

Utilities

BTH#3: Green hydrogen – Bon Appetit, the hors d'oeuvres are served

India's tryst with green hydrogen has been slow but steady on account of delay in improvement of unit economics. However, the mission is taking off now with new bids called for after aggregating demand from end users. L&T won the first bout (10ktpa at INR 397/kg) but lesser-known rivals won their fair share in the new bids. The government came out with its new green hydrogen mission in 2021 with layout of ~INR 200bn. Under the mission, the first rounds of incentives were allocated without tying up for demand. So far the bids for 1) [electrolysers](#) (3GW), 2) [green hydrogen](#) (0.8mtpa), 3) the recently concluded first tranche for the production of [green ammonia](#) (0.7mtpa), and 4) few refineries with green hydrogen capacity of 20ktpa have been concluded. Till date, ~1.2mtpa of green hydrogen (including green ammonia) has been incentivised which will likely spur an investment of USD 18bn or INR 1.6trn as well as RE power generation capacity of ~30GW.

The booster – National Green Hydrogen Mission

The government came up with the incentive scheme to boost take off of green hydrogen. It had conducted bids for 3GW for electrolyser (equal to 0.2mtpa of green hydrogen and 1.2mtpa for green hydrogen. Adani Enterprises has won incentives for 0.3GW of electrolyser manufacturing capacity, Reliance has won 0.2mtpa of green hydrogen and 0.3MW of electrolysers and L&T has won 0.1GW of electrolysers and 0.3mtpa of green ammonia.

The action has moved to the battlegrounds

The new bids have been rolled out recently by aggregating demand or by end user. Refineries and Fertilisers are using grey hydrogen for their processes; thus, the government is incentivizing them to replace a part of it by green hydrogen (because of limited impact on the final cost of products). The new bids have been called on behalf of fertiliser manufacturers and by refineries.

It's a mixed bag in recent bids for listed players

L&T won the first bid to supply hydrogen to IOCL, Occor has won the bid for HPCL and BPCL refineries. The price discovery is ~USD 3.5-4/kg (vs grey < USD 2/kg). The lesser-known players have struck big in green Ammonia bids. NTPC Green has won bid for 70ktpa. ACME Cleantech (unlisted) has won bids for ~370ktpa.

Summing it up

India has given incentive for ~1mtpa. This is likely to bring an investment of INR 1.5trn or USD 15bn, if all plants reach fruition. However, we believe few capacities would not see the light of day. We realistically assess a capacity of ~0.5mtpa bringing an investment of INR 750m and capacity of ~12GW. The initial success will improve the India's chances to become a global export hub. Note that L&T has tied up with Itochu for offtake of green ammonia (for bunkering applications).

Exhibit 1: Valuation of key bid winners

Companies	Rating	P/E (x)			EV/EBITDA (x)		
		FY25	FY26E	FY27E	FY25	FY26E	FY27E
L&T	BUY	34	30	26	23	20	17
Adani Enterprises*	Unrated	64	51	47	25	23	20
Waaree Energies*	Unrated	45	31	23	29	18	13
CESC	BUY	15	13	12	9	9	9
JSW Energy	BUY	48	28	25	24	10	9
NTPC Green	ADD	184	119	38	51	41	17

Source: I-Sec research, SECI, MNRE, *Bloomberg

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Exhibit 2: Bids of incentives worth INR 60bn are yet to be bid out

Bid Items	Mode & Tranche	Capacity	Maximum Incentive (INR bn)
Completed Bids			
Electrolyser	Tranche I	1,500 MW	22.2
	Tranche II	1,500 MW	22.2
Total		3,000 MW	44.4
Completed Bids			
Green Hydrogen	Mode 1 Tranche I	412ktpa	30.6
	Mode 1 Tranche II	450ktpa	22.4
Green Ammonia	Mode 2A Tranche I	724ktpa	15.3
Upcoming Bids			
Green Hydrogen	Mode 2B Tranche I	200ktpa (20ktpa bid out)	24.0 (2.4 bid out)
Pending Bids			
Green Hydrogen/Ammonia			38.3
Total			130.5

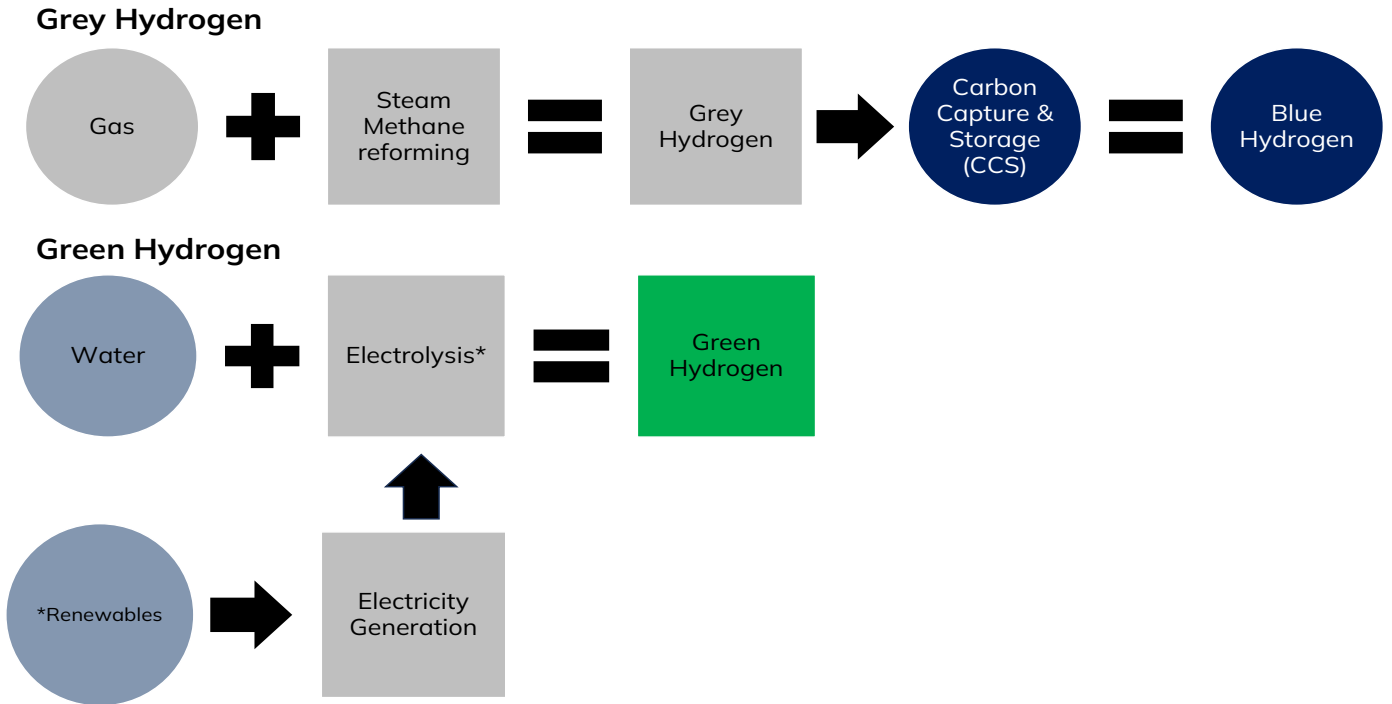
Source: I-Sec research, SECI, MNRE

Exhibit 3: Summary of bids won by large players

Companies	Green Hydrogen (ktpa)	Electrolysers (MW)	Green Ammonia (ktpa)	Investment (INR bn)
L&T				
Green Hydrogen - Tranche II	90	300		
IOCL	10			
Sub - total	100	300		135
Reliance				
Green Hydrogen - Tranche I	90			
Green Hydrogen - Tranche II	90			
Electrolyse - Tranche I		300		
Sub - total	180			243
CESC				
Green Hydrogen - Tranche I	10.5			14
JSW Energy				
Green Hydrogen - Tranche I	6.5			9
Waaree Energies				
Green Hydrogen - Tranche II	90			122
Electrolyser - Tranche II		300		
Sub - total	90	300		122
Avaada				
Green Hydrogen - Tranche II	45			61
Adani Enterprises				
Electrolyser - Tranche II		200		
Electrolyser - Tranche II		72		
Electrolyser - Tranche II		30		
Sub - total		302		
NTPC Green				
Green Ammonia			70	28
ACME Cleantech (Unlisted)				
Green Ammonia			500	200
TOTAL				933

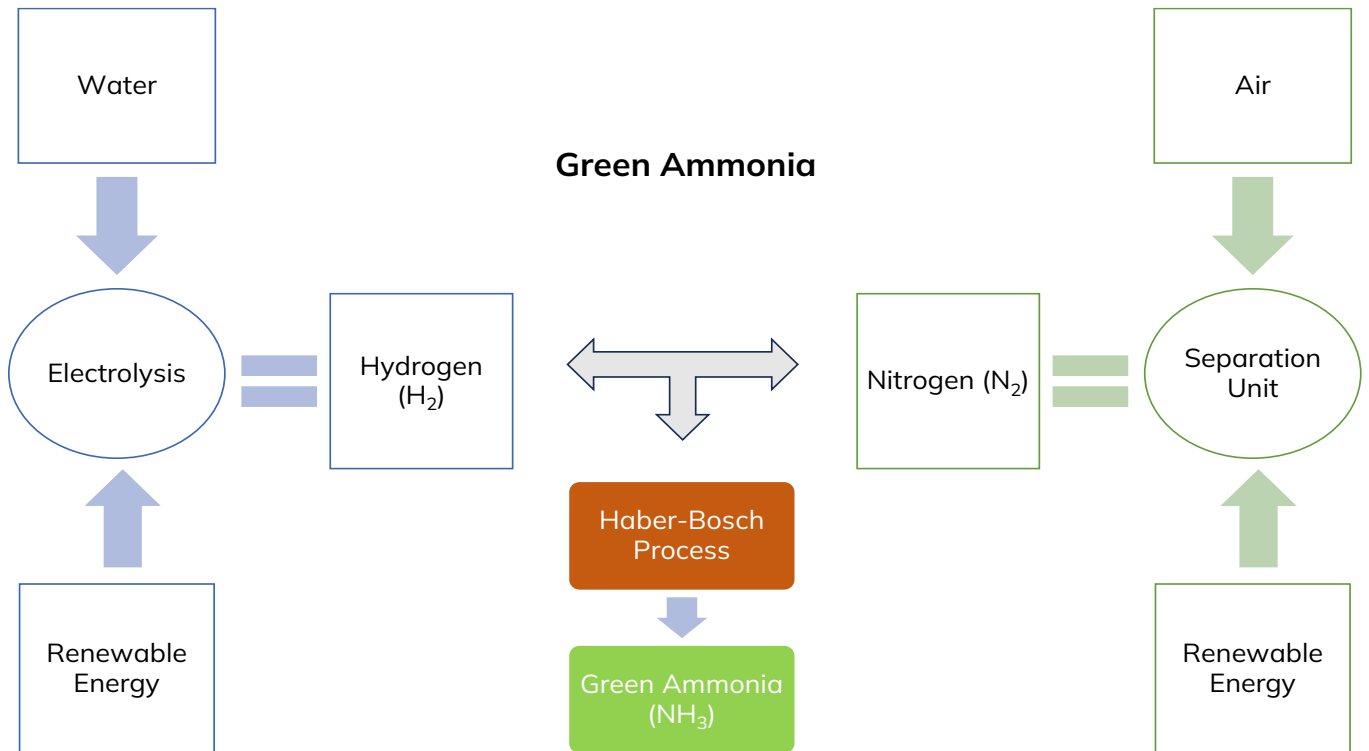
Source: I-Sec research, SECI

Exhibit 4: Grey Hydrogen vs Green Hydrogen



Source: I-Sec research, MNRE

Exhibit 5: Green Ammonia



Source: I-Sec research, MNRE

SIGHT – the solution to the cost issue

The Union Cabinet has approved the National Green Hydrogen Mission with an outlay of INR 197bn up to FY29-30. The Strategic Interventions for Green Hydrogen Transition (SIGHT) programme is a major financial measure under the Mission, with an outlay of INR 175bn. The programme proposes two distinct financial incentive mechanisms to support domestic manufacturing electrolysers and production of Green Hydrogen. These incentives are aimed at enabling rapid scale-up, technology development and cost reduction.

Of the envisaged INR 175bn outlay of SIGHT, INR 44.4bn is to be allocated for Component I (manufacturing of electrolysers) and INR 130.5bn is to be allocated for Component II (production of green hydrogen and green ammonia).

Under **Component I**, the bids were conducted on the basis of certain values of Electrolysers performance (Specific Energy Consumption) and Local Value Addition. All the bids under this component have been completed. Implementing agency (IA) was SECI.

Under **Component II**, there are two modes of bidding:

- **Mode 1:** Bidding for green hydrogen on least incentive demanded over the three-year period, through a competitive selection process.
- **Mode 2:** Bids at the lowest cost through a competitive selection process.
 - Mode 2A: Green ammonia. IA would be SECI
 - Mode 2B: Green Hydrogen for single or multiple refineries. IA will be Oil & gas companies.

Exhibit 6: Bids of incentives worth INR ~60bn are yet to be bid out

Bid Items	Mode & Tranche	Capacity	Incentive (INR bn)	Bid Parameter	Component
Completed Bids					
Electrolyser	Tranche I	1,500 MW	22.2	Minimum Specific Energy Consumption + Local Value Addition	Component I
	Tranche II	1,500 MW	22.2		
Total		3,000 MW	44.4		
Completed Bids					
Green Hydrogen	Mode 1 Tranche I	0.41mtpa	30.6	Least Incentive over 3 years	Component II
	Mode 1 Tranche II	0.45mtpa	22.4		
Green Ammonia	Mode 2A Tranche I	0.72mtpa	15.3	Least Cost for Production + Supply	
Upcoming Bids					
Green Hydrogen (10% bid out)	Mode 2B Tranche I	0.20mtpa	24.0	Least Cost for Production + Supply	
Pending Bids					
Green Hydrogen/Ammonia			38.3	Least Incentive over 3 years or Least Cost for Production + Supply	
Total			130.5		

Source: I-Sec research, SECI, MNRE

Component I: Electrolysers

Exhibit 7: Bids - Component I - Tranche I

No.	Name of Bidder	Bucket 1 (Any Stack) Quoted Mfg Capacity (MW)	Bucket 2 (Indigenous Stack) Quoted Mfg Capacity (MW)
1	Hild Electric Private Limited	100	-
2	Ohmium Operations Private Limited	137	-
3	John Cockerill Greenko Hydrogen Solutions Pvt Ltd	300	-
4	Waaree Energies Limited	300	-
5	Jindal India Limited	300	-
6	Adani New Industries Limited	300	300
7	L&T Electrolysers Limited	300	-
8	Avaada Electrolyser Private Limited	300	-
9	Green H2 Network India Private Limited	100	-
10	Reliance Electrolyser Manufacturing Limited	300	-
11	Advait Infratech Limited	100	-
12	ACME Cleantech Solutions Private Limited	100	-
13	Oriana Power Limited	100	-
14	Matrix Gas and Renewables Limited	105	-
15	HHP Seven Private Limited	100	-
16	HomiHydrogen Private Limited	-	40.0
17	Bharat Heavy Electricals Limited	-	10
18	Newtrace Private Limited	-	19
19	C. Doctor & Company Private Limited	-	102
20	Pratishna Engineers Limited	-	10
21	LiveHy Energy Private Limited	-	6
TOTAL		2,942	486.5

Source: I-Sec research, SECI

Exhibit 8: Bids - Component I - Tranche II

No.	Name of Bidder	Bucket 1 (Any Stack) Quoted Mfg Capacity (MW)	Bucket 2A (Indigenous Stack) Quoted Mfg Capacity (MW)	Bucket 2B (Indigenous Stack – Small) Quoted Mfg Capacity (MW)
1	Adani Enterprises Limited	101.5	101.5	30
2	Advait Infratech Limited	200	-	-
3	Avaada Electrolyser Private Limited	300	-	-
4	Bharat Heavy Electricals Limited	-	-	10
5	Brise Chemicals Private Limited	-	-	10
6	C. Doctor & Company Private Limited	-	-	20
7	Eastern Electrolyser Limited	-	-	30
8	GH2 Solar Private Limited	105	-	-
9	Green H2 Network India Private Limited	100	-	-
10	Greenzo Energy India Limited	-	-	20
11	Hydrosun Cleantech Private Limited	37	23	15
12	IEC Fabchem Limited	-	-	10
13	LiveHy Energy Private Limited	-	-	30
14	Matrix Gas and Renewables Limited	237	-	-
15	Newage Green Electro Private Limited	300	300	-
16	Newtrace Private Limited	-	-	30.0
17	Ohmium Operations Private Limited	137	-	-
18	Oriana Power Limited	100	-	-
19	Pratishna Engineers Limited	-	-	30
20	RRG Engineering Technologies Private Limited	-	-	30
21	Suryaashish KA1 Solar Park Private Limited	-	110	30
22	Thermax Limited	100	-	-
23	Waaree Energies Limited	300	-	-
TOTAL		2,017.5	534.5	295

Source: I-Sec research, SECI

Exhibit 9: Results - Component I - Tranche I (INR 22.2bn in incentives)

No.	Name of Bidder	Quoted Mfg Capacity (MW)	Awarded Mfg Capacity (MW)	Allotted Incentive (INR mn)	Technology
Bucket-1: Electrolyser manufacturing capacity based on any stack technology					
1	Reliance Electrolyser Manufacturing Limited	300	300	4,440	Alkaline
2	Ohmium Operations Private Limited	137	137	2,028	PEM
3	John Cockerill Greenko Hydrogen Solutions Pvt Ltd	300	300	4,440	Alkaline
4	Advait Infratech Limited	100	100	1,480	Alkaline
5	L&T Electrolysers Limited	300	300	4,440	Alkaline
6	Matrix Gas and Renewables Limited	105	63	932	Alkaline
TOTAL		1,242	1,200	17,760	
Bucket-2: Electrolyser manufacturing capacity based on indigenously developed stack technology					
1	Homihydrogen Private Limited	101.5	101.5	1,502	ASME/Solid Oxide
2	Adani New Industries Limited	300.0	198.5	2,938	Alkaline
TOTAL		402	300	4,440	

Source: I-Sec research, Company data

Exhibit 10: Results - Component I - Tranche II (INR 22.2bn in incentives)

No.	Name of Bidder	Quoted Mfg Capacity (MW)	Awarded Mfg Capacity (MW)	Allotted Incentive (INR mn)	Technology
Bucket-1: Electrolyser manufacturing capacity based on any stack technology					
1	Newage Green Electro Private Limited	300	71.5	1,058	Alkaline
2	Waaree Energies Ltd	300	300	4,440	Alkaline
3	Matrix Gas and Renewables Limited	237	237	3,508	Alkaline
4	Advait Infratech Limited	200	200	2,960	Alkaline
5	Ohmium Operations Private Limited	137	137	2,028	Proton Exchange Membrane
6	GH2 Solar Private Limited	105	105	1,554	Alkaline
7	Avaada Electrolyser Private Limited	300	49.5	733	Alkaline
TOTAL		1,579	1,100	16,280	
Bucket-2A: Electrolyser manufacturing capacity based on indigenously developed stack technology					
1	Adani Enterprises Limited	101.5	71.5	1,058	Alkaline
2	Newage Green Electro Private Limited	300	228.5	3,382	Alkaline
TOTAL		402	300	4,440	
Bucket 2B: Electrolyser manufacturing capacity based on indigenously developed stack technology-smaller units					
1	Adani Enterprises Limited	30	30	444	Alkaline
2	Eastern Electrolyser Limited	30	30	444	Alkaline
3	Newtrace Private Limited	30	30	444	Membrane Less Electrolyser
4	Suryaashish KA1 Solar Park Pvt Ltd	30	10	148	Proton Exchange Membrane
TOTAL		120	100	1,480	

Source: I-Sec research, SECI

Component II: Green Hydrogen

Component II: Green Hydrogen (Mode 1)

Exhibit 11: Bids - Component II – Mode 1 – Tranche I

No.	Name of Bidder	Bucket 1 (Any Tech) Quoted Mfg Capacity (tonnes)	Bucket 1 (Biomass) Quoted Mfg Capacity (tonnes)
1	ACME Cleantech Solutions Private Limited	90,000	
2	Torrent Power Limited	18,000	
3	UPL Limited	10,100	
4	GH4INDIA Private Limited	10,000	
5	Sembcorp Green Hydrogen India Private Limited	36,000	
6	Greenko ZeroC Private Limited	90,000	
7	CESC Projects Limited	10,500	
8	JSW Neo Energy Limited	10,000	
9	Welspun New Energy Limited	20,000	
10	Avaada GreenH2 Private Limited	90,000	
11	Reliance Green Hydrogen and Green Chemicals Limited	90,000	
12	HHP Two Private Limited	75,130	
13	Aneeka Universal Private Limited	2,000	
14	Bharat Petroleum Corporation Limited		2,000
TOTAL		551,730	2,000

Source: I-Sec research, SECI

Exhibit 12: Bids - Component II – Mode 1 – Tranche II

No.	Name of Bidder	Bucket 1 (Any Tech) Quoted Mfg Capacity (tonnes)	Bucket 1 (Biomass) Quoted Mfg Capacity (tonnes)
1	AM Green Ammonia (India) Private Limited	90,000	
2	Avaada GreenH2 Private Limited	45,000	
3	ChemSepT Engineering Private Limited		4,000
4	GH2 Solar Private Limited	10,500	
5	Green Infra Renewable Energy Farms Private Limited	90,000	
6	L&T Energy Green Tech Limited	90,000	
7	Matrix Gas and Renewables Limited	10,000	1,500
8	Nishal Enterprises Private Limited		1,000
9	Ocior Energy India Private Limited	20,500	
10	Oriana Power Limited	10,000	
11	Reliance Green Hydrogen and Green Chemicals Limited	90,000	
12	ReNew E-Fuels Private Limited	55,000	
13	Suryadeep KA1 Project Private Limited	19,000	
14	Waaree Clean Energy Solution Private Limited	90,000	
TOTAL		620,000	6,500

Source: I-Sec research, SECI

Exhibit 13: Results - Component II – Mode 1 – Tranche I (INR 30.5bn in incentives)

No.	Players	Production Capacity (tonnes)	Year	Year 2	Year 3	Average Incentive (INR/kg)	Maximum Allocated Incentive (INR mn)
1	CESC Projects Limited	10,500	-	-	-	-	-
2	UPL Limited	10,000	-	-	-	-	-
3	Reliance Green Hydrogen and Green Chemicals Limited	90,000	0.03	28.32	28.35	18.90	5,103
4	Welspun New Energy Limited	20,000	-	30.00	30.00	20.00	1,200
5	HHP Two Pvt Ltd	75,000	50.00	25.13	-	25.04	5,635
6	Torrent Power Limited	18,000	25.00	34.10	27.57	28.89	1,560
7	ACME Cleantech Solutions Pvt Ltd	90,000	50.00	40.00	-	30.00	8,100
8	Greenko ZeroC Pvt Ltd	90,000	50.00	40.00	-	30.00	8,100
9	JSW Neo Energy Limited	6,500	50.00	40.00	14.00	34.66	676
10	Bharat Petroleum Corporation Limited	2,000	30.00	30.00	30.00	30.00	180
TOTAL		412,000					30,554

Source: I-Sec research, SECI

Exhibit 14: Results - Component II – Mode 1 – Tranche II (INR 22.4bn in incentives)

No.	Players	Production Capacity (tonnes)	Year 1	Year 2	Year 3	Average Incentive (INR /kg of GH2)	Maximum Allocated Incentive (INR mn)
1	Oriana Power Limited	10,000	0.01	0.01	0.01	0.01	0.3
2	Suryadeep KA1 Project Private Limited	19,000	1.00	11	12	8.00	456
3	L&T Energy Green Tech Limited	90,000	1.00	9.33	23	11.11	3,000
4	GH2 Solar Private Limited	10,500	5.00	15	24.9	14.97	471
5	Green Infra Renewable Energy Farms Private Limited	90,000	1.00	40	7.6	16.20	4,374
6	Waaree Clean Energy Solutions Private Limited	90,000	1.00	27.85	27.85	18.90	5,103
7	AM Green Ammonia (India) Private Limited	90,000	7.00	40	10	19.00	5,130
8	Reliance Green Hydrogen and Green Chemicals Limited	49,000	4.96	40	30	24.99	3,673
9	Reliance Green Hydrogen and Green Chemicals Limited	1,500	50	40	29	39.67	179
TOTAL		450,000					22,386

Source: I-Sec research, SECI

Component II: Green Hydrogen (Mode 2B)

While the previous schemes were implemented by SECI, the scheme under Mode 2B will be implemented by the oil & gas companies and Centre for High Technology (CHT). Similar to the bids of Mode 2A, oil companies will roll out bids for their share of the capacity and select bidders on the parameter of least quote price for production and supply.

- The capacity available for bidding under the Tranche I of Mode 2B is 200ktpa of Green Hydrogen.
- The incentives for the first three years are:
 - INR 50 per kg for first year
 - INR 40 per kg for second year
 - INR 30 per kg for third year

Some of the bids have concluded. NRL (10ktpa) & ONGC MRPL (10ktpa) bids have also been opened. The details are mentioned below:

Exhibit 15: Results - Component II – Mode 2B – Tranche I (INR 24bn in incentives)

Bids	Fertiliser Company	Winner	Supply (TPA)	Price (INR/kg)
Project I	HPCL	Ocior Energy	5,000	328.0
Project II	IOCL	L&T	10,000	397.0
Project III	BPCL	Ocior Energy	5,000	328.0
TOTAL			20,000	362.5

Source: I-Sec research, SECI

Component II: Green Ammonia (Mode 2A)

The recently concluded bids for Green Ammonia indicated that the discovered selling price (post incentives) was, on average, INR 53.36/kg (20% more than grey hydrogen).

Bidders

- Acme Cleantech has won a lot of the bids (6 of 13) to supply 325ktpa.
- NTPC Green won one bid to supply 70ktpa.
- Onix Renewables, SCC Infrastructure, Jakson Green, Oriana Power are the other lesser-known players who have won bids.

Exhibit 16: Results - Component II – Mode 2A – Tranche I (INR 15.3bn in incentives)

Bids	Fertiliser Company	Winner	Supply (TPA)	Price (INR/kg)
Project I	Indian Farmers Fertiliser Cooperative (Gujarat)	ACME Cleantech Solutions	1,00,000	54.73
Project II	Indian Farmers Fertiliser Cooperative (Odisha)	ACME Cleantech Solutions	1,00,000	49.75
Project III	Madras Fertilisers	Suryam International	4,000	50.00
Project IV	Gujarat Narmada Valley Fertilizers and Chemicals	Onix Renewable	50,000	52.50
Project V	Paradeep Phosphates	ACME Cleantech Solutions	75,000	55.70
Project VI	Paradeep Phosphates	ACME Cleantech Solutions	25,000	62.84
Project VII	Indorama India	ACME Cleantech Solutions	20,000	64.74
Project VIII	Mangalore Chemicals & Fertilizers	SCC Infrastructure	15,000	57.65
Project IX	Coromandel International	ACME Cleantech Solutions	50,000	51.89
Project X	Coromandel International	Jakson Green	85,000	50.75
Project XI	Krishana Phoschem	NTPC Green	70,000	51.80
Project XII	Madhya Bharat Agro Products (Madhya Pradesh)	Oriana Power	60,000	52.25
Project XIII	Madhya Bharat Agro Products (Maharashtra)	SCC Infrastructure	70,000	53.05
TOTAL			7,24,000	53.26

Source: I-Sec research, SECI

Incentives

Since the bidding parameter was the cost of production and supply, the incentive per kg was fixed. The total incentives over 3 years amount to INR 15.3bn.

- INR 8.82 per kg for first year
- INR 7.02 per kg for second year
- INR 5.30 per kg for third year

Investment

The proforma investment for 100ktpa is estimated at INR 40bn. Thus, we believe the total investment required is INR 280-300bn.

- Investment in Renewable capacity (4GW total): INR 120bn,
- Investment in Electrolysers for Green Hydrogen: INR 70bn, and
- Investment in the production of Nitrogen and Ammonia: NR 70bn.

While the culmination of a robust green ammonia industry in the long run is beneficial, there exist certain risks, namely, 1) fixed pricing of the contract, 2) the risk of lesser known, 3) price risk of Chinese modules, and 4) banking charges.

Exhibit 17: Break-down of costs

Cost of ammonia production	
Capacity (ktpa)	100
Capacity (tpd)	274
Nitrogen Production (tpa)	82
Capacity (tpd)	226
H2 (tpa)	18
Capacity (tpd)	48
Capital Cost (INR mn)	
Cost (INR mn)	41,570
Cost of Green hydrogen plant (%)	75%
Green Hydrogen (INR mn)	31,178
N2 (INR mn)	10,393
(in INR/kg of ammonia)	
Capital cost of production	14
Opex cost of production	2
Cost of Nitrogen (INR/kg of ammonia)	16
Capital cost of production	55
Opex cost of production	3
Cost of Hydrogen (INR/kg of ammonia)	74
Derived cost of green hydrogen	
Capital cost of production (INR/kg)	236
Opex cost of production	12
Cost of hydrogen (INR/kg of hydrogen)	247
Cost of hydrogen (USD/kg)	2.9

Source: I-Sec research, MNRE

Details of individual bids

Exhibit 18: Cumulative capacity bid for by each player across the 13 projects bid out

No.	Name of Bidder	Cumulative quoted capacity (ktpa)
1	ACME Cleantech Solutions Private Limited	516
2	AM Green Ammonia (India) Private Limited	530
3	Avaada Green Fuels Private Limited	330
4	C Doctor & Company Private Limited in consortium with Krisow Performance Fluids Private Limited	4
5	H2e Power Systems Private Limited in consortium with Hyfuels Energy Private Limited	39
6	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	100
7	NTPC Renewable Energy Limited	304
8	Onix Renewable Limited	60
9	Oriana Power Limited	60
10	SCC infrastructure Private Limited in consortium with InSolare Energy Limited	85
11	Sree Green Energy Holdings Private Limited in consortium with Kaununga Extrusion Private Limited	40
12	Stockwell Solar Services Private Limited	10
13	Suryam International Private Limited	4
14	Waaree Clean Energy Solutions Private Limited	290
15	Welspun New Energy Private Limited	150
TOTAL		2,522

Source: I-Sec research, SECI

Exhibit 19: Bids for Project I - Indian Farmers Fertiliser Cooperative (Gujarat)

No.	Name of Bidder	Quoted price (INR/kg)
1	ACME Cleantech Solutions Private Limited	54.73
2	Welspun New Energy Private Limited	54.98
3	AM Green Ammonia (India) Private Limited	55.48

Source: I-Sec research, SECI

Exhibit 20: Bids for Project II - Indian Farmers Fertiliser Cooperative (Odisha)

No.	Name of Bidder	Quoted price (INR/kg)
1	ACME Cleantech Solutions Private Limited	49.75
2	Avaada Green Fuels Private Limited	50.00
3	Welspun New Energy Private Limited	108.81

Source: I-Sec research, SECI

Exhibit 21: Bids for Project III - Madras Fertilisers

No.	Name of Bidder	Quoted price (INR/kg)
1	Suryam International Private Limited	50.00
2	H2e Power Systems Private Limited	51.25
3	C Doctor and Company Private Limited	55.00
4	ACME Cleantech Solutions Private Limited	63.00
5	Onix Renewable Limited	81.90
6	NTPC Renewable Energy Limited	101.50
7	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	500.00

Source: I-Sec research, SECI

Exhibit 22: Bids for Project IV - Gujarat Narmada Valley Fertilizers and Chemicals

No.	Name of Bidder	Quoted price (INR/kg)
1	Onix Renewable Limited	52.50
2	ACME Cleantech Solutions Private Limited	52.75
3	NTPC Renewable Energy Limited	60.25
4	Waaree Clean Energy Solutions Private Limited	63.75
5	Welspun New Energy Private Limited	80.25
6	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	500.00

Source: I-Sec research, SECI

Exhibit 23: Bids for Project V - Paradeep Phosphates

No.	Name of Bidder	Quoted price (INR/kg)
1	ACME Cleantech Solutions Private Limited	55.75
2	Avaada Green Fuels Private Limited	56.00
3	SCC infrastructure Private Limited in consortium with InSolare Energy Limited	59.00
4	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	78.00
5	Welspun New Energy Private Limited	111.06

Source: I-Sec research, SECI

Exhibit 24: Bids for Project VI - Paradeep Phosphates

No.	Name of Bidder	Quoted price (INR/kg)
1	ACME Cleantech Solutions Private Limited	62.84
2	Waaree Clean Energy Solutions Private Limited	63.09
3	Welspun New Energy Private Limited	135.00

Source: I-Sec research, SECI

Exhibit 25: Bids for Project VII - Indorama India

No.	Name of Bidder	Quoted price (INR/kg)
1	ACME Cleantech Solutions Private Limited	64.74
2	Avaada Green Fuels Private Limited	64.99
3	H2e Power Systems Private Limited	66.30
4	Welspun New Energy Private Limited	132.30

Source: I-Sec research, SECI

Exhibit 26: Bids for Project VIII - Mangalore Chemicals & Fertilizers

No.	Name of Bidder	Quoted price (INR/kg)
1	SCC infrastructure Private Limited in consortium with InSolare Energy Limited	57.65
2	H2e Power Systems Private Limited	57.90
3	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	82.00
4	ACME Cleantech Solutions Private Limited	88.49
5	Waaree Clean Energy Solutions Private Limited	98.05
6	Welspun New Energy Private Limited	122.94

Source: I-Sec research, SECI

Exhibit 27: Bids for Project IX - Coromandel International

No.	Name of Bidder	Quoted price (INR/kg)
1	ACME Cleantech Solutions Private Limited	51.89
2	Avaada Green Fuels Private Limited	52.14
3	NTPC Renewable Energy Limited	54.39
4	Welspun New Energy Private Limited	113.76

Source: I-Sec research, SECI

Exhibit 28: Bids for Project X - Coromandel International

No.	Name of Bidder	Quoted price (INR/kg)
1	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	50.75
2	ACME Cleantech Solutions Private Limited	51.00
3	Avaada Green Fuels Private Limited	52.00
4	Welspun New Energy Private Limited	111.06

Source: I-Sec research, SECI

Exhibit 29: Bids for Project XI - Krishana Phoschem

No.	Name of Bidder	Quoted price (INR/kg)
1	NTPC Renewable Energy Limited	51.80
2	SCC infrastructure Private Limited in consortium with InSolare Energy Limited	52.30
3	Waaree Clean Energy Solutions Private Limited	64.05
4	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	65.30
5	ACME Cleantech Solutions Private Limited	84.37
6	Welspun New Energy Private Limited	115.20

Source: I-Sec research, SECI

Exhibit 30: Bids for Project XII - Madhya Bharat Agro Products (Madhya Pradesh)

No.	Name of Bidder	Quoted price (INR/kg)
1	Oriana Power Limited	52.25
2	SCC infrastructure Private Limited in consortium with InSolare Energy Limited	52.50
3	ACME Cleantech Solutions Private Limited	53.50
4	NTPC Renewable Energy Limited	58.10
5	Onix Renewable Limited	59.10
6	Waaree Clean Energy Solutions Private Limited	59.35
7	Jakson Green Limited in consortium with Ocior Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	64.45
8	Welspun New Energy Private Limited	121.05

Source: I-Sec research, SECI

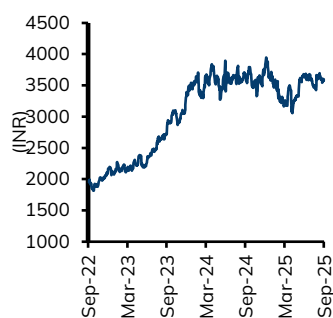
Exhibit 31: Bids for Project XIII - Madhya Bharat Agro Products (Maharashtra)

No.	Name of Bidder	Quoted price (INR/kg)
1	SCC infrastructure Private Limited in consortium with InSolare Energy Limited	53.05
2	Waaree Clean Energy Solutions Private Limited	53.55
3	ACME Cleantech Solutions Private Limited	54.55
4	NTPC Renewable Energy Limited	57.55
5	Jakson Green Limited in consortium with Ocor Energy India Private Limited, First Element Private Limited & JGGJ Renewable One Private Limited	89.00
6	Welspun New Energy Private Limited	115.93

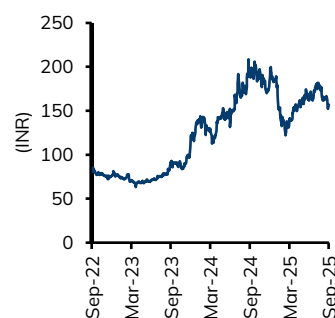
Source: I-Sec research, SECI

Price charts

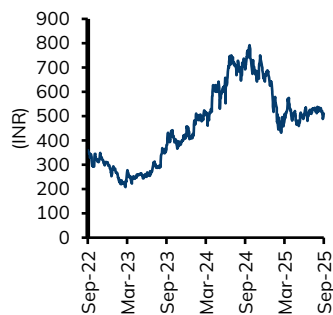
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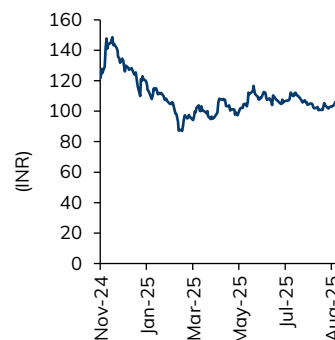
CESC



JSW Energy



NTPC Green



Source: Bloomberg

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