

COMPETITIVE ISSUES IN RENEWABLE ENERGY MARKET

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ABSTRACT

Renewable energy is not just an environmental imperative but a strategic lever for nations to strengthen their global position and emerge as a sustainable global economy. The global crises of depleting fossil fuels and natural resources has pointed towards shift to renewable sources. The Renewable energy sector which was a Government owned sector has been reformed to offer a level playing field in order to invite competition in the sector. The report aims to determine the renewable energy sector through the competitive lens. The concept of renewable energy offers better quality and efficient set up of energy generation that raises a competition in the sector. The private sectors are playing vital role in transformation, innovation, scaling manufacturing and building infrastructure for the energy needs and hence the main objective of the report is to identify the barriers that occur in the entry of such players in the market. The dominance of different existing players along with the dependence of the sector on such players has been identified through the report. The report hence determines the issues of competition in the sector by analyzing the provisions, guidelines and sectoral framework on both state and central level to ensure "fair competition for the greater good."

Keywords: Renewable energy, imperfect competition, barriers, market players

INTRODUCTION

The rapid technological advancement has seen a vast growth in different sector in accordance to the environmental protection and the agendas is to find a way out through usage of technologies to prevent depleting natural resources in the world. The International organizations to National bodies and Ministries have began to form policies that are motivated from the global Environmental crises and deploying of fossil fuels. The demand with the growth has arose for finding of an alternative method of fulfilling the need of the hour. Energy sector is one of those sector that has experienced rapid growth in past decades. The sector was earlier a Government owned entity and the major decision making role in the sector was laid by such Government only. In 1990s, the importance of private players entering the infrastructure sector was laid. The Government owned structure related to energy lacked proper infrastructure and reforms. The

lack of competition in the sector lacked service of quality, insufficient resources allocation and operational inefficiencies.¹

It was assumed that monopolies were best suited to deliver the services as they enjoyed economy of scale and scope. The main demand in the energy sector is in relation to Availability, Accessibility an Affordability. The privatization of the sector was in accordance to fulfill the demand of consumers and supplying the adequate quality of resources. The Competition in the sector was increased after the privatization that invited new market players in the sector with advancement in technologies and fulfillment of four divisions of energy sector i.e. Generation, Transmission, Distribution and Trading. The energy sector witnessed policy changes, regulatory initiatives and structural changes as it recognized that need of uninterrupted power is basic necessities for growth of industries in the country.

The dependency of the energy demand on the natural resources is huge and hence an alternative source of energy is needed to replicate the demand for the same. Renewable energy which could also be defined as energy generated through such sources that are not limited or can be relished on a human time scale. The law has not provided in itself a legal definition to renewable energy, Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 defines the term as energy generated from renewable sources. The country has saw highest year on year growth in energy addition that has increased 80 times in last nine yrs at

87.27GW of May 2024. As per ReN21 Renewable 2024 Global Status Report, India is world's 3rd largest energy consuming country, 4th in wind power capacity and 5th in solar power capacity. The country has set a targeted to COP26 of 500W of non fossil fuel based energy by 2030. The 45.5% capacity of total energy generated in the country is through non fossil sources. The Renewable Energy is thus generated through diverse sources, these sources could be relished and hence considered non fossil sources.

The global shift towards renewable energy sources, driven by the urgent need to mitigate climate change, has sparked significant growth in the renewable energy market. Solar, wind, hydropower, biomass, and geothermal energy have emerged as alternatives to fossil fuels. However, this transition is not without challenges. The renewable energy market faces several competitive issues that affect its development and integration into the broader energy sector. These include market entry barriers, regulatory challenges, pricing mechanisms, infrastructure constraints, and the influence of traditional energy markets.

1.1. **BACKGROUND**

The Energy insufficiency after the oil shock in

1970's increased the sudden demand and thus the Commission for Additional Sources of energy (CASE) 1981 was formed that regulated policies and implementation of them in renewable energy sector. The CASE did not focussed on the research and Development in the sector and In September 1982, Department of Non- Conventional Energy Sources was in corporate which was later made the Ministry of Non- Conventional Energy Sources (MNES) in 1992. And hence forth the Ministry of New and Renewable Energy was formed in order to regulate the framework of this sector in India.

The Concept of Renewable Purchase Obligation was incorporated in the Electricity Act 2003, which mandated all the electricity distribution companies to purchase or produce a specific amount of their requirements from renewable energy sources. It brought the light towards the development of the sector. The Government has launched various policies in order to promote the use of these sources and bring transition in the sector for achieving demand fulfillment, Sustainability and Environmental Goals. The Generation is done through various sources such as Solar, Wind, Geothermal, Biomass and Hydropower. The First and foremost is Solar Energy, The most abundant source of energy that can be converted from sunlight to electrical energy through photovoltaic panels or mirrors that concentrate solar radiations. The cost of production of solar panels has reduced drastically hence making solar energy affordable and hence cheapest form of electricity. The average life locate in remote areas or offshore. The kinetic energy of moving wind is used to produce maximum electricity that includes larger turbines and rotor diameters. This kind of energy offers tremendous potential in the electricity generation. Further Hydropower energy is generated through moving water from higher elevation to lower elevation. The energy is thus generate through rivers and reservoirs. It is the largest form of energy generation in the world. Geothermal energy is obtained from earth

interiors using wells or other means. Reservoirs that are naturally hot enough and permeable are called hydrothermal reservoirs, while reservoirs that are hot enough but are enhanced by hydraulic stimulation are called enhanced geothermal systems. Once on the surface, fluids of different temperatures can be used to generate electricity. The technology of generating electricity from hydrothermal reservoirs is advanced and reliable and has been in operation for more than 100 years.

Bioenergy is produced from various organic materials, called biomass, such as wood, charcoal, manure and other manure for heat and power production, and agricultural crops for liquid biofuels. Most biomass is used in rural areas for cooking, lighting and heating, generally by poorer populations in developing countries. Modern biomass systems include specialized crops or trees, agricultural and forestry residues, and various organic waste streams. Energy created by burning biomass creates greenhouse gas emissions, but at lower levels than burning fossil fuels such as coal, oil or gas. The Electricity Act introduced in 2003 brought awareness of the sector to these sources and are regulated by the Central Electricity Regulatory Commission (CERC) which is a statutory body established on 24 July 1998 under the Electricity Regulatory Commission Act, 1998 of the Department of Energy. The Commission which was established and incorporated under Section 3 of the Electricity Regulatory Commission Act, 1998, is now governed by Section 76 of the Electricity Act, 2003. Enacted to rationalize electricity rates, formulate transparent subsidy policies, promote efficient and environmentally friendly policies and for matters relating to electricity tariff regulation, CERC functions with a quasi-judicial status under the Electricity Act 2003.

2. **OVERVIEW OF RENEWABLE ENERGY MARKET**

India is one of the leading countries in renewable energy capacity, with substantial investments in solar, wind, and biomass energy. India ranks 4th globally in installed

renewable energy capacity (including large hydro), 4th in wind energy capacity and 5th in solar energy capacity (according to REN21 Renewables 2024 Global Status Report). The country set an increased target at COP26 of 500 GW of non-fossil fuel energy by 2030. This was a key commitment under the Panchamrit. This is the largest renewable energy expansion plan in the world. India's installed non-fossil fuel capacity has increased by 396%² in the last 8.5 years to over 203.19 GW (including large hydro and nuclear), which is about 45.5% of the country's total capacity (as of June 2024). India saw the highest year-on-year growth in renewable energy additions at 9.83% in 2022³ The installed capacity of solar power has increased 30 times in the last 9 years and stands at 85.47 GW in June 2024. The solar energy potential in India is estimated at 748 GWp as estimated by the National Institute of Solar Energy (NISE). Installed renewable energy capacity (including large hydro) has increased by approximately 128% since 2014.⁴

In Present, 100% FDI is allowed under the automatic route for renewable energy generation and distribution projects in accordance with the provisions of The Electricity Act 2003. The sector is thus driven by the energy demand .

The sector belongs to both in the Government and private players leading to both the agencies controlling the same. The Government agencies include Ministry of New and Renewable Energy (MNRE) it is a primary government body responsible for the formulation and implementation of policies related to renewable energy. Solar Energy Corporation of India (SECI) which is government-owned entity that facilitates the implementation of various solar energy projects and schemes. Indian Renewable Energy Development Agency (IREDA) that is non-banking financial institution that promotes, develops, and extends financial assistance for renewable energy and energy efficiency projects.

The Government has taken various initiatives to promote renewable energy in the sector like National Solar Mission (NSM) which was launched in 2010, NSM aims to promote the development and use of solar energy for both grid-connected and off-grid applications. It sets ambitious targets for increasing solar capacity and offers financial incentives, subsidies and policy support to encourage solar adoption. India has one of the largest wind energy capacities in the world. The government provides incentives such as production-based incentives (GBIs) and accelerated depreciation benefits to encourage wind energy development. The government supports the use of biofuels and biomass-based energy production. Initiatives include the Ethanol Blending Program, which mandates the blending of ethanol with gasoline, and the National Biofuels Policy.

The country aims to harness its hydropower potential while keeping environmental concerns in mind. Various policies and incentives support the development of small and large hydropower projects. The government is exploring opportunities for geothermal and ocean energy projects. Research and development initiatives are underway to exploit these resources. Under the Electricity Act of 2003, state electricity regulatory commissions enforce RPOs.

Renewable purchase obligations from distribution companies and open access consumers. They are required to source a certain percentage of their energy from renewable sources. The government provides tax incentives, including accelerated depreciation and income tax exemptions, to encourage investment in renewable energy projects. To improve grid infrastructure and facilitate the integration of renewable energy into the grid, the government is developing green energy corridors, which are dedicated transmission lines for renewable energy. India collaborates with various countries and international organizations on renewable energy projects, technology transfer and

capacity building. The Ministry of New and Renewable Energy (MNRE) funds research and development initiatives to improve renewable energy technologies and make them more cost-effective. Various states have implemented net metering and feed-in tariffs to encourage rooftop solar installations and allow consumers to sell excess electricity back to the grid.

2.1. KEY PRIVATE PLAYERS IN THE SECTOR

The other players in the sector are private. The investment trends have presented **Acme Solar⁵** as among the leading renewable energy players in India in terms of operational capacity as of March 31, 2024. It has commissioned 3,668 MWp of solar power projects as of March 31, 2024. It has diversified and expanded our portfolio from solar power projects to become an integrated renewable energy company in India. **Adani Green Energy Ltd⁶** a significant player in the renewable energy market, focusing on large-scale solar and wind power projects. Adani Green Energy Limited (AGEL) is India's largest and leading global partner for renewable energy solutions enabling the clean energy transition. AGEL develops, owns and operates solar, wind and hybrid renewable power plants connected to the public grid. With a closed growth trajectory up to 20.4 gigawatts (GW), AGEL currently has an operational renewable portfolio of 8.4 GW, the largest in India, spread across 12 states, cumulatively offsetting more than 41 million tonnes of CO₂ emissions. AGEL has been instrumental in the development of several major renewable energy power plants, the latest being the world's largest 2,140 megawatt (MW) hybrid wind and solar cluster in Jaisalmer, Rajasthan. The company has set a target of 45 GW by 2030 in line with India's decarbonisation targets. AGEL is focused on leveraging technology to lower the Levelized Cost of Energy (LCOE) in an effort to enable widespread adoption of affordable clean energy. AGEL's operational portfolio is certified as "water positive for power plants with a

capacity of more than 200 MW", "single-use plastic free" and "zero waste to landfill", a testament to the company's commitment to sustainable growth.

Tata Power Solar Systems Ltd⁷ that which is also a leading player in the solar energy sector, involved in manufacturing solar cells and modules and providing EPC (Engineering, Procurement, and Construction) services. It has pioneered technology adoption in the utility sector with many firsts to its credit including setting up one of India's first hydroelectric

power stations in 1915. Tata Power, together with its subsidiaries & joint entities, has 12772 MW of generation capacity where 30% comes from clean and green sources. From energy- saving power services, to making India EV ready with multi-city EV charging stations and being India's 1st rooftop solar provider.

Azure Power⁸ that is a solar power producer that develops, constructs, and operates solar projects across India. Other than these there are financial institutions and investor like Greenko Group supported by global investors like GIC (Government of Singapore Investment Corporation) and ADIA (Abu Dhabi Investment Authority), is a leading renewable energy company in India.

ReNew⁹, established in 2011 and a subsidiary of ReNew Energy Global PLC, is one of India's largest renewable energy IPPs in terms of total energy generation capacity. Since commencing operations in 2011 with a 25.2 MW wind project in Jasdan, Gujarat, the company has grown exponentially, and has a current renewable asset base of 13.8 GW (as on Oct 2023), including projects under development and in the pipeline. ReNew is one of the largest renewable energy companies globally and in October 2019, ReNew became the first RE company in India and among the top 15 globally to cross 8.0 GW of total capacity. ReNew's current commissioned capacity stands at ~8.3 GW (as on Oct 2023) which lights

up approximately ~14 million homes across India, represents about 1% of total electricity demand in India, and mitigates 0.5% of India's carbon emissions.

2.2. LEGALFRAMEWORK RELATED TO RENEWABLE ENERGY SECTOR

The Renewable energy sector has been dealing with legislations related to different resources utilization like solar, wind, hydropower. The sources thus establish the need for regulation in the setting up plant as well as the granting permission for transmission of the energy to the consumer for use. The Electricity Act 2003, tariff determination guidelines and several other regulations by Central Electricity Regulatory Commission are major regulatory framework in the renewable energy sector.

The Legal framework helps in the market regulation by avoiding the entry and exit barriers that are created due to the market practices that are being carried on. The barriers that are created refrain from new players to enter in the market. The high capital cost, technological expertise, regulatory and policy barriers, existing players and economy of scale effect the market and the Renewable energy framework is under the Government and hence the policy and legal decisions are taken by the Government bodies that are formed under the electricity Act. The section 2(4) of the act explains the definition of "Appropriate Commission" means the Central Regulatory Commission referred to in sub-section (1) of section 76 or the State Regulatory Commission referred to in section 82 or the Joint Commission referred to in section 83.

The 2(5) of the Act explains about central and state government. The authority to form the National Electricity and Tariff policy from time to time is bestowed with the Government as per section 3 of the Act. The Authority plays a major role in suggesting the Government on Appropriate policy framing leading to the rural and urban areas.

The Electricity Act provides for establishment of

the Generating stations that plays a major role in Government . Section 7 of the act explains that any generating company can establish, operate and maintain Generating stations without licensing if it complies with technical standards mentioned in the Act. The similar provision does not apply to Hydro electric generation in which the any company intending to establish any such plant shall submit concurrence to the Authority with scheme as notified by Central Government.The scheme is required to contain the river works needs, dam safety designs and optimum locations.The section 8 of the act demonstrates the same.Captive Generation are provided right to open access without the license.

The exemption in license could only be provided in case of public interest.Section 15¹¹ of the Act provide procedure for grant of license which must be filled under Form 1 and application shall be supported with an affidavit in accordance with Regulation 17 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023.The applicant shall, within 3 working days of filing the application, publish a notice of its application in Form-II appended to these regulations in at least two leading daily digital newspapers of the State or Union Territory where an element of the project or concerned transmission line is situated or proposed to be situated, inviting comments from the general public. The notice shall also be kept posted on the website of the applicant.

The Registry of the Commission shall carry out a preliminary scrutiny of the application and convey the defects.In the notice published in the digital newspapers and on the applicant's website under this Regulation, it shall be indicated that the suggestions and objections to the application, if any, may be filed by any person within 15 days of publication of the notice to The Secretary, Central Electricity Regulatory Commission.The Commission shall before granting license or rejecting the application under the provisions of this Regulation provide an opportunity of hearing to the applicant, CTUIL, the concerned DICs, or

the person who has filed suggestions and objections, or any other interested person.The Commission shall, within 7 days of making the order to grant the license to an applicant send a copy of the license to the Central Government, the Central Electricity Authority, the Central Transmission Utility, the applicant and the concerned DIC. The central and state regulatory commission are required to ensure the compliance to the act standards, the providing of open access, market domination and more .The regulatory framework of the electricity act is enacted to promote competition in the renewable energy market.The following provisions depict that the commission plays a major role in both enabling and prohibiting the competitive market.

3. COMPETITIVE ASSESSMENT OF RENEWABLE ENERGY MARKET.

The Competition Act, 2002, in India aims to promote and sustain competition in markets, protect consumer interests, and ensure freedom of trade. Within the context of the renewable energy sector, several competition issues may arise, which can be analyzed under the provisions of this Act.The Competition commission of India has it foundation in section 18 which is said to be duties on the commission i.e. “duty of the Commission to eliminate practices having adverse effect on competition, promote and sustain competition, protect the interests of consumers and ensure freedom of trade carried on by other participants, in markets in India.”The renewable energy market as discussed is controlled by the sectoral bodies like CERC (Central Electricity Regulatory Commission) & SERC (State Electricity Regulatory Commission). Section 60¹⁰ of the electricity Act explains “The Appropriate Commission may issue such directions as it considers appropriate to a licensee or a generating company if such licensee or generating company enters into any agreement or abuses its dominant position or enters into a combination which is likely to cause or causes an adverse effect on

Competition in electricity industry.” This depicts that the cases related to Competition in the sector are under the ambit of the bodies specified in the Act. The Act contains various provision in which there are higher probability of rising of a competitive issue. The Competition Act in section 3¹¹ explains Anti Competitive Agreements. Companies in the renewable energy sector may engage in cartel-like behavior by fixing prices, bid-rigging in auctions, or allocating markets among themselves. This restricts competition and leads to higher prices for consumers, reducing the efficiency and fairness of market operations. The Power Purchase Agreement and other distribution and generation Agreements are through which the Anti-Competitive Practices. The Act lays down in Section 57 & 59 Consumer safe guard provisions and furnishing of information related level of performances. Competition provisions 19 explains on the creation of barriers and hampering market through formation of such Agreements that are possible in the sector as there lies the issue on the distribution and providing of non-discriminatory open access to the all. Section 63 provides for competitive bidding that could be affected and could be a main reason for Anti Competitive practices. Further the Abuse of Dominant Power as per section 4¹² of the Competition Act 2002 explains that if a company having monopoly in the sector would cause the abuse of dominance leading to engagement in predatory pricing, setting prices below cost to drive out competitors. This can lead to reduced competition in the long term as smaller competitors may not be able to sustain losses and exit the mark. Dominant firms may deny access to essential facilities or resources such as grid connectivity, land, or technology. This can prevent new entrants from competing effectively, thereby maintaining or strengthening the dominant position of incumbent firms. The key players specified earlier can use their position or even the overnment sector could effect the market. The

tariff regulation that has been provided in the hands of Government as per Section 61 & 62 of the Act. The state has still refrained from providing access to the tariff pricing and thus could affect the competition in the market as well as the consumer welfare would be infringed if the following practice is not conducted in a non discriminatory manner. The consumer still pay the highest prices in power purchase parity term unlike USA, Japan & China. CCI players major role in determining the dominance that has been used unethically to hamper the market.

Section 5&6¹³ of the Competition Act suggest the Provision related to Mergers & Acquisitions. Large mergers or acquisitions in the renewable energy sector can lead to market concentration. The effect of reduced competition due to increased market power of the merged entity, potentially can lead to higher prices and reduced innovation. The Competition commission established the identification of such combinations that could cause Adverse effect on the Competition in the market.

The Competition issues are vast in the ambit of Renewable Energy sector. The cases suggest that whenever the Competition Commission has intervned in the matter of Electricity the CERC & SERC have objected the same under section 60. In the case of CCI vs. Delhi State Electricity Regulatory Commission, the information of unruly price by the companies in the sector was provided as per which CCI issued the order and hence the state Electricity Board objected the Intervention as per Section 60 of the Electricity ACT 2002. The state having all powers creates serious competition issues in the sector leading to a need of intervention Competition Commission to regulate.

CONCLUSION

The Competition Act, 2002, provides a comprehensive framework to address various competition issues in the renewable energy sector. Ensuring fair competition is crucial for the sector's growth, innovation, and

sustainability. Continuous monitoring and enforcement by the Competition Commission of India (CCI) are essential to mitigate anti-competitive practices and promote a competitive market environment. In the overall scheme of the regulatory environment, cooperation between regulators can ensure an outcome where various regulatory agencies complement overall economic growth and consumer welfare. They are Industry regulators which are best suited to set collateral standards quantity and quality of products. So they focus on what to do and how do, while the CCI focuses on curbing anti-competitive activities of businesses. Sectoral regulators regulate specific sectors with an "ex ante" approach, i.e. solves problems before they arise. CCI on the other hand primarily addresses behavioral problems after the problem occurs. The emphasis of the sector regulators is on the organized development of the

sector which ensure consumer welfare. CCI, on the other hand, ensures consumers welfare by ensuring that market participants do not abuse their market power or collusion. Section 60 of the Competition Act is an imprecise clause which claims supremacy of competition laws in the field of competition enforcement.

At the same time, there can be cooperation of various regulatory agencies with CCI beneficial for both consumers and the economy. The spirit of complementarity is it also assumes Section 62 of the Act on Economic Competition. Section 62 of the Act the Competition Act declares that competition legislation should work with other legal regulations. Under these provisions both the CCI and the sectoral regulators can work together to solve the problems they seem to have impact on the jurisdiction of the other. If the case is handled by the sector regulator and it appears that there is a possibility that the decision will be violated of the Competition Act, the sectoral regulator may refer the matter to the CCI opinion. The CCI is should express its opinion.

Similarly, if the CCI investigates the case and it is pointed out that there is a possibility that the decision will be contrary to the provision of the law authorized sector regulator, the CCI.

may refer to the sector regulator, will ask for his opinion and contribution to the matter. However, opinions from the sector regulator as well as the CCI will not be binding.

ENDNOTES

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10 Electricity Act 2003, s. 3

11 Electricity Act 2003, s. 4

13 Electricity Act 2003, s.5&6