DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

THUNDER TRENDS

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NARAYANA ENGINEERING COLLEGE :: NELLORE
(APROVED BY AICTE, NEW DELHI & PERMANENTLY AFFILIATED TO JNTU, ANANTHAPURAMU)

Vision of the Institute

To be one of the nation's premier Institutions for Technical and Management Education and a key contributor for Technological and Socio-economic Development of the Nation.

Mission of the Institute

- To produce technically competent Engineers and Managers by maintaining high academic standards, world class infrastructure and core instructions.
- To enhance innovative skills and multi disciplinary approach of students through well experienced faculty and industry interactions.
- To inculcate global perspective and attitude of students to face real world challenges by developing leadership qualities, lifelong learning abilities and ethical values.

Vision of the Department

To impart knowledge in the field of Electrical and Electronics Engineering to meet the technical challenges of industry and society with strong innovative skills, leadership qualities and ethics.

Mission of the Department

- To provide standard training and effective teaching learning process to the students by using the state-of-the-art laboratories, core instruction and efficient faculty.
- To enhance competent, innovative and technical skills amongst the students through training programs by industry and external participation.
- To inculcate leadership qualities, ethical values and lifelong learning skills in learners to serve the society and nation for overall development through value based education.

Program Educational Objectives (PEOs)

Programme Educational Objectives (PEOs) of B.Tech (Electrical and Electronics Engineering) program are: Within few years of graduation, the graduates will

PEO-1: To solve composite problems using mathematics, basic sciences and engineering principles in the domains of testing, design and manufacturing.

PEO-2: To achieve higher positions in their profession by demonstrating leadership qualities, research and innovative abilities.

PEO-3: To contribute in the field of Electrical and Electronics Engineering to finding solutions for societal problems through their lifelong learning skills and ethical values.

Program Outcomes (POs)

PO-1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO-6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO-12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

On completion of the B.Tech. (Electrical and Electronics Engineering) degree, the graduates will be able to

PSO-1: Provide alternate solutions to address the problems with specific requirements in the field of Electrical and Electronics Engineering.

PSO-2: be ready to work professionally in relevant industries like power systems, control systems and software industries.

PROFESSOR DESK

Enerdata's analysis and key figures of global energy trends and climate impacts

Each year, our analysts leverage our internationally recognized databases and expertise to produce Global Energy Trends – a comprehensive, independent study of the past year's energy market trends and the resulting environmental impacts.

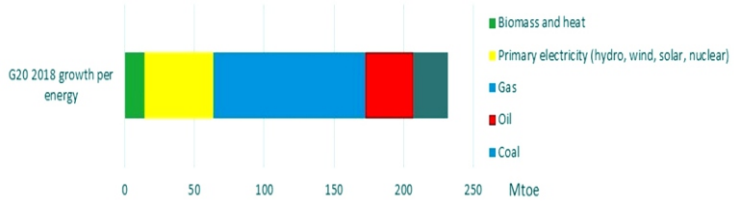
This publication analyses the G20 nations – a key to understanding energy and climate worldwide, as the G20 accounts for 80% of global energy demand – and highlights important 2018 evolutions in global markets.

* G20 countries account for 80% of global energy consumption ** Energy-related CO2-emissions from energy combustion (>80% of CO2 emissions)

Steady economic growth, slow reduction in energy intensity and slow evolution of the G20's energy mix made 2018 quite similar to 2017 in these respects. As the figures above show, this combination led to record-high energy demand (+2.1%) and energy-related CO2 emissions (+1.7%).

In the OECD, several cyclical factors contributed to these changes, such as a cold winter and hot summer in the USA, and good hydro availability combined with mild weather in the EU.

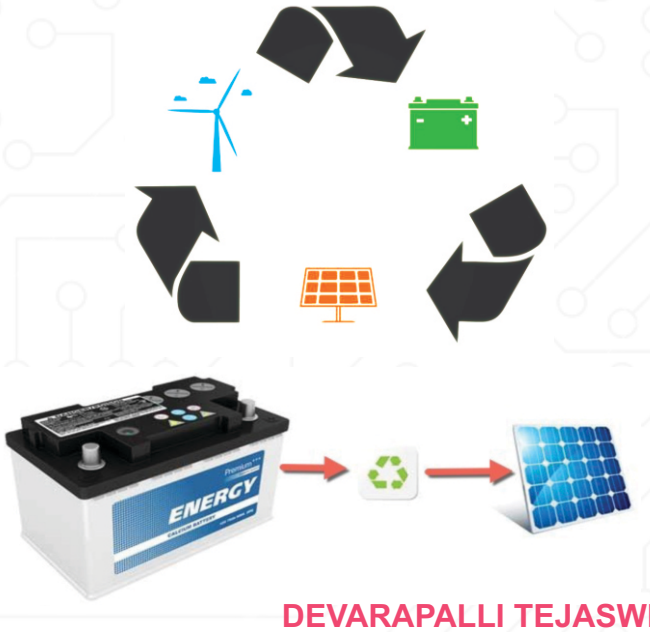
Outside of the OECD, demand growth was led by gas and electricity (+6%), but coal and oil also increased (+2-3%).



Dr. G. Venkateswarlu,
HOD, Dept of EEE, NECN.

RECYCLING OLD BATTERIES INTO SOLAR CELLS

This could be a classic win-win solution: A system proposed by researchers at MIT recycles materials from discarded car batteries — a potential source of lead pollution — into new, long-lasting solar panels that provide emissions-free power. The system is described in a paper in the journal Energy and Environmental Science, coauthored by professors Angela M. Belcher and Paula T. Hammond, graduate student Po-Yen Chen, and three others. It is based on a recent development in solar cells that makes use of a compound called perovskite — specifically, organolead halide perovskite — a technology that has rapidly progressed from initial experiments to a point where its efficiency is nearly competitive with that of other types of solar cells. “It went from initial demonstrations to good efficiency in less than two years,” says Belcher, the W.M. Keck Professor of Energy at MIT. Already, perovskite-based photovoltaic cells have achieved power-conversion efficiency of more than 19 percent, which is close to that of many commercial silicon-based solar cells. Initial descriptions of the perovskite technology identified its use of lead, whose production from raw ores can produce toxic residues, as a drawback. But by using recycled lead from old car batteries, the manufacturing process can instead be used to divert toxic material from landfills and reuse it in photovoltaic panels that could go on producing power for decades. Amazingly, because the perovskite photovoltaic material takes the form of a thin film just half a micrometer thick, the team’s analysis shows that the lead from a single car battery could produce enough solar panels to provide power for 30 households. As an added advantage, the production of perovskite solar cells is a relatively simple and benign process. “It has the advantage of being a low-temperature process, and the number of steps is reduced” compared with the manufacture of conventional solar cells, Belcher says. Those factors will help to make it “easy to get to large scale cheaply,” Chen adds.

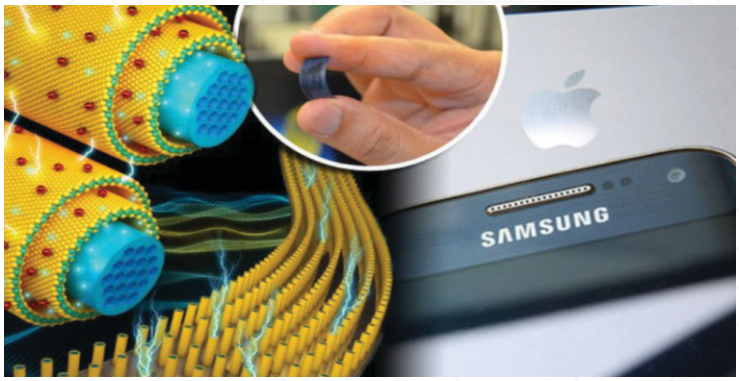


DEVARAPALLI TEJASWINI
Roll No.17711A0224, II EEE

Super capacitor battery can charge your phone in seconds

You may soon have to say goodbye to the dying battery woes. Yes, the long hours that your smart phone takes to charge may soon become a thing of the past, as scientists, including one of Indian-origin, have developed a new process to make electronic devices charge in seconds. The researchers at University of Central Florida (UCF) in the US have developed a process to create flexible super capacitors that have more energy storage capacity and can be recharged more than 30,000 times without beginning to degrade. "If they were to replace the batteries with these super capacitors, you could charge your mobile phone in a few seconds and you wouldn't need to charge it again for over a week," said Nitin Choudhary, a postdoctoral associate at UCF.

These super capacitors that are still proof-of-concept could be used in phones and other electronic gadgets, and electric vehicles, said the study published in journal ACS Nano. Anyone with a smart phone knows the problem. After 18 months or so, it holds a charge for less and less time as the battery begins to degrade. Scientists have been studying the use of nano materials to improve super capacitors that could enhance or even replace batteries in electronic devices. It is a stubborn problem, because a super capacitor that held as much energy as a lithium-ion battery would have to be much, much larger.



KANDUKURI SAMYUKTHA
Roll No.17711A0242, II EEE

New droplet-based electricity generator: A drop of water generates 140V power, lighting up 100 LED bulbs

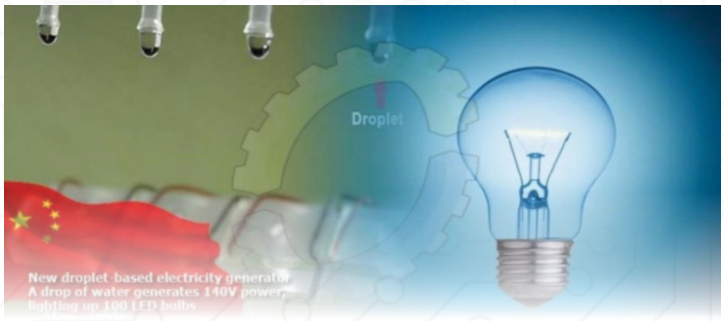
Generating electricity from raindrops efficiently has gone one step further. A research team has recently developed a droplet-based electricity generator (DEG), featured with a field-effect transistor (FET)-like structure that allows for high energyconversion efficiency and instantaneous power density increased by thousands times compared to its counterparts without FET-like structure. This would help to advance scientific research of water energy generation and tackle the energy crisis. Generating electricity from raindrops efficiently has gone one step further. A research team led by scientists from the City University of Hong Kong (CityU) has recently developed a droplet-based electricity generator (DEG), featured with a field-effect transistor (FET)-like structure that allows for high energyconversion efficiency and instantaneous power density increased by thousands times compared to its counterparts without FET-like structure. This would help to advance scientific research of water energy generation and tackle the energy crisis.

RASAM SAI SUPRIYA
Roll No.17711A0282, II EEE

Efficiency of electrical energy conversion greatly improved

Hydropower is nothing new. About 70% of the earth's surface is covered by water. Yet low-frequency kinetic energy contained in waves, tides, and even raindrops are not efficiently converted into electrical energy due to limitations in current technology. For example, a conventional droplet energy generator based on the triboelectric effect can generate electricity induced by contact electrification and electrostatic induction when a droplet hits a surface.

However, the amount of charges generated on the surface is limited by the interfacial effect, and as a result, the energy conversion efficiency is quite low. In order to improve the conversion efficiency, the research team has spent two years developing the DEG. Its instantaneous power density can reach up to 50.1 W/m2, thousands times higher than other similar devices without the use of FET-like design. And the energy conversion efficiency is markedly higher.

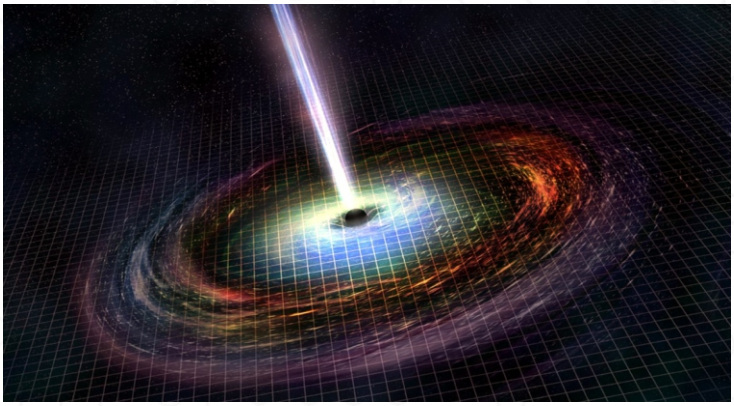


VEMU SRINADH
Roll No.17711A02B2, II EEE

Anti-solar cells: A photovoltaic cell that works at night

What if solar cells worked at night? That's no joke, according to Jeremy Munday, professor in the Department of Electrical and Computer Engineering at UC Davis. In fact, a specially designed photovoltaic cell could generate up to 50 watts of power per square meter under ideal conditions at night, about a quarter of what a conventional solar panel can generate in daytime, according to a concept paper by Munday and graduate student Tristan Deppe.

The article was published in, and featured on the cover of, the January 2020 issue of ACS Photonics. Munday, who recently joined UC Davis from the University of Maryland, is developing prototypes of these nighttime solar cells that can generate small amounts of power. The researchers hope to improve the power output and efficiency of the devices. Munday said that the process is similar to the way a normal solar cell works, but in reverse. An object that is hot compared to its surroundings will radiate heat as infrared light. A conventional solar cell is cool compared to the sun, so it absorbs light. Space is really, really cold, so if you have a warm object and point it at the sky, it will radiate heat toward it. People have been using this phenomenon for nighttime cooling for hundreds of years. In the last five years, Munday said, there has been a lot of interest in devices that can do this during the daytime (by filtering out sunlight or pointing away from the sun).



Generating power by Radiating Heat

There's another kind of device called a thermoradiative cell that generates power by radiating heat to its surroundings. Researchers have explored using them to capture waste heat from engines. "We were thinking, what if we took one of these devices and put it in a warm area and pointed it at the sky," Munday said. This thermoradiative cell pointed at the night sky would emit infrared light because it is warmer than outer space. "A regular solar cell generates power by absorbing sunlight, which causes a voltage to appear across the device and for current to flow. In these new devices, light is instead emitted and the current and voltage go in the opposite direction, but you still generate power," Munday said. "You have to use different materials, but the physics is the same." The device would work during the day as well, if you took steps to either block direct sunlight or pointed it away from the sun. Because this new type of solar cell could potentially operate around the clock, it is an intriguing option to balance the power grid over the day-night cycle.

SAPRAM PRASANNA KUMAR
Roll No.18715A0216, II EEE

SMART CHARGING

Alameda County, Calif., is running a charging pilot that allows it to charge its many EVs while controlling energy use and reducing expensive spikes. TheSmart Charging Pilot Programthe building's chargers to communicate, and for the DC fast charger to override fleet Level 2 chargers when it's in use. This increases the charging time for Level 2 chargers by just a few minutes while allowing vehicles that need it to charge immediately. Availability: This is a pilot project.

VEHICLE TO "X"

Fermata Energy, a Virginia-based startup, is connecting electric vehicles to the grid, buildings, and eventually homes through a bi-directional charger and software. This allows fleets to maximize the use of electric vehicles through energy storage when the EV is parked, and the fleet gets a percentage of savings generated. Availability: now.

BOMMASANI PADMINI
Roll No.18715A0202, II EEE

WIRELESS CHARGING

Worried about drivers forgetting to plug in? Wireless charging may be the solution. Utah-basedWAVEoffers wireless EV charging that's already being used by six transit agencies nationwide. Charging happens when buses stop to load and offload passengers or cargo, with vehicle-mounted receiver pads and ruggedized chargers embedded in the roadway. En-route charging can mean battery size reduction of up to 75%. Availability: now.

CHINAGAPALLI THANMAI
Roll No.16711A0213, III EEE

MORE SMART CHARGING

Here's another way to avoid surges in electricity use: Los Angeles-based startup MOEV Inc., has chargers that can split a single circuit into four plugs, and users can schedule charging via the company's software. Need a vehicle in a couple of hours? It will get charged first, before the other vehicles get their turn. This system allows fleets to reduce peaks in electricity use and the capital cost for equipment — buy one (slightly more expensive) charging station rather than four. Availability: now.

SOLAR CHARGING

Envision Solar, a California-based energy innovation company, produces the EV ARC — or autonomous renewable charger. This transportable, off-grid charger is an alternative when trenching and permitting drive up the cost (and time) of charging infrastructure. It comes with as many as six plugs for vehicles.

KALLURU MAHESH PREETHAM
Roll No.16711A0230, III EEE

EXTREME FAST CHARGING

A DC quick charger provides electricity output of 50-120 kWh, and it can charge a Nissan Leaf up to 80% in half an hour. The U.S. Department of Energy is hoping to reduce this by providing research funding for EV charging at 350 kWh. So if you need 50 kW of charge, and a Chevrolet Bolt has a 60 kWh battery, this could take less than 10 minutes.

How to Find the Bad Bulb on Christmas Lights

What You'll Need to Fix a String of Lights
Grab your dead strings of lights and a few simple tools, and you will bring those lights back to life in no time.

1. Voltage detector or Christmas light tester tool
2. Safety glasses
3. Outlet

Replacement bulbs at correct voltage rating
The trick to string light repair is to eliminate easy solutions first, and then move on to trickier ones. First, figure out if the problem is just a single bad bulb or a wiring issue.
check for the following:

1. Loose bulbs
2. Damaged or frayed wires

Damaged outlets or electrical plugs

KONDLAPUDI SREYA
Roll No.16711A0234, III EEE

Our Favorite Electric Cars for Kids

Kids' electric cars have been around for decades, and they've only been getting better! This gift combines the joy of gadgetry with the fun of exploration. If you remember the exhilaration of your first bike ride, you can imagine how much more fun a battery-powered mini-car will be for the child in your life.

Choosing a Kids' Electric Car

Gone are the days where Power Wheels was the only provider of ride-on electric cars. Nowadays there is a diverse selection to choose from. Electric cars for kids come in a variety of models including tractors, race cars, police cars, and even luxury cars.

Do Carbon Monoxide Detectors Expire?

According to theCenters for Disease Control, accidental carbon monoxide poisoning sends more than 50,000 people in the U.S. to hospitals every year, and tragically, it kills at least 450 people annually. Fortunately, though, carbon monoxide poisoning is entirely preventable! The first line of defense: a working carbon monoxide detector onfloor of your home.

INNAMURU GURUNADH
Roll No.16715A0209, IV EEE

Is It Possible to Hear Electricity?

What does electricity sound like? Have you ever noticed an indistinct humming sound coming from an electrical appliance and wondered,Is it possible to hear electricity? Many people report that they can "hear" or "feel" electricity in devices. Maybe the sound on your TV is muted, but you still hear that it's on, or perhaps you've noticed overhead florescent lights or high-voltage power lines emitting a faint buzz. Some people are highly sensitive to these sounds, and others learn to tune them out.

You may not have detected them before, but if you listen closely, humming electricity sounds are all around us. The incessant buzzing noise even has its own name: "mains hum." While some people find it annoying, others report that they find it sort of soothing, like white noise from a fan.

What's the Best Energy Efficient Clothes Dryer?

Has your clothes dryer seen better days? Or, maybe you're weary of those late night trips to the laundromat? If you are thinking of buying a new dryer, there are a few factors to consider before investing. Which features are most important to you? Whether it's due to environmental concerns or pocketbook worries – or a little of both – many people rank energy efficiency as a top priority. If you are one of those savvy, energy-conscious consumers, you're probably wondering what is best energy efficient clothes dryer? Getting serious about energy efficiency in your home? Check here for more tips to save on energy costs.

PANTARANGAM HEMASANDHYA
Roll No.16715A0219, IV EEE

How to Explain Electricity to a Kid

Children are endlessly curious about the world around them. If you're a parent – or anyone who spends time with kids, for that matter – you're bound to be asked about electricity sooner or later. Knowing how to explain electricity to a kid is an essential skill to have in your parenting tool box. It may even help your kids realize how brilliant you are! Use these tips to get started:

Adapt the explanation to the child's age. Keep it short and simple for preschoolers. For older kids, you can provide a more detailed, complex response like the one below.
Explain to children that electricity can be dangerous. Remind them to stay away from exposed wires or downed power lines, and to avoid using electrical devices near water, including tubs, sinks, puddles or toilets.

SMART ELECTRICAL METER

A majority of the large investor-owned utilities in North America are now either fully deployed or in the implementation or planning phases of large-scale projects, and a second wave of deployments is soon to begin for the early adopters. The penetration of smart meters is currently about 60 percent and is expected to increase to 81 percent in 2024, primarily driven by large investor-owned utility projects in the US as the relatively mature market in Canada is expected to see moderate growth.

Asia-Pacific constitutes the world's largest and fastest-growing meter market with an estimated installed base of over 1.3 billion electricity and gas metering devices. Annual demand for electricity meters in the region is in the range of 110-200 million units, with China accounting for around 70 percent of the volume. The Asia-Pacific is highly fragmented in terms of the progress of smart metering deployments, and the regional markets can be divided into three general groups. Smart meter deployments have been underway across the globe for many years with many millions of devices already deployed. Substantial and sustained further growth is expected as utility companies seek more accurate, granular and timely data to operate their businesses more efficiently.

By definition, a smart meter must be connected so it can transmit data and therefore the connectivity is a mission critical requirement. With a wide range of options available, the connectivity decision is increasingly based on the cost, security, coverage, power usage and the potential throughput of the connectivity. Each of these can cause deployments to succeed or fail and therefore must be carefully balanced against each other to create an optimal solution.

The latest whitepaper from Quectel, "Why cellular connectivity provides the robust, secure foundation for new revenues in smart metering" discusses the challenges faced by an industry trying to globalize within a fragmented market, as well as the importance of the right connectivity in the deployment of smart meters. Cellular low power wide area (LPWA) networks have a series of advantages to bring to smart meter deployments, and this white paper looks at these advantages and examines:

1. The regions driving AMI growth
2. The challenging deployment landscape

The third group consists of markets finding themselves in the early phases of smart meter deployments - Australia and India.

In this project, we will learn how to make our own IoT Based Electricity Energy Meter using ESP32 & monitor data on the Blynk Application. Earlier we built GSM Prepaid Energy Meter. With the current technology, you need to go to the meter reading room and take down readings. Thus monitoring and keeping track records of your electricity consumption is a tedious task. To automate this, we can use the Internet of Things. The Internet of Things saves time and money by automating remote data collection. Smart Energy Meter has received quite a lot of acclaim across the globe in recent years. So, why not to build our own IoT Based.

SIRIGIREDDY PRIYANKA
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