



# SDG-7

## AFFORDABLE AND CLEAN ENERGY



**Goal 7** emphasizes the importance of affordable, reliable, sustainable, and modern energy for all, especially for children. Access to sustainable energy significantly enhances the quality of life, enabling essential services that are crucial for children's survival, development, and well-being.

In homes, reliable modern lighting allows children to complete their homework and perform daily tasks after dark, while adequate heating and cooling create a comfortable living environment. For health centres and schools, energy is vital for lighting, operating medical equipment, cooking, and maintaining digital connectivity. Poor electricity access is linked to lower educational performance, decreased school attendance, and challenges in attracting and retaining qualified teachers.

Moreover, sustainable energy solutions can significantly reduce indoor air pollution, which is a major health risk for children. The burning of solid fuels in homes contributes to severe health issues, resulting in over half a million deaths among children under five each year, along with long-term damage to their developing brains and lungs. By addressing energy needs sustainably, we can improve health outcomes and educational opportunities for children, fostering a brighter future.

At CUI's campuses, all buildings are designed and constructed with a strong emphasis on energy efficiency, adhering to standards set by the Capital Development Authority (CDA) and the government of Pakistan. Energy-efficient buildings play a crucial role in reducing energy consumption and minimizing environmental impact. They also create a more comfortable and sustainable environment for occupants, promoting overall well-being. By prioritizing energy efficiency, CUI contributes to a more sustainable future while enhancing the quality of life for its community.

CUI is moving towards renewable energy production like Solar Power Plants:

**a) 100 KW Solar Power Plant Operational**

**b) 850 KW Solar Power plant at Islamabad Campus has been planned and recommended by the**

**Campus Works Committee is under execution**

**c) 300 KW Solar Generation Facility at CUI, Sahiwal Campus has been implemented**

**d) 400 KW system at CUI Wah Campus is at contract signing stage**

At CUI the Building Management System (BMS) is installed to control and monitor HVAC. The aim of BMS is to maintain occupant comfort and ensure occupant safety, whilst delivering energy efficiency and lower operating costs. Separate management systems for CCTV and firefighting are also in place and operated by the concerned departments.

Energy Research Centre, COMSATS University Islamabad, situated at its beautiful Lahore campus, has taken the year 2022 as an opportunity to grow in terms of capacity building within and outside the Centre, enhance industrial and organizational networking and relations, provide consultancy and continue the tradition of research and development in the form of funded projects, lab development and peer-reviewed impact factor journal publications. ERC continues to contribute in various sectors and intends to play its part in R&D as well as policy formulation in the context of energy and environment for Pakistan. The of Central Asia Regional Economic Cooperation (CAREC) region's energy demand is expected to grow to 30 % by 2030, including electricity as the major resources of consumption. At present Pakistan, which is a member country of CAREC, is faced with challenges of Climate Change and its impact, witnessed through devastating floods in 2022, and high-cost fuels for industrial, transport and residential applications. With the present critical economic situation of our country, the need for the inclusion of renewables was never as critical, as it is today, since these offer a clean, affordable and alternative solution to energy, especially electricity generation and efficient energy utilization in all sectors. Therefore, ERC continues to generate knowledge through R&D solutions for the research community, in the form of graduate research thesis, IF publications, and testing lab development. Moreover, ERC continues

to provide consultative advice to the local industry and HEIs. ERC has contributed to develop national SDG 7 policy to translate the universal SDGs into national goals and targets for effective domestic implementation. ERC has developed a Comprehensive Campus Energy Plan to 100% clean and green energy, which focuses on renewable energy production, conservation measures, and cost savings, followed by promoting sustainability and climate change mitigation through projects that would reduce or curb greenhouse gas. On the same lines, as in previous years, in 2022, ERC signed MoU's with industries such as, EPTEck from Faisalabad, on the national scale, and on the international front, ERC played a pivotal role in an international CUI MoU with UJFJ, Brazil, to collaborate with National Institute of Science and Technology in Electric Energy – INERGE. INERGE is a research institute formed by researchers from UJFJ, UNIFEI, UFRJ, UFF, UFSJ and UFABC, in Brazil. The institute operates in the area of Electric Energy through the development of scientific and technological research with international quality standards. ERC strives to play its role in the enhancement of academic activities related to energy and has contributed in preparing feasibility reports, and proposals for various academic programs, including BS & MS Energy Systems Engineering, Postgraduate Diplomas, workshops, short courses and trainings. With the global challenge of Climate Change, reducing Carbon footprint and pledge to limit global warming to 1.5° C by nations in COP27, the role of research Centres such ERC has become significant, and ERC aims to strive towards such goals in coming years through R&D

The centre will serve as a catalyst for innovation in integrated energy technologies through collaborative and interdisciplinary research. Its objective is to provide research oriented, efficient and eco-friendly solutions and professional services, related to energy issues, for socio-economic growth in the national as well as global perspective. ERC's mission is to enable capacity building of future scientific leaders, managers and engineers in the energy sector through continuing professional development activities.

CUI Lahore is making valuable contributions to the field of clean energy through education and training. By organizing technical courses, webinars, and seminars, they can help bridge the knowledge gap and foster a greater understanding of renewable energy

technologies. This approach not only empowers current students but also engages working professionals, promoting a culture of continuous learning and innovation in the energy sector.

Such initiatives can significantly raise awareness about clean energy solutions, encourage sustainable practices, and potentially inspire new projects and collaborations in the community. ERC also conducted a short course. The detailed is given below: -

**Energy Research Centre (ERC)**  
CUI Lahore Campus

Offers online short course (0.5 CPD Points) on **SOLAR PV SYSTEM DESIGN, INTEGRATION AND BUSINESS**

**WHY TO ATTEND THIS COURSE**

Solar PV System is the fastest growing energy market in the world. This seminar will develop a deep understanding of PV system. It covers all theoretical and practical aspects of Solar PV system which are required by an engineer to install its hardware. Secondly this training will include the most used software for PV system design i.e. Helioscope. This software is developed by FDSOM labs that includes all the features of PVsyst and adds the basic design functionality of AutoCad and SketchUp, allowing solar design engineers to do a complete design with one package.

**CONTENTS**

- Basics of solar PV
- Practical Implementation requirements.
- Types of inverters, panels and switch gears available in the market.
- PV system design requirements for standalone, hybrid and grid-tie system.
- Creating Preliminary project in Helioscope.
- Designing with multiple field segment, obstruction and shading analysis.

**WHO SHOULD ATTEND**

- Research Students
- Public and private sector solar power industry managers & officers.
- Design Engineers

**REGISTER NOW**  
<http://bit.ly/ercpcpd2>

**FEE SUBMISSION**

Account Title HBL CIIT: CPD Fund  
Account Number 2305-70000826-03  
Fee 500 PKR(UC Students)  
1000 (Professional)



**Venue**  
Online

**Date & Time**  
27th May  
2023  
10:00 am  
to  
02:00 pm

**Instructor**  
Dr. Yaqoob Javed

**Energy Research Centre (ERC), CUI Lahore**  
Offers short course(0.5 CPD Points) on

**Modern Power Systems and Role of Renewable Energy**

**Why to attend this course**

This Course introduces the Series of CPD Short Courses on Renewable Energy Technologies. The course will provide insight into new and revolutionized power systems with the integration of renewables and discuss the pros & cons of Renewable Energy integration within the grid. Performance of conventional and modernized power systems will be evaluated. Climate Change Impacts on Modern Power Systems will also be highlighted.

**Contents**

- Renewable power generation and clean energy technologies
- Distributed energy resources and storage
- Modern power system operation and planning
- Power system protection and automation in energy management systems
- Transmission technologies in modern power systems
- Modern power grid devices, sensors and wireless technologies
- Load management and customer participation


**Who should attend**

- Aspiring new entrants & professionals in the field of Renewable Energy Technologies
- Graduate Students interested in R&D work relevant to Modern Power Systems & Renewables
- Industry professionals interested in integrating renewables in their Industrial Power Systems.

**Register Now**  
<http://bit.ly/ercpcpd2>

**Fee Submission**

Account Title HBL CIIT: CPD Fund  
Account Number 2305-70000826-03  
Fee (PKR) 1000 (Professionals)  
500 (CUI UC Students)



**Venue**  
CUI Lahore Campus

**Date & Time**  
Wednesday  
17th May  
2023  
04:00 pm  
to  
08:00 pm

**Instructors**  
Dr. Sobia Baig  
Dr. Fawad Azeem

**For Info**  
Email at  
[info.erc@cui-lahore.edu.pk](mailto:info.erc@cui-lahore.edu.pk)

**Energy Research Centre (ERC)**  
CUI Lahore Campus

Offers short course (0.5 CPD Points) on **WIND ENERGY AND WIND TURBINES**

**WHY TO ATTEND THIS COURSE**

- To learn about a growing industry
- To explore career opportunities
- To understand the economic benefits of wind energy
- To contribute to a sustainable future
- Wind energy is a key component of the transition to a more sustainable energy future, and attending a short course on wind energy and wind turbines can help participants better understand how they can contribute to this important goal

**CONTENTS**

- Introduction to Wind Energy: Wind Energy Resource
- Wind Turbine Technology
- Wind Turbine Design
- Wind Turbine Materials
- Wind Turbine Installation and Operation
- Wind Energy Policies and Regulations
- Wind Energy and the Environment


**WHO SHOULD ATTEND**

- Aspiring new entrants & professionals in the field of Renewable Energy Technologies
- Graduate Students interested in R&D work relevant to Wind Power Systems & Renewables
- Industry professionals interested in updating their knowledge on wind turbines

**REGISTER NOW**  
<http://bit.ly/ercpcpd2>

**FEE SUBMISSION**

Account Title HBL CIIT: CPD Fund  
Account Number 2305-70000826-03  
Fee 500 PKR(Students)  
1000 (Professionals)



**Venue**  
CUI Lahore Campus

**Date & Time**  
Friday  
9 June  
2023  
04:00 pm  
to  
08:00 pm

**Instructor**  
Dr. Tareq Manzoor  
Associate Professor  
ERC

**For Info**  
Email at  
[info.erc@cui-lahore.edu.pk](mailto:info.erc@cui-lahore.edu.pk)

# PUBLICATIONS

Publications Title	First Author	Publisher	Impact Factor	Weblink
Robust Data Driven Analysis for Electricity Theft Attack-Resilient Power Grid	Inam Ullah Khan Nadeem Javaid C. James Taylor	IEEE Transactions on Power Systems	10	<a href="https://ieeexplore.ieee.org/document/9743316">https://ieeexplore.ieee.org/document/9743316</a>
Optimal retrofitting of MCH-Toluene dehydrogenation system: Energy and technoeconomic analysis	Muhammad Haris Hamayun, Faisal Ahmed, Murid Hussain	Energy Conversion and Management	10.4	<a href="https://www.sciencedirect.com/science/article/abs/pii/S0196890423003953">https://www.sciencedirect.com/science/article/abs/pii/S0196890423003953</a>
Dual-Atomic-Site-Integrated photocatalysts for green energy synthesis	Palagiri Bhavani D. Praveen Kumar Jong Suk Yoo	Elsevier	15.1	<a href="https://www.sciencedirect.com/science/article/pii/S1385894723021605">https://www.sciencedirect.com/science/article/pii/S1385894723021605</a>
Advances in synthesis of TiO2 nanoparticles and their application to biodiesel production: A review	Obaid Ali Qamar Farrukh Jamil Murid Hussain	Elsevier	15.1	<a href="https://www.sciencedirect.com/science/article/pii/S1385894723004655">https://www.sciencedirect.com/science/article/pii/S1385894723004655</a>
Feasibility-to-applications of value-added products from biomass: Current trends, challenges, and prospects	Obaid Ali Qamar Farrukh Jamil Murid Hussain	Elsevier	15.1	<a href="https://www.sciencedirect.com/science/article/pii/S1385894722057205">https://www.sciencedirect.com/science/article/pii/S1385894722057205</a>
Recent advances in wide solar spectrum active W18O49-based photocatalysts for energy and environmental applications	Palagiri Bhavani D. Praveen Kumar Murid Hussain	Taylor & Francis Online	10.9	<a href="https://www.tandfonline.com/doi/full/10.1080/01614940.2022.2038472">https://www.tandfonline.com/doi/full/10.1080/01614940.2022.2038472</a>
Cellulose-based adsorbent materials for water remediation: Harnessing their potential in heavy metals and dyes removal	Awais Ali Aslam Sadaf Ul Hassan, Muhammad Haris Saeed	Elsevier	11.1	<a href="https://www.sciencedirect.com/science/article/pii/S0959652623027130">https://www.sciencedirect.com/science/article/pii/S0959652623027130</a>
A Physically Based Air Proportioning Methodology for Optimized Combustion in Gas-Fired Boilers Considering Both Heat Release and NOx Emissions	Guolin Xiao Xiaori Gao Wei Lu	Elsevier	11.2	<a href="https://doi.org/10.1016/j.apenergy.2023.121800">https://doi.org/10.1016/j.apenergy.2023.121800</a>

Total Publications: 62 Only High impact Factor publications are highlighted here

In 2023 there were many research projects initiated and completed in SDG 7 two of them are worth mentioning here, **“Design and Analysis of Dual Stator Generator for wind energy Conversion System”** and **“Design and fabrication of Generator for counter rotating wind turbine application”**, having the worth of **4.58 million PKR**