27 May 2015 | 52 pages

Global

Coal

Survival of the Fittest

- **Lowering long-run price forecasts** – We are downgrading our long-run thermal and met coal price forecasts to $80/t and $125/t respectively. This report presents our long-run outlook for supply, demand and production costs, as well as updated regional views from our global team.
- **Structural decline in demand** – We forecast global thermal coal import demand to peak in the early 2020s and decline thereafter. For met coal, we forecast continued import growth, but for growth to slow from the 8.2% annual rate of the past five years to only 2.2% over 2015-2020 and 0.9% over 2020-2025.
- **Long-run prices to be set by sustaining costs** – Rather than being set by incentive prices for new projects, we expect both thermal and met coal prices in the longer run to be set by sustaining costs for existing mines. Given weak demand prospects and several low-cost expansions, even in the longer run the marginal tonne is likely to be set by current mines.
- **Lower costs** – Costs have declined due to companies driving efficiencies, a rolling over of the capex cycle, as well as lower oil prices and freight rates, and depreciated exporter currencies. We believe costs can continue to move lower in the short-term, but then are likely to rebound somewhat. We examine the sensitivity of longer term operating costs under various cost scenarios.
- **Risks skewed to the downside** – China and India represent the largest sources of risk to our long-run forecasts. We believe such risks are skewed to the downside, particularly for met coal, where China could re-emerge as a net exporter. Indian domestic thermal coal production and potential PCI adoption are also key variables.
- **Short-term outlook mixed** – We remain bearish on short-term thermal coal prices with a forecast of $53/t for NEWC prices in Q3. On the other hand, the recent sell-off has pushed spot met coal prices below our forecasts, and we anticipate somewhat of a rebound. Quarterly benchmark prices are expected to decline from Q2's $109.50, though.

Ivan Szpakowski
+852-2501-2728
ivan.szpakowski@citi.com

Heath R Jansen
+971-4-509-9558
heath.jansen@citi.com

Sumit Shekhar
+91-22-4277-5152
sumit1.shekhar@citi.com

Clarke Wilkins
+61-2-8225-4858
clarke.wilkins@citi.com

Sandy Niu
+852-2501-2475
sandy.niu@citi.com

Raashi Chopra, CFA
+91-22-6175-9862
raashi.chopra@citi.com

Brian Yu, CFA
+1-415-951-1830
brian.yu@citi.com

Barry Ehrlich, CFA
barry.ehrlich@citi.com

Sarel De Witt, CFA
sarel.dewitt@citi.com

Tracy Xian Liao
tracy.liao@citi.com

Harsh Bardia
harsh.bardia@citi.com

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Survival of the Fittest

Both thermal and metallurgical coal prices have fallen dramatically since 2011. While we believe that current prices are below sustainable long-run levels, we do not expect a return to prices anywhere near the levels seen a few years ago. We lower our long-run thermal coal price forecast to $80/t from $90/t (NEWC) and our met coal price forecast to $125/t from $170/t (HCC FOB Australia).

These downgrades are driven by several factors:

- **Lower costs:** Costs have fallen both for thermal and met coal mines in recent years. Some aspects have been driven by miners' own efforts and by reduced capex. These include labor, machinery, and contractor costs, and are likely to fall further. Others have been external, such as FX, oil, and freight. While not expected to return to year-ago levels, these factors are likely to push costs higher over the longer term.

- **Structural decline in thermal coal demand:** Global thermal coal demand is suffering from increasing environmental pressure and competition from natural gas and renewable energy. Moreover, Chinese demand is likely to peak as growth slows and the economy transitions away from manufacturing and investment led growth.

- **Weaker met coal demand:** Slowing Chinese steel demand from the real estate, infrastructure, and machinery sectors, as well as rising steel scrap usage should see Chinese met coal imports dry up. On the other hand, Indian imports are expected to grow rapidly, and BoF market share is expected to rise in most regions thanks to lower costs.

Our new long-run price forecasts are primarily set off estimates for sustaining costs at currently operating mines given our expectation that weak demand and a small number of low-cost projects will render higher cost projects unnecessary. Our long-run price is thus primarily sensitive to assumptions of cost inflation and longer-term demand.

We assess the sensitivity of costs to FX and oil price scenarios and find a roughly +/- $12/t realistic error margin for thermal coal and +/- $18/t for met coal. On the demand side, we view risks skewed to the downside, particularly for met coal.

Demand Outlook

Thermal Coal: Triple Threat – Environment, Renewables, Gas

Global thermal coal imports to decline

Global thermal coal demand is in structural decline as a result of increasing environmental pressures and improving competitiveness of alternative power sources, including renewables and natural gas. Costs for renewables are rapidly declining and costs for wind power are forecast to match that of coal within the next few years, with solar also gaining competitiveness. Governments are also enthusiastically backing the sector with subsidies and other preferential policies while levying increasing environmental compliance costs on coal plants.

Such pressure is most acute in China and the developed world. In comparison, a surge in thermal coal demand is expected from India and Southeast Asia. Globally, we forecast thermal coal imports to shrink by 35 Mt between 2020 and 2025, but factoring in an increased call on Indonesian exports, we expect the call on exporters to increase slightly by 12 Mt over the period. Over the 2018-2025, we peg such growth at 67 Mt.

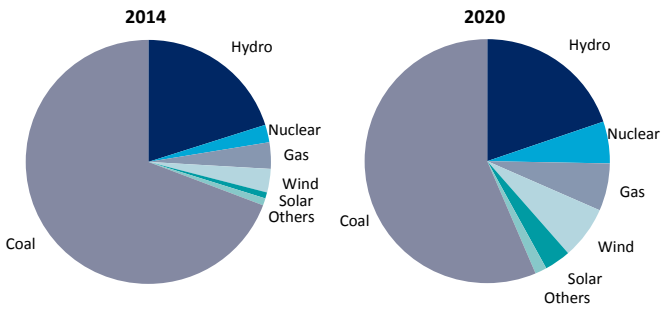
China

China's everything-but-coal strategy targets coal's share of total energy to decline to 59% in 2020 from 69% currently. As a result, we forecast China to move from its current position as the world's largest net importer to being essentially in balance by 2025.

Chinese demand is under pressure from environmental policy and shifting power mix

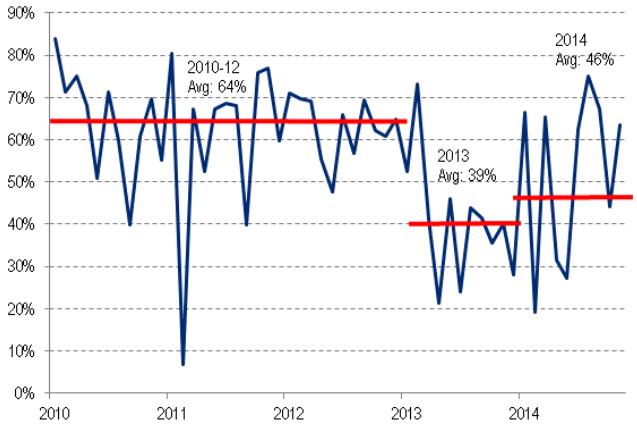
Environmental pressure will continue to rise on coal power plants, particularly in coastal regions where new capacity is unlikely to be added. In 2014, China phased out 3.3 GW coal power plants with high emission according to the NBS. The government is also planning to concentrate coal fired power generation in several inland regions, where seaborne imports will struggle to compete due to higher transportation costs to such regions and abundance of local coal resources.

Figure 1. China's power mix is moving away from coal



Source: NEA, Citi Research

Figure 2. Thermal share of new capacity shrank dramatically since 2013



Source: NBS, Citi Research

Weak demand conditions have spurred domestic curtailments, and domestic supply is expected to remain under pressure over the coming decade. However, new port procedures of testing for trace elements and other policies targeted at imported coal have prevented imports from benefitting from domestic supply weakness. The enforcement and potential escalation of such rules are likely to continue to limit imports.

Moreover, rapid development of renewables encouraged by the government will pose real threats to thermal coal. The Chinese government is planning for 17.8GW additional solar capacity and 23.9GW additional wind capacity in 2015, and new nuclear capacity of 18GW is under construction. Moreover, the ongoing nationwide electricity reform aims at maximizing utilization of renewables. These factors are expected to drive a decline in Chinese thermal coal demand in the coming decade.

United States

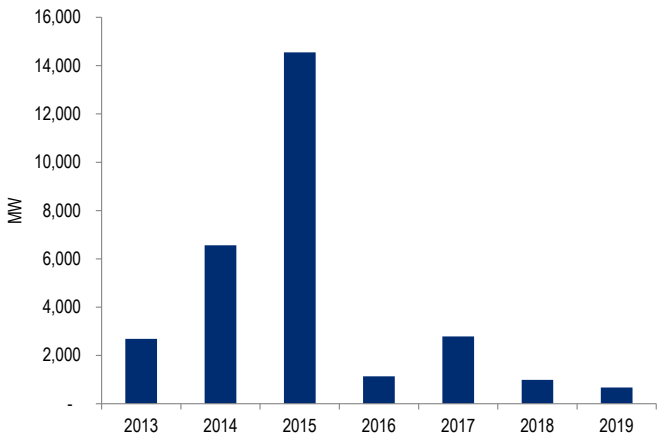
US coal power retirements will peak in 2015

Long-term US thermal coal demand is under pressure from coal plant retirements, coal-to-gas switching, environmental regulations and growing renewables capacity.

Citi expects 20 GW of additional coal power plant retirements in the US over the next five years. Moreover, rapid development of renewables is creating structural challenges. The share of renewables in the power mix of US has grown by a 13.8% CAGR over the past five years, and we expect such trend to continue thanks to policy support from individual states and the Environmental Protection Agency.

Low natural gas prices mean coal generation could fall even further as a result of coal-to-gas switching. Though sensitivity of coal-to-gas switch to prices has weakened somewhat compared to when oil prices were higher, we believe that current implied coal-to-gas switching could still be up about 4-Bcf/d YoY. In particular, Citi expects long-term (2017-2020) US Henry Hub natural gas prices to average $3.50/MMBtu in real terms. This means natural gas will be cost competitive in the long run. Outside North America, the possibility of US LNG exports flooding Asian and European markets could hit thermal coal demand in other parts of the world.

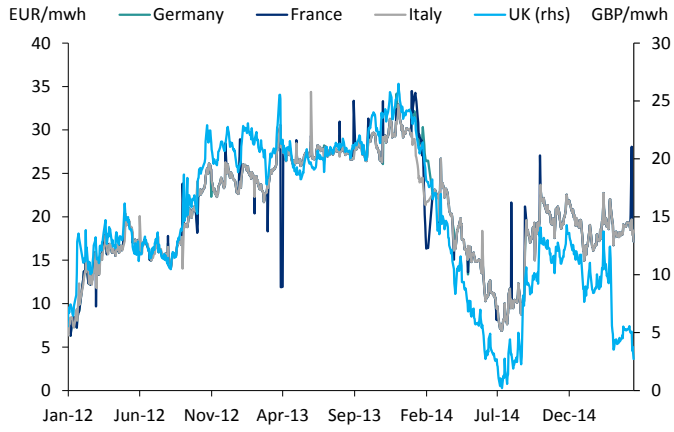
Figure 3. US coal plant retirements spike in 2015



Source: Citi Research

Figure 4. Falling natural gas prices are narrowing the advantage of coal over natural gas in the European power stack

Clean spark spread – clean dark spread



Source: Bloomberg, Citi Research

Europe

European long-term thermal coal demand is under pressure from declining natural gas prices and the implementation of its carbon emission reduction plan. We expect coal's share in Europe's energy mix will drop from 26% in 2015 to 20% in 2025.

European energy mix shifting away from coal

Low natural gas prices are increasing the competitiveness of gas-fired power plants compared to coal plants. So far coal remains cheaper, but European natural gas prices are expected to fall once the 6-9 month delay to oil linked Russian export prices filter through. In the long run, even if the oil indexation effect can be diversified away via investment in renewables and changing contract terms, potential cheap LNG imports from the US will make gas generally competitive in comparison with coal. Moreover, the EU is targeting 20% total energy from renewables by 2020, which will be ensured by feed-in-tariffs and other complementary policies to support renewables investment. Such renewables are becoming increasingly cost competitive with coal-fired plants as well.

India

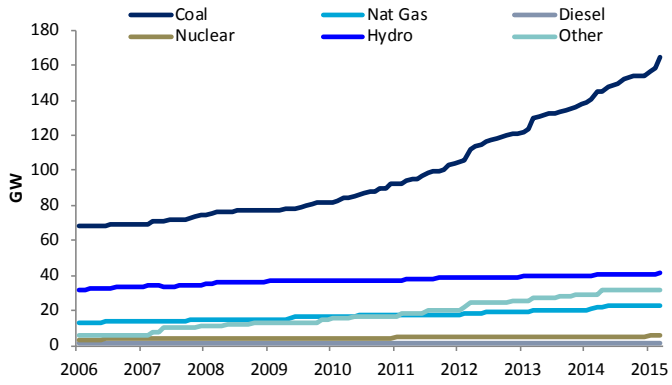
Indian domestic coal production is a key variable for import demand

India is likely to be largest source of thermal coal demand growth over the coming decade, and one of the two main drivers of import demand growth. The country is currently generating 60% of electricity from coal power plants. Domestic coal power capacity is expected to expand under the Modi government's plan to prioritize "24/7 electricity for all." Nationwide power network upgrades to improve power plant utilization rates and transmission efficiency are particular areas to watch, as is reform of state power companies. We expect these reforms to progress slowly in

the near-term, but will boost thermal coal demand over the medium and longer term.

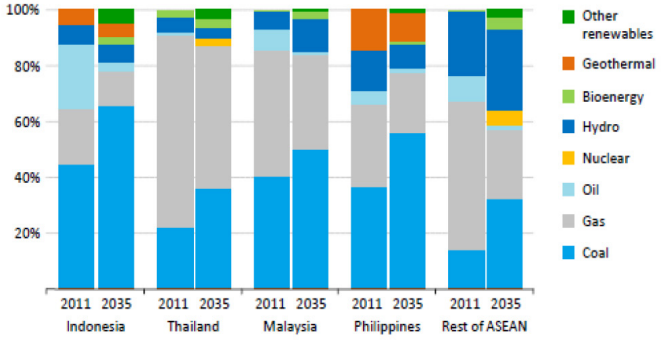
Import demand will also depend on domestic production, the outlook for which is somewhat unclear. While the government has set an ambitious target of 1.5 Bt for 2020, we expect execution to fall short. Production should rise faster than that seen in the past given the efforts by the current government though. The first signs are visible as Coal India's output growth for the first 45 days of the FY16 is the highest in over 40 years. Moreover, re-allocation of coal blocks should see significant medium term growth in non-Coal India domestic production. The result is expected to be a slowing of coal import growth in the medium term.

Figure 5. Massive Indian coal power capacity buildup during 2006-2015



Source: India Central Electricity Authority, Citi Research

Figure 6. ASEAN will see a significant expansion of coal in power mix



Source: IEA, Citi Research

ASEAN

ASEAN represents another key driver of growing thermal coal import demand. There are two components to such demand growth. The first is expected strong growth in electricity demand from the region as local economies maintain solid growth rates and transition towards export manufacturing and infrastructure led growth.

ASEAN represents one of the primary drivers of thermal coal import demand growth

The second is an expected transition away from its historic dependence on oil and natural gas fired power plants towards coal and renewables. The IEA estimates that the share of coal in the energy mix of Indonesia, Thailand, Philippines and Malaysia will rise from 17% in 2011 to 26% in 2025. This is largely thanks to cheaper available coal from Indonesia compared to deteriorating regional oil & gas reserves.

As a result, imports in the region are forecast to rise from 61 Mt in 2015 to 114 Mt in 2020 and 152 Mt in 2025. Moreover, Indonesian export volumes are likely to come under significant pressure from strong domestic demand growth.

Met Coal: Slowing China, but Better Elsewhere

China in no growth zone

Chinese demand for seaborne metallurgical coal is likely to peak this year and decline thereafter. The two major drivers of this are expected weakness in domestic steel demand and increasing usage of steel scrap.

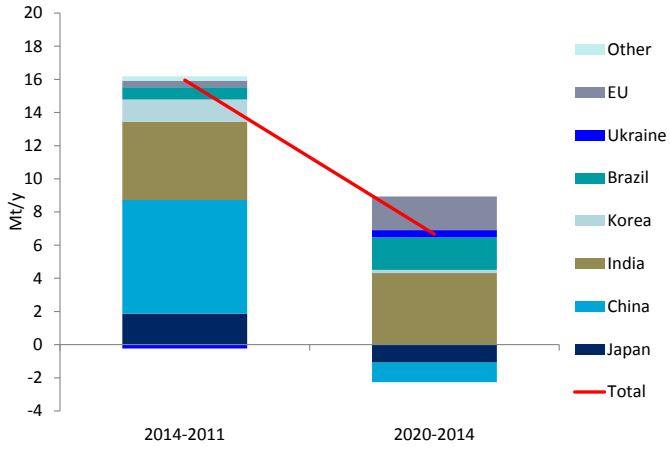
Chinese met coal imports to decline due to weak steel demand and rise of EAFs

- **Steel demand to peak:** Chinese steel demand is forecast to grow at a 1.0% CAGR over 2015-2020 and peak in the early 2020s as the country transitions away from investment led-growth. Fixed asset investment growth is expected to

remain soft led by broad based weakness in real estate and infrastructure buildup. Except transportation, all major end-use sectors are expected to see weak demand in the medium and long term. While rising export volumes to emerging markets should see steel production somewhat outperform domestic demand growth, steel production is nevertheless expected to stagnate.

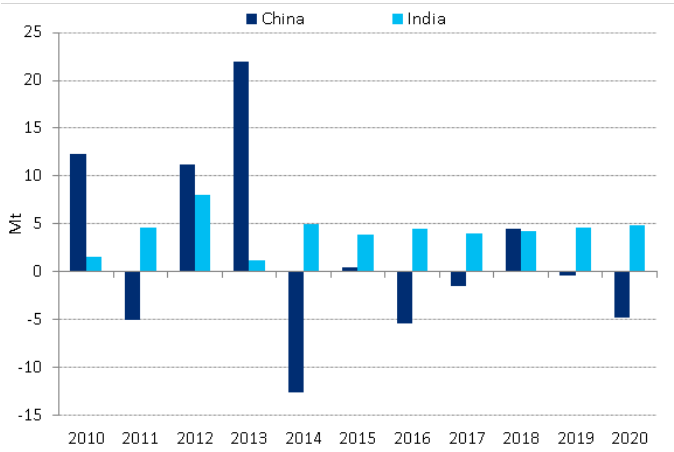
- **Increasing scrap usage:** We also expect rising steel scrap usage despite EAF based plants being uncompetitive at current prices. This is due to the rapidly rising availability of scrap from machinery, autos, and consumer goods as a result of the surge in steel consumption in the early 2000s. The government has also been supportive, encouraging construction of steel scrap collection centers. Initially, usage of scrap will grow as a share of BoF feed mix (reducing pig iron and thus coke demand), while EAF based capacity is not expected in scale until the 2020s.

Figure 7. Annual import growth is expected to decelerate sharply, with China and Japan accounting for the bulk of the shift



Source: GTIS, Citi Research

Figure 8. Indian import growth is forecast to partly offset declining Chinese imports



Source: GTIS, Citi Research

India the primary growth driver

Indian met coal imports are forecast to increase rapidly

We firmly believe that India will be the largest driver of global met coal import demand growth over the coming decade and beyond. Infrastructure investment and urbanization are expected to drive steel demand growth at a 7.7% CAGR over 2015-2025. While India will be self-sufficient in iron ore and thermal coal production is likely to increase significantly, the country's large coal reserves consist of little quality metallurgical coal. Recent coal auctions have been positive for domestic availability of thermal coal, but incremental met coal demand will need to continue to be met primarily by imports. Indian met coal imports are forecast to overtake China net imports by the end of the decade and Japan shortly thereafter.

BoF/EAF competition and PCI push-pull

BoF market share to rise in most regions

Steep declines in raw material costs for blast furnaces have made such steel mills more competitive than EAF based mills in most regions. Despite declines in oil and coal prices, electricity costs in Europe, Japan and other regions have not reacted to the same extent. As a result, BoF based plants are seeing improved utilization rates amid rising conversion margins.

Moreover, the increased competitiveness of blast furnace over EAF base production is also likely to support rising exports by Chinese BoF plants steel plants located in coastal areas.

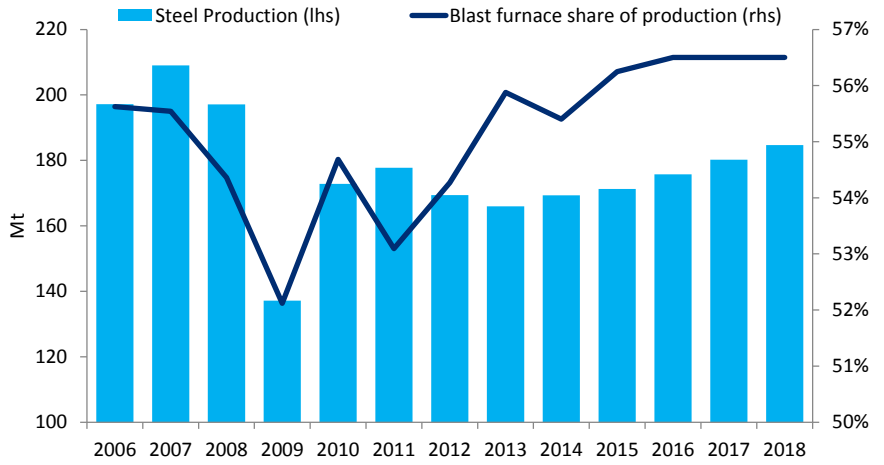
Japanese imports are expected to decline gradually over the next decade partly offset by higher utilization rates of blast furnace plants. Brazil, which has traditionally used locally available coal has stepped up its imports especially after steep decline in HCC prices. Rising steel production and usage of BoF plants will boost imports from Korea and ASEAN as well.

PCI switching incentive reduced by low prices

Though usage of PCI as a replacement for HCC is rising, the large decline in prices reduces the economic incentive. We think in the very long run the Indian steel industry could be a significant adopter of PCI technology, but this is still years away.

Globally, we forecast demand growth of around 15 Mt over 2020-2025 and 27 Mt over 2018-2025, with incremental demand primarily coming from India, and additional contributions from Brazil, Korea, and ASEAN. Offsetting much of such growth are projected declines in Chinese demand, particularly as we see the shift to scrap and EAF based steel production.

Figure 9. European demand is projected to rise as steel production increases and blast furnaces outcompete EAFs on costs



Source: Worldsteel, Citi Research

Project Pipeline

Project pipeline has deteriorated notably for both thermal and met coal

Massive price declines have made many projects unviable and have been put on hold, particularly in North America. Sharp FX depreciation has helped producers in some regions, such as Australia though. However, at current prices, many greenfield projects could face further delays. However, brownfield projects with low capital or low operating costs are still likely to proceed.

Figure 10. Thermal coal project pipeline

Project	Company	Country	Thermal	Startup Year	Type
Drake Coal project	QCoal	Australia	6	2015	Greenfield
Moatize (I + II, including logistics)	Vale	Mozambique	6	2015	Greenfield
Moolarben	Yancoal Australia	Australia	9	2017	Brownfield
Bengalla Expansion	Rio Tinto / Wesfarmers	Australia	2	2017	Brownfield
Watermark	Shenhua Energy	Australia	10	2017	Greenfield
New Acland Stage 3	New Hope Coal	Australia	2	2018	Brownfield
Taroom	New Hope Coal	Australia	6	2020+	Greenfield
Eaglefield	Peabody Energy	Australia	5	2020+	Brownfield
Potential additional projects over the medium term					
Project	**Company**	**Country**	**Thermal**	**Type**	
Elimatta	New Hope Coal	Australia	5	Brownfield	
Collingwood	New Hope Coal	Australia	4	Brownfield	
Springsure Creek	Bandanna Energy	Australia	7	Brownfield	
Mt Pleasant	Rio Tinto / Mitsubishi	Australia	11	Brownfield	
Ellensfield	Vale	Australia	6	Greenfield	
Wallarah 2	Wyong Coal	Australia	5	Greenfield	
Moorlands	Cuesta Coal Limited	Australia	2	Greenfield	
Alpha	GVK - Hancock Coal	Australia	32	Greenfield	
Woori	New Hope Coal	Australia	3	Greenfield	
Rolleston	Glencore Xstrata, Sumisho, IRCA	Australia	3	Greenfield	
The Range	Stanmore Coal	Australia	5	Greenfield	
Carmichael	Adani	Australia	60	Brownfield	
South Galilee	Bandanna Energy	Australia	17	Brownfield	
Drayton South	Anglo American	Australia	4	Brownfield	
Vermont East/Wilunga	Peabody Energy	Australia	3	Greenfield	

Source: Company reports, Citi Research

For met coal, many of the projects in the pipeline are from junior miners and coal pure play companies whose cash flows and financing abilities are being severely hit by lower prices. By 2020, around 11 Mt of low cost Australian capacity is expected to be added and Vale's Mozambique project should add another 16 Mt. Smaller Australian companies will need significant improvement in cash flows from their existing operations to support additional investment.

Figure 11. Met coal project pipeline

Project	Company	Country	Met Coal Capacity	Startup Year	Type
Amaam North O/C	Tiger's Realm	Russia	0.9	2015	Greenfield
Multi Tambangjaya Utama	PT Indika	Indonesia	1.0	2015	Greenfield
Moatize (I + II, including logistics)	Vale	Mozambique	16.0	2015	Greenfield
Grosvenor underground	Anglo American	Australia	4.5	2015	Greenfield
Bumi Barito Mineral	Cokal Limited	Indonesia	2.0	2016	Greenfield
Appin Area 9	BHP Billiton	Australia	3.8	2016	Brownfield
New Lenton	New Hope	Australia	3.0	2016	Brownfield
Metropolitan	Peabody	Australia	2.1	2016	Brownfield
Ashton South East opencut	Yancoal Australia	Australia	0.0	2016	Brownfield
Baralaba North	Cockatoo	Australia	2.5	2016	Brownfield
Groundhog	Atrum Coal NL	Canada	3.0	2016	Greenfield
Vele	Coal of Africa	South Africa	0.3	2016	Brownfield
Byerwen Coal Project	Qcoal	Australia	4.0	2017	Greenfield
Eagle Downs (Peak Downs East underground)	Aquila	Australia	4.5	2017	Greenfield
Colton	New Hope	Australia	0.5	2017	Greenfield
Comet Ridge	Acacia Coal / Bandanna Energy	Australia	0.4	2017	Greenfield
Vickery	Whitehaven	Australia	4.5	2018	Greenfield
Belview	Stanmore	Australia	3.5	2018	Greenfield
Minyango	Caledon Resources	Australia	7.0	2018	Greenfield
Spur Hill	Malabar Coal	Australia	6.0	2018	Greenfield
Drake Coal project	QCoal	Australia	6.0	2019	Greenfield
Makhado	Coal of Africa	South Africa	2.3	2019	Greenfield

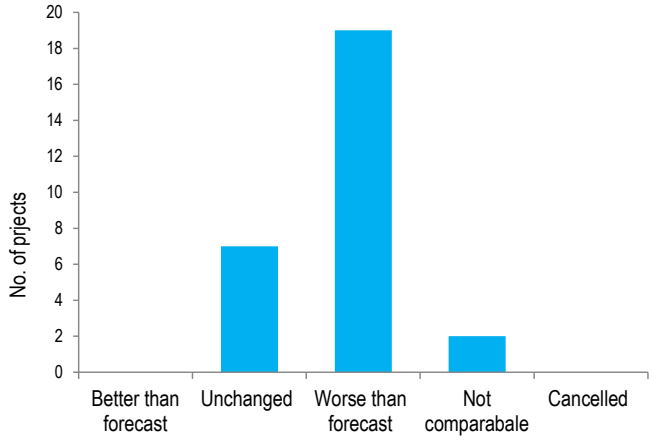
Potential additional projects over the medium term

Project	Company	Country	Met Coal Capacity	Type
Wongawilli Colliery	Wollongong	Australia	2.0	Brownfield
Russell Vale	Wollongong	Australia	2.5	Brownfield
Dingo West	Bandanna Energy	Australia	0.7	Brownfield
Stratford	Yancoal	Australia	1.9	Brownfield
Quintette	Teck	Canada	3.5	Brownfield

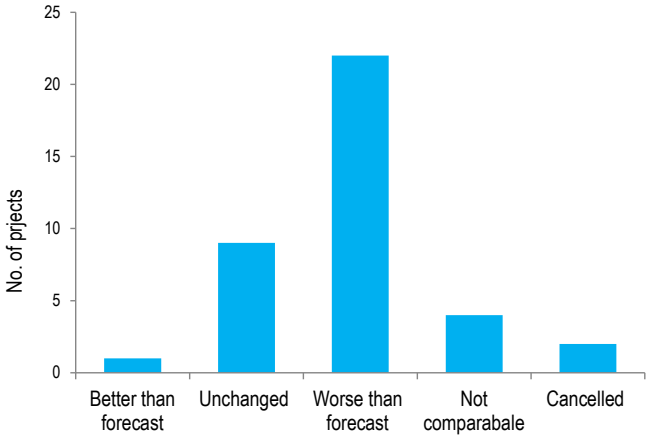
Source: Company reports, Citi Research

The pipeline of new projects has deteriorated notably over the past year for both thermal and met coal. In fact, only 50% of thermal coal projects and 80% of met coal projects remain on track from a year ago.

Figure 12. Thermal coal project pipeline comparison 2015 vs. 2014



Met coal project pipeline comparison 2015 vs. 2014



Source: Company reports, Citi Research

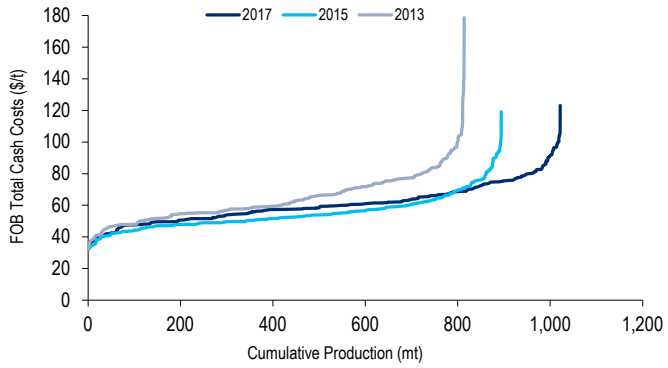
Cost Dynamics

Operating costs for the coal industry peaked in 2012 after rising for more than a decade and have been rapidly declining since that time. A peaking in the capex cycle has had a large impact on goods and services prices, including labor, machinery, and contractor costs. Moreover, the large decline in oil prices and depreciation of exporter currencies (notably the AUD), has further aided miners.

Operating costs are falling, though the biggest declines are likely behind us

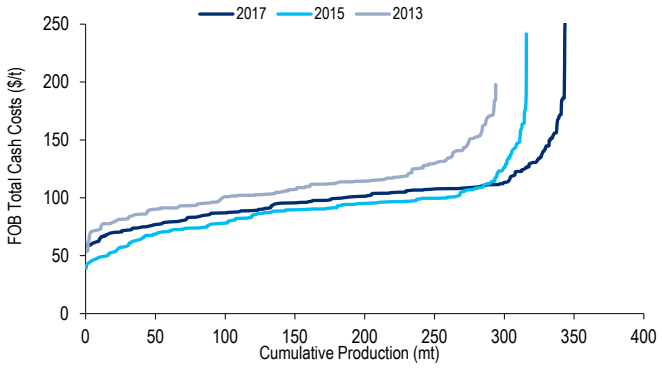
In some areas, costs still have room to fall further, notably industry contractor and transportation costs. In others, future cost inflation is likely to be significantly slower than in the past, such as labor costs. However, oil prices are now rebounding and exchange rates have stabilized.

Figure 13. Thermal coal cost curves



Source: Wood Mackenzie, Citi Research

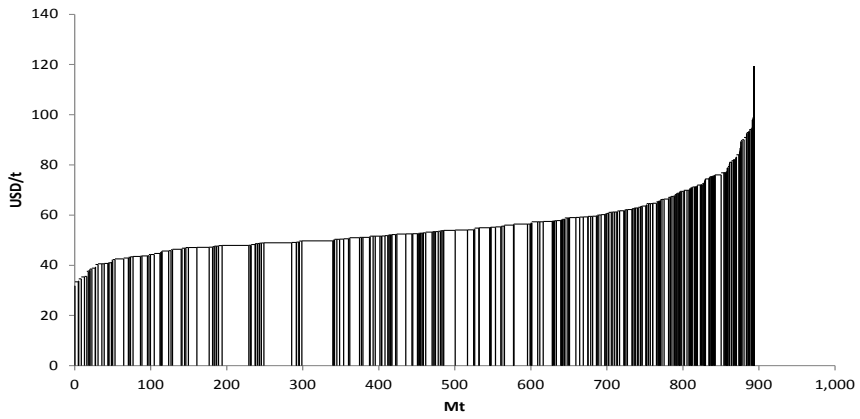
Figure 14. Met coal cost curves



Source: Wood Mackenzie, Citi Research

For thermal coal, at NEWC prices of $60/t almost 20-25% of the industry is losing money on a total costs basis (C1+royalties). While some cost savings can still be achieved, significant curtailments at higher end of the curve will be required to adjust the market. We have already seen a sharp increase in such curtailments this year, most notably from Glencore in Australia and South Africa, but further cuts will be needed.

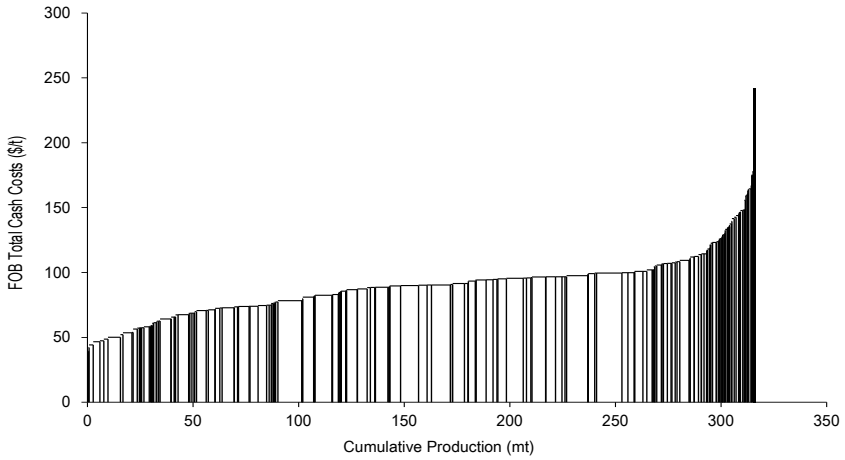
Figure 15. 2015 global thermal coal cash cost curve (energy adjusted)



Source: Wood Mackenzie, Citi Research

The situation for met coal is mixed. At prevailing spot prices of $83/t (HCC FOB Australia), almost 55-60% of the industry is making losses on a total cost basis (C1+royalties). However, at quarterly contract prices of $109.5, only 10-15% of capacity is loss making. New low cost capacity is expected from Australia over the next two years at operating costs of $50-80/t, which should put further pressure on high cost mines concentrated in North America.

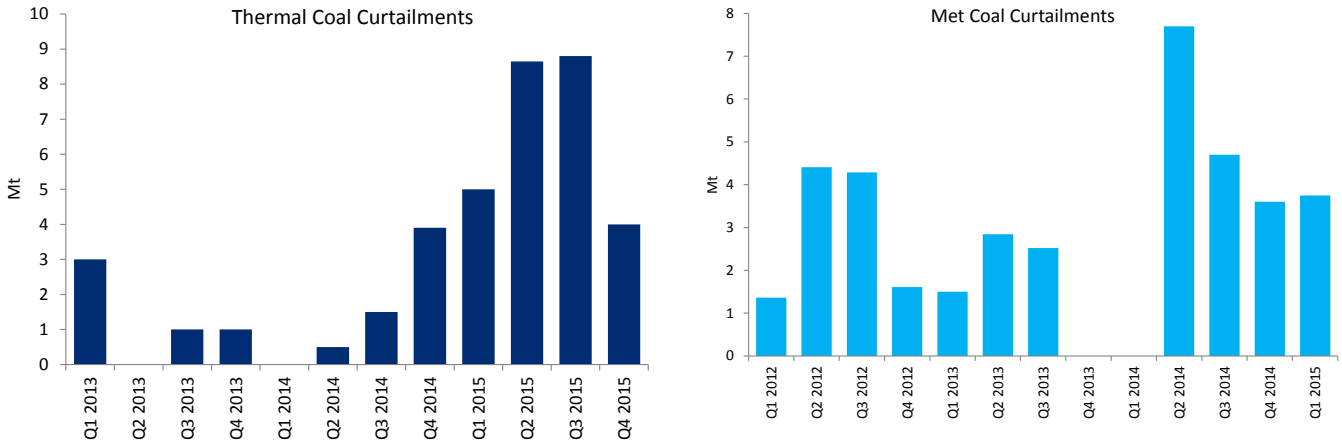
Figure 16. 2015 global met coal cash cost curve (energy adjusted)



Source: Wood Mackenzie, Citi Research

Met coal curtailments, which were initially concentrated in North America, have begun to spread to other regions, most notably Australia. 2014 saw a large increase in such curtailments, which has carried over into early 2015. Nevertheless, given continued growth in low cost seaborne tonnage and weak outlook for Chinese demand, we expect further cuts will be necessary.

Figure 17. Supply curtailments have risen for both thermal and met coal but still have a ways to go



Source: Company reports, Citi Research

Industry Costs

- **Company efficiencies:** Companies have had two reactions to lower prices. One has been a natural effort to tighten their belts by economizing on costs. The second has been to increase production volumes in order to spread fixed costs across a larger output, thus lowering unit costs.

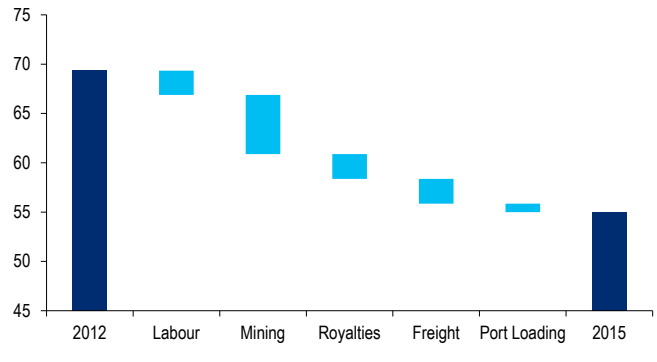
Companies driving efficiencies and innovation

- **Technology & innovation (e.g. automation):** Coal deposits have huge geological variations. In underground operations, there is a large scope for automation where rates of extraction have been low. Usage of robotics in longwall mining is increasing. Some coal mining regions remain quite labor intensive with significant room for adoption of already available technology, notably India and Indonesia. Improved extraction techniques and use of analytics in operations should help to further lower costs.
- **Labor costs:** Labor costs vary widely across the coal mining industry. Unionization generally makes cutting labor costs difficult, but companies are likely to hire greater numbers of less expensive temporary workers and contractors. Moreover, we expect the rate of labor costs increases to slow amongst traditional workers. Costs also vary by mine type, with underground mines generally having higher labor costs due to greater demand for skilled labor.

Labor, machinery, contractor costs coming off with capex

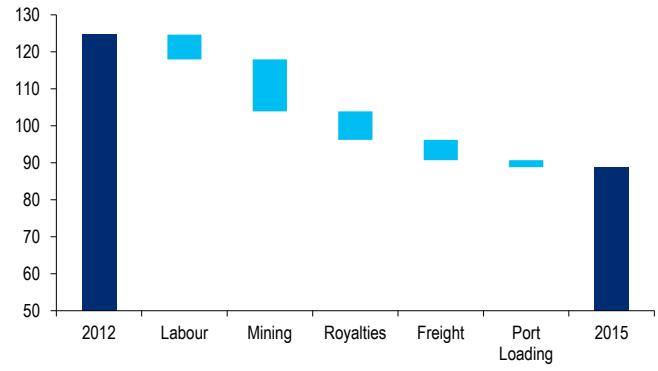
- **Machinery costs:** Demand for mining machinery is falling alongside capex. Moreover, with increasing competition from emerging market suppliers helping to further drive declines in machinery prices. A large part of the industry has already moved to pay per use basis and equipment rental costs are expected to decline.
- **Contractor costs: :** Lack of orders due to falling capex is forcing contractors to lower margins. At many mines, local contractors are fully dependent on an existing operating mine and are likely to come forward to offer support in times to difficulty.
- **Taxes and local support:** Coal mining is relatively geographically dispersed compared to most other commodities. In many remote areas, it is the only source of economic activity leading to support in the form of tax breaks and lower royalties to support operations. This includes China where implicit and explicit subsidies have supported many smaller scale mining operations.

Figure 18.Average thermal coal cash cost evolution, 2012-2015



Source: Wood Mackenzie, Citi Research

Figure 19.Average met coal cash cost evolution, 2012-2015



Source: Wood Mackenzie, Citi Research

External Costs

FX

Falling commodity prices have hit trade balances of exporting countries, contributing to weakness in FX markets. At the same time, the disconnect between US monetary tightening and monetary loosening in most other countries has also played a significant role. A large part of the fall in coal prices has been offset by FX depreciation. While Chinese and US producers have suffered, most exporters retain much stronger realizations in local currencies. A large part of mining and coal processing costs (~40-50%) is sensitive to domestic currency, including labor, rents and contractor costs, which are expected to remain soft in the longer term. Our FX analysts believe commodity exporters' FX will continue to depreciate for another one to two years before seeing gradual appreciation thereafter.

FX and oil prices represent key cost variables

Oil

Steep declines in oil prices have provided much needed relief to miners. There is a huge variation in the exposure of coal miners to oil prices though. Open pit mines with trucking have high sensitivity to diesel prices, while underground mines are more sensitive to labor, contractor costs and electricity prices, and those utilizing third party rail are not affected by oil prices on the transportation side. Depending on mine configuration, automation level, and transportation method, oil often represents 30-35% of total mining costs. Our oil analysts forecast long term crude oil prices at $75/ bbl.

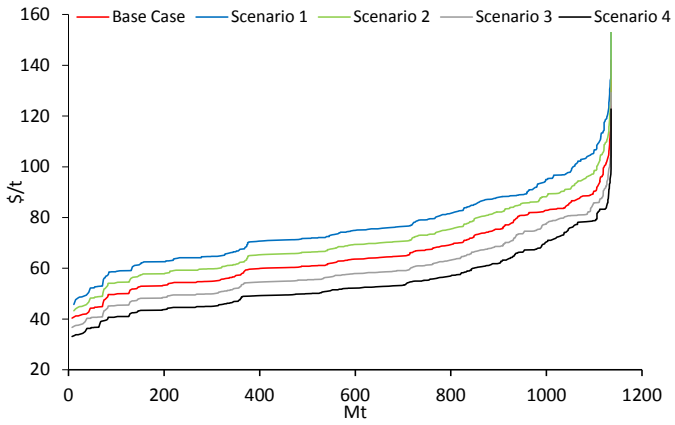
We have stress tested our forecast 2020 operating cost curves for both thermal and met coal based on a variety of scenarios for oil prices and FX rates. For example, scenario 1 depicts 20% higher than baseline oil prices and 20% stronger than baseline exporter currencies (vis-à-vis the USD).

Figure 20. 2020 thermal coal (energy adjusted) cash cost curve percentiles under different assumption for exporters' FX and long term energy prices (USD/t)

	% change	25%	50%	75%	90%
Base Case		54.8	62.9	73.2	83.6
Scenario 1	20%	64.6	74.0	85.2	96.7
Scenario 2	10%	59.7	68.5	79.8	89.5
Scenario 3	-10%	49.9	57.2	66.7	79.5
Scenario 4	-20%	44.9	51.8	60.2	72.3

Source: Citi Research

Figure 21. Thermal coal (energy adjusted) 2020 cash cost curve under different scenarios



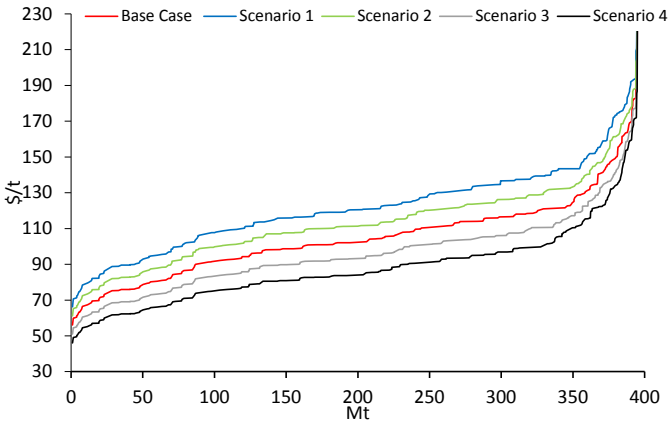
Source: Citi Research

Figure 22. 2020 met coal cash cost curve percentiles under different assumption for exporters' FX and long term energy prices (USD/t)

	% change	25%	50%	75%	90%
Base Case		91.5	102.1	115.9	128.9
Scenario 1	20%	107.7	120.4	134.5	146.1
Scenario 2	10%	99.5	111.3	124.7	136.4
Scenario 3	-10%	83.3	93.0	106.0	119.1
Scenario 4	-20%	75.1	83.7	96.2	111.9

Source: Citi Research

Figure 23. Met coal 2020 cash cost curve under different scenarios



Source: Citi Research

Freight

Freight rates to remain low, benefitting more distant exporters

Freight rates have collapsed over the past year due to lower oil prices, weaker demand for Chinese imports, and persistent overcapacity. Shipyards continued to churn out bulk carriers in anticipation of continued boom in commodities trade resulting capacity glut. Hiring charges for a Capesize vessel has collapsed from $100k/day in 2008 to $10k/day currently. We expect freight rates to remain low in the face of overcapacity and weaker global bulk commodity demand prospects. This should provide an advantage for more distant exporters, as well as opening up new routes, such as from Colombia to China.

Externalities

Take-or-pay contracts create a margin wedge, but will eventually expire

Most Australian coal producers have take-or-pay rail and port contracts of around $10-15/t. Given these contracts generally run for 10 years and still have at least 5 years remaining, in the near and medium term, this component of costs is effectively fixed regardless of whether the mines operate. It thus encourages miners to maintain production so long as losses are less than the value of take-or-pay contracts. However, once these contracts expire, it is unlikely that most miners will enter into new contracts, and if so rates will almost certainly be significantly lower.

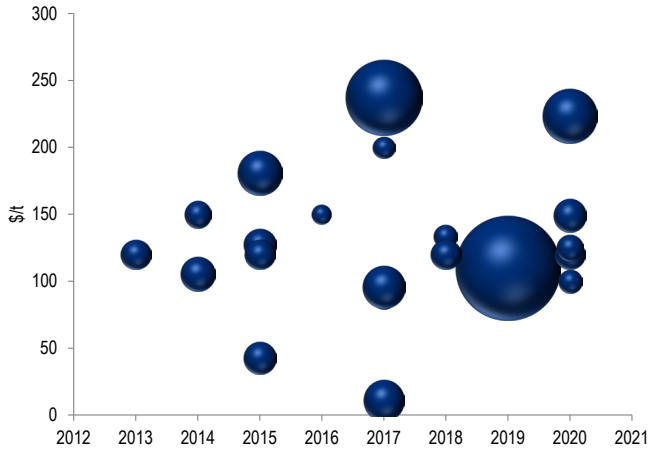
Capex Costs

Capex intensities for coal projects vary tremendously due to a variety of factors. These include geology, scale, technology employed (underground vs. open pit), and infrastructure requirements. However, capex intensities have declined universally over the past year. Partly this has been to FX depreciation, but also as the unwinding of the capex and price cycles has seen labor, machinery and other costs fall.

Capex intensities have decline significantly

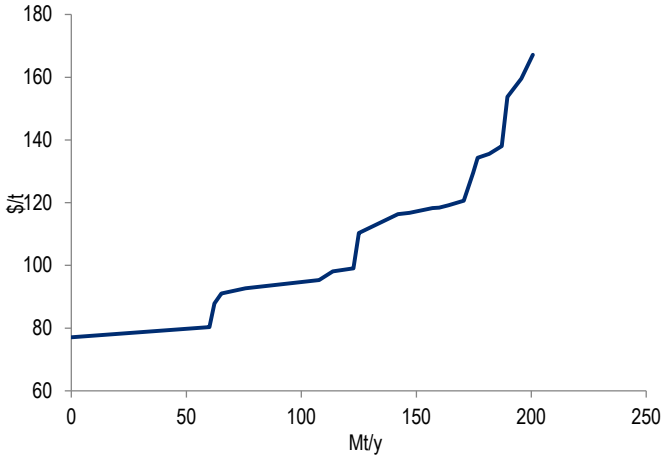
However, there is a limit to the degree that capex is able to decline due to geologic and geographic constraints. Project configuration, particularly for greenfield projects, including expenditure on access infrastructure (rail & port costs) has a large impact on capex requirements. As a result, brownfield expansions with existing evacuation infrastructure are more likely to be developed in the face of lower prices.

Figure 24. Thermal coal capex intensity varies significantly by project



Source: Company reports, Citi Research

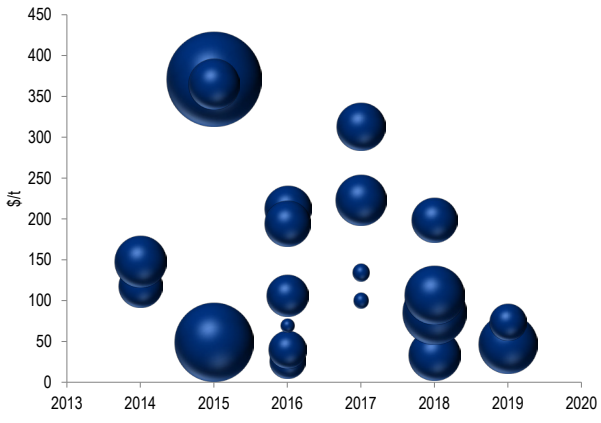
Figure 25. Thermal coal incentive cost curve



Source: Company reports, Citi Research

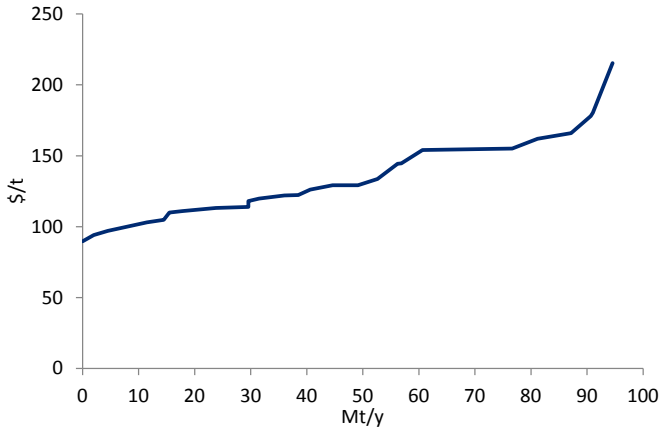
For mines that produce both thermal and met coal, it can be difficult to differentiate capex and incentive costs for each, particularly as many mines show flexibility in planning and operations depending on relative pricing. Except for a few large projects in Australia, Mozambique and Mongolia, most met coal projects are small operations though, averaging less than 3.5 Mt/y and thus raising unit costs (FOB: $70-100/t).

Figure 26. Met coal capex intensity is reasonable for many projects



Source: Company reports, Citi Research

Figure 27. Met coal incentive cost curve



Source: Company reports, Citi Research

Settling in for the Long Haul

Thermal coal long-run price of $80/t

We reduce our long term price forecast for thermal coal to $80/t from $90/t. We are currently forecasting a roughly balanced market in 2018. Between 2018 and 2025, we foresee required demand growth of 67 Mt. Adani's 60 Mt/y Carmichael project on its own would largely cover this figure.

Thermal coal to price off sustaining costs for existing mines

We thus expect that in the long run thermal coal will largely price off of sustaining costs for already completed mines, with only a small number of low cost projects likely to be built. Referring to our 2020 operating cost curve and adding $5/t for additional sustaining capex costs, we find that prices need to reach about $86-88/t in 2020$ to provide sufficient supply. Deflating this back to 2015$ yields around $80/t.

Such a scenario suggests continued overcapacity, including in China, the US, and Australia and requires a price low enough to keep such volumes out of the market and prevent additional high cost projects. On the other hand, current prices are unsustainable in the long run as seen by the rapidly rising volumes of curtailments, though we remain bearish in the short term.

Key Risks

China is the largest two way risk

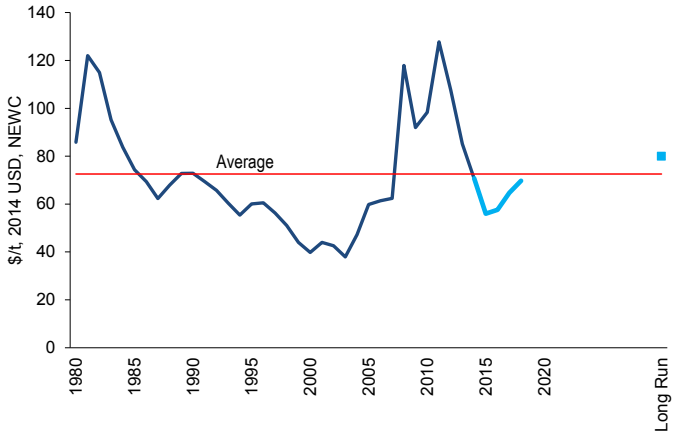
China remains perhaps the largest two way risk to our forecast. We expect Chinese import volumes to decline over the coming decade as power growth slows, generating capacity of other types is built out, and as domestic production continues to grow. However, any of these three factors could shift in either the bullish or bearish direction with massive implications for the seaborne market. For example, annual Chinese domestic production growth of 0.5% faster would see 2025 imports 132 Mt higher than forecast, while growth 0.5% slower would result in exports of 134 Mt.

Indian domestic supply is another key variable

Growth of Indian domestic supply represents another key risk. The Coal Ministry of India is targeting 1.5 Bt of coal production by 2020. Clearly this target is incredibly ambitious, and we not expect the targets to be met due to huge challenges of land acquisition, logistics and environmental clearances etc. Many of the companies developing coal blocks also have no prior experience running a coal mine. However, even supply growth below this target could see Indian imports begin to decline by 2020 despite continued rapid growth.

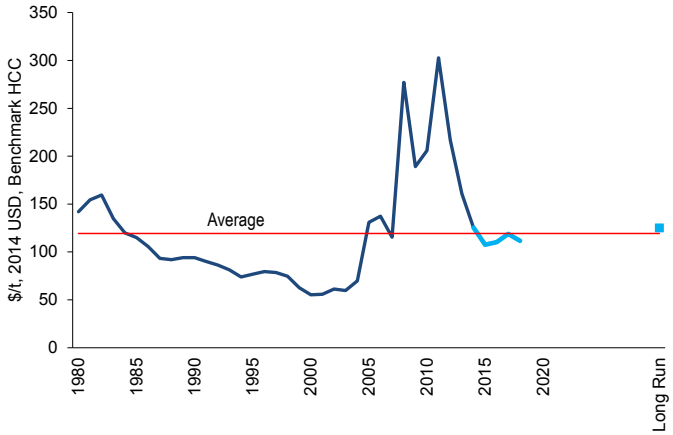
ASEAN represents one of the largest emerging sources of thermal coal import growth. However, the region's ability to continue to grow and transition to a more industrial and export driven model remains in question. Moreover, there remains a risk that regional governments will push more aggressively for renewable and nuclear power sources than they already are.

Figure 28. Long-run real thermal coal prices



Source: Citi Research

Figure 29. Long-run real met coal prices



Source: Citi Research

Met coal long-run price of $125/t

We reduce our long term price forecast for met coal to $125/t from $170/t. We forecast global demand growth of around 15 Mt over 2020-2025, but also forecast a market surplus of 38 Mt in 2020. Thus, we see no need for new projects past those already committed. In fact, we see a need for met coal prices to remain into the cost curve to prevent additional mines from re-starting production. However, there remain a number of relatively low cost expansion options that are still likely to advance and contribute 10-20 Mt of capacity by 2025.

Met coal prices need to remain well into the cost curve

Based on estimated global import demand of around 350 Mt for 2025, our 2020 operating cost curve plus $8/t for additional sustaining capex suggests a price of $130/t in 2020$ is needed to maintain adequate supply. Deflating this to 2015$ yields a price of around $125/t.

The met coal market faces a number of challenges including deteriorating demand, falling producer costs, and an influx of new low cost supply. The result is likely to be a continuation of prices below the top of the cost curve, with spare capacity being idled. Under such a scenario, the long-run price becomes quite sensitive to changes in producer costs, particularly in a market with such a flat cost curve (outside the very highest cost producers).

Key Risks

Risks skewed to the downside

The biggest downside risk to our estimate is Chinese import demand, stemming from a combination of domestic steel production, the speed at which China's EAF industry is built out, and growth in domestic met coal production. We think such risks are likely skewed to the downside for Chinese imports, with the potential for China to once again become a net exporter of met coal. However, we think the government and producers are likely to prefer exporting downstream products, particularly steel products given significant overcapacity in coke and steel production and the additional jobs and GDP generated by such activity.

India is expected to be the key driver of demand, but PCI could pose a threat to the speed of demand growth. On the other hand, persistently low iron ore and coking coal prices could see steel production shift more strongly to BoF production in developed countries than forecast. It could also retard China's build-out of EAF capacity, though increasing domestic scrap supply is likely to see EAF costs fall as well.

Regional Views

Australia: Production growth will have to be incentivized

Clarke Wilkins
+61-2-8225-4858
clarke.wilkins@citi.com

Australia is the largest coking coal and second largest thermal coal exporter, positions we expect to be retained.

Although each has different end uses, the dynamics affecting both coking coal and thermal coal in Australia have been very similar – after a rush of projects in response to higher prices, the numbers have dwindled as the reality of lower prices and still relatively high capex costs settle in.

Rather than focus on growing capacity, the big push has been to reduce costs to remain cash flow positive as prices have fallen. Assisting in this regard has been the lower AUD and fall in oil prices as the majority of Australian coal production still comes from open pit mines where strip ratio is a major cost driver.

We forecast moderating coal supply growth in Australia, although there remains a significant potential for Australia to increase coal production if an improvement in demand growth and higher prices combine to turn around project economics.

Met Coal Supply

Australia is the largest supplier into the seaborne market at around 50% of the market and also has the longest reserve life due to the extensive deposits in Queensland's Bowen Basin. Australia is therefore the key supply side driver both in the short and long term.

Production Growth

We forecast slowing production growth from Australia as output from projects committed to in the boom times is partially offset by curtailment of high cost capacity that is not economic at current coking coal prices.

There are currently three major coking coal projects either under construction or ramping up in Australia at the moment, with one major semi-soft/thermal mine also ramping-up:

- **Caval Ridge (BMA) -** 5.5 Mt/y greenfield mine that also includes upgrades to Hay Point port facilities. New capacity from Caval Ridge that is in commissioning and the recently completed Duania (4 Mt/y) has been partially offset by closure of Gregory open-cut and Norwich Park (combined ~5 Mt/y).

- **Grosvenor (Anglo American**) – Construction started in mid-2012 on the 5 Mt/y underground longwall operation with first production expected in 2016. The mine is located to the south of the existing Moranbah North mine and in addition to the potential for a second longwall, Anglo also intends to develop the Moranbah South project by 2020 as part of tripling coking coal production, although that is no doubt subject to market conditions.

- **Eagle Downs (Baosteel, previously Aquila & Vale)** – 4.5 Mt/y underground coking coal mine in Queensland near Moranbah that could be expanded to 8 Mt/y with a second longwall. The project has been proceeding at a slow rate as the JV parties were in litigation with each other and expenditure had been cut back to nominal levels due to the downturn in the coking coal market before the successful takeover of Aquila by Baosteel/Aurizon. First production has already slipped from 2016 until 1H17 and could slip further.

- **Maules Creek (Whitehaven)** – 11 Mt/y thermal/semi-soft mine that will have only a small proportion of semi-soft in the initial years (PCI and semi-soft largely in bottom seams), but increase to 50% by around years 5 (original Aston plan was to wash all coal and produce ~85% semi-soft). Has the capacity to wash all the coal through the wash plant if required. Production started in DQ14 and will ramp up to capacity over three years.

Delayed & Other Projects

On top of the projects in construction, there are a plethora of projects in Australia that could increase supply under the right economic conditions.

However, there is clearly a degree of caution warranted. The global diversified producers are all looking to reduce capex and increase returns to shareholders, meaning they are unlikely to approve any additional projects until there is a significant improvement in cash flow to prevent a rise in debt.

Smaller pure coal companies do not have the option of growth in other commodities and therefore are likely to try and push ahead with their projects, but funding these projects, which generally require significant capital, will be at the very least challenging in the current environment where debt is difficult to secure for operating assets, let alone projects that are 3+ years away from generating cash.

- **BMA** – In addition to the operating mines (Blackwater, Broadmeadow, Crinum, Goonyella Riverside, Peak Downs, Saraji and Daunia) and Caval Ridge there are a number of other projects that have been proposed. These are listed below in order that we expect them to proceed, but nothing is imminent given current coal prices and main focus on debottlenecking capacity to maximize utilization of existing infrastructure. Perhaps the best indicator of additional large major projects being approved is that President Coal Dean Dalla Vale sits on the Investment Committee that oversees all major projects – no conflict of interest is likely in the near future :
  - **Peak Downs/Caval Ridge Expansion** – expansion was originally planned as part of Caval Ridge and would increase production by ~2.5 Mt/y, although there is further upside as a preparation plant was built with capacity of 10 Mt/y. An expansion of Caval Ridge beyond initial 5.5 Mt/y is the most likely option to fully utilize this wash plant capacity.
  - **Red Hill** – greenfield development adjacent to Goonyella that was put on hold in 2012 due to the downturn in market conditions, but is now being looked at as a continuation of existing mining operations at the Goonyella Riverside and Broadmeadow mine complex. The project has three components:
    - Extend life of Broadmeadow by one year through three additional longwall panels.
    - Expand Goonyella Riverside – incremental tonnage yet to be determined.
    - Greenfield underground at Red Hill that could produce up to 14 Mt/y of high quality hard coking coal over a 20-25 year mine life.
  - **Saraji East** – underground development option that was also put on hold in 2012. Project was expected to produce up to 14 Mt/y
  - **Other** – In addition to these projects, BMA also has potential growth options in the form of expanding Saraji and Blackwater given long reserve/resource life,

although these could fall more under the debottlenecking given the new found capital discipline..

- **BMC (BHP 80%, Mitsui 20%)** – Wards Well is a >1 Bt hard coking coal resource that could sustain multiple longwall operations for >50 years.

- **Curragh (Wesfarmers)** – 1.5 Mt/y expansion to 10 Mt/y that will go to board approval in 2H15 subject to market conditions. Due to the high cost of the mine, after allowing for the Stanwell royalty, we do not include this mine in our forecasts.

- **Washpool (Baosteel, previously Aquila)** – Open cut coking coal project near Blackwater in Queensland that has a proposed capacity of 2.9 Mt/y over a 15 year mine life. Final approvals are still being secured along with an off-take contract before a decision to develop is likely. Expected operating cost of A$122/t FOB (ex-royalties) and capex cost of A$358m means that higher coal prices are required to make this project economic in our opinion.

- **QCoal –** in addition to the combined ~5 Mt/y of coking/thermal coal from Sonoma/Cows near Collinsville QCoal have the following projects:

  – **Drake Coal** – 6 Mt/y open cut coking/thermal coal mine in Queensland near Collinsville in the Bowen Basin with a life of 30 years. Construction was due to commence this year for first production in 2016, but this looks likely to slip.

  – **Byerwen (80/20 JV with JFE Steel)** – 10 Mt/y open cut hard coking/thermal coal project with a mine life of 50 years. Planned production was for 2015, but due to environmental challenges this looks likely to slip until 2016, potentially 2017+. Estimated capex is A$1.7b.

  – **Jax** – part of QCoal's northern hub (Sonoma, Cows, Drake) and planned to produce 1.8 Mt/y for 21 years.

- **Ashton (Yancoal/Itochu) –** Ashton's main product is a semi-soft coking coal with a proposal to increase capacity of 3 Mt/y ROM underground mine to 5 Mt/y ROM and also develop the SE with a 3.6 Mt/y ROM open pit (~4.7 Mt/y of product). However, production is still hovering at a ~1.5 Mt/y product rate and expansion of underground and development of open pit have been delayed due to weak markets and focus on the Moorlarben Stage 2 thermal coal expansion. Product is a semi-soft coal and first production looks unlikely before 2018 in our view.

- **Guangdong Rising Asset Management (GRAM) –** acquired Caledon Resources in 2011 who had:

  – **Cook Colliery** in Queensland's Bowen Basin that has a capacity of ~600 kt/y (80/20 coking/thermal split). There was previously a proposal to increase this to 3.5 Mt/y through installation of a longwall mining system in the lower Argo seam (previously board and pillar). Status of this project is uncertain.

  – **Minyango** – 9 Mt/y ROM underground coking/thermal project planned to be exported out of the Wiggins Island Coal Export terminal (4 Mt/y allocation) and was originally slated to be ready when the terminal opened in 2014, but the status of the project is somewhat uncertain.

- **Ellensfield (Vale)** – Proposed 5.5 Mt/y coking coal mine, but timing is uncertain as Vale looks to reduce capex spend and focus on developing Moatize in Mozambique.

- **Belvedere (Vale)** – Another project that has become a victim of the cycle, capital discipline and Vale's focus on developing the Moatize basin in Mozambique. Through various transactions with Aquila and AMCI, Vale paid ~$340m for the project that would be an underground longwall mine with a capacity of ~7 Mt/y. Remains an option for Vale if coal prices recover.

- **Eaglefield (Peabody)** – 5 Mt/y expansion of existing mine proposed but market conditions and cash flow generation of Peabody make timing of this project uncertain.

- **Oaky Creek (Glencore/Sumisho/Itochu/ICRA)** – 5 Mt/y expansion (currently ~10 Mt/y from two longwalls) through installation of a new longwall unit was originally planned over the next 5 years.

- **New Hope (NHC.AX; A$3.08; Not Rated) – Market Cap ~A$2.5b** – In addition to operating the two operating open-cut thermal coal mines in Queensland currently in operation, the company also has a number of coking coal projects:

  - **Colton** – ~0.5 Mt/y open pit coking coal project that is currently going through the environmental approval process.

  - **New Lenton** – Open pit coking/PCI/thermal coal mine that has commenced EIS – previous mining lease allowed for 2 Mt/y.

  - Other early stage projects are the Yamala and Bee Creek PCI/thermal exploration projects in Queensland and Ashford coking coal project in northern New South Wales.

- **Vickery (Whitehaven (WHC.AX; A$1.93; 2) – Market cap ~A$2b)** – 4.5 Mt/y open cut semi-soft/thermal (55/45 split) coal project in Gunnedah basin in NSW. Project is nearing final approval stage and Whitehaven is expected to sell-down a stake to a strategic investor to help fund as it has with other projects. Firstproduction is likely ~2018 given focus on completing and ramping up the Maules Creek mine over next couple of years.

- **Wongawilli South (Wollongong Coal (WLC.AX; A$0.02; Not Rated) – Market cap ~A$90m)** – proposed 5 Mt/y underground mine in the Illawarra region of NSW that would have a 25 year life. With the Wongawilli mine to be re-configured as a pillar extraction mine after the roof collapsed on the longwall earlier this year and further environmental studies required for the project, production is unlikely before 2018.

- **Comet Ridge (Acacia Coal (AJC.AX; A$0.01; Not Rated) – Market cap ~A$5m)** - proposed 350 kt/y coking/thermal open cut mine south of Blackwater progressing to mining lease stage for development when the market warrants. Capex cost estimate is <A$50m.

- **Spur Hill (Malabar Coal 35%, increasing to 80% (MBC.AX; A$0.15; Not Rated) – Market cap ~A$10m)** – 6-8mtpa ROM underground coking/semi-soft/thermal coal mine project in the Hunter Valley in NSW. Estimated capex for single longwall mining unit is ~A$800-920m. Assuming approvals proceed on schedule First production is planned for 2018 (development coal from 2017).

Thermal Coal Supply

The expected thermal coal supply growth from Australia has been substantially curtailed as the large infrastructure intensive projects in the Galilee Basin have

been delayed, along with other projects in existing major production areas of the Hunter Valley and Bowen Basin.

After a 7% increase in 2014, we therefore expect much more modest ~2% annual growth from Australia over the next few years as new projects commission (Maules Creek) and producers minimise costs by maximising production through a gradual debottlenecking of capacity. The recently opened WICET coal terminal in Gladstone will increase port export capacity in Queensland by 27 Mt/y, although this is likely to be underutilised due to reduced production of some of the major users of this facility – Glencore was trying to sell 5 Mt/y of its 10.9 Mt/y allocation to avoid take or pay costs, Cockatoo Coal recently undertook a A$125m equity raising and Bandanna Energy appointing administrators.

Australia certainly does not lack coal resources, but the reality is that with most of the infrastructure capacity largely utilised, the next generation of proposed projects are mostly in new basins that require significant rail and port infrastructure investment. This drives up capex and makes return hurdles more difficult to achieve.

Galilee Basin

The big question that lingers in terms of Australian thermal coal supply is when Galilee Basin projects get developed. Across the basin there are over 10 mines proposing to add more than 300 Mt/y, which in theory would result in a 150% increase in thermal coal exports from Australia.

Figure 30. Galilee Basin coal projects

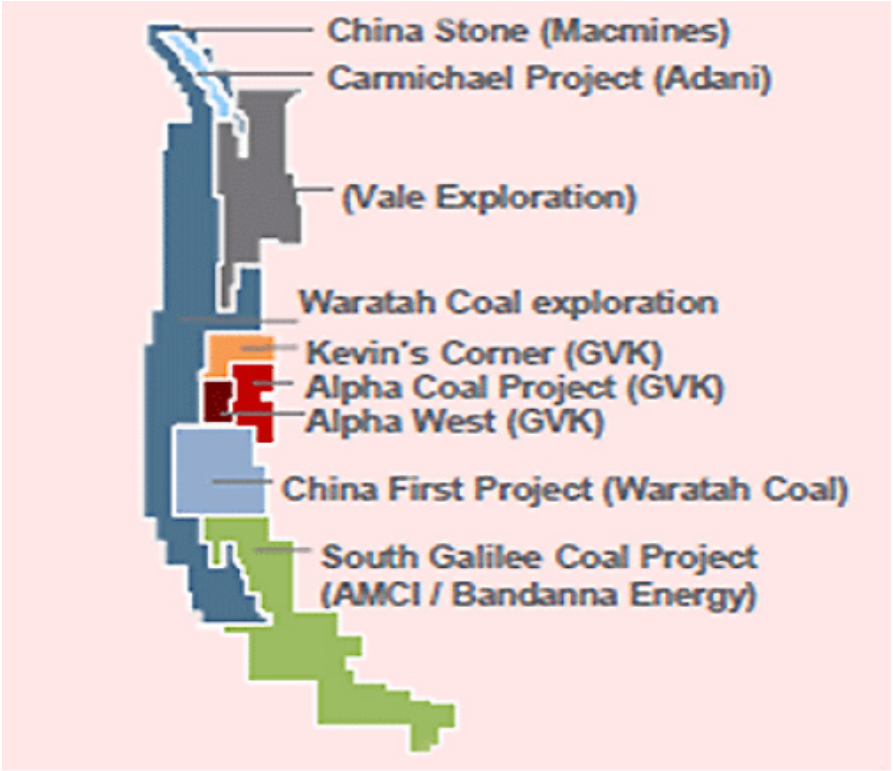
Project	Company	Capacity (Mt/y)
Alpha	GVK Hancock	30
Carmichael	Adani Group	60
Galilee (China First)	Waratah Coal	40+
Kevin's Corner	GVK	30
China Stone	MacMines AustAsia	60
South Galilee	AMCI and Bandanna Coal	15-20
Degulla Coal	Vale	20-45
Alpha West	GVK Hancock	24
Alpha North	Waratah Coal	40
Pentland, Clyde Park and Hughendon	Guildford Coal	??

Source: Citi Research

The major challenge for these projects is the massive infrastructure required from 300-500km of rail (depending on North or South in the basin) and effective greenfield new port(s) at Abbott Point.

The situation is fluid, but the current plan is to have two rail corridors to the coast, with one from the northern Galilee Basin proposed by Adani for the Carmichael project and a second from the southern end for the GVK/Hancock Prospecting Alpha Coal project.

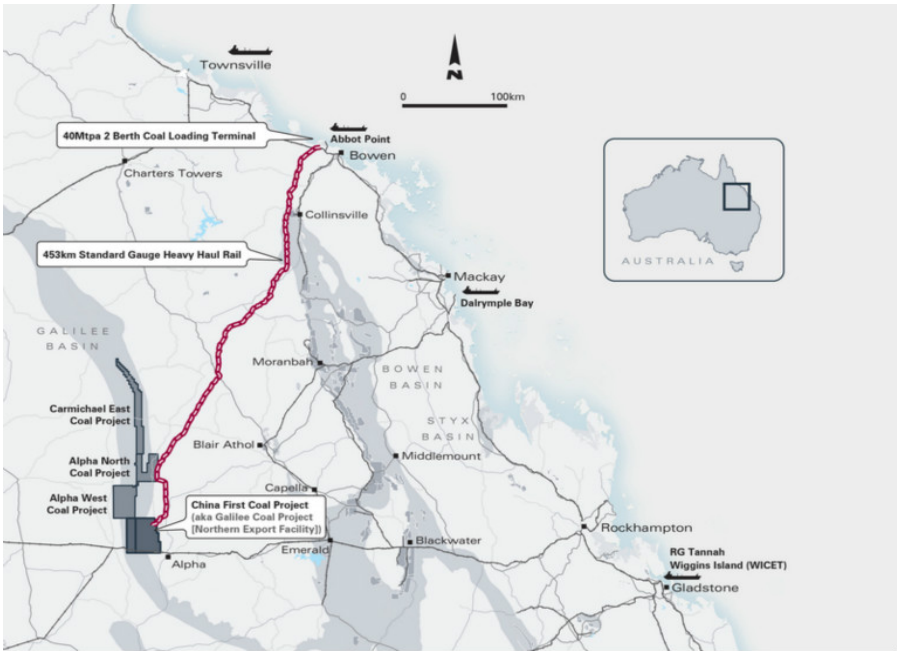
Figure 31. Coal projects in the Galilee Basin



Source: GVK

China First/Waratah Coal have also proposed a separate rail line, but ultimately it is likely that the multi-billion cost of these projects will force the construction of common user infrastructure.

Figure 32. China First/Waratah coal Project in Galilee Basin



Source: Waratah Coal

Another major hurdle facing the development of the Galilee Basin is the opposition to dumping the dredged material into the Great Barrier Reef. The recently elected Queensland government had an election policy of dumping the dredge spoils on-land but away from the wetlands proposed by the previous government, which will be required to go through an environmental approval process.

In addition to the dredging opposition, there is considerable opposition from environmental groups to the development of the Galilee Basin on factors ranging from carbon emissions, to impacts on farmlands & forests, and increased shipping traffic through the Great Barrier Reef.

China: Remain bearish

Sandy Niu
+852-2501-2475
sandy.niu@citi.com

Structural slowdown in demand

China's coal production declined by 6.1% YoY in the first four months of 2015, along with slowing GDP and negative coal-fired power generation growth. We expect China's coal demand to slow structurally in the next few years due to:

- **Energy diversification & slowing downstream industries:** Based on the "Energy Development Strategic Action Plan 2014-2020", the government targets lowering coal's share in the energy mix from 66% in 2013 to 62% or lower by 2020, and to lift the share of non-fossil energy from 9.8% in 2013 to 15%. Citi expects coal=fired power capacity as a percentage of total power capacity to drop from 61% in 2014 to 48% by 2020. Moreover, non-power coal consuming industries including cement and steel are seeing minimal or negative growth, meaning lower demand for coal.

- **Higher energy efficiency:** The unit coal consumption of China's coal-fired power plants has declined from 345g/kwh in 2008 to 318g/kwh, and should continue to decline. According to the "Clean and Efficient Utilization Action Plan for Coal (2015-2020)", newly built coal-fired power generators should have standard coal consumption <=300g/kwh.

- **Environmental protection:** To tackle the air pollution problem, the government targets to close 0.6 million steam tons of outdated industrial coal boiler capacity by 2020, and to replace the industrial coal boilers in the three major coastal economic regions (BJ-TJ-HB, YRD and PRD) with gas/heat/power/clean coal.

Oversupply to continue

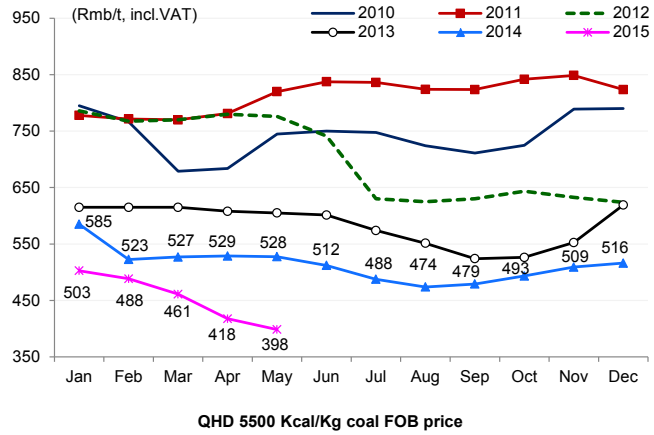
China's coal industry has seen negative FAI growth since 2013, widening from -2% in 2013 to -9.5% in 2014. Whilst producers are cutting capex and slowing new capacity additions, total capacity is still growing and the overcapacity becoming more severe. Industry consolidation looks unlikely, given that industry leaders like Shenhua and China Coal are cutting production to reduce the supply, which gives them no incentives to acquire smaller miners. The S&D is unlikely to return to balance until we see large numbers of coal producers go bankrupt, or meaningful M&A take place.

Bearish domestic price outlook

Qinhuangdao thermal coal prices (5500 kcal) has declined by 23% year-to-date, reaching at a 10-year trough of RMB 400/t in early May. It then re-bounded slightly to RMB 405/t recently with IPPs re-stocking in summer. Thermal prices may have bottomed out in the ST, but upside is capped given the overcapacity and cheap imported coal, and we remain bearish over the medium term due to structurally weaker demand and oversupply.

Coking coal prices (Liulin #4 FOR) fell by 13% YTD to RMB 700/t. We are seeing reduced supply with many big mines cutting production and small mines running at very low operational rate. The provincial investigation on over-production (Shanxi, Inner Mongolia, Shandong) will also likely reduce supply. Producers think downside risk is limited for short-term price. However, with the outlook for steel production weak, we remain bearish on the medium-term outlook.

Figure 33. QHD 5500kcal coal price 2010-2015YTD

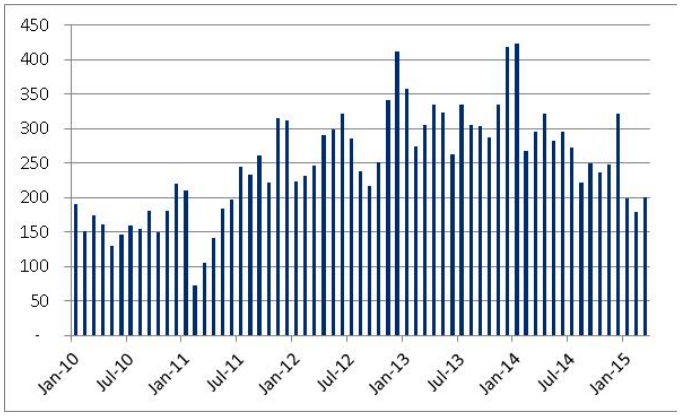


Source: SXCOAL, Citi Research

Figure 34. Domestic and international coking coal prices

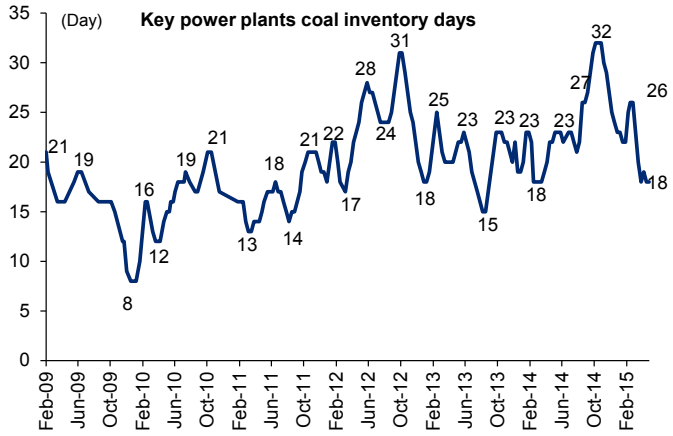
Source: SXCOAL, Citi Research

Figure 35. Annualized monthly imports of coal for China : down to ~200 Mt/y



Source: SXCOAL, Citi Research

Figure 36. Coal inventory days at key IPPs



Source: SXCOAL, Citi Research

India: Analyzing the auction impact

Raashi Chopra, CFA
+91-22-6175-9862
raashi.chopra@citi.com

Coal block auctions: game-changer?

On September 25, 2014, the Supreme Court of India (SC) ruled India's coal block allocations illegal and 1) cancelled all captive allocations except four; 2) deferred cancellation of 42 mines (producing/expected in FY15) to March 2015 ; 3) imposed a penalty of Rs295/t on coal mined up to March 2015. These blocks accounted for ~7% of India's coal production in FY14. The government decided to bring an ordinance to provide legal backing for auctioning 101 earmarked coal blocks.

What has changed?

- **Transparent allotment:** The electronic auction process of coal block allotment will not lead to legal tangles later on since it was approved by the highest court and by parliament. This takes away a big overhang on coal blocks' ownership issues which was hindering investments. Opaque allotments during the last decade had allowed non-serious players to corner blocks which affected domestic supply for industrial usage.

- **Bidding conditions and methods:** The bidding process has two stages – technical (to qualify) and financial which should effectively eliminate non-serious players. **:** 1) *Forward bidding*: iron/steel, power for captive use and cement. 2) *Reverse bidding*: power generation. Highest bidder was selected for forward bidding and lowest bidder for the reverse bidding.

- **End-Use conditions:** A successful bidder may utilize coal mined from a particular coal mine in any of its other similar end-use plants (note the end-use has to be the same) by giving prior intimation to the central government. Coal extracted in excess of the entitlement shall be required to be supplied at CIL's notified price.

- **Increase in costs:** The whole process has increased costs for end-consumers significantly. The bidders have to provide performance security as well as regular payments apart from royalties to state governments. The performance security shall be an aggregate of: (a) one year royalty payable; and (b) the annual peak rated capacity of the mine as per the approved mine plan multiplied by the final price offer. In addition to the upfront payment (10% of NPV to be made in the first year), the successful bidder has to make monthly payments with respect to the coal extracted. The payments are subject to a yearly escalation on the basis of a reference index.

- **Penalties:** In the event of coal production shortfall from the approved plan, a percentage of the bank guarantee would be deducted. Upon the exhaustion of the bank guarantee amount, the mine shall be liable for de-allocation/cancellation of mining lease. These penalties will ensure that producers keep producing at a fixed capacity.

Figure 37. Captive Coal Bocks: Peak Capacity

Number of blocks	Mining capacity pa
42	90
32	130
27	120
103	150
204	**490**

Source: Coal Ministry

Commercial mining

According to reports, the government may soon give coal blocks for commercial mining to state entities. The aim is to meet fuel demand of small local units. A number of small entities cannot bid for a coal blocks because their requirement is small. However, they also need coal and while CIL provides them the coal, state governments are localized. Commercial mining for the private sector would follow.

India's coal production should rise significantly

The government expects ~500 Mt/y of coal production from 204 captive coal blocks at peak capacity – 90 Mt/y from already operational coal blocks (Schedule II), 130 Mt/y from soon-to-be-operational blocks (Schedule III) and 120 Mt/y from the others to be auctioned in the near term. The remaining blocks (of the 204 Mt) should account for 150 Mt/y at peak capacity.

Coal supply in India has lagged demand, and has been crimping economic growth. India is the third-largest coal producer globally, thanks to its large resource base, but delays in new-mine clearances and transport bottlenecks stifled domestic coal supply growth to just ~3% in FY10-14.

The auction/allocation process provides us with visibility on India's potential to accelerate coal production. In addition to the payment going to the state, we anticipate greater support at the local levels as coal production would help states' development and coffers. However, coal availability will not improve until existing constraints are dealt with. The coal ministry is focused on expediting clearances, bringing in new technology, and improving rail connectivity.

The coal ministry has drawn up a plan of nearly tripling India's coal output, from 565 Mt in FY14 to 1.5 Bt by 2020. Of this, ~ 500Mt is expected from captive coal blocks being auctioned and the remainder from CIL, with the government target for CIL at 925mt by FY20. CIL's production growth has already accelerated to 7% in FY15 from a 2% CAGR over FY10-14.

Figure 38. CIL volume expectations

	FY15E	FY16E	FY17E	FY18E	FY19E	FY20E
Coal Ministry Target	520	548	598	661	780	925
% change	10%	5%	9%	11%	18%	19%
Citi est for CIL despatches	489	524	562	604	650	702
% change	4%	7%	7%	8%	8%	8%

Source: Citi Research, Industry Sources

Improving rail connectivity

According to the Business Standard, the government has plans to set up SPVs to evacuate coal clocked across Chhattisgarh, Jharkhand and Orissa. In addition to the three railways lines, another 54 projects have been identified for facilitation evacuation (US$12.5bn). The JVs will have equity participation from CIL, railway undertaking IRCON, and the state government concerned.

The three railway lines include a 1) ~93km Tori-Shivpur-Kathotia rail link connecting North Karanpura in Jharkhand; 2) ~50km railway track from Gopalpur to Monoharpur in Talcher and IB coalfields (Orissa) ; 3) 180km stretch in Mand-Raigarh Coalfields in Chhattisgarh (Source: Business Today). The coal secretary has indicated that the three railway lines should be completed by December 2017.

According to the Economic Times, the critical railway link project in Orissa to facilitate faster transportation of coal is likely to be completed by 2017. The coal connectivity line in Tori-Shivpur-Kathautia in North Karanpura, Jharkhand will take time. In addition, CIL has plans to invest US$800m to buy 250 rakes for transporting coal.

Focus on technology

According to the Economic Times, technology upgrades in large-scale open cast mines include an operator independent truck dispatch system, a vehicle tracking system using GPS/GPRS, coal handling plants and silos for faster loading and monitoring using laser scanners. In underground mines, the steps taken by CIL will include the introduction of continuous miner technology in large-scale, long-wall technology at selected places. Business Standard also suggests CIL is preparing to award long-term mining contracts to private companies to boost production. South Eastern Coalfields and Eastern Coalfields have identified some underground mines where high-technology mining would be required.

Citi production & import forecasts

The gov't has a target of ~15% growth for India's coal supply and ~12% for CIL.

We have extended our projections to FY20. We expect coal production from captive mines will rise from 58 Mt in FY15 to 62 Mt in FY16 and 153 Mt by FY20, accounting for 17% of total Indian production compared to 7% in FY14. We forecast growth for CIL of 7% over FY14-20 vs. 2% during FY10-14. Combined Indian production should thus see supply growth of ~8% annually through FY14-20.

We expect limited downside risk to our e-auction pricing and volume assumptions for CIL.

Our bottom-up demand analysis suggests demand growth of ~7%; imports would follow a declining trajectory over time. This will however have to be an inverted 'V'-shaped move – wherein we expect FY15 imports to rise 28%, growing a further 14% in FY16 – and deceleration likely to commence in FY19.

Figure 39. Thermal +Coking Coal Demand-Supply

	FY10	FY11	FY12	FY13	FY14E	FY15E	FY16E	FY17E	FY18E	FY19E	FY20E
Coal Production	532	533	540	558	566	604	644	699	757	828	919
-% chg	8%	0%	1%	3%	1%	7%	7%	9%	8%	9%	11%
Domestic despatches	514	523	535	570	572	599	639	694	752	828	919
-% chg	5%	2%	2%	6%	0%	5%	7%	9%	8%	10%	11%
Shortfall in domestic supply	73	89	103	138	194	246	279	283	282	264	232
-% chg	24%	21%	16%	34%	41%	27%	13%	1%	0%	-6%	-12%
Domestic demand	587	612	638	707	766	845	918	977	1,033	1,092	1,151
-% chg	7%	4%	4%	11%	8%	10%	9%	6%	6%	6%	5%

Source: Citi Research, Ministry of Coal

Figure 40. Thermal +Coking Coal Imports

	FY10	FY11	FY12	FY13	FY14E	FY15E	FY16E	FY17E	FY18E	FY19E	FY20E
Required Total Coal Imports	73	89	103	138	194	246	279	283	282	264	232
Realistic Total Coal Imports	73	89	103	138	159	204	232	236	236	222	197
-% chg	24%	21%	16%	34%	16%	28%	14%	2%	0%	-6%	-11%
-% of Domestic Consumption	12%	15%	16%	19%	22%	25%	27%	25%	24%	21%	18%

Source: Citi Research, Ministry of Coal. Realistic imports are adjusted for calorific value.

Note the decline in imports is likely to be driven by lower thermal coal imports. Coal imports would also depend on FX movements and international coal price trends.

Figure 41. Thermal Coal Demand-Supply

	FY10	FY11	FY12	FY13	FY14E	FY15E	FY16E	FY17E	FY18E	FY19E	FY20E
Coal Production	488	483	488	508	508	548	587	641	698	766	855
Domestic despatches	471	475	484	520	515	543	582	636	693	766	855
-% chg	4%	1%	2%	8%	-1%	5%	7%	9%	9%	11%	12%
Shortfall in domestic supply	49	60	71	105	156	210	237	234	230	212	178
-% chg	28%	23%	19%	48%	49%	34%	13%	-1%	-2%	-8%	--16%
Domestic demand	520	534	555	625	671	753	819	870	923	977	1,033
-% chg	6%	3%	4%	13%	7%	12%	9%	6%	6%	6%	6%

Source: Citi Research, Ministry of Coal

Figure 42. Thermal Imports

	FY10	FY11	FY12	FY13	FY14E	FY15E	FY16E	FY17E	FY18E	FY19E	FY20E
Required Total Coal Imports	49	60	71	105	156	210	237	234	230	212	178
Realistic Total Coal Imports	**49**	**60**	**71**	**105**	**125**	**168**	**190**	**187**	**184**	**169**	**142**
-% chg	28%	23%	19%	48%	19%	34%	13%	-1%	-2%	-8%	-16%
-% of Domestic Consumption	9%	11%	13%	17%	20%	24%	25%	23%	21%	18%	14%

Source: Citi Research, Ministry of Coal. Realistic imports are adjusted for calorific value.

Coal block auctions do not suggest price discovery

High coal block allocation prices do not imply price discovery for CIL

The government has introduced the reverse bidding process for the power sector. We had earlier expected this to be a price discovery mechanism for Coal India – if companies could mine coal at a lower price than Coal India's notified prices, it would have meant downside risk to Coal India's prices. Contrary to expectations, the bidding for the power sector went from reverse to forward, but we no longer conclude this as price discovery for Coal India. In other words, we do not think this suggests upside risk to pricing as the government's focus in the power sector auctions has been to keep tariffs under control.

Auction/allotment of blocks so far would make the states richer by US$43bn over (30 yrs+) and would result in incremental royalty of US$36bn

- **First round of auctions:** February 14-22 − The first round of auctions consisted of 18 blocks – 12 to the non-power sector and 6 to the power sector. The total extractable reserves for these blocks are estimated at 724 Mt. Estimated revenues (over 30 years) to the state governments are expected at ~US$17bn plus royalty at ~US$2.5bn.

- **Second round of auctions:** March 4-9 − The second round of auctions concluded consisted of 13 blocks – 8 to the non-power sector and 5 to the power sector. The total extractable reserves for these blocks are estimated at 895 Mt. Estimated revenues (over 30 years) to the state governments are expected at ~US$11bn + royalty at ~US$3bn.

The government has however rejected the winning bids for three coal blocks auctioned – Gare Palma IV/1 (Balco), Gare Palma IV/2 & IV/3 (JSPL), Tara (JSPL). Reports from the India Express indicate that bids were reviewed to determine whether winning bid prices were too low compared to winning bids for similar blocks. The Gare Palma IV/1 block was won by Balco at a price of Rs1,585 (2% over the applicable floor price). This compares to the winning bids of Rs2,300-3,500/t for Gare Palma IV/4, IV/5, IV/7, IV/8 (37-70% above the applicable floor price). The Gare Palma IV/2 & IV/3 and Tara blocks were won by JSPL at forward bids of Rs108-126/t (vs. other forward bids at Rs300-1,100/t). JSPL and Balco have moved the Delhi High Court against the gov't decision.

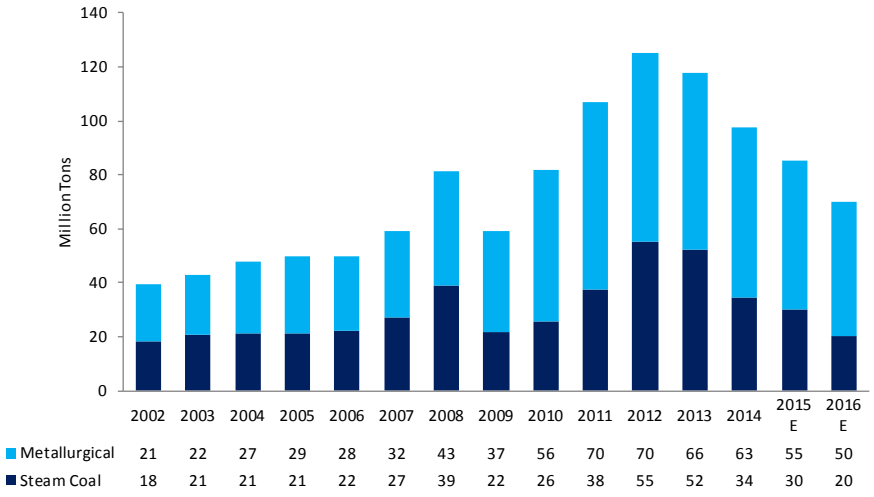
United States: Export volumes will continue to deteriorate

Brian Yu, CFA
+1-415-951-1830
brian.yu@citi.com

US coal miners tend to be swing suppliers to the seaborne markets primarily because of high transportation costs, specifically rail. Rail costs to export terminals have been as high as $40-45/t in the past although rail companies have been working with coal miners to lower transport rates so that US coal better compete in global markets.

In 2014, export tonnage dropped 17.3% YoY to 97 Mt, with thermal coal declining by 34% and metallurgical coal by 4.1%. US coal exports have declined for the past two years, reflecting slower global demand, lower international prices, and higher coal output in other exporting countries. We expect export activity to decline again in 2015 based on our forecast for sustained weakness in seaborne coal prices. At spot prices, incremental exports make little sense for US producers, but some miners have multi-year supply contracts under predetermined or financially hedged pricing, moderating declines.

Figure 43. US coal exports are declining



Source: EIA, Citi Research

Walking through the sample economics in Figure 44for Appalachian coal, we can see that after adjusting for freight and rail costs, the netback to the miner is far superior selling domestically vs. internationally. However, there are parts of the US where production costs are lower and miners can afford to export because: 1) they have a cost advantage and can still generate a positive margin, or 2) are reluctant to give-up their export share in case international prices recover so will operate on a cash breakeven basis.

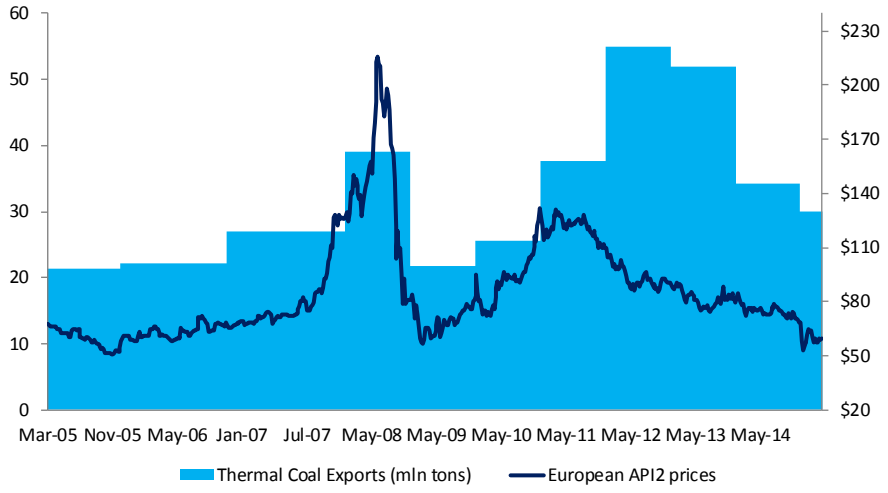
Figure 44. Appalachian coal export economics favor domestic sales

	U.S.	Europe (API2)	China (Qinhuangdao)
Reference Price ($/tonne, 10.8k Btu)		57.4	97.0
Heat Adj. Reference Price ($/tonne, 12.5k Btu)		68.8	112.3
VAT (17%)			(19.1
Freight From US ($/tonne)		(8.7)	(22.0
FOB US Terminal ($/tonne)		60.1	71.2
FOB US Terminal ($/ton)		54.5	64.6
Rail - Mine to Terminal		(30.0)	(30.0
CApp ($/ton, 12.5k Btu)	**$50.95**	**$24.52**	**$34.58**

Note: Prices as of 5/1/15. Source: Platts, Citi Research

Ultimately, US thermal coal exports will respond to market signals as illustrated by its 10-year trailing relationship with European thermal coal prices. Thermal exports did remain elevated in 2011-2013, but this was due in part to multi-year contracts and the start-up of low-cost longwalls, primarily from Foresight Energy. However, even Foresight's delivered cost to Europe is almost $60/t on a quality adjusted basis, so incremental sales are unlikely and uneconomic.

Figure 45. US thermal coal export volumes generally follow European prices



Source: EIA, Bloomberg, Citi Research

Our estimate of potential medium-term US thermal coal exports based on various European thermal coal price scenarios are as follows.

Figure 46. US thermal coal export scenarios

API 2 ($/t)	**60**	**70**	**80**	**90**	**100**
Thermal Coal Exports (Mt)	20	25	30	40	50

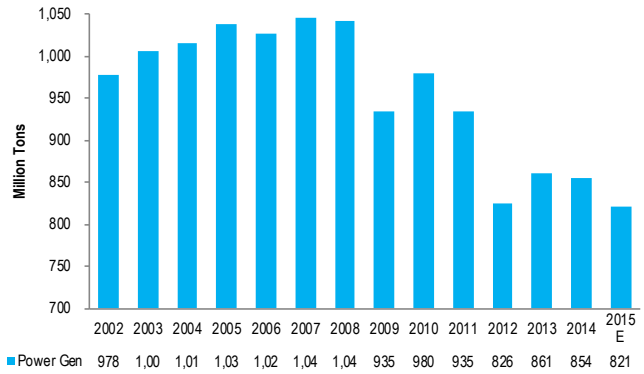
Source: Citi Research

The outlook for metallurgical coal exports is not any better than thermal coal and there are no new projects being considered. US metallurgical coal exports declined

to 63 Mt in 2014 from a peak of 70 Mt in 2012 and could fall to 40 Mt towards the end of the decade if benchmark hard coking coal prices remain below $130/t.

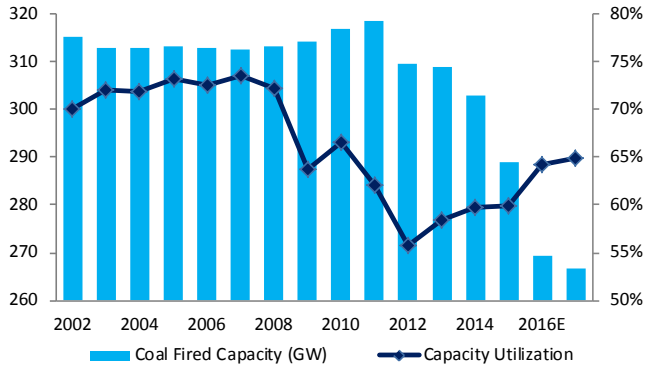
Outside of the Illinois Basin, there is little capacity being added in the US because of competitive pressures from natural gas that trades below $3/MMBtu and EPA threatened coal-fired power plant closures. Arch Coal expects roughly 20 GW of coal generation capacity to close in 2015 related to the MATS regulation. While concerns regarding plant closures persist, the more favorable economics of natural gas over coal have already done far greater damage. Compared to 2002-2008 when coal-fired plant utilizations consistently averaged above 70%, more recent utilization rates are closer to 60%. Coal-fired generation capacity is expected to continue to fall as new regulations force closures.

Figure 47. US thermal coal demand is declining



Source: EIA, Citi Research

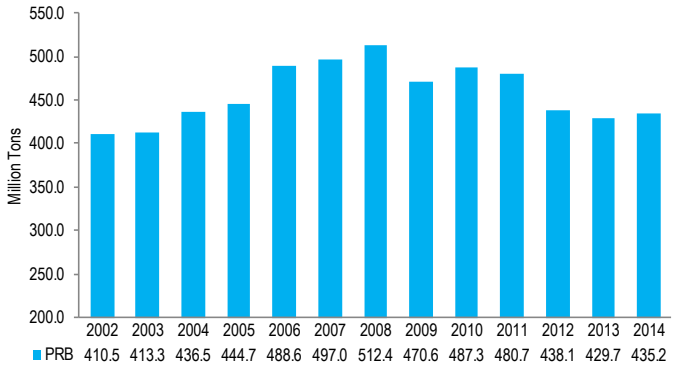
Figure 48. Coal-fired power plant capacity & utilization



Source: EIA, Citi Research

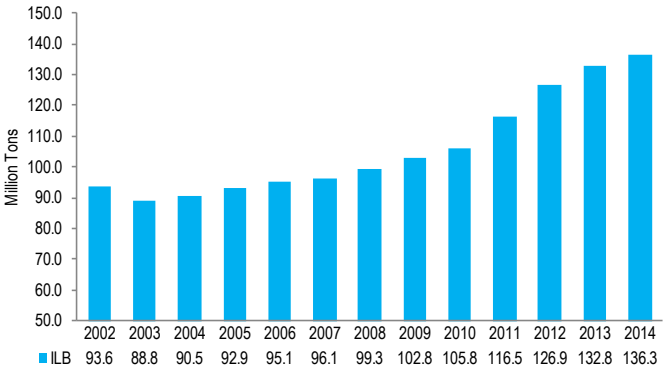
Unless prices recover, we do not expect incremental capacity additions outside of the Illinois Basin, which has a competitive cost advantage versus other sources of Eastern coal. However, any capacity addition in Illinois Basin will be offset by curtailments elsewhere, primarily Appalachia. If demand improves, the biggest coal producing region, PRB, has ample capacity that can be brought back online by adding equipment and labor. In 2014, PRB produced 435 Mt vs peak production of 512 Mt in 2008.

Figure 49. Powder River Basin coal production is falling…



Source: EIA, Citi Research

Figure 50. …While Illinois Basin output is rising

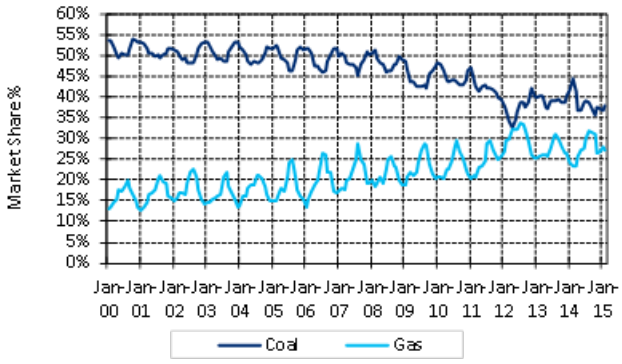


Source: EIA, Citi Research

Coal demand has suffered in recent months, primarily driven by natural gas prices averaging below $3/MMBtu. Coal fired-generation fell by 11.5% YoY in February

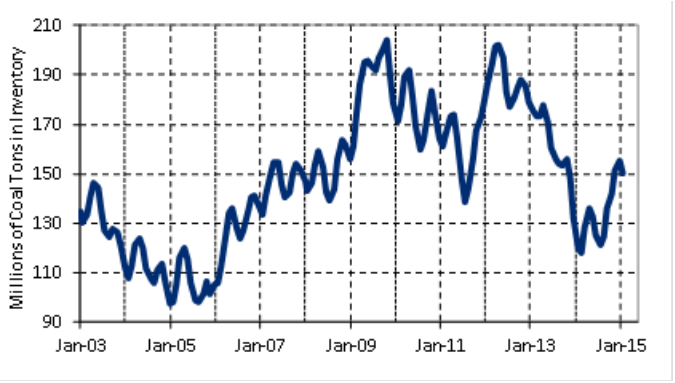
(the only category that declined in Feb) and 15.6% YoY in January. This is in contrast to gas-fired generation which increased 20.6% YoY in February and 11.4% YoY in January. As a result, coal inventories have increased meaningfully from 2014 lows to ~150 Mt during February. We estimate inventories currently stand at 166-168 Mt and Arch Coal predicts this could grow to 180 Mt by the start of the summer burn season. Given expectations for natural gas prices to remain low throughout 2015, coal inventories should continue to increase YoY. This would imply a tough 2016 as weaker spot prices work their way into new contracts and utilities reduce purchases to work down inventories.

Figure 51. Coal vs gas market share



Source: EIA, Citi Research

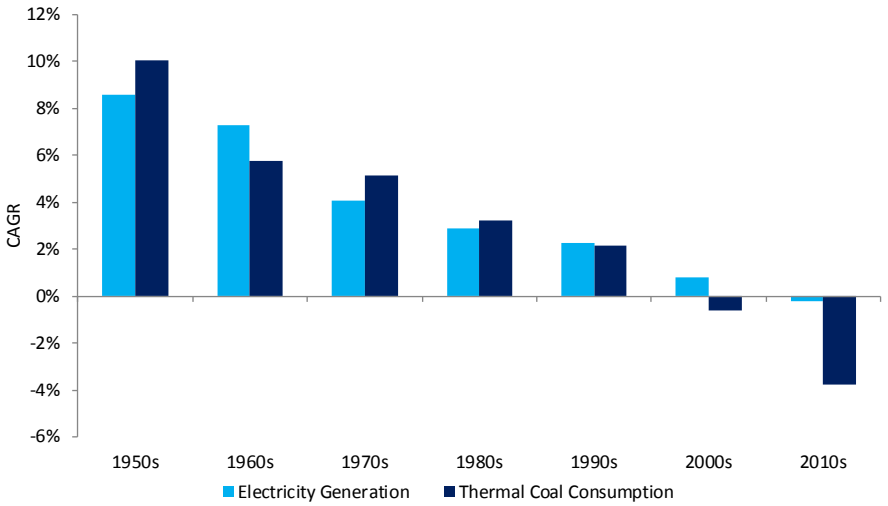
Figure 52. Coal inventory at power plants



Source: EIA, Citi Research

Longer-term, the prospects for both electricity generation and domestic thermal coal consumption are poor. US electricity generation has barely grown over the last decade and the outlook is similar given the strong consumer focus on energy efficiency. Moreover, rising renewables capacity looks to take further market share from coal plants.

Figure 53. Electricity and thermal coal demand growth continue to slow



Source: EIA, Citi Research

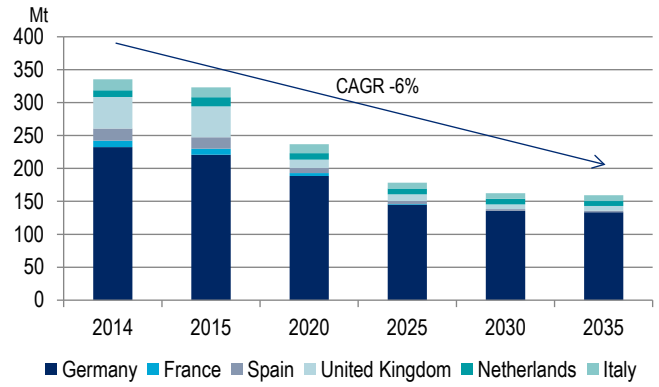
Europe: Uninspiring story

Heath R Jansen
+971-4-509-9558
heath.jansen@citi.com

Harsh Bardia
+91-22-4277-5080
harsh.bardia@citi.com

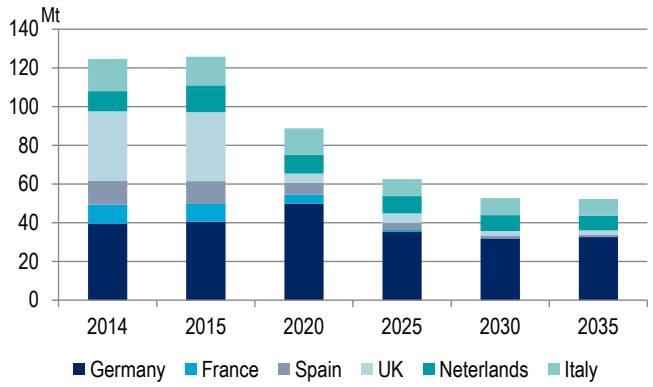
We expect thermal coal consumption in major European economies to decline by a CAGR of 6% through 2025 (Figure 54), effectively reducing absolute thermal coal requirement from the region by almost half. Germany (by far the biggest consumer) will see a rapid shift from coal based power generation in favor of renewables and natural gas. The effect on seaborne import is equally severe; we see cumulative seaborne imports declining by over 50% (Figure 55) to 62Mt by 2025 from 126Mt import forecasted in 2015.

Figure 54. Thermal coal demand profile of major European economies



Source: Wood Mackenzie, Citi Research

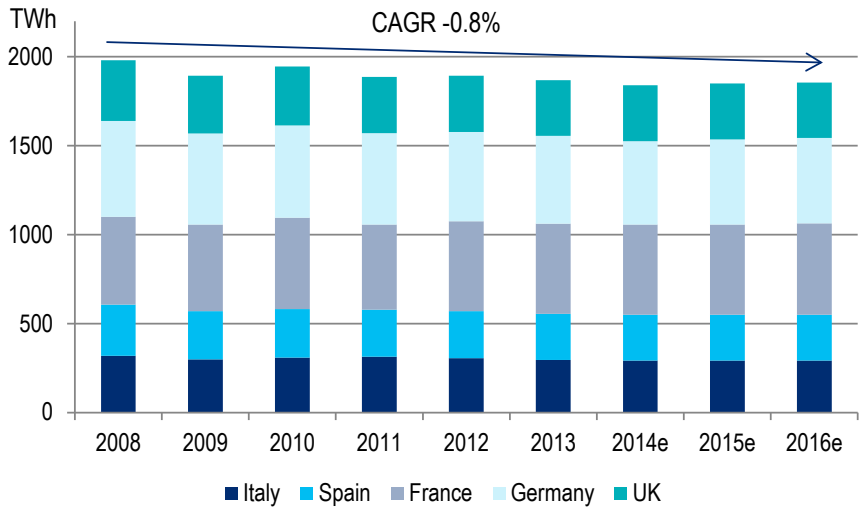
Figure 55. Seaborne imports by major European economies



Source: Wood Mackenzie, Citi Research

This structural shift in European demand has two key components. 1) Falling end-user demand, including lower electricity demand due to efficiency gains and subdued economic growth; and 2) shrinking market share of coal in power generation. Overall, we expect electricity demand in the major economies to decline by a -0.8% CAGR between 2008 and 2016 (Figure 56).

Figure 56. Electricity demand profile for major European countries

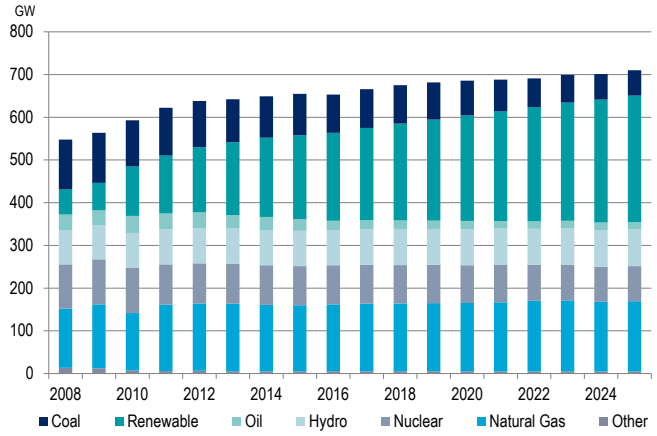


Source: ENTSO-E, Eurostat, National Grid, Terna, REE, Citi Research

Environmental concerns will also put pressure on coal. Cleaner and renewable energy sources are being boosted by subsidies and carbon credits that make them more economically competitive compared to coal fired plants. We see a continued

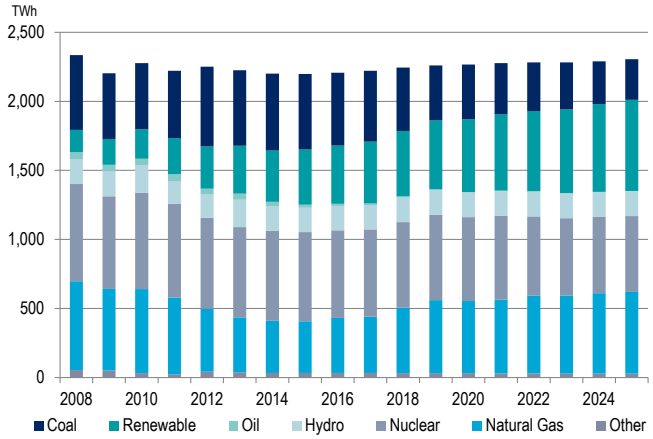
fall in both installed capacity and power generation from coal sources in major EU countries between now and 2025.

Figure 57. Cumulative installed capacity in major European countries



Source: Wood Mackenzie, Citi Research, * Cumulative for Germany, UK, France, Italy, Spain and Netherlands

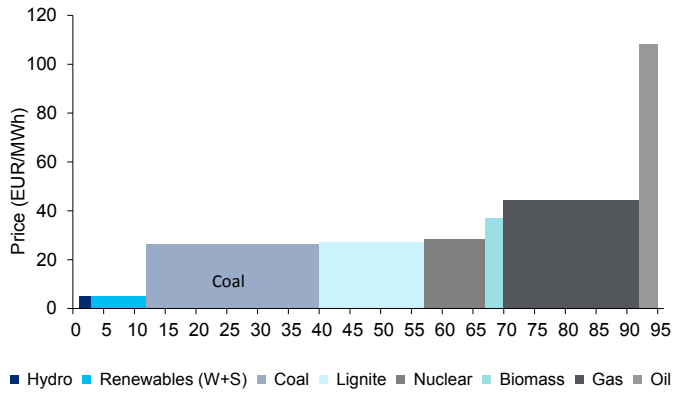
Figure 58. Cumulative power generation in major European countries



Source: Wood Mackenzie, Citi Research, * Cumulative for Germany, UK, France, Italy, Spain and Netherlands

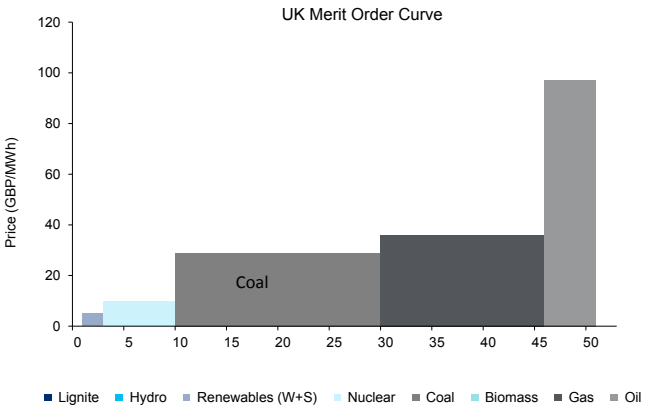
Nevertheless, renewable power still faces a number of limitations, including lack of storage ability and dependence on weather. Looking at merit order curves, coal provides better margins (Figure 59 and Figure 60) than all other conventional generation sources. As technology improves, we expect a shift in favor of renewables, but in the short-term coal remains one of the most cost effective power source (even after accounting for emissions costs).

Figure 59. German merit order curve



Source: Platts, Bloomberg, Citi Research

Figure 60. UK merit order curve



Source: Platts, Bloomberg, Citi Research

Colombia: Resilient low cost supplier

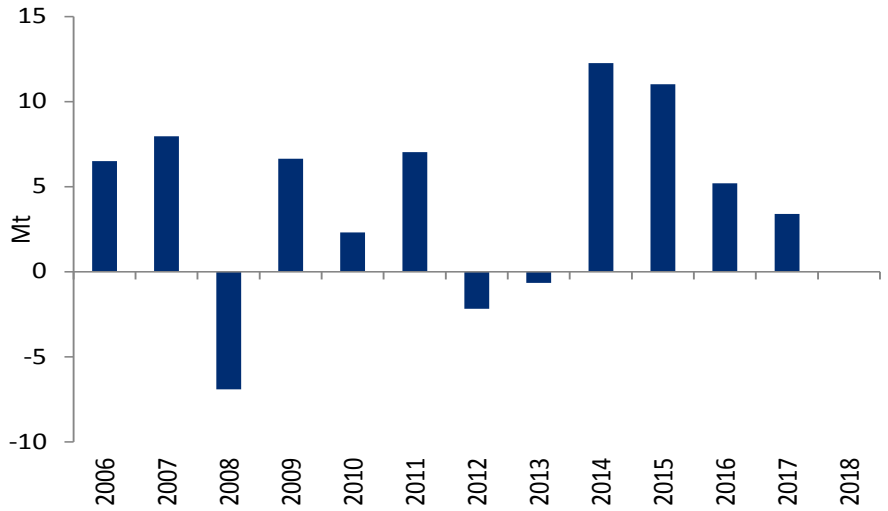
Sumit Shekhar
+91-22-4277-5152
sumit1.shekhar@citi.com

Harsh Bardia
+91-22-4277-5080
harsh.bardia@citi.com

Colombia added the second highest volume to seaborne coal markets during 2014, and we forecast continued rapid export growth in the next few years. The pace of volume expansion is expected to flatten by 2017 though when all existing projects reach rated capacity and infrastructure constraints take hold. We do not expect any new projects to be announced before evacuation infrastructure is upgraded. However, in the 2020s another round of expansion is possible as infrastructure constraints ease.

In the short to medium term, Colombian exports are displacing US producers in European and even certain US markets. US coal miners based in Appalachia are finding it difficult to compete in the US southeast in the face of competition from Colombia. For example, Colombian coal is $5-10/t cheaper on a delivered basis in Florida.

Figure 61. Export growth to slow in the medium-term

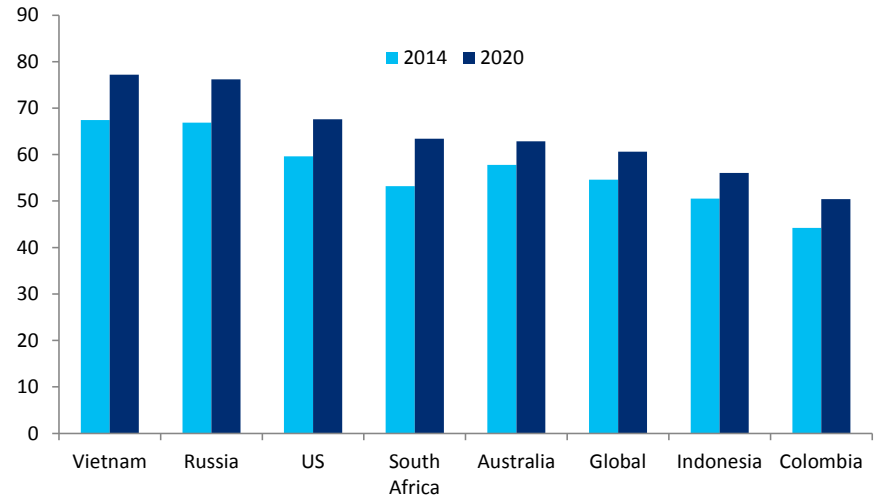


Source: GTIS, Citi Research

The industry is scrambling to cut costs or close high cost capacities but Colombian exporters retain their competiveness thanks to low costs and quality product.

- **Low cost advantage:** Colombian producers continue to enjoy the lowest costs in the industry, which provides a cushion from price volatility and ensures the long-term sustainability of the sector. Colombian weighted average cash cost (C1) stood at ~$44/t during 2014 versus a global average of ~$55/t. Above average cost inflation over the medium term for thermal coal mining in the region is expected to push costs to $50/t by 2020, but this would still be among the lowest globally. A large part of cost competitiveness comes from low labor costs, easier mining conditions, and relatively low logistics costs which should be sustained.

Figure 62. Colombia to remain a low cost supplier



Source: Wood Mackenzie, Citi Research

- **Good quality:** Over 90% of Colombian coal reserves are anthracite bituminous coal. A good part of the reserve is low-ash, low-sulphur and non-caking, which is desirable in the EU due to stringent emissions standards. This is an important differentiator in an oversupplied market and one in which environmental pressures are increasing.

- **Infrastructure bottlenecks to abate in the medium term:** Logistics costs for Colombian coal miners are on the low side, but face expansion challenges. The Fenoco railway is having to invest in sound-proofing following a nighttime railing ban. Shipping and port infrastructure is also constrained in the medium term. However, the expansion of the Panama Canal will significantly reduce costs for Colombian coal delivered to Asia. Moreover, the government is investing in doubling railway capacity to ease infrastructure constraints.

CIS: After Ukraine losses, coal production recovers

Barry Ehrlich, CFA
+7-495-643-1459
barry.ehrlich@citi.com

In Russia, consumer spending along with house prices began to contract in 2Q14 and with the collapse in oil prices toward the end of 2014, the downturn in consumer activity accelerated. Due to the lagging nature of the housing cycle, construction completions reached a new high in 1Q15.

By 2H15, we expect completions to begin to level off. Housing starts, we believe, have already begun to fall. Declining housing related steel demand along with stagnant industrial and infrastructure-related demand will generate a 5% decline in steel demand in 2015, we forecast. We expect a stabilization of demand in 2016 though. In Ukraine, steel demand turned negative in 2013, fell further in 2014 and is likely to remain weak in 2015.

Figure 63. CIS coking coal production and export forecasts, Mt

	2012	2013	2014	2015E	2016E	2017E	2018E	2019E	2020E	2021E
Russia	69	74	74	78	80	81	83	84	84	84
Ukraine	19	23	13	9	11	12	13	14	14	15
Total production	**87**	**98**	**87**	**87**	**91**	**93**	**96**	**98**	**98**	**99**
growth	*1%*	*12%*	*-11%*	*0%*	*5%*	*2%*	*3%*	*2%*	*0%*	*1%*
Net export	**20**	**30**	**20**	**17**	**20**	**21**	**24**	**26**	**24**	**25**
Domestic demand	68	68	68	70	71	72	72	72	74	74
Note: steel output	100	101	100	104	105	106	106	106	109	110

Source: Citi Research

Figure 64. CIS thermal coal forecasts, Mt

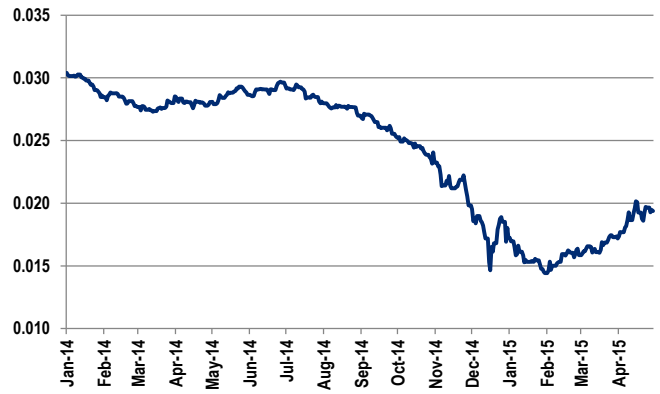
	2012	2013	2014	2015E	2016E	2017E	2018E	2019E	2020E	2021E
Thermal coal exports	113	117	118	120	121	121	120	120	120	120

Source: Citi Research

FX moves ensure cost competitiveness

Both the Ruble and Hryvvnia have fallen and this has compressed production costs including labor and internal transport. Even at current coking coal prices, the large majority of producers in Russia generate a positive cash margin. A few small mines have been closed and more are likely to close in coming years due to subscale mining volume and transport costs, but major producers are likely to be unaffected.

Figure 65. RUB/USD FX rate



Source: Bloomberg, Citi Research

Figure 66. UAH/USD FX rate

Source: Bloomberg, Citi Research

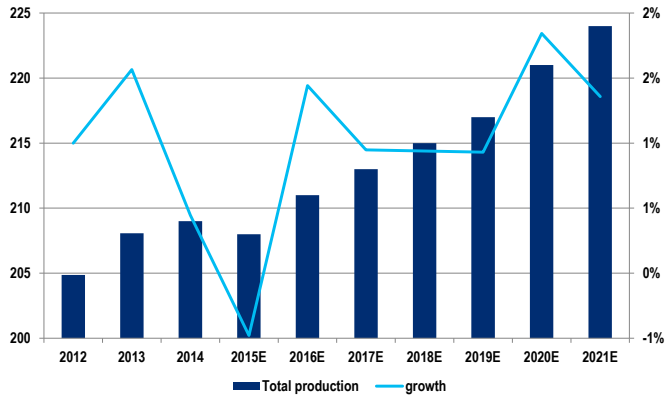
Donbass production unlikely to return

The large decline in Ukrainian coking coal output is linked to the location of coking coal assets in the Donbass conflict region. Many of the mines were loss-making even before the conflict and relied on cross-subsidies, which may no longer be available due to the political upheaval. We do not expect volumes to recover to pre-war levels. What could change this are 1) a resolution of all political issues in the Donbass region; and 2) a decision by the ruling government to resume the subsidy system, leading to a restart of production in the region.

Production to gradually rise

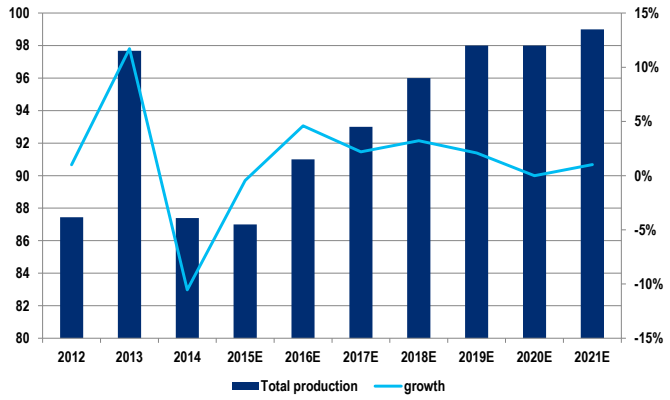
Some small mines are also being closed, but this will be more than offset by rising volume at Raspadskaya, Elga (albeit with further significant delays), and smaller producers in the Tiva Republic. Following a further downturn in 2015 due to output cuts in Donbass, volume will begin to expand as of 2016.

Figure 67. CIS iron ore production, Mt



Source: Citi Research

Figure 68. CIS coking coal production, Mt

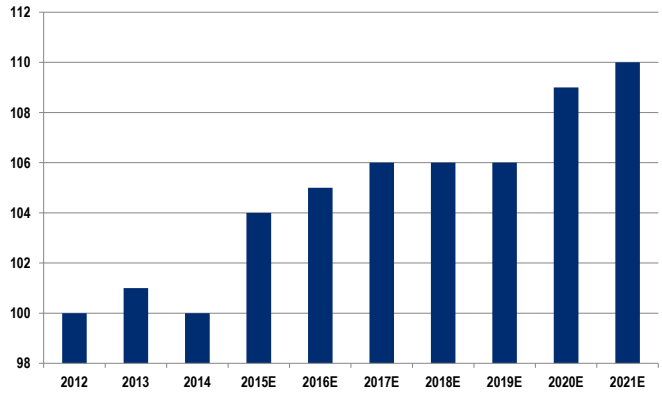


Source: Citi Research

Exports in the form of steel not bulks

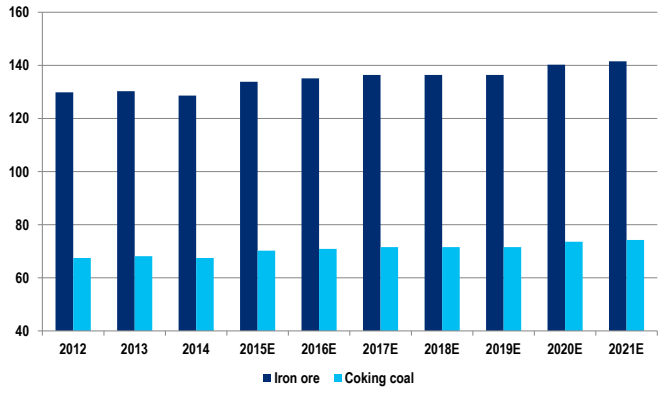
Steel product exports are rising, which is driving up domestic iron ore demand and, to a lesser degree, coking coal demand.

Figure 69. CIS steel output, Mt



Source: Citi Research

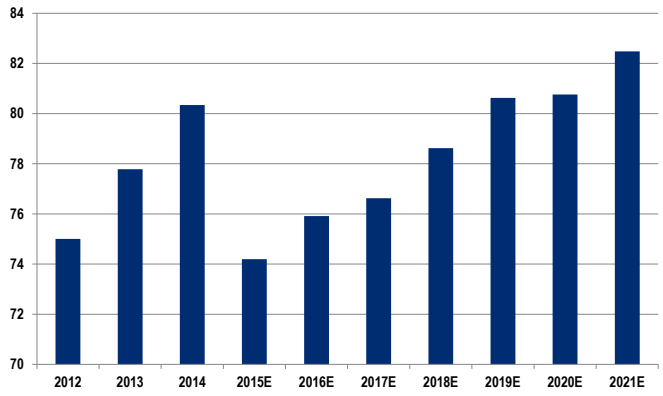
Figure 70. Domestic iron ore and coking coal demand, Mt



Source: Citi Research

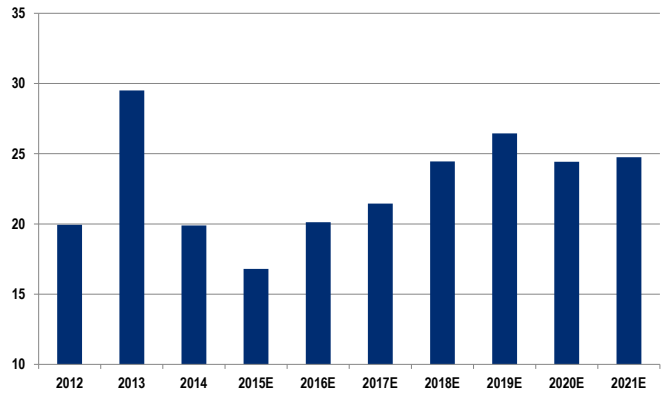
Rising steel output – driven by exports – means that despite increases in iron ore and coking coal output, export volumes are unlikely to significantly change over the coming years. In 2015, we expect a significant drop in export volumes. By 2020, volumes should recover to around the 2013-2014 average level.

Figure 71. CIS iron ore net exports, Mt



Source: Citi Research

Figure 72. CIS coking coal net exports, Mt



Source: Citi Research

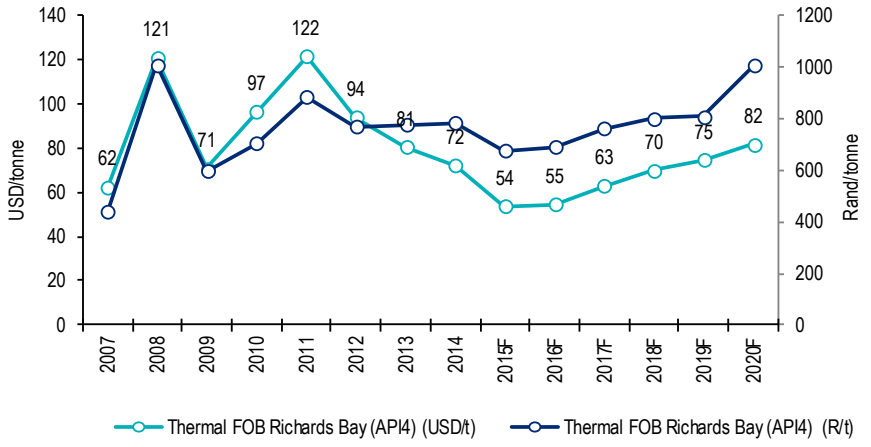
South Africa: Weak prices reducing export attractiveness

Sarel De Witt, CFA
+27-11-944-0820
sarel.dewitt@citi.com

Weak thermal export prices are the main headwind facing South African coal exporters. In addition, regulatory uncertainties created by the proposed MPRDA amendment bill, which in its current form gives the resources minister the power to declare coal a strategic mineral, are likely to deter further investment.

Since reaching a high of $125/t in 2Q11, API4 prices have gradually trended lower to around ~$62/t in 1Q15. Citi expects further medium-term weakness and forecast prices to average $53/t-$62/t over 2015-2017, before gradually recovering to $82/t in 2020 (Commodities 2Q'15 Outlook). Despite lower USD prices, Rand weakness has provided some relief (Figure 73). Continuing inflationary pressures, however, stoked by double digit electricity price increases and labor cost demands, are likely to put additional pressure on export margins and project economics.

Figure 73. API4 prices under pressure, but rand weakness lessening the blow



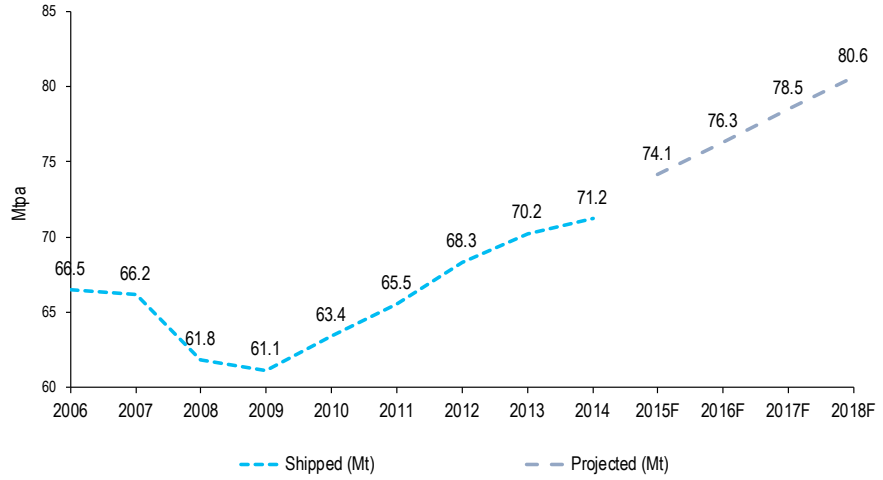
Source: Bloomberg, Citi Research

A recent casualty of weak international coal markets is Optimum Coal, a subsidiary of Glencore. Glencore is considering putting 5 Mt/y of export capacity at Optimum on care-and-maintenance, citing difficult market conditions and continued deterioration in the export coal price. Exxaro is also guiding towards lower coal exports in 2015, citing low RB3 prices, despite its intention to grow coal exports over the medium term.

The attractiveness of the Waterberg coal field as a potential coal export source is also facing serious challenges. The Waterberg, which contains more than 50% of South Africa's remaining coal reserves, requires substantial investment in water, grid, road, and rail infrastructure to enable coal extraction and transportation (see note). In addition, export quality coal needs to be railed over a distance of ~1,000 km to Richards Bay Coal Terminal, which carries significant transport costs. Weak coal markets are thus putting the export viability of this region at risk, in our view.

The main bottleneck to coal exports has been Transnet Freight Rail (TFR), the state-owned national rail operator. At present, a mismatch exists between RBCT's port capacity (91Mt/y) and TFR's installed rail capacity (~81 Mt/y). Given TFR's historic performance, we believe the rail operator may only fully utilise its current capacity in 2018, on condition sufficient quantities of coal are available for export.

Figure 74. RBCT historic and projected export coal volumes



Source: RBCT website, Transnet interim results presentation (Sep 2014), Citi Research estimates

TFR has expressed willingness to expand current capacity on its export coal line to 97.5 Mt/y by 2019, as part of its Market Demand Strategy (MDS). However, TFR will likely insist on take-or-pay agreements to finance the expansion (~R53 bn), which will oblige customers of the line to pay tariffs, irrespective whether they utilise the additional capacity.

Given Citi's relative muted outlook for API4 prices over the medium term, we believe coal producers may be inclined to reduce growth capex as a result of deteriorating project economics, making a commitment to further expansions under a take-or-pay obligation unlikely. In effect, take-or-pay creates an additional fixed cost burden, which reduces operating flexibility and increases risk in a depressed coal environment. However, the potential fallout of this scenario is reduced investment in transport infrastructure over the medium term, effectively limiting long-term volume growth potential.

Under the proposed Mineral and Petroleum Resources Development Act, the resources minister has the right to declare coal "strategic," which in effect gives him the right to impose tighter regulation of domestic prices and export volumes for 'security of supply' reasons. We argue this bill creates regulatory uncertainty which further dampens investment appetite in South Africa's beleaguered export coal industry.

Equity Research Regional Views

Indonesia: Production cuts have started

Lower coal production as smaller players exit

Ferry Wong, CFA
+62-21-2924-9213
ferry.wong@citi.com

Coal production started to decline in 1Q15 (the first time in over a decade) partly due to weather problems and some smaller producers cutting down their production. Going forward, with oil prices starting to move up while coal prices remain low, we believe coal production will remain under pressure.

News reports indicate that Indonesian coal producers expect to close up to 40 small mines in Sumatra and Kalimantan. Some coal concessions in Nunukan Regency will likely be revoked this year due to the downturn of coal prices. Six of them have been revoked because of failures to conduct exploration activities. Of 13 companies that secured production license in the regency, only four are still operating. In Kutai Barat Regency, East Kalimantan province, around 5,000 mine workers have lost their jobs. In Indragiri Hilir Regency, Riau Province, more than 300 workers lost their jobs due to difficulties at PT Riau Bara Harum (RBH), a subsidiary of Permata Energi Resources (TKGA). RBH sits over an area of 24,450 hectares with coal reserves of 29.4 mt. Its mine can produce up to 3 Mt/y.

Bigger producers also started to cut output in 1Q15, as well as lowering costs by high grading and reducing overhead expenses and energy consumption. Declines in logistics and transportation costs (and Rupiah depreciation) have also helped miners to reduce cost, but diesel prices have started to move up.

Domestic demand rising

On the flip side, the Indonesian government expects acceleration in the development of giant power stations. The government expects to add 35 GW by 2019, with around 35% coming from coal-fired plants. This is expected to boost domestic coal consumption to 190 Mt 2019 from the current 90 Mt/y. Indonesia's electrification ratio has been on the rise and currently stands at 81%, a 13 percentage point increase from 2011 and up from 55% in 2007. The government has a target of 90% by 2020.

Oil prices have reduced cash costs

Falling oil prices have been positive for Indonesia coal miners as diesel accounts for 25-40% of COGS and industrial users (as opposed to retail consumers) purchase at market prices. This should help preserve margins and help offset falling coal prices. However, we need to watch out for the hedging position taken by the coal miners as it could impact the bottom line from derivative losses. In our coverage universe, we expect the biggest beneficiaries will be miners with zero hedge positions. Moreover, Indonesian coal names are marginal beneficiaries of Rupiah depreciation as ~90% of revenue is in USD vs. 20-30% of costs in Rupiah.

Areas to watch

Increased pressure on miners could put further pressure on exports:

1. An IUP royalty hike from 3-7% to 10-13.75% is possible but we consider likely to be postponed given the low coal price environment

2. Tightening regulation on coal exports to eliminate illegal miners (illegal miners are still quite significant players in Indonesia).

Appendix A-1

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for Medium-Risk stocks, 0%-20% for High-Risk stocks, and 0%-35% for Speculative stocks); and Sell (3) (negative total return). For securities in emerging markets (Asia Pacific, Emerging Europe/Middle East/Africa, and Latin America), investment ratings were:Buy (1) (expected total return of 15% or more for Low-Risk stocks, 20% or more for Medium-Risk stocks, 30% or more for High-Risk stocks, and 40% or more for Speculative stocks); Hold (2) (5%-15% for Low-Risk stocks, 10%-20% for Medium-Risk stocks, 15%-30% for High-Risk stocks, and 20%-40% for Speculative stocks); and Sell (3) (5% or less for Low-Risk stocks, 10% or less for Medium-Risk stocks, 15% or less for High-Risk stocks, and 20% or less for Speculative stocks).

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