أهداف التنمية المستدامة البحرين 2030
BAHRAIN SDGs

الجامعة الخليجية
GULF UNIVERSITY

The Sustainability Report

7 AFFORDABLE AND CLEAN ENERGY

2024/2025

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Executive Summary – SDG 7: Affordable and Clean Energy

Gulf University (GU) upholds a strong commitment to SDG 7 – Affordable and Clean Energy – by advancing renewable energy education, green campus operations, and research promoting sustainable energy systems. During AY 2024–2025, GU implemented multiple initiatives led by the Sustainability and Development Makers Center (SDM-C) and the Community Engagement & Continuing Education Centre (CECEC) to promote energy efficiency, awareness, and innovation.

Key achievements include:

- Launch of solar panel pilot installations and daylighting systems on campus to reduce energy consumption.
- Conducting energy audits across major university buildings to identify efficiency improvements.
- Hosting Clean Energy Workshops during Sustainability Week 2024.
- Promoting community awareness on renewable energy and sustainable living practices.
- Supporting research publications focused on renewable power, green technology, and sustainable infrastructure.

Through these collective efforts, Gulf University continues to align its academic, operational, and community missions with Bahrain Vision 2030 and the UN Sustainable Development Agenda.

Community Engagement and Awareness Initiatives

Initiative	Description	Date	Stakeholders	Outcome
Renewable Energy Awareness Drive	An outreach campaign highlighting solar and wind power benefits, involving students and faculty in demonstrations.	Oct 2024	SDM-C, CECEC, Students	180 participants gained practical insights into renewable energy use.
Sustainability Week – Clean Energy Day	A special day dedicated to affordable and clean energy awareness featuring exhibitions, talks, and clean-tech showcases.	Oct 2024	SDM-C, Engineering Faculty	Enhanced student understanding of clean energy innovation.
World Energy Day Celebration	GU organized expert panels discussing Bahrain's clean energy policies and challenges in sustainable power.	Dec 2024	SDM-C, Supreme Council for Environment	Promoted collaboration on national renewable energy goals.
Clean Campus Energy Competition	Students designed prototypes for energy-saving devices and proposed ideas for solar energy implementation.	Apr 2025	SDM-C, Sustainability Club	Winning projects presented to the GU administration for pilot testing.
Gulf University Participates in Earth Hour 2025	This initiative was held in collaboration with government and environmental organizations, emphasizing the university's dedication to climate action and energy conservation. By taking part in Earth Hour, Gulf University highlighted the power of collective action in addressing climate change and strengthening community responsibility for sustainable living.	Mar 22, 2025	CECEC	GU reinforces its strategic vision to support national and global environmental initiatives through education, awareness, and engagement.

Training, Research, and Innovation Activities

Activity	Objective	Participants	Outcome
Workshop: Energy Efficiency & Conservation	To train faculty and staff on reducing power use through better campus management.	60 staff	Identified key operational areas for energy savings.
Training: Renewable Energy Systems	Provide technical knowledge on solar energy, battery storage, and clean grid integration.	75 students	Enhanced technical skills in renewable energy technologies.
Research Grant: Green Energy Solutions	Funded by SDM-C under GU's Research Grant for Sustainability.	4 research teams	Developed prototypes for small-scale solar units.
Innovation Challenge: Smart Energy Campus	Encourage innovation toward carbon neutrality.	10 student groups	Two projects shortlisted for GU Green Start-Up support.

Institutional Policies and Sustainable Energy Practices

Energy Management Policy: GU integrates renewable energy technologies and efficient power systems in all new campus facilities.

Solar Energy Initiative: Rooftop solar panels installed at key buildings under the GU Green Campus project.

Energy Audit Program: Regular audits are conducted to identify high-consumption areas and propose improvements.

LED and Daylighting Systems: Installed to reduce lighting energy use by 20%.

Smart Campus Automation: Digital systems used to optimize power use in labs and classrooms.

These initiatives support SDG Targets 7.2, 7.3, and 7.b – ensuring affordable, reliable, sustainable, and modern energy for all.

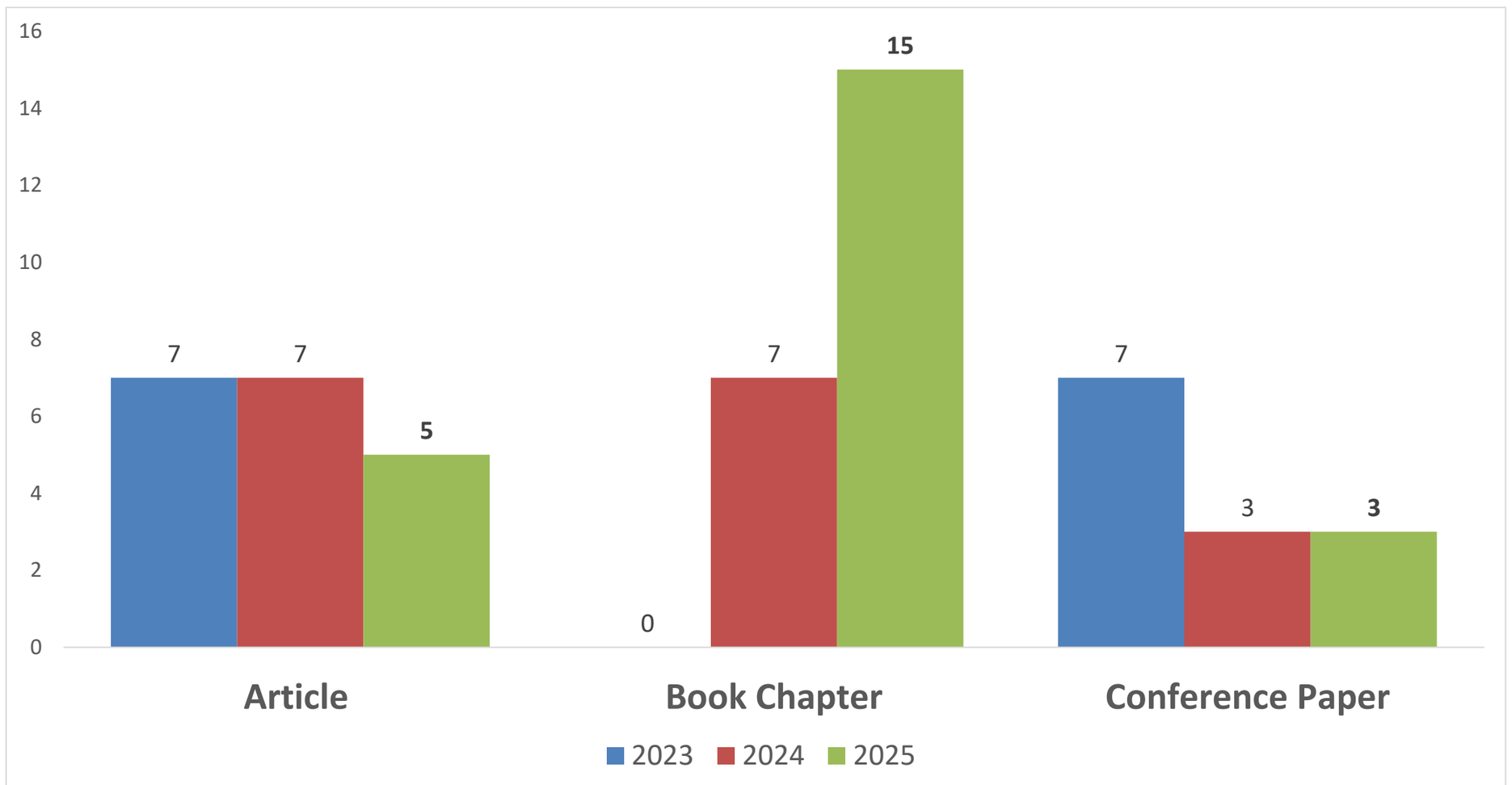
Summary of Impact and Key Performance Indicators (KPIs)

Impact Area	Key Outcomes (2024–2025)	SDG 7 Target Alignment
Renewable Energy Integration	Solar panels installed, generating 10% of GU's energy needs	Target 7.2 – Increase renewable energy share
Energy Efficiency Improvements	20% reduction in electricity use through audits and retrofits	Target 7.3 – Improve energy efficiency
Research on Clean Energy	5 academic publications on sustainable power systems	Target 7.a – Promote clean energy research
Awareness and Outreach	4 major clean energy awareness campaigns conducted	Target 7.b – Support access to modern energy
Smart Campus Systems	Automation introduced for optimized consumption	Target 7.3 – Sustainable energy management

Key Performance Indicators

KPI	Indicator Description	2024–2025 Result	Status
KPI 1	Number of renewable energy projects implemented	3	Achieved
KPI 2	Percentage reduction in energy consumption	20%	Achieved
KPI 3	Number of clean energy-related publications	5	Achieved
KPI 4	Student participation in clean energy programs	300+	Exceeded
KPI 5	Institutional policies supporting clean energy	4	On track

List of GU Publications in SDG 7



SDG 7 Articles in 2024-2025 (July)

Authors Name	Title	Journal Name	Type	Year
Majekodunmi, T.B., Shaari, M.S., Ridzuan, A.R., Vennila, J., Al-Absy, M.S.M.	The twist of longevity: exploring the convergence of the health production function and life-cycle hypothesis in Malaysia's life expectancy through savings	Discover Sustainability	Article	2025
Ahmadi Kamarposhti, M.A., Ghandour, R., Abdel-Aty, M.A., Çolak, I., Ahmed Solyman, A.A.	Optimizing capacitor bank placement in distribution networks using a multi-objective particle swarm optimization approach for energy efficiency and cost reduction	Scientific Reports	Article	2025
Bala, S., Ulfat, T.J., Hossain, H., Ridzuan, A.R., Jaheer Mukthar, K.P.	From Energy Diversity to Environmental Resilience: The Role of Government Efficiency in Shaping Ecological Footprint in Bangladesh	International Journal of Energy Economics and Policy	Article	2025
Sona, D.R., Amulya, R., al-Tamimi, A.N.J., Bagadi, K., Abdullah, O.I.	An Advanced Energy Efficient Lightweight ElGamal Cryptography Technique for IoT Device	Aip Conference Proceedings	Conference Paper	2025
Deghoum, K., al-Tamimi, A.N.J., Gherbi, M.T., Boukhari, A., Hamidatou, S.	Steady-State and Vibration Analyses of Wind Turbine Blades Based on Numerical Approach Using Different Materials	Aip Conference Proceedings	Conference Paper	2025
Abdullah, O.I., Hamzah, A.A., Adnan, A.Q., Mohammed, M.N., M Abed, A.M.	Enhance The Performance of The Wind Turbine Blade Based on The Blade Element Momentum Theory	Aip Conference Proceedings	Conference Paper	2025
Majeed, M.S., Rasheed, R.M., Jweeg, M.J., Abdullah, T.A., Abdullah, O.I.	Study the Effect of Using Carbon Nanoparticles Synthesized by Second Harmonic(Nd: Yag 532 nm) Laser Ablation on Microbial Fuel Cell Performance	Polish Journal of Chemical Technology	Article	2025
Ateeq, A.A.	Sustainability and Technology: Innovations Leading the Way to a Greener Future	Studies in Systems Decision and Control	Book Chapter	2025
Ateeq, A.A.	From Oil to Sustainability: Bahrain’s Transformation Through CSR	Studies in Systems Decision and Control	Book Chapter	2025
Mohammed, M.N., Hameed, M.S., Kassem, A., Al-Zubaidi, S.S., Abdullah, O.I.	Design and Optimization of Vertical Axis Wind Turbine for Urban Environment	Studies in Systems Decision and Control	Book Chapter	2025
Abbas, F.H., Al-Rawi, O.Y.M., Ali, R.R., Alkhayyat, A.H.R., Hassan, M.H.	A Hybrid Bio-Inspired Optimization Based Enhanced Cluster Head Selection to Improve Communication in Vehicular Ad-Hoc Networks	Studies in Systems Decision and Control	Book Chapter	2025
Abdallah, M.A.B., Fatla, O.M.H.	A Review on the Comparison of Diesel and Biodiesel Fuels on the Spray Characteristics	Studies in Systems Decision and Control	Book Chapter	2025
Alhamadani, A., Abdullah, O.I., Tolephih, M.H., Nursultan, D., Alani, Z.N.	Evaluating and Analysis of Potential Establishing Solar Power Plant in the Modern City of Bismayah, Iraq	Studies in Systems Decision and Control	Book Chapter	2025
Mohammed, M.N., Ahmed, S.E., Abbas, A.F., Al-Zubaidi, S.S., Abdullah, O.I.	Design and Development of Hydro Power Generation Using Zero Head Turbine	Studies in Systems Decision and Control	Book Chapter	2025

Hydrose, A., Alex, A.R., Junaid, R.	Transitioning to Sustainability: Analysing Energy Consumption Trends and Renewable Energy Potential in Bahrain	Studies in Systems Decision and Control	Book Chapter	2025
Alex, A.R., Yunis, G.E., El Fezzani, W.	Piezoelectric Energy Harvesting: A Sustainable Approach to Renewable Energy Generation	Studies in Systems Decision and Control	Book Chapter	2025
Mohammed, M.N., Fatima, A., Abbas, A.F., Al-Zubaidi, S.S., Abdullah, O.I.	Design and Fabrication of Water Turbine Prototype	Studies in Systems Decision and Control	Book Chapter	2025
Hadjadj, A., Deghoum, K., Tolephih, M.H., Stojanovic, N.R., Abdullah, O.I.	2E Analysis of an Earth-To-Air Geothermal Heat ExChanger Under Arid Zone	Studies in Systems Decision and Control	Book Chapter	2025
Alnawafa, E.S., Allaymoun, M.H.	Identifying the Number of Active Sensor Nodes for Energy Efficient and Area Coverage in Wireless Sensor Networks	Studies in Systems Decision and Control	Book Chapter	2025
Kadhim, E.A., Mohammed, F.L., Tolephih, M.H., Abdullah, O.I., Edwar, M.E.	Stress Analysis of a Small-Scale Wind Turbine Blade Based on the Numerical Approach	Studies in Systems Decision and Control	Book Chapter	2025
Alaskari, M., Jobair, H.K., Tolephih, M.H., Stojanovic, N.R., Abdullah, O.I.	Assessment and Analysis of Wind Energy Resources in Iraq Based on Rayleigh Model	Studies in Systems Decision and Control	Book Chapter	2025
Alawsi, H., Al-Ayash, A.A., Ibrahim, F.M., Mohammed, M.N.	Sustainability in E-Commerce: Green Practices and Their Influence on Digital Trade	Studies in Systems Decision and Control	Book Chapter	2025
Alhamadani, A., Deghoum, K., Jweeg, M.J., Abdullah, O.I., Gherbi, M.T.	Enhancement of the output power of a small horizontal axis wind turbine based on the optimization approach	Open Engineering	Article	2025
Sridevi, V.V., Hamzah, H.T., Jweeg, M.J., Abdullah, T.A., Abdullah, O.I.	Microwave Pyrolysis of Agricultural and Plastic Wastes for Production of Hybrid Biochar: Applications for Greener Environment	Indonesian Journal of Science and Technology	Article	2024
Ridwan, M.K., Akther, A., Al-Absy, M.S.M., Yağiş, O., Jaheer Mukthar, K.P.	The Role of Tourism, Technological Innovation, and Globalization in Driving Energy Demand in Major Tourist Regions	International Journal of Energy Economics and Policy	Article	2024
Al-Obaidi, Q., Ibrahim, D.S., Mohammed, M.N., Abdullah, O.I., Selem, N.Y.	A Comprehensive Analysis of the Hydrogen Generation Technology Through Electrochemical Water and Industrial Wastewater Electrolysis	Polish Journal of Chemical Technology	Article	2024
Abdullah, T.A., al-Tamimi, A.N.J., Aljibori, H.S., Azawi, K.F.A., Hussein, H.T.	Nanomaterials in Oil and Gas Industry	Petroleum Chemistry	Article	2024
Tabash, M.I., Al-Absy, M.S.M., Hannoon, A.M.T.	Modeling the Nexus between European Carbon Emission Trading and Financial Market Returns: Practical Implications for Carbon Risk Reduction and Hedging	Journal of Risk and Financial Management	Article	2024
Deghoum, K., Aljibori, H.S., Majeed, M.H., Abdullah, O.I., Boukhari, A.	Study of the Crack in Wind Turbine Blade Using the XFEM Method	Aip Conference Proceedings	Conference Paper	2024
Hussein, M.F., Al-Ayash, A.A.	Smart Home as a Source of Clean Energy(KNX and IoT in Amman Residence as a Case Study)	Studies in Systems Decision and Control	Book Chapter	2024

Mohammed, M.N., Aljibori, H.S., Jameel al-Tamimi, A.N., Helmi, R.A.A., Ahmad, A.S.	Toward Sustainable Smart Cities in Bahrain: A Study on Power Generation Using Speed Breakers for Enhanced Energy Efficiency	2024 Arab ICT Conference Aictc 2024	Conference Paper	2024
Mohammed, M.N., Deghoum, K., Jweeg, M.J., Aljibori, H.S., Abdullah, O.I.	A Computational Fluid Dynamic Simulation of Three-Dimensions of a Small Horizontal Axis Wind Turbine Blade	Studies in Systems Decision and Control	Book Chapter	2024
Mohammed, M.N., Aljibori, H.S., Jweeg, M.J., Abdullah, O.I., Alfiras, M.I.I.	Systematic Design and Simulation of a Home Stand-Alone PV System for a Located in Baghdad City	Studies in Systems Decision and Control	Book Chapter	2024
Kristanti, F.T., Riyadh, H.A., Ginting, E.S.B., Beshr, B.A.H.	Exploring the level of realm disclosure for Indonesian insurance business using ISO 31000	Journal of Infrastructure Policy and Development	Article	2024
Fatla, O.M.H., Robinson, F.C.J., Jweeg, M.J., Mohammed, M.N., Abdullah, O.I.	Technologies for high-temperature batch annealing of grain-oriented electrical steel: An overview	Open Engineering	Article	2024
Salaheldeen, M., Ateeq, A.A., Al Ani, Z., Ali, S.A., Milhem, M.	Green Entrepreneurship and Sustainability in Developing Countries: Opportunities, Challenges, and Future Research Directions	Studies in Systems Decision and Control	Book Chapter	2024
Abdulrahim, H.M., Ateeq, A.A., Al Khalifa, F.A., Milhem, M., Al Meer, S.	Exploring the Implementation Efforts and Contributions of Green Building Rating Systems(GBRS) Among Stakeholders in Bahrain's Real Estate Sector: A Qualitative Study	Studies in Systems Decision and Control	Book Chapter	2024
Abdulrahim, H.M., Ateeq, A.A., Al Khalifa, F.A., Nagi, M., Al Astal, A.Y.M.	Qualitative Investigation of Green Building Rating System Development in Bahrain's Affordable Housing Industry	Studies in Systems Decision and Control	Book Chapter	2024
Ateeq, A.A., Alaghbari, M.A., Al-Refaei, A.A.A., Yusuf, A.A.	Sustainable Solutions: The Impact of Green Technologies in University Operations	2024 Asu International Conference in Emerging Technologies for Sustainability and Intelligent Systems Icetsis 2024	Conference Paper	2024
Hashim, N., Neo, T.G., Mohammed, M.N., Jameel al-Tamimi, A.N., Alfiras, M.I.I.	Toward Sustainable Smart Cities: A New Approach of Solar and Wind Renewable Energy in Agriculture Applications	Studies in Systems Decision and Control	Book Chapter	2024

Conclusion and Recommendations

Gulf University continues to make significant progress toward SDG 7: Affordable and Clean Energy. By integrating renewable energy systems, promoting awareness, and developing innovative research, the university fosters an environmentally responsible and energy-efficient campus.

Recommendations for Next Year

- Expand solar panel coverage to additional university buildings.
- Establish long-term partnerships for renewable energy research with industry and government entities.
- Integrate clean energy topics further into academic programs and student projects.
- Develop GU's "Carbon Neutral 2030" strategy to monitor energy and carbon performance annually.

Through continuous action, GU strengthens its leadership in renewable energy innovation, aligning its goals with Bahrain Vision 2030 and the UN's Sustainable Development Agenda.

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