

A

WINTER PROJECT REPORT

ON

A STUDY OF THE GROWTH OF RENEWABLE

ENERGY IN INDIA

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SHREE J.D GABANI COMMERCE COLLEGE &

SHREE SWAMI ATMANAND SARSWATI

COLLEGE OF MANAGEMENT

VNSGU, SURAT

COLLEGE CERTIFICATE

This is to certify that this winter training report has been prepared by Rushita Nitinbhai Goti (21BBA038) under my guidance and supervision. This project is the result of her own work and is of standard expected from a candidate for the degree of Bachelor of Business Administration (B.B.A).

This report submitted toward the partial fulfilment of the requirement for the degree of Bachelor of Business Administration (B.B.A.) during academic year 2023-24 has been found satisfactory.

*Mr. Govind Dhinaiya
FACULTY GUIDE*

*Dr. Govind Dhinaiya
I/C PRINCIPAL*

Date:

Place: surat

DECLARATION

I, hereby declare that, this winter training report submitted to Shree J. D. Gabani Commerce College & Shree Swami Atmanand Saraswati college of Management, in the fulfilment of requirement of Bachelor of Business Administration (BBA) degree, is result of my own work carried out during January - February 2024.

This project report is entirely an outcome of my own efforts and has not been previously submitted to any other university or institute for any other examination and for any other purpose by any other person.

Rushita Nitinbhai Goti

(21BBA038)

Date:

Place: surat

ACKNOWLEDGEMENT

I hereby grab an opportunity to acknowledge the support which Researcher has got at the time of preparation of winter training project.

First of all, I would like to thank to my collage SHREE J.D GABANI COMMERCE COLLAGE & SHREE SWAMI ATMANAND SARSWATI COLLAGE OF MANAGEMENT which has given us the golden opportunity to prepare the Winter training report of A STUDY OF THE GROWTH OF RENEABLE ENERGY IN INDIA.

Researcher would also like to thank our internal guide Dr. Govind Dhinaiya for helping through Winter project by giving us the necessary suggestions and advices along with their valuable co-ordination in completing this project.

Thank you,

Rushita Goti

EXECUTIVE SUMMARY

This report is a details overview of my winter training Project of **A STUDY OF THE GROWTH OF RENEWABLE ENERGY IN INDIA. During my RESEARCH REPORT** Researcher has learned a lot about the renewable energy sources, importance of renewable energy, environmental benefits with the growth of renewable energy, challenges and opportunities of renewable energy in india, and the growth of renewable energy companies with the help of financial performance and ratios.

This whole project is divided into 7 parts. 1. Industry profile, 2. Company profile, 3. Literature review, 4. Research methodology, 5. Data analysis, 6. Findings, 7. Conclusion of report.

In 1st part where discuss about the Industry profile where deeply describe conventional power sources and non-conventional power sources which help in to this project. 2nd chapter is Company profile where introduce the five Indian renewable energy companies. also describe the how it started and how it going in Indian market. In 3rd chapter is Literature review which describe the past related growth of the Indian renewable energy sector research project done by various researchers. Also mentioned research topic, main objective, data collection, Research design etc. which is helpful for this research project. In 4th chapter is Research methodology where all the information is given about this project that Research topic name, Research main objective, Research design, Data analytical tool, Data collection method, sample size, variable under study, Research limitation etc. In 5th chapter is Data analysis where data collected from the various secondary sources and find the ratios with their interpretation 6th chapter is Findings WHERE all the financial data is given which is create from data analysis and find the growth of these five renewable energy companies and key findings for each individual company. In last chapter is Conclusion where Researcher summarized the whole report of selected companies of renewable energy in India.

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CHAPTER: 1

INDUSTRY PROFILE

CHAPTER: 1

INDUSTRY PROFILE

INTRODUCTION

The power industry, also known as the energy industry, is a sector involved in the generation, transmission, distribution, and sale of electricity. It encompasses various methods of electricity generation, including fossil fuels (coal, natural gas, oil), nuclear, hydroelectric, wind, solar, and other renewable sources. The industry is crucial for providing the energy needed to power homes, businesses, and various industrial processes. Key components include power plants, electrical grids, and utility companies responsible for delivering electricity to end-users. The power industry plays a vital role in supporting economic activities and modern lifestyle.

Power is among the most critical components of infrastructure, crucial for the economic growth and welfare of nations. The existence and development of adequate power infrastructure is essential for sustained growth of the Indian economy. The fundamental principle of India's power industry has been to provide universal access to affordable power in a sustainable way.

India's power sector is one of the most diversified in the world. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power, to viable non-conventional sources such as wind, solar, agricultural and domestic waste. Electricity demand in the country has increased rapidly and is expected to rise further in the years to come. In order to meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required.

India is the third largest producer of electricity in the world. During the fiscal year (FY) 2022–23, the total electricity generation in the country was 1,844 TWh, of which 1,618 TWh was generated by utilities.

India's electricity sector is dominated by fossil fuels, in particular coal, which produced about three-quarters of the country's electricity. The government declared its efforts to increase investment in renewable energy. Under the government's 2023-2027 National Electricity Plan, India will not build any new fossil fuel power plants in the utility sector, aside from those currently under construction. It is expected that non-fossil fuel generation

contribution is likely to reach around 44.7% of the total gross electricity generation by 2029–30.

The Indian national electric grid has an installed capacity of 416.0 GW as of 31 March 2023. Renewable energy plants, which also include large hydroelectric power plants, constitute 40.7% of the total installed capacity. The total installed power generation capacity in India as on October 31, 2023 is 425,535.52 MW with sector wise & type wise break up as given below.



History of Power Resources in India:

The history of power resources in India dates back to the late 19th century when the first power plant was established in Kolkata (then Calcutta) in 1899. The first demonstration of electric light in Calcutta (now Kolkata) was conducted on 24 July 1879 by P.W. Fleury & Co. On 7 January 1897, Kilburn & Co secured the Calcutta electric lighting license as agents of the Indian Electric Co, which was registered in London on 15 January 1897. Initially, power generation was limited to a few cities and industries. However, with the rapid industrialization and urbanization in the post-independence era, the demand for electricity grew substantially.

The Indian power sector witnessed significant developments in the 20th century. The first electric street light in Asia was lit on 5 August 1905 in

Bangalore. The government of India launched various initiatives to expand power generation and ensure electricity access to all. The establishment of state electricity boards and the centralization of power generation and transmission were key steps in the sector's growth.

In the 1990s, India embarked on economic reforms and liberalization, which brought reforms in the power sector as well. The Electricity Act of 2003 paved the way for competition and private participation in power generation and distribution, leading to a more diversified power generation landscape. On 18 August 2015, Cochin International Airport became the world's first fully solar powered airport with the inauguration of a dedicated solar plant. New installations of renewable energy in India surpassed installations of fossil fuel for the first time in 2016–17.

On 29 March 2017, the Central Electricity Authority (CEA) stated that for the first time India has become a net exporter of electricity. India exported 5,798 GWh to neighboring countries, against a total import of 5,585 GWh. The Government of India launched a program called "Power for All" in 2016. The program was accomplished by December 2018 in providing the necessary infrastructure to ensure uninterrupted electricity supply to all households, industries, and commercial establishments. Funding was made through a collaboration between the Government of India and its constituent states.

How work Indian Power Sector?

The power industry involves several interconnected processes to generate, transmit, and distribute electricity.

1. Capacity and Generation Mix: India has a diverse energy mix, including coal, natural gas, hydroelectric, nuclear, solar, and wind power. The country has made significant strides in increasing its power generation capacity over the years.

2. Renewable Energy Focus: There's a strong emphasis on renewable energy sources to address environmental concerns and reduce

dependency on fossil fuels. The National Solar Mission and National Wind Energy Mission are key initiatives promoting renewable energy.

3. Power Distribution and Transmission: Distribution companies are responsible for supplying electricity to end consumers. Efforts are ongoing to modernize and strengthen the transmission and distribution infrastructure.

4. Rural Electrification: Government schemes like Saubhagya aim at achieving 100% electrification of households, including rural areas.

5. Smart Grid Initiatives: Some regions are implementing smart grid technologies to enhance efficiency, monitor consumption, and reduce losses.

6. Government Reforms: The Electricity Act of 2003 introduced reforms to encourage competition, attract private investment, and establish regulatory bodies. Ujwal DISCOM Assurance Yojana (UDAY) was launched to improve the financial health of distribution companies.

7. Challenges: The power sector faces challenges, including financial health issues of distribution companies transmission and distribution losses, and regulatory complexities.

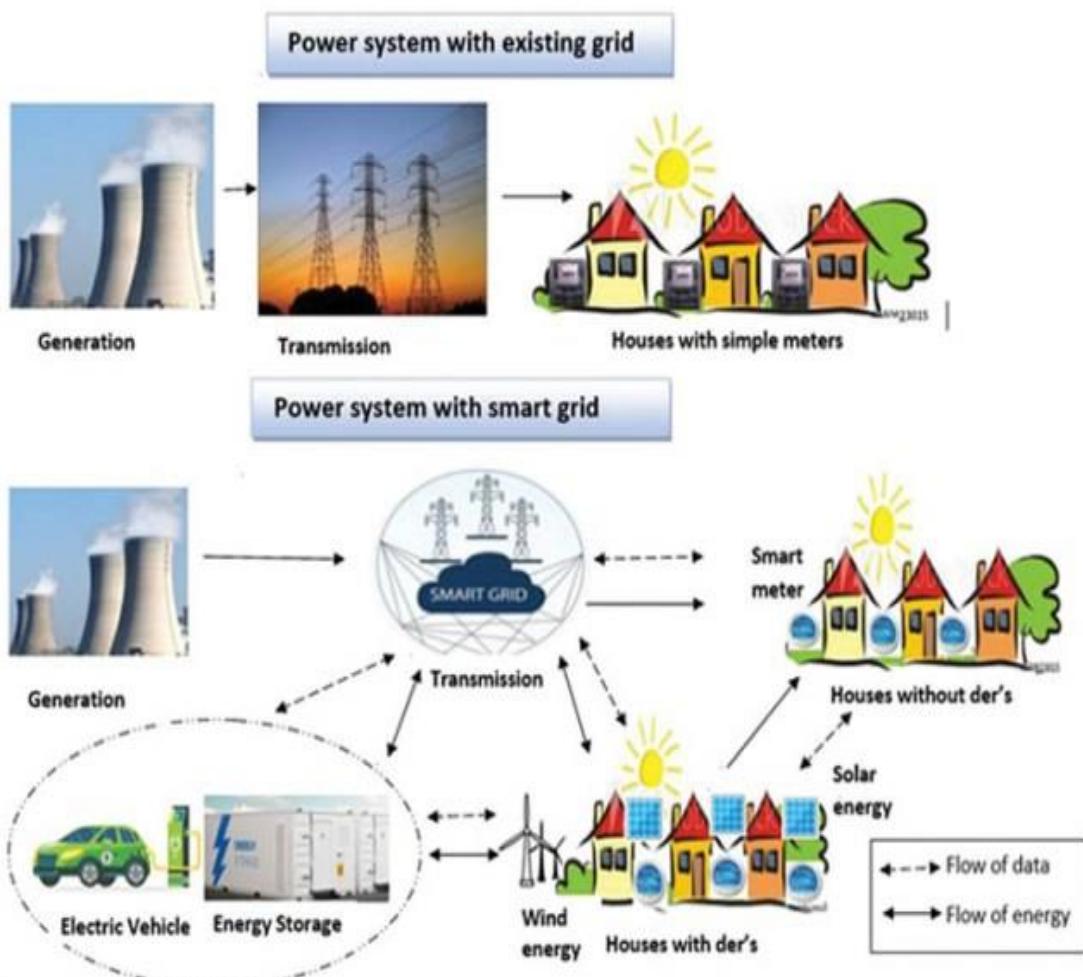
8. International Collaboration: India engages in cross-border electricity trade and collaborations for technology transfer and knowledge exchange.

9. Innovations and Research: Ongoing research and innovation focus on improving energy efficiency, adopting advanced technologies, and addressing environmental concerns.

10. Climate Goals: India has committed to achieving significant renewable energy targets and reducing carbon emissions as part of its climate goals.

11. Private Sector Participation: The power sector in India involves both public and private entities, fostering competition and efficiency.

12. Energy Efficiency Programs: Initiatives like the Perform, Achieve, and Trade (PAT) scheme aim to improve energy efficiency in industries.



WHAT IS POWER PLANT?

A power plant is an industrial facility used to generate electric power with the help of one or more generators which converts different energy sources into electric power.

Electricity is a secondary energy source, which means that electricity is obtained from the conversion of other primary sources of energy, such

as coal, natural gas, nuclear or wind energy. The energy sources used to make electricity can be renewable or non-renewable, but electricity itself is neither renewable or non-renewable. The power plant is the location in which the energy conversions take place.

Traditionally, large power plants have been located in sub-urban regions away from cities, as they need a vast area of land and sometimes water. All electricity produced in a power plant is alternating current. The type of electric current found in your home is direct current.

Power plants can be divided into two categories:

1. Conventional power plants:

- **Fossil fuel power plants:** Generates electric power by burning fossil fuels like coal, natural gas.
- **Nuclear power plants:** Controlled nuclear reaction is maintained to generate electricity.
- **Hydroelectric plants:** Electricity is produced by building dams on suitable rivers



2. Non-conventional power plants:

- **Wind power plants:** The kinetic energy of wind is used to create power.

- **Solar power plants:** Generates power by collecting solar radiation.
- **Geothermal power plants:** Uses the natural heat found in the deep levels of the earth to generate electricity.
- **Biomass power plants:** Natural organic matter is burnt to produce electricity.



Non-conventional Sources of energy in India's Perspective:

Renewable energy sources, often known as non-conventional energy, are sources that are renewed by natural processes on a continual basis. Solar energy, wind energy, bio-energy (bio-fuels cultivated sustainably), hydro-power, and other sustainable energy sources.

A renewable energy system transforms energy from the sun, wind, falling water, sea waves, geothermal heat, or biomass into heat or electricity that humans can utilize. The majority of renewable energy originates from the sun and wind, either directly or indirectly, and can never be depleted, which is why it is termed renewable.

However, traditional energy sources such as coal, oil, and natural gas provide the majority of the world's energy. Non-renewable energy sources are the word used to describe these fuels. Despite the fact that the

accessible amount of these fuels is enormous, they are finite and will, in theory, ‘run out’ at some point in the future.

Non-conventional Sources of Energy:

1. Solar Energy

Since prehistoric times, solar energy has been the most easily available and free source of energy. Every year, solar energy estimated to be equivalent to approximately 15,000 times the world’s annual commercial energy consumption reaches the planet. For 300 to 330 days per year, India receives solar energy in the range of 5 to 7 kWh/m². This energy is enough to run a 20-megawatt solar power plant per square kilometer of land.

The NTPC project would have nearly twice the capacity of Rajasthan’s Bhadla solar park, which is presently the country’s largest single-location solar power plant. By 2032, NTPC hopes to have built 60 GW (gigawatts) of renewable energy capacity.

“Longer-term benefits will come from the development of affordable, unlimited, and clean solar energy technologies,” the International Energy Agency declared in 2011. It would strengthen countries’ energy security by depending on an abundant, limitless, and mostly import-free supply. It boosts sustainability, decreases pollution, cut climate change mitigation costs, and keep fossil fuel prices lower than they would be otherwise. These benefits are widespread. As a result, the increased expenses of early deployment incentives should be viewed as learning expenditures that must be carefully spent and equitably shared “. Australia has the highest amount of solar power in the world, accounting for 9.9% of total electricity demand in 2020.

Solar thermal devices are utilized in residential and industrial solar water heaters, air warmers, solar cookers, and solar dryers.



India's solar power installed capacity was 72.31 GWAC as of 30 November 2023.

During 2010–19, the foreign capital invested in India on Solar power projects was nearly 20.7 billion US\$. In FY2023-24, India is planning to issue 40 GW tenders for solar and hybrid projects. India has established nearly 42 solar Parks to make land available to the promoters of solar plants. The International Solar Alliance (ISA), proposed by India as a founder member, is headquartered in India. India has also put forward the concept of "One Sun One World One Grid" and "World Solar Bank" to harness abundant solar power on a global scale.

The Indian Government had an initial target of 20 GW capacity for 2022, which was achieved four years ahead of schedule. In 2015 the target was raised to 100 GW of solar capacity (including 40 GW from rooftop solar by 2022, targeting an investment of US\$100 billion. The target was widely missed by 40,000 MW shortfall due to poor performance in the rooftop sector.

- **Solar potential:**

With about 300 clear and sunny days in a year, the calculated solar energy incidence on India's land area is about 5,000 trillion kilowatt-hours (kWh) per year. The solar energy available in a single year exceeds the possible energy output of all of the fossil fuel energy reserves in India.

Gujarat is one of India's most solar-developed states, with its total installed solar power generation capacity reaching 7,806 MW as of 30 June 2022. Gujarat has been a leader in solar-power generation in India due to its high solar-power potential, availability of vacant land, connectivity, transmission and distribution infrastructure and utilities.

The state has commissioned Asia's largest solar park near the village of Charanka in Patan district, the Gujarat Solar Park

It also plans to generate solar power by putting solar panels along the Narmada irrigation canals. As part of this scheme, the state has commissioned the 1 MW Canal Solar Power Project on a branch of the Narmada Canal near the village of Chandrasan in Mehsana district. The pilot project is expected to stop 90,000 liters (24,000 US gal; 20,000 imp gal) of water per year from evaporating from the Narmada River.

In March 2022, Surat based Diamond Merchant Mr. Govind Dholakia aka Govind Kaka made his native in Amreli's Dudhala Complete Solarization. A 450 KW Solar Rooftop project will be used to power around 350 houses and public areas such as anganwadis and gram panchayat. Once complete, this would be the first village to be completely powered with solar panels by a Charitable trust or Foundation. Under the mentorship of Mr. Govind Dholakia who is the founder of SRKKF and his sole thought behind this initiative is to give it back to the society.

2. Wind Energy

Wind energy is the process of harnessing wind power to generate electricity. The wind's kinetic energy is transformed into electrical energy. Because of the earth's curvature, various parts of the atmosphere are heated to varying degrees when solar radiation enters the atmosphere. The equator receives the most heat, while the poles receive the least. India started planning in 2010 to enter into offshore wind power.

Wind power generation capacity in India has significantly increased in recent years. As of 31 December 2023, the total installed wind power

capacity was 44.736 gigawatts (GW), the fourth largest installed wind power capacity in the world. Wind power capacity is mainly spread across the southern, western, and northwestern states. India has an offshore wind energy potential of around 70 GW in parts along the coast of Gujarat and Tamil Nadu.

Gujarat government's focus on tapping renewable energy has led to a sharp rise in the wind power capacity in the last few years. The project focuses on the States of Gujarat and Tamil Nadu for the identification of potential zones for development through techno-commercial analysis and preliminary resource assessment. It will also establish a platform for structural collaboration and knowledge sharing between stakeholders from European Union and India, on offshore wind technology, policy, regulation, industry, and human resource development.

Tamil Nadu's total wind capacity was 9608 MW by the end of March 2021, while Gujarat's capacity was approximately 1,000 MW lower, at 8562 MW. However, by the end of January 2023, Gujarat's total wind power capacity had risen to 9,919 MW, while Tamil Nadu's installed wind energy capacity was at 9964 MW. Gujarat gained 710 MW in the current fiscal year, whereas Tamil Nadu added only 99 MW. By mid-2023, Gujarat had surpassed Tamil Nadu in installed.



(Muppandal Wind Farm in Tamil Nadu)

3. Bioenergy

I. Biomass:

Bioenergy is energy made or generated from biomass, which consists of recently living (but now dead) organisms, mainly plants. Biomass is a renewable energy source made up of carbon-based waste from human and natural activity. It comes from a variety of places, including wood industry by-products, agricultural crops, forest raw material, domestic trash, and so on. Biomass does not emit carbon dioxide into the atmosphere since it absorbs the same amount of carbon throughout its growth as it emits when burned. It has the benefit of being able to generate energy using the same equipment that is now used to burn fossil fuels.

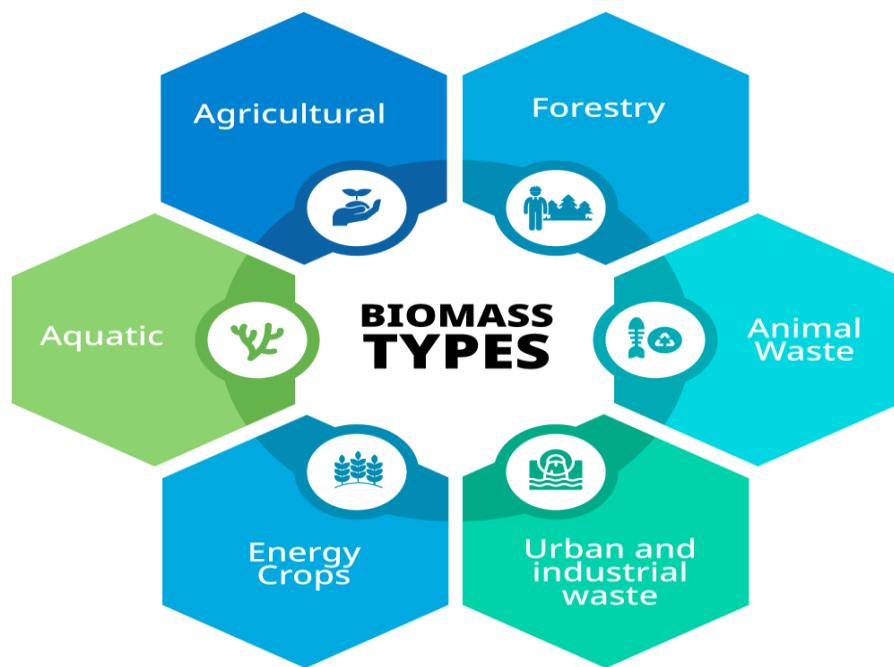
India is an ideal environment for biomass production given its tropical location, sunshine and rains. The country's vast agricultural potential provides agro-residues which can be used to meet energy needs, both in heat and power applications. According to IREDA "Biomass is capable of supplementing the coal to the tune of about 26 crore (260 million) tones", "saving of about ₹25,000 crore, every year." It is estimated that the potential for biomass energy in India includes 16,000 MW from biomass energy and a further 3,500 MW from bagasse cogeneration. Biomass materials that can be used for power generation include bagasse, rice husk, straw, cotton stalk, coconut shells, soya husk, de-oiled cakes, coffee waste, jute wastes, groundnut shells and sawdust.

Wood and wood residues is the largest biomass energy source today. Wood can be used as a fuel directly or processed into pellet fuel or other forms of fuels. Upgrading raw biomass to higher grade fuels can be achieved by different methods, broadly classified as thermal, chemical, or biochemical.

- **Thermal conversion** processes use heat as the dominant mechanism to upgrade biomass into a better and more practical fuel. The basic alternatives are torrefaction, pyrolysis, and gasification, these are

separated mainly by the extent to which the chemical reactions involved are allowed to proceed (mainly controlled by the availability of oxygen and conversion temperature).

- **Chemical conversion** are based one established coal-based processes, such as the Fischer-Tropsch synthesis. Like coal, biomass can be converted into multiple commodity chemicals.
- **Biochemical** processes have developed in nature to break down the molecules of which biomass is composed, and many of these can be harnessed. In most cases, microorganisms are used to perform the conversion. The processes are called anaerobic digestion, fermentation, and composting.



Biomass market in India is expected to reach 32,000 crore by FY2030-31 piggybacking on government schemes as well as investments from global green energy companies.

4. Hydropower

Hydropower also known as water power, is the use of falling or fast-running water to produce electricity or to power machines. This is

achieved by converting the gravitational potential or kinetic energy of a water source to produce power. Hydropower is a method of sustainable energy production. Hydropower is now used principally for hydroelectric power generation, and is also applied as one half of an energy storage system known as pumped-storage hydroelectricity.

A hydropower resource can be evaluated by its available power. Power is a function of the hydraulic head and volumetric flow rate. The head is the energy per unit weight (or unit mass) of water. The static head is proportional to the difference in height through which the water falls. Dynamic head is related to the velocity of moving water. Each unit of water can do an amount of work equal to its weight times the head.

The power available from falling water can be calculated from the flow rate and density of water, the height of fall, and the local acceleration due to gravity:

Hydroelectricity is the biggest hydropower application. Hydroelectricity generates about 15% of global electricity and provides at least 50% of the total electricity supply for more than 35 countries. In 2021, global installed hydropower electrical capacity reached almost 1400 GW, the highest among all renewable energy technologies.

The size of hydroelectric plants can vary from small plants called micro hydro, to large plants that supply power to a whole country. As of 2019, the five largest power stations in the world are conventional hydroelectric power stations with dams.

More than 90% of India's hydroelectricity is operated by the public sector through companies like NHPC, SJVNL, NTPC-Hydro, NEEPCO.



Hydroelectric Power Plant in India:

The **first hydroelectric power plant in India** is **Sidrapong hydroelectric power station** commissioned in 1897 in Darjeeling, followed by the second in Karnataka in 1902.

There are **197 Hydroelectric Power plants in India**. It is estimated that India has a hydroelectric potential of approximately 148,700MW, out of which it has developed 42,783 MW of capacity, and a total of 13,616MW is under construction. India is the third largest consumer and producer of energy in the world. It generates energy from coal, water, wind, and solar energy.

The biggest Hydro Power Plant in India is the **Koyna Hydroelectric project**, situated in the Satara district of Maharashtra. The State Electricity Board is responsible for running the project. The Konya Hydroelectric project is a complex of four dams, including one of the largest dams on the Koyna River, the Koyna Dam, situated near the Koynanagar village. The total capacity of India's largest hydroelectric power plant is 1960 MW.

The country's top five hydroelectric power plants hail from the states of Uttarakhand, Maharashtra, Andhra Pradesh, Himachal Pradesh and Gujarat.



5. Geothermal Energy

Geothermal energy is natural heat derived from the earth's interior that can be used to generate electricity and heat structures. Geothermal energy is a type of renewable energy taken from the Earth's core. It comes from heat generated during the original formation of the planet and the radioactive decay of materials. This thermal energy is stored in rocks and fluids in the centre of the earth.

India is switching from fossil fuels to renewable energy sources due to rising energy demand. Geothermal energy is one such source of energy that is gradually being explored. In India, geothermal energy is still in its nascent stage. The geothermal provinces of India have the potential to generate around 10,600 MW of electricity.

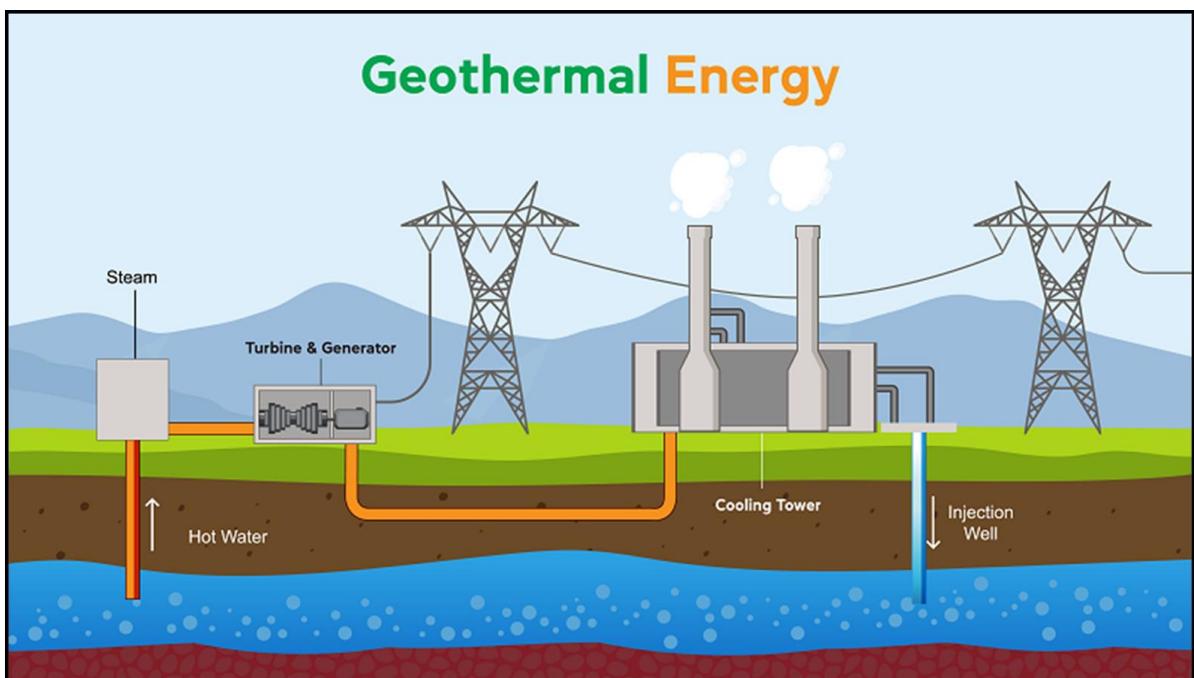
Types of Geothermal Power Plants:

- **Dry Steam Plants:** It takes the steam out of fractures in the ground and uses it to directly drive a turbine.

- **Flash Plants:** In this, they pull deep, high-pressure hot water into cooler low-pressure water. The steam then resulting from this process is used to drive the turbine.
- **Binary Plants:** The hot water is passed by a secondary fluid with a lower boiling point than actual which makes it turn into vapour. This then drives the turbine.

How is it captured?

- Steam is used to generate electricity in geothermal power plants.
- beneath the earth's surface. The steam is produced by hot water reservoirs a few miles or more.
- The steam spins a turbine, which turns a generator, which generates electricity.
- Dry steam, flash steam, and binary cycle geothermal power plants are the three types of geothermal power plants



Geothermal Energy in India:

- Exploration and study of geothermal fields began in India in 1970.

- Around 350 geothermal energy locations have been discovered in India by the Geological Survey of India.
- The Puga valley in Ladakh is the most promising of these. The project would be undertaken by ONGC. On February 7, 2021, an agreement for establishing the first geothermal Power Project was announced.
- The Himalayas, Sohana, West Coast, Cambay (Gujarat), Godavari, Mahanadi, and Son-Narmada-Tapi (SONATA) geothermal provinces, as well as a number of geothermal springs, make up India's geothermal provinces.
- According to the Ministry of New and Renewable Energy, geothermal resources in India have been mapped, and a broad estimate suggests that there could be a 10 gigawatt (GW) geothermal power potential (MNRE).
- The government of Chhattisgarh decided in 2013 to build the country's first geothermal power plant at Tattapani in the Balrampur district. The government has promised to provide a capital subsidy of up to 30% for industrial projects.
- NTPC and the Chhattisgarh Renewable Energy Development Agency (CREDA) have collaborated to bring the first geothermal power plant to Chhattisgarh.
- In India, the Ministry of New and Renewable Energy (MNRE) provides significant incentives and subsidies for geothermal energy research, design, development, and demonstration (RDD&D).
- By 2022, the Ministry of Renewable Energy plans to generate up to 1000 MW of geothermal energy.

CHAPTER: 2

COMPANY PROFILE

1. Adani Green Energy Limited:



Adani Green Energy Limited (AGEL) is an Indian renewable energy company, headquartered in Ahmedabad, India. It is owned by Indian conglomerate Adani Group. The company operates Kamuthi Solar Power Project, one of the largest solar photovoltaic plants in the world.

Founded : 2015

Headquarter : Ahmedabad, Gujarat, India

Founder : Gautam Adani

Revenue : 8,633 cr.

No employees : 2,912

Parent : Adani Group

The company was incorporated on 23 January 2016, as Adani Green Energy Limited under the Companies Act 2013.

During the initial days of existence, AGEL and Inox Wind together established a 20 MW capacity wind power project in Lahori, Madhya Pradesh. Also, AGEL bought Inox Wind's 50 MW wind power project at Dayapar village in Kutch. The project was conceived by the latter when it won a Solar Energy Corporation of India's capacity bids for wind power projects connected to the National Grid.

In 2015–2016, Adani Renewable Energy Park Limited, a subsidiary of AGEL, signed a joint venture agreement with the Government of Rajasthan.

In 2017, the company took the complete control of overall solar energy portfolio of Adani Enterprises and got itself listed at National Stock Exchange of India and Bombay Stock Exchange.

In 2022, Adani Green Energy Limited had a market cap of Rs. 3,26,635.42 crore. Currently, the company manages 5,290 MW of wind energy and solar power plants including 46 operational projects in 11 states of India namely Uttar Pradesh, Rajasthan, Punjab, Maharashtra, Gujarat, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Karnataka, Tamil Nadu, and Telangana. AGEL has a current project portfolio of ~5.29 GW and an operational capacity of ~2.36 GW

2. Tata Power Renewable Energy Limited:



Tata Power Renewable Energy Limited (TPREL) is a wholly owned subsidiary of The Tata Power Company Limited (Tata Power). TPREL is Tata Power's primary investment vehicle for the clean and renewable energy-based power generation capacity.

Tata Power Renewable Energy Limited (TPREL) develops, constructs and operates wind and solar power assets.

Wind Tata Power has an installed capacity of 982 MW wind power generation with plants spread across seven states of Maharashtra, Gujarat, Tamil Nadu, Karnataka, Rajasthan, Andhra Pradesh and Madhya Pradesh leading in promoting wind power generation in India.

solar Tata Power Solar has a portfolio of more than 11.5 GWp of ground-mount utility-scale, over 1.7 GW of rooftop and distributed ground-mounted systems, and over 1 Lakh solar water pumps in India till date.

Founded : September 1919
Headquarter : Mumbai, Maharashtra, India
Founder : Dorabji Tata
Revenue : 56,547.10 crore
No. employees : 23,025
Parent : Tata Group

The firm started as the Tata Hydroelectric Power Supply Company in 1910 which amalgamated with the Andhra Valley Power Supply Company in 1916.

It commissioned India's Second hydro-electric project in 1915 in Khopoli for 72 MW. Then second and third power plants were installed in Bhivpuri (75 MW) in 1919 and Bhira (300 MW) in 1922.

Tata Power is India's largest integrated power utility with a rich leadership legacy in the Indian power sector. TPREL leverages Tata Power's extensive experience and competencies developed over more than 100 years of experience in power plant management.

3. Suzlon Energy Limited:



Founded in 1995, Suzlon is one of the leading global renewable energy solution providers.

The Suzlon Group comprises of Suzlon Energy Limited and its various subsidiaries. The Group's vision for growth is driven by the concept of sustainable development. In recent years, Suzlon has developed strong competencies in solar power too and plans to offer Wind-Solar hybrid solutions.

In India, Suzlon is a market leader with 111+ wind farms and an installed capacity of over 14,330 MW. It has developed some of Asia's largest operational onshore wind farms in nine states including Gujarat, Rajasthan, Maharashtra and Tamil Nadu. The Group's diverse client portfolio includes power utilities and electricity producers in both the private and public sectors.

Founded	: 1995
Headquarter	: Pune, Maharashtra, India
Founder	: Tulsi Tanti
Revenue	: 4,187.33 crore
No. employees	: 58,00
Parent	: Tanti Group

Power Plants:

- The 650 MW wind park in the Sakri Taluka of Dhule District of Maharashtra. And planning to reach 1000 MW.
- A 584 MW wind park in the Eastern Ghats, (Tamil Nadu).
- The 1064 MW Jaisalmer Wind Park in Rajasthan.
- The 210 MW Vankusawade Wind Park near the Koyna reservoir in the Satara district of Maharashtra.

At COP26 in 2021, Prime Minister Shri Narendra Modi announced a multi-pronged approach to support climate action, setting targets of 500 GW of non-fossil fuels energy capacity by 2030; and achieving net zero by 2070. Suzlon wholeheartedly supports the green energy transition

In 2022, Suzlon completed the refinancing exercise to reduce debt by replacing 16 lender consortiums with two government-backed financial institutions. Suzlon also announced its Rs.1,200 crore Rights Issue that was oversubscribed by 1.8x times on closure of the issue period.

4. Borosil Renewables Limited:



Borosil Renewables Ltd. is the first and only solar glass manufacturer in India.

A part of the Borosil group which is well-known for the brand "BOROSIL" that manufactures a range of lab ware, scientific ware, and consumer ware products.

The present solar glass manufacturing capacity is 450 TPD (equivalent to solar glass for 2.8 GW of solar modules) Recently Borosil Renewables Ltd. acquired Inter float Group, the largest solar manufacturer in Europe having a capacity of 300 TPD (equivalent to solar glass for 2 GW of solar modules) The company is working on the next expansion in India to add another 550 TPD capacity (equivalent to solar glass for 3 GW of solar modules) by Q3 FY22 – 23.

Founded	: 1962
Headquarter	: Mumbai, Maharashtra, India
Founder	: Pradeep Kharuka
Revenue	: 619.76 crore
No. employees	: 500+
Parent	: Kharuka Group

Products

- Selene: An anti-glare solar glass suitable for PV installations near airports.
- Shakti: a very high-efficiency solar glass in the matt-matt finish.
- The solar glass with Anti-soiling coating.

5. JSW Energy limited:



JSW Energy Ltd and its subsidiaries are primarily engaged in the business of generation of power from its power assets located at Karnataka,

Maharashtra, Nandyal and Salboni.JSW Energy has grown steadily and strongly through the years. Today, the company's presence extends across several Indian states and includes stakes in natural resource companies in South Africa.

JSW Energy Limited is an Indian power company engaged in power generation, transmission and trading. It is part of JSW Group.

Founded	: 1994
Headquarter	: Mumbai, Maharashtra, India
Founder	: Sajjan Jindal
Revenue	: 10,867 crore
No. employees	: 1000+
Parent	: JSW Group

Power Plants:

- JSW Vijayanagar Power Station, Toranagallu village in Bellary district, Karnataka. It is a 1460 MW
- JSW Ratnagiri Power Station, Nandiwade village near Jaigad in Ratnagiri district, Maharashtra. It is a 1200 MW
- JSW Barmer Power Station, Bhadresh village in Barmer district, Rajasthan. It is a 1080 MW

CHAPTER: 3

LITERATURE REVIEW

Sharma, R. (2018)

Research Topic: Impact of Government Policies on the Growth of Renewable Energy in India.

Research Objective: To analyze the effectiveness of government policies in promoting renewable energy.

Research Design: Qualitative Case Study.

Data Collection Method: Interviews, Document Analysis.

Findings: Government policies have significantly boosted renewable energy adoption, with a 30% increase in renewable energy capacity since 2010.

Conclusion: Effective government policies play a crucial role in the rapid growth of renewable energy in India.

Patel, S. (2019)

Research Topic: Economic Viability of Solar Energy in India.

Research Objective: To assess the economic feasibility of solar energy projects in India.

Research Design: Quantitative Analysis.

Data Collection Method: Surveys, Financial Analysis.

Findings: Solar energy projects in India have achieved grid parity, making them economically viable alternatives to fossil fuels.

Conclusion: With decreasing costs and favorable policies, solar energy presents a sustainable and economically feasible option for India's energy needs.

Aniket Patel. (2019)

Research Topic: "Suzlon's Wind Power Innovation: A Technological Perspective"

Research Objective: To evaluate Suzlon's role in advancing wind power technology, emphasizing key innovations, and their implications for the wind energy sector.

Research Design: Technological Innovation Assessment.

Data Collection Method: Interviews with R&D Teams, Technological Documentation Analysis.

Findings: Suzlon's innovations in blade design, control systems, and grid integration have contributed to the evolution of wind power technology. However, challenges persist in terms of global market competition.

Conclusion: Continuous technological innovation is vital for Suzlon's sustained leadership in the global wind energy market, requiring ongoing investment in research and development.

Khan, M. (2017)

Research Topic: Role of Foreign Direct Investment (FDI) in India's Renewable Energy Sector.

Research Objective: To assess the impact of FDI on the development of renewable energy projects in India.

Research Design: Comparative Analysis.

Data Collection Method: Financial Reports, Interviews.

Findings: FDI has played a pivotal role in enhancing technology transfer, infrastructure development, and project scalability.

Conclusion: Encouraging FDI inflows can catalyze the growth of India's renewable energy sector by leveraging foreign expertise and capital.

Rakesh Verma. (2020)

Research Topic: "Renewable Energy in Indian Textile Mills: A Longitudinal Analysis of Technological Adoption and Impact"

Research Objective: To examine the evolving landscape of renewable energy technologies in Indian textile mills and assess their economic and environmental implications.

Research Design: Longitudinal Study

Data Collection Method: Interviews, Energy Consumption Records

Findings: Textile mills incorporating solar-powered machinery and energy-efficient processes demonstrate reduced carbon footprints and operational costs. However, challenges include retrofitting existing infrastructure and regulatory uncertainties.

Conclusion: The textile industry can significantly contribute to India's renewable energy goals with targeted incentives and supportive policies, emphasizing the need for technology upgrades.

Nidhi Sharma. (2021)

Research Topic: "Financial Performance and Market Dynamics: A Comparative Study of Adani Power's Renewable Energy Ventures"

Research Objective: To assess Adani Power's financial performance concerning its renewable energy ventures and understand its positioning in the competitive market.

Research Design: Longitudinal Study.

Data Collection Method: Interviews, Energy Consumption Records .

Findings: Adani Power's strategic investments in renewable energy contribute positively to its financial performance. Challenges include market volatility and policy uncertainties impacting revenue streams.

Conclusion: Adani Power's renewable energy ventures contribute to its financial resilience, requiring ongoing adaptation to navigate market dynamics and policy changes.

Joshi, A. (2022)

Research Topic: Growth and Adoption of Renewable Energy in the Indian Agriculture Sector.

Research Objective: To examine the adoption, challenges, and benefits of renewable energy technologies within the Indian agriculture sector.

Research Design: Mixed-Methods Approach.

Data Collection Method: Field Surveys, Interviews, Secondary Data Analysis

Findings: The agriculture sector in India has increasingly adopted solar-powered irrigation systems, biogas plants, and wind turbines, leading to enhanced productivity, reduced costs, and environmental sustainability. However, challenges such as initial investment costs, technological awareness, and policy frameworks need addressing.

Conclusion: Integrating renewable energy solutions into the agriculture sector offers dual benefits of sustainable energy access and agricultural productivity, necessitating supportive policies, financial incentives, and awareness programs.

Neha Deshmukh (2022)

Research Topic: "Renewable Energy Adoption in the Indian Information Technology (IT) Industry: A Comparative Analysis"

Research Objective: To compare the renewable energy adoption patterns among different-sized IT companies in India and identify factors influencing their decisions.

Research Design: Comparative Analysis.

Data Collection Method: Surveys, Energy Consumption Data Analysis.

Findings: Larger IT firms exhibit a higher inclination toward renewable energy integration, driven by corporate social responsibility and cost-effectiveness. Smaller firms face challenges related to initial capital and lack of awareness.

Conclusion: Policies encouraging renewable energy adoption, especially tailored for smaller IT enterprises, can foster sustainability in the rapidly growing IT industry.

V. Kapoor. (2023)

Research Topic: Integration of Renewable Energy in the Indian Manufacturing Sector: Opportunities and Challenges.

Research Objective: To assess the potential and barriers of incorporating renewable energy in the Indian manufacturing industry.

Research Design: Longitudinal Study.

Data Collection Method: Surveys, In-depth Interviews, Energy Consumption Analysis.

Findings: Manufacturers embracing solar and wind energy solutions experience cost savings, environmental benefits, and increased energy independence. However, challenges such as intermittency, upfront costs, and regulatory uncertainties hinder widespread adoption.

Conclusion: Strategically integrating renewable energy technologies in manufacturing processes can lead to sustainable practices and economic advantages, necessitating targeted policies, financial incentives, and technological support.

Vikrant Sharma. (2023)

Research Topic: "Future Growth Trajectories of the Indian Renewable Energy Sector: A Prospective Analysis"

Research Objective: To project and analyze the potential future growth of the Indian renewable energy sector, considering policy frameworks, technological advancements, and market dynamics.

Research Design: Future-Oriented Scenario Analysis.

Data Collection Method: Analysis of Government Policies, Industry Reports, Expert Opinions.

Findings: Future growth in the Indian renewable energy sector is expected to be robust, driven by favorable government policies, increasing public awareness, and a growing emphasis on sustainability. Projections indicate a significant surge in solar and wind energy capacity, with advancements in storage technologies contributing to grid stability. Collaboration between the government, private sector, and international entities plays a crucial role in shaping this positive trajectory.

Conclusion: The Indian renewable energy sector is poised for substantial growth, offering vast opportunities for economic development, job creation, and environmental sustainability. Continued policy support, technological innovation, and collaborative efforts will be instrumental in realizing the full potential of the sector, positioning India as a global leader in renewable energy adoption.

Akshay Singhania. (2023)

Research Topic: "Market Entry and Growth Strategies of Borosil Renewables: A Comprehensive Analysis"

Research Objective: To investigate Borosil Renewables' market entry strategies, growth initiatives, and the impact on its positioning within the Indian renewable energy sector.

Research Design: Longitudinal Study.

Data Collection Method: Interviews with Executives, Market Reports Analysis.

Findings: Borosil Renewables' strategic focus on solar glass production for photovoltaic modules has positioned the company as a key player in the solar energy supply chain. Successful market entry strategies include technological investments and global partnerships.

Conclusion: Strategic focus and global collaborations have propelled Borosil Renewables into a significant role in the Indian solar energy ecosystem, emphasizing the importance of specialized market positioning.

CHAPTER: 4

RESEARCH METHODOLOGY

1. Need for research:

In the coming years, the global focus will shift towards adopting clean and sustainable energy sources. India, as a rapidly developing nation has the potential to become a global leader in the renewable energy sector for this reason researcher wants study and their aims to explore the growth of renewable energy in India. The present study focuses on the analysis of the growth of the Indian renewable energy industry with the help of statistical tools like ratio, percentage.

2. Problem statement:

“A study of the growth of renewable energy in India.”

3. Research objective:

The objectives are as under:

a. Primary objective:

- To analyze/measure the growth of renewable energy in India.

b. Secondary objective:

- To study overall financial health of selected renewable energy companies.
- To study the development of renewable energy companies/Industry in India.

4. variable under study:

- Net Profit
- Net Sales
- Return on Assets (ROA)
- Return on Investment (ROI)

5. Research Design:

a. Type of research

Being a Researcher, I have used 'Descriptive Research Design'. This design aims/helps to provide a detailed account of a phenomenon or describe the existing situation and this research design would allow researchers to collect and analyze data on the financial performance of companies including their revenue, profitability, to provide a comprehensive understanding of the topic.

b. Data collection method

Being a Researcher, I have used secondary data. This secondary information will be collect through internet, official website.

c. Sample design:

i. Sampling unit:

Researcher take these five Indian renewable companies:

1. Adani Green energy Ltd.
2. Tata power Renewable Energy Ltd.
3. Suzlon Energy Ltd.
4. Borosil Renewables Ltd.
5. JSW Energy Ltd.

Researcher choosing these five companies for India's growth ensures a balanced approach to sustainable development, energy security, economic and technological advancement, leveraging their expertise and capabilities to drive India's progress across various sector and domains.

ii. Sample Period:

Sampling period was last five financial year from 1st April 2018 to 31st March 2023.

iii. Sample size:

I have taken 5 Renewable energy companies as above.

6.Tools used for Data Analysis:

- Table
- Chart

7.Limitation of study:

- The study was limited to five companies.
- The data collected is through the secondary sources hence the reliability of the data is not 100% and I have taken only past 5 years data.
- It has been not possible to get a personal interview with the top Management employees of all companies under study.

CHAPTER: 5

DATA ANALYSIS

Liquidity Ratio:

Liquidity analysis aims to determine the ability of a business to meet its financial obligations during the short term and to maintains its short-term debt-paying ability. The liquidity ratios answer the question of whether a business firm can meet its current debt obligations with its current assets.

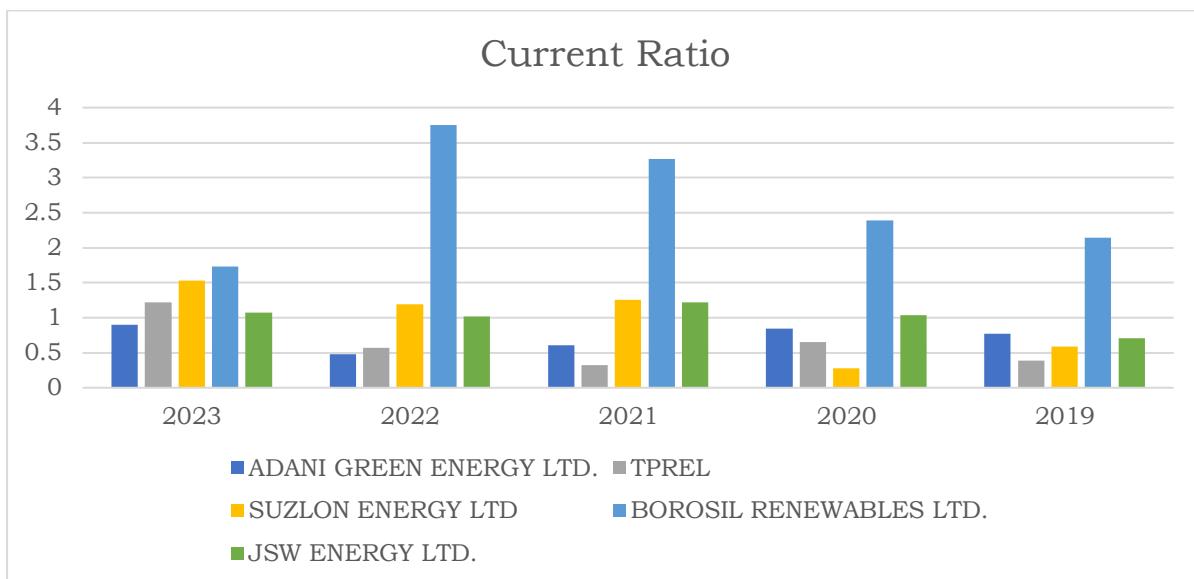
Current ratio (%):

The current ratio is also known as the working capital ratio or banker's ratio. It expresses the relationship of a current asset to current liabilities.

Current Assets / Current Liability

Company Name	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	0.9	0.48	0.61	0.84	0.77
TPREL.	1.22	0.57	0.32	0.65	0.39
SUZLON ENERGY LTD.	1.53	1.19	1.26	0.28	0.59
BOROSIL RENEWABLES LTD.	1.73	3.75	3.27	2.39	2.14
JSW ENERGY LTD.	1.07	1.02	1.22	1.04	0.71

Chart:-



Interpretation:

Adani Green Energy Ltd.: There's a noticeable peak in 2022 with a current ratio above 3.5, indicating a strong liquidity position. However, this ratio has seen a significant decrease in 2023, dropping to just above 1.

Suzlon Energy Ltd.: This company's current ratio has been consistently below 1 across the five years, suggesting that it may have had insufficient current assets to cover its current liabilities during this period.

JSW Energy Ltd.: The current ratio for JSW Energy Ltd. has shown volatility, with a peak around 2.5 in 2021, a drop in 2022, and a slight increase again in 2023 to approximately 1.5.

Tata Power Renewable Energy Ltd.: The current ratio for TPREL has been relatively stable compared to others, hovering around the 1 to 1.5 range for the entire period. There's a small uptick in 2023, suggesting a slight improvement in liquidity.

Borosil Renewables Ltd.: This company's current ratio has varied significantly, with the highest point in 2020 above 2.5, a sharp decrease in 2021 to approximately 0.5, and then a gradual increase to just below 1 in 2023.

Profitability ratio:

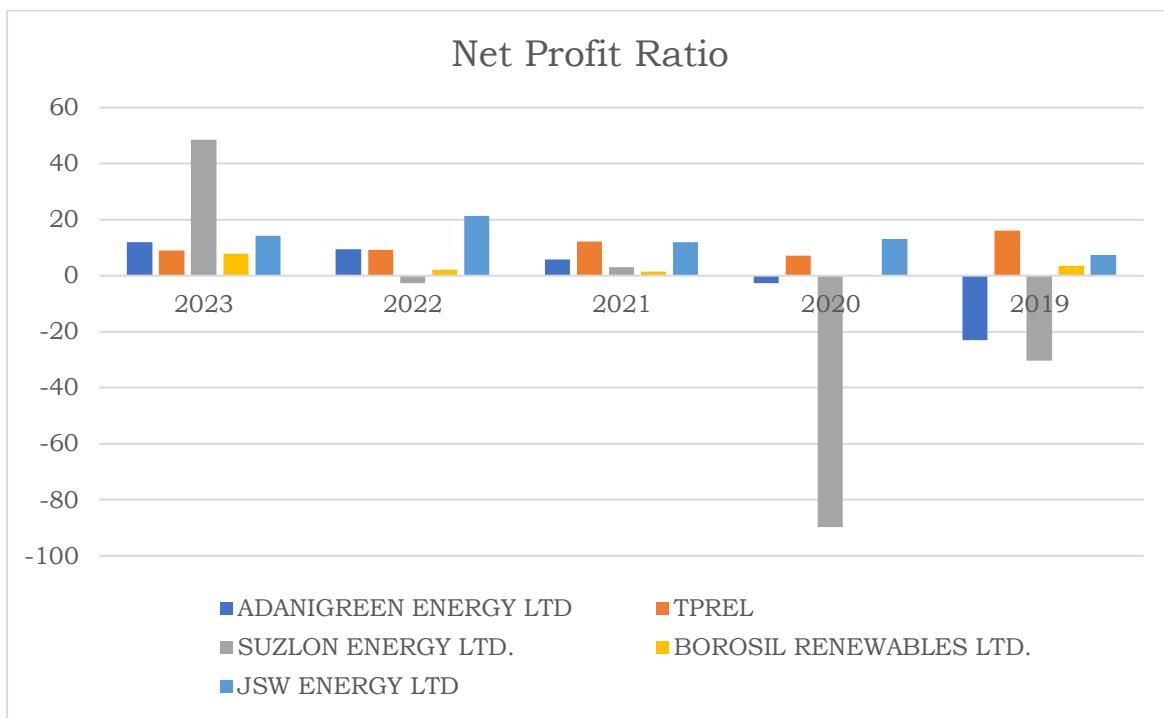
Net Profit Ratio (%):

Net Profit ratio is indicating the company's or firm's profit in a business segment. It is calculated by dividing the company's profit by the net sales. We can express the net profit ratio in percentage or rational or decimal form. This helps in evaluating a company's financial health.

$$\text{Net profit} / \text{Revenue from Operation} * 100$$

Year	2023	2022	2021	2020	2019
ADANIGREEN ENERGY LTD.	12.00	9.52	5.83	(2.65)	(23.08)
TPREL.	8.90	9.11	12.15	7.24	16.05
SUZLON ENERGY LTD.	48.55	(2.71)	3.14	(89.71)	(30.29)
BOROSIL RENEWABLES LTD.	7.90	2.08	1.41	0.17	3.49
JSW ENERGY LTD.	14.33	21.35	11.88	13.07	7.49

Chart:-



Interpretation:

Adani Green Energy Ltd.: This company's highest net profit ratio is in 2023 which is 120, and lowest in 2019 which is (23.08).

Suzlon Energy Ltd.: The net profit ratio for suzlon energy was negative in 2019, 2020, 2022 but it turned positive in 2021 and projected to stay positive till 2023. Trend line shows that company's net profit ratio is in fluctuating trend.

JSW Energy Ltd.: JSW Energy had a consistent positive operating profit ratio from year 2019 to 2023. The highest net profit ration in year 2022 which is 21.35, it is decrease in 2023 which is 14.33.

Tata Power Renewable Energy Ltd.: This company has shown a positive net profit ratio in all years from 2019 to 2023. The highest profit ratio is in 2019.

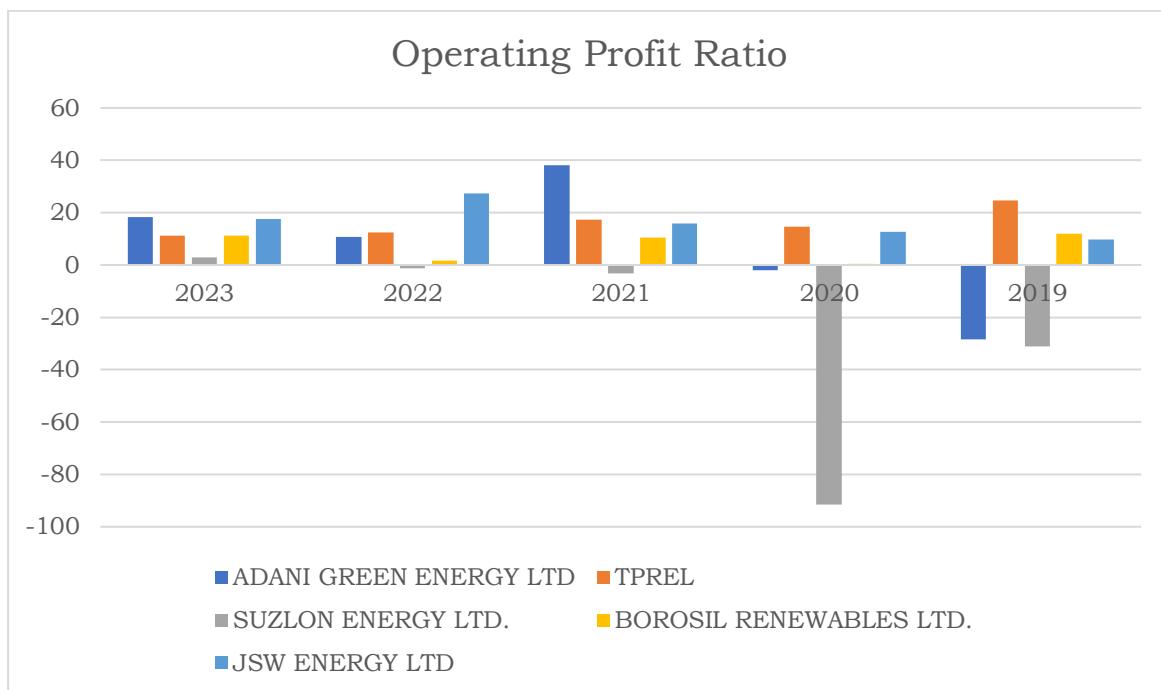
Borosil Renewables Ltd.: In Borosil Renewables company's highest net profit ratio in 2023 which is 7.90 and it is decrease in 2022, 2021, 2020 respectively.

Operating Profit Ratio (%):

It shows the relationship between operating profit and net sales. The operating profit ratio is the amount of money a company makes from its operations. It is best to maintain an operating profit ratio that's close to 20%. Companies can establish a protocol for operations and production lines, manage supply chains better to bring the operating costs down, operating income up, and boost their marketing efforts to increase sales. i.e., revenue from operations.

Operating Profit / Revenue from Operations * 100

Company name	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	18.30	10.77	37.99	(1.94)	(28.40)
TPREL.	11.29	12.31	17.32	14.73	24.63
SUZLON ENERGY LTD.	2.88	(1.28)	(3.19)	(91.50)	(30.99)
BOROSIL RENEWABLES LTD.	11.30	1.57	10.47	0.47	12.06
JSW ENERGY LTD.	17.64	27.41	15.87	12.72	9.81

Chart:-**Interpretation:**

Adani Green Energy Ltd.: This company has shown a positive operating profit ratio in all years from 2019 to 2023. The highest profit ratio is in 2022, and it has been increasing each year.

Tata Power Renewable Energy Ltd.: The operating profit ratio for TPREL was negative in 2019 and 2020 but turned positive in 2021 and projected to stay positive till 2023. Trend line shows that company's operating ratio was sharply falls in last five years.

Suzlon Energy Ltd.: Suzlon had a negative operating profit ratio from 2019 to 2021, with the lowest being in 2020. It is expected to have a positive ratio in 2022 and 2023.

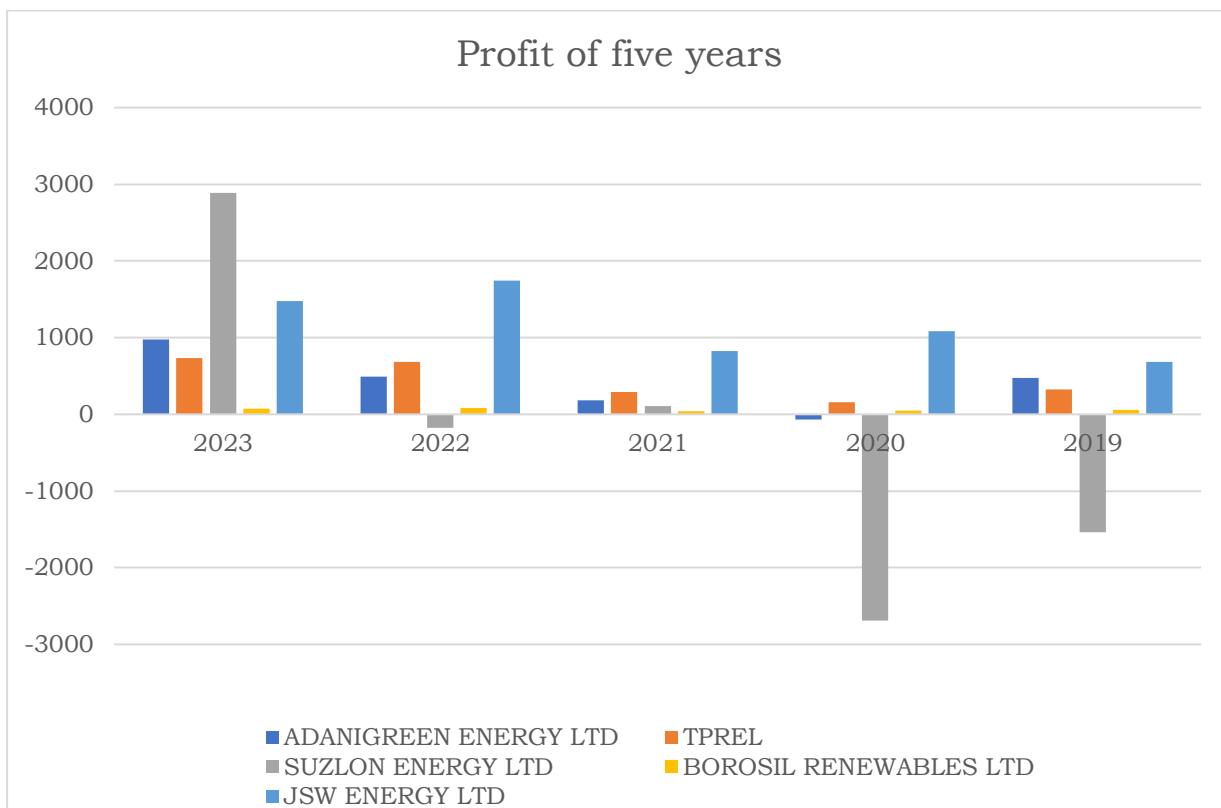
Borosil Renewables Ltd.: Borosil had a negative operating profit ratio in all years except for a significant positive spike in 2022.

JSW Energy Ltd.: JSW Energy had a consistent positive operating profit ratio from the year 2019 to expected figures of up until the year of projection, which is till the year of projection.

Profit Of Five Years (cr):

Company Name	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	973.00	489.00	182.00	(68)	475.06
TPREL.	729.91	685.30	287.48	157.76	328.45
SUZLON ENERGY LTD.	2887.29	(176.55)	103.59	(2691.84)	(1537.19)
BOROSIL RENEWABLES LTD.	70.64	85.24	42.36	45.28	60.01
JSW ENERGY LTD.	1480.12	1743.48	822.68	1081.18	684.49

Chart:-



Interpretation:

Adani Green Energy Ltd.: This company showed a significant profit in 2022, with the bar reaching above 3000. In other years, the profits are relatively low or negative, especially in 2020 where losses were incurred.

Suzlon Energy Ltd.: The company faced losses in all five years from 2019 to 2023, with the most significant loss occurring in 2020.

JSW Energy Ltd.: This company had moderate profits in all years except for 2020, where it incurred a loss.

Tata Power Renewable Energy Ltd.: The profit of TPREL fluctuated over the five years. It made a profit in 2019 and 2021 but faced losses in the other three years.

Borosil Renewables Ltd.: Borosil Renewables also experienced fluctuations. It made profits in 2019 and slight profits in other years except for a loss incurred in 2022.

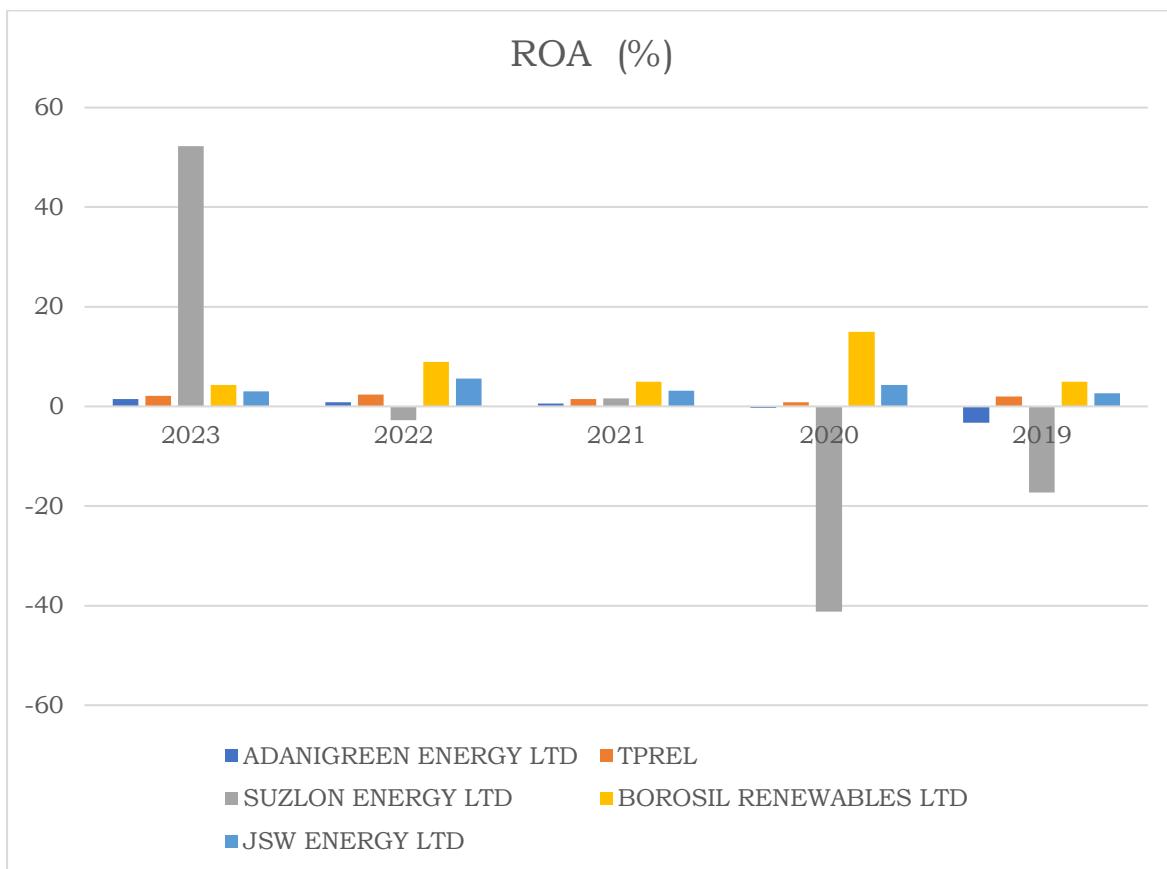
Return on assets (%):

Return assets (ROA) is a profitability ratio that shows how much profit a company earns from its total assets on its balance sheet. ROA is a percentage that indicates how efficiently a company's management uses its resources to generate profit. ROA is a branch of the return-on-investment matrix and one of the tools to assess the managerial performance of a company.

Net Income / Total Assets * 100

Finance year	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	1.44	0.83	0.63	(0.36)	(3.24)
TPREL.	2.13	2.42	1.51	0.89	1.96
SUZLON ENERGY LTD.	52.27	(2.72)	1.57	(41.22)	(17.33)
BOROSIL RENEWABLES LTD.	4.33	8.91	4.91	15.03	5.00
JSW ENERGY LTD.	3.04	5.64	3.11	4.31	2.64

Chart:-



Interpretation:

Adani Green Energy Ltd.: This company has shown a negative return on asset in 2019 and 2020. But in 2021 it turned positive which was 0.63. The highest return on asset is in year 2023 which was 1.44.

Tata Power Renewable Energy Ltd.: This company has shown a positive return on assets all years from 2019 to 2023. The highest return on assets in year 2022 which is 2.42.

Suzlon Energy Ltd.: In year 2020, company's return on assets is lowest which is (-41.22). Similarly in year 2022 and 2019 it was negative. But in previous year it converted into positive return which is 52.27. It was highest return of assets. The higher ROA means a company is more efficient and productive at managing its balance sheet to generate profits.

Borosil Renewables Ltd.: This company has shown a positive return in all years from 2019 to 2023. The highest return on assets is in 2020 which is 15.03.

JSW Energy Ltd.: The return on assets is positive in all years for this company. In year 2023 and 2021, it was 3.04 and 3.11 respectively, and 2.64 is lowest value which was in 2019.

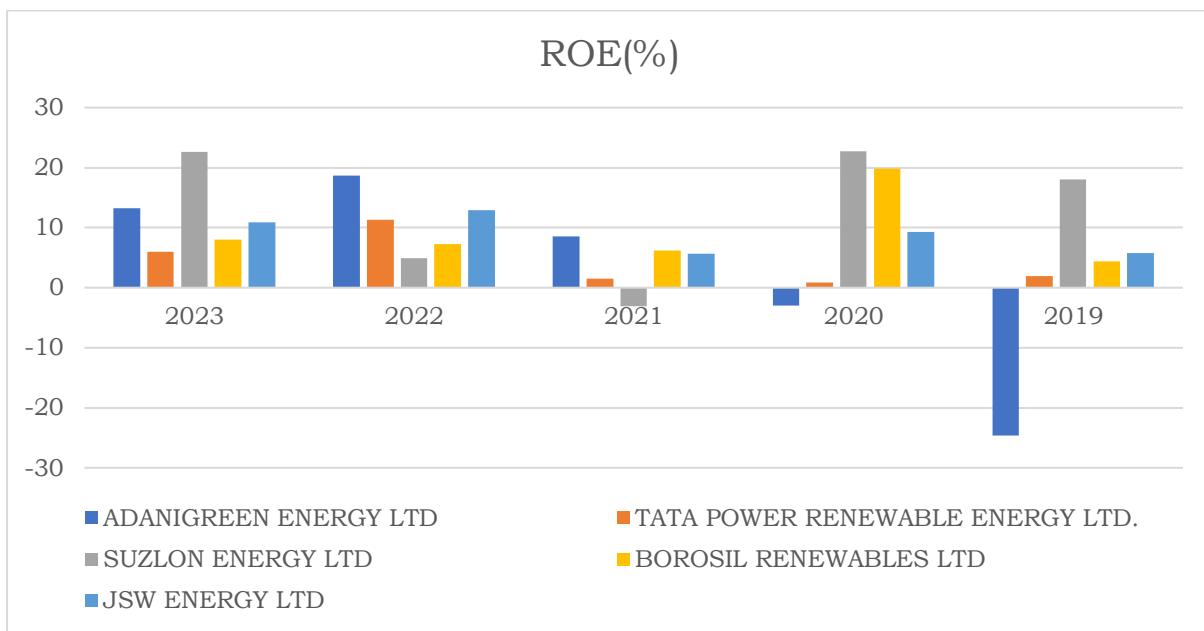
Return on equity (%):

Return on equity (ROE) is a profitability metric that shows how much profit a company can generate from the money contributed by its shareholders and retained profits. ROE can help assess a company's performance and management of equities and investments.

Net Income / Shareholder's Equity * 100

Company Name	2023	2022	2021	2020	2019
ADANIGREEN ENERGY LTD.	13.23	18.70	8.56	(2.94)	(24.58)
TPREL.	5.95	11.33	1.52	0.90	1.96
SUZLON ENERGY LTD.	22.66	4.96	(3.05)	22.73	18.08
BOROSIL RENEWABLES LTD.	8.01	7.22	6.22	19.80	4.43
JSW ENERGY LTD.	10.88	12.93	5.67	9.30	5.79

Chart:-



Interpretation:

Adani Green Energy Ltd.: This company has shown a negative return on equity (ROE) in 2019 and 2020. A negative ROE would signify that the company has problems with debt, asset retention or both. The highest ROE is in 2020, and it has been decreasing slightly each year.

Tata Power Renewable Energy Ltd.: This company's Highest ROE value in year 2020 which is 11.33 and lowest is 0.90 which is in 2019.

Borosil Renewables Ltd.: This company's lowest ratio is 4.43 and highest ratio is 19.80 which is in year 2019 and 2020 respectively.

Suzlon Energy Ltd.: This company had a positive ROE in 2019, which was around 18 %. This company's highest ROE value in year 2023 which is 22.66.

JSW Energy Ltd.: This company's ratio fluctuated year by year.

Return on capital employed (%):

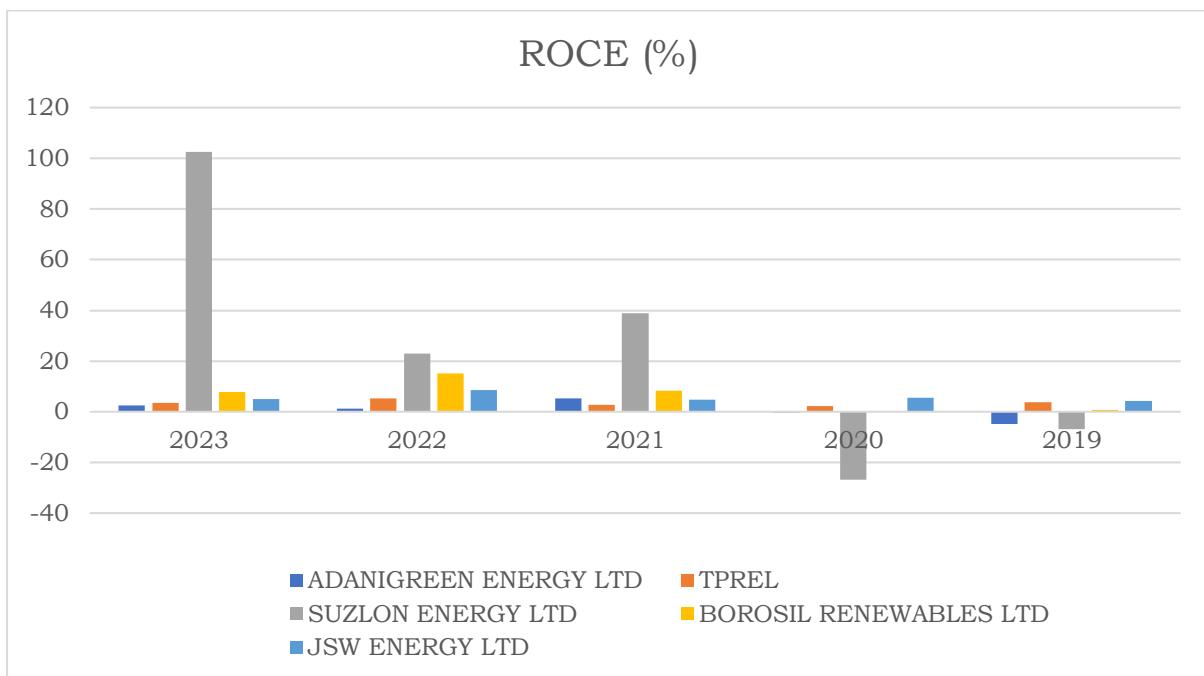
The term return on capital employed (ROCE) refers to a Financial ratio that can be used to assess a company's profitability and capital efficiency. In other words, this ratio can help to understand how well a company is generating profits from its capital as it is put to use. ROCE is one of several

profitability ratios financial managers, stakeholders, and potential investors may use when analyzing a company for investment.

Net Operating profit / Total assets – current liability * 100

Company Name	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	2.40	1.16	5.18	(0.32)	(4.89)
TPREL.	3.52	5.19	2.86	2.20	3.77
SUZLON ENERGY LTD.	102.64	23.04	38.85	(26.79)	(6.76)
BOROSIL RENEWABLES LTD.	7.71	15.09	8.39	0.31	0.84
JSW ENERGY LTD.	5.01	8.66	4.80	5.41	4.16

Chart:-



Interpretation:

Adani Green Energy Ltd.: we can see from the chart that the ratio of Adani Green Energy Ltd. Is negative in 2019 and 2020 that was going in the wrong direction; this could happen when a business experience a loss and has no net income. In year 2020 it was turn into positive.

Suzlon Energy Ltd.: It maintains a consistent but low positive ROCE throughout the five years. In year 2023, the return of ROCE 102.64 which is higher than the other companies.

JSW Energy Ltd.: The ROCE for this company is mostly negative except for a small positive value in 2021.

Tata Power Renewable Energy Ltd.: This company also has negative ROCE values throughout the years, with a slight increase in 2021 but not enough to reach positive values.

Borosil Renewables Ltd.: In this company, the highest ratio of ROCE is 15.09 and lowest is 0.84.

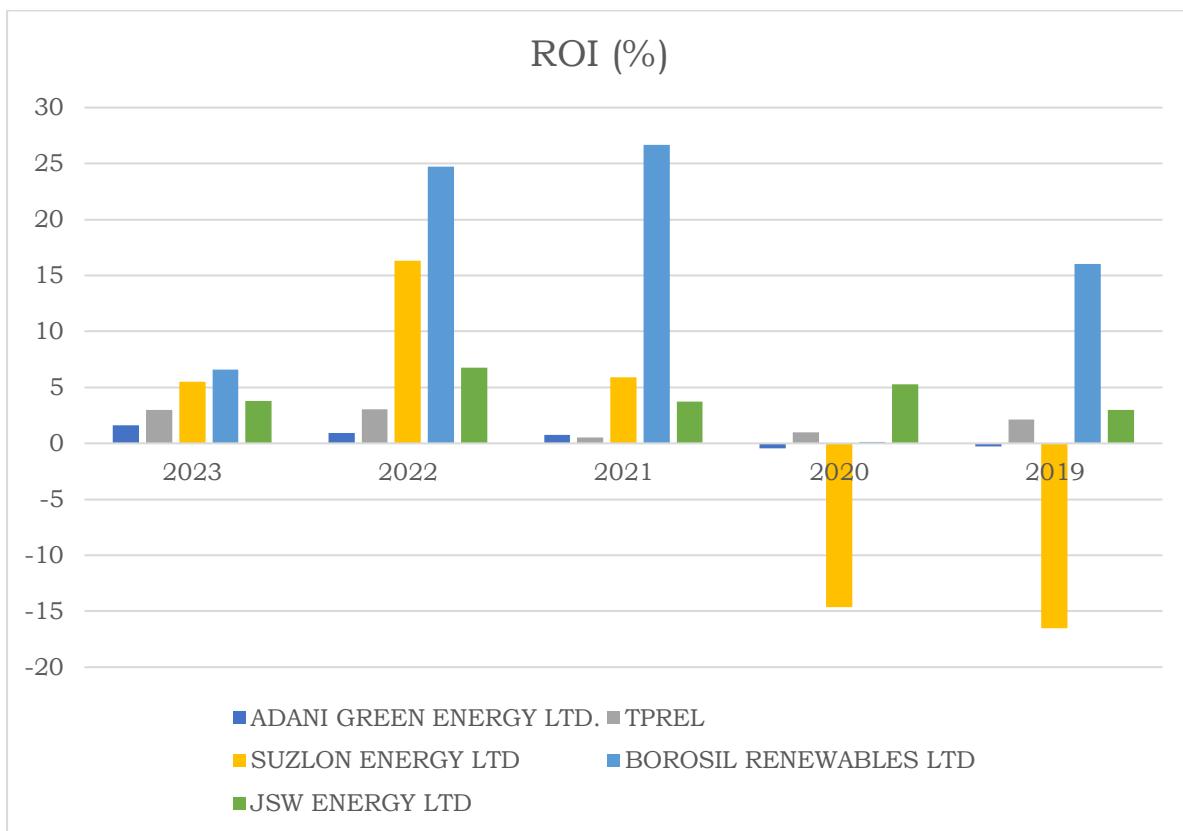
Return on Investment

Return on Investment (ROI) is a popular profitability metric used to evaluate how well an investment has performed. ROI is expressed as a percentage and is calculated by dividing an investment's net profit (or loss) by its initial cost or outlay. ROI can be used to make apples-to-apples comparisons and rank investments in different projects or assets.

Net profit / Investment * 100

Company Name	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	1.63	0.92	0.74	(0.43)	(0.29)
TPREL.	2.98	3.07	0.51	1.01	2.14
SUZLON ENERGY LTD.	5.53	16.31	5.91	(14.63)	(16.54)
BOROSIL RENEWABLES LTD.	6.57	24.71	26.69	0.12	16.05
JSW ENERGY LTD.	3.78	6.78	3.74	5.26	3.00

Chart:-



Interpretation:

The ratio can be seen as representing the efficiency with which capital is being utilized to generate revenue.

Adani Green Energy Ltd.: It shows negative ROI in 2019 and 2020. In 2021 ROI turn into positive value, it was 0.74, 0.92, 1.63 respectively from year 2021 to 2023.

Tata Power Renewable Energy Ltd.: From the above table and graph chart it is interpreted that company's highest ratio is 3.07 in 2022 and lowest ratio is 0.51 which is in year 2021.

Suzlon Energy Ltd.: This company also has negative ROI values in 2019 and 2020. In year 2022, company's return on investment value is 16.31 which is highest return for this company.

Borosil Renewables Ltd.: This company's ROI values is overall good from other companies. In year 2021, company's ratio was 26.69 which is highest from other companies.

JSW Energy Ltd.: All ROI ratio is near by 3 to 6. The company's ratio was 3.00 in 2019 which is lowest, and 6.78 in year 2022 which is highest.

Efficiency Ratio:

An efficiency ratio measures a company's ability to use its assets to generate income. For example, an efficiency ratio often looks at various aspects of the company, such as the time it takes to collect cash from customers or the amount of the time it takes to convert inventory to cash.

Assets turnover ratio:

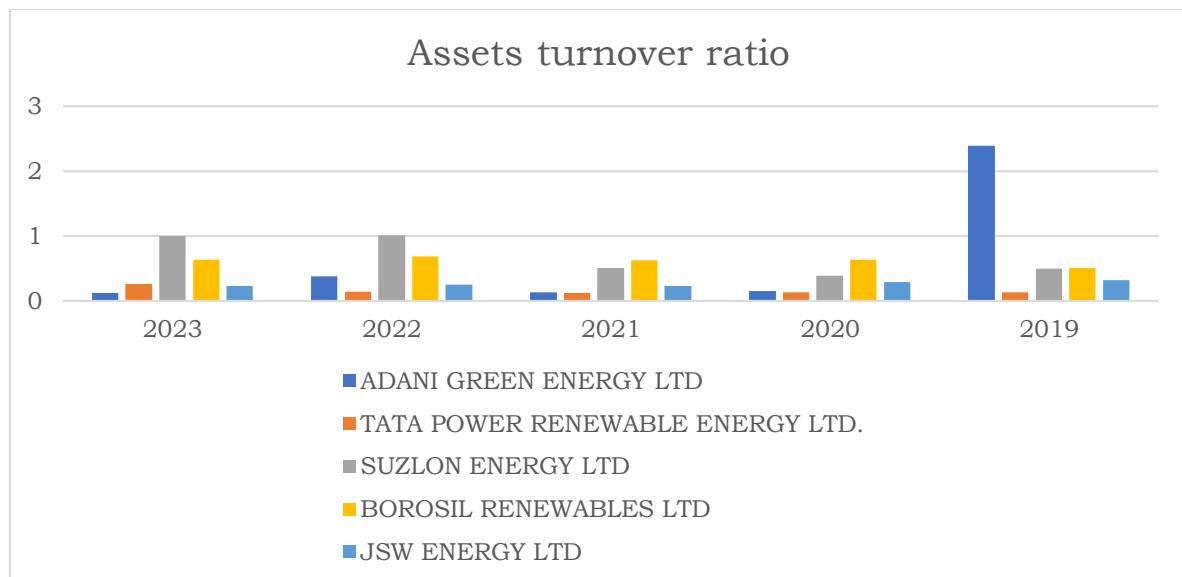
The asset turnover ratio measures the value of a company's sales or revenues relatives to the value of its assets. The asset turnover ratio can be used as an indicator of the efficiency with which a company is using its assets to generate revenue.

The higher the asset turnover ratio it means the more efficient a company is at generating revenue from its assets, conversely, if a company has a low asset turnover ratio, it indicates it is not efficiently using its assets to generate sales.

$$\text{Net Sales} / \text{Average total assets}$$

Company Name	2023	2022	2021	2020	2019
ADANI GREEN ENERGY LTD.	0.12	0.38	0.13	0.15	2.39
TPREL.	0.26	0.14	0.12	0.13	0.13
SUZLON ENERGY LTD.	1.00	1.01	0.51	0.39	0.50
BOROSIL RENEWABLES LTD.	0.63	0.68	0.62	0.63	0.51
JSW ENERGY LTD.	0.23	0.25	0.23	0.29	0.32

Chart:-



Interpretation:

Adani Green Energy Ltd.: In the given chart we can easily interpret that the growth of assets turnover ratio is between in 0 to 2. In the year 2019, it is the highest ratio which value is 2.39.

Tata Power Renewable Energy Ltd.: In this company all ratios is related from each other. In year 2019 and 2020 ratio is same which is 0.13 and year 2021 it decrease by 0.01. In year 2023, it was highest.

Suzlon Energy Ltd.: This company's asset turnover value is between in 0 to 1. In 2019, it was 0.50 and it was increase in double in 2023.

Borosil Renewables Ltd.: This company's assets turnover ratio has been consistently below 1 across the five years. In 2023 and 2020 same value for the company which is 0.63.

JSW Energy Ltd.: From the above chart and graph chart it is interpreted that, in 2019 ratio was 0.32 which is highest in five years. It becomes in 0.29 in 2020, and last year assets turnover ratio is 0.23 which is less than previous year.

CHAPTER: 6

FINDINGS

Ratio	Adani green energy	Tata power renewable energy	Suzlon energy	Borosil renewables	JSW energy
Current ratio	0.9	1.22	1.53	1.73	1.07
Net profit ratio	12.00	8.90	48.55	7.90	14.33
Operating profit ratio	18.30	11.29	2.88	11.30	17.64
ROA	1.44	2.13	52.27	4.33	3.04
Return on equity	13.23	5.95	22.66	8.01	10.88
Return on capital employed	2.40	3.52	102.64	7.71	5.01
Return on investment	1.63	2.98	5.53	6.57	3.78
Assets turnover ratio	0.12	0.26	1.00	0.63	0.23

- The current ratio of Borosil renewables is the highest so it means is the more capable of paying its obligation because it has a larger proportion of short-term asset value relative to the value of its short-term liabilities.
- Borosil renewables limited net profit is less than other companies. And the highest net profit ratio is in Suzlon energy So, It can say that

- Suzlon energy limited earn more profit and more finance stable and able to effectively control its costs or provide goods and services at a higher price significantly than it's cost.
- Adani green energy has a higher operating profit ratio, it is good indicator that a business has a high quality of earnings.
- Suzlon energy is the higher return on assets. That mean company much better generating profit than other companies.
- Tata power renewable energy has lowest return on equity ratio. And Suzlon energy has a higher return on equity ratio so it is better a company is at converting its equity financing into profits.
- Suzlon energy capital employed ratio is the highest so it's shows good sign that company is in good financial position.
- The return on investment (ROI) is higher in borosil renewables limited compare to others, therefore this company's return on the investments outweighs the costs. Which means that company's business is doing great.
- Suzlon energy has a higher asset turnover ratio, it means this company has effectively used investment in assets to generate sales.
- Above five companies are financial stable and healthy. In some proportion of ratio suzlon energy performance is very well and same as other companies. A higher ratio indicates that the company is more efficient at using its assets to generate revenue or profit.

CHAPTER: 7

CONCLUSION

In conclusion, renewable energy is a vital part of the future of our planet. It is clean, sustainable, and has the potential to provide us with all the energy we need without harming the environment. While there are still some challenges to overcome. We must continue to invest in renewable energy research and development so that we can make the switch to a clean energy future as soon as possible. In this research, five renewable energy companies selected. First is Adani green energy limited and second is Tata power renewables energy limited, third is Suzlon energy limited, fourth is Borosil renewables limited or fifth is JSW energy limited. These companies are well-known and reputed renewable energy companies in India.

Adani green energy is continue growing in net profit ratio. This is likely due to number of factors, including its efficient operations, strong financial position and its favorable market condition. It indicates that the company is well managed and that it is generating strong profits. The company continues to grow and expand its operations.

Tata power renewable energy limited performance declined in 2023. Ratios decline suggests that tata renewable energy is not as profitable as it was in previous year. Net profit ratio and operating profit ratio is decline in 2023. It appears that tata renewable energy needs to take steps to improve its profitability.

Suzlon energy limited is a volatile company with fluctuating ROI. In 2019 to 2022 company's net profit is fluctuated but in last year the company made high profit, and it indicates that the company is very efficient at generating profits. Return on equity ratio has been downward trend due to the company issued new shares. The company is generating a high return on the capital it has invested. so that it is using its resources efficiently and generate a good return for its shareholders.

Borosil renewables has increased its net profit ratio and operating profit ratio in last year that indicates the company is performing well and

generating a healthy profit in future. This company has been generating very little revenue from its assets. And ROI has been declined in recent years that is just a snapshot of their performance.

APPENDIX

BALANCE SHEET

BALANCE SHEET OF ADANI GREEN ENERGY (in Rs. Cr.)	MAR 23	MAR 22	MAR 21	MAR 20	MAR 19
	12months	12months	12months	12months	12months
ASSETS					
NON-CURRENT ASSETS					
(a) Property, plant and equipment	46,105	26,884	15,969	12,122	10,384
(b) Capital work-in- progress	5,291	19,899	4,452	1,208	743
(c) Goodwill	3	3	3	3	3
(d) Other intangible Assets	76	80	78	2	1
(e) Intangible assets under development	-	-	36	30	-

(g) FINANCIAL ASSETS					
(i) Investments	131	73	250	250	36.71
(ii) Trade receivables	38	-	-	-	-
(iii) Loans	74	70	994	-	34.13
(iv) Other financial assets	4342	3029	1,336	933	436.49
(h) Income tax assets (net)	143	157	52	36	18.61
(i) Deferred tax assets (net)	459	562	420	350	376.36
(j) Other non-current assets	739	798	763	481	550.90
(k) Right-of-Use Assets	2,152	1,485	379	427	-
TOTAL NON-CURRENT ASSETS	59,553	53,040	24,732	15,842	12,584
CURRENT ASSETS					
(a) Inventories	52	17	29	104	136

(b) FINANCIAL ASSETS					
(i) Investments	1,018	501	216	197	40
(ii) Trade receivables	2,206	1,809	1,203	740	758
(iii) Cash and cash equivalents	1,002	567	184	637	254
(iv) Bank balances other than (iv) above	982	1,026	835	58	107
(v) Loans	87	25	103	117	94
(vi) Other financial assets	1,426	439	473	562	284
(c) Other current assets	440	1,122	505	147	400
TOTAL CURRENT ASSETS	7,213	5,506	3,548	2,562	2,074
Assets classified as held for sale	595	621	441	21	-
TOTAL ASSETS	67,361	59,167	28,721	18,425	14,658
EQUITY AND LIABILITIES					

EQUITY					
(a) Equity share capital	1,584	1,564	1,564	1,564	1,564
(b) Other equity	4,296	(374)	(703)	(801)	(724)
(c) Instruments entirely equity in nature	1,424	1,424	1,339	1,593	1,093
TOTAL EQUITY ATTRIBUTABLE TO OWNERS OF THE PARENT	7,304	2,614	2,200	2,356	1,933
Noncontrolling interests	46	-	(74)	(46)	1.10
TOTAL EQUITY	7,350	2,614	2,216	2,310	1,932
LIABILITIES					
NON-CURRENT LIABILITIES					
(a) FINANCIAL LIABILITIES					
(i) Borrowings					
Through Stapled Instrument	4,013	4,013	4,013	-	-

From Banks, Financial Institutions and Others	44,619	38,704	15,733	12,610	9,948
(ii) Lease liabilities	1,276	586	304	355	-
(iii) Other financial liabilities	3	89	2	-	31.37
(b) Provisions	216	114	21	15	10
(c) Deferred tax liabilities (net)	452	213	29	1	0.46
(d) Other non- current liabilities	989	902	565	118	37
TOTAL NON- CURRENT LIABILITIES	51,568	44,621	20,667	13,099	10,027
CURRENT LIABILITIES					
FINANCIAL LIABILITIES					
(i) Borrowings	4,215	9,471	3,693	1,115	742
(ii) Lease liabilities	100	58	31	20	-

(iii) Trade payables	-	-	-	-	-
total outstanding dues of micro enterprises and small enterprises	4	5	10	33	0.63
total outstanding dues of creditors other than micro enterprises and small enterprises	387	140	119	142	161
(iv) Other financial liabilities	1,430	1,404	1,801	1,666	1,763
(b) Other current liabilities	1,703	427	129	36	27
(c) Provisions	10	8	6	4	5
(d) Current tax liabilities (net)	92	0	8	-	-
TOTAL CURRENT LIABILITIES	7,941	11,513	5,797	3,016	2,699

Liabilities classified as held for sale	502	419	131	-	-
TOTAL LIABILITIES	60,011	56,553	26,595	16,115	12,726
TOTAL EQUITY AND LIABILITIES	67,361	59,167	28,721	18,425	14,658

BALANCE SHEET OF SUZLON ENERGY (in Rs. Cr.)	MAR 23	MAR 22	MAR 21	MAR 20	MAR 19
	12months	12months	12months	12months	12months
ASSETS					
NON-CURRENT ASSETS					
(a) Property, plant and equipment	696.34	773.50	803.85	905.04	1,147.32
(b) Capital work-in- progress	2.57	15.21	103.93	110.08	218.33

(c) Goodwill	-	-	7.63	7.63	7.63
(d) Other intangible Assets	58.48	121.11	190.46	267.50	327.14
(e) Intangible assets under development	3.43	4.42	3.52	12.30	10.41
(f) Investments in an associate and a joint venture	-	-	22.97	19.71	20.30
(g) FINANCIAL ASSETS					
(i) Investments	0.03	0.03	0.03	0.03	0.13
(ii) Trade receivables	-	-	-	-	-
(iii) Loans	-	-			
(iv) Other financial assets	433.14	264.31	402.63	284.40	483.81
(h) Deferred tax assets (net)	0.20	17.48	-	-	-
(i) Other non-current assets	40.22	29.24	54.46	51.05	103.84

(j) Right-of-Use Assets	82.11	133.83	131.46	143.39	-
(k) Investment Properties	29.21	30.86	32.64	34.67	37.36
TOTAL NON-CURRENT ASSETS	1,345.73	1,389.99	1,753.58	1,835.80	2,356.57
CURRENT ASSETS					
(a) Inventories	1827.13	2207.90	2,172.76	2,055.59	2,913.93
(b) FINANCIAL ASSETS					
(i) Investments	-	-	-	-	-
(ii) Trade receivables	1170.44	1376.95	1,189.72	1,364.54	1,880.59
(iii) Cash and cash equivalents	367.31	437.38	262.50	57.59	74.62
(iv) Bank balances other than (iv) above	-	63.05	-	24.74	-
(v) Loans	0.61	0.96	21.27	22.45	11.52
(vi) Other financial assets	149.05	120.50	175.97	108.71	316.31

(c) Other current assets	627.10	811.26	969.58	989.47	1,211.93
TOTAL CURRENT ASSETS	4,142.18	5,019.11	6.12	4,643.55	6,424.98
Assets classified as held for sale	35.47	65.76	49.59	51.00	89.36
TOTAL ASSETS	5,523.38	6,474.86	6,601.09	6,530.35	8,870.91
EQUITY AND LIABILITIES					
EQUITY					
(a) Equity share capital	2,454.40	1,843.49	1,701.60	1,063.95	1,063.95
(b) Other equity	(1,355.26)	(5,369.22)	(5,044.63)	(12046.9)	(9,561.56)
TOTAL EQUITY ATTRIBUTABLE TO OWNERS OF THE PARENT	-	-	-	-	-
Noncontrolling interests		(36.08)	(57.68)	(58.90)	(5.48)

TOTAL EQUITY	1,099.14	(3,561.81)	(3,400.71)	(11,041.8	(8,503.
				4)	09)
LIABILITIES					
NON-CURRENT LIABILITIES					
(a) Financial					
liabilities					
(i) Borrowings	1,517.27	5,592.44	6,027.20	841.77	6,244.14
(ii) Lease liabilities	18.06	57.54	55.19	63.07	-
(iii) Other financial liabilities	19.46	21.67	22.35	28.02	50.49
(b) Provisions	168.18	130.43	82.51	93.27	118.46
(d) Other non-current liabilities	0.48	0.19	0.77	0.89	11.70
TOTAL NON-CURRENT LIABILITIES	1,723.45	5,802.27	6,188.02	1,027.02	6,424.79
CURRENT LIABILITIES					
(a) FINANCIAL LIABILITIES					

(i) Borrowings	387.61	798.12	175.34	8,843.85	3,379.79
(ii) Lease liabilities	14.98	17.12	11.52	9.88	-
(iii) Trade payables	894.64	1,840.49	1,581.99	1,298.18	2,175.19
total outstanding dues of micro enterprises and small enterprises	573.04	477.25	-	-	-
(iv) Other financial liabilities	201.55	363.26	1,012.66	5,300.66	3060.65
(b) Other current liabilities	58.13	81.04	87.80	128.58	115.98
(c) Provisions	569.09	483.61	539.14	705.66	739.52
(d) Current tax liabilities (net)	1.75	173.51	3,813.78	16,545.17	10,949.21
Contract Liabilities	-	-	405.33	258.36	1,478.08
TOTAL CURRENT LIABILITIES	2,700.79	4,234.40	3,813.78	16,545.17	10,949.21
TOTAL LIABILITIES	4,424.24	10,036.67	10,001.8	17,512.19	17,374

TOTAL EQUITY AND LIABILITIES	5,523.38	6,474.86	6,601.09	6,530.35	8,870. 91
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BALANCE SHEET OF TPREL (in Rs. Cr.)	MAR 23	MAR 22	MAR 21	MAR 20	MAR 19
	12months	12months	12months	12months	12months
ASSETS					
NON-CURRENT ASSETS					
(a) Property, plant and equipment	17,494.49	14,781.71	11,818.7 6	11,750.9 9	10,257.36
(b) Capital work-in- progress	2,422.96	1,142.84	1,972.05	469.83	1,569.53
(c) Goodwill	1,636.03	1,636.03	1,636.03	1,636.03	1,636.03
(d) Other intangible Assets	980.67	1044.35	1107.12	1167.2	1227.76

(g) FINANCIAL ASSETS					
(i) Investments	-	-	-	-	-
(ii) Trade receivables	359.63	657.91	382.75	-	-
(iii) Loans	0.17	59.87	79.68	86.65	84.30
(iv) Other financial assets	425.15	362.12	352.52	315.98	310.18
(v) Finance Lease Receivables	91.93	67.50	69.04	35.89	11.35
(h) Income tax assets (net)	64.99	32.56	46.32	78.93	47.99
(i) Deferred tax assets (net)	100.76	42.26	48.94	54.49	80.85
(j) Other non-current assets	501.31	3.73	3.93	84.54	85.18
(k) Right-of-Use Assets	408.85	137.64	122.28	-	-
TOTAL NON-CURRENT ASSETS	24,436.94	19,968.52	17,639.42	15,680.35	15,310.53

CURRENT ASSETS					
(a) Inventories	1,002.49	14.96	14.63	17.02	19.55
(b) FINANCIAL ASSETS					
(i) Investments	674.25	83.85	81.96	220.10	89.43
(ii) Trade receivables	2,915.05	866.23	715.45	1,251.41	650.00
(iii) Unbilled revenue	422.79	392.94	270.98	230.40	187.29
(iv) Cash and cash equivalents	1,170.41	302.75	114.40	165.59	65.56
(v) Bank balances other than (iv) above	2,670.72	11.25	11.25	14.05	22.06
(vi) Loans	-	192.08	11.16	13.40	90.05
(vii) Other financial assets	443.14	195.25	136.69	119.38	179.09
(viii) Finance Lease Receivable	4.22	2.34	2.14	1.31	0.32
(c) Other current assets	553.78	15.34	7.21	-	12.82

TOTAL CURRENT ASSETS	9,856.85	2,076.99	1,365.88	2,040.62	1,316.17
Assets classified as held for sale	-	-	-	-	131.27
TOTAL ASSETS	34,343.79	22,045.51	19,005.30	17,720.97	16,757.97
EQUITY AND LIABILITIES					
EQUITY					
(a) Equity share capital	1,379.48	1,045.11	1,045.11	1,045.11	1,045.11
(b) Other equity	8,840.27	1,528.96	929.91	642.77	486.72
(a) Unsecured Perpetual Securities	-	3,895.00	3,895.00	3,895.00	3,895.00
(b) Compulsorily Preference Shares	2000	-	-	-	-
TOTAL EQUITY ATTRIBUTABLE TO OWNERS OF THE PARENT	12,219.75	6,469.07	5,870.02	5,582.88	5,426.83

Noncontrolling interests	48.05	26.67	20.05	19.86	-
TOTAL EQUITY	12,267.80	6,495.74	5,890.07	5,602.74	5,426.83
LIABILITIES					
NON-CURRENT LIABILITIES					
(a) Financial liabilities					
(i) Borrowings	12,842.48	10,103.97	6,404.56	8,236.30	7,466.79
(ii) Lease liabilities	231.97	84.17	84.25	90.29	-
(iii) Other financial liabilities	-	2.78	327.64	13.32	6.64
(b) Provisions	75.43	16.52	12.83	11.59	7.00
(c) Deferred tax liabilities (net)	475.87	507.86	387.66	350.00	250.12
(d) Other non- current liabilities	400.85	346.85	298.12	256.59	205.10
TOTAL NON- CURRENT LIABILITIES	14,026.60	11,062.15	7,515.06	8,960.09	7,935.65
CURRENT LIABILITIES					

FINANCIAL					
LIABILITIES					
(i) Borrowings	3,351.74	3,219.66	4,231.41	2,200.67	1,103.9 1
(ii) Lease liabilities	10.54	6.69	6.69	0.34	-
(iii) Trade payables	1,602.36	148.90	104.67	73.74	60.57
(iv) Other financial liabilities	1,038.73	1,043.62	1,218.44	856.06	2,206.8 4
(b) Other current liabilities	1,854.56	35.41	21.79	21.76	21.45
(c) Provisions	186.63	17.18	17.12	1.53	0.32
(d) Current tax liabilities (net)	4.83	16.16	0.04	4..04	2.40
TOTAL CURRENT LIABILITIES	8,049.39	4,487.62	5,600.17	3,158.14	3,395.4 9
TOTAL LIABILITIES	22,075.99	15,549.77	13,115.23	12,118.23	11,331. 14
TOTAL EQUITY AND LIABILITIES	34,343.79	22,045.51	19,005.30	17,720.97	16,757. 97

BALANCE SHEET OF BOROSIL RENEWABLES (in Rs. LAKHS)	MAR 23	MAR 22	MAR 21	MAR 20	MAR 19
	12months	12months	12months	12months	12months
ASSETS31					
NON-CURRENT ASSETS					
(a) Property, plant and equipment	96,386.16	27,707.48	31,981.4 5	34,426.0 8	11,640.9 9
(b) Capital work-in- progress	6,969.58	29,677.71	421.88	95.82	12,513.0 5
(c) Goodwill	2.47	-	--	-	-
(d) Other intangible Assets	1310.77	64.81	43.70	48.30	39.63
(e) Intangible assets under development	41.70	16.00	-	-	6.92
FINANCIAL ASSETS					
(i) Investments	1,097.80	-	-	-	-

(ii) Trade receivables	-	-	-	-	-
(iii) Loans	27.90	20.42	-	-	-
(iv) Other financial assets	1,059.84	508.80	483.72	197.82	134.09
(h) Income tax assets (net)	-	-	-	1,654.04	307.10
(i) Other non-current assets	653.45	9,100.41	656.20	753.15	4,180.60
TOTAL NON-CURRENT ASSETS	107,549.67	67,095.63	33,586.95	37,175.21	28,822.38
CURRENT ASSETS					
(a) Inventories	26,469.01	6,879.38	3,787.47	4,679.36	3,701.15
FINANCIAL ASSETS					
(i) Investments	-	21,367.99	28,028.11	703.57	4,569.92
(ii) Trade receivables	9,329.64	5,955.11	7,244.25	4,063.49	2,406.80

(iii) Unbilled revenue	-	-	-	-	-
(iv) Cash and cash equivalents	12,632.63	1,146.36	215.45	79.40	22.37
(v) Bank balances other than (iv) above	636.21	684.38	659.69	355.94	461.69
(vi) Loans	66.50	38.74	3,549.24	30.98	372.24
(vii) Other financial assets	1,767.97	341.55	51.15	44.17	82.84
(c) Other current assets	4,452.34	988.68	889.10	2,767.32	2,032.77
(e) Current Tax Assets (Net)	320.72	1,045.90	275.58	72.81	48.96
TOTAL CURRENT ASSETS	55,675.02	38,448.09	44,700.04	12,797.04	13,698.74
TOTAL ASSETS	163,224.69	105,543.72	78,286.99	49,972.04	42,521.12
EQUITY AND LIABILITIES					
EQUITY					
(a) Equity share capital	1,304.98	1,303.55	1,300.49	1,140.60	924.00

(b) Other equity	90,636.72	77,184.54	60,153.81	31,503.29	32,078.98
(c) Equity Share suspense	-	-	-	-	266.22
(d) Share to be Cancelled	-	-	-	-	(49.62)
TOTAL EQUITY ATTRIBUTABLE TO OWNERS OF THE PARENT	91,941.70	-	-	-	-
Noncontrolling interests	2,311.04	-	-	-	-
TOTAL EQUITY	94,252.74	78,488.09	61,454.30	32,643.89	33,219.58
LIABILITIES					
NON-CURRENT LIABILITIES					
(a) FINANCIAL LIABILITIES					
(i) Borrowings	31,928.32	13,963.17	5,997.09	7,683.12	2,367.87
(ii) Lease liabilities	227.42	-	-	-	-

(iii) Other financial liabilities	860.02	-	-	-	-
(b) Provisions	284.77	209.58	179.29	130.99	104.62
(c) Deferred tax liabilities (net)	3,434.56	2,626.98	2,189.93	1,254.93	1,183.47
(d) Other non-current liabilities	-	-	-	-	-
TOTAL NON-CURRENT LIABILITIES	36,735.09	16,799.73	8,366.31	9,069.04	3,655.96
CURRENT LIABILITIES					
FINANCIAL LIABILITIES					
(i) Borrowings	9,720.78	1,759.79	146.02	666.85	1,872.64
(ii) Lease liabilities	193.03	-	-	-	-
(iii) Trade payables	-	-	-	-	-
total outstanding dues of micro enterprises and	775.70	422.39	292.78	362.11	150.07

small enterprises					
total outstanding dues of creditors other than micro enterprises and small enterprises	8,163.58	2,833.72	1,947.51	1,373.97	873.87
(iv) Other financial liabilities	8,900.30	3,393.14	3,387.53	5,495.98	2,548.46
(b) Other current liabilities	2,362.56	1,640.60	1,610.53	268.37	153.58
(c) Provisions	831.49	169.67	164.66	89.83	46.96
(d) Current tax liabilities (net)	1,289.42	36.59	917.35	2.21	-
TOTAL CURRENT LIABILITIES	32,236.86	10,255.90	8,466.38	8,259.32	5,645
TOTAL LIABILITIES	68,971.95	27,055.63	16,832.69	17,598.36	9,301.54
TOTAL EQUITY AND LIABILITIES	163,224.69	105,543.72	78,286.99	49,972.25	42,521.12

BALANCE SHEET OF JSW ENERGY (in Rs. Cr.)	MAR 23	MAR 22	MAR 21	MAR 20	MAR 19
	12months	12months	12months	12months	12months
ASSETS					
NON-CURRENT ASSETS					
(a) Property, plant and equipment	23,065.01	13,422.82	14,166.2 6	15,217.1 1	16,289.96
(b) Capital work-in- progress	4,779.50	2,090.60	472.77	391.32	399.97
(c) Goodwill	639.82	639.82	639.82	639.82	639.82
(d) Intangible assets	1315.66	768.00	830.68	855.80	894.76
(e) Intangible assets under development	8.69	-	-	-	-
(f) Investments in an associate and a joint venture	55.51	36.22	27.68	10.53	-

(g) FINANCIAL ASSETS					
(i) Investments	4,906.11	5,194.60	3,340.24	1,098.95	2,108.26
(ii) Trade receivables	99.46	99.46	5.34	-	-
(iii) Loans	567.64	567.64	569.09	664.96	720.59
(iv) Other financial assets	2,092.07	1,312.97	1,262.84	1,195.22	1,187.06
(h) Income tax assets (net)	192.55	130.26	112.27	123.85	64.15
(i) Deferred tax assets (net)	324.44	418.20	229.76	180.54	-
(j) Other non-current assets	1,071.13	1,051.45	315.50	186.08	513.30
(k) Right-of-Use Assets	-	-	-	-	-
TOTAL NON-CURRENT ASSETS	39,117.5	25,732.0	21,972.2	20,564.2	22,817.87
CURRENT ASSETS					
(a) Inventories	987.08	901.02	395.08	639.58	454.73
(b) FINANCIAL ASSETS					

(i) Investments	1,071.15	1,392.35	684.23	744.07	342.27
(ii) Trade receivables	1,531.92	670.22	964.46	1,565.20	1,427.75
(iii) Unbilled revenue	776.03	544.43	336.78	543.81	-
(iv) Cash and cash equivalents	3,422.29	585.16	366.84	151.69	132.16
(v) Bank balances other than (iv) above	591.59	548.95	112.34	49.04	71.41
(vi) Loans	180.90	150.90	1,130.84	250.84	178.42
(vii) Other financial assets	675.91	252.78	254.19	484.36	424.72
(c) Other current assets	285.60	154.61	104.99	119.06	76.75
TOTAL CURRENT ASSETS	9,522.47	5,200.42	4,349.75	4,547.65	3,108.21
Assets classified as held for sale	101.64	-	114.33	-	-
TOTAL ASSETS	48,741.	30,932.	26,436.	25,111.	25,926
	70	46	33	85	.08

EQUITY AND LIABILITIES					
EQUITY					
(a) Equity share capital	1,640.54	1,639.67	1,642.33	1,641.90	1,640.87
(b) Other equity	16,988.27	15,775.23	12,864.67	10,003.72	10,181.37
(c) Instruments entirely equity in nature	-	-	-	-	-
TOTAL EQUITY ATTRIBUTABLE TO OWNERS OF THE PARENT	18,628.	17,414.	14,507.	11,645.	11,822.
Noncontrolling interests	81	90	00	62	24
TOTAL EQUITY	18,734.18	17,416.96	14,498.28	11,621.78	11,810.21
LIABILITIES					
NON-CURRENT LIABILITIES					
(a) Financial liabilities					
(i) Borrowings	19,207.90	6,876.37	6,972.41	8,280.74	9,240.35

(ii) Lease liabilities	221.47	45.29	-	-	-
(iii) Other financial liabilities	101.82	73.45	453.43	195.02	0.17
(b) Provisions	62.41	111.56	99.29	82.39	70.02
(c) Deferred tax liabilities (net)	1,078.41	892.26	608.13	370.48	380.44
(d) Other non-current liabilities	329.89	423.81	235.52	186.45	63.33
TOTAL NON-CURRENT LIABILITIES	21,001.90	8,422.74	8,368.78	9,115.08	9,754.31
CURRENT LIABILITIES					
FINANCIAL LIABILITIES					
(i) Borrowings	5,609.32	2,016.17	289.97	-	-
(ii) Lease liabilities	12.38	4.74	-	-	-
(iii) Trade payables	1,274.06	1,075.93	949.94	1,602.87	1,839.52

(iv) Other financial liabilities	1,917.48	1,893.11	2,226.51	2,674.39	2,366.19
(b) Other current liabilities	59.46	53.49	53.01	48.99	84.47
(c) Provisions	20.16	12.53	13.05	11.85	31.33
(d) Current tax liabilities (net)	44.82	36.79	36.79	36.89	40.05
TOTAL CURRENT LIABILITIES	8,937.71	5,092.76	3,569.27	4,374.99	4,361.56
Liabilities classified as held for sale	67.91	-	-	-	-
TOTAL LIABILITIES	30,007.52	13,515.50	11,938.05	13,490.07	14,115.87
TOTAL EQUITY AND LIABILITIES	48,741.70	30,932.46	26,436.33	25,111.85	25,926.08

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