

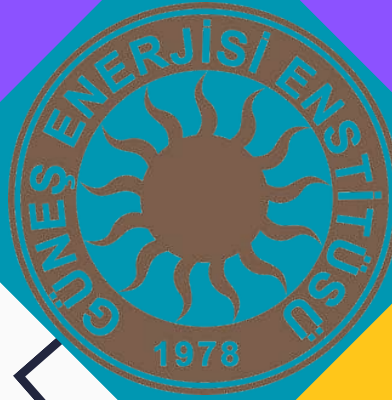
ANNUAL REPORT

2023

**Ege University
Solar Energy Institute**

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

www.eusolar.ege.edu.tr



EGE UNIVERSITY
SOLAR ENERGY INSTITUTE

ANNUAL REPORT

2023

Prepared By:

Fırat Salmanođlu
Alper Ekici
Harun Gümüő

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CHAIR'S MESSAGE

"Welcome to the annual report of the Solar Energy Institute (EGE-SOLAR). Our mission is to enhance lives through forward-thinking education and research. This year, our theme is 'Innovative for a green tomorrow,' emphasizing the critical need for eco-friendly energy solutions in the face of global challenges like climate change and environmental damage.

Despite last year's significant challenges, our leading academics have gathered to envision a brighter, greener future. We believe that through research and innovation, we can positively impact society and the planet, even during times of rapid change and economic uncertainty.

Since its inception, the Solar Energy Institute has been a pioneer in renewable technology education and research. We have partnered with institutions and businesses worldwide to develop practical, cutting-edge solutions to global energy challenges.

At EGE-SOLAR, we cultivate a dynamic environment for interdisciplinary research and teaching. Our experts collaborate to generate new ideas and solutions that benefit the world and improve lives.

In this report, our academics detail how their research and innovations are creating transformative benefits for the planet and its inhabitants. We present our latest discoveries and insights, reinforcing our commitment to a sustainable future through smart and green energy solutions.

The world is facing a climate crisis, and transitioning to sustainable energy is crucial for our planet's future. At the Solar Energy Institute, we understand the urgency of this issue and are dedicated to developing innovative solar power solutions to meet our energy needs. By investing in renewable energy, we can lessen our dependence on fossil fuels, reduce greenhouse gas emissions, and create a more sustainable future for generations to come. We are proud to lead this essential work and look forward to the opportunities that lie ahead in the renewable energy sector."



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 2023, 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 GÜNEŞ



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

Sibel Günal

Personnel Affairs

Gülbahar Yılmaz

Circulating Capital

Erol Suna

Accounting

Ali Adil Arvalı

Electrician

Galip Turan

Electronics Technician

Hüseyin Aykurt

Staff

Serkan Tekin

Staff

Hakan Çetin

Staff

FELLOWS, GRANTS, HONORS

Name	Programme
Dr. Duygu AKIN KARA	TUBITAK BIDEB-2218- National Postdoctoral Research Fellowship Program
Gökhan DEVEKIRAN	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
Dilvin ÇEBİ	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science
Ecem Şen	TUBITAK - 2210-C National MSc/MA Scholarship Program in the Priority Fields in Science and Technology
Hatice Arıcı Kahyaoğlu	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology TUBITAK - 3501 - Career Development Program (CAREER)
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 - 3501 - Career Development Program (CAREER)
Dilek Çırak	Ministry of Development
Sevdiye Başak TURGUT	ARDEB-1003 TUBITAK - 2210-C National - MSc/MA Scholarship Program in the Priority Fields in Science and Technology
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

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

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ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASST. PROF. DR. NESLİHAN ÇOLAK GÜNEŞ
ASST. PROF. DR. HASAN SARPTAŞ

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

QUALITY BOARD

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ASSOC. PROF. DR. M. SONER ÇELİKTAŞ
ASST. PROF. DR. BURAK GÜLTEKİN
RES. ASST. ALPER EKİCİ

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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

Solvent Engineering of Hole-Transport Layer for Improved Efficiency and Stability in Perovskite Solar Cells

Mutlu, Adem; Turgut, Sevdije Başak; Ekici, Alper; Gültekin, Burak; Zafer, Ceylan

Enhanced Hole Mobility of p-Type Materials by Molecular Engineering for Efficient Perovskite Solar Cells

Yeşil, Tamer; Mutlu, Adem; Gültekin, Sirin Siyahjani; Günel, Zeynep Gülay; Zafer, Ceylan

Evaluation of the bio-based materials utilization in shape memory polymer composites production

Uyan, Merve; Celiktaş, Melih Soner

Cleaner and sustainable synthesis of high-quality monoglycerides by use of enzyme technologies: techno-economic and environmental study for monolaurin

Mustafa, Ahmad; Fathy, Sara; Kutlu, Ozben;....;Mohsen, Reham

Smart, sustainable and controllable bio-based shape memory polymer composite fabrication

Uyan, Merve; Celiktaş, Melih Soner

New Approach to Shape Memory Polymer Composite Production Using Alkaline Lignin-Reinforced Epoxy-Based Shape Memory Polymers

Uyan, Merve; Celiktaş, Melih Soner

Thieno[3,2-b]thiophene and triphenylamine-based hole transport materials for perovskite solar cells

Isci, Recep; Unal, Melis; Yesil, Tamer; Ekici, Alper; Sütay, Beray; Zafer, Ceylan; Ozturk Turan

Conformational control of morphology for perylene diimide dimer as electron transporting material at perovskite surface

Ötken, Aysun Albayrak; Saltan, Gözde Murat; Yeşil, Tamer; Zafer, Ceylan; Dinçalp, Haluk

Miscanthus-Derived Energy Storage System Material Production

Alptekin, Fikret Muge; Dunford, Nurhan Turgut; Celiktaş, Melih Soner

2021 Turkey mega forest Fires: Biodiversity measurements of the IUCN Red List wildlife mammals in Sentinel-2 based burned areas

Kandemir, Fulya Aydın; Demir, Nusret

MILESTONES

ENERGY TECHNOLOGY DEPARTMENT

A parametric study on energy, exergy and exergoeconomic analysis of a paint curing oven

Ayvalı, Zeynep Naz; Ozgener, Onder; Ozgener, Leyla

For different industrial applications: Outer rotor and low speed induction machine design

Çalik, Hakan; Çetin, Numan Sabit

New additive as Li⁺ source for charge transfer improvement at triple-cation perovskite/Spiro-OMeTAD interface

Mutlu, Adem; Çırak, Dilek; Yeşil, Tamer; Zafer, Ceylan; Gültekin, Burak

Optimum PV distributed generation based on grid and geographical area: A case study of Aden governorate, Yemen

Bawazir, Raiman O.; Çetin, Numan Sabit; Fadel, Waleed

LIST OF PUBLICATIONS

2023 Publications

ENERGY DEPARTMENT

Investigation of concentrating solar-biomass-fired power technologies based on advanced exergy, exergoeconomic and exergoenvironmental analyses

Biboum, Alain; Yilanci, Ahmet; Thiery, Sosso Mayi Oliver; Yimen, Nasser; Mouangue, Ruben

Developing Biopolymer-Based Electrolytes for Supercapacitor and Dye-Sensitized Solar Cell Applications

Konwar, Subhrajit; Singh, Pramod K.; Dhapola, Pawan; Singh, Abhimanyu; Savilov, Serguei V.; Yahya, Muhd Zu Azhan; Gultekin, Sirin Siyahjani; Gültekin, Burak

Non-metal doped ZnO photocatalyst prepared by sonication-assisted Sol-gel method and use for dye degradation

Gulsah, Yılmaz; Dindar, Bircan

Tuning charge transfer efficiency by functionalizing ligands in FAPbBr₃ nanocrystals and graphene heterostructures

Mukhtar, Maria; Mubeen, Muhammad; Ul-Hamid, Anwar; Ela, Sule Erten; Iqbal, Azar

Electronic and optical aspects of novel quinoxaline derivatives as electron donor materials for bulk heterojunction solar cells

Aboulouard, Abdelkhalk; Demir, Nefise; Can, Mustafa; El idrissi Mohammed

Fabrication of g-C₃N₄-reinforced CdS nanosphere-decorated TiO₂ nanotablet composite material for photocatalytic hydrogen production and dye-sensitized solar cell application

Yavuz, Cagdas; Ela, Sule Erten

Synthesis of novel pyridinium based compounds and their possible application in dye-sensitized solar cells

Matović , Luka; Trišović, Nemanja; Lađarević, Jelena; Vitnik, Vesna; Vitnik, Zeljko; Yavuz, Cagdas; Sen, Burak; Yasir, Albashir; Ela, Sule Erten, Mijin, Dušan

Heterojunction solar cell based on donor-acceptor pi-conjugated naphthalene bisbenzimidazole, perylene bisbenzimidazole, and naphthalene imidazole: A spectroscopic, microscopic and DFT assessment

Unsalan, Ozan; Sert, Yusuf; Altunayar-Unsalan , Cisem; Erten-Ela, Sule

2023 Publications

LIST OF 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)

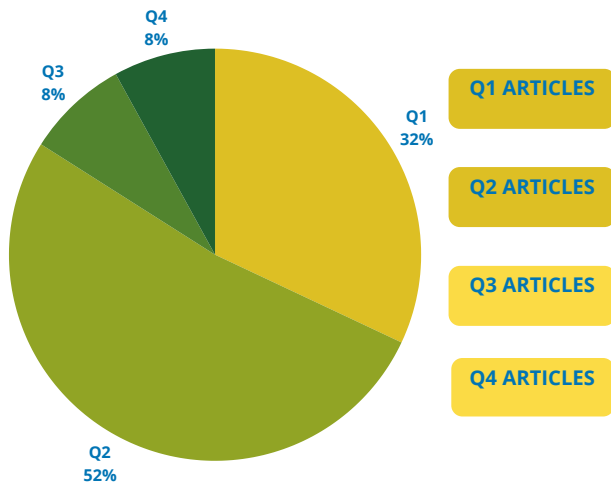
Almora, Osbel; Cabrera, Carlos I.; Erten-Ela, Sule;...Vaillant-Roca, Lídice; Bravec, Christoph J

Fabrication of g-C₃N₄-reinforced CdS nanosphere-decorated TiO₂ nanotablet composite material for photocatalytic hydrogen production and dye-sensitized solar cell application

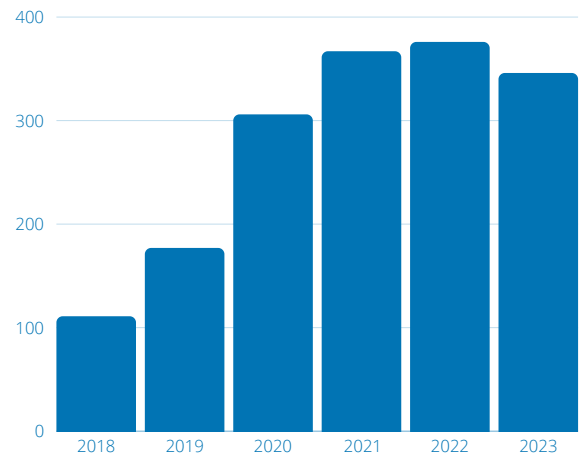
Yavuz, Cagdas; Erten-Ela, Sule

PUBLICATIONS & CITATIONS

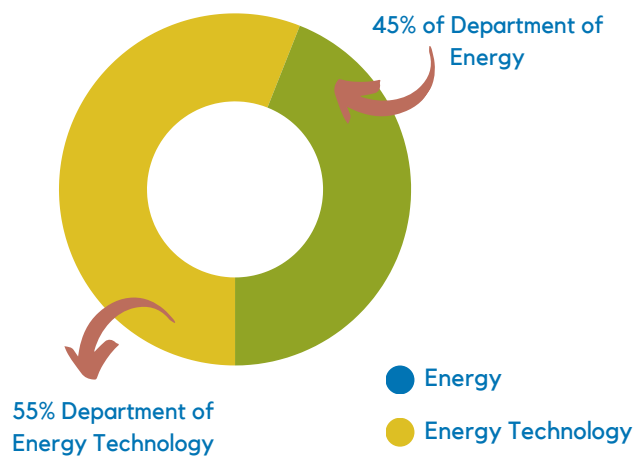
More than the quantity in numbers, quality parameters of research articles are also valuable for us. Our development vision encourages researchers to be involved in high impact factor journals. In the year 2022, 21 of the total 35 articles (approximately %63) were published in Q1 and Q2 Science Citation Index journals.



2023 articles by Q category



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



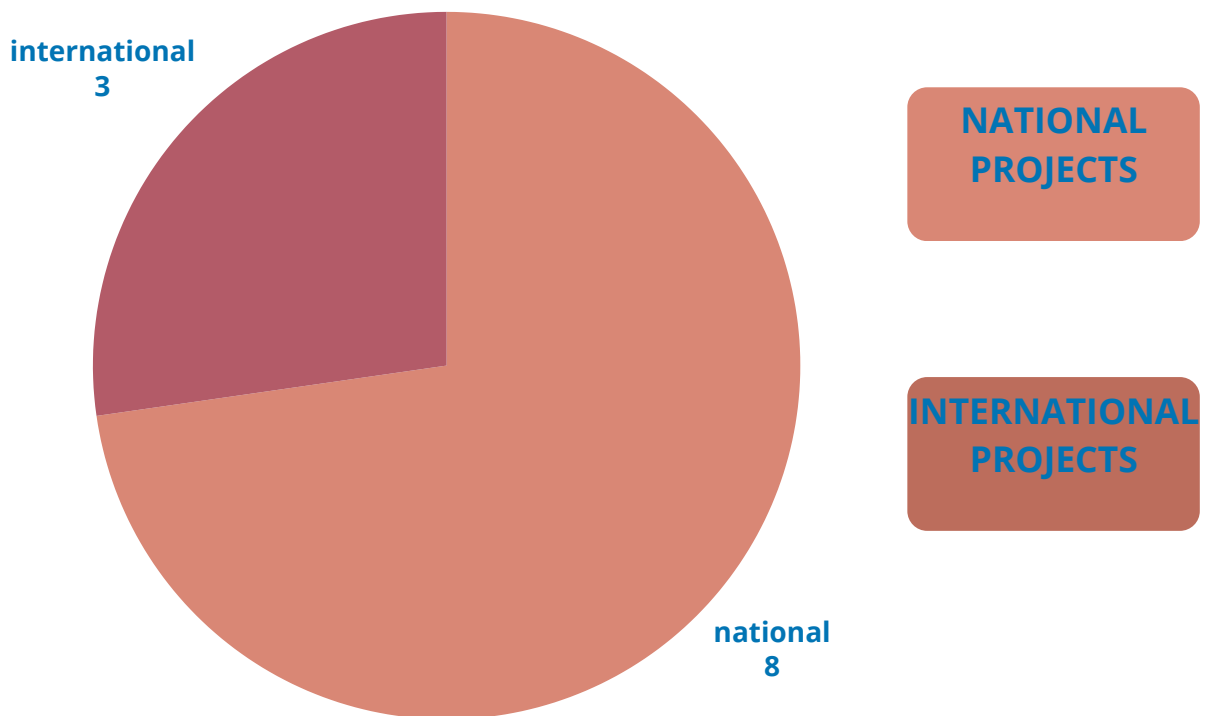
Number of publications in 2023, by departments

MILESTONES

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



2023 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

Resarcher: Prof. Dr. Ceylan Zafer

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

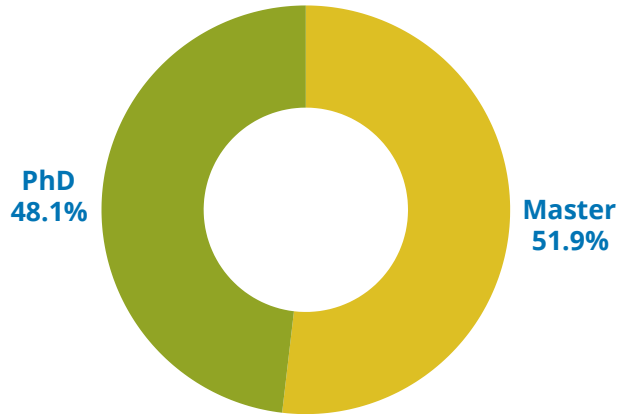
Project Coordinator: Burak Gültekin

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

MILESTONES

Number of Students

Master.....84
PhD.....78



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

78 students and
11 alumnis
in PhD Program
2023

Number of 2023 Alumni

Master.....10
PhD.....11



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



Ege University (EÜ) continues its academic collaboration

Ege University (EÜ) continues its academic collaboration with Tokyo Metropolitan University, involving new researchers from both countries. The collaboration, initiated when EÜ Solar Energy Institute faculty member Prof. Dr. Şule Erten Ela was invited as a speaker at the "International Hydrogen Energy Conference" organized by Tokyo Metropolitan University in 2017, has been ongoing uninterrupted for seven years. This year, Tokyo Metropolitan University sent Airi Suzuki to conduct research and receive training in perovskite and organic solar cells.



Ege University continues to receive acceptance for internationally collaborative projects

Ege University continues to receive acceptance for internationally collaborative projects led by its academics under the auspices of TÜBİTAK. One such project, titled "Electrochemical Green Hydrogen and Oxygen Production," led by Prof. Dr. Şule Erten Ela from the Ege University Solar Energy Institute, has been selected as one of three projects supported under a collaboration framework between TÜBİTAK and the Italian National Research Council (CNR).



Prof. Dr. Nurmammad Mammadov who is a researcher at Azerbaijan University of Architecture and Construction, Baku, Azerbaijan made a presentation. In his presentation, he gave information opportunities to benefit from renewable energy resources in construction sector and energy efficiency in buildings.



The event titled "Can we make Neurons with Halide Perovskites?" took place on May 2nd, 2023. The presentation was delivered by Prof. Dr. Juan Bisquert from the Institute of Advanced Materials at Universitat Jaume I, Castelló, Spain.

Prof. Bisquert shared in-depth insights into the potential of creating neurons with halide perovskites. The presentation explored the role of these advanced materials in next-generation electronic and biological applications, as well as their potential impact in the future. Attendees had the opportunity to learn about the latest developments and innovative approaches in this cutting-edge field.



Student groups from different levels

Student groups from different levels of educational systems such as secondary, high, and vocational school visited our institute. They had the chance to visit the laboratories of the institute. They were informed about the sustainability and the renewable energy technologies. All these visits were in the frame of the activities organized for the disadvantaged groups.

- MEV Koleji Özel Güzelbahçe Fen Lisesi (May 8th, 2023)
- Bornova Mahzar Zorlu Mesleki Ve Teknik Anadolu Lisesi (May 12th, 2023)
- E.Ü. Aliağa Meslek Yüksekokulu Kimya Teknolojisi Programı (May 23rd, 2023)
- E.Ü. Aliağa Meslek Yüksekokulu Elektrik Programı (May 23rd, 2023)
- Bornova Belediyesi Mevlana Toplum ve Bilim Merkezi (September 9th, 2023)
- 29 Mayıs Okulları Bornova Koleji Fen ve Anadolu Lisesi (December 6th, 2023)
- Bornova Şükrü Seher Ergil Çok Programlı Anadolu Lisesi (December 18th, 2023)

E.Ü. GÜNEŞ ENERJİSİ ENSTİTÜSÜ
Kariyer Etkinlikleri

**Erasmus+ ile Gençleri güçlendirmek:
Fırsatlar Dünyası**
Empowering Youth Through Erasmus+: A
World of Opportunities

 Doç. Dr. Melih Soner ÇELİKTAŞ

 19 Ekim 2023

 15.30

 Güneş Enerjisi Enstitüsü
Konferans Salonu




**Proje Koordinatörü/ Doktora Öğr.
Valda TUFAN/ F. Müge ALPTEKİN**

Assoc. Prof. Dr. Bekzod Abobakirovich Abdukarimov is in Turkey due the cooperation protocol signed between TÜBİTAK and the Ministry of Innovative Development of the Republic of Uzbekistan. His doctoral study is on solar air collectors, and he got a patent for his work. He explained the working principles, energy modelling and efficiency of the systems he searched.



Within the framework of the "TÜBİTAK 2237-A Scientific Education Event Support" program, we organized the "Renewable Energy Technologies Summer School" at our institute on September 27-29, 2023. Over the course of three days, we hosted 30 participants at the master's, doctoral, and researcher levels from various institutions and disciplines. During the summer school, fundamental theoretical knowledge in the field of renewable energy was provided, our laboratories were introduced, and a technical tour was organized. In the discussion and evaluation section, the training process was assessed, and feedback from participants was both gratifying and insightful, offering valuable input for future events.

E.Ü. GÜNEŞ ENERJİSİ ENSTİTÜSÜ
Kariyer Etkinlikleri

New Trends on Photovoltaic Applications

Assoc. Prof. Dr. Mete Çubukçu

02.11.2023

14:00-15:40

Güneş Enerjisi Enstitüsü
Konferans Salonu

Dr. Anna Heimsath / Dr. Björn Müller
Özal Emre Özdemir

"New Trends on Photovoltaic Applications," which took place on November 2, 2023. This event featured distinguished speakers from the Fraunhofer Institute, Dr. Anna Heimsath and Dr. Björn Müller, and Özal Emre Özdemir.

The event delved into the latest advancements and innovations in the field of photovoltaic applications. Our visitors shared their insights on cutting-edge technologies, research breakthroughs, and practical applications that are shaping the future of renewable energy.



Ege University Solar Energy Institute continues to maintain its international collaborations across all departments.

In this context, the Ege University Solar Energy Institute, in cooperation with Italy, organized the “International Green Hydrogen Energy Workshop.” The workshop, held at the EÜ Solar Energy Institute, featured notable speakers such as Prof. Dr. Şule Erten Ela from Ege University, Prof. Dr. Alberto Vomiero, and Dr. Paolo Moras from Italy, as well as experts from Scotland, Pakistan, the United Kingdom, Japan, Iraq, and Nigeria.

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: Müge Öztürk

Synthesis and characterization of CsSnxPb1-xBr3 quantum dots as active layer for perovskite solar cells

Supervisor: Prof. Dr. Ceylan Zafer

Writer: Ecem Şen

Investigation and modeling of energy storage using phase change material in photovoltaic panels

Supervisor: Assoc. Prof. Dr. Melih Soner Çeliksaş

Writer: Seçil Uysal

Evaluation of renewable energy use according to future scenarios as an alternative to thermal power plants

Supervisor: Assoc. Prof. Dr. Melih Soner Çeliksaş

Writer: Hande Demiröz

Comparison of the efficiency of dual-axis solar tracking systems

Supervisor: Assoc. Prof. Dr. Koray Ülgen

Writer: Metin Şavural

Technical, economic, and social analysis of green jobs and digitalization requirements

Supervisor: Assoc. Prof. Dr. Mete Çubukçu

Writer: İlker Turp

Performance analysis of powertrain system for all electric vehicle applications

Supervisor: Assoc. Prof. Dr. Mete Çubukçu

Writer: Kerim Aydın

Energy management of a combi boiler production facility within the scope of ISO 50001: A case study

Supervisor: Asist. Prof. Neslihan Çolak Güneş

Writer: Gizem Güler Arslan

Energy analysis of flexible packaging production processes: A case study

Supervisor: Asist. Prof. Neslihan Çolak Güneş

Writer: İrem Cengiz Boz

Assessment of site suitability for wind power plants by GIS and multi-criteria decision analysis approach

Supervisor: Asist. Prof. Hasan Sarptaş

Writer: Ezgi Canbaz

Macro economic and regional approach to biogas systems: Torbalı example

Supervisor: Asist. Prof. Ahmet Eryaşar

PHD THESIS

Writer: Tamer Yeşil

Enhanced Hole Mobility of P-type materials by molecular engineering for efficient perovskite solar cells

Supervisor: Prof. Dr. Ceylan Zafer

Writer: Selen Çekinir

Türkiye's energy vision in the next 50 years

Supervisor: Prof. Dr. Önder Özgener

Writer: Gürhan Tahtalı

Exergy analysis and exergoeconomic performance evaluation of a current tunnel kiln and determination of the methodology for its transformation to a smart tunnel kiln

Supervisor: Prof. Dr. Hayati Olgun

Writer: Aslı Menekşe Odabaş Kırar

Development of a financial incentive model for renewable energy production cooperatives in consideration of a practical case study in Turkey

Supervisor: Assoc. Prof. Dr. Hayati Olgun

Writer: Raimon Ba Wazir

Determination of optimal location and size for photovoltaic power systems by using geographical information systems and metaheuristic algorithm

Supervisor: Assoc. Prof. Dr. Numan Sabit Çetin

Writer: Beril Gündoğan

Investigation of the effect of different pre-treatment techniques on biomethane potential for the co-fermentation of Cynara cardunculus L. and cattle manure

Supervisor: Prof. Dr. Günnur Koçar

Writer: Halil İbrahim Murat Çelik

Renewable energy focused smart specialisation model: Izmir case

Supervisor: Prof. Dr. Günnur Koçar

Writer: Sema Sert

Research of applying carbon derived from various wastes on textiles, their use in energy technologies, and applications requiring electrical conductivity

Supervisor: Prof. Dr. Ayşegül Körlü

2023
THESIS

PHD THESIS

Writer: Pınar Taban

Modelling of biomass gasification system and syngas treatment

Supervisor: Assist. Prof. Ahmet Eryaşar

Writer: Sevim Özgül

Investigation of the usability of different biomass sources in biocomposite material production

Supervisor: Prof. Dr. Günnur Koçar

Writer: Abdulhalik Emre Teksan

Development of a four cylinder biogas engine as cogeneration application for small-scale biogas plants

Supervisor: Prof. Dr. Günnur Koçar

MASTER SEMINARS

Speaker: Onurcan Kılıç

Supervisor: Assoc. Prof. Dr. Numan Sabit Çetin

Investigation of Solar Energy Potential of Wind Power Plant Site

Speaker: Yağmur Olgun

Supervisor: Assist. Prof. Hasan Sarptaş

Use of Biochar as Adsorbent for CO2 Capture

Speaker: Ilyass Hlioua

Supervisor: Assoc. Prof. Dr. Koray Ülgen

Innovative Shading Solutions in Public Buildings

Speaker: Büşra Arslan

Supervisor: Prof. Dr. Ceylan Zafer

Applications of Microalgal Biomass in the Energy Sector

Speaker: Tolga Yüksel

Supervisor: Assoc. Prof. Dr. Ahmet Yılandı

Floating Platform Types for Offshore Wind Turbines

Speaker: Selin Taşyonar

Supervisor: Prof. Dr. Günnur Koçar

Effect of Fermented Manure on Biochemical and Microbiological Properties of Soil

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Speaker: Dilek Çırak

Supervisor: Assoc. Prof. Dr. Burak Gültekin

Passivization of Defects in Perovskite Layer and Perovskite/HTL Interface in Perovskite Solar Cells

Speaker: Faruk Öner

Supervisor: Assist. Prof. Neslihan Çolak Güneş

Investigation of the Performance of Solar Geothermal Hybrid Power Plants

Speaker: Sevdije Başak Turgut

Supervisor: Assoc. Prof. Dr. Burak Gültekin

Effects of Spiro-OMeTAD Doping on Device Performance in Perovskite Solar Cells

Speaker: Zeynep Özkan

Supervisor: Prof. Dr. Günnur Koçar

GES-Agriculture Agrivoltaic Systems

2023
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Supervisor: Prof. Dr. Ceylan Zafer

Self-repairing Encapsulants and Perovskites

Speaker: Safwan Haider

Supervisor: Prof. Dr. Önder Özgener

Utilization of Solar Energy in Food Industry and Agriculture: A Debate on Sustainability and Technological Innovation

Speaker: Ali Sarı

Supervisor: Assist. Prof. Bircan Dindar

Piezoelectric Materials

Speaker: Orhun Üzdiyem

Supervisor: Prof. Dr. Hayati Olgun

Prediction and Optimization Methods with Machine Learning in Pyrolysis Systems

Speaker: Ege Batu Eltez

Supervisor: Assoc. Prof. Dr. Koray Ülgen

Parametric Design Approach in Energy Efficient Building Design

Speaker: Berkan Polat

Supervisor: Assoc. Prof. Dr. Koray Ülgen

Parametric Design Algorithms for Building Energy Simulations

Speaker: Aslı Birtürk

Supervisor: Assoc. Prof. Dr. Melih Soner Çelikaş

Critical minerals in the energy sector

Speaker: Tamer Yeşil

Supervisor: Prof. Dr. Ceylan Zafer

Relationship Between Electrochemical and Photophysical Properties and Molecular Structures of 2,7- and 3,6-Carbazole Bridged Triazatrucoxene Derived Isomers

Speaker: Gülay Zeynep Günel

Supervisor: Prof. Dr. Ceylan Zafer

Fabrication and Characterization of Perovskite-Organic Tandem Solar Cells.

Speaker: Gülşah Yılmaz

Supervisor: Assoc. Prof. Dr. Burak Gültekin

Developments in Multiple Active Layer Structures in Organic Solar Cells.

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COURSES

Spring Term Master Courses

ENERGY TECHNOLOGIES

- Renewable Energy Fundamentals
- Smart System Applications in Energy Systems
- Use of Renewable Energy Resources in Agriculture
- Microgrids and Active Electricity Distribution systems
- Biorefinery Applications
- Functional Thin Film Technologies
- Solar Electricity II
- Wind-Photovoltaic Hybrid Power Systems
- Technology Foresight
- Energy Management in Buildings
- Exergy Analysis of Renewable Energies II

ENERGY

- Introduction to Energy Conversion Systems
- Solar Thermal Applications
- Sustainable Production in Industry II
- Hydrogen Energy and Technologies
- Life Cycle Analysis of Renewable Energy Systems
- Fullerenes, Carbon Nanotubes and Applications
- Structural Description by Spectroscopic Methods II
- Applications of Inorganic Nanoparticles in Photovoltaic Systems
- Introduction to Solar Radiation Photophysics-Photochemistry Practice
- Renewable Energy Applications
- Solar Irradiated Chemical Production

ENERGY TECHNOLOGIES

- Geothermal energy applications
- Energy and environment
- Heat pumps and applications
- Bioenergy generation and applications
- Organic semiconductor based PV systems
- Energy Economics
- Wind Energy Conversion Systems II
- Solar Architecture
- Organic Optoelectronic Materials II
- Underground heat exchangers applications
- Renewable Energy Technologies

ENERGY

- Photodegradation Mechanisms of Organic Compounds - II
- Nanotechnology and Sustainability
- Electrochemistry of Organic Compounds
- 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 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

- Organic Optoelectronic Materials-I
 - 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

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