



YASHODA SHIKSHAN PRASARAK MANDAL, SATARA
YASHODA TECHNICAL CAMPUS
DEPARTMENT OF ELECTRICAL ENGINEERING

ELECTRICAL MIRROR

MAY 2026

AN ELECTRICAL MAGAZINE



Department of Electrical Engineering



YASHODA INSTITUTES, SATARA

ENGINEERING (B.TECH)

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ELECTRICAL MIRROR

*.... AN TECHNICAL MAGAZINE***MAY 2026**

**TODAY'S READER
CAN BE A TOMORROW'S
LEADER!**

PRESIDENT'S DESK

I welcome you to YSPM's Yashoda Technical Campus, Satara. an Institution which inculcates true values while disseminating quality education for shaping the career of our students. All our institutes are approved by the concerned statutory bodies and fulfill all the norms and standards laid down by them. Our technical campus is located in a lush, green, pollution free, picturesque environment. Our institutes have well qualified, experienced and student caring faculty, well equipped laboratories, spacious lecture halls and tutorial rooms, well maintained rich library, e-library, Wi-Fi Campus, Computer with Internet Facility, and a playground with sports facilities. We emphasize on overall personality development of our students. Our faculty pays attention to each students a platform to excel not only in academics but also in co-curricular and a multi disciplinary study culture. Amenities provided by our institutes include transport facility, hostel facility, reprographics facility, canteen, STD PCO, medical center, sports center etc.

We are committed to import value-based quality education along with development of positive attitude, skills and abilities to apply knowledge in order to meet the challenges of future. I extend my best wishes for your bright and prosperous future.

Prof. Dasharath Sagare
Founder President
YSPM - YSS, Satara



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PRINCIPAL'S MESSAGE

GREETINGS TO ALL!

I am really honored and feel very privileged to function as the Principal of Yashoda Technical Campus (YTC), Satara. Let me take this opportunity to thank the Management, Yashoda Shikshan Prasarak Mandal (YSPM), Satara for giving me an opportunity to serve the community here in YSPM family.

We believe that the existence, growth, survival and future of every Educational Institute will long lasting only if that Institute make and keep the students & parents and all the stakeholders of the Institute feel very happy and satisfied. The students & parents will be happy only if they get their expectations and dreams are fulfilled for which the student has taken an admission in the Institute. This can be achieved only if every entity in an Institute works with Academic Excellence, Research Excellence and Training & Placement Excellence, along with Overall Development of the Student to Serve the Society thereby exceling and ensuring EXCELLENCE IN TECHNICAL EDUCATION with OUTCOME BASED EDUCATION. Our Institute Growth lies in Institute Motto that is "PARENTS AND STUDENTS DREAMS ARE OUR INSTITUTE MISSIONS".

Therefore I appeal everyone to join together in achieving the aim "A HAPPY STUDENT, A HAPPY PARENT, AND A HAPPY & MOST PREFERABLE INSTITUTE.

Dr. Vikram S. Patil
Principal, YSPM, Satara



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HOD'S MESSAGE

Welcome to the Department of Electrical Engineering. The Department has been immensely active and professionally productive since its inception in 2011. Presently, the department has U.G. Program with more than 100 undergraduate students.

Since the commencement of the program, the department has made sincere efforts in the development of students through effective teaching - learning processes, training and industrial visits. Eight (8) batches of Electrical Engineering have been passed out from the institute. The students graduated from our department have been securing good placements in Private and Public sectors.

The Department is having mixture of well experienced and young, enthusiastic faculty members. The Laboratories are well equipped with Latest Experimental and Computational Facilities. Industry Interaction has been increased with industry-sponsored projects. Industries also offer the vocational training to our students. The department organizes Guest Lectures, Faculty Development Programs, Workshops and Seminars in various specialized field which offers an opportunity to meet eminent speakers and exchange ideas. The faculty frequently publishes and presents their research work in reputed national/ international Journals and Conferences. Apart from the curriculum, students from our department have won prizes by participating in Local, State and National level competitions.

I am pleased to release 2025-26 third edition of technical magazine. The magazine will help you to update recent trends in electrical engineering. We are growing and our mission to improve the quality and utility of Teaching-learning mechanism.

Prof. Dr. N. N. Jamadar
HOD, Faculty of Electrical Engineering, Yashoda Technical Campus, Satara

Overview of Department

Welcome to the Department of Electrical Engineering at YSPM's Yashoda Technical Campus, Satara. The department has been immensely active and professionally productive since its inception in 2011 and **NBA accredited in year 2025**. The department offers 4 years Bachelor of Technology in Electrical Engineering. The department undergoes several curricular and extra-curricular activities throughout the year. The department is having mixture of well experienced and young, enthusiastic faculty members who are involved in industry institute interaction besides their day to day teaching activities. The Electrical Engineering department has been established at Yashoda Technical Campus, Satara, in the academic year 2011-12 and offers Bachelor of Technology Degree. The Department of Electrical Engineering at Yashoda Technical Campus (YTC) delivers latest knowledge in Electrical Engineering along with the Computational Facilities including MATLAB, Mi- Power, and Turbo C+ programming Software. It prepares students for careers in industry, academia, and also create young entrepreneurs.

Strength of Department

- Well Qualified, Experienced staff.
- Well-Equipped laboratories.
- World class infrastructure.
- Excellent academic performance.
- E-Library, E-Books, Departmental Library facility for students.
- Girls' and boys' hostel with all facilities.
- College bus facility for students and staff.
- Wi-Fi, Computers, Software Facility.

Vision of the Department

To emerge as a center of excellence in Electrical Engineering education producing knowledgeable, employable, and ethical engineering graduates to serve industry/society.

Mission of the Department

We, at Department of Electrical Engineering, are committed to achieve our vision by-

M1: Preparing technically and professionally competent engineers by imparting quality education through effective teaching learning methodologies.

M2: Developing professional skills and right attitude among students that will help them to succeed and progress in their personal and professional career.

M3: Inculcating moral and ethical values in students with concern to society and environment.

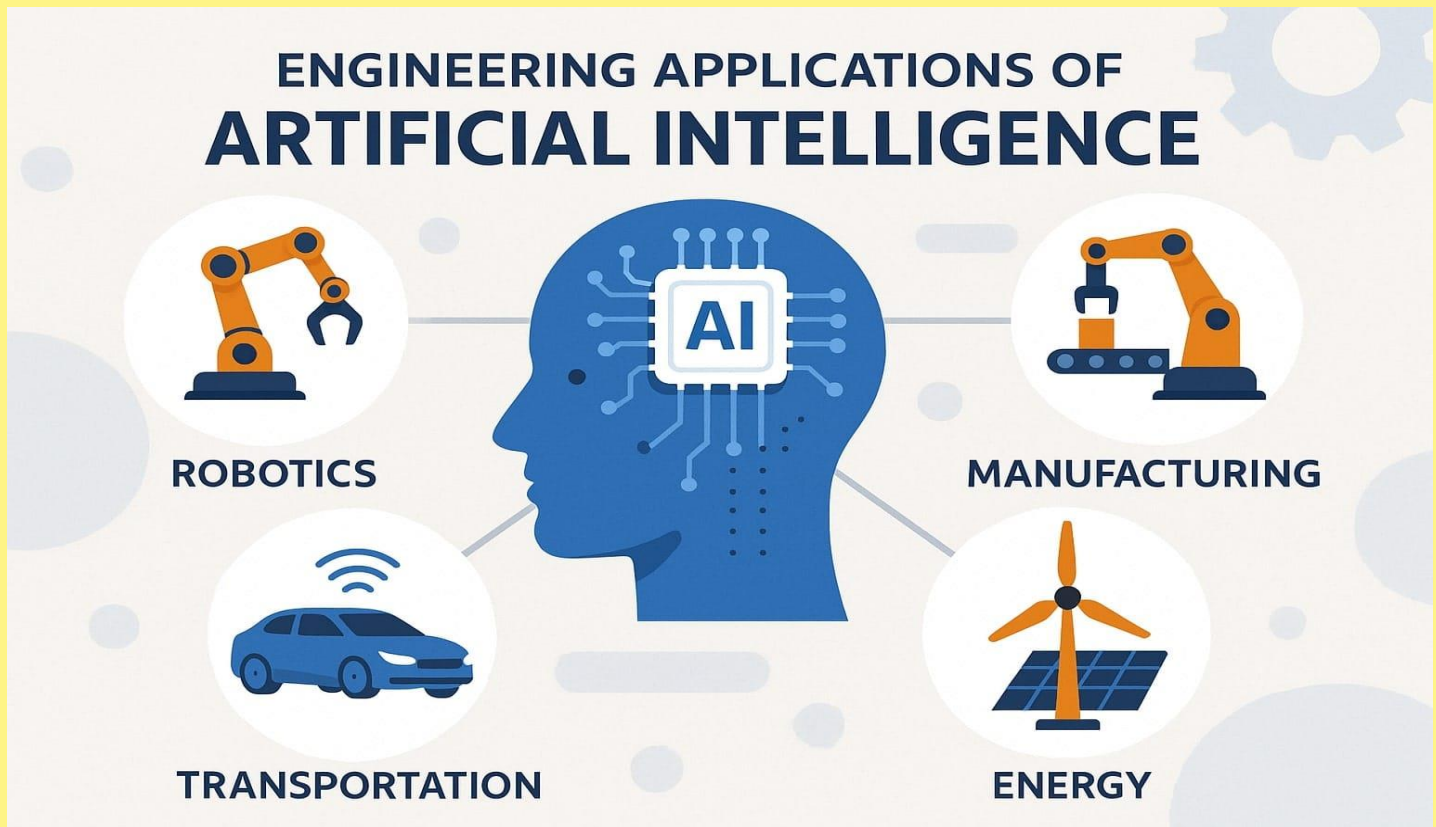
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MAY 2026

The Impact of Artificial Intelligence on Electrical Engineering

Artificial Intelligence (AI) has significantly impacted electrical engineering by enhancing decision-making, automation, and system performance. AI methodologies such as machine learning, deep learning, and neural networks are being implemented across various subfields of electrical engineering, including power system optimization, renewable energy integration, fault detection, smart grids, and energy management. These methodologies offer enhanced efficiency, reliability, and predictive capabilities compared to conventional rule-based methodologies. The integration of AI in electrical engineering is anticipated to drive innovation in energy management, fault detection, and system optimization, leading to more intelligent, efficient, and resilient systems.



PAWAR PIYUSH PRASHANT

Second Year



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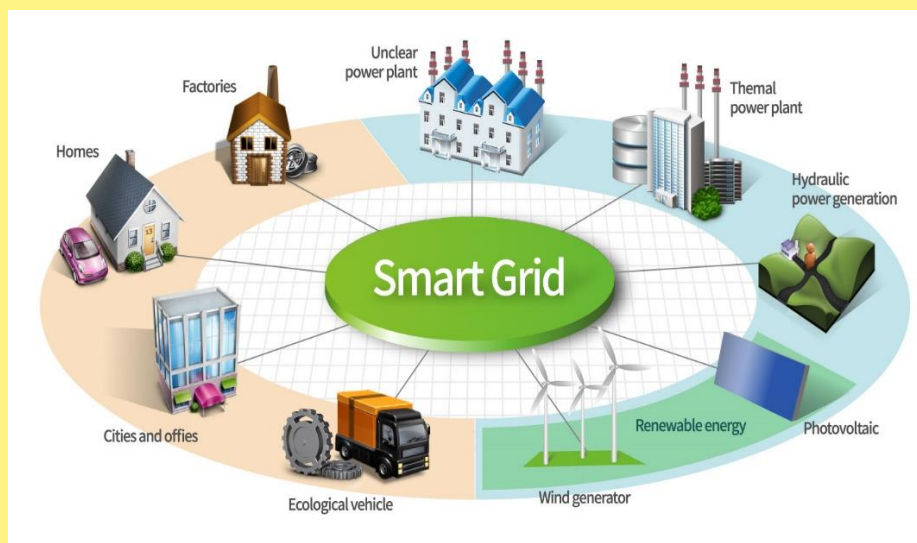


Smart Grid Technology

Now a day, we are often hearing about smart grid, in the news and around all of us too but most of the people do not have the basic understanding of what a smart grid really is?

Just because the word 'smart' has been attached to it, do not assume that it is something relevant to our smartphones or smart TVs, not relevant but the concept of it maybe comes from that. You will get to understand what smart grid really is and what it is made up of as you read ahead.

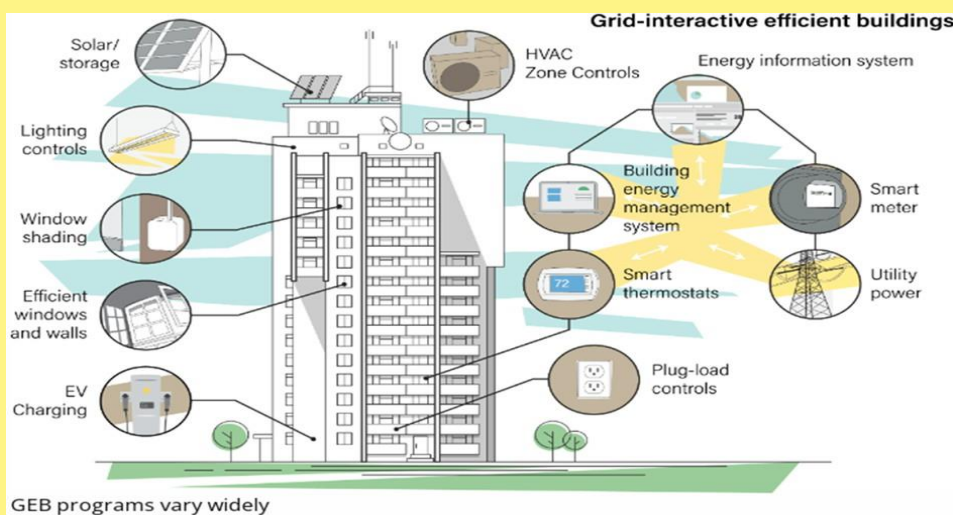
Have you ever heard the term "Grid"? If so, then you must know that it has something to do with the electricity. The power grid is the main supply route and a network of transmission lines, transformers, distribution substation along with all the accessories that are combined for supplying electricity to various regions at the same time. Also, a power grid is the one that produces electricity.



KADAM SAKSHI MOHAN
Second Year

Grid-Interactive and Energy-Aware Buildings

Grid-interactive and energy-aware buildings leverage smart technologies to optimize energy usage, reduce costs, and support grid stability. These buildings integrate sensors, actuators, and automation systems to monitor occupancy, energy consumption, and environmental conditions. Building energy management systems (BEMS) analyze real-time data to control lighting, HVAC systems, and other appliances, ensuring energy efficiency and occupant comfort. Demand response programs enable buildings to adjust their energy usage based on grid demand and electricity prices, reducing stress on the grid during peak periods. Energy-aware buildings incorporate renewable energy sources, energy storage systems, and energy-efficient technologies to minimize their environmental impact. Rooftop solar panels, wind turbines, and geothermal systems generate clean energy on-site, reducing reliance on the grid. Battery storage systems store excess energy for later use, improving energy resilience and supporting grid stability. Research in grid-interactive and energy-aware buildings explores innovative energy management algorithms, human-centric design approaches, and grid integration strategies, shaping the future of sustainable and intelligent buildings.



MANE DIVYA LAXMAN
Third Year

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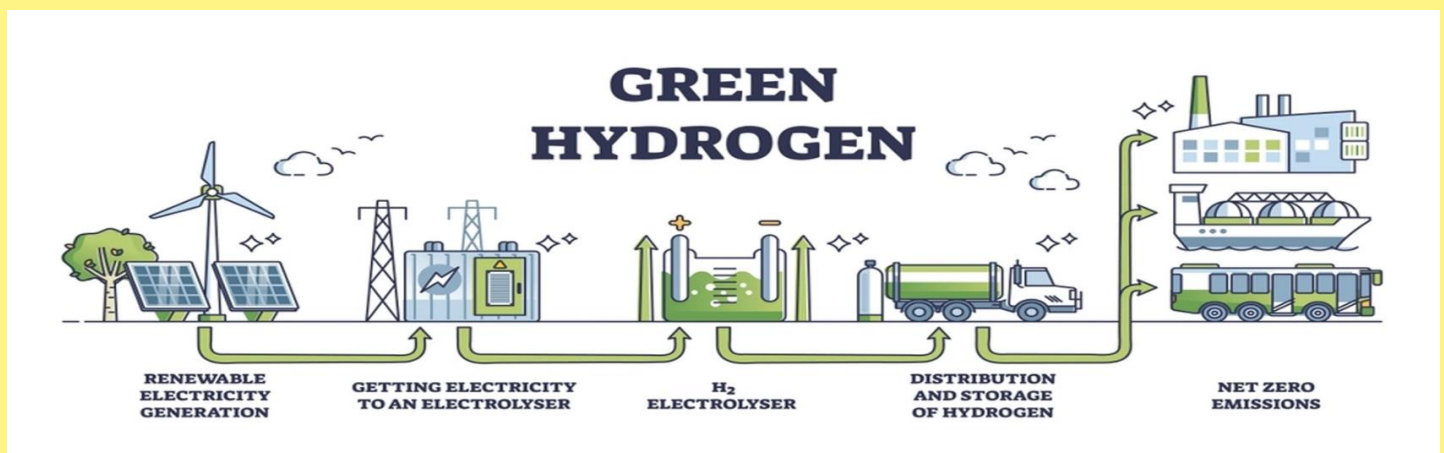
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Green hydrogen

Green hydrogen is hydrogen produced through the electrolysis of water using renewable electricity, resulting in significantly lower greenhouse gas emissions compared to grey hydrogen, which is derived from fossil fuels

Green hydrogen's principal purpose is to help limit global warming, reduce fossil fuel dependence by replacing grey hydrogen, and provide for an expanded set of end-uses in specific economic sectors, sub-sectors and activities. These end-uses may be technically difficult to decarbonize through other means such as electrification with renewable power. Its main applications are likely to be in heavy industry (e.g. high temperature processes alongside electricity, feedstock for production of green ammonia and organic chemicals, as direct reduction steelmaking), shipping, and long-term energy storage.

It has the potential to replace fossil fuels in various sectors, including fertilizer production, steel manufacturing, and shipping



JADHAV ROHIT DILIP

Third Year

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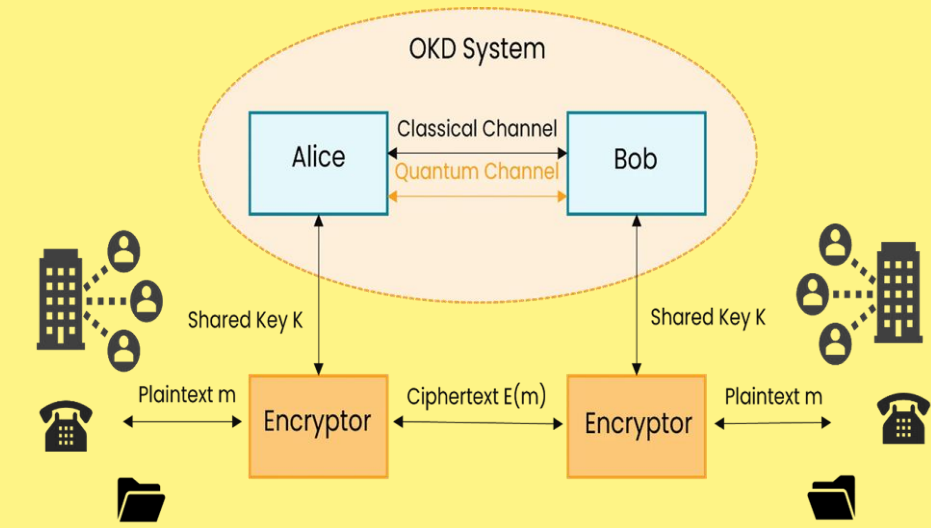
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Quantum Communication and Quantum Cryptography

Quantum communication leverages the principles of quantum mechanics to secure communication channels against eavesdropping and interception. Quantum cryptography, a subset of quantum communication, offers theoretically secure methods for encrypting and decrypting messages. Quantum key distribution (QKD) systems enable two parties to exchange cryptographic keys with unconditional security. The security of QKD relies on the principles of quantum superposition and entanglement, making it impossible for an eavesdropper to intercept the key without detection. Quantum communication also includes quantum teleportation, a process in which quantum states are transferred from one location to another using quantum entanglement. Quantum communication technologies have potential applications in secure communication networks, financial transactions, and government communications, offering unparalleled security compared to classical cryptographic methods. Ongoing research focuses on developing practical QKD systems, extending the range of quantum communication, and addressing challenges related to quantum repeaters and quantum memory, paving the way for quantum-secured communication infrastructures.



PAWAR PRIYANKA SUDHIR
Final Year

Renewable Energy Sources: Powering a Sustainable Future

Renewable energy sources have emerged as the linchpin in the global pursuit of sustainable and clean energy solutions. As the world grapples with the challenges of climate change and environmental degradation, renewable energy offers a promising path forward. One of the most abundant and versatile sources of renewable energy is solar power, harnessed through various technologies. This section delves deep into solar energy, exploring its mechanisms, applications, benefits, and the pivotal role it plays in shaping a greener future.

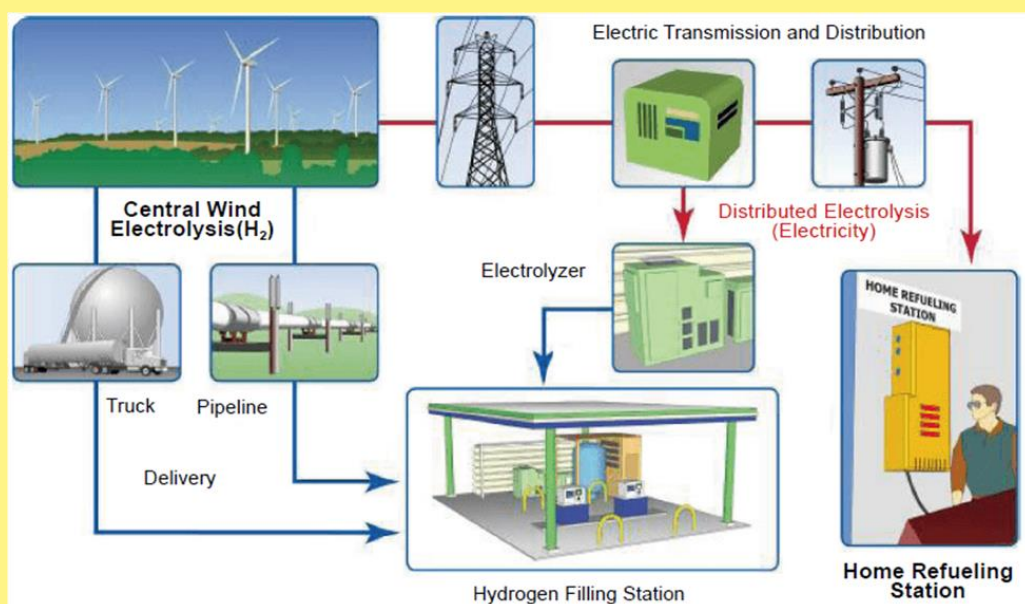
Solar Energy: Harnessing the Power of the Sun Solar energy, the radiant energy emitted by the sun, is harnessed using photovoltaic (PV) cells to create electricity or through concentrated solar power (CSP) systems for thermal energy. The key component driving this technology is the PV cell, a semiconductor device that directly converts sunlight into electricity through the photovoltaic effect. When photons, particles of light, strike the PV cell, they dislodge electrons from their atoms, creating an electric current. This process



GORE BHAIKAV JAYWANT
Second Year

Renewable Energy Sources: Powering a Sustainable Future (Wind Energy)

Wind energy, one of the oldest and most widely used forms of renewable energy, has become a cornerstone of the global push towards sustainability. Harnessing the power of the wind, wind energy provides a clean and renewable source of electricity. In this section, we explore the mechanisms of wind energy, its applications, benefits, and the transformative impact it has on the global energy landscape. The Mechanics of Harnessing the Wind energy is harnessed through the use of wind turbines. These turbines consist of large blades attached to a central hub. As the wind blows, it causes the turbine blades to rotate. This rotational motion is transferred to a generator, which converts the kinetic energy of the rotating blades into electricity. The amount of energy generated is directly proportional to the wind speed; higher wind speeds result in greater electricity production. Wind turbines are strategically placed in areas with consistent and strong winds, such as coastal regions and elevated landscapes. Modern wind turbines come in various sizes, from small turbines used for residential or agricultural applications to massive utility-scale turbines that form wind farms.



KUMBHAR VARUN SUBHASH
Second Year



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Renewable Energy Sources: Powering a Sustainable Future (Hydropower)

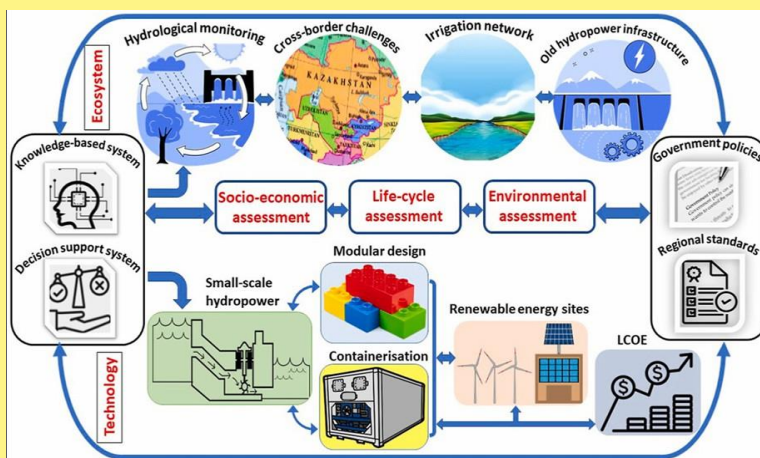
Hydropower, derived from the energy of flowing or falling water, has been a fundamental source of renewable energy for centuries. It is a versatile and reliable energy source that has powered communities, industries, and civilizations throughout history. In this section, we explore the mechanisms of hydropower, its applications, benefits, and the role it plays in shaping a sustainable energy landscape.

Hydropower: Tapping into the Flow of Water

Hydropower systems harness the kinetic energy of moving water to generate electricity. There are two primary methods of harnessing hydropower: through dams and turbines or utilizing run-of-the-river systems.

Dams and Turbines: In dam-based hydropower systems, large dams are constructed across rivers. The stored water is released through turbines, driving them to generate electricity. The potential energy of the water at a height is converted into mechanical energy, which is then transformed into electrical energy.

Run-of-the-River Hydropower: Run-of-the-river systems do not involve large dams. Instead, they use the natural flow of rivers to generate electricity. A portion of the river's water is diverted through turbines, which convert the kinetic energy of the flowing water into electricity. Run-of-the-river systems minimize environmental impact, allowing rivers to maintain their natural flow.



BHUSNAR SACHIN MAHADEV
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Renewable Energy Sources: Powering a Sustainable Future (Biomass Energy)

Biomass energy, derived from organic materials such as wood, agricultural residues, and waste, has been a part of human energy use for millennia. It is a versatile and renewable energy source that can be converted into electricity, heat, or biofuels. In this section, we explore the mechanisms of biomass energy, its applications, benefits, and the challenges associated with its sustainable utilization.

Biomass Energy: Harnessing the Power of Organic Matter

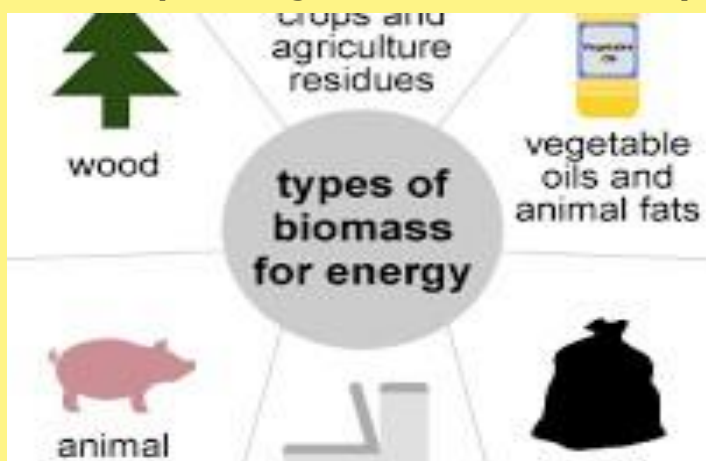
Biomass energy is derived from organic materials through various conversion processes:

Combustion: Biomass materials can be burned directly for heat or electricity generation.

Biomass combustion releases the stored energy in the form of heat, which can be used for space heating, water heating, or to produce steam for electricity generation through steam turbines.

Biogas Production: Biomass, such as agricultural and organic waste, can undergo anaerobic digestion, a biological process where microorganisms break down the organic matter in the absence of oxygen. This process produces biogas, a methane-rich gas that can be used as a renewable fuel for electricity generation, heating, or transportation.

Biofuels: Biomass can be converted into biofuels, such as biodiesel and bioethanol, through processes like fermentation and transesterification. Biofuels serve as renewable alternatives to conventional fossil fuels, powering vehicles and machinery with lower greenhouse gas



SAPKAL TEJAS TANAJI
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