RISING STAKES :

An analysis of regulatory treatment of renewable electricity in Gujarat from 2010-2021

Prayas (Energy Group)

GERMI
GUJARAT ENERGY RESEARCH AND MANAGEMENT INSTITUTE

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Jay Joshi | Akhilesh Magal
Ashwin Gambhir | Bhavin Bhatt

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About GERMI

Gujarat Energy Research & Management Institute (GERMI) is a centre of excellence in renewable and conventional energy sources. The organization was set up to further research, serve as a think-tank on various policy and regulatory matters and provide training to develop human resources in the energy sector. The organization has played a critical role in the development of solar energy policies and pilots in the state of Gujarat.

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1st Floor, Energy Building,
Pandit Deendayal Energy University Campus,
Raysan Village, Gandhinagar - 382 007.
E-mail: information@germi.org; Fax : +91 079 23275380; https://www.germi.org/

About Prayas

Prayas (Initiatives in Health, Energy, Learning and Parenthood) is a non-Governmental, non-profit organization based in Pune, India. Members of Prayas are professionals working to protect and promote the public interest in general, and interests of the disadvantaged sections of the society, in particular. Prayas (Energy Group) works on theoretical, conceptual regulatory and policy issues in the energy and electricity sectors. Our activities cover research and intervention in policy and regulatory areas as well as training, awareness, and support to civil society groups. Prayas (Energy Group) has contributed in the energy sector policy development as part of several official committees constituted by Ministries and Planning Commission. Prayas is registered as SIRO (Scientific and Industrial Research Organization) with the Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India.

Prayas (Energy Group)

Unit III A & III B,
Devgiri, Kothrud Industrial Area,
Joshi Railway Museum Lane, Kothrud Pune 411 038. Maharashtra Phone: 020 - 2542 0720
E-mail: energy@prayaspune.org; http://www.prayaspune.org/peg

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Abbreviations

APTEL	Appellate Tribunal for Electricity
CEA	Central Electricity Authority
DISCOM	Distribution Company
EPC	Engineering, procurement, and construction
ERC	Electricity Regulatory Commission
F&S	Forecasting and Scheduling
FY	Fiscal Year
GERC	Gujarat Electricity Regulatory Commission
GERMI	Gujarat Energy Research and Management Institute
GJ	Gujarat
GoI	Government of India
GRIIC	GERMI Research, Innovation and Incubation Centre
GUVNL	Gujarat Urja Vikas Nigam Limited
GW	Giga Watt
IPP	Independent Power Producer
MH	Maharashtra
MHRD	Ministry of Human Resource Development
Misc	Miscellaneous
MNRE	Ministry of New and Renewable Energy
MSME	Micro, Small & Medium Enterprises
MU	Million Units
MUPL	MPSEZ Utilities Private Limited
MW	Mega Watt
NIRF	National Institutional Ranking Framework
NM	Net Metering
OA	Open Access
PDEU	Pandit Deendayal Energy University
PGVCL	Paschim Gujarat Vij Company Limited
PPA	Power Purchase Agreement
PRAAPTI	Payment Ratification And Analysis in Power procurement for bringing Transparency in Invoicing of generators

R&D	Research and Development
RE	Renewable Energy
REC	Renewable Energy Certificate
RPO	Renewable Purchase Obligation
SCOD	Scheduled Commercial Operation Date
SERC	State Electricity Regulatory Commission
SIRO	Scientific and Industrial Research Organization
SLDC	State Load Dispatch Centre
SNA	State Nodal Agency

Executive Summary

This report is the second in a series of reports by Prayas (Energy Group) (Gambhir & Das, 2020) on the analysis of regulatory proceedings particularly on Renewable Energy (RE) in various Indian states. This report focuses on Gujarat, covering the time period between April 2010 to March 2021 and encompasses 339 proceedings before the Gujarat Electricity Regulatory Commission (GERC) as well as Gujarat specific RE judgements by Appellate Tribunal for Electricity (APTEL).

This detailed analysis is necessary considering the rapid growth of renewables across the country. There is an urgent need to look at the historical progress that states (and eventually India) are making in the field of renewable energy. Analysing regulatory proceedings shed much-needed light on key issues in the sector. Hindsight always provides crucial insights into the various developments in the state and also helps assess macro trends. This in turn helps regulators and policy makers make necessary changes for the years to come - given that India has a strong emphasis on renewable energy for the future.

India has set a target to install 175 GW of RE power plants by 2022 and has managed to install over 94 GW capacity by March 2021 (Ministry of New and Renewable Energy, 2021). While the 175 GW target date is likely to be missed, the GoI (Government of India) has further enhanced the national renewable energy target to 450 GW by 2030. Gujarat has installed over 13 GW of RE power plants by March 2021.

RPO Compliance: A Sticky Matter

The State's RPO targets are divided into three different categories i.e. solar, wind and others (biogas, biomass, small hydro). Very few states in the country have separate wind and solar targets. GERC has so far set the RPO targets till FY 22, in line with national renewable energy goals. While the wind and solar RPO targets are being raised every year to increase the share of RE, the 'others' category has been kept constant at 0.5% since FY 12[1].

With regards to RPO compliance, data from FY 11 to FY 18 shows us that the distribution companies (DISCOMs) have been unable to fulfil the total RPO targets. DISCOMs have in general been able to meet solar targets in the recent years but have fallen short in meeting wind and other RPO targets.

Since FY13, GERC has been revising the yearly wind and 'others' category RPO targets downward to allow DISCOMs to 'meet' the RPO targets. This revision defeats the original purpose of the targets in the first place. The only exception is with solar RPO, which the DISCOMs are meeting. On various occasions, GERC has allowed the adjustment of excess solar energy purchased against shortfall in fulfilment of Non-Solar RPO and vice versa. Again, this defeats the purpose of having separate RPO categories. Even in the case of a shortfall, DISCOMs are often opting not to purchase Renewable Energy Certificates (RECs).

The recent trend in the overall RPO compliance is showing a decrease in the gap between the original RPO target and the revised target. Of late, however, some of the DISCOMs have

1. GERC RPO Regulations 2010 and Amendments

been able to exceed their total RPO targets, indicating that there may be some increasing traction in compliance.

However, in no instance was the DISCOMs penalized, nor forced to purchase RECs to make up the deficit, highlighting the lack of robustness in the RPO compliance framework in the state.

No Payment Delays: A Hat-tip to DISCOMs

In all the 339 proceedings regarding Gujarat, there was not a single proceeding initiated by any party against Gujarat DISCOMs for any payment delay. This is highly unusual when seen from the perspective of other states across India. For instance, the state of Maharashtra has an average of 119 petitions on payment delays between FY 11 to FY 20. The financial stability of the DISCOMs remains one of the most important issues for the viability and indeed the growth of the renewable energy sector in India. Gujarat's DISCOMs have so far been able to honour most power purchase agreements and make timely payments to generating companies.

Open Access: A closed matter?

In eleven years, there were 44 petitions related to open access issues. Most of these were filed by captive power users, with the DISCOMs as the primary respondents. Surprisingly, the main topic in this theme was related to principle and/or procedural issues such as clarity in set off mechanisms and difference between commissioning date and date of signing the Power Purchase Agreement (PPA). There was not a single petition against the DISCOM in granting open access permissions pertaining to renewable energy. This is extraordinary, given that open access has been a thorny issue in most states in the country. In fact, the state of Maharashtra has a lot of proceedings related to procedural and operational issues of open access, which was also covered in the previous report on Maharashtra.

Regulatory Development: The lack of a consistent methodology

In most cases, GERC's regulations for renewable energy have mirrored policy provisions promulgated by the State energy department. While this in itself is not an issue, there are specific provisions that lack an objective basis. For instance, GERC in its net metering regulation in 2016 had set a 50% cap on the maximum permissible installed capacity vis-a-vis the connected load of a consumer. While this number tallies with the Solar Power Policy of 2015, there appears to be no rational basis for doing so. Further, this number was revised to 100% in the first amendment of net metering regulations[2]. Another example is determining the buyback tariff for net-metering. While there is a concurrence in the rate prescribed by the policy and the regulation, there appears to be no transparent and objective methodology in determining such rates. This uncertainty may hamper the consistent growth of the rooftop solar sector and result in a boom-and-bust cycle.

2. Notification No. 2 of 2017: GERC (Net Metering Rooftop Solar PV Grid Interactive Systems) (First Amendment) Regulations, 2017

1. Introduction

Renewable energy is playing an increasingly important role in India's energy mix. The country added 9.3 GW (Central Electricity Authority, 2020) of renewable capacity in FY 20, more than that of the thermal capacity in the same year (4.3 GW). This is not a peculiarity limited to only one year, but a part of a larger trend over the last few years. The growth in renewables in India can be attributed to the policy support for wind since the early nineties but also the landmark National Solar Mission announced in 2009. Since then several states have gone on to announce their own dedicated RE policy. Renewable energy is moving ahead to become a mainstay of India's power generation mix with the GoI setting the bar high, at 450 GW of RE by 2030.

The state of Gujarat is a renewable rich state, with ample resources for both wind and solar energy, with 36 GW (Ministry of New and Renewable Energy, 2019) being the claimed solar energy potential. The state has also been among the early adopters for both solar and wind and is currently ranked at 3rd in overall installed capacity for renewables in India. The state currently has a total power installed capacity of 30 GW, with over 13 GW coming from solar, wind and biomass (Ministry of New and Renewable Energy, 2021).

Given such a strong policy push to renewables, it becomes imperative to track the progress both from a policy and regulatory perspective. The analyses provided in this report can be a valuable tool to policy makers to make corrections and adjustments to RE policy. This study is the second in a series of reports on regulatory analysis of different states in India, the first being for Maharashtra (Gambhir & Das, 2020). This is a review of renewable energy orders and judgements by Gujarat Electricity Regulatory Commission (GERC) and Gujarat specific APTEL renewable energy orders and judgements between 1st April 2010 and 31st March 2021[3].

Of the 286 RE proceedings at GERC during the study period, there were 270 orders and 16 judgements. These included 47 Suo Motu orders, 214 orders and 25 review petitions. At APTEL, a total 53 Gujarat related RE proceedings were analysed, which included 46 appeals and 7 review petitions. Thus, there were 339 combined proceedings included in this study. Breakdown of this data has been shown in the statistical overview.

This report provides valuable insight into questions such as:

- What are the major RE related issues raised at GERC over the last eleven years?
- Do we see a growth in matters related to renewable energy?
- Are there certain technologies that face greater challenges?
- Are there repeated matters that are persistent over the years?
- How effective is the regulatory process in terms of time taken to resolve these issues?
- Who were the major respondents? Who were the major petitioners?
- Are there larger trends indicative of the need for a course correction?

Understanding these regulatory proceedings and answering these questions should be able to shed some light on these common patterns and possible interventions in the future. We hope that this report serves the purpose.

3. Note: Daily orders were not included for analysis and only reportable orders and judgments were tracked.

2. Methodology and process

Apart from very small adjustments, the methodology used in making this report follows an almost identical path as adopted by Prayas (Energy Group) in their Maharashtra report.

The methodology consisted of the following steps:

1. Collection of all renewable energy related regulatory proceedings
    a. For orders and judgements by GERC- proceedings w.r.t the following energy sources: Renewable, Solar, Wind, Small hydro, Biomass, Municipal Solid Waste, bagasse and any non-conventional energy source
    b. For judgements by APTEL- Gujarat specific RE proceedings
2. Categorizing each of the proceedings with appropriate 'tags' (see Table 1 for a detailed description)
3. Analysis of major trends over the stated period.

All the proceedings were available in the public domain on the websites of GERC and APTEL. For some specific details such as the number of total petitions disposed over the year, the annual reports of GERC were referenced. The annual reports of GERC also served as a valuable cross-check to ensure that the total tally of the proceedings analysed were correct. Detailed description of all 18 tags, topics and subtopics is given in the appendix.

This database has been used in the analysis described in this report. The report broadly comprises two parts. First, it looks at some statistical aspects that were captured from the orders and judgements. Second, it also scrutinises in detail a few crucial issues related to sector development that came to light from statistical analysis.

Though the authors have taken several measures to ensure accuracy and completeness of the data captured in the database, it is created mainly for research purposes and hence should be used appropriately. We hope to improve this database over time by periodically updating it when data becomes available in the public domain. We welcome contributions from all stakeholders to address any errors/data gaps as well as pointers to any new data which can be integrated in the database. We wholeheartedly welcome all comments and suggestions.

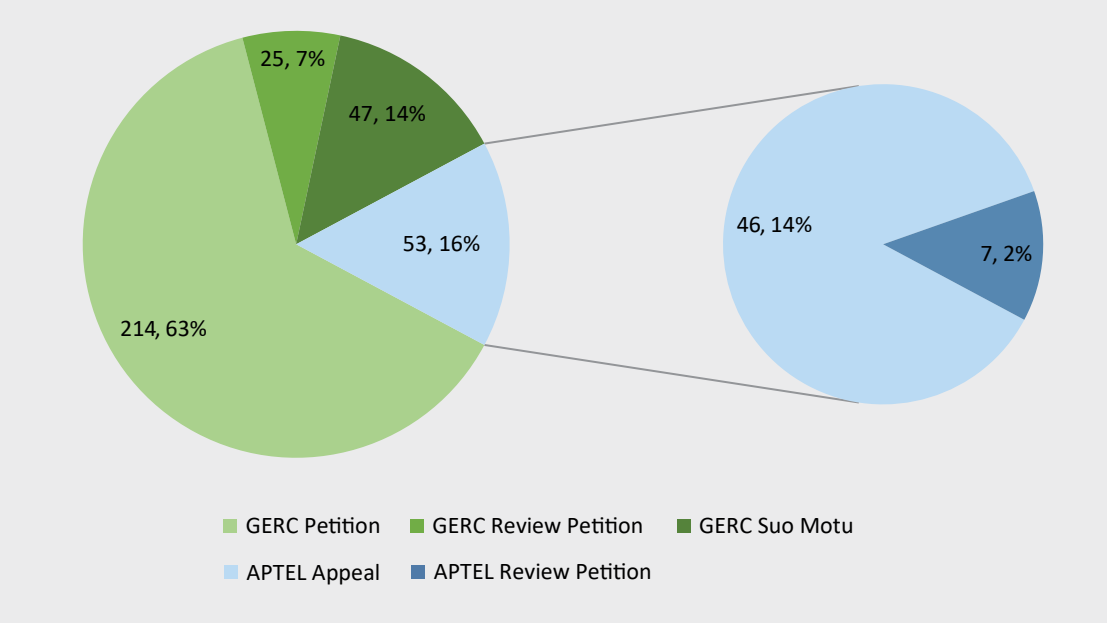
3. Statistical Overview

3.1. Overview of Proceedings

This section shows the detailed analysis of the regulatory proceedings between FY 11 to FY 21 along different themes / parameters.

Figure 1 shows the breakdown of GERC and Gujarat specific APTEL proceedings initiated between FY 11 and FY 21. At GERC, there were a total of 286 proceedings, out of which 270 were orders and 16 were judgements. These included 47 Suo Motu orders, 214 orders and 25 review petitions. At APTEL, there were a total of 53 Gujarat specific judgements in relation to the 46 appeals and 7 review petitions. In total, there were 339 proceedings between GERC and APTEL through FY 11 to FY 21. A graphical representation has been shown in Figure 1.

Figure 1: Breakup of proceedings initiated between FY 11 and FY 21

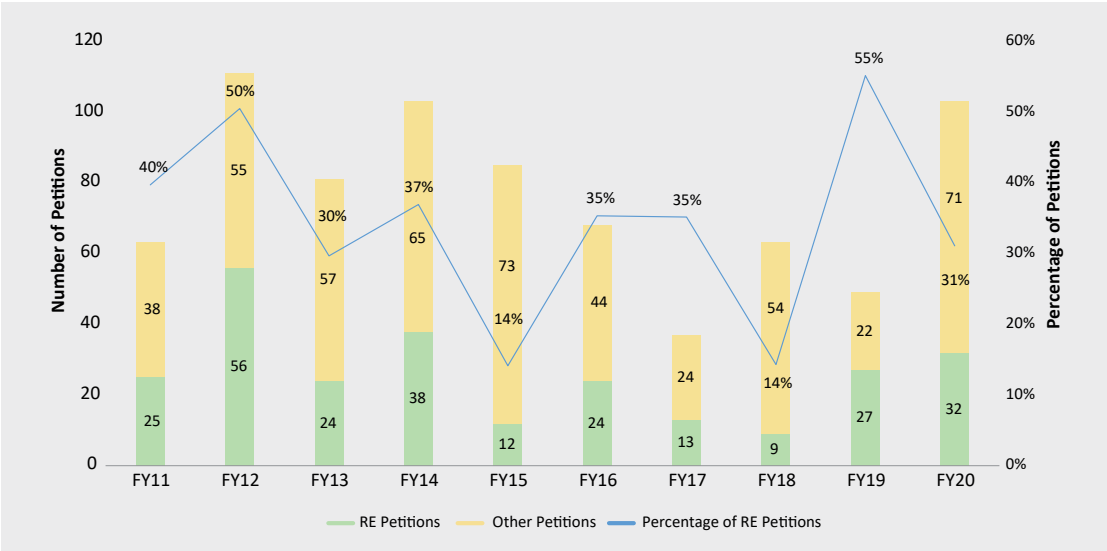


Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 2 shows the percentage share of RE related petitions disposed by GERC in the total number of proceedings from FY 11 to FY 20[4]. The chart shows a high share of RE proceedings in some years, but there is no clear trend or increase commensurate with the increasing RE generation over the years. FY 12 saw a number of project developers filing individual petitions to extend the control period of solar tariff order (which expired in 2012), hence a steep rise in the RE petitions from FY 11. At the time of writing this, GERC has yet to publish a yearly report for FY 21, thus the data has been shown only till FY20.

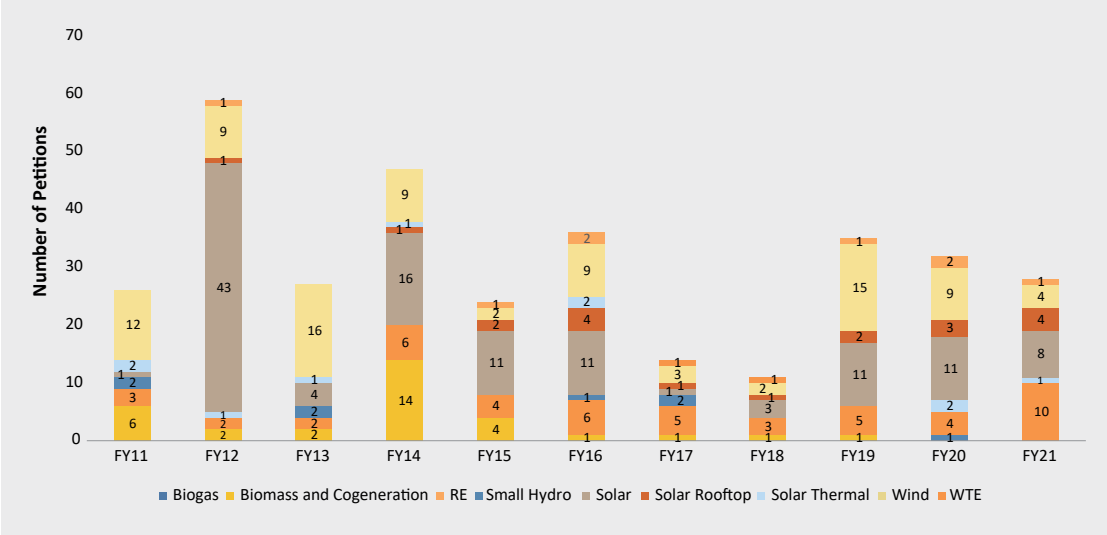
4. Note: The non-RE petitions were aggregated from GERC's annual reports.

Figure 2: Share of RE in total petitions disposed by GERC from FY 11 to FY 20



Source: GERC Annual Reports, GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 3: Energy-wise breakup of petitions from FY 11 to FY 21 (GERC)



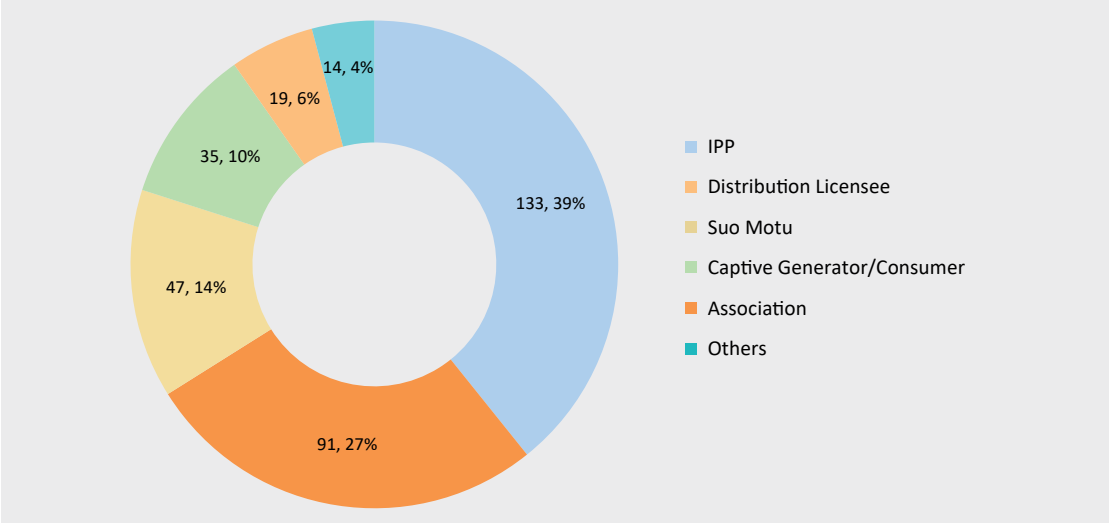
Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 3 shows source-wise breakup of GERC petitions from FY 11 to FY 21. The legend indicates the petitions by 'type' and includes various technologies such as biogas, biomass and cogeneration, solar, wind and so on. In particular, the RE category is applied when the petition was related to RPOs, which includes all RE technologies.

As is evident from the graph (Figure 3), matters regarding solar PV have been prevalent since FY 12. Notably, wind has been a major contributor to the regulatory proceedings, indicating that both these technologies are dominant in the energy mix of the state. FY 14 saw a sharp (albeit one time) increase in proceedings for biomass and cogeneration. Out of 14 proceedings related to biomass and cogeneration in FY 14, 9 proceedings were related to tariff determination and regulation. Out of the remaining 5 proceedings, 3 were related to open access and other 2 were related to PPA and REC each.

3.2. Petitioners and Respondents

Figure 4: Breakup of petitioners between FY 11 to FY 21 (GERC + APTEL)

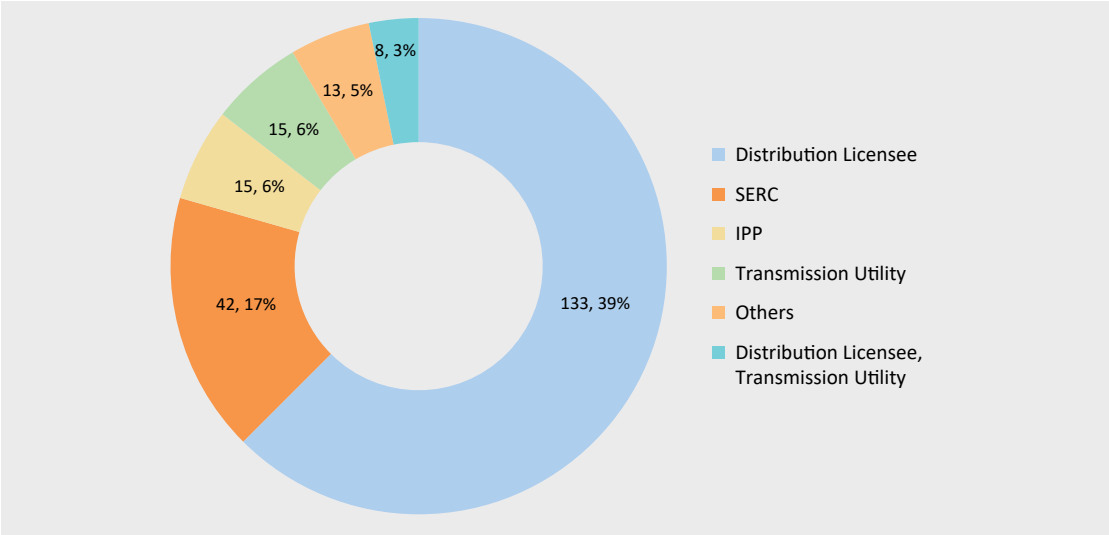


Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 4 shows the breakup of petitioners in various proceedings from FY 11 to FY 21[5]. Majority of the petitioners were Independent Power Producers (IPPs) and DISCOMs, occupying a share of 66% of the total. They are followed by suo-motu proceedings at 14% and captive generators/consumers at 10%. Others include Engineering, Procurement and Construction (EPC) companies/manufacturers, transmission utilities and municipal corporations.

Distribution licensees (63%) and State Electricity Regulatory Commission (SERC) (17%) have been the primary respondents in more than 80% of all the petitions. This chart includes the APTEL appeals as well as the GERC petitions, hence SERC is the second largest primary respondent. Other notable respondents are IPPs and transmission utilities, both at 6 %.

Figure 5: Breakup of respondents between FY 11 to FY 21 (GERC + APTEL)

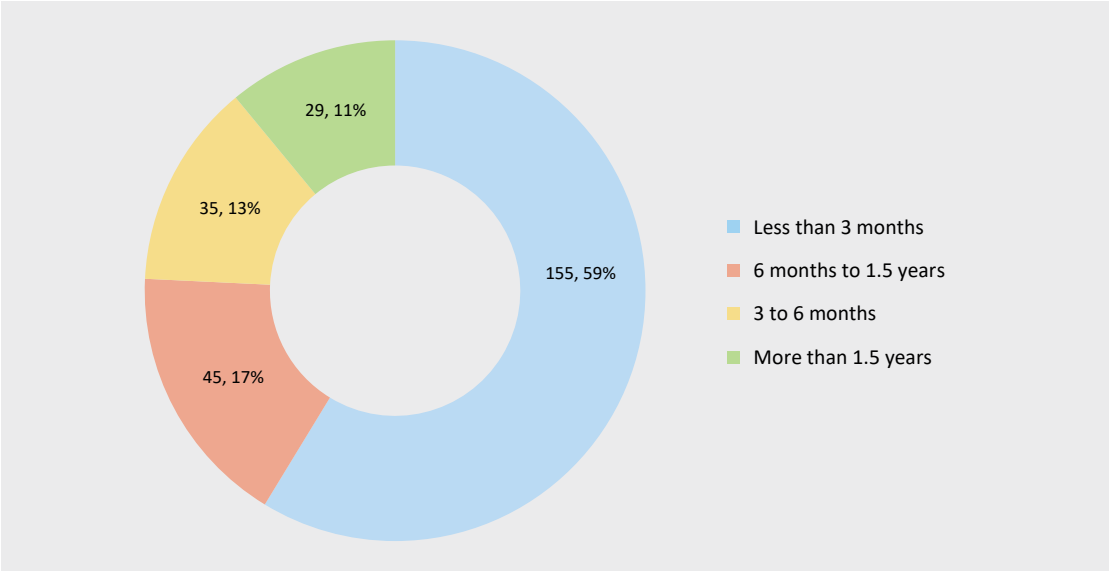


Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

5. In case of multiple petitioners present in a petition, only the primary petitioner has been taken in account

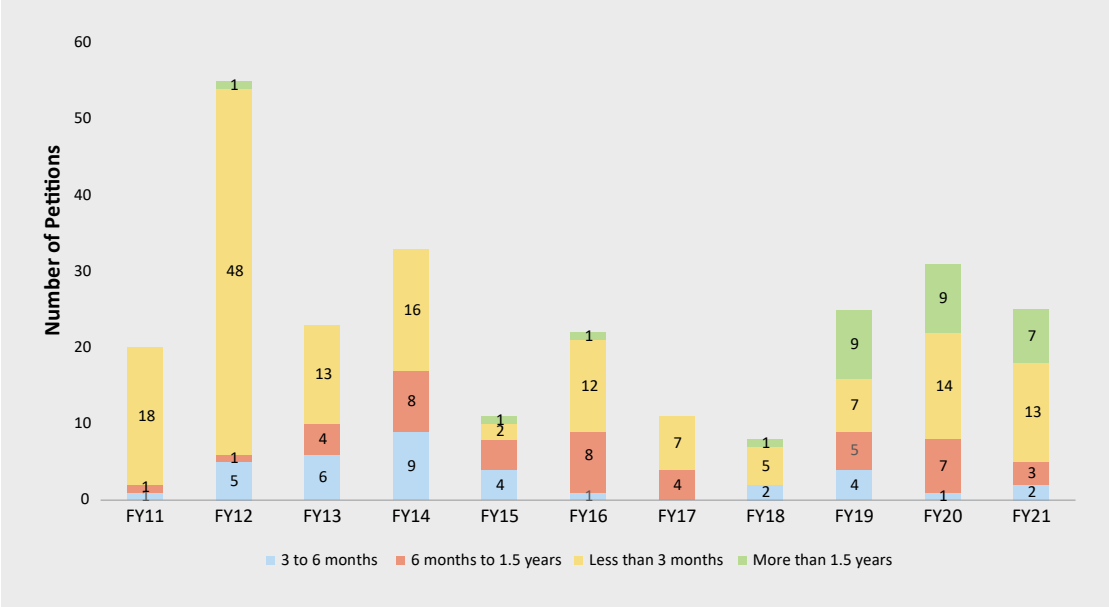
3.3. Pendency

Figure 6: Number of months/years taken between first hearing and final order by GERC[6]



Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 7: Time taken to process the proceedings by GERC, Year-wise



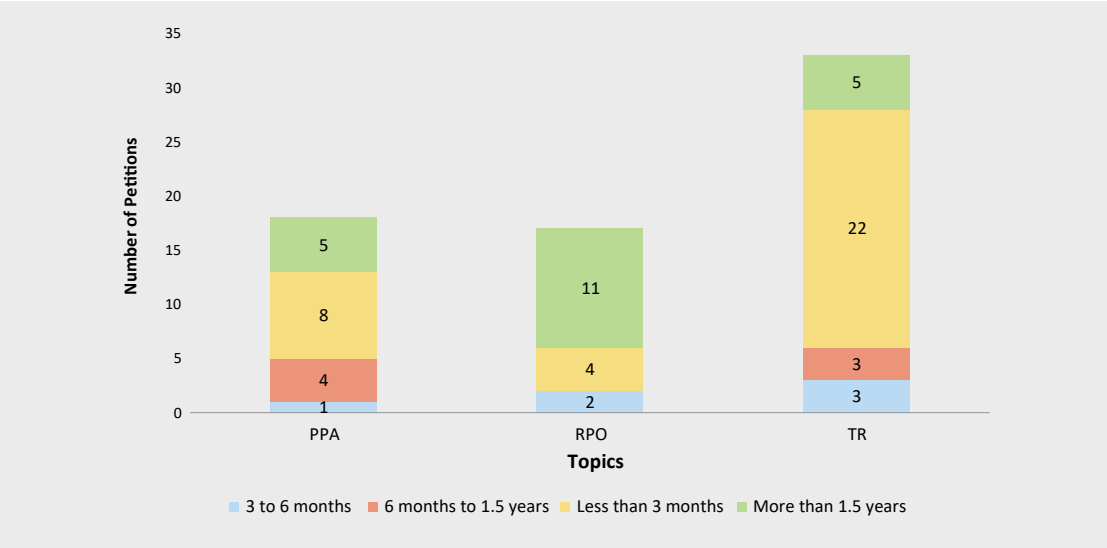
Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

6. APTEL proceedings didn't have filing dates or hearing dates mentioned in their documents and hence they were excluded from this pendency analysis.

This section aims to understand the time taken by GERC to deliver an order or judgement from the first hearing date[7]. Unlike Maharashtra proceedings, in which the filing dates are mentioned in the documents, petitions and judgments from GERC didn't contain such information. Hence, we have considered the first hearing dates as the starting point for the analysis. Thus the actual time taken will be slightly higher than the results shown below. The data shows that GERC has been able to dispose of 72% of its total renewable energy proceedings in less than 6 months, with over 59% proceedings being disposed of in less than 3 months. The figure 7 shows the time taken by GERC to process the different proceedings over the years. The share of proceedings taking more than 1.5 years to complete has increased since FY 19.

Upon looking at the data for the past three years (Figure 8), it is clear that the majority of PPA and Tariff related petitions were disposed in less than 3 months, while RPO related proceedings took the most time. Out of the total 25 proceedings which took GERC more than 1.5 years to dispose, 11 were related to RPO (incl. compliance, regulations and verification). This indicates that RPO has been a rather complex issue in Gujarat.

Figure 8: Time taken to dispose PPA, RPO and TR related proceedings for the FY 19, FY 20 and FY 21



Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

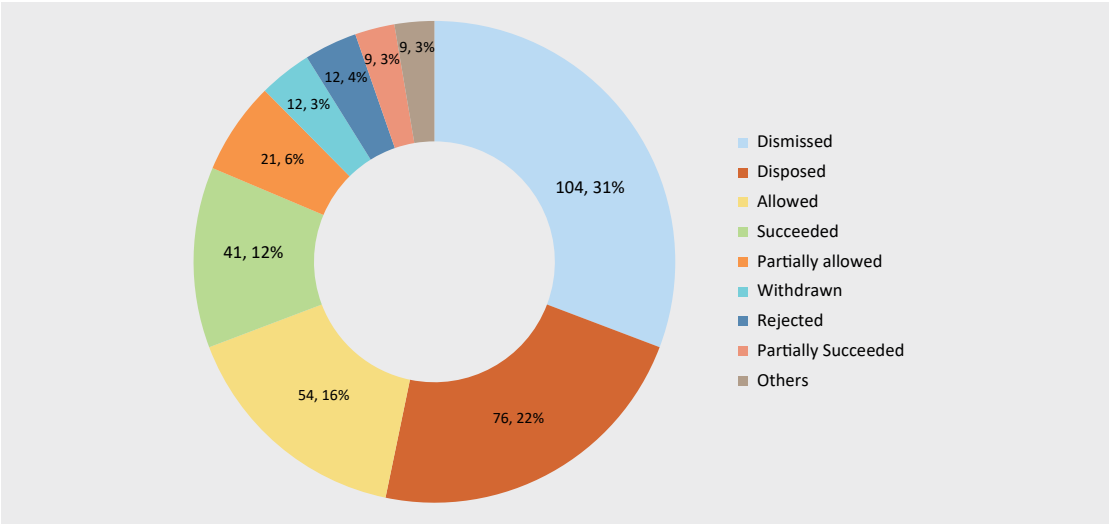
3.4. Decision on all Cases

The information on the final decision by GERC or APTEL on all the 339 orders and judgements that have been issued between FY 10-11 and FY 20-21 was taken from the final part of the order/judgement. All suo motu orders by GERC have been marked as disposed. The tags assigned to the decisions are mentioned in the methodology. 104 petitions (31% of all the petitions) stand dismissed while 76 (22%) stand disposed of. More than 22% petitions have been either allowed or partly allowed while 3% of the total petitions were withdrawn by the petitioners. Others include maintainable, not maintainable and approved decisions.

7. A few proceedings didn't mention their hearing dates, and thus they were excluded from this study. Some of the GERC orders had public hearing dates and they were considered as the starting point (e.g. Order No. 2 of 2010).

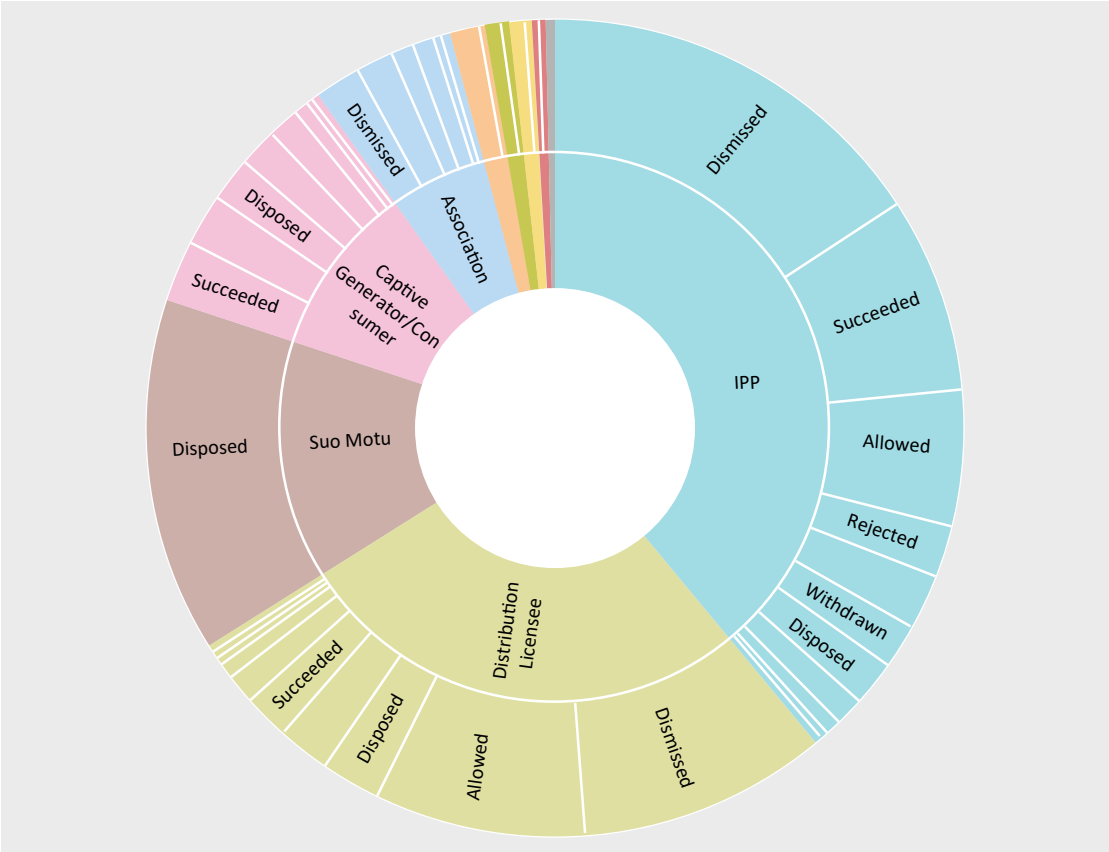
An in-depth analysis of the petitioners and their decisions are shown in figure 10. For both IPPs and DISCOMs, the majority of the decision given by GERC in their petitions is "dismissed". In the case of IPPs, the second most common decision was "succeeded" with 26 proceedings. In the case of captive generator/consumer type of petitioners, the majority of the petitions were 'succeeded'.

Figure 9: Decisions on all orders and judgements issued between FY 11 and FY 21



Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 10: Petitioner-wise break up of decisions on judgments and orders issued between FY 11 and FY 21



Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

3.5. Energy Source and Topic/Subtopic

Figure 11 shows the most commonly occurring topics and sub-topics in each RE category for GERC and APTEL. Solar energy has seen most petitions related to tariff extension, while wind energy has more petitions related to procedural issues for open access. For solar rooftop, most occurring topics and sub-topics were about net metering and their regulations. For biomass and cogeneration, small hydro and waste to energy (WTE), most commonly occurring petitions were about tariff determination.

Most Open Access, transmission and evacuation related petitions are only seen in the context of wind power and not for any other source. Petitions related to RPO topics were listed under the "RE" category and these petitions were mostly related to the RPO regulations (e.g. revision of RPO targets) and their compliance from GERC. In the figure 12 for APTEL related proceedings, we can see PPA and tariff related issues dominating in the solar energy sector. In wind energy, there's a mix of different topics with PPA and open access related petitions appearing the most.

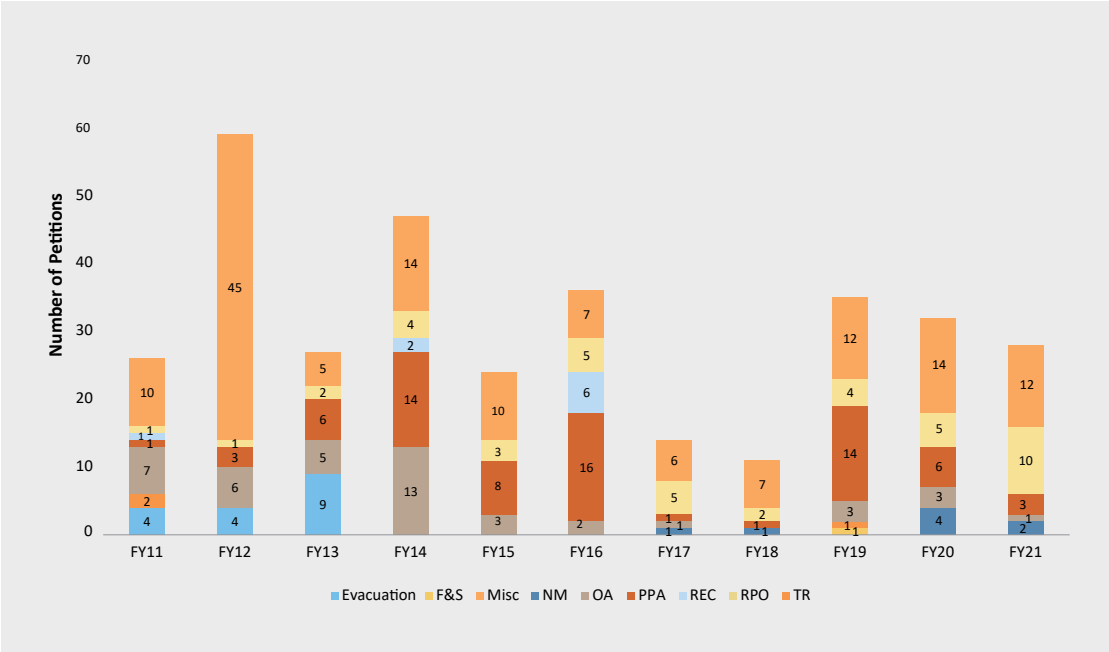
Figure 11: Source-wise and sub topic-wise break up of all proceedings in GERC between FY 10-11 and FY 20-21

Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 12: Source-wise and sub topic-wise break up of all proceedings in APTEL between FY 11 and FY 21

Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

Figure 13: Year-wise appearance of different topics



Source: GERMI's Renewable Energy Regulatory Database as Compiled from GERC and APTEL Datasets

The figure 13 shows all the different topics appearing from FY 11 to FY 21. A quick glance at the chart reveals that the issues related to tariff and PPA have always been present, occupying the majority share amongst all RE proceedings. Apart from tariff and PPA related proceedings, the second most frequently appearing topic was RPO, relating to RPO compliance and deviation in RPO regulations.

PPA and open access related petitions were not about one common topic, but rather a mixture of different issues. PPA related proceedings included, but were not limited to, extension of Scheduled Commercial Operation Date (SCOD), tariff for projects who do not avail accelerated depreciation, approvals of PPAs between the petitioners and respondents, payment obligations of DISCOM, etc. Open access related proceedings include the proceedings related transmission and wheeling charges, sale of surplus energy, date of set-off period, changing the wheeling location, etc.

During FY 11 to FY 13, a total 17 petitions were filed regarding the delay in erection of evacuation and transmission facilities. Interestingly, the majority of these issues were only related to wind power plants. After verifying facts and different circumstances, GERC approved[8] the extension in some cases and denied[9] in others. From FY 14 onwards, GERC has not received any petitions regarding evacuation and transmission facilities.

In FY 12, GERC witnessed a steep increase in tariff related petitions. It happened due to many solar power developers filing petitions[10] praying GERC to extend the control period of solar tariff order[11]. GERC decided to give a common order to all 36 different petitions containing the similar prayers. In the common order, GERC decided that the petitioners have been unable to make out a case for invoking the inherent power of the Commission to extend the control period. The reasons indicated by the petitioners appeared to be in the manner of indirectly invoking the Force Majeure clause specified in PPA, and GERC decided not to address them in a general order and dismissed all 36 petitions.

In the past couple of years (FY 20 and FY 21), there has been a significant increase in the number of tariff related petitions. In the majority of the tariff related petitions, the petitioners were seeking adoption of tariff discovered in a bidding process[12]. It shows the activeness and increased willingness of DISCOMs to purchase renewable energy and meet RPO.

There have been a few petitions submitted by the Gujarat DISCOMs to GERC seeking deviations in the solar PV bidding guidelines published by the Ministry of Power (MoP)[13]. On various instances[14],TPL Ahmedabad and Surat asked for deviation in clause (5.3.1) (b) payment security, (5.7) change in law, Force Majeure provisions, commissioning schedule and (7.1) bid responsiveness of the bidding guidelines. After the observations, GERC approved

8. e.g. Petition No. 1216 of 2012
9. e.g. Petition No. 1150 of 2011
10. e.g. Petition No. 1126 of 2011
11. GERC Order No. 2 of 2010
12. e.g. Petition No. 1906 of 2020
13. Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Solar PV Power Projects, No. 23/27/2017-R&R and its amendments Resolution No. 283/57/2018-GRID SOLAR
14. Petition No. 1744 of 2018, 1804 of 2019 and 1905 of 2020

all deviations (except for clause 14.3 in the guidelines) sought by the petitioner. Gujarat Urja Vikas Nigam Limited (GUVNL) also filed various petitions[15] seeking deviations in the bidding guidelines. GUVNL sought deviations related to payment security funds, change in law, early commissioning, technical criteria, Force Majeure provisions. GERC approved all the deviations except technical criteria and early commissioning clauses.

15. Petition No. 1709 of 2018, 1731 of 2018, 1848 of 2019, Review Petition No. 1775 of 2019, 1793 of 2019

4. Substantive Issues

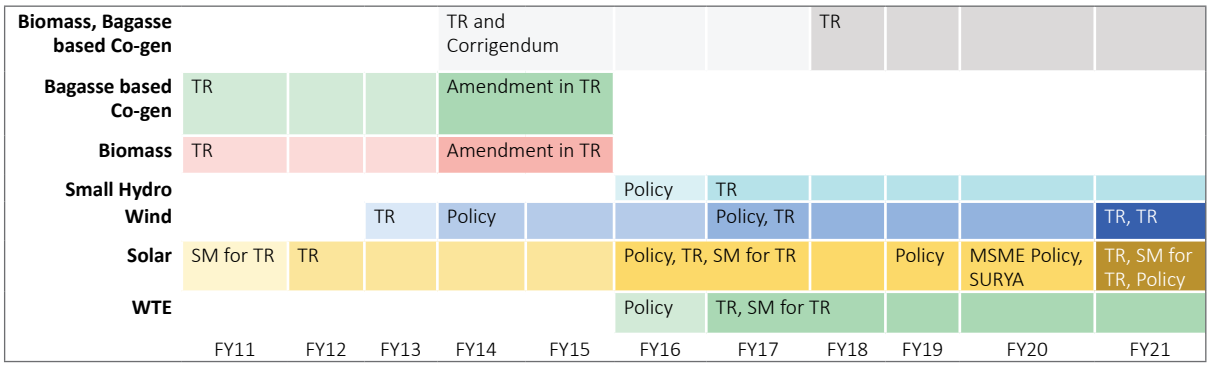
Based on the detailed analysis, there are four substantive issues identified. These are: non-compliance of RPOs by DISCOMs, tariff determination under RE regulations, absence of payment delays in Gujarat and absence of challenges in the grant of open access.

4.1 RE Regulations

Tariff Regulations

GERC has historically played an important role in determining the tariffs at which DISCOMs must procure renewable energy from developers. This has helped to shape the market significantly, given that the price of renewables has initially been higher than their thermal counterpart. Figure 14 shows the historical development of tariff regulations and policy in the state of Gujarat.

Figure 14: Timeline of major GERC RE tariff regulations and GoG RE Policies



GERC has been coming up with Tariff Regulations for different RE sources to provide a direction to the market. The ceiling tariffs in the Tariff Regulations serve as a benchmark for DISCOMs to procure power from the power producers[16]. But with the price of solar and wind energy witnessing a drastic reduction in the last decade, DISCOMs have adopted a reverse auction strategy for purchasing power. Initially, the benchmark tariff from GERC served as the ceiling against which the DISCOMs would conduct the reverse auction. With the passage of time, as the difference between regulated tariffs and market price discovery got starker, DISCOMs have eschewed using the regulated benchmark. In time, DISCOMs announced their own benchmarks, mentioned in the bidding documents. Recognizing the redundancy of these benchmarks, in the most recent Tariff Regulation[17], GERC has abandoned determining ceiling tariffs and decided to leave it completely on market discovery. As a consequence, tariffs are now market determined through open reverse auction.

A recent trend being adopted by DISCOMs is that of scrapping auctions citing higher tariffs. In February 2018, GUVNL had tendered 500 MW of grid-connected solar PV projects to meet its RPO. The lowest bid received in the auction was ₹2.98 per kWh for 50 MW capacity. GUVNL cited the tariff quoted in the bid to be too high and decided to scrap the auction

16. Order No. 3 of 2015: Determination of Tariff for Procurement of Power by Distribution Licensees and Others from Solar Energy Projects for the State of Gujarat

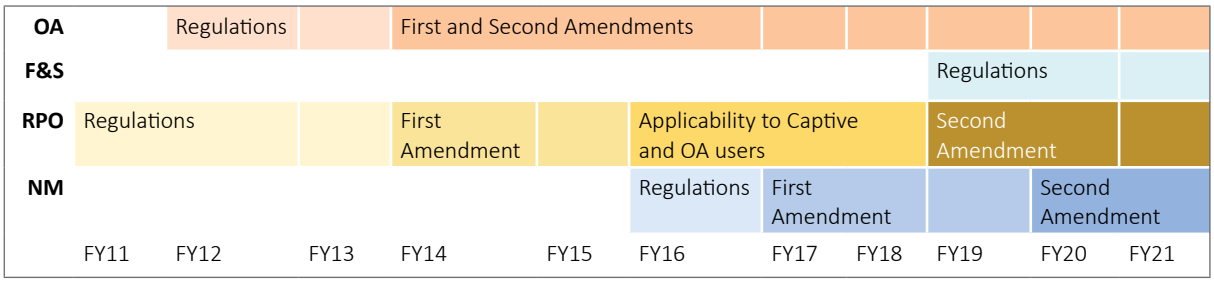
17. Order No. 3 of 2020: Tariff framework for procurement of power by distribution licensees and others from Solar energy projects and other commercial issues for the State of Gujarat

(Prateek, 2018). On another instance, GUVNL scrapped the solar PV auction of 700 MW in 2019 (Prateek, 2019) and in 2021 (Prasad, 2021). GERC further allowed GUVNL to cancel the 700 MW auction. From the standpoint of GUVNL and consumers of the state, these may potentially ensure procurement of tariffs at lowest possible rates. However, from the developers' side, this erodes trust and could potentially violate the sanctity of the auction. Having said that, DISCOMs usually reserve the right to 'scrap auctions' before signing of the PPA. These recent developments have resulted in solar developers writing to the Prime Minister's Office requesting an intervention in the matter (Nair, 2021).

Net Metering

GERC issued Net Metering regulations for the first time in 2016[18], following the launch of Gujarat Solar Policy 2015. The regulations introduced restrictions on the installation capacities for all eligible consumers. Eligible consumers were allowed to install solar rooftop PV power systems up to only 50% of their sanctioned load. These restrictions limited the installed capacity and therefore the growth of overall capacity of solar rooftop PV power plants in the state of Gujarat until later on, when GERC amended the net metering regulations in 2017 for the first time[19]. The installation restrictions for residential consumers were removed and they were allowed to install solar rooftop PV power plants irrespective of their contracted demand. The second amendment[20] was released in 2020 and it introduced a new definition clause for MSMEs. Just like residential consumers, MSMEs were also given full immunity from capacity restriction and were allowed to install solar rooftop PV power plants irrespective of their contracted demand. But, this change also came with a modification in the energy accounting and settlement mechanism. If the solar rooftop PV power plant capacity of MSME consumers was above their 50% contracted demand, they were mandated to follow a 15-minute time block billing period. Thus, this was a mixed bag for MSME consumers since 15 minute billing takes away the ability of these consumers to bank energy on a monthly cycle. Figure 15 shows clearly that the net metering regulations were announced in 2016, post the announcement of the Gujarat Solar Policy in 2015. While the regulator aligned the regulatory provisions with that of the policy provisions to retain synchrony, no rationale was given to determine the 50% limit.

Figure 15: Timeline of major GERC RE regulations



Similarly, the sale of excess energy to the DISCOM is different for different consumer categories. For instance, the buy-back rate for residential consumers is ₹2.25 per unit while for other types of consumers it is ₹1.75 per unit. For MSME consumers, this was amended to ₹2.25. There is no valid rationale for determining the tariff for excess energy under the net metering regulation.

18. Notification No. 5 of 2016: GERC (Net Metering Rooftop Solar PV Grid Interactive Systems) Regulations, 2016
19. Notification No. 2 of 2017: GERC (Net Metering Rooftop Solar PV Grid Interactive Systems) (First Amendment) Regulations, 2017
20. Notification No. 2 of 2020: GERC (Net Metering Rooftop Solar PV Grid Interactive Systems) (Second Amendment) Regulations, 2020

Another interesting observation is that for solar, wind, waste to energy and small hydro, the policy has preceded the regulatory announcement. This, in itself, is natural, for the policy provides the direction to the regulator to come up with a framework. However, there are some instances where the regulator has merely mirrored the policy provisions without a sufficient explanation in the statement of reasons. The following table highlights some of these examples:

Provision	Policy	Tariff Regulation
Installed capacity for rooftop PV solar system	Clause 9.1.2 of Gujarat Solar Power Policy 2015: up to maximum of 50% of consumer's contracted demand	Clause 6.2 of GERC (Net Metering Rooftop Solar PV Grid Interactive Systems) Regulations 2016: The maximum capacity shall be upto a maximum of 50% of consumer's contracted demand. Later, it was amended to any capacity in the first amendment[21] of Net Metering Regulation.
Installed capacity for Micro, Small & Medium Enterprises (MSME) consumers	Clause 1 of Amendment in Gujarat Solar Power Policy 2015 (for MSME Manufacturing Enterprise): allowed to set up of solar projects of any capacity, irrespective of their contracted demand	Clause 2.5.1 of GERC Order No. 03 of 2020: allowed to set up Solar Power project of any capacity irrespective of their sanctioned load

While an alignment of policy and regulatory provisions help prevent any confusion in the market, the methodology on which such parameters need to be determined are often not mentioned.

4.2 Renewable Purchase Obligation and Compliance

Renewable Purchase Obligations (RPOs) were introduced to increase the share of renewable energy in the total power mix. GERC has been consistently monitoring and verifying the RPO compliance each year. Keeping in mind different technologies and their associated costs, the total RPO target has been divided into three different categories, solar RPO, wind RPO and others (biogas, biomass and hydro). Gujarat is one of the very few states in India (another state being Rajasthan) to have a three-fold RPO system.

Although the RPO targets have been decided in the GERC regulations[22], DISCOMs have mostly been unable to achieve them throughout the years (see figure 16). In fact, since FY 10, there has not been a single year when all DISCOMs were able to achieve the total RPO target. GERC has not penalized any DISCOM for this non-compliance. Instead, the regulator has allowed DISCOMs to carry forward the deficit to the next few years. In addition, since FY12 GERC also has lowered the RPO target using a weighted average method. In this method, GERC compiles the RPO achieved in any particular year for each DISCOM. Then, it formulates a weighted average (weighted as per MUs) RPO achieved among all

21. Notification No. 2 of 2017: GERC (Net Metering Rooftop Solar PV Grid Interactive Systems) (First Amendment) Regulations, 2017

22. Notification No. 3 of 2010 - Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) Regulations) 2010, Notification No. 2 of 2014 - first amendment, Notification No. 1 of 2018 - second amendment

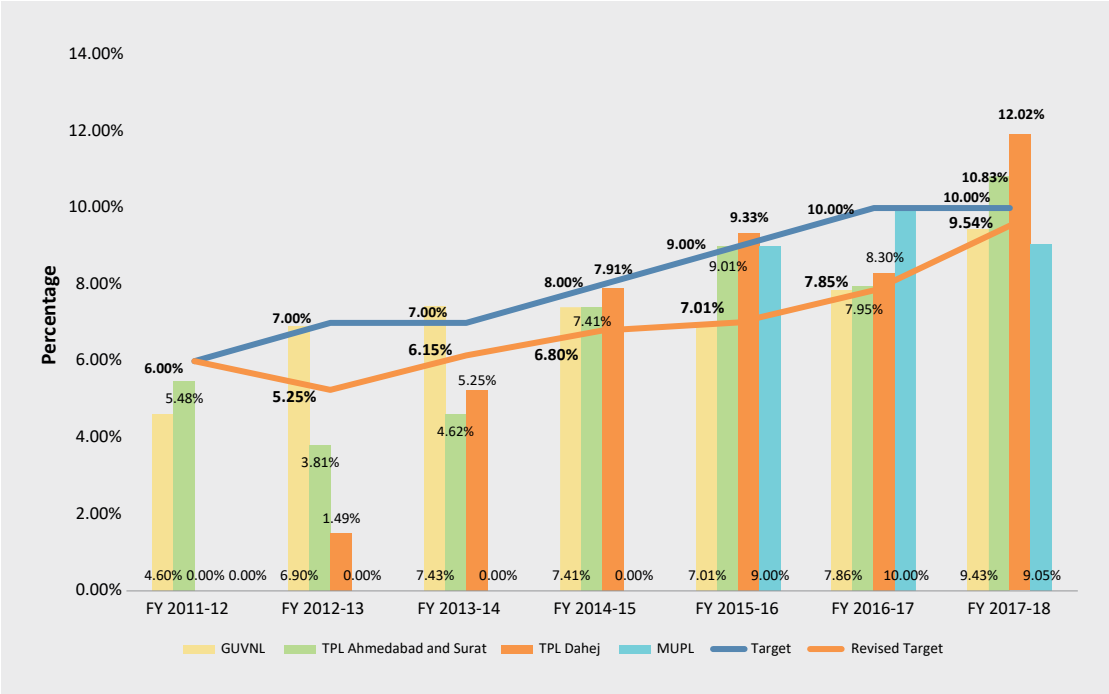
the DISCOMs in Gujarat. This weighted average becomes the 'revised RPO' against which DISCOMs are measured. For those DISCOMs who fall above the revised weighted average RPO, no action is necessary, nor any penalty is imposed. For those DISCOMs that fall below the weighted average, they are allowed to carry forward this deficit to the next year. In all cases, no penalties have been imposed. The trend in actual targets vs the revised targets and their declining gap over the recent years is shown in figure 16. Such a practice defeats the purpose of having the original RPO targets in the first place. It also dilutes the sanctity of the regulatory mechanism.

The recent trend shows that the DISCOMs are gradually catching up in compliance to the actual (original i.e., not the revised weighted average) target set in the RPO regulations.

Solar RPO compliance has historically been a strong area for the DISCOMs. In fact, the solar RPO target has never been revised by GERC, due to the fact that the DISCOMs have nearly been able to reach the minimum quanta every year. It shows a very strong presence, emphasis and availability of solar energy in Gujarat.

Wind RPO compliance has been a mixed bag. In the earlier years, DISCOMs found it difficult to achieve the target, but the scenario has changed in recent years. In FY 2017-18, Torrent Power Limited (TPL) Ahmedabad and Surat, TPL Dahej and MPSEZ Utilities Private Limited (MUPL) have been able to purchase excess wind power and GUVNL has only fallen short, that too by a very small margin.

Figure 16: Total RPO (wind+solar+others) revised vs actual vs complied[23]



Source: GERMI's RPO Compliance Database Compiled from GERC's Datasets

23. Figure 16 only includes those DISCOMs that are independently managing power procurement. DISCOMs such as GIFTPCL and KPL purchase energy from GUVNL's subsidiaries and only distribute the power in their licensed jurisdiction.

Alarmingly, the 'Others' category RPO target has never been met by any of the DISCOM in any of the previous years, with TPL Ahmedabad and Surat being an only exception for the FY 2011-12. Only GUVNL has been able to partially comply with this category. As is evident from figure 16, this target has never been revised since FY12. This is a chicken-and-egg problem. Given the fact that energy from these 'other' sources are significantly more expensive than that of solar and wind, DISCOMs tend to avoid procuring energy from these sources. However, the lack of this demand never gives the impetus needed to make this technology achieve economies of scale. This is perhaps where the regulator can mandate that the RPO from this category be met, failing which they might use their powers to penalize DISCOMs. Secondly, irrespective of whether the DISCOMs are able to meet this target or not, GERC must keep these targets in line with the national targets for the others category to ensure India meets its RE goals.

Further, under clause 4 of second amendment of RPO regulations[24], GERC has been allowing the DISCOMs to adjust their excess purchase of one form of renewable energy against the shortfall to the other form of renewable energy. Again, this defeats the purpose of having separate RPOs to support nascent technologies in the first place.

GEDA is the state nodal agency to monitor RPO for the state of Gujarat. Apart from RPO monitoring DISCOMs, GEDA also monitors RPO compliance of Captive Power Producers and Short-term Open Access users.

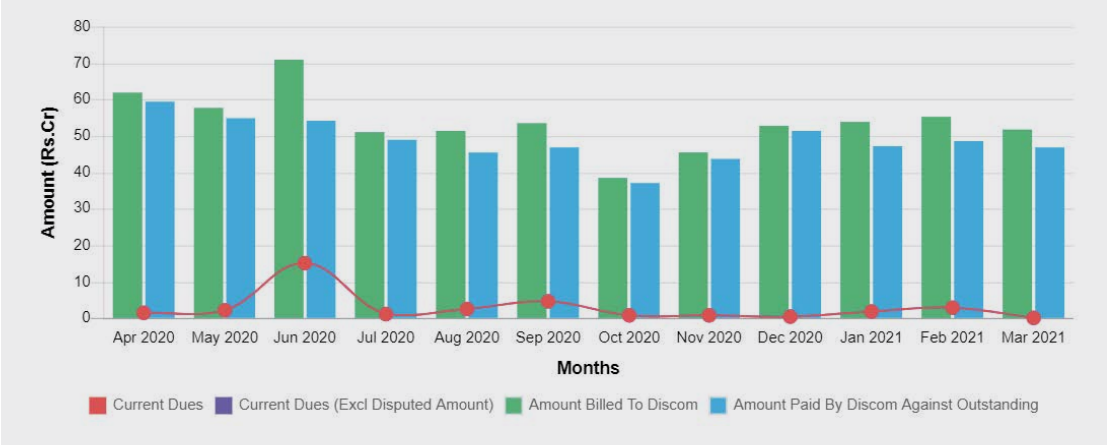
4.3 Absence of Payment Delays

Out of the total 339 RE proceedings from GERC and APTEL, no petitions were found pertaining to payment delays from DISCOMs to the power developers. Payment delays are one of the most critical issues in the country presently (Central Electricity Authority, 2019). This is remarkable and shows the strong financial position and good governance structures of Gujarat DISCOMs. Timely payments provide much needed security to attract the power developers to invest in the State. In comparison, Maharashtra had 119 instances between FY 11 and FY 20, where the payment delay was a primary issue (Gambhir & Das, 2020).

However, data from the Government of India's PRAAPTI (Payment Ratification And Analysis in Power procurement for bringing Transparency in Invoicing of generators) portal shows outstanding amount of ₹218 crore (which is 63.02% of total overdue amount) as of March 2021 (State Dashboard - PRAAPTI, 2021) from GUVNL and its subsidiary DISCOMs to the RE power developers (shown in figure 17 and 18). As it is apparent in figure 18, these overdues appear to be a long-standing issue between specific developers and GUVNL. In comparison, GUVNL has ₹125.80 crore overdue for non RE power generators. In case of current RE dues, GUVNL only owes ₹0.23 crore to RE power developers by March 2021. A few developers interviewed as a part of this research also corroborated the absence of payment delays in Gujarat.

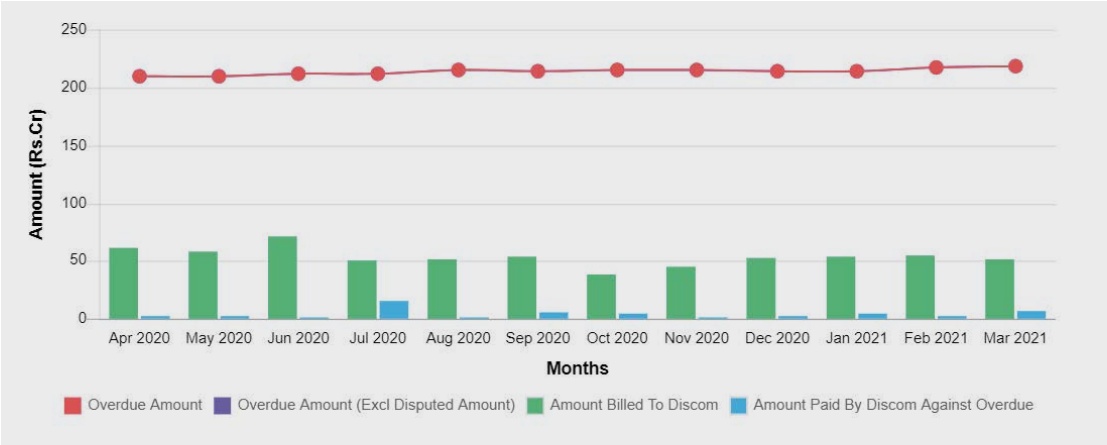
24. Notification No. 1 of 2018: GERC (Procurement of Energy from Renewable Sources) (Second Amendment) Regulations, 2018

Figure 17: GUVNL current dues to all RE generators



Source: PRAAPTI Portal (March 2021)

Figure 18: GUVNL overdue amount to all RE generators



Source: PRAAPTI Portal (March 2021)

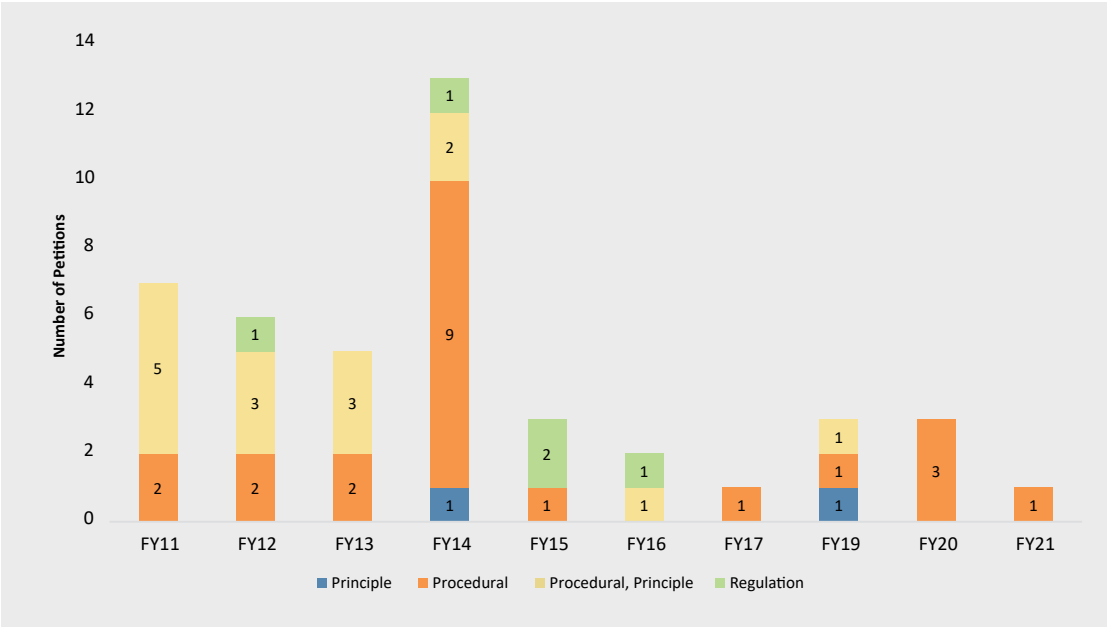
4.4 Open Access

In the past eleven years, there have been only 44 instances when the proceedings regarding open access issues were filed at GERC and APTEL. Out of the 44 proceedings, 37 were filed at GERC and 7 were filed at APTEL. In the same time, there wasn't a single complaint (or petition) by a consumer or a developer against the DISCOM as respondents for the lack of granting open access for RE power plant. This is again an important point to highlight, given that non-discriminatory open access is one of the recurring issues across most DISCOMs in the country. In fact, the previous report for Maharashtra reported open access as a major issue with 138 proceedings around it.

The issues on open access in Gujarat is a collection of multiple procedural issues such as petitions related to tariff of surplus units, banking of excess units, wheeling charges, etc. Out of all 44 proceedings, there were 11 proceedings related to set off against the owner's monthly consumption. In set off related proceedings, 5 of them were about petitioners asking to give 'set off' from the date of commissioning instead of from the date of wheeling agreement[25].

25. e.g. Petition No. 1030 of 2010

Figure 19: Different subtopics for the open access related petitions

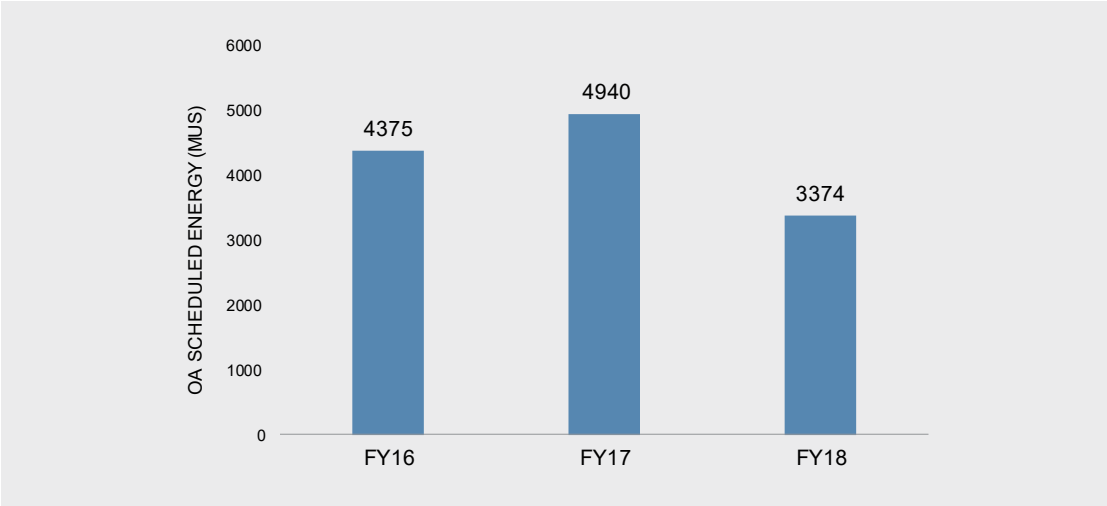


Source: GERMI's analysis compiled from GERC and APTEL regulatory filings

Background on Open Access in Gujarat

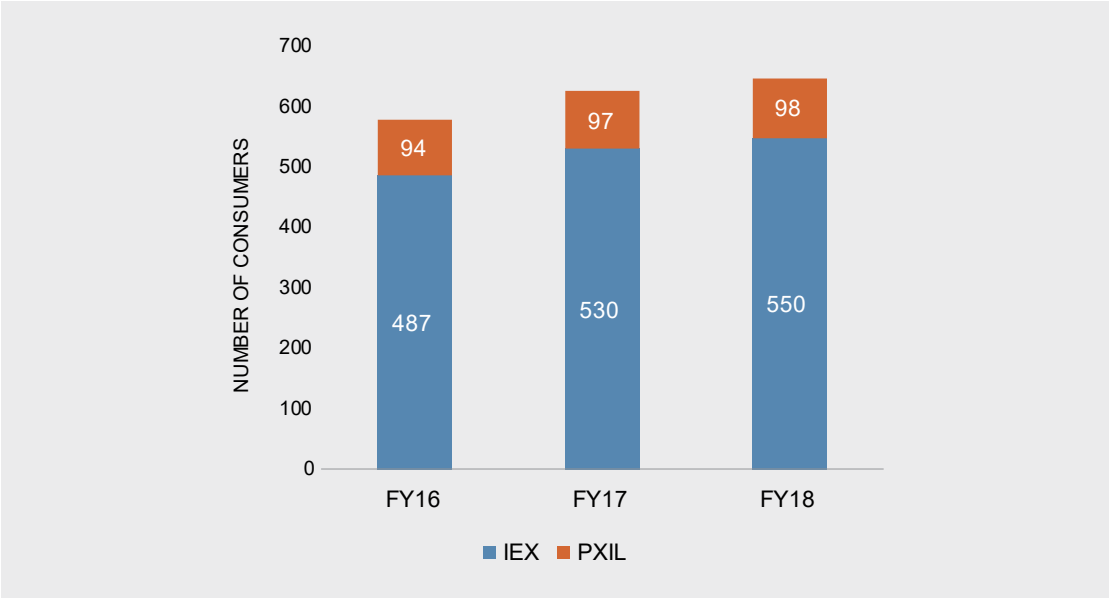
Scheduled Open Access energy has decreased from FY16 to FY18 (figure 20) while the number of Open Access consumers have increased (figure 21 and 22) in the same period. Also, the number of Open Access consumers using IEX and PXIL for procuring energy has increased. This implies that the consumers are moving towards captive consumption, especially towards RE. Figure 22 shows the decline in conventional energy OA consumers and increase in RE OA consumers. This trend could indicate that RE captive power consumption has gained traction in Gujarat's OA sector. One of the reasons for this trend can be given as the introduction of Gujarat Solar Power Policy 2015. The policy allowed exemption of cross subsidy and additional surcharge for solar captive power plant consumers.

Figure 20: Open Access Scheduled Energy (MUs)



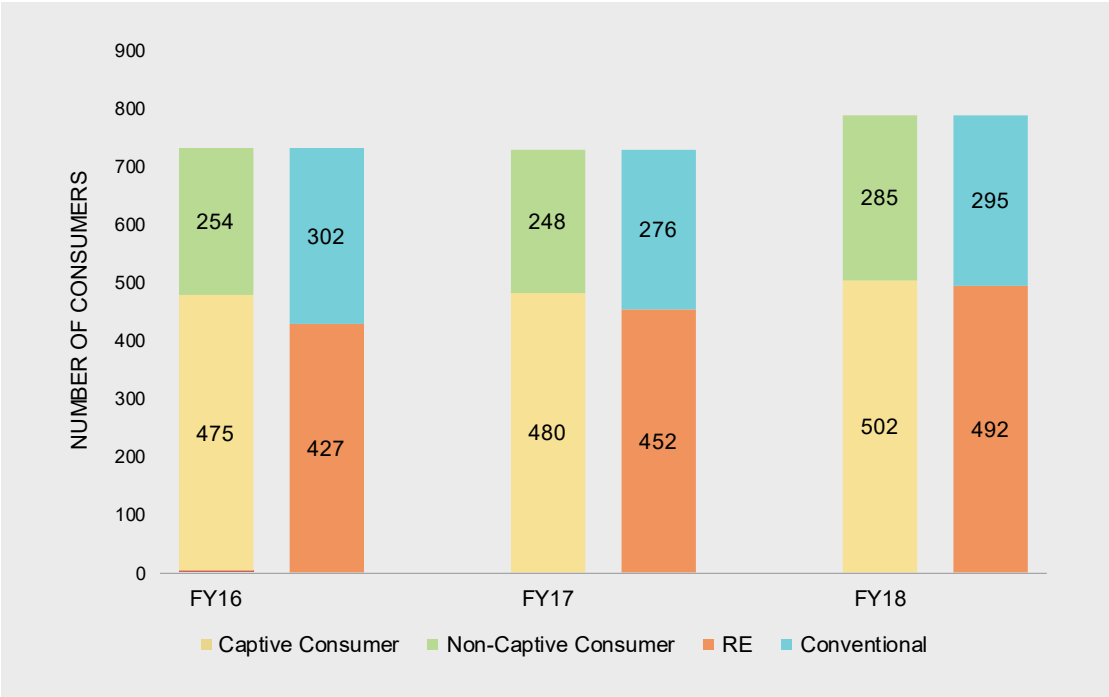
Source: GERC Additional Surcharge Orders

Figure 21: Number of OA Consumers from Gujarat Getting Energy from IEX and PXIL



Source: CEA Annual Reports

Figure 22: Breakup of OA Consumers



Source: Forum of Regulators (FoR) Report, 2019 (Deloitte, 2019)

5. Appendix

5.1 Different Tags and their Description

The description of all 18 tags is given in the table below. A more detailed description can be found in the Appendix of Maharashtra report published by Prayas (Energy Group). The differences in tags with Maharashtra report have been highlighted.

Table 1: Description of tags used for creation of the regulatory database

Tags	Description
Jurisdiction	The authority under whom the proceedings took place, that is, GERC or APTEL.
Document Type	The type of document that was finally passed by adjudicating authority. It was tagged as Orders and Judgments for GERC and Judgment for APTEL. *Divergence from MH: MH only had Orders whereas, GJ has Orders and Judgements. The differences between Orders and Judgements are not amply clear in the GERC nomenclature.*
Document Reference No.	Appeal Number, Petition Number, Order Number, Notification Number, Suo Motu Petition Number or Review Petition Number as the case may be.
Proceedings Initiated as	All final orders and judgments for which the proceedings were initiated under the following names: Appeal, Review petition, Suo Motu order, Petition. *Divergence from MH: There were no Original Petitions present in Gujarat related proceedings and thus its absence.*
Topics and Sub Topics	All orders and judgements were analysed on the basis of the prayers that were stated in the petitions and the final decision issued by GERC and APTEL. The tags assigned were as follows: Evacuation, Forecasting and Scheduling, Miscellaneous (Misc), Net Metering, Open Access, Power Purchase Agreements (PPAs), Renewable Energy Certificates (RECs), Renewable Purchase Obligation (RPO), Tariff. Further segregation under each of the topics was done on the basis of: Regulations, Principles and Procedures and others. For more details please see table number 2.
Energy Source	Source-wise categorization was done on the basis of which renewable energy source the order and judgement pertained to. For orders which are related to all RE sources (e.g., RPO orders), the tag is assigned as RE.
Petitioner / Appellant Type	Categorisation was done based on the following types – Association, Captive Generator/Consumer, Distribution Licensee (includes Deemed Licensee), Distribution Licensee Consumer, EPC/Manufacturer, IPP, SERC (GERC), Suo Motu, Transmission Utility, Generation Utility, Municipal Corporation, Consumer.
Primary Respondent	Categorisation was done based on the following types – Association, Distribution Licensee (includes Deemed Licensee), IPP, SERC (GERC), State Load Dispatch Center (SLDC), State Nodal Agency (SNA), Transmission Utility, Generation Utility, Municipal Corporation.
Other Respondents	All respondents apart from the primary respondent were identified under this tag.

Tags	Description
Section of Electricity Act, 2003	For all orders under the jurisdiction of the GERC and APTEL, the regulations were noted from the prayers of the petitions.
Decision	The information on the final decision by GERC or APTEL was taken from the final part of the order. *Divergence from MH: GJ related proceedings were found to have eleven[26] different decisions in comparison to five different decisions mentioned in the MH report.*
Date of First Hearing	The date on which the order or judgment was first heard by the authority. *Divergence from MH: The filing date of proceedings were not available in GJ, hence the date of first hearing was used in pendency analysis.*
Date of Order/ Judgement	The date on which the order or judgment was issued by the authority.
Petition/Appeal Description	A description of the case and its prayers.
Common Order/ Judgement	This identified the petitions for which the GERC or APTEL issued a common order or judgement respectively.
No. of Days until Final Order/ Judgement	Calculated from date of order and first hearing date.
Notes	Interesting observations and caveats for each of the orders and judgements were listed under this heading.

5.2 Topics and Subtopics

All orders and judgements were analysed on the basis of the prayers that were stated in the petitions and the final decision issued by GERC or APTEL. A total of nine[27] classification of categories were identified which were assigned the tags namely, Evacuation, Forecasting and Scheduling (F&S), Miscellaneous (Misc.), Net Metering (NM), Open Access (OA), Power Purchase Agreements (PPA), Renewable Energy Certificates (REC), Renewable Purchase Obligation (RPO), Tariff (TR).

- Regulation: The orders and judgements which concern a petitioner seeking amendments, exemption, relaxation, clarification, rectification, review or modification in regulations.
- Principle: The orders and judgements which raised questions related to a substantive rationale for tariff, Open Access and Power purchase agreements were tagged as 'Principal' issues. All such matters that fall under this purview have been stated in the table. Petitions asking for the applicability of a certain regulation are also tagged under this label.

26. Decisions: These tags were namely, allowed, not allowed, approved, dismissed, disposed, maintainable, not maintainable, partially allowed, partially succeeded, succeeded, withdrawn and rejected.

27. There were a few petitions and appeals which pertain to more than one topic. Such petitions and appeals were categorized under the topic which was more closely related to them. They are few in number and do not affect the overall results.

- Procedural: The orders and judgements which cited procedural problems in processes related to Open Access, tariff determination, Power purchase agreements, net metering and RECs were tagged as such.
- In certain cases, both 'Principle' and 'Procedural' were tagged, as prayers of the petition or appeal and the final decision included features of both these sub topics.
- In addition to the above three there are some sub topics that are applicable to specific topics like Extension of applicability of tariff orders (tagged as Extension) come under the purview of tariff and Compliance of Renewable Purchase Obligation (tagged as Compliance) come under the purview of RPO.

The table given below contains the topics and sub-topics along with their details.

Table 2: Description of topics and sub-topics

Topic		Sub-Topic	Matters that Come under this topic
Renewable Purchase Obligation	RPO	Regulation	seeking amendment of existing RPO regulations so as to exempt captive cogeneration from RPO, review regulations to merge solar and non-solar RPO targets, for allowing exemption from RPO targets.
		Compliance[28]	Verification and compliance of RPO targets.
Tariff	TR	Determination	Approval and adoption of tariff on a case-to-case basis, determination/ redetermination of tariff by the Electricity Regulatory Commission (ERC) or under competitive bidding process, review of tariff petitions on account of alleged error apparent in determining tariff due to consideration of different tariff components.
		Extension	Extension of applicability of tariff orders and regulations.
		Principle	Consider changes in tariff components, review of tariff petitions on account of alleged error apparent in determining tariff due to wrongful consideration of tariff principles, applicability and clarification of tariff orders.
		Regulation	Seeking amendment in tariff regulations, asking for deviation in the bidding guidelines and review of tariff orders.
		Procedural	Allowing competitive bidding for projects, cases on non-compliance of previous orders.
Open Access	OA	Regulation	Seeking amendments in OA regulations related to banking charge and other provisions.
		Principle	Issues related to reduction in contract demand, allowance of banking facility, condoning waivers/ exemptions on OA charges and all other Open Access regulation's application related issues.
		Procedural	Permissions for OA, payment of dues for surplus energy injected into the grid, incorrect treatment of surplus units injected, non-compliance of previous orders, revocation of trading licenses, alterations in the banking mechanism, issues related to set off against the energy injected.

28. There are a few petitions in which the petitioners have asked about revising the RPO targets as well as verification of RPO. They have been tagged under both "regulation" and "compliance" tags.

Topic		Sub-Topic	Matters that Come under this topic
Power Purchase Agreement	PPA	Procedural	Approval of PPAs, request for removal of clauses, issues in following various clauses of PPA, extension of SCOD,
		Principle	Petitions related to the applicability of particular regulations,
		Payment Delay	Delay in payment of dues
Forecasting and Scheduling	F&S	Regulation	Seeking amendments or removal of difficulties in implementation of Forecasting and Scheduling regulations.
Renewable Energy Certificate	REC	Procedural	Accreditation of generators under the REC mechanism,
		Principle	Issues related to wrongful issuance of RECs
Net Metering	NM	Regulation	Seeking amendments or relaxations in Net Metering regulations.
		Procedural	Approval for setting up a solar plant under net metering, approval of grid connectivity.
Evacuation		Connectivity	Petitions requesting connectivity of RE power plants to the grid
		Transmission	Petitions related to evacuation arrangements, relaxations in provision of the same, refund and reimbursement of evacuation charges, issues related to the erection of transmission facilities.
Miscellaneous	Misc	Miscellaneous	Petitions related to SKY scheme, designation of state nodal agency and other topics outside of the listed above

5.3 Decision

The information on the final decision by GERC or APTEL was taken from the final part of the order or judgement. All these orders and judgements were assigned one of the eleven tags. These tags were namely, allowed, not allowed, approved, dismissed, disposed, maintainable, not maintainable, partially allowed, partially succeeded, succeeded, withdrawn and rejected. Although the differences between the decision types are not amply clear in the GERC nomenclature, they have further been described below:

- Allowed: The proceedings in which all the prayers were allowed by the GERC or APTEL.
- Not allowed: The proceedings in which the prayers of the petitioner(s) were not allowed.
- Approved: The proceedings in which all the prayers were approved by the GERC or APTEL.
- Dismissed: The proceedings in which GERC or APTEL dismissed the petition.
- Disposed: The proceedings in which GERC or APTEL disposed the petition. All the Suo Motu, regulations and notifications were also tagged under this decision.
- Maintainable: The proceedings were declared maintainable by APTEL.
- Not Maintainable: The proceedings which the commission decided not to entertain were declared as not maintainable.
- Partially Allowed: The proceedings in which some of the prayers of petitioner(s) were allowed.

- Partially Succeeded: The proceedings in which some of the prayers of petitioner(s) were succeeded.
- Succeeded: The proceedings in which all of the prayers of the petitioner(s) were succeeded.
- Withdrawn: The proceedings in which the petitioner(s) have decided to withdraw their petitions.
- Rejected: The proceedings in which all of the prayers of the petitioner(s) were rejected.

5.4 Actual RPO Targets vs Revised Targets

Table 3: Segment Wise RPO Target Comparison [Actual vs Revised]

Year	Solar		Wind		Others		Total	
	Target	Revised	Target	Revised	Target	Revised	Target	Revised
2010-11	0.25%	NA	4.50%	NA	0.25%	NA	5.00%	NA
2011-12	0.50%	0.50%	5.00%	5.00%	0.50%	0.50%	6.00%	6.00%
2012-13	1.00%	1.00%	5.50%	4.15%	0.50%	0.10%	7.00%	5.25%
2013-14	1.00%	1.00%	5.50%	5.04%	0.50%	0.11%	7.00%	6.15%
2014-15	1.25%	1.25%	6.25%	5.43%	0.50%	0.12%	8.00%	6.80%
2015-16	1.50%	1.50%	7.00%	5.43%	0.50%	0.08%	9.00%	7.01%
2016-17	1.75%	1.75%	7.75%	6.04%	0.50%	0.06%	10.00%	7.85%
2017-18	1.75%	1.75%	7.75%	7.71%	0.50%	0.08%	10.00%	9.54%

*Revisions marked in red

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A robust regulatory framework is critical to the development of the renewable energy sector. This will be increasingly important going ahead, as India begins to integrate a significantly larger amount of renewable energy into its energy mix. Understanding the development of regulations, RE specific regulatory matters and litigation in the sector helps one understand trends and periodic issues that stakeholders in the sector face. Further, the intersection with the national and state level RE policies create peculiarities that could either serve as bottlenecks or aid the growth of the sector.

Gujarat being one of the states in India with a high RE energy mix, is a natural case study for such an exercise. This study aims at understanding the development of RE specific regulatory issues over the last decade (2010-2021) in Gujarat. It highlights important issues that have led to petitions at the state regulator. This report can serve as a useful aid to researchers, analysts, potential investors and to regulatory officials in the sector. The report is the second in a series of such reports (the first being the state of Maharashtra).

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