SONA - EDISON Pages

SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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Persons of Influence

I feel extremely delighted to observe that the department of Electrical Engineering is coming out with a magazine this year also with the dedicated and committed efforts of the faculty and students. The activity depicts the commitment and involvement of students, faculty members and their thirst for knowledge. I congratulate the efforts of the members of the department in bringing the magazine. It is because of their selfless and untiring efforts that we see the magazine enriched with variety of articles.

Dr. S.R.R.Senthil Kumar, Principal

I feel privileged in presenting the new volume of our department association magazine. I would like to place my sincere and heartfelt thanks to all those who have contributed to make this effort a success. My special thanks to the Management, for their guidance which enabled us to bring out this volume. The magazine has a variety of articles endowed with different subjects contributed by the students of our department and their participation in various activities round the year.

Dr. S. Padma, HOD/EEE

Vision - EEE

To become a front-runner in bringing out globally competent electrical and electronics engineers, innovators, researchers, and entrepreneurs and thereby contribute value to the knowledge-based economy and society.

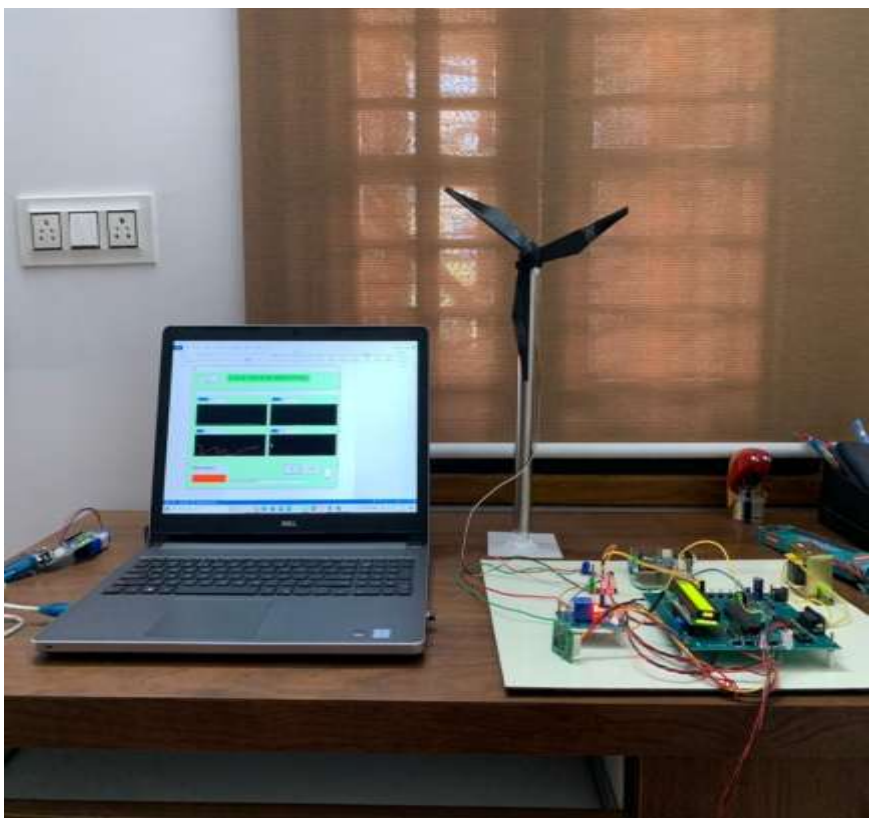
Mission - EEE

- To offer good quality Under-Graduate, Post-Graduate and Doctoral programmes in electrical and electronics engineering
- To provide state-of-the-art resources that contribute to achieve excellence in teaching-learning, research and development activities
- To bridge the gap between industry and academia by framing curricula and syllabi based on industrial and societal needs
- To provide suitable forums to enhance the creative talents of students and faculty members
- To enable students to develop skills to solve complex technological problems of current times and also provide a framework for promoting collaborative and multidisciplinary activities
- To inculcate moral and ethical values among the faculty and students.

Students Technical Projects

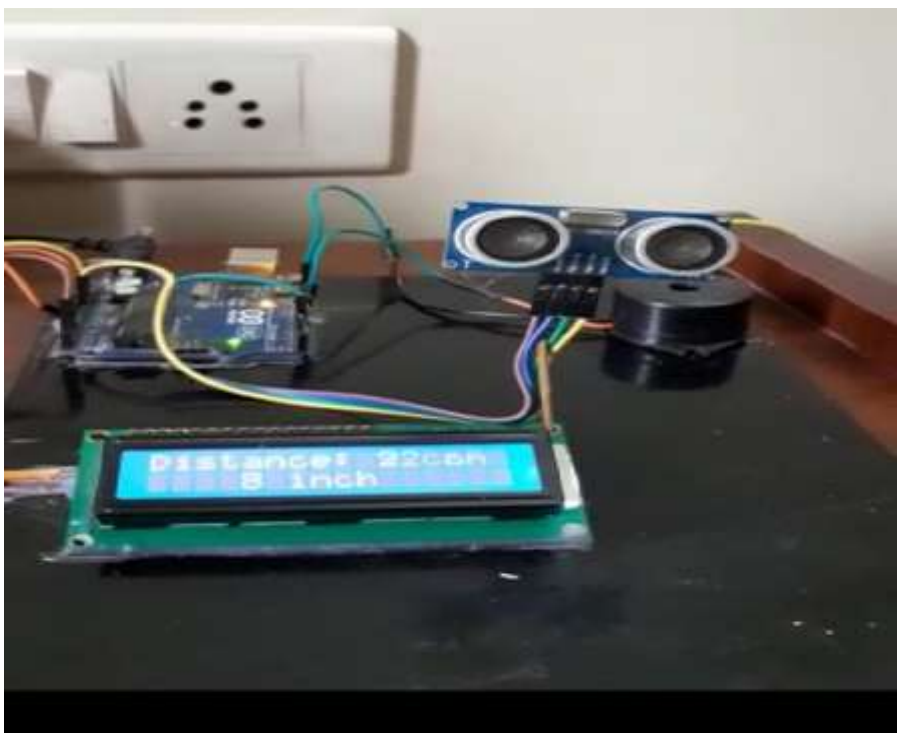
Condition Monitoring of Doubly Fed Induction Generator using SCADA Data Analysis

Utility-scale wind turbines are equipped with a supervisory control and data acquisition (SCADA) system for remote supervision and control. The SCADA system accumulates a large amount of data that contains the health conditions of the wind turbines. Thus, it is interesting to mine the health status-related information from SCADA data for wind turbine condition monitoring. In this project, an easy approach is proposed to detect abnormalities and diagnose faults in wind turbines. Finally, wind turbine faults are diagnosed through the analysis of the distributions and correlations of their SCADA data.



Distance measurement and precision system using ARDUINO

It is used in several applications, like measuring liquid level, checking proximity and even more popularly in automobiles to assist in self-parking or anti-collision systems. We know that human audible range is 20 Hz to 20 kHz. The project utilize these frequency range waves through ultrasonic sensor HC-SR04.The advantages of this sensor when interfaced with arduino which is a control and sensing system, a proper distance measurement can be made with new techniques. This distance measurement system can be widely used as range meters and as proximity detectors in industries.



Real Time Monitoring of Electric Vehicle parameters using IOT Module

Power management in electric Vehicle has been revolutionized by using the battery as an energy source. The motor and battery are the most essential component of electric vehicle (EV) and so maintenance is needed for proper function. The proposed system describes the application of Internet-of-things (IOT) in monitoring the performance of the electric vehicle to protect those components.

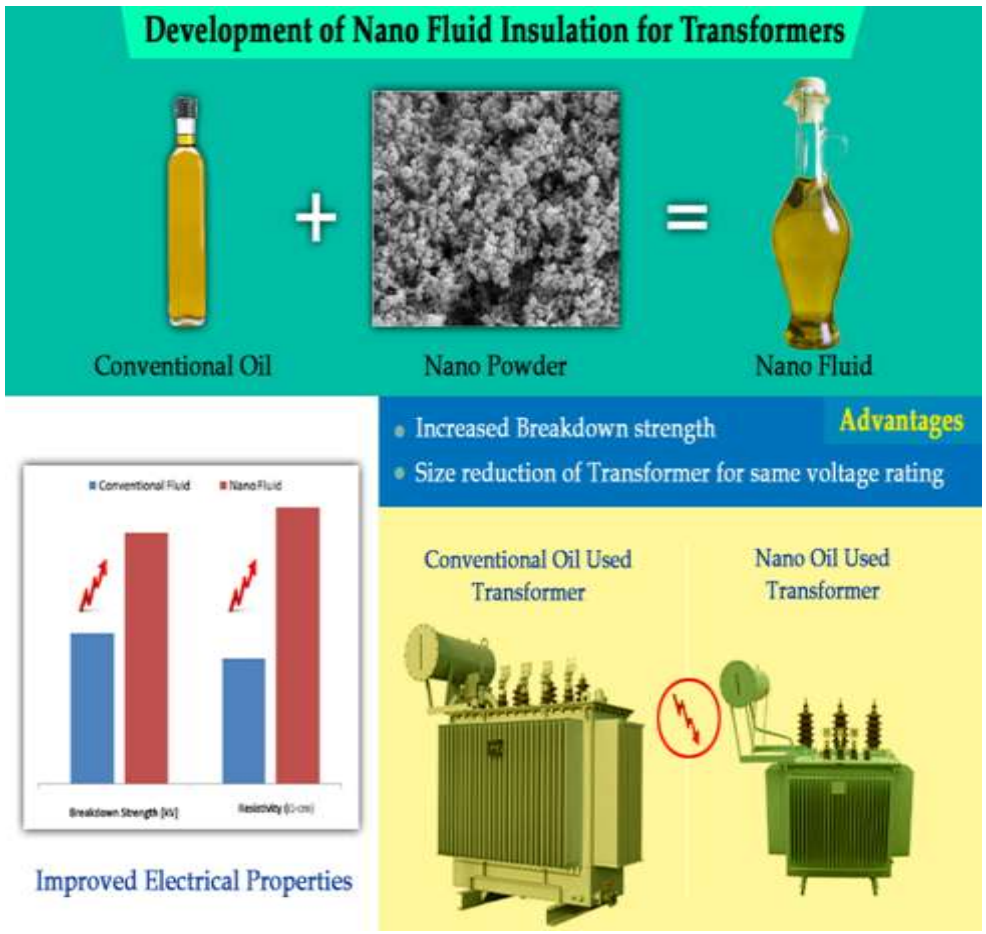
Cooling System for PPE Suit

SONA PEDAC is a R&D that develops innovative solutions to address healthcare challenges. Their latest product, the UV Sterilization Kit, is designed to disinfect personal protective equipment (PPE) and other items quickly and efficiently using ultraviolet (UV) light. The R&D's investment in the state-of-the-art research and development center is a testament to their commitment in developing innovative solutions to address healthcare challenges. The R&D center is staffed by a highly skilled team of scientists and engineers who are dedicated in developing cutting-edge technologies and products that can improve healthcare outcomes.

UV sterilization Kit with VEE Technologies

- An Automatic non-contact based UV sterilization box is designed with combined features of automatic opening and closing of box by proximity sensing and UV light sterilizer for objects.
- UV (ultraviolet) light is flashed over the entire object surface placed inside the box for few seconds which kills any microbes like bacteria and viruses if any remaining over the surface.
- This ensures the infection not passed to any other person with 100% guaranteed protection and avoids cross contamination Essential articles are generally not being sterilized by even those who are at high risk of infection from corona such as health, sanitation and security personnel.
- Any virus can be deactivated up to 99% by the ultraviolet germicidal irradiation (UVGI) dose of 2,400 microwatt.sec/cm^2.

SONA – PERT Product



- To improve the dielectric properties of liquid insulation, Sona PERT has focused on developing nano-fluids, which are fluids in which nano-particles are dispersed in a base liquid.
- This new technology has shown significant advantages over conventional mineral oil, as it enhances the thermal conductivity, surface wettability, insulation strength, and heat transfer coefficient of the liquid insulation.
- The high surface area and fast heat transfer between particles and fluid are mainly attributed to the improvements in the fundamental properties of liquid insulation.

Design and Development of Single Phase Deck Power Converter for Shallow Water

- Single phase 4kW power converter model 19.01, developed by SonaPERT R&D Centre an innovative system developed with 1 % voltage regulation and 2 % output ripple, which is able to meet the highest standards of industries to perform testing of any DC equipment.
- It can be used as a source for DC motors, BLDC motors, special electrical machines and Robotic applications. It is provided with required digital input and analog output for user interface. In addition, operator can continuously monitor the voltage, current and power through the LCD display.

Simplex Motor by SONA-SPEED

There is a mandatory requirement from ISRO for applying tenders for the development, realization and supply of Space grade/MIL grade motors for Launch vehicle and Satellite applications. The clean room avoids the intervention of moistures and brings control to the laboratory eco-system as proper workspace than helps in providing accurate lab results.

Research in SONA – SPEED R&D Centre

VSSC team comprising personnel from EMAD, and QIDM visited SONA SPEED, Sona College of technology, in regard to supply to Dual redundant stepper motors. The purpose of visit is to participate in the Final assembly and performance testing of dual stepper motors for Gaganyaan mission.

LED Street Light - Student Project

The initiative by the EEE department students to fabricate LED street lights in-house is a remarkable achievement. The final year students of our EEE department, under the guidance of faculty, have successfully fabricated five 50 W LED street lights. It is noteworthy that the actual market price of a 60 W LED street light is Rs. 3900, whereas the cost investment for fabricating a 50 W LED lamp in-house by our students is Rs. 950.

Guest Lecture on Basics of Railway Signaling

G. Dineshvaran, Signalling Design Lead, Alstom Transportation India Pvt Ltd,Bengaluru

Alumnus of 2018 batch Currently working in Alstom Transportation India Pvt Ltd. Bangalore as Signaling design lead, Having nearly 4years of experience in Railway Signaling design. Has experience in handling Indian Railways and US railways projects. A "Signal" is a medium to convey a particular predetermined meaning in nonverbal form. Every aspect of signal of signal is pre-determined meaning like, Red aspect meaning is stop dead, yellow aspect meaning is caution and green aspect meaning is proceed.

Dissemination of Technical Knowledge through Publications

Author	Title of Paper	Name of the Journal	Impact Factor	Indexed	Technical novelty and Major contributions
Karthik B	Modeling of lossless contactless power transformer using improved particle swarm optimization algorithm	Power Technology	1.32	SCI	The contactless power transmission is applicable recently for various real time applications like electric vehicle charging, in space travelling, and other distribution systems.
S. Vijay Shankar	Design and Implementation of Comprehensive Converter	Journal of Electrical Engineering & Technology	1.069	SCI	This novel Comprehensive Converter (CC) proposes multiple power conversion approach for step-up and step-down processes in AC-DC, DC-DC, AC-AC and DC-AC conversions.
V. Shanmugasundaram	Investigation on Solar PV generation and design of switched reluctance motor for Smart Agriculture actuation system	Journal of nuclear energy science & power generation technology	0.14	SCOPUS	Generation, transmission, and distribution have been an integral part of the conventional power sector, interconnected over long distance through a diverse network of wire known as the electric grid.
Dr.R.Shivakumar, Dr. K. S.Yamuna	A Novel Nature-Inspired Improved Grasshopper Optimization-Tuned Dual-Input Controller for Enhancing Stability of Interconnected Systems	Journal of Circuits, systems and Computers.	1.278	SCOPUS	Power system often experiences the problem of low-frequency electromechanical oscillations which leads the system to unstable condition. The problem can be corrected by implementing power system stabilizers (PSSs) in the excitation control system of alternator
K.Krishnamoorthi	Photovoltaic module integrated modified three-port interleaved flyback converter fed six-level shunt active power filters	International transactions on electrical energy systems	0.87	Scopus	In this paper, a photovoltaic (PV) array tied modified three-port interleaved flyback converter (MTPIFC) is proposed to power shunt active power filter (SHAPF).

Guest Lecture on Industrial Automation in Manufacturing

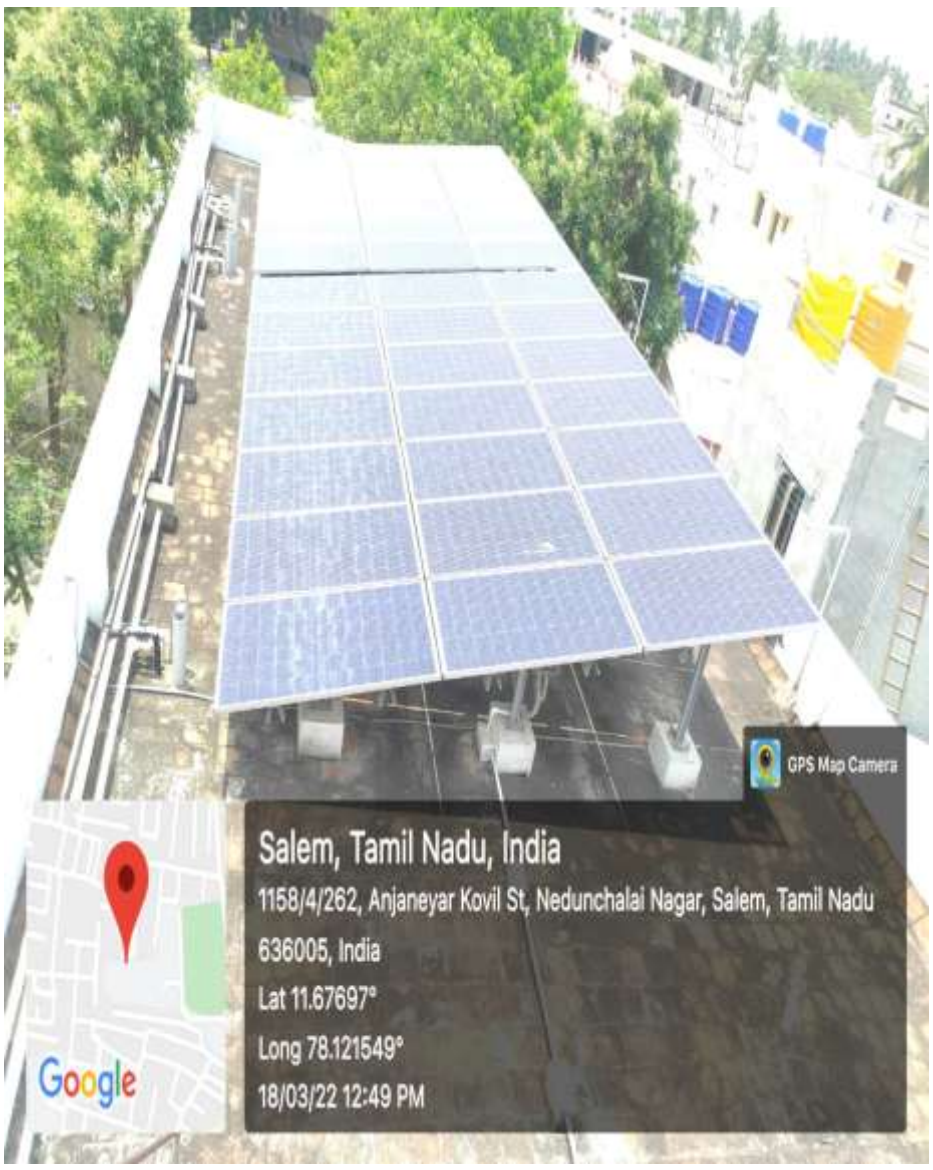
A guest lecture on "Basics and Innovations of Industrial Automation in Manufacturing" was organized by the Electrical and Electronics Engineering Department of our institution. The lecture was delivered by Mr. Vinoth Kumar V, Assistant Manager/Electrical and Automation Hot Rolling Mill, JSW Steel Ltd. The event was convened by Dr. S. Padma, the Head of the EEE Department.

Solar Power Generation in SONA Campus

Solar power plants directly connected to the utility power grid are on-grid solar power plants. The excess electricity created by the solar power system is exported to the DISCOM and then imported during the night when there's no more sunlight.

- These systems work in tandem with the electrical grid and are ideal when your power consumption is excessive and you want to save money on your electricity bills. With or without net metering, on-grid systems can be installed.
- Commercial solar plants are utility-connected solar systems that are joined to the grid. These solar systems, including solar panels, a solar inverter, and other solar accessories, are also known as on-grid solar systems.
- Solar power Rooftop solar power can meet up to 25% of a college's electricity requirements in India.

Month	2020		2021	
	Units	Amount	Units	Amount
	Gen	Saved	Gen	Saved
Jan	-	-	7285	48590
Feb	-	-	11169	74497
Mar	-	-	12550	83708
April	-	-	10990	73303
May	-	-	8514	56788
June	-	-	8827	58876
July	10456	69741	-	-
Aug	10349	69027	-	-
Sep	8979	59889	-	-
Oct	11002	73383	-	-
Nov	7193	47977	-	-
Dec	7517	50138	-	-
Total	55496	370155	59335	395762



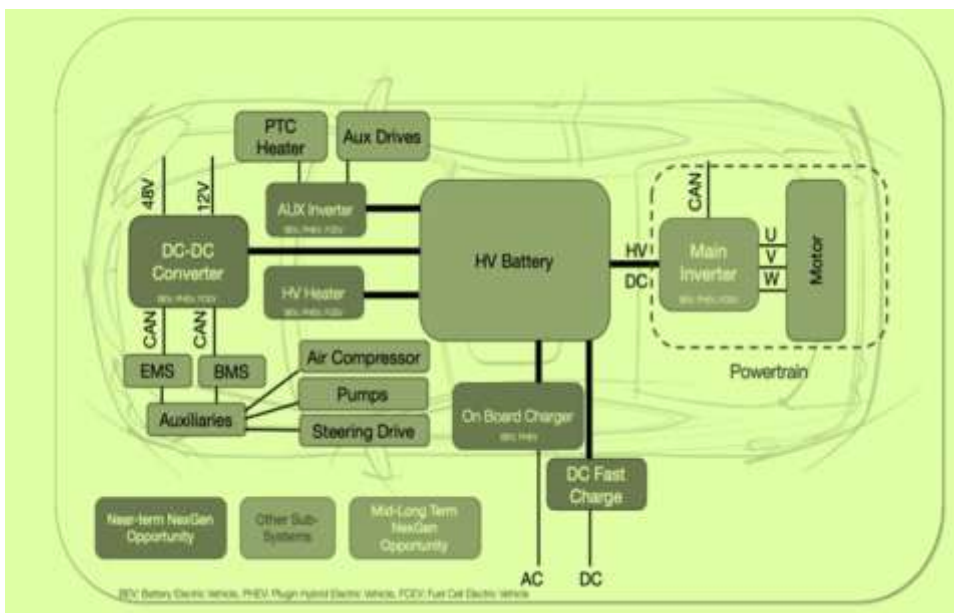
- Our institution consumes a lot of diesel for power generation, rooftop solar can abate up to 15% of your diesel bills, subject to timing of load shedding
- Students gain practical, hands on knowledge of solar plants
- Energy security – Rooftop solar plants can deliver power during load-shedding, ensuring that critical loads are always running
- Not all solar plant configurations can deliver power during load-shedding.

Cost-effective – Rooftop solar power has a levelised cost considerably lower than diesel power cost. Additionally, your energy cost is now fixed for the next 25 years, unlike diesel power which keeps increasing. A solar plant requires very little maintenance from the energy consumer.

Young Researcher Award

Dr. V. Shanmugasundaram, a young and dynamic researcher, was awarded the Young Researcher Award 2021 by the Institute of Scholars (InSc), Bengaluru, in recognition of his outstanding contribution to the field of research. He has published several research articles in high-impact journals and has presented his research work He has also received several awards and accolades for his research work, including the CSIR-NET fellowship and the INSPIRE fellowship.

Embedded Electronics in Electric Vehicles



The next e-learning then focusses more closely on charging itself. The basics of EV charging will be explained, as well as different charging standards and modes, charging plugs or bidirectional charging. This includes discussing basic electric drive system design, considering aspects of functional safety and highlighting various elements of the system energy management.

Electronic BLDC Drive for 8 kW Hubless Thruster Underwater Hydrodynamic BLDC Motor- SONA PERT

BLDC Motor Drive version 16.1, developed by SonaPERT R&D Centre of Sona College of Technology, Salem, is an electronic drive used to control the underwater submersible BLDC motor which is connected with remotely operated vehicles (ROV) under the sea for deep sea mining operation. This drive can operate any BLDC motor upto 8 kW power rating comfortably. It is provided with over current, over temperature protection. User interface is given through Keypad by which operator can set the required acceleration/deceleration settings, speed commands and direction of rotation.

Ironless BLDC Motor for Laser Doppler Velocimeter
SONA-SPEED, R&D

This product is an example of Indigenous technology development of space grade motors. This ironless brushless dc motor is developed for Laser Doppler Velocimeter mechanism of chandrayaan-1 technology development mission done by Laboratory for Electro Optics Systems LEOS, ISRO, Bengaluru.

Digital optic warp, weft stop motion and counter
SONA PEDAC R&D

The product relates to the field of fabric production or weaving. It is an attachment designed for power looms that will help to reduce the weaving strain of loom operators.

This is composite product that offers warp and weft pick counter that can be used in shuttle based power looms. If a warp threads breaks or overlaps another or the weft pirn is about to exhaust itself of thread this device will stop the machine through electromagnetic actuated brake, with a display of the type of fault and sound an alarm.

The pick value is stored in an internal memory during power failure and continues the count when power comes again.

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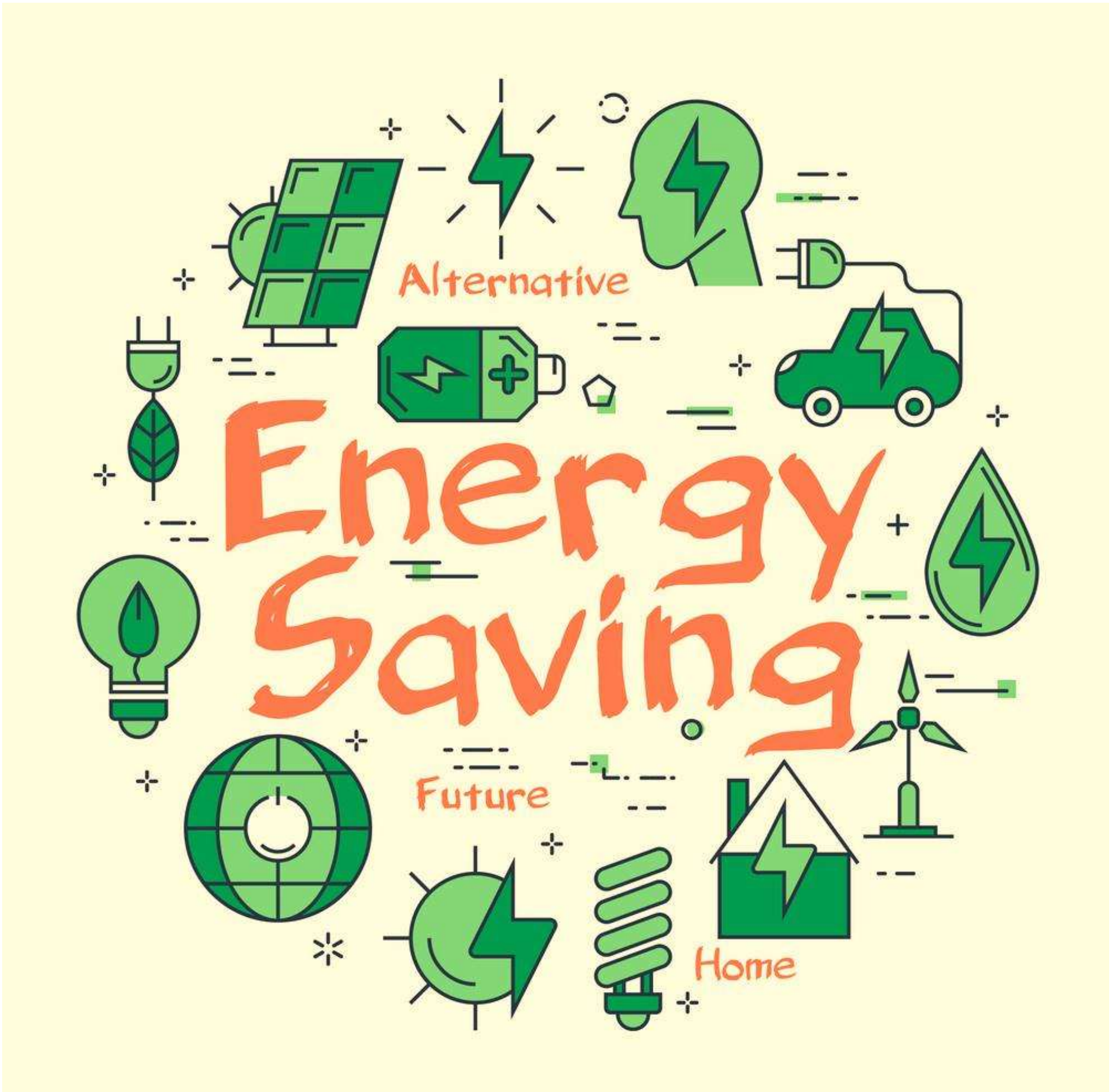
Alternative
Energy
Saving
Future
Home

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