SITAMS

Technical Magazine

ISSUE 01

SHOW YOUR PRODUCTIVITY

MECHZINE 2020

MECHANICAL ENGINEERING

EDITORIAL
EDITOR:
M MANOJ IV MECH

MEMEBRS:
D HARI PRASAD II MECH
P SUNIL III MECH B SEC

FACULTY ADVISORS:
P.KARUNYAMOORTHY
V.ARAVIND RAM SHARMA

DEPARTMENT VISION

TO BECOME A CENTRE OF EXCELLENCE IN MECHANICAL ENGINEERING STUDIES AND RESEARCH.

DEPARTMENT MISSION

- Provide congenial academic ambience with necessary infrastructure and learning resources.
- Inculcate confidence to face and experience new challenges from industry and society.
- Ignite the students to acquire self-reliance in State-of-the-Art Technologies.
- Foster Enterprising spirit among students.

MESSAGE FROM HOD

I feel ecstatic to introduce you to Department of Mechanical Engineering, which is the foundation of Engineers. Department of Mechanical Engineering strives for increasing the knowledge, enhancing the critical thinking, ability to change information into knowledge and power of analyzing the things technically of each and every individual of ever changing society through students.

We always intend to impart knowledge through a closed knit family of highly competent faculty. Department of Mechanical Engineering plays a vital role in an engineering college catering to the teaching of Mechanical and Humanities courses for engineering students.

Our Laboratories have been very well established not only to cover complete syllabus but to motivate students to learn beyond the syllabus which definitely develops complete knowledge of the subject (both the practical and theoretical depth of knowledge) and develop skill sets of students to become promising engineers in future.

I would like to conclude with the words of Thomas Friedman who has rightly opined “World is flat opportunities are immense. It’s just a question of identifying opportunities and making the best of them”. I wish a very best of luck to the students.

MESSAGE FROM EDITOR

The Magazine "MECHZINE" team works to bring out the annual official student-publication of department of Mechanical Engineering. Each year, our team works extensively to bring out the technical report writing skills of the students. The final publication reflects and encompasses the creative technical presentation skills inherent to the academic and upcoming areas in the field of Mechanical Engineering.

The magazine's primary focus has been geared at covering articles reflecting the student's knowledge and associations with latest and leading edge-technologies.

The magazine continues to expand its reach to achieve its vision of being a truly representative student publication.

I am thankful to all the staff and students of MECH department for their contributions in making of "MECHZINE" and I hope to build on this ethos just as much during the upcoming academic years.

TABLE OF CONTENTS

RENEWABLE ENERGY

MS. MANOJ
IV MECH

Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished. Renewable energy sources are plentiful and all around us.

Fossil fuels - coal, oil and gas - on the other hand, are non-renewable resources that take hundreds of millions of years to form. Fossil fuels, when burned to produce energy, cause harmful greenhouse gas emissions, such as carbon dioxide. Generating renewable energy creates far lower emissions than burning fossil fuels. Transitioning from fossil fuels, which currently account for the lion’s share of emissions, to renewable energy is key to addressing the climate crisis.

Renewables are now cheaper in most countries, and generate three times more jobs than fossil fuels.

SOLAR ENERGY

Solar energy is the most abundant of all energy resources and can even be harnessed in cloudy weather. The rate at which solar energy is intercepted by the Earth is about 10,000 times greater than the rate at which humankind consumes energy.

Solar technologies can deliver heat, cooling, natural lighting, electricity, and fuels for a host of applications. Solar technologies convert sunlight into electrical energy either through photovoltaic panels or through mirrors that concentrate solar radiation.

Although not all countries are equally endowed with solar energy, a significant contribution to the energy mix from direct solar energy is possible for every country.

The cost of manufacturing solar panels has plummeted dramatically in the last decade, making them not only affordable but often the cheapest form of electricity. Solar panels have a lifespan of roughly 30 years, and come in variety of shades depending on the type of material used in manufacturing.

WIND ENERGY

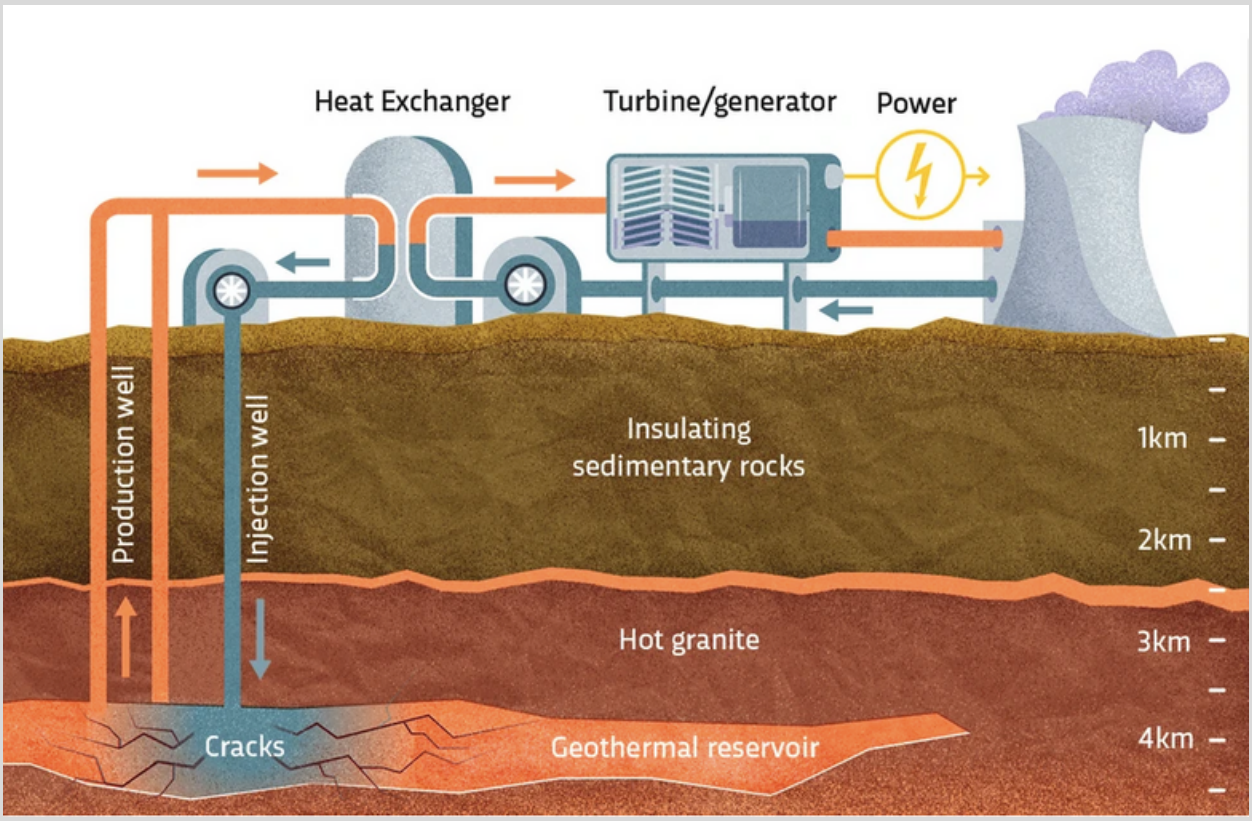
Wind energy harnesses the kinetic energy of moving air by using large wind turbines located on land (onshore) or in sea- or freshwater (offshore). Wind energy has been used for millennia, but onshore and offshore wind energy technologies have evolved over the last few years to maximize the electricity produced - with taller turbines and larger rotor diameters.

Though average wind speeds vary considerably by location, the world's technical potential for wind energy exceeds global electricity production, and ample potential exists in most regions of the world to enable significant wind energy deployment.

Many parts of the world have strong wind speeds, but the best locations for generating wind power are sometimes remote ones. Offshore wind power offers tremendous potential.

GEOTHERMAL ENERGY

Geothermal energy utilizes the accessible thermal energy from the Earth's interior. Heat is extracted from geothermal reservoirs using wells or other means.
Reservoirs that are naturally sufficiently hot and permeable are called hydrothermal reservoirs, whereas reservoirs that are sufficiently hot but that are improved with hydraulic stimulation are called enhanced geothermal systems.
Once at the surface, fluids of various temperatures can be used to generate electricity. The technology for electricity generation from hydrothermal reservoirs is mature and reliable, and has been operating for more than 100 years.



AUTONOMOUS VEHICLE

B CHARAN
III MECH A SEC

An autonomous vehicle, or a driverless vehicle, is one that is able to operate itself and perform necessary functions without any human intervention, through ability to sense its surroundings.
An autonomous vehicle utilises a fully automated driving system in order to allow the vehicle to respond to external conditions that a human driver would manage.

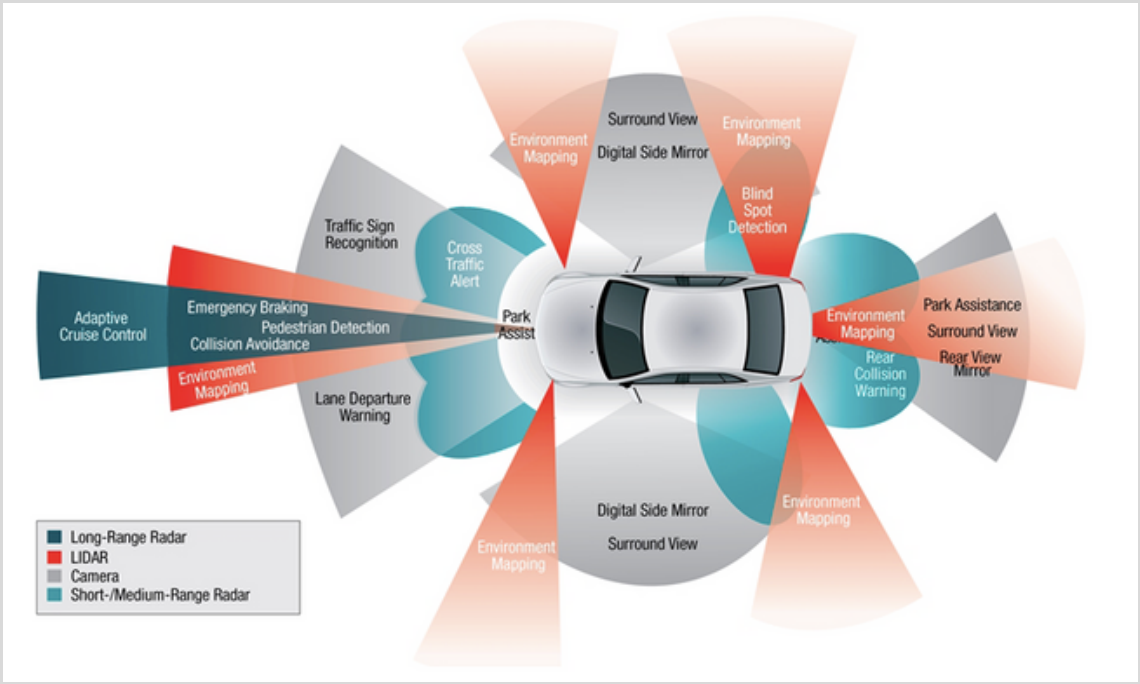
There are six different levels of automation and, as the levels increase, the extent of the driverless car's independence regarding operation control increases.
At level 0, the car has no control over its operation and the human driver does all of the driving.
At level 1, the vehicle's ADAS (advanced driver assistance system) has the ability to support the driver with either steering or accelerating and braking.

At level 2, the ADAS can oversee steering and accelerating and braking in some conditions, although the human driver is required to continue paying complete attention to the driving environment throughout the journey, while also performing the remainder of the necessary tasks.

At level 3, the ADS (advanced driving system) can perform all parts of the driving task in some conditions, but the human driver is required to be able to regain control when requested to do so by the ADS. In the remaining conditions, the human driver executes the necessary tasks.

At level 4, the vehicle's ADS is able to perform all driving tasks independently in certain conditions in which human attention is not required.

Finally, **level 5** involves full automation whereby the vehicle's ADS is able to perform all tasks in all conditions, and no driving assistance is required from the human driver. This full automation will be enabled by the application of 5G technology, which will allow vehicles to communicate not just with one another, but also with traffic lights, signage and even the roads themselves.



Durability as a Goal: Be mindful about aiming for a durable, long-lasting design and not aim for the unattainable goal of immortality.

Design Simplicity: For products and designs with multiple components, material diversity should be at a minimum. Fewer parts mean less disassembly and greater retention of the product's value.

Renewable Sources of Materials: The three factors that determine whether the source of the material is sustainable are its location and vicinity to its intended delivery area, the materials' compostable properties, and the manageability of the source of the materials.

Robust Pollution Sources: With inevitable sources of potential pollution, design measures should be done to make them robust and manageable.