirements at its Ultra Mega Chhattisgarth plant (Saha, 2013).

Investment in expanding port facilities will reinforce the recourse to imported coal. The port facility that services Adani's Mundra Port and Special Economic Zone Ltd is reckoned to be the largest coal import port in the world (International Mining, 2012). The Cochin Port Trust is launching a major redevelopment to expand capacity, which would service imports from Africa (Cochin Port Trust 2013). A number of government measures that remove restrictions on importing coal, it is forecast, will see India becoming the world's largest coal importer, more significant than China, in the not too distant future (PTI, 2013).

The principal countries from which coal is being sourced include Indonesia, Australia and Mozambique, with Indonesia accounting for 86 per cent of total imports and the main source of imported thermal coal, (Salva Report, 2013).

A critical feature of this recent turn to international sourcing of coal requirements is that securing imports has become integrally tied to investing in overseas coal mines. The state has been a crucial institutional actor in this development. In 2006 the Indian government established Coal Videsh, an arm of CIL, to invest in and buy outright overseas coal mines, but in six years bought just one mine (Doherty 2012). Another state-initiated venture, International Coal Ventures Private Limited was established in May 2009 as a consortium of

five leading steel and mining PSUs SAIL., Coal India Limited, Rashtriya Ispat Nigram Limited, National Mineral Development Corporation and NTPC Limited with a major goal of acquiring overseas coal assets. The venture was comparatively shortlived because of the respective partners' different priorities. CIL and NTPC quit the consortium because their main interest was in securing thermal coal imports, while ICVL is primarily interested in coking coal. The NMDC subsequently withdrew because of the lack of any acquisitions.

CIL has, however, persevered in its global acquisition ambitions. In 2010, CIL commenced negotiations with Peabody to acquire interests in four mines (Dutta, 2010). CIL subsequently floated expressions of interest for acquiring offshore coal deposits in a range of locations, including in Indonesia, Australia, the USA, Mozambique, Chile and Columbia (Firger, 2010; Validakis, 2013). The state-owned corporation is presently exploring the acquisition of two Australian companies (Validakis, 2013). CIL has set aside $4 billion, and is seeking to move quickly to acquire these assets, and is awaiting approval from the Coal Ministry before moving to finalise the purchase. The acquisition would enable the importation of 28 million tonnes of high quality thermal coal a year. (Sengupta, 2013).

This strategy of endeavouring to secure overseas supplies of coal by investing in mines has been taken to a whole different level by private corporations in a very short time frame. There is a long list of overseas mine acquisitions.

Adani bought into Bunya Indonesia in 2007 and commenced mining in 2008, and the company also has interests in Sumatra (Stern , El Badrawy and Nedelec-Lucas, 2012; Adani, 2013). Essar Group, India's second largest power generation company in the private sector bought assets in the USA and Indonesia (Adhikari, 2010; Firger, 2010). Reliance Industries has acquired coal shale gas companies and mines in the USA (Firger, 2010). Indian corporate investments in Indonesia have been consolidated following the granting of exploration licences in East Kalimantan in 2007, with production commencing in 2008, with current output of 2.3 Mt and a target of 4 Mt for 2012-13(Adani, 2013)

In November 2012 Tata Power bought a 26% per cent stake in PT Baramulti Suksessarana Tbk that would permit the purchase of up to 10 million tonnes of coal per annum. The corporation also purchased a 30 per cent stake in two coal mines owned by Bumi Resources' PT Kaltim Prima Coal and PT Arutmin Indonesia to secure a long-term agreement to supply

of 10 million tonnes per annum to its Trumbay power plant as well as its Ultra Mega Power Project at Mundra

Jindal Steel & Power Ltd, the third largest steel maker in India, has coal mines in Botswana and Mozambique (Saha 2013).

Australia has also been an important investment location in the efforts to secure coal overseas supplies. Sourcing coking coal has resulted in Gujarat NRE Coke's acquisition of two hard-coking coal mines in New South Wales, and is in the process of increasing production. Lanco Infratech's subsidiary Griffin Coal acquired the Western Australia, primarily with the objective of exporting coal to India. It planned to increase output fourfold to meet the increasing requirements of its Indian generating plant.[5] The Aditya Birla Group and CIL bidding for Rio's Clermont mine in Queensland (NDTV, 2013; Tan, 2013).

More recently, the focus of these companies has shifted from acquiring established mines to investing in exploration licences and acquiring underdeveloped coal deposits. Jindal Steel and Power Ltd, which is importing coking coal from Australia, invested in Australian coking coal exploration projects in 2009, and had acquired four fully-owned coal exploration blocks in the Bowen and Surat Basins, and it also acquired an interest in an ASX-listed coal exploration company.

These ventures, however, are being overshadowed by the very much more substantial investments by Adani and GVK in the coal fields of the Galilee Basin in Central Queensland. In its biggest overseas investment foray, the Adani Group bought Linc Energy's Queensland coal tenements worth $A2.72 bn in August 2010. At the time, the project was reckoned to become the largest coal mining endeavour in Australia, promising to extract 60M/t of coal per annum (Adani, 2013). In May 2011 the Adani subsidiary Mundra Port and Special Economic Zone Ltd paid $A1.829 bn for a 99-year lease of the Abbot Point Coal Terminal.

The scale of Indian investment in the Australian coal mining industry will be expanded even further following GVK Power's investment in the still larger mining Galilee Basin project

5. ,In Lanco Infratech's determination to concentrate production for export, the company neglected a long-term coal supply agreement that the previous owner had with a local industrial company, and this is now the subject of legal action (Barrett, 2012).

with its June 2011 $2.4bn agreement to purchase the Alpha coal deposit and Kevin's Corner deposit from Hancock Mining.

The significance of these developments cannot be overstated. The GVK Reddy/Hancock Alpha coal project will be one of Australia's largest coal mines, with a 30 Mt/y pit, and with other mines a projected 60 M/t with the prospect of this increasing to 120 Mt/y (International Mining 2012). The Adani mines are projected to produce When fully activated the amount of coal extracted and exported will be greater than all of the coal presently consumed in firing Australia's coal-fired power generators and industry furnaces (Pearse, McKnight and Burton, 2013) and consolidate Australia's position as the world's largest exporter of coal.

Driving this is the continued expansion of these companies' electricity generating capacity. Adani has built the '4,620 MW power station at Mundra, and has plans to construct two more very large coal-fired power stations at other locations in Gujarat, and is developing three other coal station projects in Mahrashtra and Madhya Pradesh' (Greenpeace, 2013). The shortfall in supply has grown, to 165.5 Mt in 2011-12, up from 132.8 Mt in 2010-11 and 90.5 Mt in 2009-10 (International Mining 2012). Adani is the largest coal importer in India, and has plans to increase its power generation capacity to 20,000 MW by 2020 from the current 9,200 MW (International Mining, 2012). In order to accommodate the import of coal, Adani is undertaking a massive expansion of its Mundra port infrastructure to become the largest coal import facility in the world.

3. *The end of the resources and energy boom – an antidote to the coal-fuelled climate change challenge?*

The proposed expansion in the scale of coal mining in the Galilee Basin will provide a substantial boost to the value of Australian coal exports at a time when global commodity prices, including the price of thermal coal, have declined. Yet, the exploitation of the Galilee Basin coal deposits flies in the face of the debate on the reliance on fossil fuels as the key energy source and the need to reduce the generation of greenhouse gas emissions if runaway climate change is to be avoided. The tensions being played out here could not be more critical to the ambition to mitigate carbon emissions. They are underscored by the Indian government's commitment to expanding energy generating capacity to foster economic development and the government's resistance to signing onto a global accord on emissions

mitigation for fear that this would frustrate the nation's development. The tensions have an additional paradoxical dimension insofar as governments in both Federal and State jurisdictions are committed to the continued expansion of the resources and energy export industries, while the Federal government simultaneously endorses efforts to reduce the nation's emissions.

However, there is an emerging argument that what appears on the face of it to be irreconcilable dilemma may in fact be resolved through the vagaries of market forces. Partly in response to the downturn in global economic activity, and partly in response to the increased competition with the supply of less greenhouse gas pollution-intensive energy sources, and most notably natural and coal seam gas, there has been a sustained decline in thermal coal prices. The introduction of emissions trade schemes, taxes of carbon emissions and direct regulation in a number of countries has also contributed to this diminution in global coal prices. The collapse in commodity prices from the highs of the resources and energy boom has had the effect of eroding investor confidence in the merits of investing in t the industry. This is evident in the loss of momentum in the resources and energy boom in Australia. The value of coal assets has declined substantially, and a number of existing mining activities have been suspended and a number of mine development proposals either postponed or abandoned altogether.

The fall in the global coal price would normally be beneficial to coal buyers, but any market advantage for Indian importers has been offset with the depreciation of the Indian Rupee. In fact, the net effect of commodity price deflation and the Rupee's depreciation has proved costly for importers and the thermal power stations and steel makers reliant on imported coal. With a view to addressing the deleterious economic consequences of this shift in the market, the Indian government has sought to provide some relief for coal importers. Import duties have been reduced and electricity generators have been allowed to increase prices. Indian importers have sought to negotiate the deferral of coal shipments from Indonesia as they move to renegotiate supply prices (Wulandan, 2013).

An equally, if not more significant, consequence has been the effect of the coal price decline on the value of coal mine investments. This is clear in the Australian context where several established mining companies have disposed of their mine interests and others have abandoned plans to develop holdings. This situation certainly means that buying into coal

mining is less expensive, but the slump in the Indian Rupee has meant that for Indian corporations wanting to acquire mines funding the purchase of assets in Rupee denominated loans is proving, or will prove, more expensive. Indeed, concerns have been voiced that companies have over-borrowed, and with falling global coal prices will face 'shrinking profit margins … [and] incurring losses after servicing the debt raised at high interest rates' (Ramsuyra and Sukumar 2012). This has had the not unexpected effect of diminishing interest among Indian corporations in investing in overseas acquisitions, although Jindal, for one, is still seeking overseas assets (Shanker and Alexander, 2013).

It is in the context of the depressed commodity market that the environment movement has sought to engineer political traction for campaigns directed at reducing the world's consumption of coal by engaging the business community by questioning the financial viability of these the mega-coal mining projects. It is contended that, in terms of expected investment returns, the business case for proceeding with the development of the Galilee Basin cannot be justified, and institutional investors are being canvassed to exercise extreme caution in directing funds to support these particular projects. Moreover, they argue when the immediate environmental costs, including those associated with the transport of coal,[6] are taken into account and the medium- and longer-term costs associated with the increased issue of greenhouse gas emissions are taken into account, the economic viability of the projects is held to be even more questionable. Any considered economic appraisal, it is contended, suggest that the net economic benefits of containing the growth of greenhouse gas emissions are perfectly reconcilable with the business case for not proceeding with exploiting the Galilee Basin coal deposits.

Among the more prominent articulations of this contention has been the British-based *Carbon Tracker* programme (Carbon Tracker and The Climate Institute, 2013). In a series of risk analysis assessments, the *Carbon Tracker* programme has concluded that the emerging climate change pressures will force the adoption of measures to contain emissions, forcing a reduction in the world's reliance on fossil fuels, and that this will result in a write down in the value of fossil fuel investments generally and investments in coal reserves more particularly. This contention has been underscored by the International Energy Agency's declaration that

6. There will be substantial environmental costs associated with the construction of the rail network connecting the Galilee Basin mines to the ports, and there will be inestimable damage to the Great Barrier Reef arising from the dredging required at Point Abbot to accommodate cargo vessels.

if the world is to keep global warming within 2º, then the proportion of energy generated from coal-fired power station will have to be cut and that two-thirds of known fossil fuel reserves should not be exploited and remain in in situ (IEA, 2012).

Joining the Carbon Tracker assessment, the Climate Institute has sought to spell out the implications of this appraisal for the Australian coal mining industry (Carbon Tracker and The Climate Institute, 2013). The report, *Unburnable Carbon: Australia's carbon bubble*, provides a warning to investment funds, and the Australian community more generally, that the industry is substantially overcapitalised and that the time has come to take stock of the need to recognise that the promise of investing in coal does not make good business sense and that such investments will become in the fullness of time 'stranded'.

An even more powerful case emphasising the shortsightedness of this tendency to overcapitalise in the industry has been advanced by The Institute for Energy Economics and Financial Analysis in an assessment of the Indian company GVK's partnership with Hancock Prospecting to develop coal reserves in the Galilee Basin and rail and port facilities in Queensland (The Institute for Energy Economics and Financial Analysis, 2013). The assessment, commissioned by Greenpeace, provides a robust appraisal of the viability of the investment. Several reasons are advanced for concluding that the project is facing many challenges and the prospect of the project coming to fruition is decidedly unlikely. The fact that GVK has all but no demonstrated experience in constructing overseas a venture of this scale, its heavy reliance on funding project development by borrowing rather than drawing on equity, no firm contracts with customers for the future supply of coal, a considerably lower market price than that that prevailed when GVK bought into the project and the possibility of further price deflation, and some major environmental impact concerns, prompt the Institute to conclude that the project is financially unviable. Indeed, the implication is that the Alpha Mine and GVK's related projects, along with other coal mining ventures in the Galilee Basin, some of which involve other Indian energy companies, are unlikely to proceed. In this scenario, the force of market pressures will prevail to halt the development of the coal deposits.

4. *Beyond the market – project viability and global production chains*

The arguments regarding the value of the coal deposit assets and the financial viability of the Galilee Basin coal mining projects are powerful ones, but the contention that the deposits constitute 'stranded assets' rests on the misconception of the ventures being evaluated as stand-alone investments. As CIL has made abundantly clear, securing coal is essential to India's economic development, and this necessitates moving beyond the world's largest coal producer to commit to establishing an international presence. In fact, CIL declared its intention:

> To emerge from the position of domestic leader to leading global player in the energy sector by adopting best practices from mine to market…(http://www.coalindia.in).

As we have noted, CIL launched an ambitious program to acquire overseas coal deposits as a key element in this ambition, and it has not been alone in the objective with major energy and industrial corporations investing in overseas coal assets to secure supply. Lanco's Griffin Coal mine was a conscious decision to provide fuel for its power stations, and its determination to secure adequate supplies has resulted in the company facing legal action for breaching existing supply contracts (Adhikari 2010).

These international investments signal a more fundamental aspect of the industrial transformation that is driving the efforts to lift energy production in India, namely the institution of global production chains that has locked energy and steel corporations into transnational production systems. Investing in overseas coal mines is regarded as an essential stage in securing coal supplies, and nowhere has this been played out more explicitly than in the Indian corporate investments in the Galilee Basin.

Adani's chief executive of Australian operations, Jignesh Derasari, 'declared the company wanted to control "whatever component the coal touches"', from pit to port, carried on Adani-owned bulk carriers to supply a chain of seven power stations (Fraser, 2011). Adani plans to control the production chain at each and every stage:

> "Whatever component the coal touches, we would like to be in control of that. So that means the mine, the rail, the port where the coal is transported out of, the ship that the coal sits on until it gets to port in India. Then it goes on a conveyor belt to the power station".[7]

7. One politically contentious issue that has been raised with Adani's moves to construct a global commodity chain relates to the labour market and employment implications. Some of the earlier criticism of the Indian

When questioned about the financial viability of its Galilee investment in the context of depressed coal prices, Adani's chief executive officer, Harsh Mishra, was reported as making the point quite clearly that the depressed price was not a pivotal concern:

> We are largely insulated because our coal is largely for use in our coal plants in India as well as our trading portfolio and thus protected from falling commodity prices. (Ludlow, 2012)

GVK's business approach is no different. GVK is also planning on exercising complete control over an integrated production chain, controlling the mine, transporting coal 'almost 599 km along its own rail line to the port,' transferring the coal through its coal loader at 'its Abbot Point port facility', and the venture has secured environmental approvals from State and Federal governments for the integrated mine, rail and port project (Bana 2012; Barrett, 2012). GVK asserts its intention of not being dependent on any third party in transporting coal mined in the Galilee Basin (Bana, 2012).[8] Once again, direct control of the production and supply chain is regarded as a crucial factor in avoiding market volatility.

> [T]aking an equity position is the preferred model to hedge against movements in the coal prices, and in effect to get access to coal at the cost of production (Adkins, 2012).

Indeed, it has been argued by the Coal Ministry that the depressed coal prices presents an opportunity to consolidate the transnationalisation of India's energy industry and extend the reach of global production chains: the downturn in the coal price and the 'lock down' of the industry in Australia opens up further scope for overseas investment, and, according to India's Minister for Coal, 'it was time for India to "be more aggressive in acquiring energy assets abroad."' (iMINCO, 2012).

5. *Australia's place in the Indian global energy production chain*

---

investment in the development of the Australian resources sector was based on the possibility that mines would be developed as enclaves which would rely wholly on the deployment of Indian workers, employed on short-term 456 visa that were really fast-tracking of the long-stay 457 skilled worker visa program. Concerns were also raised about the possibility that Adani would utilise the Enterprise Mining Agreements to recruit large numbers of migrant workers, although the company spokesperson indicated that the company was not considering such arrangements at the early stage (Ludlow, 2012).

8. In fact, the Queensland Government is negotiating with the companies 'to plan a single rail corridor linking the Galilee Basin to the ports instead of a "spaghetti mess" of intersecting company rail lines' (Barrett, 2012).

The massive Indian investments in the Galilee Basin begs the question as to the significance of Australia's – and the Australian coal industry more particularly – place in India's global energy production chain, especially when it is considered that a disproportionate proportion of coal imports are sourced from Indonesia. The Galilee Basin developments will lift substantially the proportion of coal sourced from Australia, and it is not difficult to see why, and more especially so with respect to the construction of the global production chain.

In the first instance, rising Indonesian nationalism is creating some uncertainty with respect to mining investments (Burrell 2012). Indonesia's national government recommended increasing royalties on coal exports to 13 per cent in 2014 that would deliver a larger share of the revenue generated from the development of mining to the nation, and regional governments have added momentum to this proposition by advocating that royalties be increased to 25 per cent so that the regions could also benefit from the resources boom (Salva Report, 2013). Increased mining royalties have adding to the uncertainties about the financial viability of projects that have been raised with the decline in world coal prices (Chatterjee, 2012). Further uncertainties were fuelled with pronouncements on the introduction of a tax on coal exports, although these were subsequently dismissed as discussions that had no real salience (Duffy 2012b).

Of more significance are the changes in Indonesia's mining regulations that would require foreign mining companies to divest any controlling interest in mines to local interests (Duffy, 2012a). The devolution of government authority, which has increased the powers of regional administrations over resources, has reinforced the uncertainties on the future of mining rights, and these have been compounded by the pressure being exerted by the national government for foreign investors in the resource sector to establish domestic processing facilities (Duffy, 2012a). In short, there is considerably less scope for foreign investors in Indonesia to consolidate their control over the exploitation and transport of coal, to establish a well-articulated global commodity chain, than is the case in Australia (Adhikari 2010).

While political risk is a factor that is at the forefront of investment assessments in Indonesia, this is a minor consideration in the Australian context. Australia is regarded as being political stable. Indeed, the Australian Government publicises this arguing that 'business can expect a supportive framework including a stable and efficient regulatory environment' and the government 'welcomes foreign investment that is in our national interest' (Department of

Industry 2013: 24). Reflecting the still more favourable investment environment under the Coalition Government, the Government has committed to abolishing the Resources Super Profit Tax, a tax introduced by the Gillard Labor Government.[9] The Queensland Government has assured investors that it is committed to not increasing royalties beyond levels set in 2012 (Ker 2013). With well-developed and transparent governance institutions, mining and development approval processes are clearly defined and relatively efficient, more so than is the case in Indonesia, and certainly much more so than those in India as a number of Indian energy companies have attested (United Press International, 2011). The Queensland government has fast-tracked conditional approval of the GVK Reddy/Hancock Alpha coal project, and while the Federal Labor government did question the integrity of the environmental impact assessment, the Federal Environment Minister had earlier approved some stages of the project (International Mining 2012). Indeed the enthusiasm with which Federal and State governments had jointly celebrated the Adani project belies the substance of the Federal Environment Minister's protestations, and the protests were more likely aimed at courting the votes of environmentalists in the run-up to the 2013 federal election (Hodge, 2013). As is it happens, with the change of Federal government following the election of the Coalition Abbott Government, it is unlikely that there will be any hold up to the approval process (Shafy, 2013).

Certainly, the mining sector confronts a more politically potent force in the environment movement in Australia than is the case in Indonesia, and there are a number of challenges launched by environmental non-government organisations and farming communities that contest the veracity of the environmental impact assessments of the Galilee Basin mines (Morton and Wroe, 2012; Milman, 2013). But, with the conservative Newman Government in office having already given development approval and the newly-elected conservative Abbott Coalition Government in office and the new Minister for Industry and Resources signalling the need to remove obstacles to the development of the resources sector, the

9 . Mining companies and the resources and energy sector had conducted a very-substantially financed campaign against the super profits tax that had been proposed by the Rudd Labor Government resulting in the tax being abandoned and the successor Gillard Labor Government negotiating with major resource companies a much weaker tax. The industry won the support of the Coalition parties in the run up to the 2013 election to abolish the watered-down Resources Super Profit Tax.

potential for the environmental non-government organisations to achieve much political traction seems pretty limited.[10]

Given all this, it should not be surprising that the India's Ministry of Coal has called for concerted efforts to establish 'strategic partners' in Australia in order to secure its coal requirements (iMINCO, 2012). And Australian governments have been only too keen to endorse such initiatives. Speaking in the context of the focus on the Indian investments, Australia's former Minister for Resources and Energy, Martin Ferguson, 'said he was supportive of any coal investment by any country "in principle"' (and this declaration was obviously with an eye to the Indian investments given that the Foreign Investment Review Board had recently rejected an application of by Chinese state-owned company to takeover an Australian-owned coal mine) (iMINCO, 2012). In fact, Australian governments could not be any more receptive than they have been to welcoming Indian investment in the Australian resources sector. The former Labor Government has been determined to consolidate economic relations between Australia and India. In 2012 it established the Australia-India CEO Forum to coordinate regular round-table meetings to bring together the captains of industry from Australia and India to discuss issues and facilitate trade. The resources and energy sector has been placed at the forefront of this initiative; the Forum is chaired by Naveen Jindal, the head of the Jindal steel corporation (Doherty, 2013b). Additional institutional resources have been devoted to supporting this with the Department of Resources, Energy and Tourism engaging a dedicated officer at the High Commission in India to consolidate this economic relationship (Department of Resources, Energy and Tourism, 2012: 217). Significantly, the Coalition Government has explicitly articulated this link in terms of the need to foster foreign investment with a view to 'accessing global value chains' as a means of increasing energy exports (Department of Industry 2013: 24).[11]

Conclusion

There has been a significant transformation is economic relations between Australia and Indian in the last few years. Energy security has emerged as a defining feature of this. It has

10. The Queensland Government has strengthened its capacity to override some resistance to the development of the Galilee Basin mining projects and related infrastructure developments by declaring that GVK project one of significant status which gives the Government the power to compulsorily acquire land (Barrett, 2012).
11. Interestingly, the argument is also made that this would go hand-in-hand with developing 'a highly skilled and multi-lingual workforce.' (Department of Industry 2013: 24).

been based on the Indian government, in partnership with energy and industrial corporations, placing more reliance on importing coal and, more importantly, investing in overseas coal deposits in such a way as to secure control over the extraction and transport of coal from pit to port and across the oceans to power stations. This has dovetailed neatly with Australian government ambitions to place Australia at the centre of the vision of achieving global resources security by establishing 'an energy and minerals freeway linking suppliers and consumers across the globe' as the Federal Treasurer Peter Costello announced when chairing the G20 Forum in 2006 (my emphasis – *The Australian Financial Review* 16 November 2006).

This transformation in the economic relations has been founded on Indian investment in expanding the exploitation of Australia's coal reserves. The logic of this development seemingly flies in the face of the two fundamental pressures that the industry is presently facing. In the first instance, the current deflated price of coal would suggest that the Adani and GVK investments in the Galilee Basin coal fields do not make any business sense. For all intents and purposes the investments are not financially viable. But, as has been argued here, these particular investments cannot be regarded as stand-alone enterprises. They are but one stage in a larger process of securing the energy resource to feed the larger corporate venture of generating electricity and deepening the respective corporation's industrial profile. The construction of the global production chain that ties together the different stages of the energy cycle provides the means for carrying the cost of what critics regard as an overcapitalisation in the Galilee Basin.

The corollary for Australian governments is that the investments will contribute to maintaining the momentum of the resources and energy based economy. This may of course come at some local environmental cost, indeed is likely to do so, but the short-term gain is reckoned to be worth the price of the economic stimulus. It may also prove less stimulatory than is envisaged since the transnational foundations of the Galilee Basin corporate ventures will enable the respective companies to minimise reported profits, and thus the corporate tax payments that could be expected to flow from such enterprise and which would otherwise reward governments for endorsing the projects. Indeed, the preoccupation of critics of these projects with the significance of coal's deflated market value should not serve to detract critical reflection of the ways in which the organisation of global production chains can be

deployed to concentrate in accounting terms the more value-adding stages of the chain in the lowest taxing locations of the chain.

The second pressure arises with the more challenging issue of the critical significance of coal as the principal contributor to the emission of greenhouse gases. While successive Australian governments have committed to emission abatement targets, their resistance to committing to more substantial emissions reductions has been justified on the grounds that there is little point in committing to these more ambitious targets when developing nations, and China and India in particular, continue to increase the magnitude of emissions. While India, and China, is coming under increasing international pressure to address the problem of its increasing contribution to global greenhouse gas emissions[12], the Indian government has defended its right to expand its capacity to generate electricity in order to advance the economic development of the nation.

Interestingly, this argument defending the increased combustion of coal in the interests of advancing the nation's development is one that has also been entertained by the Australian government as well as by Australian Coal Association when defending the continued expansion of coal mining and the coal export industry (Kumar, 2013). The Australian Coal Association has defended the continued expansion of the Australian coal industry and the export of coal in the interests of helping in forging the path of India's development ambitions. Even more intriguing is the defence of the industry on environmental grounds with industry representatives as well as the industry union, the CFMEU, contending that, because Australian coal has a lower ash content and higher calorific value than coal sourced from other countries, such as Indonesia, and, importantly, Indian-mined coal, there are net environmental benefits from exporting Australian coal when this substitutes for these other more polluting sources.

This is, of course, a somewhat spurious argument when it is considered that the alleged 'environmental benefits' from substituting the 'cleaner' Australian coal for the dirtier Indonesian and Indian coal would presumably be offset by the emissions generated in transporting coal halfway across the world as well as all the other environmental costs that have been identified with developing some of the largest coal mines in Australia, building the

12. The US Secretary of state has, for example, recently appealed to the Indian government to cut the nation's greenhouse gas emissions (Gordon and Broder, 2013).

400-to-500 kilometre of rail to transport the coal to Australian ports, and dredging and dumping the spoil adjacent to the Great Barrier Reef to ensure that the coal vessels are able to load and begin their journey across two oceans. It is questionable whether these benefit-cost equations justify the economic case for approving the Galilee projects. And arguments about the benefit-cost calculus that is reckoned to justify these projects pay little heed to the multiplication of greenhouse gas emissions consequent upon the mining and export of Australian coal. The cost of this 'carbon leakage' should surely be taken into account in the economic calculus, not set beyond the market and eclipsed in the organisation of the coal-energy framing the global production chain.

References:

Adani (2013) http:adanimining.com/Indonesia_Project_Details_Milestones, accessed 25 July 2013.

Adhikari, Supratim (2010) 'India's hunger for Aussie coal' *Business Spectator* 30 December, at http://www.businessspectator.com.au/article/2010/12/30/commodities/indias-hunger-aussie-coal, accessed 2 May 2013.

Aditi, N. (2012) "Coal workers' protest against 'denationalisation' of mines' *The Hindu Business Line*, 12 September, http://www.thehindubusinessline.com/economy/coal-workers-protest-against-denationalisation-of-mines/article3881747.ece, accessed 23 September.

Adkins, Bruce (2012) 'The Great Indian Coal Rush' Corrs Chambers Westgarth, at http://www.corrs.com.au/thinking/insights/the-great-indian-coal-rush/, accessed 2 May 2013.

Bana, Sarosh (2012) 'Australian Coal Presents Opportunity for India' *Business Review* 9 November, at http://www.businessreviewaustralia.com/business_leaders/australian-coal-presents-opportunity-for-india, accessed 2 May 2013.

Barrett, Rosanne (2012) 'Port approval comes at a price for miner' *The Australian* 11 October: 4.

Buckley, Tim, and Tom Sanzillo (2013) *Stranded: A Financial analysis of GVK's proposed Alpha Coal Project in Australia's Galilee Basin*, Institute for Energy Economics and Financial Analysis

Burke, Jessica (2011) 'Theiss developing coal infrastructure in India' *Australian Mining* 16 February, at http://www.australianmining.com.au/news/theiss-developing-coal-infrastructurein-india- (accessed 25 July 2013).

Burrell, Andrew (2012) 'Indonesian nationalism a growing risk for miners, says Noke Kiroyan' *The Australian* 26 October, at http://www.theaustralian.com.au/business/mining-energy/indonesian-nationalism-a-growing-risk-for-miners/story-e6frg9df-1226503468931 (accessed 2 August 2013).

Byerly, Rebecca (2011) 'India Maps Out Nuclear Power Future, Amid Oposition', *National Geographic News* 22 July, at http://news.nationalgeographic.com.au/news/energy/2011/07/110722-india-nuclear-jaitapur/, accessed 15 July 2013.

Carbon Tracker and The Climate Institute (2013) *Unburnable Carbon: Australia's carbon bubble*, Sydney: The Climate Institute.

Chatterjee, Neil (2013) 'Indonesia Plan for Higher Coal Royalties to Hurt Low Rank Miners' *Bloomberg* 12 June, at http://www.bloomberg.com/news/2013-06-12/indonesia-plan-for-higher-coal-royalties-to-hurt-low-rank-miners.html (accessed 25 July 2013).

Chauhan, Neeraj (2013) 'Did private companies remove coal files to derail CBI probe?' *The Times of India* 23 September, at http://articles.timesofindia.indiatimes.com/2013-09-23/india/42322920_1_coal-files-coal-ministry-amr-iron, accessed 25 September 2013.

Coal Guru (n.d.) 'CIL forays into rail project to tap coal reserves', at http://www.coalguru.com/india/cil_forays_into_rail_project_to_tap-coal_reserves .

Coal Swarm (2013) 'India and Coal', at http://www.sourcewatch.org/index.php/India_and-coal (accessed 30 August 2013).

Cochin Port Trust (2013) 'Modernisation of Coal Handling in Cochin Port', at http://www.cochinport.com/index.php?opt=project&sub=20&id=8&tab=1 (accessed 12 September 2013).

Cranston, Matthew (2012) 'Price falls hit miners' carbon offset plans' *The Australian Financial Review* 9 October 2012: 44.

Cubby, Ben (2013) 'Super coal port decision delayed' *The Sydney Morning Herald* 10-11 August 2013: 12.

Department of Industry, Australia (2013) *Energy White Paper: Issues Paper to inform preparation of a White Paper*, December. Canberra.

Department of Resources, Energy and Tourism (2012) *Energy White Paper 2012*, Canberra.

Doherty, Ben (2012) 'Political indecision strangles India's coal industry' *The Sydney Morning Herald BusinessDay* 8 May: 8.

Doherty, Ben (2013a) 'Childhood lost in the misery of a mine' *The Sydney Morning Herald* 20-21 April: 16

Doherty, Ben (2013b) 'Jindal caught up in coal bribe scandal in India' *The Sydney Morning Herald BusinessDay* 13 June: 26.

DNA Correspondent (2013) '36 infrastructure projects get the go-ahead from Cabinet panel', 27 August, at http://www.dnaindia.com/money/1880463/report-36-infrastructure-projects-get-the-go-ahead-from-cabinet-panel (accessed 30 August 2013).

Duffy, Andrew (2012a) 'Indonesia's shocking changes' *Australian Mining* 22 May, at http://www.miningaustralia.com.au/features/indonesia-s-shocking-changes (accessed 25 July 2013)

Duffy, Andrew (2012) 'Indonesia flip-flops on mining law' *Australian Mining* 8 June, at http://www.miningaustralia.com.au/news/indonesia-flip-flops-on-mining-law (accessed 25 July 2013).

Dutta, Indrana (2010) 'Coal \India selects merchant bankers to acquire overseas assets' *The Hindu* 15 April, at http://www.thehindu.com/todays-paper/tp-business/coal-india-selects-merchant-bankers-to-acquire-overseas-assets/article750408.ece, accessed 1 May 2013.

Dutta, Sanjay and Pradeep Thakur (2012) 'Coal ministry ignored law ministry's advice favouring auction: CAG' *The Times of India* 18 August, at http://epaper.timesofindia.com/Repository/ml.asp?Ref=VE9JQS8yMDEuLzE410Fy , accessed 22 September 2012.

ET Bureau (2013) 'World bank to refurbish old power plants' *The Economic Times* 19 September, at http://articles.economictimes.indiatimes.com/2013-09-19/news/42218285_1_pilot-project-thermal-power-stations-power-sector, accessed 16 June 2013.

Firger, Daniel M. (2010) 'India, China buying U.S. coal mines, shale gas fields' 19 November, at http://grist.org/article/2010-11-18-india-china-buying-u-s-coal-mines-shale-gas-fields/ (accessed 27 August 2013).

Fraser, Andrew (2011) 'From pit to port: India's $10bn coal export plan' *The Australian* 20 August, at http://www.theaustralian.com.au/national-affairs/from-pit-to-port-indias-10bn-coal-export-plan/story-fn59niix-1226118491805, accessed 2 May 2013.

Gordon, Michael R., and John M. Broder (2013) 'Kerry Prods India to Cut Greenhouse Gas Emissions' *The New York Times* 24 June, at http://www.nytimes.com/2013/06/24/world/asia/kerry-prods-india-to-cut-greenhouse-gas-emissions.html?_r=1&, accessed 25 June 2013.

Greenpeace (2013) 'Research briefing: Adani's record of environmental destruction and non-compliance with regulations' 11 February.

Hannam, Peter (2013) 'GVK rejects claim Alpha coal project is 'stranded'' *The Sydney Morning Herald BusinessDay* 20 June: 24.

Harris, Gardiner (2013) 'Children Work in India Mines Despite a Ban' *The New York Times* 25 February, at http://www.nytimes.com/2013/02/26/world/asia/in-india-missing-school-to-work-in-the-mine.html?pagewanted=all (accessed 26 February 2013).

Hodge, Amanda 'Gautam Adani defies trend with $10bn Galilee project' *The Australian*, 3 December, at http://www.theaustralian.com.au/national-affairs/state-politics/adani-defies-trend-with-10bn-galilee-project/story-e6frgczx-1226528487966#, accessed 1 May 2013.

The Hindu Business Line (2013) 10 September: 18.

iMINCO (2013) 'More Coal Mining Jobs As India Looks to Invest', at http://iminco.net/coal-mining-jobs-as-india-looks-to-invest (accessed 17 August 2013).

International Mining (2012) World Coal: Coal still reigns, August.

Katakey, Rakteem (2013) 'India to Eclipse China as World's Coal Power, Buoying BHP', Bloomberg, 28 June, at http://www.bloomberg.com/news/2013-06-27/india-to-eclipse-china-as-world-s-coal-power-buoying-bhp.html (accessed 30 June 2013).

Ker, Peter (2013) 'Qld Premier vows no new coal royalties' *The Sydney Morning Herald BusinessDay* 5 September: 28.

Kinetz, Erika (2010) 'Coal India in talks for Peabody, Massey mines', *Forbes.com* 12 November, at http://www.forbes.com/feeds/ap/2010/11/12/business-energy-as-india-us-coal_80999798.html, accessed 1 May 2013.

Kumar, Chaitanya (2013) 'Australian Coal Is Not the Poverty-saving Saviour for India' *Huntington Post*, 13 August, at http://www.huffingtonpost.com/chaitanya-kumar/australian-coal_b_3750589.html, accessed 20 August 2013.

Lahiri, Atrayee (2011) '28 coal block limits to be redefined to boost supply' *Financial Chronicle* 16 May, at my digitcalfc.com, http://www.mydigitalfc.com/news/28-coal-block-limits-be-redefined-boost-supply-574. Accessed 23 September 2013.

Ludlow, Mark (2012) 'Adani denies visa breaches' *The Australian Financial Review* 17 July: 13.

Mehdudia, Sujay (2012) 'Before IMG, companies point the finger at States' *The Hindu* 8 September: 15.

Milman, Oliver (2013) ''Mega-mines' in Queensland's Galilee basin would guzzle water, report says', *The Guardian* 23 September, at http://www.theguardian.com/environment/2013/sep/23/coal-australia, accessed 23 September 2013.

Mitra, Sumit (2011) 'Coal India eyes underground route out of land impasse' *dna* 19 July, at http://www.dnaindia.com/money/1567129/report-coal-india-eyes-underground-route-out-of-land-impasse, accessed 27 August 2013.

Morton, Adam and David Wroe (2012) 'Greenpeace leads the war against coal' *The Age* 7 March, at http://www.theage.com.au/national/greenpeace-leads-war-against-coal-20120306-1uic5.html, accessed 1 May 2013.

Nagia, Tarun (2012) 'Coalgate: Former Babus' Role Under CBI Scanner' *The New Indian Express* 13 September: 9.

ND TV (2011) 'Coal Minister speaks on Jairam's green nod to 16 coal projects - NDTV.com' 15 February, at http://www.indiaeveryday.in/news-coal-minister-speaks-on-jairams-green-nod-to-16-coal-1001-2311576.htm, viewed 20 September 2013.

Newport Consulting (2013) 'In every cloud there is a silver lining' *Mining Business Outlook Report 2013-14*

Newsome, Matthew (2013) 'Anger at blow to rights of India's forest people' *The Guardian Weekly* 22 February: 4.

Pearse, Guy, David McKnight and Bob Burton (2013) *Big Coal: Australia's Dirtiest Habit*, Kensington, NSW: NewSouth Press.

Priest, Marcus (2012) 'Alpha coalmine raises concerns' *The Australian Financial Review* 13-14 October: 12.

PTI (2013) 'India likely to be the largest coal importer in 3-5 years: Platts' *The Economic Times* 2 September, at http://articles.economictimes.indiatimes.com/2013-09-02/news/41689034_1_largest-importer-coal-rupee-volatility, accessed 14 September 2013.

NDTV 'Aditya Birla Group, Coal India in race for Rio's $3.2 bn Australia coal mines: report' *ProfitNDTV* 11 June 2013, at http://profit.ndtv.com/news/corporates/article-aditya-birla-group-coal-india-in-race-for-rios-3-2-bn-australia-coal-mines-report-323214, accessed 27 August 2013.

Raghaven, S. 'With a self-appointed trustee like this' *The Hindu* 8 September: 13.

Ramsuyra, M.V., and E.T. Sukumar (2012) 'India Inc's foreign coal mine play to hit margins as prices fall' *The Economic Times* 27 August, at http://articles.economictimes.indiatimes.com/2012-08-27/news/33424891_1_coal-prices-coal-mine-coal-india accessed 2 May 2013.

Sabarinath, M 'Kumar Mangalam Birla to turn Essel Mining into India's largest coal developer', *The Economic Times* 27 May, at http://articles.economictimes.indiatimes.com/2013-05-27/news/39557629_1_coal-india-ltd-coal-mining-essel-mining, accessed 27 August 2013.

Saha, Sambit (2013) 'Jindal Chhattisgarh bother' 15 September, at http://www.telegraphindia.com/1130916/jsp/business/story_17354074.jsp, accessed 15 Septemebr 2013.

Salva Report (2013) 'Indonesia contributed 86% of India's total thermal coal imports in June' *Salva Report* at https://salvareport.com/indonesia-contributed-86-of-indias-total-thermal-coal-imports-in-june/ accessed 27 August 2013.

Sengupta, Debjoy (2013) 'Coal India in talks to acquire 2 Australian assets for $4billion' *The Economic Times* 17 June, at http://articles.economictimes.indiatimes.com/2013-06-17/news/40027630_1_cil-s-narsing-rao-foreign-acquisition-committee (accessed 20 June 2013).

Shafy, Samiha (2013) 'Australia's New Prime Minister Vows to Bolster Coal Industry As Environmental Groups Denounce Coal Exports', *Ecowatch* 17 September, at http://ecowatch.com/2013/australias-prime-minster-to-bolster-coal-industry/, accessed 20 September 2013.

Shanker, Abhishek and George Smith Alexander (2013) 'Billionaires Halt Mining Deals on Rupee Erosion: Corporate India', *Bloomberg* 12 September, at http://www.bloomberg.com/news/2013-09-11/billionaires-halt-mining-deals-on-rupee-erosion-corporate-india.html, accessed 15 September 2013.

Siddartha, S. (2012) 'Coal blocks review: many projects held up for eco okay', *The Hindu Business Line* 10 September, at http://www.thehindubusinessline.com/industry-and-economy/coal-blocks-review-many-projects-held-up-for-eco-okay/article3881904.ece, accessed 15 September 2013.

Singh, Nigel (2013) 'Coal cycle wallahs struggle to survive' *The Guardian Weekly* 20 September: 32.

Source Watch (2012) 'Ultra Mega Power Projects in India', at http://www.sourcewatch.org/indx.php/Ultra_Mega_Power_Projects_in_India, accessed 27 August 2013.

Sreenivas, Ashok (2012) ''Coalgate' is about opaque decision-making' *The Hindu Business Line* 10 September: 8.

Stern , Caroline, Karim El Badrawy and Camille Nedelec-Lucas (2012) 'Mining in Indonesia: AS Vibrant as the Country that Hosts It' A Report by Global Business Review, *Engineering and Mining Journal* July: 49-65.

Tan, Gillian (2013) 'India, China companies eye Rio Tinto coal stakes' *The Australian* 12 June, at http://www.theaustralian.com.au/business/wall-street-journal/india-china-companies-eye-rio-tinto-coal-stakes/story-fnay3vxj-1226662384289, accessed 27 August 2013.

United Press International (2011) 'India's coal projects face obstacles' 12 September, at http://www.upi.com/Business_News/Energy-Resources/2011/09/12/Indias-coal-projects-face-obstacles/UPI-82851315856225/print, accessed 1 May 2013.

Validakis, Vicky (2013) 'Coal India to acquire $4 billion worth of Australian assets' *Australian Mining* 16 June, at http://www.miningaustralia.com.au/news/coal-india-to-acquire-$4-billion-worth-of-aust-2, (accessed 25 July 2013).

Vidal, John (2013) 'Indian coal power plants 'kill 120,000 people a year', says Greenpeace' *The Guardian* 10 March, at http://www.guardian.co.uk/world/2013/mar/10/india-coal-plants-emissions-greenpeace, accessed 11 March 2013.

World Coal Institute (2013) Coal Statistics, at http://www.worldcoal.org/resources/coal-statistics/.

Wulandan, Firi (2013) 'Indian Coal Buyers Seek Deferrals as Rupee Slump Raises Costs', Bloomberg, at http://www.bloomberg.com/news/2013-09-04/indian-coal-buyers-seek-deferrals-as-rupee-slump-raises-costs.html.