







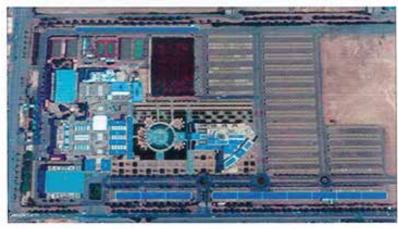
Affordable and Clean Energy

AFFORDABLE AND CLEAN ENERGY

SDG 7, an integral component of the United Nations' Sustainable Development Agenda, stands as a guiding beacon in Prince Sultan University (PSU) collective mission to ensure equitable access to affordable, reliable, sustainable, and modern energy for all. As a dedicated institution that nurtures innovation and progress, PSU acknowledges the crucial significance of sustainable energy in shaping the future. PSU's commitment to this goal aligns with our dedication to empowering not only our students but also the broader community with the knowledge and tools needed to navigate the complexities of energy sustainability. PSU is committed to SDG 7, actively participating in sustainable energy projects and educational programs that contribute to a greener and more accessible energy future.







Upgrade buildings to higher energy efficiency

HAALA Energy initiated the PSU Solar PV Project in Riyadh, Saudi Arabia, with the goal of upgrading existing university buildings to achieve higher energy efficiency. This multifaceted project involves the installation of a solar photovoltaic system, comprehensive energy audits, and the incorporation of cutting-edge energy-efficient technologies, including LED lighting, enhanced insulation, and optimized HVAC systems. By reducing energy consumption and carbon emissions, the project not only contributes to environmental sustainability but also yields substantial long-term economic savings, aligning with international sustainability objectives and setting a commendable example for similar initiatives globally. HAALA Energy, with a keen eye on sustainability, embarked on a comprehensive study to assess the feasibility of implementing solar photovoltaic (PV) technology to power 5 Building on the PSU campus. The investigation delved into several potential locations, encompassing the rooftops of buildings 1 to 5 and the campus parking areas. After careful analysis, it became evident that the car-port solutions stood out as the most compelling option. These solar carports not only harnessed abundant sunlight but also proved to be cost-effective with the lowest installation and maintenance expenses. HAALA's commitment to renewable energy and forward-thinking approach paved the way for a greener and more eco-friendly future on campus.







Plan to reduce energy consumption

In the fall of 2021, an initiative was launched by PSU to initiate a feasibility study on the implementation of smart building designs. This project received strong institutional support from both the Information Technology Center (ITC) and the Project Management Office (PMO). The study aims to assess the practicality and viability of incorporating smart technologies into building infrastructure, potentially leading to more efficient and sustainable structures. It reflects a forward-looking approach to modernizing building design and aligning it with evolving technological advancements.

A comprehensive energy efficiency plan has been established for the Building 101 and 104, and the associated electrical systems at Prince Sultan University. The project aims to reduce overall energy consumption, primarily focusing on the 1000 KVA and 1500 KVA transformers within these rooms. The specific characteristics of the electrical components, such as voltage, phase, and frequency, have been considered in the plan. The energy efficiency initiative encompasses geographical site data, time-defined simulations, meteorological conditions, and PV array characteristics. These measures align with the university's commitment to sustainability and energy conservation, contributing to a greener and more efficient energy ecosystem within the institution.

Energy wastage identification

PSU is working to save energy by checking its campus, including buildings 101 and 104. They want to find places where they waste a lot of energy and fix them.

PSU plans to use electricity more efficiently to save energy and money. This matches PSU's goal to be more eco-friendly and cost-effective. Also, PSU has rules to make sure they don't waste energy stuff and use energy wisely, showing their commitment to a green and sustainable campus. Additionally, PSU has adopted a Sustainable Waste Management, Prevention, and Disposal Policy, which emphasizes minimizing waste, using proper disposal channels, and adhering to energy efficiency standards, further highlighting the institution's commitment to a sustainable and eco-friendly campus.

Divestment policy

PSU has established a Sustainable Investment Policy (SIP) to guide responsible and sustainable investment practices. The SIP promotes active investment in companies and funds aligned with PSU's values, emphasizing environmental, social, and governance (ESG) criteria. PSU has divested from fossil fuels, contributing to the UN Sustainable Development Goals. Implementation includes monitoring and communication, overseen by the Institutional Financial and Risk Management Committee. PSU also has a Sustainable Procurement Policy, recognizing the impact of procurement on sustainability. It encourages sustainable purchasing, supplier compliance with ESG standards, and sustainability risk assessments. Implementation involves regular reviews and oversight by the same committee. Both policies reflect PSU's commitment to sustainable and responsible practices







Energy use density

The energy use density at PSU stands at 173 kWh per square meter per year, resulting in a total annual energy consumption of 15.9 GWh. The university's vast floor space, totalling 92,016 square meters, spans across various buildings, including B101, B102, B103, B104, B105, and B106. Individual buildings exhibit an average energy use density of approximately 173 kWh per square meter per year, resulting in varying annual energy consumptions. B101, as one of the largest contributors, consumes around 7.79 GWh, while B105 closely follows at 3.44 GWh. B102, B104, and B106 each consume about 1.28 GWh, 1.6 GWh, and 1.08 GWh, respectively, while B103 has the lowest consumption at 0.72 GWh. These numbers highlight the importance of custom energy-saving plans for each building, especially B101 and B105, which use the most energy. By doing this, the university can use less energy overall and be more efficient. These figures reflect PSU's energy utilization and provide a basis for assessing energy efficiency measures within the campus.





Local community outreach for energy efficiency

Prince Sultan University in Saudi Arabia is committed to producing research that supports sustainability, from architecture to renewable energy. At Prince Sultan University (PSU), the entire institution is prioritising progress towards the United Nations' Sustainable Development Goals. By working with local communities and global networks, PSU is producing sustainable solutions to tackle the greatest challenges facing the world.









Solar pv based speed control of DC motor using ardiuno for fan and pump applications

On November 7, 2022, a project emerged from the Department of Electrical Engineering at Prince Sultan University, in alignment with the Saudi Vision 2030. Students Abdul Rahman Al-Zeer, Talal Al-Sharif, and Abdule-lah Al-Yemeni, guided by Dr. Uma Shankar and Eng. Sivakumar, successfully completed a project centered around the operation and speed control of a DC motor powered by solar energy. This DC motor finds application in a wide range of areas, including electric vehicles, household appliances, pumps, and refrigeration systems. The project has dual objectives: first, to reduce greenhouse gas emissions and, second, to contribute to Saudi Arabia's liquid fuel displacement program. This project not only resonates with the Saudi Vision 2030 but also aligns with the United Nations Sustainable Development Goals for 2030, specifically targeting SDG 7. The solar panel used in this project delivers a voltage of 24 volts and a maximum current of 1.5 amps, providing the necessary power to drive the DC motor at its maximum speed, equivalent to 36 watts. This endeavor serves as a valuable platform for enhancing students' skills in sustainable technology and equips them with the necessary knowledge to work towards future sustainability goals both within Saudi Arabia and on a global scale. It exemplifies a significant step towards a more sustainable and environmentally friendly future.

Conferences

The International Conference on Sustainability Developments and Innovations (ICSDI 2022), held at PSU in Riyadh, Saudi Arabia from February 19 to 22, 2022, was a remarkable event that brought together scholars, experts, and innovators to explore and exchange ideas on sustainability. The conference covered a wide range of tracks and topics, including Manufacturing and Industrial Systems towards Sustainability, Sustainable Construction Technologies and Materials, Energy Sustainability, Sustainable Urbanization and Smart Cities, Sustainability in the Built Environment, and Policies, Regulations, and Economic Assessments towards Sustainable Development Goals (SDG).



CONNECTING TALENT WITH OPPORTUNITY











SmartTech 2022 An International Conference on Smart Systems and Emerging Technologies

On May 9, 2022, SmartTech 2022, the Second International Conference on Smart Systems and Emerging Technologies, took place. This conference served as a crucial platform for the exchange of cutting-edge research and developments across various domains, including Artificial Intelligence, Internet of Things, Emerging Technologies, Unmanned Systems, Communication and Networking, and Cybersecurity. It focused on aligning these advancements with the technological progress envisioned in Saudi Arabia's Vision 2030. SmartTech 2022 aimed to foster innovation and knowledge sharing in line with the ambitious goals of the Kingdom's vision for the future.





Solar Car Design Contest conducted in collaboration with the Sustainability club



Hands-on training on "Hybrid AC-DC Microgrid system for renewable energy applications" during 12th – 16th February, 2023 by Ecosense sustainable pvt ltd, India.



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pic.twitter.com/cx8luOWTue

7:50 am - 31 Mar 2

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VAULTe -GLOBAL, in Partnership with Prince Sultan University, Proudly Presents



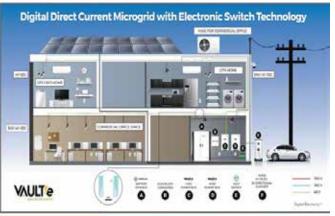
Low Voltage Technology for Export to All Communities of the World

Our 48 VDC Microgrid Shipping Today to Prince Sultan University.

Next Stop: Botswana International University of Science and Technology

























ORGANISED BY:

DEPARTMENT OF ELECTRICAL ENGINEERING, C V RAMAN GLOBAL UNIVERSITY









List of university's achievements to the SDG











International Webinar on

Recent developments in high voltage transmission and Capabilities of GCC Electrical Testing Laboratory

GCC Electrical Testing Laboratory will be a world class Electrical Product

Testing and Services Hub in the GCC and MENA region, Independent authority for testing and certificating High-Voltage, Medium-Voltage and Low-Voltage electrical equipment. Act as a third party for failure



investigations and arbitration, provide Low Voltage calibration services for electrical equipment and testing tools and certification courses for engineers and technicians.

TECHNICAL CONSULTANT GCC ELECTRICAL TESTING LABORATORY, KSA ADDITIONAL DIRECTOR (Rtd) at CPRI



- Mr. AbdulRahman Almujahed, 219211224@psu.edu.sa Mr. Mohammed Alghamdi, 219110748@psu.edu.sa
- Dr. Umashankar Subramaniam, usubramaniam@psu.edu.sa
- Dr. Mahajan Sagar Bhaskar, smahajan@psu.edu.sa
- Dr. Dhafer Almakhles, dalmakhles@psu.edu.sa
- Eng. Sivakumar Selvam, sselvam@psu.edu.sa

Date: 29th March, 2022 Time: 4:30 PM (KSA)



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Registration





ICSDI 2022

INTERNATIONAL CONFERENCE ON SUSTAINABILITY: DEVELOPMENTS AND INNOVATIONS

February 19 - 22, 2022 - Riyadh, KSA





GOALS

INTERNATIONAL CONFERENCE ON SUSTAINABILITY **DEVELOPMENTS AND INNOVATIONS**

9-22 FEBRUARY PRINCE SULTAN UNIVERSITY RIYADH, SAUDI ARABIA



Mr. AbdulRahman Almujahed, 219211224@psu.edu.sa Mr. Mohammed Alghamdi, 219110748@psu.edu.sa

Dr. Mahajan Sagar Bhaskar, smahajan@psu.edu.sa Dr. Dhafer Almakhles, dalmakhles@psu.edu.sa

Eng. Sivakumar Selvam, sselvam@psu.edu.sa





Invited talk - Special session





Annual Conference of the IEEE Industrial Electronics Society (IECON 2022)

Special Session on

"Power Electronics and Energy Storage Strategies for DC Microgrid"

Mahajan Sagar Bhaskar (sagar25.mahajan@gmail.com, smahajan@psu.edu.sa) Renewable Energy Lab, Prince Sultan University, Riyadh, Saudi Arabia.

Dhafer Almikahles (dalmakhles@psu.edu.sa) Renewable Energy Lab, Prince Sultan University, Riyadh, Saudi Arabia.

Padmanaban Sanjeevikumar (sanjeevi_12@yahoo.co.in) KPR Institute of Engineering and Technology, Tamilnadu, India. CTIF Global Capsule, Aarhus University, Denmark.

Call for Papers

Power Electronics (PE) configurations have grown in popularity in various renewable systems, particularly in Microgrid systems. Various PE Converters have been installed in several countries, and the growing renewables and energy storage industries have resulted in the development of dependable systems based on a variety of power electronics technologies. PE research in the present day has focused on the advancement of more energy-efficient, dependable, cheaper, appropriate, high voltage and current characteristics, and device reduction for DC Microgrid. This special session aims to bring the current growth in power electronics configurations for eco-friendly and power storage modern technologies, in terms of power electronics devices and circuits, into a common platform.

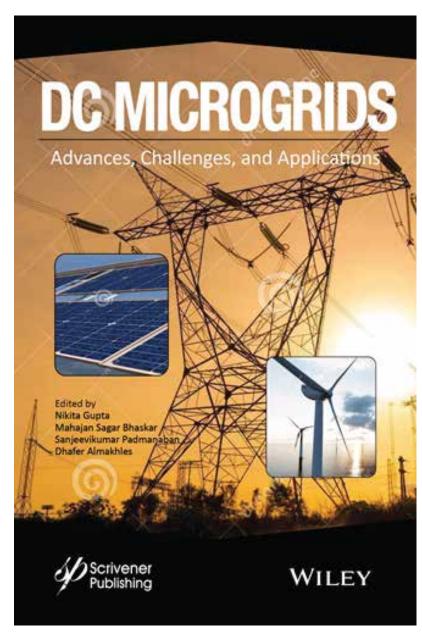
Topics of interest include, but are not limited to:

- DC-DC, DC-AC, AC-AC, and AC-DC Converters for DC Microgrid.
- Power Electronics control for DC Microgrid.
- Energy Storage Strategy for DC Microgrid.
- 6 High-Frequency Converters- topology, control for DC Microgrid.
- Hybrid Multilevel-, Switched capacitor-, Z Source-based Converters, etc for DC Microgrid.
- 8 Reliable and efficient DC Microgrid and system.
- Analysis, Loss distribution, and modeling of DC Microgrid.

Sponsoring IES Technical Committee(s)

IEEE IES Power Electronics Technical Committee (PETC)

Good quality papers may be considered for publication in the IEEE Trans. on Industrial Electronics, subject to further rounds of review.











100% renewable energy pledge

On January 20, 2022, PSU marked a historic moment as the first Saudi university to commit to achieving Net Zero Carbon status by 2060. This official pledge was made through participation in the Race to Zero campaign, a global initiative uniting various stakeholders to drive a resilient, zero-carbon recovery that fosters job creation, future threat prevention, and sustainable growth. As part of the Race to Zero for Universities and Colleges campaign, in partnership with EAUC, Second Nature, and UN Environment, PSU solidified its position within the UNFCCC Race to Zero campaign. This powerful coalition includes over 3,000 businesses, 733 cities, 31 regions, 173 major investors, and 622 Higher Education Institutions, representing nearly 25% of global CO2 emissions and over 50% of the world's GDP. PSU's commitment to achieving Net Zero Carbon status reflects its dedication to sustainability and environmental leadership, positioning it as a pioneering force in addressing climate change in Saudi Arabia and globally. PSU is taking a significant step by committing to 100% renewable energy, aligning with global sustainability efforts. PSU's initiative not only sets an example but also contributes to a cleaner, more sustainable future. While PSU's commitment is vital on campus, its impact reaches beyond, serving as a model for others to embrace renewable energy and sustainability. This pledge is not just a reflection of PSU's responsibility but also an inspiration for a cleaner, greener world.

Prince Sultan University is the First Saudi University to Pledge Net Zero Carbon University by 2060

Official Race to Zero Signatory

We are part of the Race to Zero and are leading the education sector for a healthy and resilient zero carbon recovery in the lead up to COP26!









Race To Zero is a global campaign to rally leadership and support from businesses, regions, investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

Institutions involved

Students represented

1094

10,634,957

IRACE TO ZERO







Energy efficiency services for industry

In Dec. 2022, PSU took significant strides in fostering energy efficiency within the local industrial sector. PSU, in collaboration with Al Watania and the Center for Community Service and Continuing Education, actively participated in the annual ceremony of the Ambition Elite program, organized by the General Authority for Small and Medium Enterprises. This event showcased PSU's and Al Watania's commitment to supporting, developing, and nurturing small and medium enterprises in the Kingdom of Saudi Arabia. PSU's role in the event emphasized the importance of energy efficiency in the industrial sector, offering direct services such as energy efficiency assessments, workshops, and research into renewable energy options. These initiatives underline PSU's and Al Watania's dedication to enhancing energy efficiency and promoting clean energy practices within local industries, aligning with broader sustainability goals and contributing to a more environmentally responsible and economically efficient future.

Policy development for clean energy technology

PSU is leading the way in supporting clean energy policies and smart investments. PSU's Sustainable Investment Policy (SIP) is all about making responsible investments following global best practices. This policy focuses on sustainable research, managing risks, and coming up with new ideas, especially in areas related to the environment and society. It's not just about making smart investments; it's also about doing good for the world and being careful about risks like following the rules and protecting our reputation. PSU is actively working to achieve the United Nations' goals for a better world, overseen by the Vice-President for Administrative and Financial Affairs Office. PSU is transparent, reviews its policies regularly, and makes sure everyone follows them, all to create a more sustainable and environmentally friendly future.

Assistance to low-carbon innovation

PSU is committed to fostering low-carbon innovation and supporting startups that drive a sustainable future. PSU's Center for Sustainability and Climate (CSC) plays a crucial role in promoting and assisting ventures focused on low-carbon economy and innovative technologies. By offering resources, guidance, and expertise, the CSC ensures that these startups have the necessary support to thrive. PSU's dedication to sustainability and innovation aligns with global efforts to combat climate change and create a greener, more sustainable world. To learn more about PSU's initiatives in this regard, please visit the CSC's website at https://www.psu.edu.sa/en/CSC









PSU's commitment to SDG 2030

Mission

PSU is committed to United Nations Sustainable Development Goals (SDGs) through effective institutional resource management, innovative teaching and learning, research, national and international partnerships, continuous studies, and outreach. PSU shall undertake the following activities: form higher and steering committees, evaluate each SDG, formulate and develop related SDG policies, conduct awareness campaigns to the PSU community, establish a sustainability office, identify the SDGs related to each college, program, and course, and lab centers at PSU, and implement sustainability-related initiatives.

Vision

Prince Sultan University strives to support Saudi Arabia's Vision 2030 and the United Nations Sustainable Development Goals (SDGs) by paving the way for higher education in KSA and Middle East.

Mission

Supporting the Saudi Arabia's Vision 2030 and the PSU's strategic directions, PSU aligns its mission with SDGs by providing quality education, sustainability initiatives, lifelong learning, scientific research, and community service





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