



Monthly Generation Report (Renewable Energy Sources) 2012-13 (July 12)



**Central Electricity Authority
Grid Operation and Distribution Wing
Operation Performance Monitoring Division**

BACKGROUND

As on 31st March, 1990 Renewable Energy Sources (RES) capacity was 18 MW and generation during the year 1989-90 was 6 MU. Initially the annual capacity addition was very slow, but from 2008 onwards the contribution from RES is considerable. As on 31st March, 2012 the RES capacity was 24503.45 MW and generation during the year 2011-12 is expected to be 51226 MU (provisional). The growth of installed capacity and the growth of gross electrical energy generation from RES since 1989-90 onwards is given below:-

Growth of Installed Capacity & Percentage share of RES in the total installed generating capacity			
	Total Installed Generating Capacity in India (MW)	Total Installed RES Generating Capacity (MW)	% of Total capacity
As on 31.03.1990	63636	18	0.03
As on 31.03.1992	69065	32	0.05
As on 31.03.1997	85795	902	1.05
As on 31.03.2002	105046	1658	1.58
As on 31.03.2007	132329	7761	5.86
As on 31.03.2008	143061	11125	7.78
As on 31.03.2009	147965	13242	8.95
As on 31.03.2010	159398	15521	9.74
As on 31.03.2011	173626	18455	10.63
As on 31.03.2012	199877	24503	12.26
As on 31.03.2017*	318414*	54503**	17.12
Source: General Review 2011, DMLF division, CEA, ** Tentative projection for XII th plan			
GROWTH OF ENERGY GENERATION & Percentage share of generation from RES in the total energy generation			
Generation during the Year	Total Gross Energy Generation in India (MU)	Total Gross RES Energy Generation (MU)	% of Total Generation
1989 - 1990	245438	6	0.00
1991 - 1992	287029	39	0.01
1996 - 1997	395889	876	0.22
2001 - 2002	517439	2085	0.40
2006 - 2007	670654	9860	1.47
2007-2008	722626	25210	3.49
2008-2009	741167	27860	3.76
2009-2010	799850	36947	4.62
2010 - 2011	844846	41150	4.87
2011 - 2012*	928113	51226*	5.52
Source: General Review 2011, DMLF division, CEA, * Tentative			

As on 31st March, 2012, the percentage share of RES in total generation capacity was 12.26% which is expected to increase to 17.12% by 31st March, 2017. The percentage share of RES in total generation in the country during 2011-12 was around 5.5 %.

Realizing the importance of generation from renewable energy sources (mainly wind energy at that time), in 2008-09, Ministry of Power (MOP) suggested CEA to adopt a methodology for calculation, compilation of generation data in respect of grid connected wind projects. Accordingly, Compilation of wind generation data by OPM division, CEA was initiated with the help of all five RPCs. Despite lots of effort, it was observed that the generation data from grid connected wind projects could be compiled from April, 2009 onwards and that too from a few states (Tamil Nadu, Karnataka, Maharashtra, MP, Rajasthan, and Gujrat). It was also observed that, being a very small fraction of total generation from conventional sources, the data received was partial on account of problems of data collection at the RPC level and sometimes the information were missing or received very late.

Keeping in view of the appreciable growth of generation from Renewable Energy sources, on 4th November, 2011, during the meeting taken by Secretary, MNRE, it was desired that CEA should also capture the energy generation data from all other Renewable Energy Sources. During the meeting, a need to build a data base for Renewable Energy Generation Data Management was felt. It was also desired that CEA should take initiative in the matter in coordination with MNRE so that the information could be utilized by both (MNRE & CEA). Subsequently, three meetings were held with MNRE officers to streamline the process of data collection etc. Data collection, compilation and report generation has been planned in following two phases:

- (1) **Interim Data Base** and
- (2) **Detailed Data Base** - Renewable Energy Sources- information management system (res-ims).

Under the interim phase the collection and compilation on monthly basis has already been started from April, 2012 onwards received through various SLDCs. Under phase-II, it is planned to collect the information using internet facilities (online) directly from the Developers/ RES generators/ SLDC and also to integrate it with the data base for conventional energy sources.

In spite of acute shortage of manpower and infrastructure, under the guidance of Chairperson & Member (GO&D), CEA, OPM Division took the appropriate initiatives to capture the RES generation data. To understand the system, CEA officers made visits to a Wind Farm and a Solar Generating Plant to understand the infrastructure available for onward transmission of data to SLDCs etc. In order to accelerate the data collection with SLDCs and to bridge the missing gaps from all the states, a meeting was conducted with all SLDCs under the aegis of Member (GO&D), CEA on 28th June, 2012. Presentations to show the increasing impact of RES generation and its importance was made at CEA, NRPC, WRPC and SRPC forums. This has resulted in submission of generation data from grid connected RES from respective SLDCs. It was also observed that the data of installed capacity is not available with SLDCs. Therefore, effort has also been made with the cooperation of MNRE to seek the complete information from State Nodal Agencies.

In view of the above constraints, the compilation as indicated below is provisional and would be updated on receipt of updated information.

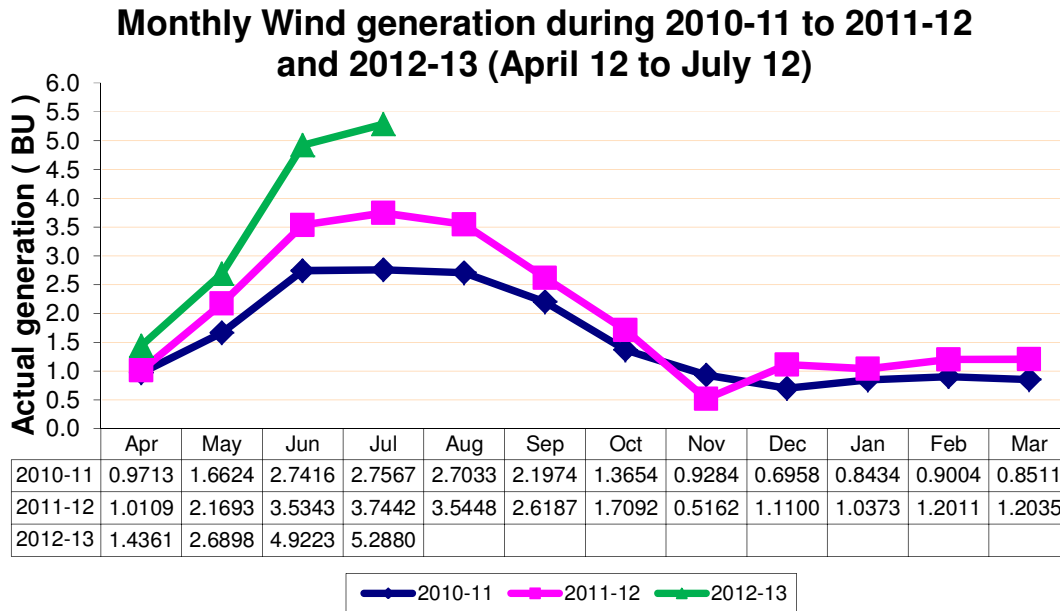
Electricity Generation (provisional) from Renewable Energy Sources connected to grid during the month of July'12 and during the period April'12- July'12 (updated as per information received in CEA up to 31.08.2012)

HIGHLIGHTS

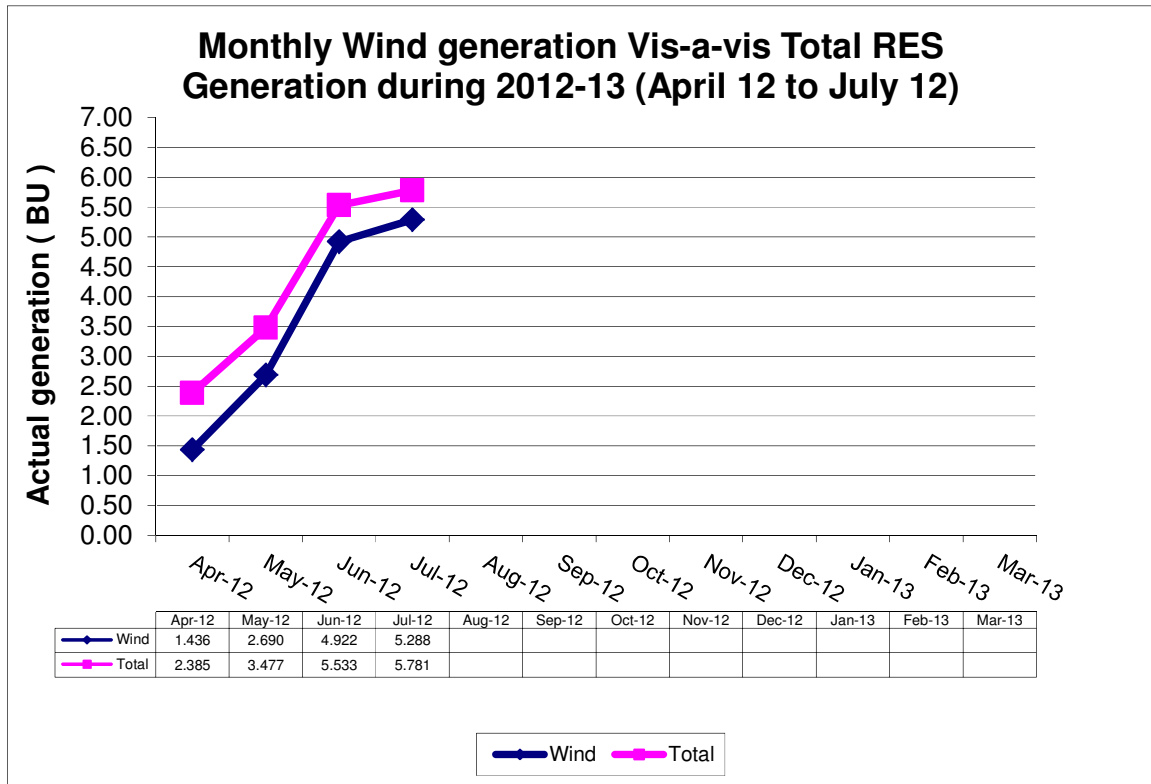
- The electricity generation from Renewable Energy Sources during the month of July'12 has been 5.78 BU.
- The cumulative generation from Renewable Energy Sources during April- July'12 was 17.18 BU.
- The generation from Wind during July'12 was 5.29 BU with a growth rate of 41 % over same period last year. Last year, the corresponding growth rate was 36 %.
- The generation from solar during July'12 was 81.75 MU.

Wind Generation performance in the country during July'12 & during the period April'12- July'12:

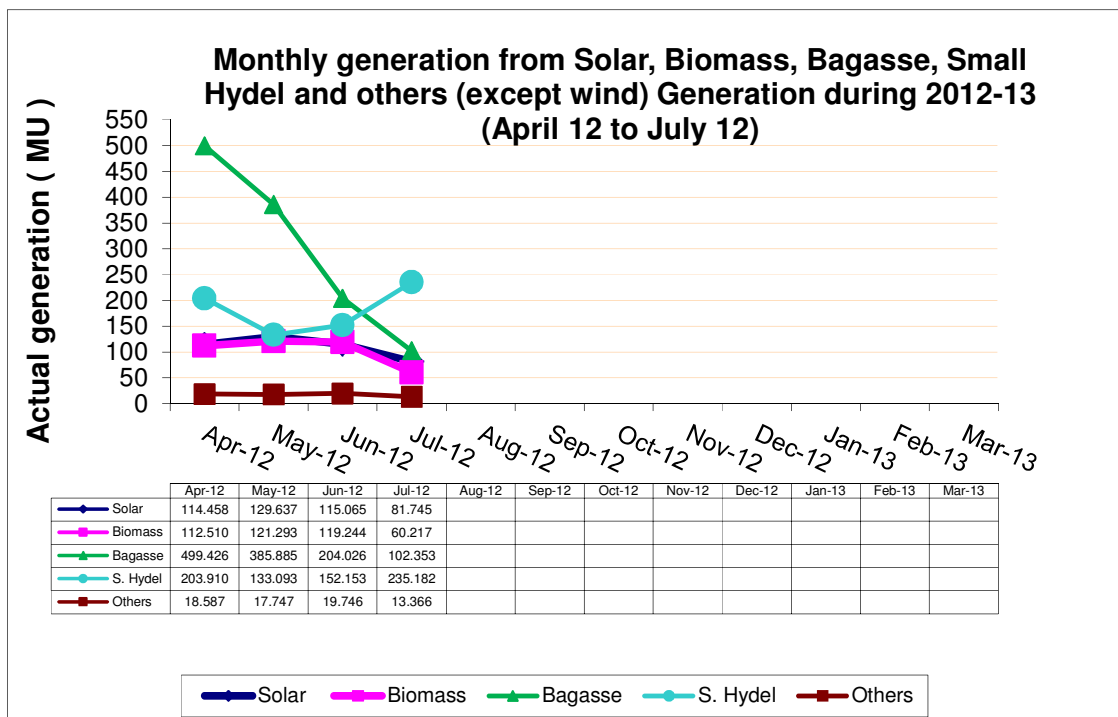
The pattern of monthly wind energy generation in the country during 2010-11, 2011-12 and the current financial year is graphically represented below:-



The peak generation from wind is during June to August. The contribution from wind is maximum among RES. A Graph representing the monthly wind generation vis-à-vis the total RES generation is shown below.



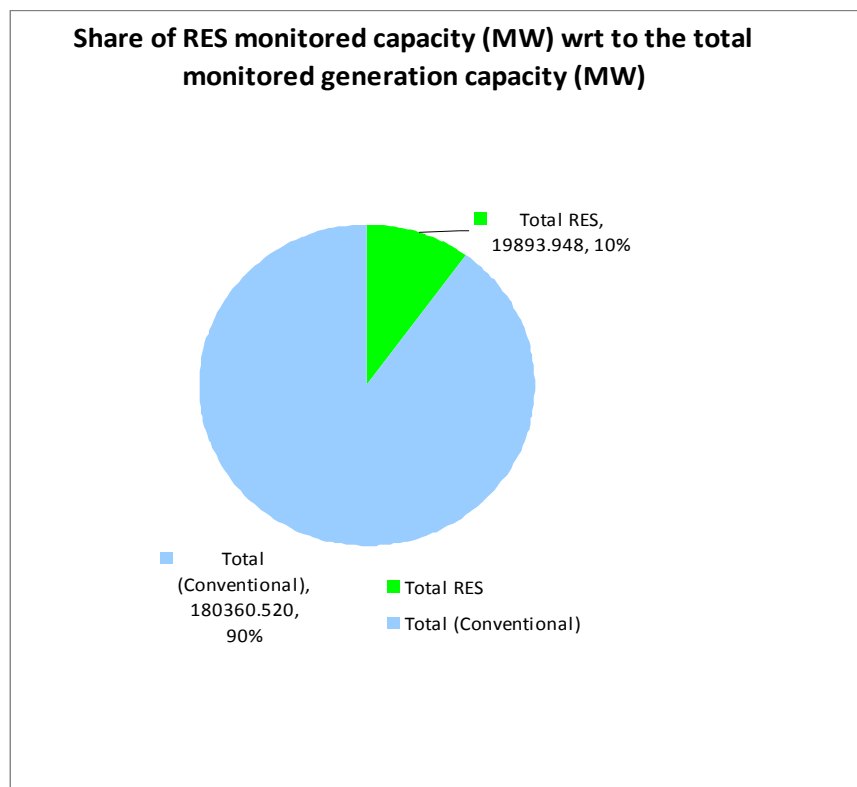
Monthly generation from Solar, Biomass, Bagasse, Small Hydel and others (except wind) Generation during 2012-13 (April 12 to July 12) is shown below. Share of generation from these sources are small. The generation from bagasse is seasonal and would start peaking up from October onwards.



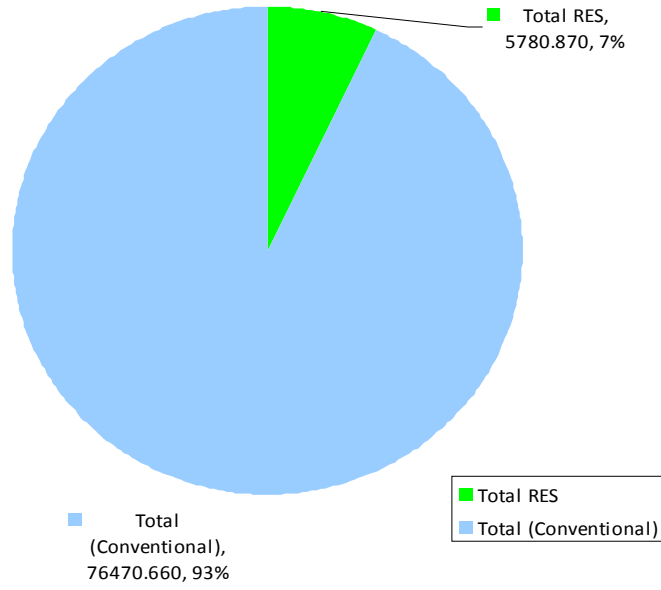
Category-wise Generation performance:

The category-wise details of electricity generation in the country during July '12 and during April 2012 to July 2012 are given below:

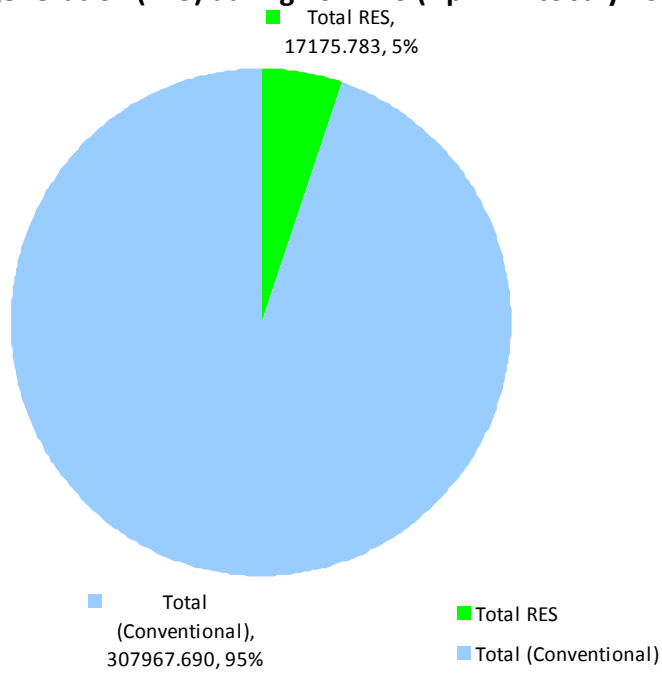
Category	Monitored Capacity (MW)	ACTUAL GENERATION (MU) during July 2012	ACTUAL GENERATION (MU) during April 2012 to July 2012
RES			
Wind	14744.185	5288.007	14336.139
Solar	958.650	81.745	440.904
Biomass	528.250	60.217	413.264
Bagasse	2240.810	102.353	1191.690
Small Hydel	1290.293	235.182	724.339
Others	131.760	13.366	69.446
Total (RES)	19893.948	5780.870	17175.783
Total (Conventional)	180360.52	76470.66	307967.69
Total	200254.468	82251.530	325143.473
% Share of RES in total generation capacity	9.93	7.03	5.28



Share of RES generation (MU) wrt to the total generation (MU) during July 2012



Share of RES generation (MU) wrt to the total generation (MU) during 2012-13 (April 12 to July 2012)



State-wise Generation:

Tamilnadu is leading in generation from wind with an installed capacity of 7084.175 MW as on 31.07.2012 in Wind and energy generation of 2283.18 MU and 5483.27 MU during the month of July 12 and 2012-13 (April12 to July 12). There are some states which are yet to submit the RES information to CEA (the data would be updated accordingly).

The details of State-wise generation during the month of July 12 and during 2012-13(April12 to July 12) are given below.

STATE WISE MONTHLY GENERATION from Renewable Energy Sources during July 2012

(Tentative, as per information received in CEA till 31.08.12)

(All figures in MU)

S.N.	State	Wind	Solar	Biomass	Bagasse	Small Hydel	Others	Total
Northern Region								
1	Delhi		0.183				6.376	6.558
2	Haryana							
3	HP							
4	J & K							
5	Punjab							
6	Rajasthan	603.320	13.887	24.366		0.710		642.283
7	Uttar Pradesh		1.335	1.864	49.175	1.930	6.500	60.804
8	Uttarakhand					11.650		11.650
	Sub Total (Northern Region)	603.320	15.405	26.230	49.175	14.290	12.876	721.295
Western Region								
1	Chhattisgarh							
2	Gujarat	901.484	63.770	4.345		1.820		971.419
3	Madhya Pradesh	62.800	0.190	1.700		16.770	0.490	81.950
4	Maharashtra	712.503						712.503
	Sub Total (Western Region)	1676.787	63.960	6.045	0.000	18.590	0.490	1765.872
Southern Region								
1	Andhra Pradesh	14.519						14.519
2	Karnataka	698.107	1.288	24.800	49.841	110.643		884.679
3	Kerala	12.093			3.337	48.055		63.485
4	Tamil Nadu	2283.182						2283.182
	Sub Total (Southern Region)	3007.901	1.288	24.800	53.178	158.698	0.000	3245.865
Eastern Region								
1	Bihar				0.000	7.540		7.540
2	Orissa		1.092	3.142		31.014		35.248
3	West Bengal							
4	DVC					5.050		5.050
	Sub Total (Eastern Region)	0.000	1.092	3.142	0.000	43.604	0.000	47.838
North Eastern Region								
1	Arunachal Pradesh							
2	Assam							
3	Manipur							
4	Meghalaya							
5	Nagaland							
6	Tripura							
	Sub Total (North Eastern Region)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total	5288.007	81.745	60.217	102.353	235.182	13.366	5780.870

**STATE WISE GENERATION from Renewable Energy Sources during 2012-13
(APRIL 2012 to JULY 2012)**

(Tentative, as per information received in CEA till 31.08.12)

(All figures in MU)

S.N.	State	Wind	Solar	Biomass	Bagasse	Small Hydel	Others	Total
Northern Region								
1	Delhi	0.000	0.920	0.000	0.000	0.000	25.371	26.292
2	Haryana	0.000	0.000	0.000	0.000	25.304	0.000	25.304
3	HP	0.000	0.000	0.000	0.000	0.000	0.000	
4	J & K	0.000	0.000	0.000	0.000	0.000	0.000	
5	Punjab	0.000	0.000	0.000	0.000	0.000	0.000	
6	Rajasthan	1841.652	53.845	110.620	0.000	1.460	0.000	2007.577
7	Uttar Pradesh (Flue Gas)	0.000	4.650	27.229	659.092	8.696	15.255	714.922
8	Uttarakhand	0.000	0.000	0.000	0.000	52.200	0.000	52.200
	Sub Total (Northern Region)	1841.652	59.416	137.849	659.092	87.660	40.626	2826.295
Western Region								
1	Chhattisgarh	0.000	0.000	0.000	0.000	1.720	0.000	1.720
2	Gujarat	2688.401	340.835	24.736	0.000	10.250	0.000	3064.222
3	Madhya Pradesh	218.770	1.000	4.170	0.000	37.640	1.910	263.490
4	Maharashtra	2135.677	0.000	0.000	0.000	72.660	0.000	2208.337
	Sub Total (Western Region)	5042.848	341.835	28.906	0.000	122.270	1.910	5537.769
Southern Region								
1	Andhra Pradesh	85.449	27.330	144.690	59.330	15.340	26.910	359.049
2	Karnataka	1850.175	4.014	78.745	428.246	265.566	0.000	2626.746
3	Kerala	35.684	0.000	0.000	17.371	142.348	0.000	195.403
4	Tamil Nadu	5480.331	2.938	0.000	0.000	0.000	0.000	5483.269
	Sub Total (Southern Region)	7451.639	34.282	223.435	504.947	423.254	26.910	8664.467
Eastern Region								
1	Bihar	0.000	0.000	0.000	27.651	10.549	0.000	38.200
2	Orissa	0.000	5.372	23.074	0.000	62.206	0.000	90.651
4	West Bengal	0.000	0.000	0.000	0.000	0.000	0.000	
3	DVC	0.000	0.000	0.000	0.000	17.344	0.000	17.344
	Sub Total (Eastern Region)		5.372	23.074	27.651	90.099		146.195
North Eastern Region								
1	Arunachal Pradesh	0.000	0.000	0.000	0.000	1.057	0.000	1.057
2	Assam	0.000	0.000	0.000	0.000	0.000	0.000	
3	Manipur	0.000	0.000	0.000	0.000	0.000	0.000	
4	Meghalaya	0.000	0.000	0.000	0.000	0.000	0.000	
5	Nagaland	0.000	0.000	0.000	0.000	0.000	0.000	
6	Tripura	0.000	0.000	0.000	0.000	0.000	0.000	
	Sub Total (North Eastern Region)	0.000	0.000	0.000	0.000	1.057	0.000	1.057
	Total	14336.14	440.904	413.264	1191.690	724.339	69.446	17175.783

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Installed capacity (MW) and Generation (MU) from renewable resources (injected in to the GRID)

1. State : _____

2. Month /Year : _____

Renewable Resources / Organisations	Installed capacity (MW) as on last date of the month		Generation (MU) during the month		Cumulative Generation (MU) during the Year 1 st April onwards	
	State Sector	Private Sector	State Sector	Private Sector	State Sector	Private Sector
1. Wind						
2. Solar - Photovoltaic						
3. Solar - Thermal						
4. Biomass- Combustion						
5. Biomass- Gasification						
6. Bagasse						
7. Small Hydro (1MW to 25 MW)						
6. DG Set (1 MW to 25 MW)						
7. Any other (please Specify the resources)						

- The data to be furnished before 15th of every month.

Installed capacity (MW) from Renewable Energy Sources
(GRID connected)

3. State : _____

4. Month /Year : _____

Name of Developer/ customer	Sector (Central, State, Private)	Type of Renewable energy sources	Total Installed capacity as on last date of the previous month	New capacity added during the current month	capacity derated/ uprated or retired during the current month \$	Total Installed capacity as on last date of the month
			(MW)	(MW)	(MW)	(MW)
		1. Wind				
		2 Solar - Photovoltaic				
		3 Solar - Thermal				
		4. Biomass- Combustion				
		5. Biomass- Gasification				
		6. Bagasse				
		7. Small Hydro (1MW to 25 MW)				
		8. Any other (please Specify the sources)				
		Total				

- The data to be furnished before 15th of every month.

\$ the details of the capacity derated/ uprated or retired during the current month should be furnished

Name of Developer/ customer	Unit derated/ uprated or retired during the current month	Type of Renewable energy sources	Installed Capacity (MW)	Derated / Uprated Capacity (MW)
	Derated / Uprated stations/units			
	1.			
	2.			
	Retired Units			
	1.			
	2.			