

7. AFFORDABLE AND CLEAN ENERGY

Energy efficiency and the transition to renewables are core priorities for KHAS. The University continuously upgrades lighting to LED systems, promotes energy-saving practices, and incorporates sustainability into academic programs. Faculty members organized and participated in international conferences on energy transition, European energy markets, and climate change. Courses like “Energy and Sustainability” and “Energy Security and Geopolitics” prepare students to address global energy challenges while supporting Türkiye’s green transition initiatives.

7.1. Events

- European Green Deal – Closing Meeting, 27 September 2024 – Volkan Ş. Ediger
- “Energy Transition: Energy Transition or Energy Transformation?”, 25 September 2024 – Volkan Ş. Ediger
- EEM24 – International Conference on European Energy Market, 10–12 June 2024 (Co-Chair) – Volkan Ş. Ediger
- “Youth Seeking Solutions for Sustainable Development Goals,” 23 May 2024 – Volkan Ş. Ediger
- “From Fossil Fuel Geopolitics to Sustainable Energy Geopolitics,” 30 April 2024 – Volkan Ş. Ediger
- ICCI 2023 Energy Awards (Jury Member) – Volkan Ş. Ediger
- “The New World Order in Energy,” 2 April 2024 – Volkan Ş. Ediger
- “Transition to Renewable Energy,” 5 March 2024 (Yaşar University) – Volkan Ş. Ediger
- “Turkish Energy Sector” Workshop, 28 February 2024 – Volkan Ş. Ediger
- “Energy in the First 100 Years of the Republic” Panel, 19 December 2023 – Volkan Ş. Ediger
- “Energy in the 100th Year of the Republic,” 7–9 December 2023 – Volkan Ş. Ediger
- “Energy Problems in the Early Years of the Republic,” 28 November 2023 – Volkan Ş. Ediger
- “Transition to Renewable Energy,” 1 November 2023 – Volkan Ş. Ediger
- “Renewable Energy in the Axis of Sustainable Development,” 20 October 2023 – Volkan Ş. Ediger
- “Energy Transition: Dynamics of the New System,” 11 July 2023 – Volkan Ş. Ediger
- “Impacts of Climate Change on Water, Food, and Energy Sustainability,” 11 May 2023 – Volkan Ş. Ediger
- “Energy and Sustainability,” 15 April 2023 – Volkan Ş. Ediger
- “Political Economy of Energy: Past to Future,” 28 April 2023 – Volkan Ş. Ediger
- “Energy Efficiency 2030 Vision” Workshop, 16 January 2023 (Moderator) – Volkan Ş. Ediger
- 12th Development Plan Special Commission on Climate (Member), 2022–2023 – Volkan Ş. Ediger
- 12th Development Plan Special Commission on Green Growth (Member), 2022–2023 – Volkan Ş. Ediger
- “Economy, Politics and Power: Beyond Climate Change,” May 2024 – Alp Erinç Yeldan
- “From the Solow Model to Green Transformation,” November 2023 – Alp Erinç Yeldan
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7.2. Projects

- Green Library Project: Energy-saving practices were implemented.
- TÜBİTAK 1001 Project (2024–2027) – Volkan Ş. Ediger
- TÜBİTAK 1005 Project (2022–2024) – Volkan Ş. Ediger
- Man0euvre – Net-Zero Energy System Models (2024–2027) – Gökhan Kirkil
- TÜBİTAK 1002 Project (2023–2024) – Ahmet Yücekaya

- Ümit Şahin, Osman Bülent Tör, Bora Kat, Saeed Teimourzadeh, Kemal Demirkol, Arif Künar, Ebru Voyvoda, Erinc Yeldan “Türkiye’nin Karbonsuzlaşma Yol Haritası: 2050’de Net Sıfır Raporu,” Sabancı University, Istanbul Policy Center.
- Sevil Acar, A. Erinc Yeldan, & Ahmet A. Aşıcı “Europe’s Carbon Pricing Plans: Potential Effects on Türkiye’s Economy,” paper presented at the ERF Policy Forum.
- Sevil Acar, Bora Kat, & A. Erinc Yeldan “Türkiye’de Elektrik Sistemi Dönüşümünün Sosyoekonomik Etkileri,” Sabancı University SHURA Report.
- Occupational Health and Safety (ISG) Projects:
 - o Regular meter monitoring and maintenance are conducted to track energy savings; safety breakers are installed to prevent electrical leakage.
 - o LED lighting is used across the university to reduce electricity consumption. All newly purchased equipment, machinery, and devices are selected with energy efficiency in mind.
 - o The new Engineering Building incorporates heat recovery systems to optimize HVAC operations. Heat energy recovered from indoor air is reused, ensuring energy consumption is managed efficiently.
- Faculty: Faculty of Art and Design | Project Type: TÜBİTAK 1001 | Project Title: Determination of Visual Comfort Variables in Workspaces Based on Human-Centered Lighting and Energy Performance Requirements | Project Leader: Prof. Dr. Banu Manav | Researchers/Experts:
 - o Prof. Dr. Selahattin Adil Sarıbey (Kadir Has University)
 - o Prof. Dr. Mehmet Timur Aydemir (Kadir Has University)
 - o Asst. Prof. Dr. Burcu Çiğdem Yılmaz (Kadir Has University)
 - o Res. Asst. Dr. Egemen Kaymaz (Uludağ University)
- Project Period: 10 December 2023 – 10 August 2026 | Summary: The project examines the structure of lighting systems used in today’s work environments. It will investigate visual comfort variables and the importance of human-centered lighting design in a full-scale (1:1) controlled experimental environment. Another goal is to determine the energy performance levels of recommended lighting scenarios that achieve optimal lifetime cost efficiency. Within the human-centered lighting approach, the project will measure the improvement rate of lighting energy performance achieved through the combined use of dynamic LED luminaires and lighting control strategies.

7.3. Publications

- **Simultaneous impacts of correlated photovoltaic systems and fast electric vehicle charging stations on the operation of active distribution grids**
Authors: Tourandaz Kenari, M. and Ozdemir, A.
Year: 2024
- **Comprehensive survey of artificial intelligence techniques and strategies for climate change mitigation**
Authors: Amiri, Z., Heidari, A., and Jafari Navimipour, N.
Year: 2024
- **A new energy-economy-environment modeling framework: Insights from decarbonization of the Turkish power sector towards net-zero emission targets**
Authors: Kat, B., Şahin, U., Teimourzadeh, S., Tör, O., Voyvoda, E., and Yeldan, A.
Year: 2024

- **An ultra efficient 2:1 multiplexer using bar-shaped pattern in atomic silicon dangling bond technology**
Authors: Rasmi, H., Mosleh, M., Navimipour, N., and Kheyrandish, M.
Year: 2024
- **A new service composition method in the cloud-based Internet of things environment using a grey wolf optimization algorithm and MapReduce framework**
Authors: Vakili, A., Al-Khafaji, H., Darbandi, M., Heidari, A., Navimipour, N., and Unal, M.
Year: 2024
- **An Evaluation of AI Models' Performance for Three Geothermal Sites**
Authors: Demir, E., Çavur, M., Yu, Y., and Düzgün, H.
Year: 2024
- **A new energy-efficient design for quantum-based multiplier for nano-scale devices in internet of things**
Authors: Ahmadpour, S., Noorallahzadeh, M., Al-Khafaji, H., Darbandi, M., Navimipour, N., Javadi, B., Ain, N., Hosseinzadeh, M., and Yalcin, Ş.
Year: 2024
- **A multi-criteria decision-making method for thermal insulation material selection in nZEB level questioned affordable multifamily housings**
Authors: Yılmaz, B., Acun Özgünler, S., and Yılmaz, Y.
Year: 2024
- **A cost- and energy-efficient SRAM design based on a new 5 i-p majority gate in QCA nanotechnology**
Authors: Kassa, S., Ahmadpour, S., Kumar Lamba, V., Misra, N., Navimipour, N., and Kotecha, K.
Year: 2024
- **Cascaded H-bridge multilevel inverters optimization using adaptive grey wolf optimizer with local search**
Authors: Ceylan, O., Neshat, M., and Mirjalili, S.
Year: 2024
- **Synthetic Data for Non-Intrusive Load Monitoring: A Markov Chain Based Approach**
Authors: Sayilar, B., Mihci, G., and Ceylan, O.
Year: 2024
- **Capacity Planning for Electricity Utility Call Centers: A Time Series Analysis Approach**
Authors: Kavas, E., Alsan, H., and Arsan, T.
Year: 2024
- **A Data Science Perspective on Global Trends in Energy Production**
Authors: Hatira, N., Alsan, H., and Arsan, T.
Year: 2024
- **Clustering and Mathematical Optimization Approaches for Efficient Estimation of Electric Vehicles Charging Stations' Locations**
Authors: Ekmekçi, Y., Demirörs, D., Rassad, N., Polat, Z., Akkaya, E., Baytürk, E., and Pehlivan, M.
Year: 2024
- **Data-Driven Methods for Optimal Setting of Legacy Control Devices in Distribution Grids**
Authors: Savasci, A., Ceylan, O., and Paudyal, S.
Year: 2024

- **A novel hybrid coil design and implementation for wireless power transfer systems**
Authors: Pashaei, A., Aydin, E., Akif Ozdemir, M., Kösesoy, Y., and Aydemir, M.
Year: 2024
- **Energy-Efficient Secure Communication for IOS Aided CFMMIMO Network**
Authors: Li, B., Hu, Y., Dong, Z., Panayirci, E., Jiang, H., and Wu, Q.
Year: 2024
- **Probabilistic approach to assess and minimize the voltage violation risk in active distribution networks**
Authors: Tourandaz Kenari, M., Ozdemir, A., and Heidari, A.
Year: 2024
- **Voltage Profile Improvement in Unbalanced Distribution Networks for Probabilistic Generation and Consumption**
Authors: Bamatraf, M., Ceylan, O., Pisica, I., and Ozdemir, A.
Year: 2024
- **Joint Resource Allocation in Multi-RIS and Massive MIMO-Aided Cell-Free IoT Networks**
Authors: Li, B., Hu, Y., Dong, Z., Panayirci, E., Jiang, H., and Wu, Q.
Year: 2024
- **Interdependency of Passive Design Strategies for Energy-Efficient Building Envelope**
Authors: Reffat, R., Cetin, M., and Abdou, A.
Year: 2024
- **Energy Management in Organized Industrial Zones: Promoting the Green Energy Transition in Turkish Manufacturing Industry**
Authors: Ediger, V., Kucuker, M., Berk, I., Inan, A., and Uctug, F.
Year: 2024
- **Energy Performance Optimisation of a Single Dwelling Archetype Targeted to ZEB in the Earthquake Zone**
Authors: Yilmaz, Y. and Yilmaz, B.
Year: 2024
- **Multi-Criteria Decision Making in Optimal Operation Problem of Unbalanced Distribution Networks Integrated With Photovoltaic Units**
Authors: Ebadi, R., Aboshady, F., Ceylan, O., Pisica, I., and Ozdemir, A.
Year: 2024
- **Technology Assessment of Hydrogen Storage: Cases Enabling the Clean Energy Transition**
Authors: Qudaih, S., Bektas, Z., Guven, D., Kayakutlu, G., and Kayalica, M.
Year: 2024
- **Towards Better Energy Efficiency Through Coil-Based Electricity Consumption Forecasting in Steel Manufacturing**
Authors: Koca, A., Erdem, Z., and Dağ, H.
Year: 2024
- **Resilience in Power Generation: Two Case Studies from Türkiye**
Authors: Avci, F. and Ediger, V.
Year: 2024

- **Permissioned Blockchain-Based Monitoring Framework for DER-Integrated Distribution Networks**
Authors: Angin, P., Zehir, M., Ceylan, O., Eissa, M., Yüksel, M., Deveci, U., Yilmaz, S., and Göl, M.
Year: 2024
- **A new nano-design of 16-bit carry look-ahead adder based on quantum technology**
Authors: Ahmadpour, S. and Navimipour, N.
Year: 2023
- **A new QoS-aware method for production scheduling in the industrial internet of things using elephant herding optimization algorithm**
Authors: Avval, D., Heris, P., Navimipour, N., Mohammadi, B., and Yalcin, Ş.
Year: 2023
- **Superior Conductivity of Transparent ZnO/MoS₂ Composite Films for Optoelectronic and Solar Cell Applications**
Authors: Tareq, S., Kirkil, G., and Özüğür Uysal, B.
Year: 2023
- **Re-investigating the Effect of the Vergence-Accommodation Conflict on 3D Pointing**
Authors: Batmaz, A., Türkmen, R., Sarac, M., Barrera-Machuca, M., and Stuerzlinger, W.
Year: 2023
- **Decision support model for PV integrated shading system: Office building case**
Authors: Yilmaz, B. and Yilmaz, Y.
Year: 2023
- **Future availability of natural gas: Can it support sustainable energy transition?**
Authors: Ediger, V. and Berk, I.
Year: 2023
- **Global energy use**
Authors: Ediger, V.
Year: 2023
- **Transforming Türkiye's power system: An assessment of economic, social, and external impacts of an energy transition by 2030**
Authors: Acar, S., Kat, B., Rogner, M., Saygin, D., Taranto, Y., and Yeldan, A.
Year: 2023
- **A green, secure, and deep intelligent method for dynamic IoT-edge-cloud offloading scenarios**
Authors: Heidari, A., Navimipour, N., Jabraeil Jamali, M., and Akbarpour, S.
Year: 2023
- **Energy-Efficient Design for Reconfigurable Intelligent Surface Aided Cell-Free Ultra Dense HetNets**
Authors: Li, B., Hu, Y., Dong, Z., Panayirci, E., Jiang, H., and Wu, Q.
Year: 2023
- **Modulated relay based stable election protocol for large-scale wireless sensor networks**
Authors: Hamad, L., Dağ, T., and Güçlüoğlu, T.
Year: 2023

- **Validation Of Wind Turbine Model Software Simulation Using Real Time Windspeed Measurements**
Authors: Polycarpou, A., Shiacallis, S., Christofides, N., Papadakis, A., Papadopoulos, T., and Ceylan, O.
Year: 2023
- **Parallel-Input Series-Output Z-Source Converters for High Voltage DC Power Supplies**
Authors: Ozdemir, M., Aydin, E., Dağ, B., Tamyürek, B., and Aydemir, M.
Year: 2023
- **Historical Pattern Analysis of Global Geothermal Power Capacity Development**
Authors: Ediger, V. and Akar, S.
Year: 2023

7.4. Courses

Faculty: Faculty of Art and Design | Program: Interior Architecture and Environmental Design (Undergraduate)
| Course: IAR306 Interior Architecture Design Systems IV: Installation | Term: 2022–2023 / 2023–2024 Spring
Semester: This course aims to provide fundamental knowledge and awareness of environmentally conscious and sustainable building practices, including environmental design, passive and active design strategies, mechanical systems, plumbing systems, technical infrastructure, and fire safety. It is designed to equip students with a professional vision that integrates environmental, economic, and social sustainability principles into practice.