

Details of calculation for All India scenario for 2022

Item No.	Balancing Cost	Rs./kWh
1	Total balancing charge for Coal and Gas based station (fixed +fuel charge)(Rs/kWh)-Spread over renewable generation	0.04
*2	Impact of DSM (Rs/kWh)- Spread over renewable generation	0.30
**3	Impact on tariff (Rs./kWh) for All India discom for backing down Coal generation assuming solar and wind at Rs. 2.50/kWh and tariff of coal based generation at Rs. 3.50/kWh- Spread over renewable generation	0
4	Stand by charge (Rs/kWh)- Spread over renewable generation	0.50
5	Extra transmission charge (Rs/kWh)- Spread over renewable generation	0.26
	Total Impact- Spread over renewable generation (Rs/kWh)	1.10

* Assuming that deviation charge on account of renewables remains the same as for Gujarat since Gujarat also has 20% penetration of renewables at present.

** In future, for setting up new capacity, it will be cheaper to procure from new renewable capacity rather than from new coal based capacity. Therefore, Rs. 0.50 reduces to zero

All India (2022)-Item no. 1

Hour	Coal
1	164801
2	162356
3	163176
4	161876
5	162636
6	164483
7	166726
8	166079
9	148574
10	139013
11	129047
12	123450
13	119140
14	120338
15	128095
16	138106
17	154818
18	160163
19	158362
20	164323
21	166326
22	163214
23	165765
24	167085

Total generation MWh 3657955 IC
 Max Capacity available MW 167085
 Max generation MWh 4010046.3
 PLF Achieved 91.22

Fixed cost (Rs/kWh)@85 % PLF	1.5
total fixed cost (Rs) in crores at 85% PLF	511.28
total fixed cost (Rs) in crores at 91.22% PLF	1.40
Difference in fixed cost (Rs/kWh)	-0.10

Since PLF for coal based generation is more than 85% so there will be no extra charge for fixed and fuel cost

Total generation M Us(85% plf) 167085 3408.539355

Hour	Gas
1	4000
2	3000
3	4000
4	3000
5	3000
6	3000
7	6000
8	4000
9	3600
10	3600
11	3600
12	3600
13	3600
14	3600
15	3600
16	3600
17	3600
18	6000
19	6000
20	6000
21	6000
22	6000
23	6000
24	6000

Total generation MWh 104400 IC
 Max Capacity available MW 6000
 Max generation MWh 144000.0
 PLF Achieved 72.50

Fixed cost (Rs/kWh)@85 % PLF	1.4
total fixed cost (Rs) in crores at 85% PLF	17.14
total fixed cost (Rs) in crores at 72.5% PLF	1.64
Difference in fixed cost (Rs/kWh)	0.24

Loss of efficiency due to operation at 72.5% PLF 5% As per CERC Grid Code
 Fuel charge for combined cycle (Rs./kWh) 2
 Total loss due to low PLF operation (Rs.) 10440000
 Total generation MWh 4968122.9
 Total loss due to low PLF operation (Rs./unit) 0.002
 total balancing charge for Gas based station (fixed +fuel charge)(Rs/kWh) 0.243

Total balancing charge for All India Gas based station (fixed +fuel charge)(Rs/kWh)-Spread over renewable generation	0.04
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Total generation M Us(85% plf) 6000 122.4

Hour	Wind+Solar
1	6874.46
2	5967.91
3	5724.17
4	5895.18
5	6717.71
6	6928.74
7	6262.19
8	11519.04
9	32519.38
10	50547.81
11	62340.37
12	69281.12
13	71311.97
14	67265.85
15	58856.30
16	44682.33
17	25991.98
18	9661.49
19	8008.09
20	10474.81
21	10424.52
22	9871.43
23	10024.90
24	8616.57
Total	605768.35

All India (2022)-Item no. 2

Hour	Wind+Solar	deviation (15%)	Deviation beyond 2000 MW	Charges (Rs.) due to DSM considering Rs. 4/kWh
1	6874.46	1031	-969	-3875322
2	5967.91	895	-1105	-4419257
3	5724.17	859	-1141	-4565500
4	5895.18	884	-1116	-4462892
5	6717.71	1008	-992	-3969374
6	6928.74	1039	-961	-3842756
7	6262.19	939	-1061	-4242686
8	11519.04	1728	-272	-1088573
9	32519.38	4878	2878	11511627
10	50547.81	7582	5582	22328688
11	62340.37	9351	7351	29404225
12	69281.12	10392	8392	33568672
13	71311.97	10697	8697	34787183
14	67265.85	10090	8090	32359512
15	58856.30	8828	6828	27313781
16	44682.33	6702	4702	18809400
17	25991.98	3899	1899	7595188
18	9661.49	1449	-551	-2203107
19	8008.09	1201	-799	-3195144
20	10474.81	1571	-429	-1715112
21	10424.52	1564	-436	-1745286
22	9871.43	1481	-519	-2077142
23	10024.90	1504	-496	-1985059
24	8616.57	1292	-708	-2830056
Total	605768.35			217678276

only +ve values

Impact of DSM per unit (Rs/kWh)- Spread over renewable generation	0.36
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All India (2022)-Item no. 3

Hour	Wind+Solar
1	6874.46
2	5967.91
3	5724.17
4	5895.18
5	6717.71
6	6928.74
7	6262.19
8	11519.04
9	32519.38
10	50547.81
11	62340.37
12	69281.12
13	71311.97
14	67265.85
15	58856.30
16	44682.33
17	25991.98
18	9661.49
19	8008.09
20	10474.81
21	10424.52
22	9871.43
23	10024.90
24	8616.57
Total	605768.35

Total wind and solar (MWh)	605768.35
Money spent extra by backing down coal generation to take renewables (Rs)	1211536702.63
Impact on tarrif (Rs./Unit) for Gujarat discom for backing down Coal generation assuming solar and wind at Rs. 4/kWh and coal fuel charge at Rs. 2.0/kWh- Spread over renewable generation (Considering 25% on account of renewables)	0.50

All India (2022)-Item no. 4

Hour	Wind+Solar
1	6874.46
2	5967.91
3	5724.17
4	5895.18
5	6717.71
6	6928.74
7	6262.19
8	11519.04
9	32519.38
10	50547.81
11	62340.37
12	69281.12
13	71311.97
14	67265.85
15	58856.30
16	44682.33
17	25991.98
18	9661.49
19	8008.09
20	10474.81
21	10424.52
22	9871.43
23	10024.90
24	8616.57
Total	605768.35

Max wind+solar generation	71311.97
10% standby available capacity	7131.20
10% standby gross capacity	8389.64
MWh generated during day	201351.45
Total implication during the day (Rs.)	302027176.51
Stand by charge (Rs/kWh)- Spread over renewable generation	0.50

All India (2022)-Item no. 5

Extra transmission charge (Rs/kWh)- Spread over renewable generation	0.26
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