



Summary

- ❖ Subsequent to the de-allocation of 204 coal blocks by the Supreme Court (SC) of India in September 2014, the Government of India (GoI) notified “The Coal Mines (Special Provisions) Ordinance, 2014” on October 21, 2014 in order to provide guidelines for reallocation of aforesaid coal mines and thereafter, has concluded the first phase of e-auction of 33 coal blocks (out of which 12 blocks earmarked for power sector and balance for end use in non-regulated sectors) between February 14, 2015 till March 13, 2015. Out of these 12 blocks put up for e-auction in the first two rounds, successful bidders have been announced for 9 mines. These 9 coal blocks allocated to power sector have geological reserves of 1200 MMT (*out of which extractable reserves are assumed at 60%*) and estimated to provide a fuel security for about 6 GW of generation capacity in the power sector, in ICRA’s view. ICRA notes that the bidding by power generating companies in the auction has been quite aggressive with the bidding¹ happening on a forward basis on the reserve price payable as bid quoted is zero in reverse bidding. Thus, bids quoted by the successful bidders range from Rs. 302 per MT to Rs. 1110 per MT, which are “negative price bids” for the bidders which essentially means that a winning bidder would have a zero fuel charge recovery in PPA and in addition would bear the cost of both i.e. cost of coal mining and quoted reserve price payable to State Government. As a result, winning bidders remain exposed to a significant under-recovery in fuel cost which is estimated to range from Rs. 0.39/kwh to Rs. 1.02/kwh on a levelized basis over a 25-year period. Aggregate under-recovery for the bidders is estimated at Rs. 8 billion² in FY 2015-16, which is likely to increase to about Rs. 18 billion by FY 2017-18; further, the quantum of under-recovery in fuel cost would remain sensitive to both the stripping ratio of the coal mine and cost of mining related to over-burden removal during the operating phase, in ICRA’s view. ICRA estimates that the SC ruling cancelling allotment of coal blocks had impacted capacity in private IPP segment to the tune of 18 GW³ and the current coal auctions have secured fuel for ~2.5 GW⁴ out of those 18 GW. Thus, capacity of about 15.5 GW (with cumulative project cost at around Rs. 930 Billion) continues to remain affected and within the same, about 8 GW is at risk also due to absence of tapering coal linkage, in ICRA’s view.
- ❖ The winning bidders may however look at options to bridge the under-recoveries in fuel cost using the additional gains generated from sale of 15% of the generation capacity in the merchant/short term trading market as well as possibility of quoting higher fixed capacity charge in the upcoming competitively bid PPAs for the capacity which is yet to be tied-up. However, the slow progress seen in tie-up of PPAs for power procurement on long term / medium term basis by the state owned distribution utilities in the last 2 year period remains a key concern for the IPPs which are yet to tie-up their capacity. Also, there could be possibility of delays in the finalization of competitive bidding guidelines which are currently under review. Further, ability of the bidder (who is yet to tie-up capacity) to quote a higher fixed capacity charge so as to recover the under-recovery in fuel cost in a competitive bidding process remains to be seen.

¹ While the guidelines provided for forward bidding (i.e. bidder quoting the highest bid price winning the mine) for non-regulated sectors, it provided for a reverse bidding mechanism for the power sector. Under the reverse bidding process approved for auction of coal blocks by Ministry of Coal (MoC), GoI on December 26, 2014, bidders are required to quote a bid price, which is at a discount to the ceiling price (equivalent to notified price for similar grade of coal by Coal India Ltd) wherein the bidder with the lowest bid price is declared to be the winner. Subsequently, notification on the auction guidelines was issued by Nominated Authority appointed as per the provisions of “Coal Mines (Special Provisions) Ordinance 2014”, to the bidders on Feb 13, 2015 which stated that if quoted bid price remains zero, then bidding will be based on forward auction on the additional premium (or the reserve price) payable.

² Based on generation estimated for 85% of coal mine linked capacity at 80% PLF; Under-recovery estimate for FY 2016 is based on mine output from operational mines and for FY 2018, the same is estimated also including the output expected from Schedule III mines (which are about to start operations within 1-2 year); The estimates exclude the blocks initially won by Jindal Power Ltd.

³ Refer ICRA Comment dated September 2014 on Supreme Court Ruling on Captive Coal Mining – Impact Assessment; Estimated affected capacity at 18 GW (coal block based) in private IPP segment

⁴ The coal blocks won in e-auction by the bidders provides a fuel security to about 6 GW capacity which includes capacity of 3.5 GW which was earlier based on coal linkage.

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- ❖ ICRA notes that absence of fuel charge recovery in PPA for the generation capacity linked to coal blocks of the winning bidders remains favorable for the key off-takers i.e. state owned distribution utilities, as the same is expected to result into a reduction in power procurement costs and consequently, a tariff relief for the consumers. As the power generation projects of the winning bidders have existing signed PPAs with distribution utilities mainly in states such as Madhya Pradesh, Chhattisgarh, West Bengal and Odisha, average tariff relief is estimated at about 0.9% for consumers in these four states by FY 2016-17.
- ❖ Illustrative impact is highlighted as shown below in a table for a project with 1000 MW capacity having cost plus based PPA which is sourcing coal from a mine won at negative price bid with average stripping ratio of 4 cu.m/ton. Aggregate cash flow deficit over a 12 year period for such project is estimated to be quite significant resulting into likely average DSCR below 1 in most of the scenarios, except in the case where quoted bid is at reserve price of Rs. 100 /MT and bilateral tariff at not less than Rs. 3.6/kwh. Even though the fuel charge recovery is zero in a PPA for such cases which would improve the merit order position in the power procurement pattern of the distribution utilities and also result into a better off-take, average DSCR is estimated to remain weak (i.e. below 1) even at high PLF level of 85% for a bidder which has quoted a reserve price payable of Rs. 500/MT or above, as per ICRA estimates. Hence, the under-recoveries in fuel cost as well as project cash flows and DSCR (debt service coverage ratio) remain sensitive to [a] PLF level achieved and [b] bilateral short term traded tariff.

Cost plus based PPA : Sensitivity of average DSCR over a 12 year period to quoted bid price in forward bidding and merchant tariff							
		Short term / Bilateral traded tariff (in Rs./unit)					
Average DSCR (times) at 70% PLF		3.2	3.4	3.6	3.8	4.0	4.2
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	0.96	0.98	1.00	1.02	1.04	1.06
	300	0.84	0.87	0.89	0.91	0.93	0.96
	500	0.70	0.72	0.75	0.78	0.81	0.84
	700	0.55	0.58	0.61	0.64	0.67	0.70
	900	0.41	0.44	0.47	0.50	0.53	0.56
	1100	0.27	0.30	0.33	0.36	0.39	0.42

Source: ICRA estimates

- ❖ For a project with competitively bid PPA with a coal mine at negative price bid, project cash flows and DSCR remain sensitive to quoted fixed capacity charge. In addition the variables such as bilateral tariff & PLF. As shown below, DSCR shows an improvement considerably as the first year fixed capacity charge increases however, the ability of the bidder to win such PPA by quoting a higher level of fixed capacity charge in new PPAs remains to be seen.

Competitively bid based PPA: Sensitivity of first year fixed capacity charge in competitively bid PPA & reserve price						
		First Year Competitively bid Capacity Charge* (Rs./kwh)				
Average DSCR (times) at bilateral tariff of Rs. 4/kwh		1.8	2.0	2.2	2.4	2.6
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	1.02	1.12	1.22	1.33	1.43
	300	0.91	1.01	1.12	1.22	1.32
	500	0.78	0.90	1.01	1.11	1.21
	700	0.64	0.77	0.90	1.00	1.10
	900	0.50	0.63	0.76	0.89	1.00
	1100	0.36	0.49	0.62	0.75	0.88

Source: ICRA estimates,

*Assumed to decline by 3% on y.o.y basis and % reduction takes into account of the debt amortization schedule & indexation of inflation to O&M expense

Aggressive Bidding as seen from the 'Negative Price Bids' quoted by IPPs in the first two rounds of Coal Mine Auctions

Subsequent to the cancellation of allocation of 204 coal blocks by Supreme Court of India in September 2014, the Ministry of Coal (MoC), Government of India (GoI) initiated the process of coal mine allocation, identifying 108 blocks for allocation through auction and allotment route, in the month of December, 2014. The blocks identified for auction and allotment comprise 42 blocks which are operational, with the remaining 66 blocks being at an advanced stage of completion & expected to commence mining operations over the next 1-2 year period. Within these 108 coal blocks, 70 coal blocks (28 for allotment through auction & balance 42 for allotment to central/state government companies) are earmarked for allocation to the power sector. The remaining mines have been allocated to non-regulated sectors such as Iron & Steel and Cement. The nominated authority appointed as per the provisions of "Coal Mines (Special Provisions) Ordinance 2014" has completed the first round of e-auction for 19 operational coal mines during February 14, 2015 to February 22, 2015, which included 7 mines reserved for the power sector. The second round of e-auction for 14 coal mines was carried out from March 4, 2015 to March 13, 2015, which included 5 mines for the power sector. Out of the 12 mines (with end use in power sector) put up for e-auction in the first two rounds, successful bidders have been announced for 9 mines, while MoC, GoI has rejected bids received for the remaining 3 mines citing that the highest bidder does not reflect fair value. These 9 coal blocks allocated to power sector have geological reserves of 1200 MMT (*out of which extractable reserves are assumed at 60%*) and estimated to provide a fuel security for about 6 GW of generation capacity in the power sector, in ICRA's view. The details of the successful bidders along with the quoted closing bid price for coal mines with end use in power sector are provided in Table 1 here.

Table 1: Winning bidders and quoted bid price in the auction of coal mines earmarked for Power sector

Auction of Schedule-II Coal Mines in Phase-1									
S. No	Coal Block	Successful Bidder	Bid Price in forward bidding* (Rs. /MT)	Annual Production in MTPA as per Mine Plan	End user Project Capacity (MW)	Estimated annual coal requirement for the end use project (MTPA)	Capacity linked to coal block (MW)	Quantum of LT PPAs required for capacity linked to coal block (MW)	Capacity with Long Term/ Medium Term PPAs in the end use project (MW)
1	Amelia North	Jaiprakash Power Ventures Limited	712	2.8	1320	6.5	568	483	495
2	Sarisatolli	CESC Limited	470	3.5	1225	6.0	710	604	1225
3	Talabira-I	GMR Chhattisgarh Energy Limited	478	3.0	1370	6.8	609	518	480
4	Trans Damodar	The Durgapur Projects Limited	940	1.0	641	3.2	203	173	641
5	Tokisud North	Essar Power MP Limited	1110	2.3	1200	5.9	471	400	420
Auction of Schedule-III Coal Mines in Phase-2									
S. No	Coal Block	Successful Bidder	Bid Price in forward bidding* (Rs. /MT)	Annual Production in MTPA as per Mine Plan	End user Project Capacity (MW)	Estimated annual coal requirement for the end use project (MTPA)	Capacity linked to coal block (MW)	Quantum of LT PPAs required for capacity linked to coal block (MW)	Capacity with Long Term/ Medium Term PPAs in the end use project (MW)
1	Jitpur	Adani Power Limited	302	2.5	4620	22.8	507	431	3424
2	Mandakini	Mandakini Exploration and Mining Limited [#]	650	7.5	2250	11.1	1522	1294	860
3	Ganeshpur	GMR Chhattisgarh Energy Limited	704	4.0	1370	6.8	812	690	480
4	Utkal C	Monnet Power Company Limited	770	3.4	1050	5.2	684	581	704

Source: ICRA Research, MoC, GoI, *Forward bidding is on reserve price payable since quoted bid price is zero under the reverse auction for power sector

[#]: Joint venture between Monnet Ispat & Energy Limited and Jindal Photo Lab Limited

The MoC, GoI approved a reverse bidding process for the power sector on December 26, 2014. As per this process, bidders are required to quote a bid price which is at a discount to the ceiling price (equivalent to notified price for similar grade of coal by Coal India Ltd) and the bidder with the lowest bid price shall be the winner. Subsequently, notification of the auction guidelines was issued by the Nominated Authority to the bidders on Feb 13, 2015; as per the notification, if the quoted bid price remains zero, then bidding will be based on forward auction on the additional premium (or the reserve price) payable. The coal mine auctions have seen aggressive bidding by the power generating companies with all the 12 coal mines receiving zero as the lowest quote in the reverse bidding process. In this scenario, the bidding process was reversed and the company quoting the highest bid price in the forward bidding on reserve price payable was declared the winner of the coal mine. In the first round of e-auction, the successful bids were in the range of Rs. 470 per MT to Rs. 1110 per MT in the forward bidding, with the highest winning bid price of Rs. 1110 per MT quoted by Essar Power MP Limited for the Tokisud North coal mine, while the lowest winning bid price of Rs. 470 per MT was quoted by CESC Limited for Sarisatolli coal mine. In the second round of e-auction, the successful bids were in the range of Rs. 302 per MT to Rs. 704 per MT in the forward bidding, with the highest winning bid price of Rs. 704 per MT quoted by GMR Chhattisgarh Energy Limited for the Ganeshpur coal mine, while the lowest winning bid price of Rs. 302 per MT was quoted by Adani Power Limited for Jiput coal mine.

Given the quoted price of zero in the reverse auction process, the winning bidders cannot charge any ROM coal cost for supply to state distribution utilities from their power generation projects by the way of energy charge component and additionally will have to pay the bid price to the state governments (where the mines are located) for every metric ton of coal extracted from these mines. This would in turn result into significant under-recoveries in variable cost for these projects (primarily the mining cost and the reserve price payable to state governments as quoted in the forward bidding). Based on our analysis of the successful bids for 9 mines so far, levelized under-recovery in fuel cost for the bidders is estimated to be in the range of Rs. 0.39 per unit to Rs. 1.02 per unit. The aggressive bidding is a result of intense competition among power generation companies to ensure fuel security for their projects, especially given that the coal mines under auction in the first round are operational and the mines under auction in the second round are at advanced stage of development. The winning bidders may look at options to bridge the under-recoveries in fuel cost using the additional gains generated from sale of 15% of the generation capacity in the merchant market based on captive coal as well as possibility of quoting higher fixed capacity charge in the upcoming competitively bid PPAs. However, the slow progress seen in tie-up of PPAs for power procurement on long term / medium term basis by the state owned distribution utilities in last 2 year period remains a key concern for the IPPs which are yet to tie-up their capacity. Also, there could be possibility of delays in the finalization of competitive bidding guidelines which are currently under review. Further, ability of the bidder (who is yet to tie-up capacity) to quote a higher fixed capacity charge so as to recover the under-recovery in fuel cost in a competitive bidding process remains to be seen.

On the other hand, while absence of fuel charge recovery in PPA remains favorable for the key off-takers i.e. state owned distribution utilities, as the same is expected to result into a reduction in the energy charge component of power procurement costs and consequently, a tariff relief for the consumers, the impact of the same could be partially offset by higher fixed charge component in the PPA. As seen from Table 2 here, the levelized under-recovery per unit for the winning bidders over a 25 year period remains highly sensitive to the quoted bid price in forward bidding as well as to the average stripping ratio of the mine under auction. For a quoted bid price of Rs. 500 per MT, the levelized under-recovery per unit increases from Rs. 0.43 per unit to Rs. 0.56 per unit as the stripping ratio for the mine varies from 1.5 cu.m/ton to 4.0 cu.m/ton.

		Average mine stripping ratio (Cu. m/ ton)					
		1.5	2.0	2.5	3.0	3.5	4.0
Levelized under-recovery per unit (Rs./unit) over 25 years	100	0.15	0.18	0.20	0.23	0.26	0.28
	300	0.29	0.32	0.34	0.37	0.39	0.42
	500	0.43	0.46	0.48	0.51	0.53	0.56
	700	0.57	0.59	0.62	0.65	0.67	0.70
	900	0.71	0.73	0.76	0.79	0.81	0.84
	1100	0.85	0.87	0.90	0.93	0.95	0.98
	Quoted bid price (reserve price payable) in forward bidding (Rs./MT)						

Source: ICRA estimates; Assumptions: Cost of over-burden removal at Rs.70/scm with escalation at 3% per year, Sp. Coal Consumption: 0.56 Kg/kwh; Coal GCV: 4000 Kcal/Kg

Aggregate under-recovery for the bidders is estimated at Rs. 8 billion⁵ in FY 2015-16, which is likely to increase to about Rs. 18 billion by FY 2017-18; further, the quantum of under-recovery in fuel cost would remain sensitive to both the stripping ratio of the coal mine and cost of mining related to over-burden removal during the operating phase, in ICRA's view. ICRA estimates that the SC ruling cancelling allotment of coal blocks had impacted capacity in private IPP segment to the tune of 18 GW⁶ - the current coal auctions have secured fuel for ~2.5 GW⁷ out of those 18 GW & thus, capacity of about 15.5 GW (with cumulative project cost at around Rs. 930 Billion) continues to remain affected. Within the same, about 8 GW is at risk also due to absence of tapering coal linkage, in ICRA's view.

Impact of the aggressive coal auction bids on cash flows for projects in power sector

a. Projects with cost plus based PPAs

Among the winning bidders in the coal mine auctions, CESC Limited and The Durgapur Projects Limited have regulated PPAs (cost plus basis) for the entire capacity wherein tariff is determined as per the tariff regulations approved by the respective state electricity regulatory commissions (SERCs). As per the methodology approved by the MoC, Gol, the quoted bid price in the reverse auction process together with applicable taxes and other allowable expenses like transportation cost forms the basis for determination of energy charges by the appropriate SERCs in case of cost plus PPAs. An illustration is highlighted for a 1000 MW project having cost-plus based PPA to show the impact of negative price bid under various scenarios of reserve price quoted in forward bidding, bilateral traded tariff and PLF level.

Table 3: Key Assumptions

Project Capacity	1000 MW	Mine Stripping ratio	4.0
Capital Cost	Rs. 60 million per MW	Mining cost	Rs. 70 per SCM of overburden
Debt	70%	Escalation in mining cost	3%
Equity	30%	Additional reserve price for merchant sales	Rs. 150 per MT
O&M cost	Rs. 1.46 million per MW	Debt repayment	12 years
O&M cost escalation	5.72%	Long term PPA	850 MW
Depreciation	5.28% for first 12 years	Short term PPA	150 MW
Interest on long term debt	12.0%	Auxiliary Consumption	7.5%
Interest on working capital debt	12.5%	Working capital norms	
Station Heat Rate	2250 Kcal/unit	Coal stock	20 days
Coal Gross Calorific Value	4000 Kcal/kg	O&M expenses	30 days
Quoted bid price in reverse auction	Rs. 0 per MT	O&M spares	2% of O&M cost
Distance from coal mine	250 KM	Receivables	60 days

⁵Based on generation estimated for 85% of coal mine linked capacity at 80% PLF; Under-recovery estimate for FY 2016 is based on mine output from operational mines and for FY 2018, the same is estimated also including the output expected from Schedule III mines (which are about to start operations within 1-2 year); The estimates exclude the blocks initially won by Jindal Power Ltd.

⁶ Refer ICRA Comment dated September 2014 on Supreme Court Ruling on Captive Coal Mining – Impact Assessment; Estimated affected capacity at 18 GW (coal block based) in private IPP segment

⁷ The coal blocks won by the bidders provides a fuel security to about 6 GW capacity which includes capacity of 3.5 GW which was earlier based on coal linkage.

Table 4: Sensitivity of aggregate Free Cash Flows* (over a 12 year period) to quoted bid price in forward bidding and merchant tariff							
		Short term / Bilateral traded tariff (in Rs./unit)					
Aggregate FCF (after debt repayment) (Rs. billion) at 70% PLF		3.2	3.4	3.6	3.8	4.0	4.2
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	-2.9	-1.3	0.2	1.8	3.4	4.9
	300	-11.3	-9.3	-7.5	-5.9	-4.4	-2.8
	500	-21.1	-19.1	-17.1	-15.2	-13.2	-11.2
	700	-30.9	-28.9	-26.9	-24.9	-22.9	-20.9
	900	-40.8	-38.8	-36.7	-34.7	-32.7	-30.7
	1100	-50.7	-48.7	-46.7	-44.6	-42.6	-40.6

Source: ICRA estimates; *cash flows after meeting all operating expenses, interest cost, taxes and debt repayment obligations

Table 5: Sensitivity of average DSCR over a 12 year period to quoted bid price in forward bidding and merchant tariff							
		Short term / Bilateral traded tariff (in Rs./unit)					
Average DSCR (times) at 70% PLF		3.2	3.4	3.6	3.8	4.0	4.2
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	0.96	0.98	1.00	1.02	1.04	1.06
	300	0.84	0.87	0.89	0.91	0.93	0.96
	500	0.70	0.72	0.75	0.78	0.81	0.84
	700	0.55	0.58	0.61	0.64	0.67	0.70
	900	0.41	0.44	0.47	0.50	0.53	0.56
	1100	0.27	0.30	0.33	0.36	0.39	0.42

Source: ICRA estimates

As seen from Table 4 & Table 5 above, aggregate free cash flow deficit for the IPP over a 12 year period in a cost plus based PPA is estimated to be quite significant resulting into likely average DSCR below 1 in nearly all the scenarios, except in the case where quoted bid is at reserve price of Rs. 100 /MT and bilateral tariff at not less than Rs. 3.6/kwh. This assumes that coal requirement for sale of power is entirely met from the captive coal block which is won at negative price bid and the off-take is assumed at equivalent to 70% PLF.

Table 6: Sensitivity of Average DSCR to quoted bid price in forward bidding and PLF level						
		Average PLF (%)				
Average DSCR (times) at bilateral tariff of Rs. 4/kwh		65%	70%	75%	80%	85%
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	0.97	1.04	1.12	1.19	1.28
	300	0.86	0.93	1.00	1.06	1.13
	500	0.73	0.81	0.88	0.94	1.00
	700	0.60	0.67	0.73	0.80	0.86
	900	0.47	0.53	0.58	0.64	0.70
	1100	0.34	0.39	0.43	0.48	0.53

Table 7: Sensitivity of Average DSCR to quoted bid price in forward bidding and PLF level						
		Average PLF (%)				
Average DSCR (times) at bilateral tariff of Rs. 4.5/kwh		65%	70%	75%	80%	85%
	100	1.02	1.10	1.17	1.25	1.34
	300	0.92	0.99	1.06	1.13	1.19
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	500	0.80	0.88	0.94	1.00	1.06
	700	0.67	0.74	0.81	0.88	0.93
	900	0.54	0.60	0.66	0.72	0.78
	1100	0.41	0.46	0.51	0.56	0.61

Source: ICRA estimates

Given that the extent of off-take would affect the gains available in sales based on bilateral / merchant tariff, both the project cash flows and in turn DSCR remain sensitive to a) PLF level, and b) bilateral short term traded tariff. For example, for a bidder in case of reserve price payable at Rs. 500/MT, average DSCR over the 12 year period assuming bilateral tariff of Rs. 4/kwh is estimated to improve from 0.73 times to 1 time as the PLF levels improve from 65% to 85% respectively. Also, if bilateral tariff was to remain higher at Rs. 4.5/kwh, average DSCR in this case is estimated to be higher i.e. at about 0.8 times at 65% PLF which is estimated to further improve to 1 time at 80% PLF level. Even though the fuel charge recovery is zero in a PPA which would improve the merit order position in the power procurement pattern of the distribution utilities and also result into a better off-take, ICRA notes that average DSCR is estimated to remain weak (i.e. below 1) at a high PLF level of 85% for a bidder which has quoted a reserve price payable at Rs. 500/MT and above.

While the bidders having projects with contracted capacity based on cost plus based PPA and using the coal at negative price bids are estimated to show significant cash flow deficits, ability of such bidders to achieve healthy PLF levels (i.e. above 80%) and to ensure bilateral PPA at a relatively higher tariff rate (Rs. 4 Rs./kwh & above) would remain crucial to minimize such deficits.

b. Projects with PPAs signed through Case 1 bidding or about to sign such PPAs

As per the approved methodology for coal mine auctions for power projects with PPAs signed through case I competitive bidding or projects proposed to sign PPAs under case-1 bidding, the energy charges in the PPA shall be revised based on the bid prices quoted in the reverse auction process along with statutory levies and other allowed expenses.

An illustration is highlighted for a power project (1000 MW capacity) having a competitively bid PPA to show the impact of negative price bid for winning the coal block under various scenarios of reserve price quoted in forward bidding, bilateral traded tariff and PLF level. Key assumptions remain similar to those presented for cost plus PPA, while the quoted fixed cost per unit is assumed at Rs. 2.0 per unit in the first year declining by 3% per annum.

Table 8: Sensitivity of aggregate Free Cash Flows (over a 12 year period) to quoted bid price in forward bidding and merchant tariff							
		Short term traded tariff (in Rs./unit)					
Aggregate FCF (after debt repayment) (Rs. billion) at 70% PLF		3.2	3.4	3.6	3.8	4.0	4.2
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	3.1	4.7	6.2	7.8	9.3	10.9
	300	-4.5	-3.0	-1.4	0.1	1.7	3.2
	500	-13.4	-11.4	-9.5	-7.7	-6.0	-4.4
	700	-23.2	-21.3	-19.3	-17.3	-15.3	-13.4
	900	-33.0	-31.1	-29.1	-27.1	-25.1	-23.2
	1100	-42.9	-40.9	-38.9	-36.9	-34.9	-33.0

Table 9: Sensitivity of aggregate Free Cash Flows (over a 12 year period) to quoted bid price in forward bidding and merchant tariff							
		Short term traded tariff (in Rs./unit)					
Average DSCR at 70% PLF		3.2	3.4	3.6	3.8	4.0	4.2
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	100	1.04	1.06	1.08	1.10	1.12	1.14
	300	0.93	0.95	0.97	0.99	1.01	1.03
	500	0.80	0.83	0.86	0.88	0.90	0.93
	700	0.66	0.69	0.71	0.74	0.77	0.80
	900	0.52	0.55	0.57	0.60	0.63	0.66
	1100	0.38	0.41	0.43	0.46	0.49	0.52

Source: ICRA estimates

As can be seen from Table 8 & Table 9 above, aggregate free cash flow deficit for the IPP over a 12 year period in a competitively bid based PPA is estimated to be quite significant resulting in an average DSCR of below 1 in most of the scenarios, except in the case where quoted bid is at reserve price of Rs. 100 /MT. This assumes that the coal requirement for sale of power is entirely met from the captive coal block which is won at negative price bid and the off-take is assumed at equivalent to 70% PLF.

The sensitivity to changes in first year competitively bid capacity charge under the varying scenarios of reserve price is given below.

Table 10: Sensitivity of first year fixed capacity charge in competitively bid PPA & reserve price						
		First Year Competitively bid Capacity Charge*				
Average DSCR (times) at bilateral tariff of Rs. 4/kwh		1.8	2.0	2.2	2.4	2.6
	100	1.02	1.12	1.22	1.33	1.43
	300	0.91	1.01	1.12	1.22	1.32
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	500	0.78	0.90	1.01	1.11	1.21
	700	0.64	0.77	0.90	1.00	1.10
	900	0.50	0.63	0.76	0.89	1.00
	1100	0.36	0.49	0.62	0.75	0.88

Source: ICRA estimates

*Assumed to decline by 3% on y.o.y basis and % reduction takes into account of the debt amortization schedule & indexation of inflation to O&M expenses

As seen above in Table 10, average DSCR for a bidder is estimated to show considerable improvement as the first year fixed capacity charge in competitively bid PPA increases. However, ability of the bidder to win such PPA by quoting a higher level of fixed capacity charge in new PPAs remains to be seen. Further, cash flows and average DSCR remain highly sensitive to the PLF level as shown below, also assuming the bilateral traded tariff at Rs. 4/kwh in Table 11 and at Rs. 4.5/kwh in Table 12.

Table 11: Sensitivity of PLF & reserve price on Average DSCR						
		Average PLF (%)				
Average DSCR (times) at bilateral tariff of Rs. 4/kwh		65%	70%	75%	80%	85%
	100	1.04	1.12	1.20	1.27	1.35
	300	0.94	1.01	1.08	1.15	1.22
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	500	0.83	0.90	0.97	1.03	1.09
	700	0.70	0.77	0.84	0.90	0.96
	900	0.57	0.63	0.69	0.75	0.81
	1100	0.44	0.49	0.54	0.59	0.64

Table 12: Sensitivity to quoted bid price in forward bidding and PLF level on Average DSCR						
		Average PLF (%)				
Average DSCR (times) at bilateral tariff of Rs. 4.5/kwh		65%	70%	75%	80%	85%
	100	1.09	1.18	1.26	1.33	1.41
	300	0.99	1.07	1.14	1.21	1.28
Quoted bid price (reserve price payable) in forward bidding (Rs./MT)	500	0.89	0.96	1.02	1.09	1.15
	700	0.76	0.84	0.91	0.97	1.02
	900	0.63	0.70	0.76	0.83	0.88
	1100	0.50	0.56	0.61	0.67	0.72

Source: ICRA estimates

State distribution utilities to benefit from Negative Price Bids in the coal mine auction

As stated earlier, in view of the negative price bids in the reverse auction process, the winning bidders cannot charge any coal cost for supply to state distribution utilities from their power generation projects. This is a positive development for the off-takers i.e. state owned distribution utilities, as the absence of fuel charge recovery is expected to result into a reduction in power procurement costs. As shown in Table 13 here, the production from the coal mines awarded through the e-auction process is estimated at 12.6 million MT and 19.6⁸ million MT in FY2016 and FY2017 respectively, given the 5 of the 9 mines awarded under auction are already operational and the remaining 4 mines are expected to be become operational by FY2017. The production from these mines is estimated to result in net power generation of 20753 MUs and 32178 MUs in FY2016 and FY2017 respectively. As per the methodology approved by the MoC, GoI, 85% of the power generated from the power generation projects of the winning bidders must be sold through long term PPAs to state distribution utilities, with energy charges arrived as per the quoted bid price. The power generation projects of the winning bidders have existing signed PPAs for about 60% of the power generation capacity linked to the coal mines with distribution utilities, primarily in the states of Madhya Pradesh, Chhattisgarh, West Bengal and Odisha. Given the negative price bids, the distribution utilities in these states are expected to achieve savings to the tune of Rs. 4.17 billion and Rs. 6.46 billion in FY2016 and FY2017 respectively while procuring power from these winning bidders, which otherwise would have been spent on fuel charges payable to these power generating companies (arrived based on the notified coal price by CIL). The savings in fuel costs are estimated to result in tariff relief of about 0.9% for consumers in these four states put together in FY2017.

Table 13: Estimated relief in retail tariffs		
	FY2016	FY2017
Total coal production from the coal mines awarded through e-auction (MMT)	12.6	19.6
Coal Consumption per unit (kg/unit)	0.56	0.56
Estimated cost of equivalent grade coal as per CIL's notified price (Rs./MT)	700	700
Cost of ROM coal per unit of power generated (Rs./unit)	0.39	0.39
Estimated generation using coal produced from the above mentioned mines (MUs)	22436	34788
Auxiliary consumption (MUs)	1683	2609
Net energy available for supply to state distribution utilities (MUs)	20753	32178
Sales under existing long term PPAs accounting for 60% of the coal block linked capacity (MUs)	10584	16411
Savings in fuel cost for distribution utilities on procuring the power generated from these mines (Rs. billion)	4.17	6.46
Estimated overall procurement by distribution utilities in the states with which the winning projects have long term PPAs (MUs)	181275	190338
Savings in power procurement cost for the utilities in these states (paise per unit)	2.3	3.4
Savings in cost adjusted for T&D losses (paise per unit)	3.1	4.5
Estimated relief in retail tariffs (%)	0.6%	0.9%

Source: ICRA Estimates

⁸ Production from the schedule III mines is estimated at 40% of their peak capacity in the first year of operation



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