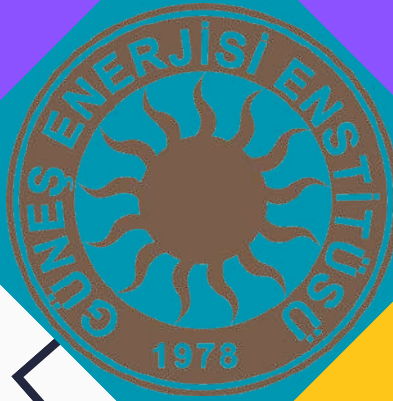


ANNUAL REPORT 2024

**Ege University
Solar Energy Institute**

119/1 St., #2
Bornova, Izmir TR

www.eusolar.ege.edu.tr



EGE UNIVERSITY
SOLAR ENERGY INSTITUTE

ANNUAL REPORT

2024

Prepared By:

Gülay Zeynep Günel
Tayfun Mustafa Tavman
İpek Gülçin Uysal

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CHAIR'S MESSAGE

"As humanity navigates an era marked by pressing environmental challenges and evolving energy needs, the Solar Energy Institute (EGI-SOLAR) remains dedicated to advancing research and education that contribute meaningfully to addressing the climate crisis. In this year's annual report, we emphasize the importance of decarbonizing electrification as a pathway toward a sustainable and resilient future.

In 2024, the Institute expanded its efforts across the renewable energy field, with a particular focus on reducing the carbon footprint of electricity generation and consumption. Our researchers have explored advancements in next-generation photovoltaics, versatile energy storage solutions, and integrated energy systems. These developments are essential for supporting cleaner transportation, industries, and communities.

Over the past year, EGI-SOLAR strengthened collaborations with both national and international partners, reaffirming our belief that collective expertise drives innovation. Our interdisciplinary teams have pursued initiatives that combine material science, engineering, and environmental awareness—reflecting the complexity of today's energy challenges.

This report showcases a wide range of studies and projects. From ultra-efficient next-generation photovoltaics, which offer improved performance and application versatility, to hybrid photovoltaic-thermal systems and advancements in energy storage technologies, our research supports the foundation for a low-carbon energy landscape.

Our academic programs also continue to empower students with the knowledge and skills needed to navigate and shape the future of sustainable energy.

As the world progresses toward greater electrification, ensuring that these changes are environmentally responsible and beneficial to all is essential. By prioritizing decarbonization, we aim to reduce emissions, promote energy access, and contribute to sustainable development.

We remain committed to developing practical and innovative solutions that serve society and the environment. As you review this report, I invite you to share our vision for an energy future that is clean, equitable, and sustainable."



PROF. DR. CEYLAN ZAFER



Ege University Solar Energy Institute



ABOUT US:

Ege University Solar Energy Institute serving as a research and education centre for renewable energy resources such as solar power, biomass, wind and geothermal is established in 1978. It is the first and only institute leading these fields in Turkey. In accordance with the order from Council of Higher Education that taken into account on 23 December 1982, two departments have structured; namely Energy and Energy Technology. As of 2024, 26 academic, 7 administrative personnel, and 13 staff serve in our institute. Currently, there are 84 masters and 78 doctorate researchers are proceeding with their studies.

OUR MISSION & VISION

We are aspiring to be an international institute holding up to universal standards in terms of generating information and technological development regarding energy resources and their utilization, with the objective of having a say in national energy policies by setting an example in our field through constant improvement.

Our mission is to produce information regarding renewable and clean energy resources, developing technologies, apply and extend the scope of these technologies by providing education, research and consultancy services to universities, research centers, industrial establishments and the society in general in order to achieve a sustainable environment.

OUR TEAM

ENERGY TECHNOLOGY DEPARTMENT



Chair

Prof. Dr.

Ceylan ZAFER



Prof. Dr.

Günnur KOÇAR



Prof. Dr.

Hayati OLGUN



Prof. Dr.

Önder ÖZGENER



Prof. Dr.

Engin KARATEPE



Assoc. Prof. Dr.

Numan Sabit ÇETİN



Vice Chair

Assoc. Prof. Dr.

Melih Soner ÇELİKTAŞ



Assoc. Prof. Dr.

Koray ÜLGEN



Assoc. Prof. Dr.

Mete ÇUBUKÇU



Asist. Prof. Dr.

Ahmet ERYAŞAR



Asist. Prof. Dr.

Hasan SARPTAŞ



Asist. Prof. Dr.

Halide DİKER



Res. Asst. Dr.

Ayşe İsmet ÇALIŞ



Asist. Prof. Dr.

Özben KUTLU



Res. Asst.

Fırat SALMANOĞLU



Asist. Prof. Dr.

Adem MUTLU



Res. Asst.

Şefik ARICI



Lect.

ASIYE GÜL BAYRAKCI ÖZDİNGİŞ

OUR TEAM

ENERGY DEPARTMENT



Prof. Dr.

Mustafa GÜNEŞ



Assoc. Prof. Dr.

Ahmet YILANCI



Asist. Prof. Dr.

Bircan DİNDAR



Res. Asst.

Alper EKİCİ



Prof. Dr.

Şule ERTAN ELA



Asist. Prof. Dr.

Neslihan ÇOLAK



Res. Asst.

Harun GÜMÜŞ



Vice Chair

Asist. Prof. Dr.

Burak GÜLTEKİN

OUR TEAM

ADMINISTRATIVE AND SUPPORT STAFF

Gültekin Özgür

Institute Secretary

Hülya Bardakçı

Chair Assistant

Melek Ersoy

Student Affairs

Nurcan Arvalı

Student Affairs

Dilek Topaloğlu

Personnel

Galip Turan

Electronics Technician

Gülbahar Yılmaz

Circulating Capital

Erol Suna

Accounting

Ali Adil Arvalı

Electrician

Hakan Çetin

Staff

Hüseyin Aykurt

Staff

Serkan Tekin

Staff

FELLOWS, GRANTS, HONORS

Name	Programme
Dr. Duygu AKIN KARA	TUBITAK BİDEB-2218- National Postdoctoral Research Fellowship Program
Gökhan DEVEKİRAN	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Fikret Müge ALPTEKİN	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Sadık Can Karagöz	TÜBİTAK 1001 - The Scientific and Technological Research Projects Funding Program
Betül Aksoy	TÜBİTAK 1001 - The Scientific and Technological Research Projects Funding Program
Gülay Zeynep Günel	Ministry of Development
Hatice Arıcı Kahyaoğlu	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Burak KAHRAMAN	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology Ministry of Development
Damla Şahin	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Müge ÖZTÜRK	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Dilek Çırak	Ministry of Development
Sevdiye Başak TURGUT	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology TÜBİTAK 1001 - The Scientific and Technological Research Projects Funding Program
Semra Koçyiğit	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Merve UYAN	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Tamer Yeşil	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Aslı Birtürk	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology TÜBİTAK 1001 - The Scientific and Technological Research Projects Funding Program

ORGANIZATIONAL BODIES

ADMINISTRATIVE BOARD

PROF. DR. CEYLAN ZAFER
PROF. DR. HAYATİ OLGUN
PROF. DR. ENGİN KARATEPE
ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASSOC. PROF. DR. KORAY ÜLGEN
ASİST. PROF. DR. BURAK GÜLTEKİN
REPORTER: GÜLTEKİN ÖZGÜR

INSTITUTIONAL BOARD

PROF. DR. CEYLAN ZAFER
PROF. DR. ŞULE ERTEN ELA
ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASİST. PROF. DR. BURAK GÜLTEKİN
REPORTER: GÜLTEKİN ÖZGÜR

EDITING COMMITTEE

PROF. DR. CEYLAN ZAFER
PROF. DR. ŞULE ERTEN ELA
ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASST. PROF. DR. NESLİHAN ÇOLAK
ASST. PROF. DR. HASAN SARPTAŞ

PHD QUALIFYING COMMITTEE

PROF. DR. CEYLAN ZAFER
PROF. DR. MUSTAFA GÜNEŞ
ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASSC. PROF. DR. KORAY ÜLGEN
ASST. PROF. DR. BİRCAN DINDAR

QUALITY BOARD

PROF. DR. CEYLAN ZAFER (HEAD)
ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASST. PROF. DR. BURAK GÜLTEKİN
RES. ASST. ALPER EKİCİ

SYLLABUS CHECK TEAM

PROF. DR. CEYLAN ZAFER
PROF. DR. MUSTAFA GÜNEŞ
PROF. DR. ENGİN KARATEPE
ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASSOC. PROF. DR. KORAY ÜLGEN

QUALITY ENVOYS

RES. ASST. ALPER EKİCİ (PH.D CAND)
RES. ASST. ÖZKAN NUHOĞLU (MASTERS)

STUDENT REPRESENTATIVE

RES. ASST. ALPER EKİCİ (PH.D CAND)
SEVDİYE BAŞAK TURGUT (MASTERS)

ENERGY TECHNOLOGY DEPARTMENT

[Utilizing a Carbazole-Incorporated Regioisomeric Synthesis Strategy to Design Hole Transporting Materials for Perovskite Solar Cells](#)
Tamer Yeşil, Adem Mutlu, Sevdije Başak Turgut, Burak Gültekin, Ceylan Zafer

[Perylene Diimide-Based Dimeric Electron Acceptors with Molecular Conformations for Perovskite Solar Cells](#)
Gözde Murat Saltan, Tamer Yeşil, Aysun Albayrak Ötken, Ceylan Zafer, Haluk Dinçalp

[Optimization of Green Extraction Techniques for Polyphenolics in Pinus brutia Bark Extract and Steam Gasification of the Remaining Fraction to Obtain Hydrogen-Rich Syngas and Activated Carbon](#)
Ece Yıldız-Ozturk, Pelin Secim-Karakaya, Fikret Muge Alptekin, Melih Soner Celiktaş

[Hydrogen as an Alternative Biofuel Through Gasification Process: Comparative Study of the EU and Turkey](#)
Fikret Muge Alptekin, Melih Soner Çeliktaş

[Performance evaluation and thermal stabilization of photovoltaic panels using phase-change materials](#)
Ecem Sen, Melih Soner Celiktaş

[Subcritical water delamination: A promising path to efficient recycling of critical minerals](#)
Melih Soner Celiktaş, Aslı Birtürk

[Novel constitutive models, challenges and opportunities of shape memory polymer composites](#)
Merve Uyan, Melih Soner Celiktaş

[Examining the Cooling Effect in Photovoltaic Systems](#)
Betül Aksoy, Melih Soner Celiktaş

[The Emergence of Artificial Intelligence and Applications in the Energy Sector](#)
Gamze Mersin, Melih Soner Celiktaş

[The Importance of Recycling for Sustainable Energy Production With C-Si Photovoltaic Panels](#)
Sadik Can Karagoz, Melih Soner Celiktaş

[Utilization of Biomass-Derived Carbon Materials in Phase Change Materials](#)
Fikret Muge Alptekin, Merve Uyan, Melih Soner Celiktaş

ENERGY TECHNOLOGY DEPARTMENT

Ongoing Waste Issue Towards the Development of Photovoltaic Module Recycling Regulations

Aslı Birtürk, Melih Soner Çeliktaş

Theoretical Exergoenvironmental Analysis of a Tunnel Furnace and Drying System in a Brick Production

Gürhan Tahtalı, Hayati Olgun, Mustafa Güneş, Arif Hepbaşlı

Ticari Biyokütle Yakma Sistemlerinde Kül Kaynaklı Problemler Üzerine Bir Değerlendirme

Anıl Badem, Hayati Olgun

Digital Twin of Photovoltaic Power Plants Considering Spatio-Temporal Characteristics

Faruk Ugranlı, Esref Deniz, Engin Karatepe

Optimum ground-mounted on-grid connected photovoltaic system

Raimon O Bawazir, Numan S Çetin, Waleed Fadel

Implementation of Caputo type fractional derivative chain rule on back propagation algorithm

Mücahid Candan, Mete Çubukçu

Design and Application of Intelligent Scalable Automatic Fault Detector for Commercial Photovoltaic Systems

Mücahid Candan, David Melgar, Christian Schill, Mete Çubukçu, Eduardo Sarquis Filho, Björn Müller, Duarte Kazacos

Improving the Stability of Ink-Jet Printed Red Qleds by Optimizing the Device Fabrication Process

Halide Diker, Secil Sevim Unluturk, Serdar Ozcelik, Canan Varlikli

Copper and nickel complexes based on 4-((4-nitrophenyl)diazenyl)-3-(trifluoromethyl)-1H-pyrazol-5-ol; synthesis, characterization, X-ray studies, DFT calculations, molecular docking and antimicrobial activity

Mina A Amin, Halide Diker, Onur Şahin, Canan Varlikli, Ahmed A Soliman

LIST OF PUBLICATIONS

2024 Publications

MILESTONES

ENERGY TECHNOLOGY DEPARTMENT

Improving the Device Stability by Controlling the Morphology of Quantum Dot Emissive Layer Via a Coating Process in Blue QLEDs

Halide Diker, Sahika Ozguler, Secil Sevim Unluturk, Serdar Ozcelik, Canan Varlikli

A polymeric copper complex based on a pyrazole derivative: Synthesis, spectroscopic, X-ray, and biological activity studies

Mina A Amin, Halide Diker, Onur Şahin, Canan Varlikli, Ahmed A Soliman

Converting lignocellulosic biomass into valuable end products for decentralized energy solutions: A comprehensive overview

Ahmad Mustafa, Shah Faisal, Jaswinder Singh, Boutaina Rezki, Karan Kumar, Vijayanand S Moholkar, Ozben Kutlu, Ahmed Aboulmagd, Hamdy Khamees Thabet, Zeinhom M El-Bahy, Oguzhan Der, Cassamo Ussemame Mussagy, Luigi di Bitonto, Mushtaq Ahmad, Carlo Pastore

SAM-mediated interface engineering for enhanced Schottky diode characteristics

Adem Mutlu, Mustafa Can, Cem Tozlu

Electrical characterization of Ag/MoO_{3-x}/p-Si Schottky diodes based on MoO_{3-x} synthesized via sol-gel method: an investigation on frequency and voltage dependence

Adem Mutlu, Cem Tozlu

Effect of Anode Interfacial Modification by Self-Assembled Monolayers on the Organic Solar Cell Performance

Adem Mutlu, M Zeliha Arkan, Mustafa Can, Cem Tozlu

LIST OF PUBLICATIONS

2024 Publications

ENERGY DEPARTMENT

Theoretical investigation of novel electron donors for bulk heterojunction solar cells with potential photovoltaic characteristics
ElGhazi, Alham ;Aboulouard, Abdelhalk; Gultekin, Burak; Tounsi, Abdessamad; El Idrissi Mohammed

Device Performance of Emerging Photovoltaic Materials (Version 4)
Almora, Osbel; Cabrera, Carlos I.; Erten-Ela, Sule;...Vaillant-Roca, Lídice; Bravec, Christoph J

Life cycle assessment of apricot puree concentrate production
Baris Kiyak, Neslihan Colak Gunes

Life Cycle Assessment of Aerogels: A Critical Review
Ilkay TURHAN KARA, Baris KIYAK, Neslihan COLAK GUNES, Sevil YUCEL

A Facile Approach to Produce Activated Carbon from Waste Textiles via Self-Purging Microwave Pyrolysis and FeCl₃ Activation for Electromagnetic Shielding Applications
Sema Sert, Şirin Siyahjani Gultekin, Burak Gültekin, Deniz Duran Kaya, Ayşegül Körlü

Photoexcited electron transfer in hydrophobic fluorescent FAPbBr₃ perovskite nanocrystals and graphene heterostructures
Maria Mukhtar, Muhammad Mubeen, Muhammad Adnan Khalid, Poshmal Sumreen, Anwar Ul-Hamid, Sule Erten Ela, Azhar Iqbal

ENERGY DEPARTMENT

Stable Efficient Solid-State Supercapacitors and Dye-Sensitized Solar Cells Using Ionic Liquid-Doped Solid Biopolymer Electrolyte

Subhrajit Konwar, Sirin Siyahjani Gultekin, Burak Gultekin, Sushant Kumar, Vinay Deep Punetha, Muhd Zu Azhan Bin Yahya, Markus Diantoro, Famiza Abdul Latif, Ikhwan Syafiq Mohd Noor, Pramod K Singh

Dopant Free Donor-Acceptor Type Polymer Hole Transport Materials for Efficient and Stable Perovskite Solar Cells

Duygu Akin Kara, Sevdije Basak Turgut, Dilek Cirak, Merve Karaman, Mustafa Can, Sermet Koyuncu, Burak Gultekin

Dye-sensitized solar cells (DSSC): Principles, materials and working mechanism

Samina Qamar, Sule Erten Ela

Current progress of perovskite solar cells stability with bibliometric study

Christian Harito, Syauqi Abdurrahman Abrori, Munawar Khalil, Brian Yulianto, Sule Erten-Ela

Tribological investigation of ceramic incorporated novel compositionally graded multilayer tungsten alloys

Mahmood Hussain, Zafar Iqbal, Muhammad Zarif, Sule Erten Ela, Abbas Saeed Hakeem, Muhammad Yasir, Zahid Asghar, Hafiz Zahid Shafi

Performance optimization of CsPbI₂Br₂-based perovskite solar cells through device modeling

Saad Ullah, Samina Qamar, Atta ur Rehman, Sule Erten-Ela, Firoz Khan

p-Type DSSCs by sensitizing a benzofuran [b]-fused BODIPY with cyanoacrylic acid

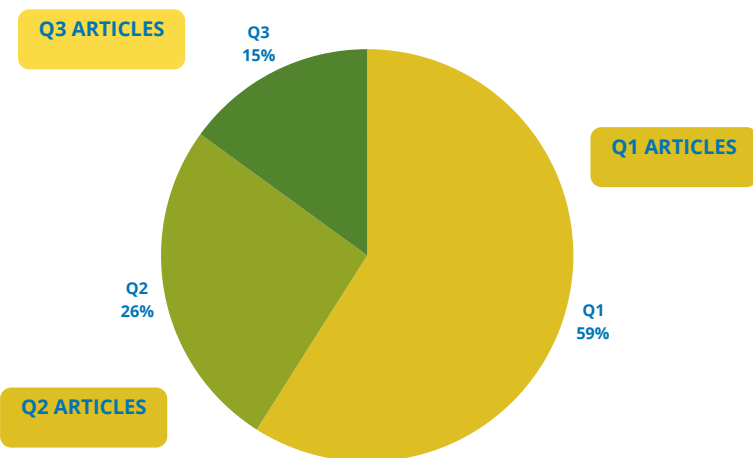
Sule Erten-Ela, Cagdas Yavuz, Ryohei Hasegawa, Yuji Kubo

LIST OF PUBLICATIONS

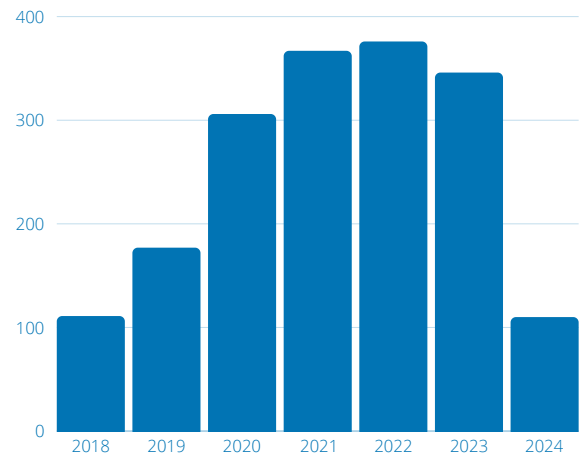
2024 Publications

PUBLICATIONS & CITATIONS

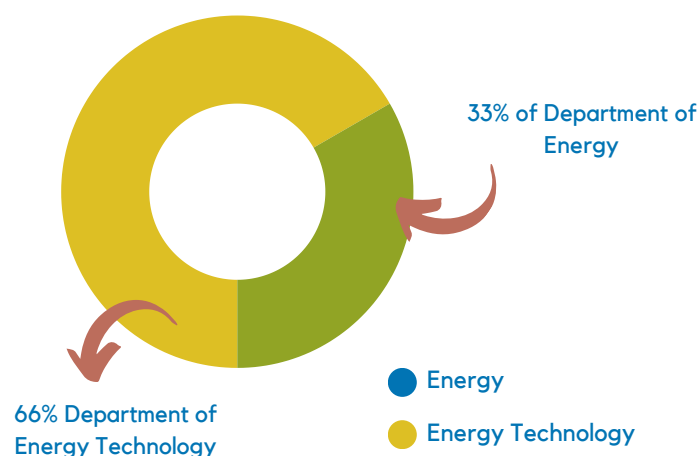
More than the quantity in numbers, quality parameters of research articles are also valuable for us. Our development vision encourages researchers to be involved in high impact factor journals. In the year 2024, 23 of the total 39 articles (approximately %59) were published in Q1 and Q2 Science Citation Index journals.



2024 articles by Q category



The distribution of the citations from publications that made by our institute in last 6 years

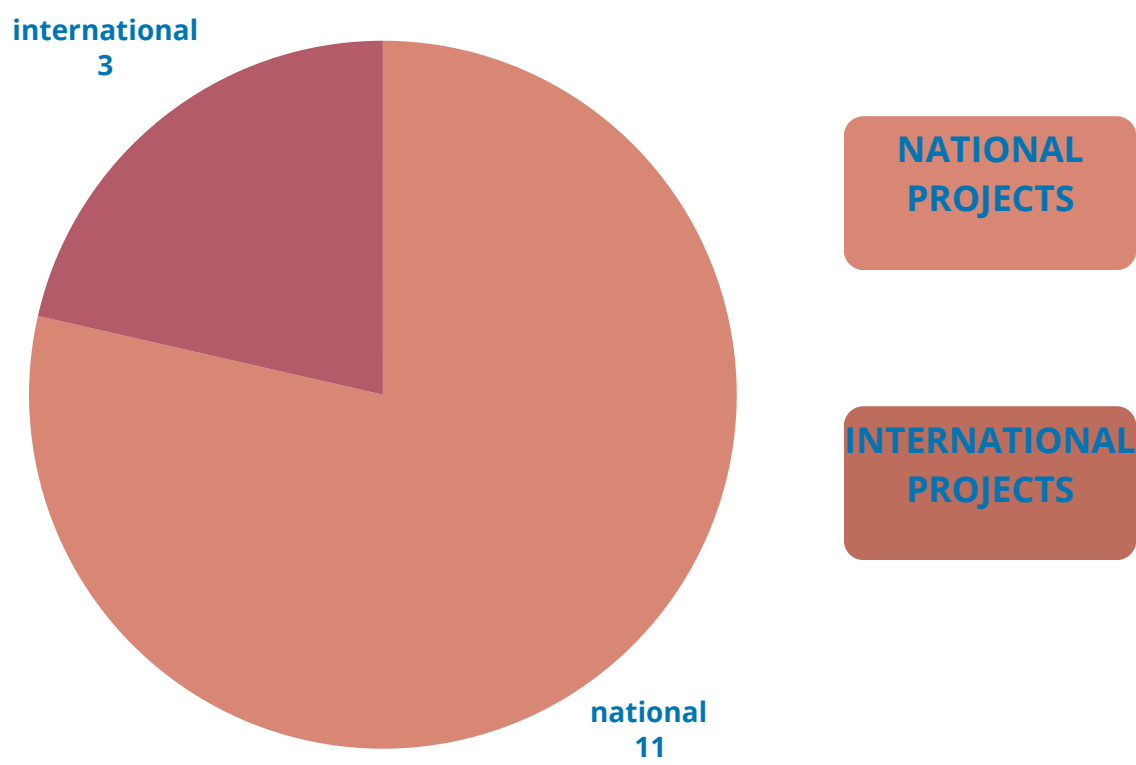


Number of publications in 2024, by departments

PROJECTS

The Solar Energy Institute, striving to lead the country's sustainable development efforts, actively encourages graduate student involvement in research projects. Our facilities and laboratories are continuously reorganized to accommodate new research initiatives, ensuring maximum output from their efforts.

While the majority of these projects are currently funded by national resources, we anticipate the emergence of potential collaboration projects with the European Union in the near future



2024 ongoing projects of EUSOLAR

LIST OF PROJECTS

Project Coordinator: Neslihan Çolak Güneş

Design and Experimental Examining of a Hybrid Food Dryer System that Used with Photovoltaic/Thermal (PV/T) System and Heat Pump - TUBITAK 1001

Project Coordinator: Burak Gültekin

Synthesis of Undoped Benzoselenidiazole Derived Polymers for High Efficiency and Stable Perovskite Solar Cells and Their Device Applications as HTM - TUBITAK 1003

Project Coordinator: Ceylan Zafer

Production and Characterization Infrastructure Development of Next Generation Photovoltaics - T.C. Ministry of Development

Project Coordinator: Melih Soner Çeliktaş

Recycling of Crystalline Silicon Photovoltaic Panels via Life Cycle Analysis - TUBITAK 1001

Project Coordinator: Hayati Olgun

PHIGO/Thermal Processing of P-rich Ashes Aiming for a High-Grade Phosphorus - ERA-NET 3 - Under Contract

Project Coordinator: Hayati Olgun

Developing Pelletizing and Pyrolysis Process of Spent Coffee Grounds and Spent Tea Wastes for Solid Fuel and Soil Improver - Under Contract - Dual Project Support (TUBITAK 2525)

Project Coordinator: Numan Sabit Çetin

Design, Optimization and Implementation of Grid Connected Multi-Source Renewable Hybrid Energy System - TUBITAK 1002

Researcher: Burak Gültekin

Production of Hybrid Supercapacitors with Organic Single Crystal Nanocomposite Electrodes - TUBITAK 3501

Researcher: Ceylan Zafer

A Greek-Turkish Solar Energy Excellence Hub to Advance the European Green Deal - AB Horizon 4.1

Project Coordinator: Burak Gültekin

Development of Large Area Composite Electrode-Based Supercapacitor with High Energy Density - SEARCH UNIVERSITIES SUPPORT PROGRAM

Project Coordinator: Burak Gültekin

Preparation of Lead-Free Perovskite Solar Cells with Low Toxicity Solvents, Thesis Project, PhD (BAP)

Project Coordinator: Burak Gültekin

Innovative approaches in photovoltaic (PV) module and Photovoltaic Thermal Systems (PV/T) recycling methods, (ÖNAP)

Project Coordinator: Burak Gültekin

Investigation of Lead Retention Mechanisms in Perovskite Solar Cells, (GAP)

Project Coordinator: Mete Çubukçu

Digital Solutions for Electricity Consumption by Global Climate Community Izmir (GCC-SYNERGY) NZC Pilot Cities Programme

MILESTONES

Number of Students

Master.....85
PhD.....76



There were:
85 students and
10 alumnis
in Masters Program,

76 students and
8 alumnis
in PhD Program
2024

Number of 2024 Alumni

Master.....10
PhD.....8



INFRASTRUCTURE



Multiscale Glovebox

**Class 1000
Clean Room**



Characterization Lab

INFRASTRUCTURE

Concentrated Solar Power System



Geothermal Greenhouse



Experimental Rooftop Photovoltaic System



INFRASTRUCTURE



Chemistry Lab

Advanced Smart Biomaterials Lab



Food Drying Lab

VISITS



On February 14, 2024, we hosted 9th-grade students from 29 Mayıs Schools Bornova College Science and Anatolian High School at our institute, accompanied by their teachers, Mr. Evren Ertüfekçi and Ms. Merve Aydemir. The students were divided into two groups: 39 students in the morning session and 40 students in the afternoon session. After introducing our institute, we answered the students' questions about renewable energy. Using our experimental kits, we explained energy production through solar and wind power. The students toured the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, and the Green Process Technologies Application Area. Information about the ongoing studies was also provided.



On March 28, 2024, a group of nine students from the Department of Photonics at İzmir Institute of Technology visited our institute as part of the course "PHOT 444 Photonics in Nanotechnological Energy Applications," coordinated by Prof. Dr. Canan Varlıklı.

Following a presentation introducing our institute, the students were given a tour of the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room), and the Lamination Laboratory. Detailed explanations were also provided regarding the work conducted at the Solar-Powered Drying and Process Heat Laboratory, the rooftop systems connected to the laboratory, and the Green Process Technologies Application Area.



On October 16, 2024, as part of the TEAMS (Technology Embracing Arts, Music, and Sustainability) project supported under the Erasmus+ Short-Term Projects for Student and Staff Mobility in School Education, a Portuguese group consisting of three teachers and five students visited our institute. During the Turkish leg of the project, three teachers and six students from Mustafa Kemal Anatolian High School, who were hosting the Portuguese group, also participated in the visit. A presentation introducing our institute was given to the students and teachers from 10th, 11th, and 12th grades. The group was then guided through the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room), and the Green Process Technologies Application Area.



On October 21, 2024, a group of 23 ninth-grade students from 29 Mayıs Schools Bornova Campus, accompanied by their teacher Mr. Kaan Ateş, visited our institute. A presentation introducing the institute was given to the students. Afterwards, they toured the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, and the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room), where the ongoing studies were explained. The students' questions regarding renewable energy were also answered.

VISITS



On November 20, 2024, a group of 30 ninth-grade students from 29 Mayıs Schools Bornova Campus, accompanied by their teacher Mr. Murat Işıkoğlu, visited our institute. A presentation introducing the institute was given to the students. Afterwards, they toured the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, and the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room), where the ongoing studies were explained. The students' questions about renewable energy were also answered.



On November 27, 2024, a group of 23 students from the 7th and 8th grades of Şehit Erkan Er Middle School, accompanied by their teachers Ms. Fatma Uçar and Ms. Elif Rüya Yıldırım, visited our institute. A presentation was given to the students about the studies conducted at the institute and renewable energy. They toured the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, and the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room). The students were particularly excited to visit the laboratories. Their questions and enthusiasm greatly pleased us.

VISITS



On December 4, 2024, a group of 16 ninth- and tenth-grade students from BEGOS Technical College, accompanied by their teachers Mr. Ali Yıldırım, Mr. Çağatay Özçınar, and Mr. Mehmet Bülent Ünal, visited our institute. A presentation was given to the students about the studies conducted at the institute and renewable energy. Using the solar electricity modular training kit, PV systems were introduced and their working principles were explained. The students also toured the Material Research Laboratories I and II, the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room), and the ASBERG Laboratory.

VISITS



On September 17, 2024, a delegation visited our institute as part of the “Turkey-Lithuania Cooperation Project as a Learning and Networking Tool in Combating Climate Change,” conducted by Kent-Lab | Urban Strategies and Local Practices Association with financial support from the Embassy of Lithuania.

The delegation, consisting of representatives from the Association of Local Authorities in Lithuania, the Lithuanian Association of Municipal Companies, Vilnius Technical University, Kent-Lab, and İzmir Metropolitan Municipality, was provided with information about the renewable energy studies carried out at our institute, as well as the current situation and potential in İzmir and at the institute level. The delegation toured the Solar-Powered Drying and Process Heat Laboratory, the Material Research Laboratories I and II, the Solar Radiation Photochemistry Laboratory I, the Next-Generation Photovoltaic and Energy Storage Technologies Laboratory (Clean Room), the ASBERG Laboratory, and the Green Process Technologies Application Area.

MEETINGS



As part of the "Development of a Governance Model and Communication Strategy for the EU Climate-Neutral and Smart Cities Mission" project, jointly carried out by Ege University Solar Energy Institute and İzenerji A.Ş., we organized the event titled "Towards a Climate-Neutral City: Actions and Opportunities for İzmir" on March 19, 2024, at the Ege University Faculty of Science Conference Hall.

During the event, experts shared updates on İzmir's current progress within the EU Climate-Neutral and Smart Cities Mission, the opportunities the Mission presents for the city, and best practices for building a democratic, fair, and participatory model. Approximately 200 participants, including 15 students, attended the event, which aimed to discuss how to implement projects planned for a climate-neutral İzmir in collaboration with all city stakeholders and to evaluate the next steps.

We extend our sincere thanks to all participants.



MEETINGS



The project "SolarHub: A Greek-Turkish Solar Energy Excellence Hub to Advance the European Green Deal" aims to develop a roadmap for promoting the use of solar energy in agricultural practices. The SolarHub Project seeks to synergistically strengthen the solar energy innovation ecosystems of Greece and Türkiye to support the Clean Energy Transition and the Green Deal.

Within the scope of the SolarHub Project, an event was organized on December 12, 2024, at the İzmir Atatürk Cultural and Congress Center, hosted by Ege University.

SUMMER SCHOOL



As part of the “TÜBİTAK 2237-A Scientific Education Activities Support” program, we organized the event titled "The Sustainable Future of Renewable Energy" on May 9–10, 2024, at our institute. We would like to express our sincere thanks to our distinguished speakers Prof. Dr. Ceylan ZAFER, Prof. Dr. Hayati OLGUN, Assoc. Prof. Dr. Melih Soner ÇELİKTAŞ, Assoc. Prof. Dr. Tuğba KESKİN GÜNDOĞDU, Assoc. Prof. Dr. Gözde DUMAN TAÇ, Assoc. Prof. Dr. Burak GÜLTEKİN, and Research Assist. Dr. Hüseyin SARIALTIN for their valuable presentations, as well as to Ms. Ayşe Merve TELİS for providing information about TÜBİTAK support programs.

Over the course of two days, we welcomed undergraduate and graduate students and recent graduates from 13 different universities and various disciplines to our institute. Discussions covered topics such as the current status of renewable energy, related policies, future projections, photovoltaic technologies, biomass, life cycle analysis, circular economy, and the United Nations Sustainable Development Goals (SDGs).

To reinforce the broad perspective intended to be developed in the field of renewable energy, participants were asked to analyze a fictional case study. Representing different sectors of society through assigned roles, the participants actively contributed their views, creating a lively and highly enjoyable debate environment.

We are deeply grateful to the participants, who traveled from across Türkiye with their incredible energy and dedication. We also extend our heartfelt thanks to TÜBİTAK for their financial support, to our esteemed speakers for sharing their expertise, and to our academic, administrative staff, and students who worked hard to organize the event.



YENİLENEBİLİR ENERJİNİN SÜRDÜRÜLEBİLİR GELECEĞİ

09.05.2024

09:00 - 09:45 Kritik Mineraller
10:00 - 10:45 Kritik Mineraller
11:00 - 11:45 Yeni Nesil Güneş Hücreleri
12:00 - 12:45 Yeni Nesil Güneş Hücreleri
14:00 - 14:45 Enerji Dönüşüm Sistemleri
15:00 - 15:45 Enerji Dönüşüm Sistemleri
16:00 - 16:45 Nanoteknoloji ve Sürdürülebilirlik
17:00 - 17:45 Yaşam Döngüsü Analizi(YDA)

10.05.2024

09:00 - 09:45 Yenilenebilir Enerji Sistemlerinde Döngüsel Ekonomi Uygulamaları
10:00 - 10:45 Yenilenebilir Enerji Sistemlerinde Döngüsel Ekonomi Uygulamaları
11:00 - 11:45 Sürdürülebilir Kalkınma Hedefleri ve Yenilenebilir Enerji Uygulamalarıyla İlişkisi
12:00 - 12:45 Sürdürülebilir Kalkınma Hedefleri ve Yenilenebilir Enerji Uygulamalarıyla İlişkisi
14:00 - 14:45 Münazara Toplantıları 1
15:00 - 15:45 Münazara Toplantıları 2
16:00 - 16:45 Münazara Sunumları 1
17:00 - 17:45 Münazara Sunumları 2

EGE ÜNİVERSİTESİ
Güneş Enerjisi Enstitüsü

BU ETKİNLİK TÜRKİYE KURUMSAL YATIRIM ETKİNLİKLERİ DESTEĞİ KURUMUNDAN DESTEKLENMEKTEDİR

SEMINARS



Capacitive Characterization of Emerging Photovoltaic Cells

Introduction to Impedance Spectroscopy of Photovoltaic Cells

 Prof. Dr. Şule Erten Ela

 08.02.2024

 11.00

 Güneş Enerjisi Enstitüsü Konferans Salonu



Dr. Osbel ALMORA
FRIEDRICH ALEXANDER UNIVERSITY, ALMANYA
UNIVERSITAT ROVIRA I VIRGILI, İSPANYA

yetenekkapısı



The Emerging-PV Website and Reports Understanding Research Tools

 Prof. Dr. Şule Erten Ela

 08.02.2024

 14.00

 Güneş Enerjisi Enstitüsü Konferans Salonu



Dr. Osbel ALMORA
FRIEDRICH ALEXANDER UNIVERSITY, ALMANYA
UNIVERSITAT ROVIRA I VIRGILI, İSPANYA

yetenekkapısı



Surface versus Bulk space Charge limited in metal halide perovskites

 Prof. Dr. Şule Erten Ela

 12.02.2024

 11.00

 Güneş Enerjisi Enstitüsü Konferans Salonu



Dr. Osbel ALMORA
FRIEDRICH ALEXANDER UNIVERSITY, ALMANYA
UNIVERSITAT ROVIRA I VIRGILI, İSPANYA

yetenekkapısı



Sub-bandgap generation effects in the External Quantum Efficiency of Emerging Photovoltaics



Prof. Dr. Şule Erten Ela



15.02.2024



11.00



Güneş Enerjisi Enstitüsü
Konferans Salonu



Dr. Osbel ALMORA
FRIEDRICH ALEXANDER UNIVERSITY, ALMANYA
UNIVERSITAT ROVIRA I VIRGILI, İSPANYA

yetenekkapısı



E.Ü. GÜNEŞ ENERJİSİ ENSTİTÜSÜ
Kariyer Etkinlikleri

**Yenilenebilir Enerji
Sistemlerinde Döngüsel
Ekonomi Uygulamaları**

 Doç. Dr. M. Soner ÇELİKTAŞ

 10.05.2024

 09:00 – 10:45

 Güneş Enerjisi Enstitüsü
Konferans Salonu



Doç. Dr. Tuğba KESKİN GÜNDOĞDU
İzmir Demokrasi Üniversitesi

yetenekkapısı



E.Ü. GÜNEŞ ENERJİSİ ENSTİTÜSÜ
Kariyer Etkinlikleri

**Sürdürülebilir Kalkınma
Hedefleri ve Yenilenebilir
Enerji Uygulamalarıyla İlişkisi**

 Doç. Dr. M. Soner ÇELİKTAŞ

 10.05.2024

 11:00 – 12:45

 Güneş Enerjisi Enstitüsü
Konferans Salonu



Doç. Dr. Gözde DUMAN TAÇ
Ege Üniversitesi

yetenekkapısı



70. YIL KARIYER SÖYLEŞİLERİ

Yurtdışında Yüksek Lisans Kabul Süreci Yönetme ve Türkiye'de Çalışma Hayatı

 Prof. Dr. Hayati OLGUN

 24.10.2024

 10.30

 Güneş Enerjisi Enstitüsü
Konferans Salonu



Dr. Turgut Oruç YILMAZ
Güres Group Merkez Üretim Tesisleri

yetenekkapısı



70. YIL KARIYER SÖYLEŞİLERİ

Academic Career in France



Prof. Dr. Şule ERTEN ELA



29.11.2024



09.00



Güneş Enerjisi Enstitüsü
Konferans Salonu



Dr. Dmitry ALDAKOV
University of Grenoble, FRANCE

yetenekkapısı



70. YIL KARIYER SÖYLEŞİLERİ

Prospects for the creation of LEDs based on perovskites, problems and solutions

 Prof. Dr. Ceylan ZAFER

 18.12.2024

 11.00

 Güneş Enerjisi Enstitüsü Konferans Salonu



Prof. Dr. Rustam KABULOV
Özbekistan Fizikoteknik Enstitüsü

yetenekkapısı

LECTURE/ SEMINARS:

"Pb and Cd free quantum dots: Synthesis, properties and applications"

Dr. Dmitry ALDAKOV
Molecular Systems and NanoMaterials
for Energy and Health
University of Grenoble, FRANCE



Prof. Dr. Şule ERTEN ELA



28.11.2024



Saat 11.00



Ege Üniversitesi Güneş Enerjisi Enstitüsü Konferans Salonu

PANELS



Panel: Selected Highlights from Education in the Republican Era

Speakers: Ali Türcan and Günuğur İldem



PANEL **"CUMHURİYET DÖNEMİ EĞİTİMDEN** **SEÇKİLER"**

KONUŞMACILAR

- ALİ TÜRÇAN (ÖĞRETMEN-AKPINAR K.E.)
- GÜNUĞUR İLDEM (ÖĞRETMEN-ORTAKLAR Ö.O.)



MODERATÖR

- DR.ÖĞR.ÜYESİ BİRCAN DİNDAR

24 Ekim 2024

Saat 14:00

YER: EGE ÜNİVERSİTESİ GÜNEŞ ENERJİSİ
ENSTİTÜSÜ KONFERANS SALONU - BORNOVA

CONFERENCES



Conference: The Republic's Education Revolution and Village Institutes

Speaker: Prof. Dr. Kemal Kocabaş



KONFERANS

“Cumhuriyet Eğitim Devrimi ve Köy Enstitüleri ”



06 KASIM 2024
SAAT 14:00

KONUŞMACI

PROF.DR . KEMAL KOCABAŞ

YENİ KUŞAK KÖY ENSTİTÜLÜLER
DERNEĞİ KURUCU GENEL BAŞKANI



**Yer: Ege Üniversitesi Güneş
Enerjisi Enstitüsü Konferans Salonu - Bornova**

- Egeli bilim insanı Dr. Öğr. Üyesi Adem Mutlu'nun, 'Yenilikçi ve Çevre Dostu' projesine TÜBİTAK'tan destek

<https://www.euegeajans.com/index.php/2024/08/26/egeli-bilim-insani-dr-ogr-uyesi-adem-mutlunun-yenilikci-ve-cevre-dostu-projesine-tubitaktan-destek/>

- EÜ Güneş Enerjisi Enstitüsünden "Cumhuriyet Dönemi Eğitiminden Seçkiler" Paneli

<https://www.euegeajans.com/index.php/2024/10/31/eu-gunes-enerjisi-enstitusunden-cumhuriyet-donemi-egitiminden-seckiler-paneli/>

- EÜ Güneş Enerjisi Enstitüsünde "Cumhuriyet Eğitim Devrimi ve Köy Enstitüleri" konferansı düzenlendi

<https://www.euegeajans.com/index.php/2024/11/14/eu-gunes-enerjisi-enstitusunde-cumhuriyet-egitim-devrimi-ve-koy-enstituleri-konferansi-duzenlendi/>

- Prof. Dr. Şule Erten Ela'ya, TÜBİTAK-Fransa Dışişleri Bakanlığı Bosphorus Programı kapsamında proje desteği

<https://www.euegeajans.com/index.php/2024/02/15/prof-dr-sule-erten-elaya-tubitak-fransa-disisleri-bakanligi-bosphorus-programi-kapsaminda-proje-destegi/>

SOCIAL MEDIA

FOLLOW US..



At present, number of followers of the social media accounts are Facebook 1568, LinkedIn 587, Instagram 106 and Twitter 51 respectively. The questions from the followers were used as a feedback for the improvement of the Institute.

In 2022, social media accounts (except Youtube) were actively used to make announcements of seminars/webinars, application due dates for different education and training programmes and social life at the institute, organizations related to the Career Planning Center of Ege University, and the general information provided by the university were shared.

In the forthcoming years, it is planned that the institute social accounts will have a broader content such as information about the ongoing projects, announcements of scientific and social events organized by the institute, details about the visits to or collaborations with other institutions in Turkey or abroad. Youtube broadcasting is on agenda, as well. It is aimed to rebuild the connection with alumni and make the institute more visible in the renewable energy world.

SOCIAL MEDIA



MASTER THESIS

Writer: Hasan Alper GÜCİN

Off-grid photovoltaic system design for electrical energy requirement of a biogas reactor

Supervisor: Prof.Dr.Günnur KOÇAR

Writer: Atakan CANATAN

Characterization and optimization of active layer of p-i-n perovskite solar cell based on nickel oxide nanostructured hole transport material

Supervisor: Prof.Dr.Şule ERTEN ELA

Writer: Seda YAHŞİ

Sustainability analysis in production of starch and derivatives from corn raw material

Supervisor: Asist. Prof.Neslihan ÇOLAK GÜNEŞ

Writer: Elif TAVZAR

Comparison of sustainability performance in the textile industry with the multi criteria decision making method

Supervisor: Prof.Dr.Günnur KOÇAR

Writer: Ilyass HLIQUA

A strategic approach for energy efficient renovation of public buildings

Supervisor: Assoc. Prof. Dr.Koray ÜLGEN

Writer: Gamze MERSİN

Solar energy production estimation with the help of artificial intelligence and comparative analysis of realized production values and design program outputs

Supervisor: Prof.Dr.Melih Soner ÇELİKTAŞ

Writer: Onur Özgür ESER

Nearly zero-energy residential building design and life cycle assessment

Supervisor: Prof.Dr.Mustafa GÜNEŞ

Writer: Mert AFACAN

Development of rooftop photovoltaic system solutions integrated with electric vehicles to achieve the net zero city target in İzmir city

Supervisor: Assoc. Prof. Dr. Mete ÇUBUKÇU

Writer: Sadık Can KARAGÖZ

Trials of alternative methods for delamination of photovoltaic panels

Supervisor: Prof.Dr.Melih Soner ÇELİKTAŞ

Writer: Yiğit ERSAN

Techno-economic optimization for off-grid hybrid renewable energy systems

Supervisor: Assoc. Prof.Dr.Koray ÜLGEN

PHD THESIS

Writer: Fikret Müge ALPTEKİN

Production of thermal energy storage and hydrogen-rich gas from biomass

Supervisor: Prof. Dr. Melih Soner ÇELİKTAŞ

Writer: Fırat SALMANOĞLU

Dynamic system design software for photovoltaic power plant investments

Supervisor: Assoc. Prof. Dr. Numan Sabit Çetin

Writer: Merve UYAN

Shape memory polymer composite material production with using biobased materials

Supervisor Prof. Dr.Melih Soner ÇELİKTAŞ

Writer: İbrahim ERDEN

Integration of renewable energy technologies to the energy system and evaluation of related support mechanisms

Supervisor: Assoc. Prof.Dr.Mümin KÜÇÜK

Writer: Anıl BADEM

Evaluation of the performance of an industrial biomass combustion plant in terms of 4E and sustainability

Supervisor: Prof.Dr. Hayati OLGUN

Writer: Burak KAHRAMAN

Utilizing machine learning in production optimization of photovoltaic technologies

Supervisor: Assoc. Prof. Dr. Ahmet YILANCI

Writer: Mücahid CANDAN

Using fractional derivatives for intelligent fault detection in photovoltaic systems

Supervisor: Assoc. Prof..Mete ÇUBUKÇU

2024
THESIS

SEMINARS

2024

MASTER SEMINARS

Speaker: Barış SAYIN

Supervisor: Prof. Dr. Günnur KOÇAR

An Overview of Agrivoltaic Systems in the World and Turkey

Speaker: Çilem CAVILDAK

Supervisor: Assoc. Prof. Dr. Koray Ülgen

Slip Ring Innovation for Wind Turbines

Speaker: Ahmet BALCI

Supervisor: Prof. Dr. Önder ÖZGENER

Permanent Magnet Synchronous Generators and Their Advantages

Speaker: Betül Aksoy

Supervisor: Assoc. Prof. Dr. M.Soner Çeliktaş

Investigation of Cooling Effect in Photovoltaic Systems

Speaker: Helin Su ACAR

Supervisor: Assist. Prof. Halide DİKER

Environmental Impacts and Life Cycle Analysis of Carbon Nano Materials Production Processes

Speaker: Görkem EREK

Supervisor: Prof. Dr. Engin Karatepe

Load Flow Methods in Electric Grids with Photovoltaic Systems

Speaker: Yiğit Mehmet KİLERCİLER

Supervisor: Dr. Öğr. Üyesi Ahmet ERYAŞAR

The Role of Waste Derived Fuels (WDF) in Sustainable Energy Production: Technical Requirements, Legislation and Environmental Impacts

Speaker: Dilay Naz Özkan

Supervisor: Prof. Dr. Engin Karatepe

Small Signal Stability in Electricity Networks and Wind Energy

Speaker: İbrahim Nurettin Erdenk

Supervisor: Prof. Dr. Engin Karatepe

Emissions in Electric Power Systems and Effects of Wind Turbines on Inter-field Emissions

SEMINARS

2024

Speaker: Kemal Onur Özcan

Supervisor: Prof. Dr. Engin Karatepe

Electricity Grid Codes for Wind Power Plants

Speaker: Mustafa Erkan Gönül

Supervisor: Prof. Dr. Engin Karatepe

Effects of Solar Power Plants on Voltage in Electricity
Distribution Networks

Speaker: Engin Deniz

Supervisor: Prof. Dr. Melih Soner Çeliktaş

The Role of Circular Economy and Sustainability in Solar PV
Systems

Speaker: Sertaç Aldı

Supervisor: Prof.Dr. Mustafa Güneş

An Overview of Web-Based Solar Energy Calculators

Speaker: Ezo Ferah Kaplanseren

Supervisor: Prof. Dr. Günnur KOÇAR

Enzymes Involved in Biogas and Bioethanol Production and
Commercial Usage Opportunities

Speaker: Özgür KURT

Supervisor: Öğr. Üyesi Özben KUTLU

Alternative Energy Solutions for Energy Efficiency in Natural
Gas Distribution Lines

Speaker: Derşan NERMİŞ

Supervisor: Numan Sabit ÇETİN

Meeting the Base Load with Multi-Source Renewable Energy
Plants

PHD SEMINARS

Speaker: İbrahim Küçük

Supervisor: Prof. Dr. Engin Karatepe

High Voltage Direct Current Systems and Development in
Grid Integration of Wind Power Plants

Speaker: Celalettin BAKIR

Supervisor: Doç. Dr. Ahmet YILANCI

Photovoltaic assisted mobile cold storage design with phase
change material

Speaker: Rengin SIKI

Supervisor: Dr. Öğr. Üyesi Ahmet ERYAŞAR

Factors Affecting Microbiological Inactivation by Ohmic
Heating Method

SEMINARS

2024

Speaker: Cevat Mutlu Tunç

Supervisor: Doç. Dr. Mete Çubukçu

Effective Climate Parameters in Photovoltaic Panel Performance

Speaker: Timur İsmail Tavman

Supervisor: Prof Dr. Mustafa Güneş

An Overview of Solar Radiation Measurements in Turkey

Speaker: Kadriye AVCÜ

Supervisor: Mete Çubukçu

Digitalisation and Energy Management in Industry: Izmir KOSBİ Case

Speaker: Alper EKİCİ

Supervisor: Prof. Dr. Ceylan ZAFER

Ink Formulation for Large Area Perovskite Photovoltaic Module Produced by All-Printing Methods

Speaker: Ali SARI

Supervisor: Dr. Öğr. Üyesi Bircan DİNDAR

Fabrication and Characterisation of ZnO Based Piezoelectric Sensor

Speaker: Şeyda Tüzüner

Supervisor: Prof. Dr. Şule Erten Ela

Climate Change and the Importance of Domestic Consumption

Speaker: Gökhan DEVEKIRAN

Supervisor: Prof. Dr. Hayati OLGUN

Historical Development of District Heating Systems and Integration with Renewable Energy

Speaker: Othman Haji Mahmood

Supervisor: Prof. Dr. Şule ERTEN ELA

Semiconductor Materials in Photocatalysis

Speaker: Damla ŞAHİN

Supervisor: Doç. Dr. Burak GÜLTEKİN

Utilisation of Cobalt Selenide Embedded Carbon Matrix Electrode for High Performance Asymmetric Supercapacitors

COURSES

Spring Term Master Courses

ENERGY TECHNOLOGIES

- Renewable Energy Fundamentals
 - PV Power System Achievement Review
 - Energy Recovery from Municipal Solid Waste
 - Use of Renewable Energy Sources in Agriculture
 - Biorefinery Applications
 - Smart System Applications in Energy Systems
 - Use of Renewable Energy Resources in Agriculture
 - Microgrids and Active Electricity Distribution systems
 - Exergy Analysis of Renewable Energies II
 - Energy Management in Buildings
 - Technology Foresight
 - Functional Thin Film Technologies
 - Solar Power Plants
-

ENERGY

- Introduction to Energy Conversion Systems
- Solar Fuel and Clean Hydrogen Technologies
- Solar Thermal Applications
- Inorganic Nanoparticles in PV System Applications
- Applications of Solar Irradiance in Photophysics and Photochemistry
- Hydrogen Energy and Technologies
- Life Cycle Analysis of Renewable Energy Systems
- Fullerenes, Carbon Nanotubes and Applications
- Solar Irradiated Chemical Production

ENERGY TECHNOLOGIES

- Data Analysis and Visualization with R for Energy Systems
 - Sustainable Energy and Climate Action Plan Preparation Techniques
 - Energy Economics
 - Geothermal Energy Applications
 - Solar Architecture
 - Subsoil Heat Exchange Applications
 - Next Generation Photovoltaic Technologies
 - Biofuels
 - Organic Optoelectronic Materials II
 - Heat Pumps and Applications
 - Daylight Lighting Systems
 - Bioenergy Production and Applications
 - Process Integration in Renewable Energy Systems
 - Renewable Energy Technologies
 - Physics of Solar Cells 2
 - Biogas Production Technologies II
-

ENERGY

- Photoelectronic Technologies and Organic Materials
- Electrochemistry of Organic Compounds
- Nanotechnology and Sustainability
- Organic Materials in Photoelectronic Technologies
- Liquid Crystal Organic Materials
- Renewable Energy Applications
- Techniques for preparing renewable energy projects
- Graphene and Graphene Oxides: Electronics/Optoelectronics Applications
- Organic Materials in Photoelectronic Technologies

COURSES

Spring Term Phd Courses

COURSES

Fall Term Master Courses

ENERGY TECHNOLOGIES

- Renewable Energy Fundamentals
- Renewable Energy Applications of Geographic Information Systems
- Geothermal Energy Fundamentals
- Biomass Energy
- R&D Based Energy Investments
- Wind Energy Cycle Systems I
- Energy Management in Industry I
- Exergy Analysis of Renewable Energies I
- Electrical Energy Systems Optimization
- The Role of Renewable Energy Resources in Sustainable Development
- Solar Electricity I
- Underground Heat Exchanger DesignUnderground Heat Exchangers Design
- Photovoltaic Systems
- Bioprocess and Renewable Fuel Production Technologies
- Basics of Lighting

ENERGY

- Introduction to Energy Conversion Systems
- Sustainable Production in Industry I
- Laboratory Techniques
- Energy Storage Systems
- Photodegradation Mechanisms of Organic Compounds - I
- Organic Chemistry Basic Terms & Basic Definitions for Organic Electronic Technologies
- Design Principles of Solar Thermal Systems
- Structural Description by Spectroscopic Methods I
- Evaluation of Energy Investment Projects
- Structural Description Application by Spectroscopic Methods I
- Introduction to Inorganic Nanoparticles and Semiconductor Quantum Dots
- Flexible and Lightweight New Generation Polymer Solar Cells

ENERGY TECHNOLOGIES

- Fundamentals of Renewable Energy
 - Energy Policies
 - New Generation Photovoltaic Technologies
 - Energy Efficiency in Buildings
 - Biogas Production Technologies I
 - Energy Conservation in Buildings
 - Semiconductors and Optoelectronic Applications
 - Fundamentals of Thermal Energy Storage
 - Biogas Production Technologies II
 - Wind Energy Cycle Systems II
 - Renewable Energy Technologies
 - Functional Nanomaterials in Next Generation Battery Technologies
-

ENERGY

- Computational Heat Transfer – I
- Conjugated Polymers
- Field Effect Transistors (FETs, MOSFETs, OFETs, photOFETs)
- Chemistry of Semiconductors
- Macromolecules for Nanoscience-Nanotechnology
- Solar Radiation Photochemistry and Technologies
- Renewable Energy Project Preparation Techniques

COURSES

Fall Term Phd Courses

