



The Energy Solutions Company

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Dear Reader,

We are delighted to share with you that REConnect Energy recently won an award in the Digital India 2017 Summit for “Innovation in Digital Energy”. A half an hour program covering our flagship analytical product GridConnect will be telecast on Times Now and ET Now TV channels on Saturday and Sunday this week. Telecast times are mentioned on page 9 of this newsletter. Please do take out some time and watch. At Team REConnect we are thankful to all our clients and well-wishers to help achieve this milestone.

The month of May and early part of June have been very interesting for the renewable energy sector for two reasons - First, Karnataka became the first state to implement DSM regulations. These regulations are very important if India is to achieve large-scale integration of renewable energy in its grid. Many stakeholders are watching how DSM regulations are implemented in Karnataka, and one can expect that the implementation of these regulations will gather pace in other states also. The main article this month analyses the draft DSM regulation of Madhya Pradesh.

And second, REC trading remained suspended in the month of May. This was the first month since the start of the REC market (in March 2011) that trading has not happened. One hopes that the legal process will be concluded soon and REC markets will be back on track. However, no matter what the outcome of the legal process, it seems that the road to a well functioning REC market is a distant one as there appear to be no real drivers for better enforce RPO regulations.

Most states revise power tariff in the first quarter of the financial year. Several such revisions are covered in the regulatory section of this newsletter. Many states have also declared generic wind and solar tariffs. However we believe that this is an increasingly redundant exercise as most states are now likely to buy power from new projects only under the reverse bidding route. It is also instructive to see the difference between the latest solar bid tariff (ranging from Rs 2.44 to Rs 2.9/kwh) and the regulatory tariffs (Rs 4.5 - 4.75/kwh).

We hope that you find this newsletter an informative read and, as always, we look forward to feedback and comments.

- Team REConnect





Analysis of Draft DSM Regulations of Madhya Pradesh

Madhya Pradesh has released draft DSM regulations for solar and wind generating stations in the state

Madhya Pradesh has recently published draft DSM regulations. These regulations cover DSM charges and rules for all types of generating stations including wind and solar generating stations.

Regulations regarding DSM charges for wind and Solar generating stations are becoming increasingly important. In June Karnataka became the first state to implement these regulations, and commercial settlement for wind and Solar plants in Karnataka is expected soon.

In recent months several other states have also come up with draft DSM regulations. Gujarat and Andhra Pradesh are key States which are expected to formalized there DSM regulations soon.

The recent draft proposed by MP is analysed in detail below. It is important to note that MP had come out with draft regulations in early 2016 and a hearing had already been conducted in February 2016. However further progress on the regulation was not made. In fact it is imperative that these regulations are adopted quickly as renewable capacity in MP in recent years has increased significantly driven by large solar projects like the REWA project (under execution) and wind capacity. In FY 15-16, RE capacity in the state doubled from approx 1,500 MW to 3,000+ MW. which increased on the back of attractive tariffs.

Analysis of draft DSM regulations of MP

The regulations proposed by MP are broadly in line with the model FOR regulations and those proposed by other states.

Some significant differences are:

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broadly in line with the model FOR regulations and those proposed by other states. Some significant differences are

1. By proposing an integrated DSM regulation MP seems to be doing away with merit order dispatch and “Must Run” status for renewable energy projects.
2. The model FOR regulations and most States have allowed aggregation of capacities for forecasting and scheduling. Karnataka, where these regulations have already been implemented, is the prime example. Draft regulations of Gujarat also proposed to allow aggregation. However MP regulations do not do not cover aggregation.
3. MP regulation propose different acceptable error ranges for older projects and newly commissioned projects. CERC regulations or Model FOR regulations do not make such a differentiation. However, several states like Gujarat and Tamilnadu have adopted a similar approach.

Detailed analysis:

Must run status for Renewable Energy Projects -

Traditionally, renewable energy projects have enjoyed the status of “Must Run” projects. However with increasing proportion of renewable energy in the grid this situation has not always been tenable. For example many industry associations have reported of increasing instances of the grid curtailment for



Wind projects particularly in Tamil Nadu and Rajasthan. In some States generators and industry associations have also filed petition against curtailment.

With these draft regulations MP seems to be the first state to acknowledge the new reality that renewable energy projects may no longer enjoy “Must Run” status. The draft regulation says the following:

“all state entities shall have equal and non discriminatory treatment as regards the deviation settlement mechanism as specified in these regulation”

And

“SlDC shall take all decisions with regard to the dispatching of stations after evaluating all possible network parameters, constraints, congestions in the transmission network and in the eventuality of any such network aberration, instruction by the slDC with regard to dispatch and drawal shall be binding on all state entities”

Aggregation -

MP regulations currently do not include the scope for an “Aggregator”. The role of an aggregator has been described in the Model FoR regulations, and has been adopted in Karnataka. It is also proposed to be adopted by other states like Gujarat.

Aggregation is a win-win approach as it enables better grid management by providing a larger area schedule and improved accuracy, while also lowering overall DSM charges for generators.

The Model FoR regulations states: Clause 3.1

“the Commission proposes to formalize a new aggregator entity, termed as Qualified Coordinating Agency or the QCA. This aggregator or the QCA shall coordinate all forecasting, scheduling and commercial settlement processes for all wind or solar generators connected to a pooling station. The QCA might aggregate one or more pooling stations.

and several QCAs may come together to aggregate even at the State level for leveraging maximum benefit of aggregation. The QCAs shall interact with the SLDC (or RLDC, if required) on behalf of the generators. This significantly cuts down the complexity both for small generators as well as the SLDC, which now has to interact with a few number of agencies instead of thousands of generators.” (emphasis added)

and further, the Explanatory Memorandum to the above regulation states as follows:

“benefits of aggregation on forecasting accuracy are well documented.”

While the draft regulations have defined QCA, it will be important to define the term “Aggregator” as well to enable its function for *leveraging maximum benefit of aggregation.*

In keeping with the above, Karnataka, in its final regulations, have defined aggregator as-

Clause 2(d)

“Aggregator “means an entity registered with SLDC/ RLDC to provide aggregation of one or more services like Providing schedules with periodic revisions as per this Regulations, being responsible for metering, data collection and transmission, communication, coordination with DISCOMS, SLDC, RLDC, RPC and other agencies, undertaking commercial settlement of all the charges on behalf of wind and solar generators including payments to the regional / state UI pool accounts through the concerned RLDC/ SLDC and undertaking commercial settlement of any other charges on behalf of wind and solar generators as may be mandated from time. Aggregator may be one of the generators or any other mutually agreed agency registered with SLDC”

It is noteworthy that the above definition in the Karnataka final regulation is in addition to the definition of QCA.

Permitted deviation bands -

In case of Intra-State transmission, Penalty

Mechanism for **wind** generating station or station **commissioned prior to 26.5.2017.**

$$\text{Error (\%)} = 100 \times \frac{(\text{Scheduled Generation} - \text{Actual Generation})}{\text{Available Capacity}^*}$$

In case of Intra-State transmission, Penalty Mechanism for **wind** generating station or pooling station **commissioned after after the regulations are notified.**



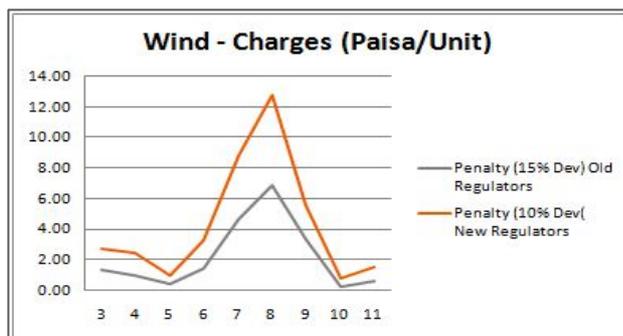
In case of Intra-State transmission, Penalty Mechanism for **wind** generating station or pooling station **commissioned after to 26.05.2017.**



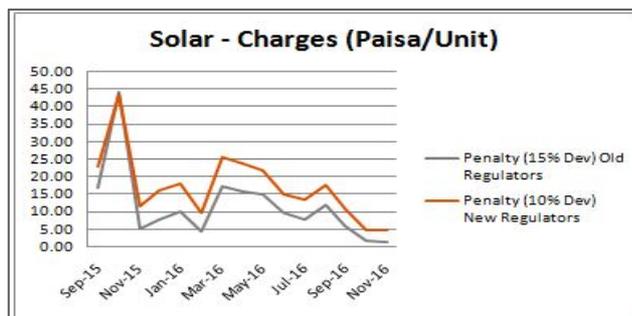
It is to be noted that the new projects commissioning after **the regulations are notified.**, have to comply by stricter deviation norms, and may have to consider the costs and liabilities of this mechanism in their project financial planning.

Regulations	Permissible Deviation	Aggregation Allowed
FoR-Model Regulation	+/- 15% Old +/- 10% New	Y
Odisha (Draft)	+/- 15% for all	N
MP (Draft)	+/- 15% Old +/- 10% New	N
Karnataka (Final)	+/- 15% for all	Y
TN (Draft)	+/- 5% - Solar +/- 10% - Wind	N
Rajasthan (Draft)	+/- 15% for all	N
Jharkhand (Draft)	+/- 15% Old +/- 10% New	N
Chattisgarh (Draft)	+/- 10% for all	N
Andhra Pradesh (Draft)	+/- 15% Old +/- 20% New	N
Gujarat (Draft)	Wind: +/- 12% Old; +/- 8% New; Solar: +/- 7%	Y

Following will be the difference in revenue (in paisa per unit) as per the old and new deviation for a wind generator. The largest difference between the charges payable by old and new regulators is 5.86 paisa per unit and the average difference is 2.10.



Following will be the difference in revenue paisa per unit as per the old and new deviation for a solar generator. The largest difference between the charges payable by old and new regulators is 8.26 paisa per unit and the average difference is 5.48 paisa per unit.





Regulatory Updates

Tariff changes, RPO notifications, Regulatory and orders

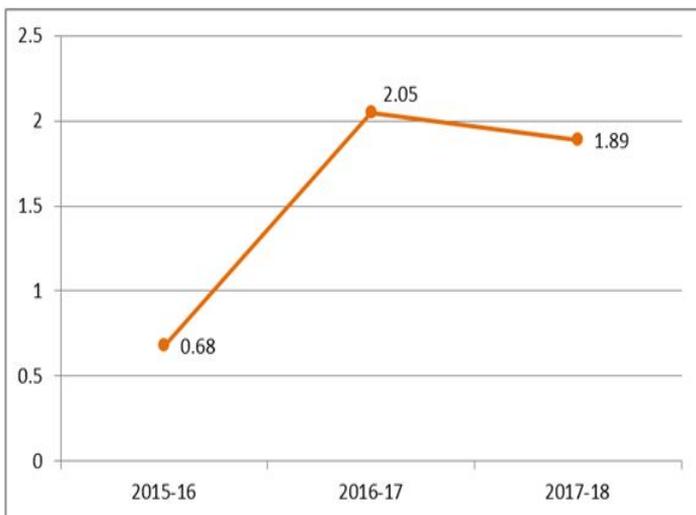
HPERC DETERMINES TARIFF FOR FY 2017-18:

The HPERC has released the retail tariff for FY 2017-18 in its order. The tariff has basically remained unchanged to a large extent.

The tariff is given as follows:

		Demand Charge (Rs/kVA/month)	Energy Charge (Rs/kVAh)
HT 1 (Upto 1 MvA)		250	4.5
HT II (More than 1 MvA)		400	4.2
Commercial Supply	More than 20-100 KVA	110	4.8
	Above 100 KVA	170	4.7

The change in the cross subsidy surcharge can be seen as follows:



Wheeling charges: **Rs 1.83/unit**
Additional Surcharge: **Rs 0.49/unit**

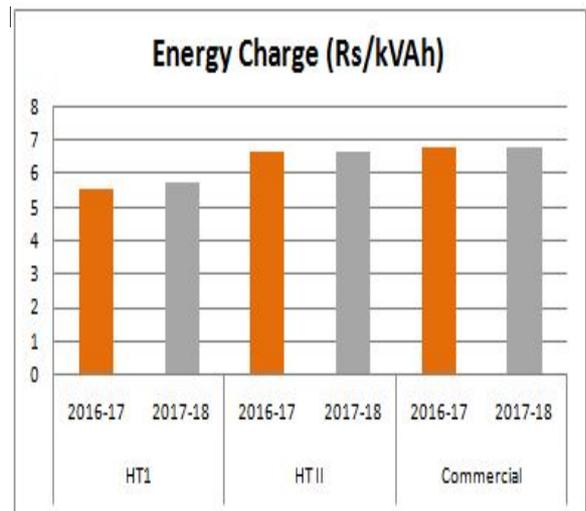
The order can be accessed [here](#).

KSERC RELEASES ORDER FOR TARIFF DETERMINATION FOR FY 2017-18:

KSERC has recently released its retail tariff order for FY 2017-18. There has been an increase in the tariff proposed for domestic consumers. The average increase has been 5.17%. However, tariff for industrial consumers has largely remained the same.

Category	Demand Charge (Rs/kVa/month)	Energy Charge (Rs/kWh)	
		Of and above 30,000 units	Above 30,000 units
HT Industry	300	5.5	
HT Commercial	400	6.3	7.3

The increase in the energy charge can



Although the industrial tariff remained constant, the commercial tariff increased.

Transmission Charge: **Rs 0.37/unit**
Wheeling Charges: **Rs 0.31/unit**



Cross Subsidy Surcharge: **Rs 1.28/unit**

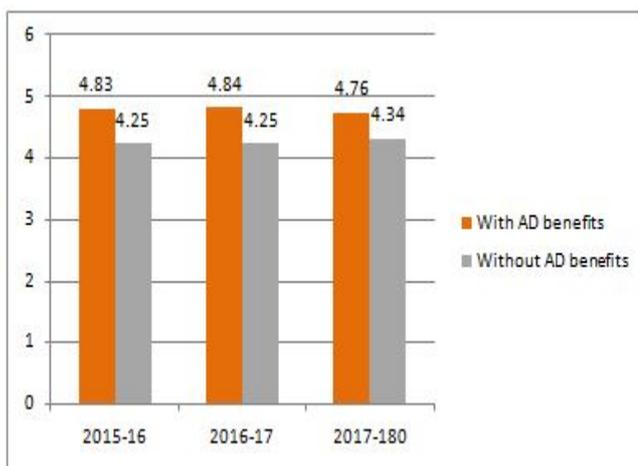
The order can be accessed [here](#).

APERC determines wind tariff for the FY 2017-18:

The Andhra Pradesh Electricity Regulatory Commission has recently proposed the tariff for wind energy sources which will be applicable for the projects commissioned during FY 2017-18. The tariff will be applicable for 25 years. The details of the tariff proposed are as follows:

Tariff without AD benefits (Rs/kWh)	Tariff with AD benefits (Rs/kWh)
4.76	4.35

A comparison in tariff as compared to previous years is given as follows:



The order can be accessed [here](#).

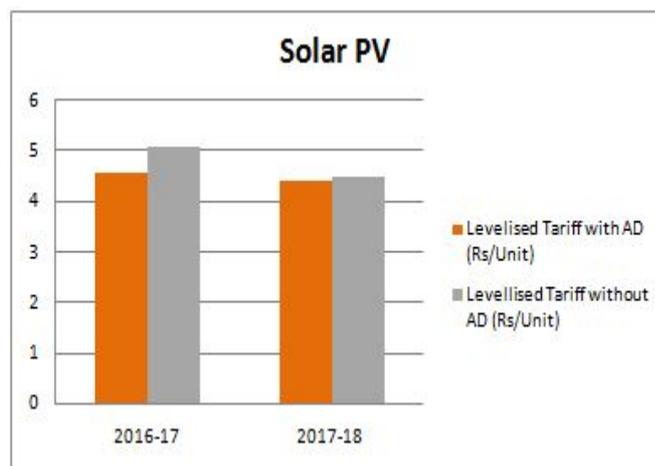
TNERC determines tariff for solar projects for the FY 2017-18:

Tamil Nadu Electricity Regulatory Commission, in its latest order dated 28th March, 2017, has released the tariff values for solar projects in the state.

The tariff values are given as follows:

Solar Projects	Levelised Tariff with AD	Levelised tariff without AD
Solar PV	4.41	4.5
Solar Thermal	9.98	10.19

It is important to note that most solar projects are awarded through reverse bidding Tariffs have recently been hitting record lows- most recent bid was at Rs 2.44. This is 46% below the TN tariff.



The order can be accessed [here](#).

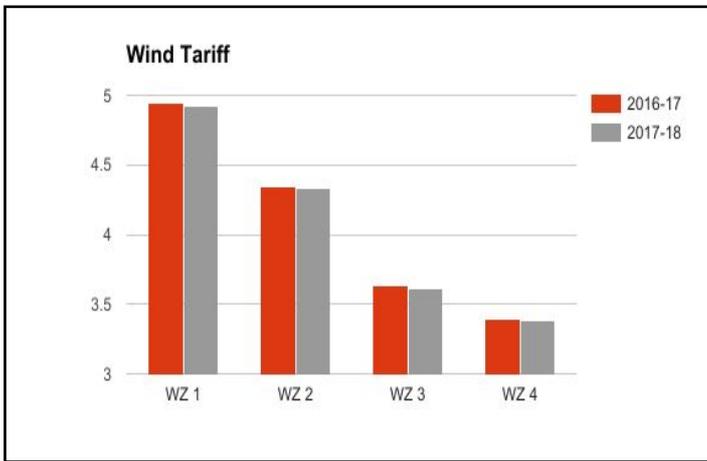
MERC determines generic levelised tariff for FY 2017-18

The Maharashtra Electricity Regulatory Commission (MERC) has released an order for the generic tariff for renewable energy for FY 2017-18. It mentions the generic tariff for solar (Solar PV, Rooftop PV, Solar Thermal), wind, biomass and small hydro projects.

The capital cost for wind energy projects has been determined on the basis of revised capital cost given by CERC. The value for capital cost is **Rs 594.41 lakh/MW**.

Wind Energy	Tariff Period	Levelised tariff from FY 2017-18 (Rs/ kWh)	Net Levelised tariff after availing AD benefits (Rs/ kWh)
Wind Zone - 1	13	5.40	4.92
Wind Zone - 2	13	4.75	4.33
Wind Zone - 3	13	3.96	3.61
Wind Zone - 4	13	3.71	3.38

A comparison of the capital cost and levelized wind tariff last year and this year has been given as follows:



into before 1st April, 2017 but are not commissioned within the specific commercial operation date (COD) and achieve COD from during the period from 1st April 2017 to 31st March 2018. **The tariff approved by the commission is Rs 4.36 per unit.**

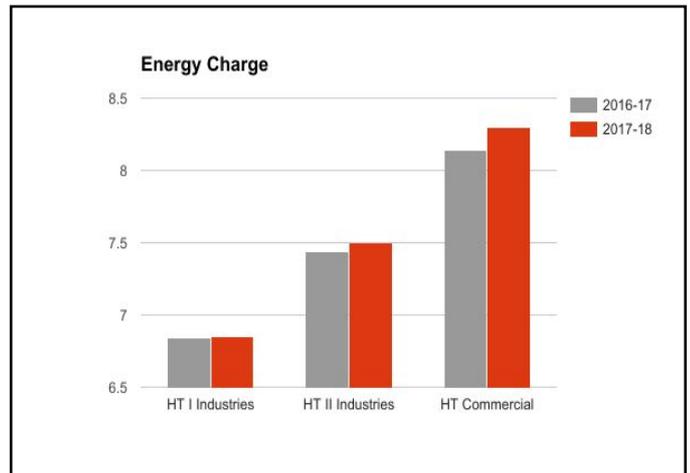
The order can be accessed [here](#).

AERC determines retail tariff for FY 2017-18:

The Assam Electricity Regulatory Commission (AERC) has released a tariff order dated 1st April 2017 stating its retail tariff rates. The tariff for different categories is given as follows:

Categories	Demand Charge	Energy Charge
	Rs/ kWh	Rs/ kWh
HT I Industries	120	6.85
HT II Industries	160	7.50
HT Commercial	135	8.30

A comparison in the FY 2016-17 and that in FY 2017-18 can be seen as follows:



The open access charges are as follows:

Cross Subsidy Surcharge: The CSS for FY 2017-18 is Rs 1.31/kWh

Wheeling Charge : The wheeling charge applicable for FY 2017-18 is Rs 0.23/kWh

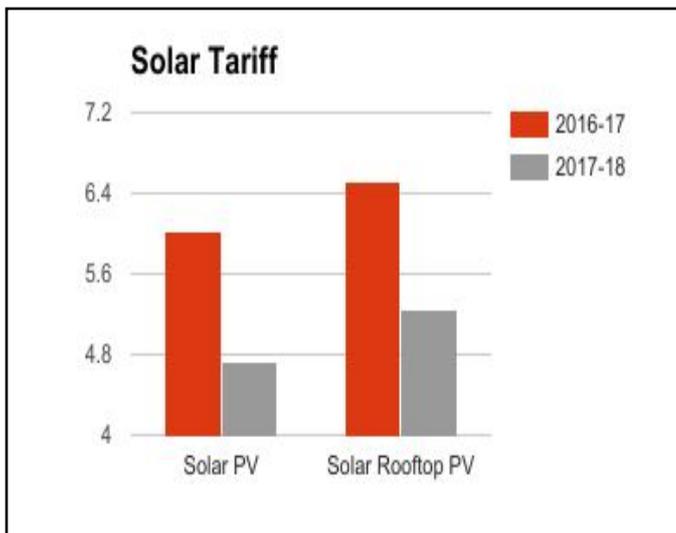
Wheeling Loss: The wheeling loss at 11 kV is 11% and that at 33 kV is 5%

Transmission Loss: The transmission loss for Assam has been determined as 3.49%

The order can be accessed [here](#),

Particulars	Tariff Period	Levilled tariff from FY 2017-18	Net Levilled tariff after availing AD benefits
		Rs/ kWh	Rs/ kWh
Solar PV Projects	13	5.13	4.74
Solar Rooftop PV	13	5.63	5.24
Solar Thermal Power Projects	25	11.28	10.26

A comparison of the solar tariff since the FY 2016-17 to FY 2017-18 is given as follows:



The order can be accessed [here](#).

KERC determines solar tariff for FY 2017-18:

Karnataka Electricity Regulatory Commission (KERC) in an order dated 12th April, 2017 has determined tariff for all new grid connected solar PV plants which will enter into Power Purchase Agreement (PPA) on or after 1st April 2017 but not after 1st April 2018. This tariff shall also be applicable to those grid connected MW scale solar PV plants for which PPAs were entered



Trade Statistics

REC trade results for the month

The Supreme Court has put a stay on trading of RECs until the Appellate Tribunal of Electricity (APTEL) give a judgement on the petition filed by REC project developers regarding issues with vintage multiplier. For this reason, trading did not take place in the month of May. For more details on the stay by SC, please refer to our blog [here](#).

IEX has released a notice on the approved rules and by-laws of trading of ESCerts (Energy Saving Certificates). The trading is going to start some time in July and will be done on every Tuesday of every week from 1PM to 3PM. The price quotation will be in INR/ESCerts. Price tick which has been determined is 1 INR and minimum volume order volume limit is one ESCert.

The notice can be accessed [here](#).

We are delighted to share with you that we have been awarded in the Digital India Summit 2017 in the energy and utilities space by Times Now. A short program covering our flagship analytics product GridConnect will be aired on Times Now and ET Now on Saturday and Sunday this week. Telecast times are as below:

Program - Digital India Heroes, on the Times Network:

3:30pm Saturday, June 17th on Times Now

4:00pm Saturday, June 17th on ET Now

3:30pm Sunday, June 18th on Times Now

4:00pm Sunday, June 18th on ET Now



Please take out some time and do watch.

As always we are thankful for your support and encouragement in our journey at REConnect Energy - this award would not have been possible without the support and encouragement of our clients and well-wishers. We look forward to continue to work together with you in the future.

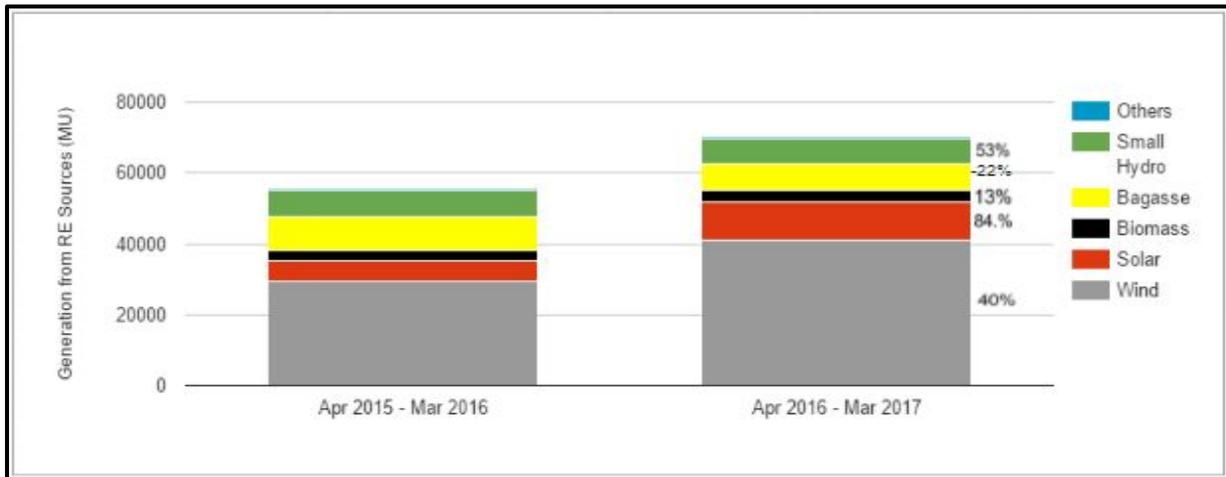
**Thanks
- Team REConnect**





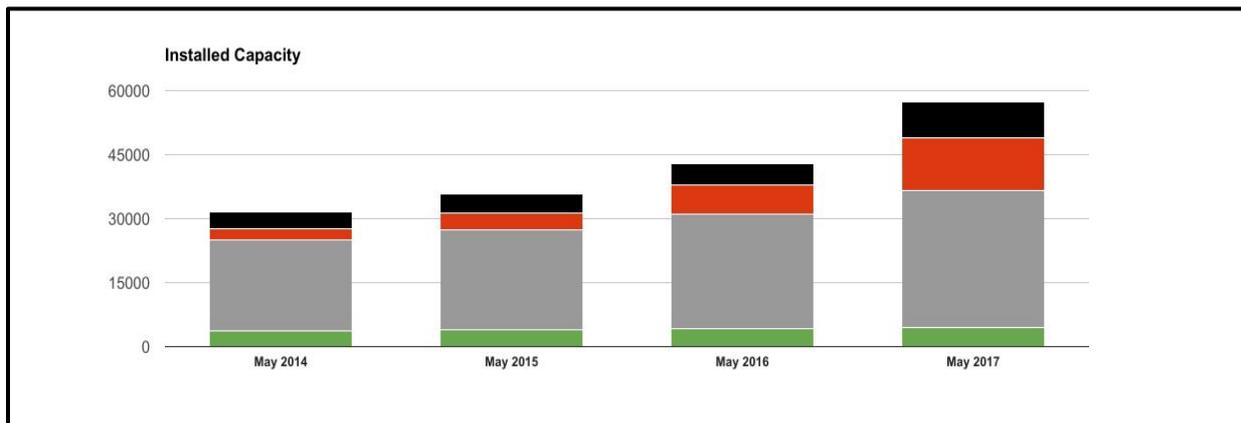
RE Generation

RE power capacity and generation statistics for the month



Source: CEA and REConnect Analysis

There has been a 40% increase in the electricity generation from wind projects in the FY 2016-17 as compared to FY 2015-16. The increase in generation from solar projects is 84%. This is in keeping with increased focus and installation of solar projects. There has been a decrease in the generation from Bagasse and Small hydro.



Source: CEA and REConnect Analysis

The above graph shows cumulative installed capacity of RE. As compared to May 2016, there has been a 20% increase in the installed capacity of wind till May 2017. Similarly for solar, there has been an 81% increase in the installed capacity. But the real surprise has been the growth in Bio-power capacity (this category includes biomass and bagasse based power projects) - this category grew by a significant 68%.





About REConnect

REConnect Energy is India's leading service provider to the renewable energy sector. We provide advanced data analytics for grid management, REC and ESCerts trading services. We also work with power consumers to manage Renewable Purchase Obligation (RPO) liabilities, and develop and execute their energy sourcing strategy. We are India's largest provider of forecasting and scheduling services, serving government and power generators. We are a knowledge focused company that prides itself in providing premium services to our clients backed by proprietary technology, an in-house data science capability and in-depth research & analysis.

REConnect is run by an experienced and professional team. The team consists of members with relevant experience of working at IEX, L&T, JP Morgan, Arthur Andersen and Gensol. Key members of the team are alumnus of IIT Bombay and Columbia University (an Ivy League university).



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For more details of services provided and profile of the management team, please visit our [website](#).

