

MECH GEAR

August 2024

Voice of Mech.....

DEPARTMENT OF MECHANICAL ENGINEERING

SREE RAMA GOVERNMENT POLYTECHNIC COLLEGE, THRIPRAYAR

VISION

Shaping technologically proficient and socially responsible mechanical engineering professionals.

MISSION

To provide an education that builds a solid foundation in mechanical engineering.

To equip students for career, higher education and life long learning.

To develop good communication, leadership, entrepreneurship and social skills for sustainable development.

EDITORIAL

Sreerama Government Polytechnic College abiding as one of the prime institutions in the field of technical education since last eleven decades.

As one of the most comprehensive professional discipline, we department of Mechanical Engineering mainly focus to motivate, inspire and build trust in our students.

Against such a notion Mech gear is rollout...

A portable platform to deliberate the Recent trends in the fields of engineering and technology, Automotive industry, Myths and facts and some other exchange of views.

Mech gear is an experiment and represents a new focus, a new ratio between technical education and intellect.

SINJO FRANCIS V

TOP NEWS

First series examination will start on 23/08/24

The Diploma Examination April-2024 have been published.

Two students from Mechanical Engineering secured rank below 150 in the Kerala LET 2024 examination

More than 30 students from Mechanical Engineering got placed in 2024

PRINCIPAL'S MESSAGE

It is a matter of pride and delight for the department of mechanical engineering of Sree Rama Government Polytechnic College to publish Department Newsletter 'MECH GEAR'

I hope that this publication will showcase the best endeavour of students and also have a great role in promoting students inventiveness

BABAURAJAN T S(I/C)

HOD'S MESSAGE

As we gear up for another exciting month, I wanted to take a moment to appreciate the incredible work and dedication of our team. Your passion for innovation and excellence is what drives us forward, and I'm honored to be a part of this community. Let's keep pushing boundaries, exploring new ideas, and shaping the future together!

JINTO FRANCIS (I/C)

WORLD ENERGY SCENARIO AND ROLE OF HYDROGEN

Energy is a resource, which is for the development of human beings. Energy consumption per capita is the measurement/scale of standard of living. The main conventional energy source is fossil fuel and it over-explored than replenishment, which is the cause of getting non-renewable status. Hence, we are searching for other resources which are available in Earth. Some energy sources are available at large scale such energy sources is called renewable energy sources.

The total energy supply in the world at 2021 is 6.17x10⁸ TJ and increase of 47% within two decades. Energy supply of different energy source for the period of 1965 to 2020 as shown in Fig. 1.1

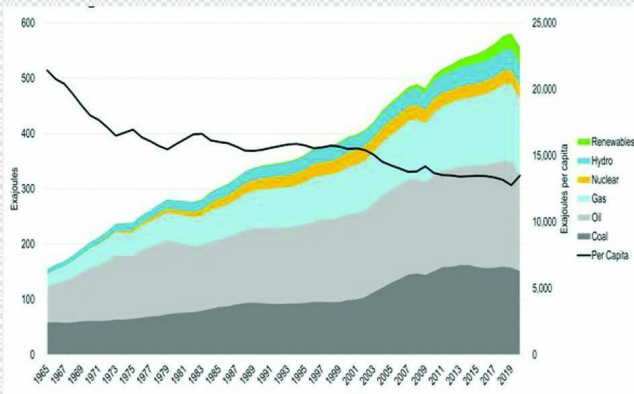


Fig.1 Energy supply of different energy source for the period of 1965 to 2020

SI No	Energy Source	% of Total supply	% of increment during 2000-2020
1	Oil	29	18
2	Coal	27	73
3	Natural gas	23	69
4	Nuclear energy	5	-
5	Bio fuel & waste	9.5	69
6	Wind/Solar & Hydro	5	69

Table 1 1 World energy source with % total supply during the period of 2000-2020

Major source of energy is fossil fuel. Thermal energy is liberated from fossil fuel by combustion, and the main by-product of combustion is CO₂, which is Green House Gas (GHG), the same cause of Global warming. Global warming is initiated by industrialization. Paris Agreement entered into force in 2016 to achieve the long-term temperature goal of limiting global temperature rise limiting to 2 °C with pre-industrialization. 17 goals are set by UN for sustainable development, as per 7th goal is deal with clean & affordable energy. Ecofriendly, affordable, renewable source of energy is required to complement with conventional energy system, might be solved the world energy challenges.

Renewable energy (RE) is cleaner and more sustainable energy. Wind & solar energy are available at everywhere and it is seasonal. RE are hard to store and transport. Hence it converted to other form such as electrical and Energy carrier gas. Some challenges are facing for electrical form such as grid stability, for storage of electrical energy, some issues also to be faced such as less energy density, less life span, poor for long duration energy storage, Cost etc. RE can be stored in H₂. It can storable, transportable and accessible.

A Road map for net zero CO₂ emission by 2050 was presented by the IEA on the COP 26 summit. One of the proposals is to expand the usage of Hydrogen. Present consumption is 90 MT in 2020 and to expand to

more than 200 MT in 2030 and 530 MT by 2050, besides of the above, Low carbon H₂ reduced to 30% and increase electrolyser H₂ to 60%. Here low-carbon H₂ means that H₂ is produced from fossil fuel with the CUSS & Biochemical method. India pledged that the country become energy independent by 2047 and net zero by 2070. Presently India imports 34% of net energy, Details of the supply of energy are given on Table 1-2.

SI No	Energy Source	% of Total supply	% of increment during 2000-2020
1	Oil	24	99
2	Coal	45	189
3	Natural gas	6	-
4	Bio fuel & waste	22	139

Table 1 2 Energy supply in India with % of total supply during the period of 2000-2020

India recognizes the role of green hydrogen and established a National green hydrogen mission. The goal of the mission is to enhance the production of green hydrogen, Hydrogen yield from 5 MMT to 10 MMT by 2030, Replace the fossil fuel feedstock to renewable, and utilize Hydrogen for the production of Ammonia, refinery & steel Manufacturing, other mission is to Decentralized green hydrogen production from i) Bio-mass especially from industrial waste & Municipal wastewater), use of Renewable energy source to operate electrolyser.

BRAINTEASER

There are 50 bikes, each with a tank that holds enough gas to go 100 km. Using these 50 bikes, what is the maximum distance you can go?

A SIMPLE BILLING TRICK TO GET PEOPLE COMPETING COULD BE WHAT ENDS ENERGY WASTE

Getting Customers Upset That They Have A Higher Electricity Bill Than Their Neighbours Could Prove To Be The Right Incentive To Lower Energy Use.

Public service campaigns tell us to save energy, but many of us don't listen. Messages like "switch off appliances when not in use" go in one ear and out the other. What has been effective in saving energy is services like Opower, which aggregate consumption data and give people tips on how to save. They work because we're social animals. When we're told our neighbors are saving money on electricity, we want to do the same. Anand Damani has a simple idea for adapting this in India, where energy efficiency is a priority. He wants to stamp people's electricity bills with the average bill cost for their area. Why? Because most people don't want to spend more than their neighbors. Damani's design outfit, Briefcase, recently tried out the idea in Bandra, Mumbai. It contacted several housing associations and asked to see electricity bills before they were sent to tenants. Over six months, Briefcase took bills from 86 households-unbeknown to the residents- and averaged out the amount they were paying. Then they stamped the bills both with that figure and a "frownie face" if the household was over the norm. After six months, the group of 86 homes had saved 1.3% overall. "Human behavior is contagious," Damani says. "Our actions are often guided by how people around us are behaving. The average consumption in the society and a frownie next to their above-average amount on the bill let them know that their neighbors were consuming less and they were over-consuming. That set the social norm and the peer pressure got them to reduce their power consumption and their bill. "A1.3% saving isn't that much in the context of 86 households, but extrapolated more widely, it could be a big deal. Briefcase is now talking to India's Bureau of Energy Efficiency about expanding idea (utilities would probably need to be involved, not just cooperative doormen). India needs to invest heavily to meet the needs of 1.2 billion people affected by blackouts, and the further 25% who have no access to grid electricity at all. But simple energy efficiency techniques could help while that's happening.

SALMANUL FARISI A A

S5 ME

GLIMPSES FROM GEAR X 2024

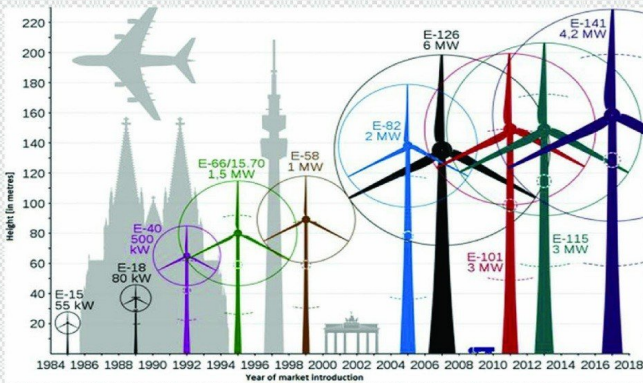


HOW BIG IS A WIND TURBINE

Wind turbines come in a range of sizes, tailored to different applications. Residential turbines are relatively small, generating a few kilowatts of power, suitable for individual homes. In contrast, utility-scale turbines are significantly larger, with hub heights around 98 meters (322 feet) and rotor diameters exceeding 130 meters (430 feet). These giants can reach total heights of over 150 meters (500 feet) and produce several megawatts of power, enough to supply electricity to thousands of homes.

Here is an illustrative image shows relative size of Wind Turbine

What do you think about wind turbine manufacturers increasing the size of turbines, given that it increases costs and air is thinner at higher altitude?



AKSHAY G KRISHNA
S5 ME

ACHIEVEMENTS

Secured a rank below 150 in the Kerala LET 2024 Examination

ADHVAITH P C

RIDHIK M K



1).The friction experienced by a body. when in motion, is known as ?

a).rolling friction b).dynamic friction

c).limiting friction d).static friction

2).Bernoulli's equation is applied to ?

a).venturimeter b).orifice meter

c).pitot tube d).all of these

3).The load required to produce a unit deflection in a spring is called ?

a).flexural rigidity b).torsional rigidity

c).spring stiffness d).Young's modulus

4).The type of space lattice found in gamma-iron is ?

a).face centred cubic space lattice

b).body centred cubic space lattice

c).close packed hexagonal space lattice

d).none of these

5).The efficiency of Joule cycle is ?

a).greater than Carnot cycle

b).less than Carnot cycle

c).equal to Carnot cycle

d).none of these

1).b 2).d 3).c 4).a 5).b
Answers

EDITORIAL BOARD MEMBERS

GAYAL KRISHNA C G

ANISHKA VALSAN

AJAY KRISHNAN EJ

VISHNU P. B

AKSHAY G KRISHNA