MECHANICAL ENGINEER

V.E.S.

MECHANICAL ENGINEERING DEPARTMENT PRESENTS

MECHAZINE

VOLUME 1
ISSUE 1

E-NEWSLETTER

EDITION 2019-20

VISION

To pr**ODU**ce mechanical engineers with technical competency driven by ethical v**ALU**es

MISSIONS

MISSION 1: To impart v**ALU**e-based Q**U**ality e**DU**cation t**HU**s enabling st**U**dents to meet **U**p with the demands of the INDUSTRY as well as society

MISSION 2: To create technically expertise engineers with the desire for lifelong learning

MISSION 3: To Provide a platform for overall personality development of st**U**dents

[redacted]

- **PEO 1. Provide socially responsible, environment-friendly solutions to Mechanical engineering related broad-based problems adapting professional ethics.**

- **PEO 2. Adapt state-of-the-art Mechanical engineering broad-based technologies to work in multi- disciplinary work environments.**

- **PEO 3. Solve broad-based problems individually and as a team member communicating effectively in the world of work.**

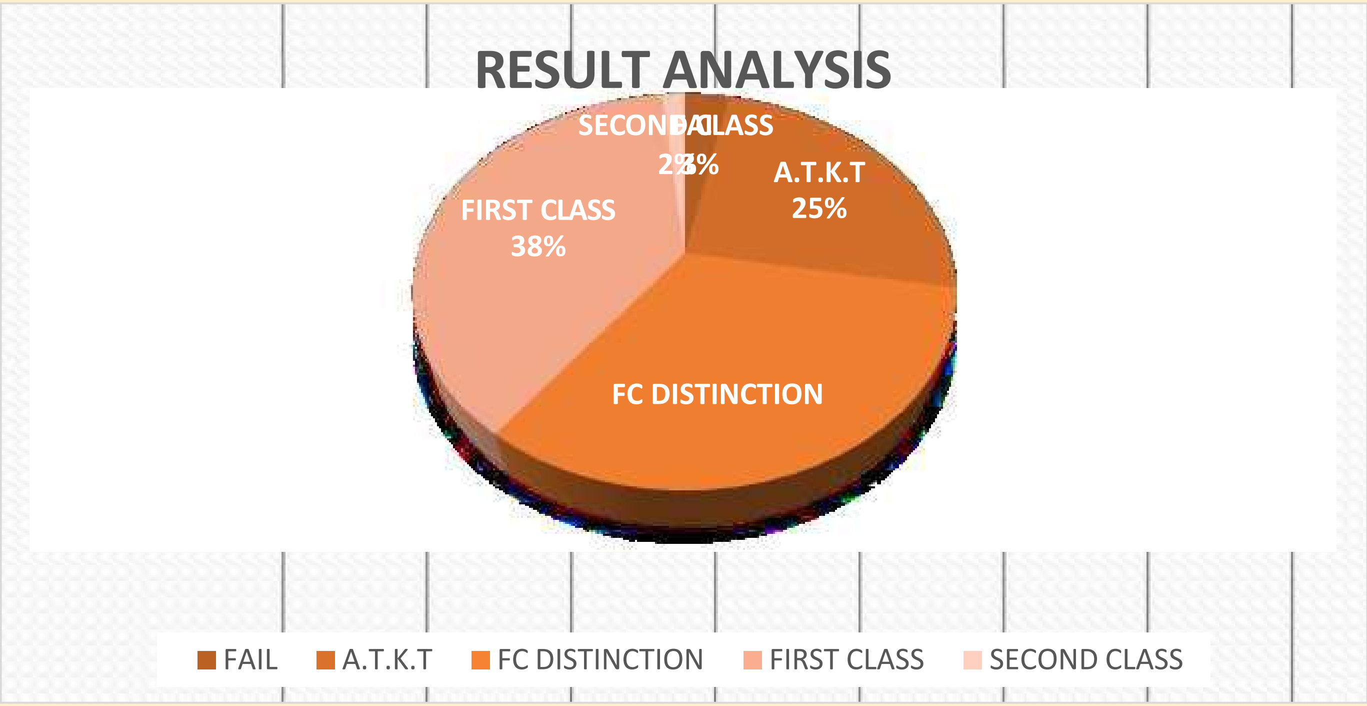
[redacted]

- **PSO 1. Modern Software Usage: Use the latest Mechanical engineering related software for simple design, drafting, manufacturing, maintenance and documentation of mechanical engineering components and processes.**

- **PSO 2. Equipment and Instruments: Maintain equipment and instruments related to Mechanical Engineering.**

- **PSO 3. Mechanical Engineering Processes: Manage Mechanical engineering processes by selecting and scheduling relevant equipment, substrates, quality control techniques, and operational parameters.**

RESULT ANALYSIS FOR THE YEAR 2018-19



TOPPERS

RANK	NAME OF THE TOPPER	PERCENTAGE
1	THAKUR CHIRAG RAJIV	88.62
2	KASWANKAR SANMEY SNEHAL	86.41
3	KORGAONKAR JANHAVI SANJAY	85.59
4	RANE AMEY VILAS	84.90

OVERALL PERCENTAGE OF PASSING:

98.33 %

ACTIVITIES AND PRIZES

1) ANVESH TALENT HUNT BY SANMAY KASWANKAR
2) ANVESH PERFROMANCE BY NAMRATA UBALE AND JANHAVI KORGAONKAR
3) ISTE QUIZ COMPETION – WINNERS ANIMESH GHOSH AND ADITYA SAHU
4) ANTI RAGGING POSTER MAKING COMPETION- 1st PRIZE BERFIN TERLO, 2nd prize – SANMAY KASWANKAR
5) CARD MAKING COMPETION- PARTICIPANT RASHMI VERMA
6) CHESS COMPETION IN GPM BANDRA- SEMI FINALISTS ADITYA SAHU, SIDDESH AVHAD, ANIRUDH ACHARYA
7) ANVESH SECURITY COUNCIL- ANIRUDH ACHARYA & PIYUSH GHUMBRE
8) ANVESH ROBO RACE- 1st Prize PIYUSH GHUMBRE
9) POSTER MAKING COMPETITION – 1st Prize By TEJAS SALUNKE & VEDANT PATIL

GUEST LECTURES :

1. Personality changes during transition from school to college by Priya MUkharji
2. Inspirational Talk by Shubham Vanmali
3. Suicide Prevention - "The shrink and The nut" by Dr. Anjali Chhabria; Mr. Atul Khatri
4. Accelerate & nurture the success by Dr. Sudhakar Upadhyay; Apoorva Wadikar
5. Importance of Counseling by Meeta Brahmbhatt
6. General CAD awareness by Karan Kokane
7. Energy Conservation by Nirmal Nariani
8. ISTE Motivational lecture by Mrs.Mansi Thakkar
9. Santulan - Smart and Sorted Students
10. Orientation by V.E.S Faculty
11. Other activities

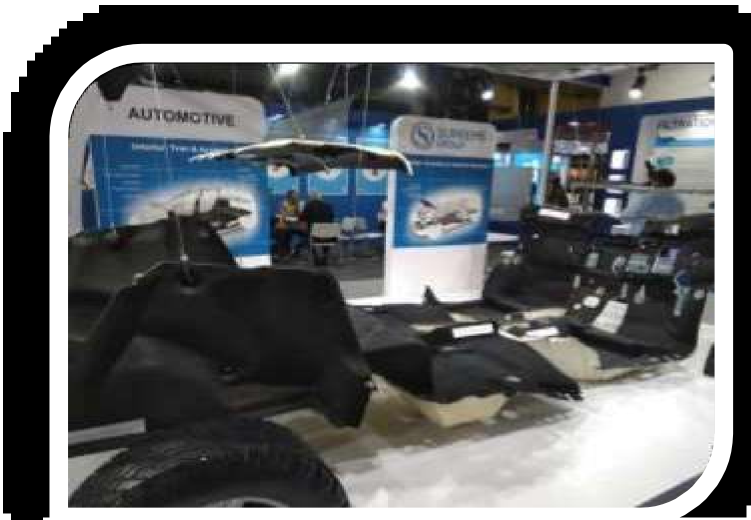
a) GYAN VISTAR book Launch in VESIT

b) Lecture by CM Shri Devendra Fadnavis on leadership attended by Berfin, Aditya & Rashmi

c) VESIM BUSINESS LECTURE attended by Namrata & Vivek

Industrial Visits :

1. Apoorva Industries at Asangaon, Thane
2. Anubhav Fabricators at Airoli MIDC, Thane
3. Bombay Exhibition Centre- Textile exhibition at Goregaon
4. NAB – IDBI Polytechnic at Ambernath , Thane



MoU SIGNED :

Academic Year 2018-19

Sr.no	Name of the Industry	Duration
1	ANUBHAV FABRICATION	3 YEARS
2	APURVA INDUSTRIES	3 YEARS
3	LAKSHAY ORGANISATION	3 YEARS

Academic Year 2019-20

Sr. No.	Name Of Industry	Duration
1	MCED	MUTUAL TERMINATION
2	RCF LTD	3 YEARS

ACTIVITIES UNDER MOU:

Industrial Visits

Sr.No.	Academic Year	Date	Class	Name of Company	Address
1	2018-2019	10/1/2019	ME2I	APURVA INDUSTRIES	ASANGAON
2	2018-2019	24/1/2019	ME2I	ANUBHAV FABRICATORS	No. B-14, T. T. C. Industrial Area, M. I. D. C. Road, Opposite Sandoz, Compound Digha, Thane, Maharashtra 400708

Expert Lecture

Sr.No.	Academic Year	Date	Class	Name of the person with designation	Company Address
1	2019-2020	5/9/2019	ME3I	H K KADAM, MANAGER	Administrative Building, Mahul Rd, Mysore Colony, Chembur, Mumbai, Maharashtra 400074

SUSTAINABLE GREEN MANUFACTURING

(Infusing A Sustainable Green Manufacturing Course into Manufacturing/Mechanical Engineering Technology Program)

Abstract—**Green manufacturing is an emerging field in recent years and is also the sustainable development model for modern manufacturing industries. Sustainable green manufacturing encompasses the concept of combining technical issues of design and manufacturing, energy conservation, pollution prevention, health and safety of communities and consumers. Many industries are directing their resources to reduce the environmental impact of their produced products and services. To remain competitive in the global economy, these industries need to train engineering and technology professionals to understand the impact of their decisions on the environment and society. It is important for universities to prepare these future engineering technologists to meet this need. Many technology programs do not offer this type of information to their undergraduate students**.

I. INTRODUCTION

Green manufacturing is an emerging field in recent years and is also the sustainable development model for modern manufacturing industries. The U.S. Dept of Commerce defines sustainable green manufacturing as "the creating of manufactured products that use processes that are nonpolluting, conserve energy and natural resources, and are economically sound and safe for employees, communities and consumers"[1]. There is a growing awareness among many manufacturing industries of the need to consider the economic, societal, and environmental performance. Demand for environmentally sustainable products and the advances in sustainable technology have become increasingly important components of engineering and engineering technology education. In order to be able to come up with environmentally sustainable products, sustainability issues need to be a part of the every engineering decision. This includes every step, from the design phase until the product reaches to its end-of life, and continues even after that, when the efforts to regain the material's value may take place [2]. The engineering technology education program should reflect the needs and changes of today's manufacturing industry and prepare young engineer technologists to meet the challenges of the competitive world of manufacturing. The need to integrate sustainability and green manufacturing subject matter into undergraduate curriculums in either engineering or engineering technology has become increasingly important over the last decade [3].

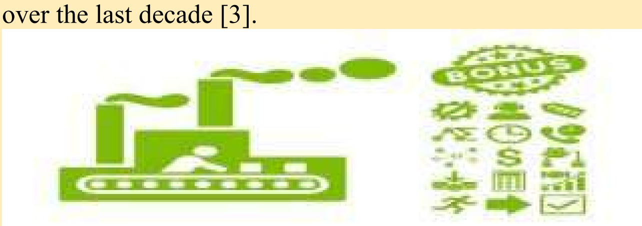


FIG 1: Benefits of green manufacturing

II. GENERAL CONCEPTS IN SUSTAINABLE GREEN MANUFACTURING

Manufacturing industries account for a significant part of the world's consumption of resources and generation of waste. It is widely recognized that industrial production inevitably results in an environmental impact. In 2006, the total output of the U.S. manufacturing sector in the form of a variety of products had a gross value of $5.3 x 1012 and these products were responsible for about 84% of energy related carbon dioxide (CO_2) emissions and 90% of the energy consumption in the industrial sector [4]. Therefore, identifying the environmental footprints associated with these assessment (LCA) provides the common framework with science-based analysis methods for decision makers. LCA is an approach used to quantify the environmental impacts of a product by measuring the inputs, such as raw materials and energy, and outputs, such as aerosols, waste and greenhouse gases, associated with the entire supply chain of a product [5]. During Life cycle inventory (LCI), construction there is a clear flow chart of the whole manufacturing process, all entrance and exit flow of input and energy, and the balance between them, which means that a detailed map of the whole production process is obtained. Sustainable manufacturing practices adopted by manufacturers usually focus on manufacturing input materials, manufacturing processes, packaging and waste disposal, among others. Students should, upon entering the workforce, be able to assess a manufacturing process efficiently in terms of environmental impact. The manufacturing process consists of the inputs, process, and outputs of an operation. Each unit process is converting material/chemical inputs into a transformed material/chemical output. The unit process diagram of a machining process is shown in Figure 2.

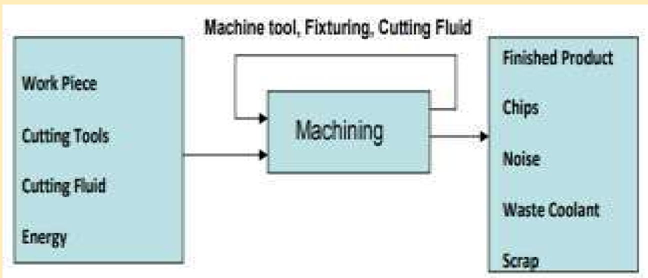


FIG 2: Input-Output diagram of a machining process

III. CONCEPT OF GREEN MANUFACTURING

The main objective of sustainable green manufacturing is to conceive products which can be recycled, remanufactured or reused. The product lifecycle is divided in the four main phases: material production, manufacturing, use and end-of-life. The life cycle of a given product is made up of various linked processes or manufacturing plants that are each required in support of the production and use of a product, and all have inputs and outputs that impact the environment. This resulting database is the life cycle inventory (LCI) and provides a transparent description of a product. The life cycle inventory contains data that quantifies energy and raw material requirements i.e. emissions to air & water, solid waste, and other environmental releases that are included within the scope and boundaries of the systems. These data can be found in the literature, educational and industry manuals, or databases. The data can also be gathered experimentally. The proposed course will look at the environmental concerns of each individual process as shown below figure 3. Figure 3 shows an overview of the environmental-based factors for drilling operations as an example. The efficiency of energy utilization in manufacturing is an important indicator of performance. The focus of energy efficiency studies is changing from energy efficient productsto energy efficient manufacturing [6]. Manufacturing processes consume resources directly and produce environmental pollution as well as being the main factors that affect sustainability. Therefore, innovative studies on green manufacturing processes are promising. Efforts to minimize the environmental impacts of manufacturing processes can be classified into the development of new processes and the improvement of existing processes based on the requirements of sustainability [7]. The life cycle approach addresses all phases of the product life cycle, including the design phase, the raw material production phase, the manufacturing phase, the distribution phase, the usage phase and the end of life phase, and it aims to maximize total product performances during the product lifetime [8].

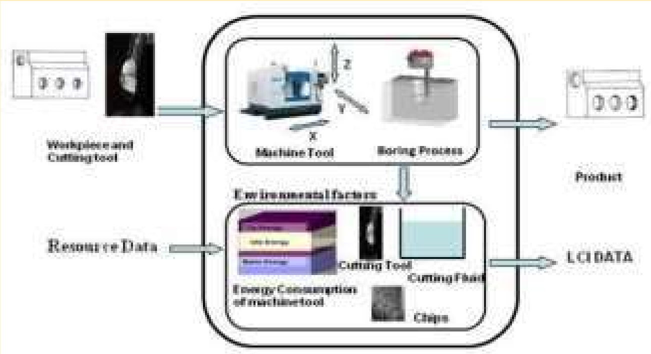


FIG 3: LCI DATA FOR MACHINING PROCESS

	CO_2 Laser Cutting	2.5 kW	4 kW	6 kW
ELECTRICAL ENERGY	Cutting energy [kWh]	31.42	55.22	74.89
	Production ready [kWh]	1.64	2.98	3.64
	Table changing [kWh]	1.00	1.81	2.21
CONSUMABLES	Cutting gas - N_2 [l]	28.12	20.31	19.33
	Laser gas [l]	10	10	20
	Cooling water [l]	0.13	0.13	0.2
	Compressed air [m^3]	5.4	5.4	8.1
	Regularly replaced parts (spare parts)	Mirror, lens, O-ring, lubrication oil, filters, Gas tubes and valves		
DIRECT PROCESS EMISSIONS	Aerosols [g]	45.0	72.0	108.0
	NO_x [mg]	201.6	324.0	486.0
	Ozone [mg]	21.6	36.0	54.0

FIG 4: LCI DATA TABLE

IV. CONCLUSION

Engineering technology education strives to produce graduates who are ready to perform at a high level immediately after receiving their degrees and who can achieve strong professional growth throughout their careers. There is no doubt that sustainable green manufacturing will continue to be developing, be a benefit to society and improve the environment in various ways. We recognize the need for incorporating an environmental conscious course into our manufacturing curriculum. This paper has highlighted the importance of infusing sustainability into current mechanical/manufacturing engineering technology curriculum in order to address current unsustainable practices in industry and society.

V. REFRENCES

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[3] Bower, K., Brannan, K., Davis, W. (2016) Sequential course outcome linkage: a framework for assessing environmental engineering curriculum within a CE program. Paper No. 2006-1669. Proceedings of the 2006 American Society for Engineering Education Annual Conference & Exhibition.

[4] Ramani, K., Ramanujan, D., Zhao. F., Sutherland, J., Handwerker., C., Kim., H., Thurston, D. and Choi, J. (2010) Integrated Sustainable Life Cycle Design: A Review, Journal of Mechanical Design,

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[7]Zuming, B. (2011) Revisiting System Paradigms from the Viewpoint of Manufacturing Sustainability, Sustainability

JET SUIT

(To have efficient way of travelling due to advance mechanical equipment's and machine)

Abstract - **A jet pack, rocket belt, or rocket pack is a device worn on the back which uses jets of gas or liquid to propel the wearer through the air. The concept has been present in science fiction for almost a century and became widespread. Real jet packs have been developed using a variety of mechanisms, but their uses are much more limited than their fictional counterparts because of the challenges of Earth's atmosphere, gravity, low energy density of available fuels, and the human body not being suited to fly, and they are principally used for stunts.**

I. INTRODUCTION

Jet suits is the device which can be used for flight for a single person in air by providing thrust. Except for use in a microgravity environment, this thrust must be upwards to overcome the force of the gravity and must be enough to overcome the weight of the person. The upper thrust is produced by the jet engine in the jet suit [1]. In the most general terms, a jet pack is a wearable device which allows the user to fly by providing thrust. With the exception of use in a microgravity environment, this thrust must be upwards so as to overcome the force of gravity, and must be enough to overcome the weight of the user, the jet pack itself and its fuel. This necessarily requires the jet pack to continually push mass in a downwards direction. While some designs have power and/or mass supplied from an external, ground-based source, untethered flight requires all a flight's fuel to be carried within the pack. This results in problems relating to the overallmass ratio, which limits the maximum flight time to tens of seconds, rather than the sustained flight envisaged in science fiction [2]. The flying jet suit is again made by Gravity Industries, a young British start-up that builds the real life working "jet suit" which has a flight for about 10-20 minutes. It was designed by Richard Browning; it weighs 27 kg without fuel. These is powered by five mini jet engines [3].

II. JET SUITS HISTORY

The U.S. Army began researching rocket pack technology in 1949 at Redstone Arsenal in Alabama. The Ordnance Rocket Centre at Redstone was the agency in charge of the program. Their goal was a back-mounted device that could propel a single soldier into the air. In 1952, Thomas Moore successfully tested a rocket pack which lifted him into the air, but only for a few seconds. A device called the Jump belt was demonstrated at Fort Benning, Ga., in 1958 with a slightly greater flight time. News footage of these demonstrations fuelled the public's interest in jet packs. The project was then shifted to Bell AeroSystems in Buffalo, N.Y. Bell developed something they called the Rocket Belt, though the official name was the Small Rocket Lift Device (SRLD). Over the course of the next decade, Bell's Rocket Belt made several improvements in speed and flight time, reaching speeds up to 10 mph. Plans for a jet-powered version, which did achieve longer flight times in initial tests, were scrapped when the military decided it didn't fit the design parameters because it was too large and heavy [4].

FIG 1: U.S. ARMY JET SUIT

III. GRAVITY JET SUIT

A start-up based in Salisbury, England that has developed the coolest flying suit this side of Iron Man. The suits are extremely expensive—a recent model went for $440,000—and extremely loud. [5] These Jet engines use many miniature turbines to achieve the vertical flight. The kerosene engines are rated at 22 kg of thrust each. To control the direction and speed of the flight, whilst being shown fuel consumption among other usage data within the head-up display inside the helmet. Gravity jet suit achieve the speed of 32.02 miles per hour (51.53 km/h) with the suit during a Guinness World Records attempt for 'Fastest speed in a body controlled jet engine powered suit [6].

FIG 2: GRAVITY JET SUIT

IV. REFERENCE

[1] https://en.wikipedia.org/wiki/Jet_pack
[2] Burnett, Dean (23 September 2014). "Jetpacks: here's why you don't have one | Dean Burnett". the Guardian. Retrieved 9 March 2018
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[6] https://time.com/collection/bestinventions-2018/5454241/gravity-jet-suit/

BERFIN TERLO

BIOFUELS

Abstract—**Biofuels are the energy sources which has the potential to solve a number of problems related to climate and sustainability. Biofuels are mainly produced from plants, agriculture wastes, commercial-domestic waste containing biological origin. Basically biofuels contains atoms of oxygen and their chemical compositions may include acids , alcohols and esters.**

I. INTRODUCTION

A fuel that is produced through contemporary processes from biomass, rather than very slow geological processes involved in fossil fuels is known as biofuels. Technically biomass can be used as direct fuel (eg. Wood logs). Biomass and biofuels are both same terms people use them interchangeably. Biomass denotes the biological raw material the fuel which is made up of some form of thermally/chemically altered solid end products. Biofuel is a word usually reserved for liquid or gaseous fuels used for transportation. The U.S. Energy Information Administration (EIA) follow this naming practice[1].If the biomass that is used in the production of biofuel can quickly regrow, the fuel is generally considered to be a form of renewable energy. Biofuels are mainly produced from plants, agriculture wastes, commercial-domestic waste containing biological origin. Basically biofuels contains atoms of oxygen and their chemical compositions may include acids, alcohols and esters[2].

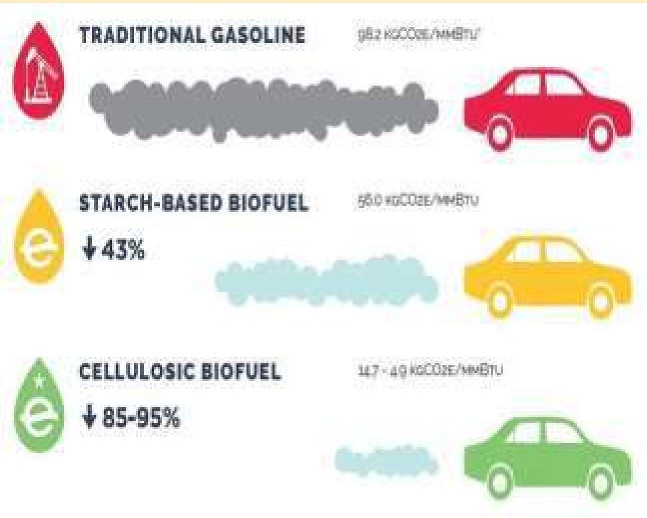

FIG 1: Transportational Benefits Of Biofuels.

II. DIFFERENT TYPES OF BIOFUELS

Bioethanol and biodiesel are the two most types of Biofuels. Bioethanol is an alcohol basically made by fermentation process, carbohydrates produced in starch or sugar crops such as sugarcane, corn, or sweet sorghum. Cellulosic biomass, which is derived from non-food sources, such as grasses and tress, is also being developed as a feedstock for ethanol production. It can be used as a fuel for vehicles in its pure form (E100), but it is usually used as a gasoline additive to increase octane and improve vehicle emissions. Ethanol is used widely in Brazil and in the United States. Biodiesel is produced from fats or oils using transesterification and it is the most commonly used biofuel in Europe. Biodiesel can be used as a fuel for vehicles in its pure form (B100), but it is usually used as a diesel additive to reduce levels of particulates, hydrocarbons and carbon monoxide, fromdiesel-powered vehicles[3].

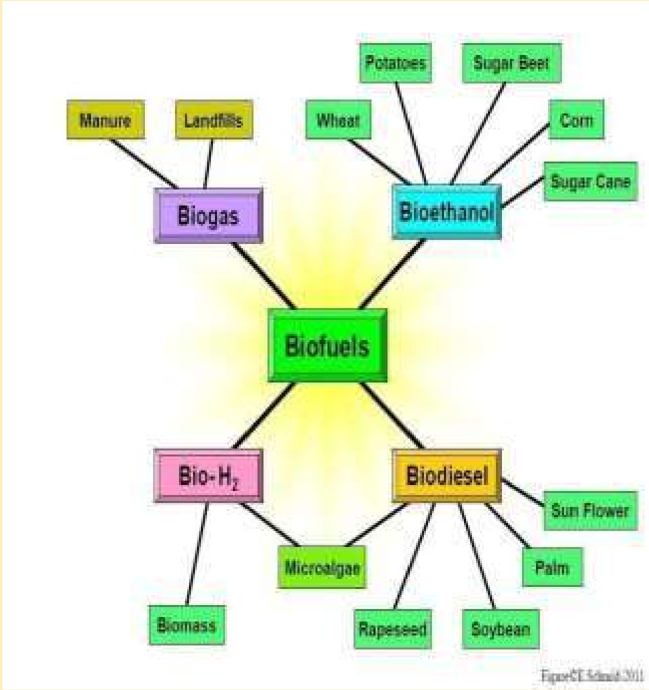

FIG 2: Types Of Biofuels

Biogas is a methane produced by the process of anaerobic digestions of organic material by anaerobes.It can be produced either from biodegradable waste materials or by the use of energy crops fed into anaerobic digesters to supplement gas yields. Biogas can be recovered from mechanical biological treatment waste processing systems.A less clean form of biogas, is produced in landfills through naturally occurring anaerobic digestion. Green diesel is a fuel produced through hydrocracking biological oil, such as vegetable oils and animal fats[4]. Hydrocracking is a refinery method that use elevate temperatures and pressure in the presence of a catalyst to break down larger molecules, such as those found in vegetable oils, into shorter hydrocarbon chains which are used in diesel engines.It may also be called as renewable diesel, hydrotreated vegetable oil or hydrogen-derived renewable diesel. Unlike biodiesel, green diesel has exactly the same chemical properties as petroleum-based diesels.As it does not require any new engines, pipelines or infrastructure to distribute and use, but it has not been produced at a cost that is competitive with petroleum.Versions of gasoline are also being developed. Green diesel is being developed in Singapore and Louisiana[5]

III. CONCLUSION

Continuously use of fossil fuels to fulfill our daily needs and requirements of energy will soon lead to depletion in the availability of these fuels. It will clear indication of this situation can be observed with the increase in fuel prices in coming years. The need to look for an alternative fuel sources to meet up the energy requirements has increased. Many alternative energy sources out of which biodiesels have been attracting attention as liquid transportation fuels..Biofuels can be used for lighting, heating, power and transport.There are a no. of biological products that can be used as biofuels which includes wood, grass, oils, starches and sugars[6].

IV. REFERENCE

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[5] https://www.shell.com/business-customers/catalysts-technologies/catalysts/refining-catalysts//hydrocracking-catalysts.

[6] https://web.stanford.edu/class/e297c/trade_environment/energy/hfossil.html