



NARAYANA
ENGINEERING COLLEGE
NELLORE (AUTONOMOUS)



Department of
Electrical and Electronics Engineering

THUNDER TRENDS

Technical Magazine

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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.

TOP TRENDS IN THE ELECTRICAL INDUSTRY IN 2020

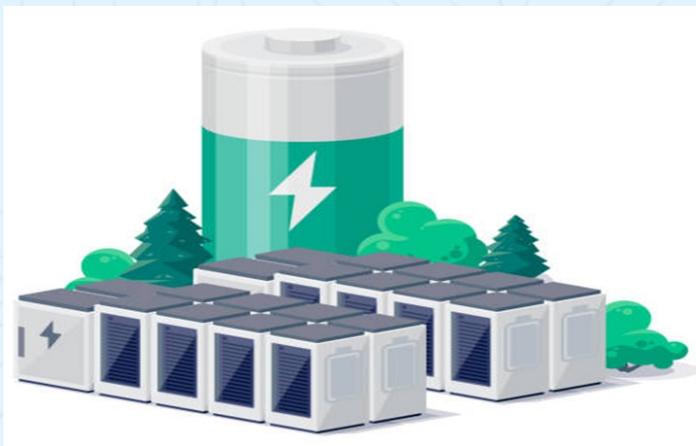
1. Energy Storage: One of the most important trends this year in the electrical industry is energy storage. Regulators believe it's a necessary component to improve the future of the grid, and it's quickly growing to be a favorite resource because it can help consumers not only reduce wasteful energy consumption, but it can also help them cut on energy costs.

In short, consumers want more control over their energy. However, the current infrastructure doesn't exactly support this movement on a larger scale. Utilities will need to be further optimized before seeking a growing involvement in energy storage, but with policies driving the development of energy storage technologies, this should help accelerate its adoption.

In fact, the Federal Energy Regulatory Commission (FERC) has already created a "Pay-for-Performance" pricing structure to incentivize the development of energy storage technologies. It's recognized as a way to bring stability to the U.S. energy grid, and it has the potential to making this a cost-effective solution on a commercial scale.

In addition, a well-developed energy storage system will improve the effectiveness of renewable energy. Although a 100% renewable-powered energy grid is possible, it will need a massive volume of energy storage behind it to accommodate energy demands when production dips.

Until then, consumers can begin buying energy storage technologies to give them greater independence from the grid. Generac's PWRcell is one solution that can protect residents during a power outage and give them more control on their energy usage to avoid peak rates.



2. Growing Energy Demand: Energy demand is growing, and it's expected to skyrocket as much as 57% by 2050. It's already grown by more than 25% in the last decade.

More and more consumers and businesses are concerned about energy efficiency, not just as a way to save money, but also to cut down on carbon emissions. Energy production happens to be the largest source of carbon emissions in the world, but with renewable energy becoming more efficient and attaining a larger share of overall energy production in the U.S., this should change for the better.

Additionally, embracing the young technologies that exist on the market right now seem to be the best way to address the concern of a booming energy demand. From distributed energy resources (DERs) to better energy storage and more accessible renewable energy options, these technologies will be a huge player in how we maximize the efficiency of our energy consumption in the coming decades.

3. Grid Parity: Grid parity is ultimately the next step for many utility companies in the U.S. To keep it brief, grid parity occurs when an alternative energy source like solar can generate power at a cost equal to or less than the price of power from fossil fuels. Powered by the interests of consumers concerned about sustainable energy, companies that take advantage of supplying the renewable energy market can capitalize on this national interest quickly and efficiently. Even for states that may not have as many natural resources to help generate power, grid parity will help them save in the long-term. Grid parity is also a much more attainable goal than most may realize. By 2020, we're expected to achieve grid parity in 42 states.

4. Building Information Modeling (BIM): Building information modeling (BIM) helps contractors visualize the entire construction process before the build even starts. With cutting-edge virtual technology, BIM uses computer-generated images to show buildings, roads, utilities, and even the underlying infrastructure.

Modeling how a building's materials will hold up over time is another key feature that allows architects and engineers to recommend the best materials for a project. Even subcontractors can get a more accurate estimate of how much material will be needed, and how much time it will take to complete a job. With BIM, construction projects should see less waste, more sustainability, and a significant ROI in the long term.

But that's not all. If there's a retrofit project underway, subcontractors can identify which areas need energy consumption improved. They can even go so far as to project potential solutions to improve energy efficiency, troubleshooting any problems that could arise during the retrofit and what needs to be done differently to ensure the project's success.

Dr. G. Srinivasulu
Principal, NECN

Signify achieves carbon neutral operations in India

Signify has achieved carbon neutrality in India, which is a part of its growth markets. The achievement is part of a total of five more markets – specifically ASEAN, Far East, India, Indonesia and Pacific – achieving carbon neutrality, boosting Signify's number of markets with carbon-neutral operations to 15 out of a total of 19. By focusing on energy efficiency, renewable energy consumption and office space optimisation, the five markets have reduced their overall carbon emissions by 19 per cent in 2019.

This includes a reduction of 33 per cent from non-industrial sites, 17 per cent from industrial sites, 32 per cent from business travel and 18 per cent from logistics. Signify offsets its remaining emissions through contributions to projects that have a positive environmental and social impact, including small-to medium-sized wind farms in India and a hydro plant in Vietnam that operates without using a dam. “I'm extremely proud of the relentless commitment of all our employees that resulted in this great milestone, showing that carbon neutrality is possible and that it is possible today,” said Sumit Padmakar Joshi, Market Leader – India at Signify. “We hope that our achievements inspire other companies around us and we call upon them to join initiatives that will result in global carbon neutrality by 2050.”

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KONDAPALLI PAVAN KUMAR,
Roll No. 16711A0233, IV EEE

Sterlite Power acquires Green Energy Transmission Corridor Project

Sterlite Power announces the acquisition of its inter-state GEC transmission project, Lakadia-Vadodara Transmission Project Limited (LVTPL) from PFC Consulting. The company had won this project (WRSS 21 – Part B) through tariff-based competitive bidding process and would execute it under the Build, Own, Operate and Maintain (BOOM) model for 35 years in Gujarat.

The project is aligned to enable the country's renewable energy target of installing 175 GW Renewable Energy by 2022 and connects the wind energy zones of Bhuj in Gujarat to the load centres in Gujarat and Maharashtra. The project involves laying 350 kms of 765 kV double-circuit transmission line connecting 765/400 kV Lakadia substation to Vadodara substation in Gujarat, in an aggressive timeframe of 18 months. Pratik Agarwal, Managing Director, Sterlite Power said, “This is another resounding success for Sterlite Power. We are proud to be part of this energy-transition journey of the country.” With the acquisition of this project, the company has increased its domestic footprint in inter-state transmission projects to 22 states with a cumulative transmission line network of more than 9000 ckms and 16,000 MVA transformation capacity. This marks the 14th addition to domestic project portfolio. The project involves laying 350 kms of 765 kV double-circuit transmission line connecting 765/400 kV Lakadia substation to Vadodara substation in Gujarat, in an aggressive timeframe of 18 months. We are proud to be part of this energy-transition journey of the country.” With the acquisition of this project, the company has increased its domestic footprint in inter-state transmission projects to 22 states with a cumulative transmission line network of more than 9000 ckms and 16,000 MVA transformation capacity. This marks the 14th addition to domestic project portfolio. The project involves laying 350 kms of 765 kV double-circuit transmission line connecting 765/400 kV Lakadia substation to Vadodara substation in Gujarat, in an aggressive time frame of 18 months.



NAGINENI SIVAKALYAN,
Roll No. 16711A0244, IV EEE

Siemens Gamesa wind turbine enters Denmark

Electrical India | January 2020 www.electricalindia.in

Siemens Gamesa has entered into a contract with Torp Vind I/S for the delivery of three wind turbines of the new SG 5.0-132 model for Torp Vindmoellepark in the municipality of Struer. The three wind turbines will be the first in the world of their kind to be installed. Torp Vindmoellepark will have a total capacity of 15 MW and it will be operated without subsidies. “We will exchange our three old Bonus wind turbines, each featuring 1 MW, from 1999.

They have always worked well and with the high wind we have in this area we expect the new wind turbines to give us good production,” says Carl Lyngs from Torp Vind I/S. “This wind farm is deeply rooted in the local community,” he continues. The installation of Torp Vindmoellepark will begin in late summer of 2020 and the production from the repowering project will be supplied to the grid. Besides delivery and installation of the wind turbines, Siemens Gamesa has also sold a long-term service contract.

“We are happy that Torp Vind has renewed our long-standing partnership. We have recently introduced this type of wind turbine and the first order has come from Denmark. The order shows that our product helps to secure a positive business case for our customers without public subsidies,” says Mikael Nielsen, Sales Director at Siemens Gamesa. The installation of Torp Vindmoellepark will begin in late summer of 2020 and the production from the repowering project will be supplied to the grid. Besides delivery and installation of the wind turbines, Siemens Gamesa has also sold a long-term service contract.



YADHALA MOUNIKA
Roll No.17711A02B5, III EEE

R K Singh presents awards on 29th National Energy Conservation Day

Bureau of Energy Efficiency (BEE), under the guidance of Ministry of Power organised the 29th National Energy Conservation Awards. R K Singh, Minister of State for Power and New & Renewable Energy and Minister of State for Skill Development & Entrepreneurship was the chief guest on this occasion. This year, Energy Conservation is celebrated through a week long activity culminating on the National Energy Conservation Day i.e. 14th December at Vigyan Bhawan. The concluding event witnessed awards distribution to the winners from different industries and establishments, and the winners of National Painting Competition for students. R K Singh highlighted the importance of energy conservation in the country's sustainable development approach. He emphasised the need for taking measures in order to reduce CO2 emission so as to minimise adverse impact of climate change.

The Power Minister lauded the outcome and efforts of BEE program and complimented the industry for making sincere efforts in implementing various schemes. On the occasion, Star Labelling Programme for Solar Water Heater was launched. The event witnessed award presentations to 65 industries and institutions from various sectors for their excellent performance in achieving energy efficiency.

Altogether 355 units and establishments across the country participated to save 10,566 million units which is over Rs 5,000 crore. Secretary, Ministry of Power, said, “We celebrate NEC Day every year to recognise and celebrate the efforts towards energy conservation. We congratulate every award winner for their performance. We have launched Star Labelling Programme for Solar Water Heater to promote use of efficient appliances.”



ODUGU SAI CHANDRIKA,
Roll No. 17711A0273, III EEE

ABB completes divestment of two electrification JVs in Shanghai

ABB has completed the divestment of all its shares in two Shanghai-based electrification joint ventures, Shanghai ABB Breakers Co and Shanghai ABB Guangdong Electric Co Ltd to holding subsidiaries of Shanghai Guangdong Electric Group (SGEG), ABB's joint venture partner in the two companies.

Financial details have not been disclosed. Tarak Mehta, President of ABB's Electrification business, said, "The completion of this divestment reduces the complexity of the electrification business in China and improves our focus in this key market.

It is a significant step forward in ABB's ongoing strategy of active portfolio management." ABB acquired a 60 per cent stake in the two joint ventures as part of the GE Industrial Solutions acquisition in 2018. With the sale now complete, SGEG now owns the two Shanghai companies. ABB and SGEG will continue to operate as long-term partners via a multi-year mutual supply agreement. After decades of development, ABB has a full range of business activities in China. The company operates 44 local companies with nearly 20,000 employees located in more than 130 cities. China is ABB's second-largest market worldwide with more than 90 percent of sales from locally made products, solutions and services. ABB has invested more than US\$2.4 billion in China since 1992.



SANAPALA MANEESHA
Roll No. 17711A0285, III EEE

Cabinet approves MoU between India and Japan Coal Energy Centre

The Union Cabinet chaired by the Prime Minister Narendra Modi has given its approval for the signing of Memorandum of Understanding between Central Electricity Authority, India and Japan Coal Energy Centre, on Japan-India cooperation for efficiency and environmental improvement for sustainable,

stable and low-carbon supply of electricity. This MoU will provide an enabling framework to address issues and barriers in expediting sustainable, stable and low carbon thermal power development by means of studies, training program and knowledge-sharing activities, outcomes of which are to be conducive to overall power development in India as well as to expedite relevant policy implementation by the Government of India.



VADLAMUDI KALPANA
Roll No. 18711A0283, II EEE

Thermax wins Rs 431 crore order for two Flue Gas Desulphurisation (FGD) systems

Thermax has concluded an order of Rs 431 crore from a public-private joint venture power company to set up two flue gas desulphurisation (FGD) systems at their thermal power plant in the Jharkhand. The customer will install two units of FGD systems of 525 MW capacity each at their plant, to limit SOx emissions as per the revised regulations from the Ministry of Environment, Forest and Climate Change. "The Environment business has had a good run in terms of order intake, and I am happy that we have concluded the year on a high note with this inclusion. It also shows that the implementation of industrial pollution norms has gained momentum in the country, considering that we bagged two large FGD orders within a short span of six months," said M S Unnikrishnan, MD & CEO, Thermax. The scope of supply includes design, engineering, manufacturing, civil work, construction and commissioning of the FGD systems. The commissioning of the project is scheduled over 30 months.



YETAGIRI PRANUSHA
Roll No. 18711A0291, II EEE

Govt's UJALA & SLNP complete Successful five years

The Government of India's zero subsidy Unnat Jyoti by Affordable LEDs for All (UJALA) and LED Street Lighting National Programme (SLNP), marked its fifth anniversary recently. SLNP is the world's largest streetlight replacement programme and UJALA is the world's largest domestic lighting project.

Both have been spearheaded and implemented by Energy Efficiency Services Limited (EESL), a joint venture of PSUs under the Ministry of Power, Government of India. Under the SLNP program, over 1.03 crore smart LED streetlights have been installed till date, enabling an estimated energy savings of 6.97 billion kWh per year with an avoided peak demand of 1,161 MW and an estimated greenhouse gas (GHG) emission reduction of 4.80 million CO₂ annually. LED streetlights have been installed in various states across the country, helping generate approximately 13,000 jobs to support 'Make in India' initiative. Through the UJALA initiative, over 36.13 crore LED bulbs have been distributed across India.

This has resulted in estimated energy savings of 46.92 billion kWh per year, avoided peak demand of 9,394 MW, and an estimated GHG emission reduction of 38 million t CO₂ annually. With the concerted efforts towards building a robust ecosystem for LED in India, these programmes have bagged global awards like the prestigious South Asia Procurement Innovation Award (SAPIA) 2017 and for the innovative use of IT and the business results achieved in SLNP, it won 2019 CIO 100 award. The highly successful UJALA and SLNP have also bagged the Global Solid-State Lighting (SSL) award of excellence for the transformational contribution to the LED sector.



G SASI KUMAR, III EEE, ROLL NO : 18111A0216

Fortum-Rusnano wind investment fund to start implementation of 50 MW project in Russia

The Fortum-Rusnano wind investment fund has taken the investment decision for a 50-megawatt (MW) wind power project in the Rostov region, Russia. It is the fifth project of the total 1,823 MW awarded to the fund in the Russian wind auction in 2017 and 2018. The wind farm is expected to start production during the fourth quarter of 2020. In the Rostov region, the partnership is already constructing 300 MW of wind power. Power production and capacity supply is expected to start during the first half of 2020. The first joint project was the 50 MW Ulyanovsk 2 wind farm which started supplying capacity to the market on 1 January 2019.

The Fortum-Rusnano wind investment fund is a 50/50 owned investment partnership to invest in wind power in Russia. The investment decisions related to the renewable capacities won by Fortum and the Fortum-Rusnano wind investment fund in 2017-2019 will be made on a case-by-case basis. Fortum's maximum equity commitment is RUB 15 billion. In June 2018 and June 2019, Fortum won the right to build in total 116 MW of solar capacity.



JAGANNATI CHAKRI, Roll No. 19715A0212, II EEE

KEC International wins new orders of Rs. 1,025 crore

KEC International Ltd has secured new orders of Rs 1,025 crore across its various businesses Transmission & Distribution. The business has secured orders of Rs 750 crore for T&D projects in India 765 kV GIS substation order from a Power Grid Corporation of India (PGCIL) entity under Tariff Based Competitive Bidding (TBCB) route in Western India 400 kV transmission line and 400 kV GIS Substation orders from Tamil Nadu Transmission Corporation Limited (TANTRANSCO) in Southern India 400 kV transmission line order from a private player in Eastern India Cables. The business has secured orders of Rs 150 crore for various types of cables or cabling projects.

Vimal Kejriwal, MD & CEO, KEC International commented, “Our order book in India continues to grow, despite the general headwinds in the country. These orders along with the orders announced earlier during the year, reaffirms our confidence in achieving the targeted growth.”



K DILEEP, III EEE, ROLL NO 18711A026

Sembcorp signs agreement to increase stake in Sembcorp Energy India to 100%

Sembcorp Industries (Sembcorp) announces that its wholly-owned subsidiary Sembcorp Utilities has signed an agreement with its local partner, Gayatri Energy Ventures Pte Ltd (GEVPL), a wholly owned subsidiary of Gayatri Projects Limited (GPL), to acquire the remaining 5.95 per cent stake in Sembcorp Energy India Limited (SEIL).

Neil McGregor, Group President & CEO of Sembcorp Industries, said, “Since Sembcorp's entry into the fast-growing Indian energy market in 2010, Gayatri has been a valuable partner in our journey to become an established energy player with a strong track record in delivering commitments. This acquisition will give Sembcorp full flexibility to evaluate and pursue an exciting range of growth opportunities in the renewables segment, while at the same time seeking the right equity window to list our India business or to pursue other capital recycling options.



growX ventures invests in Cell Propulsion as part of Huddle's EV Accelerator Program

growX ventures has invested in Cell Propulsion (CP), a forerunner in the deployment of electric LCV and electric bus solutions, as part of the EV accelerator program being conducted Huddle. Other investors that have invested in CP include Endiya Partners, Sangam Ventures, CIIE (IIM-A). The EV accelerator program by Huddle is the first dedicated acceleration program for EV companies in India. CP will work closely on strategy with Huddle team and gain access to contextual business development and pilot opportunities while also getting to work with other Huddle partner companies. Paras Kaushal, Founder & COO of CP said, “A major obstacle for the adoption of ECVs is the lack of local support ecosystem and the indigenous availability of core technologies. We are focused on solving these issues and this investment will enable us to quickly bring our solutions to the market.” Ishaan Khosla, Co-Founder & Partner at Huddle, stated, “By targeting use-cases around commercial vehicles, Cell Propulsion is bringing value to the EV value chain. We will be working closely with the team to partner with the right set of organisations to drive this revolution in India.”



SK AFRIN, III EEE, ROLL NO: 18711A0261



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