ANNUAL REPORT

2022

Ege University
Solar Energy Institute

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EGE UNIVERSITY

SOLAR ENERGY INSTITUTE

ANNUAL REPORT

2022

Prepared By:

Fırat Salmanoğlu
Alper Ekici
Harun Gümüş

CHAIR'S MESSAGE

Welcome to the annual assessment of the Solar Energy Institute (EGE-SOLAR), where we aim to improve lives through practical education and research. This year, our showcase theme is 'Be Smart and Go Green' which highlights the importance of prioritizing sustainable energy solutions in the face of global challenges like climate change and environmental degradation.

Despite the unprecedented challenges of the past year, we have brought together our leading academics to envision a better, greener future. We believe that through innovation and research, we can make a positive impact on society and the planet, even in times of rapid change and economic uncertainty.

Since our establishment, the Solar Energy Institute has been at the forefront of higher education and research in the field of renewable technologies. We have partnered with institutions and businesses around the world to develop practical, cutting-edge solutions to global energy challenges.

At EGE-SOLAR, we provide a vibrant and productive environment for research and teaching across disciplines. Our experts collaborate to develop new ideas and solutions that improve the world and the lives of people.

In this report, our academics share how their research and innovation are creating transformative benefits for the planet and its inhabitants. We highlight our most recent discoveries and insights, emphasizing our commitment to a sustainable future through smart and green energy solutions.

As Turkey celebrates its 100th year of the Republic, there is no better time to emphasize the importance of renewable energy sources. The world is facing a climate crisis, and the transition to sustainable energy is critical for our planet's future. At our Solar Energy Institute, we recognize the urgency of this matter and are committed to developing innovative solutions that harness the power of the sun to meet our energy needs. By investing in renewable energy sources, we can reduce our reliance on fossil fuels, cut greenhouse gas emissions, and create a more sustainable future for generations to come. As we celebrate the centennial of the Republic of Turkey, we are proud to be at the forefront of this vital work and are excited about the opportunities that lie ahead in the renewable energy field.

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 2022, 27 academic, 7 administrative personnel, and 13 staff serve in our institute. Currently, there are 89 masters and 84 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.

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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.
ASİYE GÜL BAYRAKCI ÖZDİNGİŞ

OUR TEAM
ENERGY DEPARTMENT

Prof. Dr.
Mustafa GÜNEŞ

Prof. Dr.
Şule ERTAN ELA

Prof. Dr.
Orhan EKREN

Assoc. Prof. Dr.
Ahmet YILANCI

Asist. Prof. Dr.
Bircan DİNDAR

Asist. Prof. Dr.
Neslihan ÇOLAK GÜNEŞ

Vice Chair
Asist. Prof. Dr.
Burak GÜLTEKİN

Res. Asst.
Alper EKİCİ

Res. Asst.
Harun GÜMÜŞ

OUR TEAM
ADMINISTRATIVE AND SUPPORT STAFF

Gültekin Özgür
Institute Secretary

Hülya Bardakçı
Chair Assistant

Melek Ersoy
Student Affairs

Nurcan Arvallı
Student Affairs

Dilek Topaloğlu
Personnel

Sibel Günal
Personnel Affairs

Gülbahar Yılmaz
Circulating Capital

Erol Suna
Accounting

Ali Adil Arvallı
Electrician

Galip Turan
Electronics Techician

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
Fikret Müge ALPTEKİN	Higher Education Council 100/2000 TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology 2214-A - International Research Fellowship Programme for PhD Students
Dilvin ÇEBİ	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology YÖK 100/2000
Gökhan DEVEKIRAN	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Shattar Khalili	Mınıstry of Culture and Toırism
Celal Hakan Canbaz	Higher Education Council 100/2000
Gülay Zeynep GÜNEL	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
Damla Şahin	TUBITAK - 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology
Müge ÖZTÜRK	TUBITAK - 2210-C National - MSc/MA Scholarship Program in the Priority Fields in Science and Technology TUBITAK - 3501 - Career Development Program (CAREER)
Arsen SUCU	Higher Education Council 100/2000
Pınar BÜYÜK TABAN	Higher Education Council 100/2000
Sevdiye Başak TURGUT	ARDEB-1003 TUBITAK - 2210-C National - MSc/MA Scholarship Program in the Priority Fields in Science and Technology
Merve UYAN	TUBITAK - 2214-A International Research Fellowship Programme for PhD Students TUBITAK - 2211-C National PhD 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
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

ORGANIZATIONAL BODIES

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ASSOC. PROF. DR. KORAY ÜLGEN
ASİST. PROF. DR. BURAK GÜLTEKİN
REPORTER: GÜLTEKİN ÖZGÜR

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ASST. PROF. DR. HASAN SARPTAŞ

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

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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)

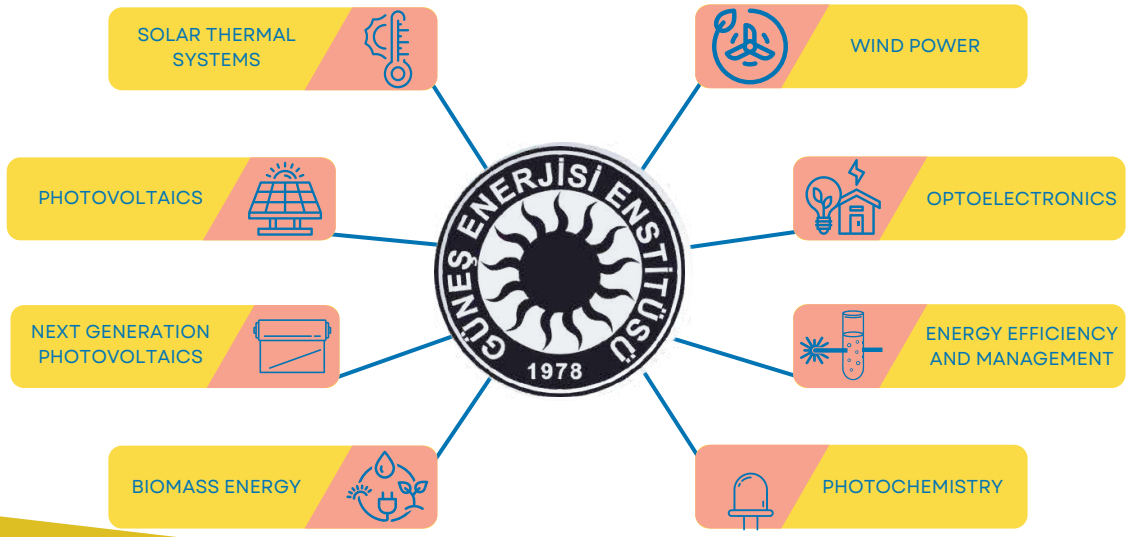
STUDENT REPRESENTATIVE

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

PUBLICATIONS

Upon almost 45 years of development in renewable energy platforms and infrastructure, the Solar Energy Institute is currently the most productive institution in Ege University. Over the 2022 calendar year, we come along with 35 SCI articles that researched by our precious professors, students and guest researchers. Besides, most of these articles have covered modern power generation and smart usage technologies that directly connected to UNDP Sustainable Development Goals. In line with the purpose of producing renewable and sustainable energy technologies, the Solar Energy Institute is excitedly working on further developments while the planet earth is desperately needing them.

Solar Energy Institute has rewarded by the Presidency of Ege University as the BEST RESEARCH INSTITUTE OF THE YEAR 2020, according to results of EGEVIDO performance criterias



LIST OF PUBLICATIONS

2022 Publications

ENERGY TECHNOLOGY DEPARTMENT

Assessment of human-induced effects in the Sultan marshes (Ramsar Protection), Kayseri (Turkey) Aydin-Kandemir, Fulya; Demir, Aynur

Türkiye's energy projection for 2050 Çekinir, Selen; Ozgener, Önder; Ozgener, Leyla

Attribution of changes in the water balance of a basin to land-use changes through combined modelling of basin hydrology and land-use dynamics Gunacti, MC; Kandemir, FA; Najar, M; Kuzucu, A; Uyar, M; Barbaros, F; Boyacioglu, H; Gul, GO; Gul, A

Geographic information systems-based land suitability assessment for switchgrass cultivation in marginal lands: a case study for Izmir-Turkey Aydin-Kandemir, Fulya; Sarptas, Hasan

Evaluation of Climate Change Impacts on the Geographic Distribution of Fritillaria imperialis L. (Liliaceae) (Turkey) Demir, Aynur; Aydin-Kandemir, Fulya

Charge transport kinetics in flower like alpha-MnO2 nano-sheet and alpha-MnO2 nanowire based supercapacitors Kiymaz, Deniz; Kiymaz, Aykut; Tekoglu, Serpil; Mayr, Felix; Dincalp, Haluk; Zafer, Ceylan

Review on Catalytic Biomass Gasification for Hydrogen Production as a Sustainable Energy Form and Social, Technological, Economic, Environmental, and Political Analysis of Catalysts Alptekin, Fikret Muge; Celiktas, Melih Soner

Evaluation of Poultry Manure: Combination of Phosphorus Recovery and Activated Carbon Production
Topcu, Nurdan Sevde; Duman, Gozde; Olgun, Hayati; Yanik, Jale

Simultaneous Optimization of Charge Transport Properties in a Triple-Cation Perovskite Layer and Triple-Cation Perovskite/Spiro-OMeTAD Interface by Dual Passivation Mutlu, Adem; Yesil, Tamer; Kiymaz, Deniz; Zafer, Ceylan

Performance evaluation of novel photovoltaic and Stirling assisted hybrid micro combined heat and power system Incili, Veysel; Dolgun, Gulsah Karaca; Georgiev, Aleksandar; Kecebas, Ali; Cetin, Numan Sabit

LIST OF PUBLICATIONS

2022 Publications

ENERGY TECHNOLOGY DEPARTMENT

Minimization of metallic Bi-0 species to increase the efficiency and stability of Ag3BiI6 solar cells via Cu doping Mutlu, Adem; Zafer, Ceylan

Potential Usability of Cynara cardunculus L. Residues in Biogas Production in Various Regions of Turkey Gundogan, Beril; Kocar, Gunnur

Investigation of lactic acid production by pressurized liquid hot water from cultivated Miscanthus x giganteus Gunes, Kaniye; Sargin, Sait; Celiktas, Melih Soner

Influence of Cation Size and Polarity on Charge Transport in Ionic Liquid Based Electrolytes Aydin, Banu; Oner, Saliha; Zafer, Ceylan; Varlikli, Canan

Single-stage photovoltaic system design based on energy recovery and fuzzy logic control for partial shading condition Kandemir, Ekrem; Cetin, Numan Sabit; Borekci, Selim

Highly conjugated isoindigo and quinoxaline dyes as sunlight photosensitizers for onium salt-photoinitiated cationic polymerization of epoxy resins Ercan, Bahar T.; Gultekin, Sirin S.; Yesil, Tamer; Dincalp, Haluk; Koyuncu, Sermet; Yagci, Yusuf; Zafer, Ceylan

A study on heating and cooling requirements for green buildings and refugee settlements Cekinir, Selen; Ozgener, Onder; Ozgener, Leyla

Stochastic AC Transmission Expansion Planning: A Chance Constrained Distributed Slack Bus Approach With Wind Uncertainty Mir, Gunes Becerik; Karatepe, Engin

Photocatalytic activity of dye-sensitized and non-sensitized GO-TiO2 nanocomposites under simulated and direct sunlight İlhan, Hatice; Belkıs, Gamze; Çaycı, Durmaz; Aksoy, Erkan Diker, Halide; Varlıklı, Canan

LIST OF PUBLICATIONS

2022 Publications

ENERGY DEPARTMENT

Dithizone, carminic acid and pyrocatechol violet dyes sensitized metal (Ho, Ba& Cd) doped TiO2/CdS nanocomposite as a photoanode in hybrid heterojunction solar cell Ullah, Naimat; Erten-Ela, Sule; Shah, Syed Mujtaba; Hussain, Hazrat; Ansir, Rotaba; Qamar, Samina

Selected organic dyes (carminic acid, pyrocatechol violet and dithizone) sensitized metal (silver, neodymium) doped TiO2/ZnO nanostructured materials: A photoanode for hybrid bulk heterojunction solar cells Ullah, Naimat; Erten-Ela, Sule; Shah, Syed Mujtaba; Hussain, Hazrat; Ansir, Rotaba; Qamar, Samina

Photon-Induced Electron Transfer in Ligand-Stabilized Monoclinic CsPbBr3 and Alanine-Functionalized Graphene Heterostructures Mukhtar, Maria; Bibi, Saima; Ela, Sule Erten; Yavuz, Cagdas; Mubeen, Muhammad; Sumreen, Poshmal; Khalid, Muhammad Adnan; Ul-Hamid, Anwar; Iqbal, Azhar

Solar light-responsive a-Fe2O3/CdS/g-C3N4 ternary photocatalyst for photocatalytic hydrogen production and photodegradation of methylene blue Yavuz, Cagdas; Erten-Ela, Sule

Comparative analysis of hybrid renewable energy systems based on concentrating solar and biomass technologies for Faro-Poli, Cameroon Biboum, Alain C.; Yilanci, Ahmet; Mouangue, Ruben

Synthesis and structural, electrical, optical, and gamma-ray attenuation properties of ZnO-multi-walled carbon nanotubes (MWCNT) composite separately incorporated with CdO, TiO2, and Fe2O3 Basgoz, Oykum; Guler, Omer; Evin, Ertan; Yavuz, Cagdas; ALMisned, Ghada; Issa, Shams A. M.; Zakaly, Hesham M. H.; Tekin, H. O.

A facile one-step solution synthesis of Cs2SnI6-xBrx using less-toxic methanol solvent for application in dye-sensitized solar cells Qamar, Samina; Sultan, Muhammad; Akhter, Zareen; Ela, Sule Erten

Rubrene single crystal solar cells and the effect of crystallinity on interfacial recombination Kara, Duygu Akin; Burnett, Edmund K.; Kara, Koray; Usluer, Ozlem; Cherniawski, Benjamin P.; Barron, Edward J.; Gultekin, ; Kus, Mahmut; Briseno, Alejandro L.

Decreased surface defects and non-radiative recombination via the passivation of the halide perovskite film by 2-thiophenecarboxylic acid in triple-cation perovskite solar cells Kara, Duygu Akin; Cirak, Dilek; Gultekin, Burak

LIST OF PUBLICATIONS

2022 Publications

ENERGY DEPARTMENT

Ionic liquid doped Poly (methyl methacrylate) for energy applications Sharma, Tejas; Gultekin, Burak; Dhapola, Pawan Singh; Sahoo, N. G.; Kumar, Sushant; Agarwal, Daksh; Jun, H. K.; Singh, Diksha; Nath, Gaurav; Singh, Pramod K.; Singh, Abhimanyu

Synthesis of 4-((4-(4-nitrophenoxy)phenyl)diazenyl)benzene-1,3-benzoate:Experimental, DFT and, DNA binding investigation through spectral and molecular docking studies Qamar, Samina; Perveen, Fouzia; Akhter, Zareen; Yousuf, Sammer; Sultan, Muhammd; Ela, Sule Erten; Ullah, Naimat; Fatima, Maida; Fatima, Kalsoom; Nazir, Uzma

Improving power conversion efficiency by Light-Assisted annealing of triple cation perovskite layer in solar cell applications Turgut, Sevdiye Basak; Gultekin, Burak

4,4-Nitrophenoxyaniline derived Azo ester: Structural elucidation, DFT simulation, and DNA interactional studies via wet and in silico methods Qamar, Samina; Perveen, Fouzia; Akhter, Zareen; Yousuf, Sammer; Sultan, Muhammd; Ela, Sule Erten; Ullah, Naimat; Fatima, Maida; Fatima, Kalsoom; Kanwal, Sehrish

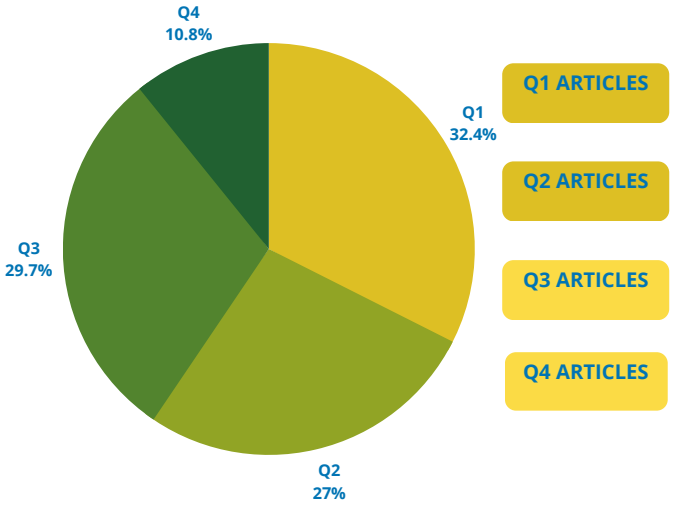
Device Performance of Emerging Photovoltaic Materials (Version 3) Almora, Osbel; Baran, Derya, Guillermo C., Bazan; Cabrera, Carlos I.; Ela, Sule Erten; Froberich, Karen; Guo, Fei; Hauch, Jens; Ho-Baillie, W.Y.; Javobsson, T.Jesper; Janssen, Rene A. J.; Kirchartz, Thomas; Kopikidas, Nikos; Loi, Maria A.; Lunt, Richard R; Mathew, Xavier; McGehee, Micheal D; Min, Jie; Mitzi, David B.; Nazeeruddin, Mohammed K; Nelson, Jenny; Nogueira, Ana F.; Paetzold, Ulrich W.; Rand, Barry P.; Rau, Uwe; Snaith, Henry; Unger, Eva; Vaillant-Roca, Lídice; Yang, Chenchen; Yip, Hin-Lap; Brabec, Christoph. J.

Evaluation of fuel production technologies by using renewable energy for smart cities Canbaz, Celal Hakan; Ekren, Orhan; Ekren, Banu.Y.; Kumar, Vikas.

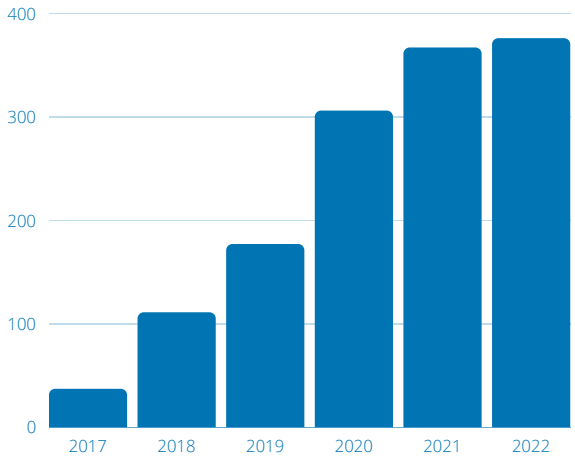
Review of wellbore flow modelling in CO2-bearing geothermal reservoirs Canbaz, Celal Hakan; Ekren, Orhan; Aksoy Niyazi

PUBLICATIONS & CITATIONS

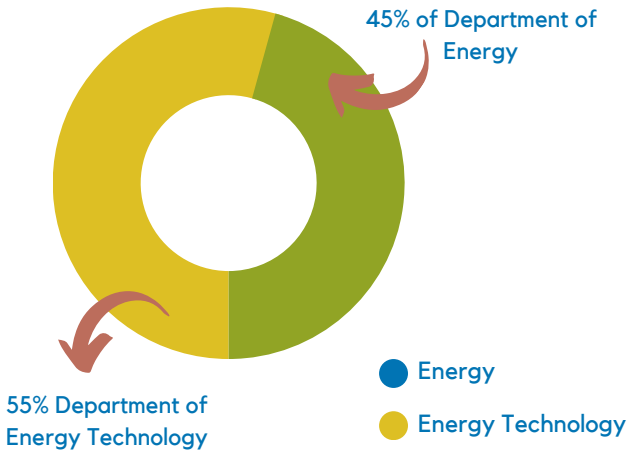
More than the quantity in numbers, quality parameters of research articles are also valuable for us. Our development vision encourages researchers to be involved in high impact factor journals. In the year 2022, 21 of the total 35 articles (approximately %63) were published in Q1 and Q2 Science Citation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



2022 articles by Q category



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

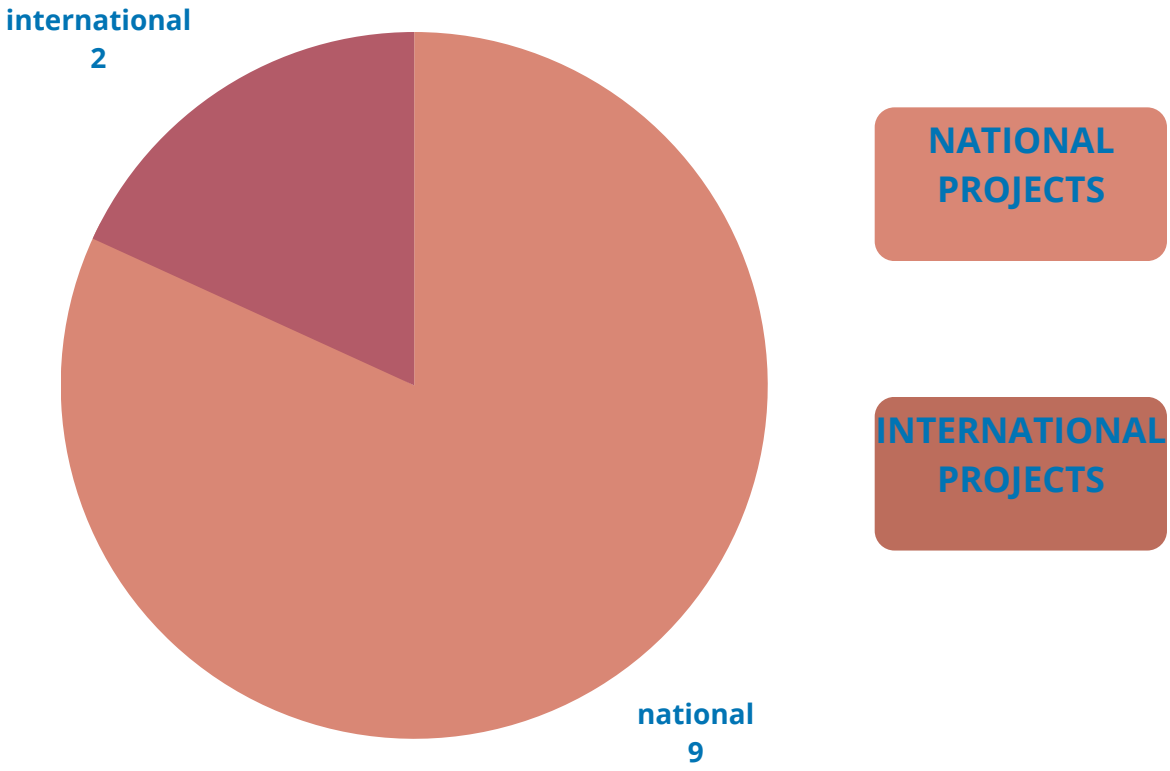


Number of publications in 2022, by departments

PROJECTS

Aiming to be a pioneer in country's sustainable development, Solar Energy Institute has always been pushing graduate students to involved in research projects. In order to maximize the outputs of their effort, facilities and laboratories in our building are readily rearranged with brand new periodic research projects.

Most of these projects are founded by national resources. However, in the near future, potential European Union collaboration projects will likely arise in after-covid era.



2022 ongoing projects of EUSOLAR

MILESTONES

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

Researcher: Ceylan Zafer
Development of New Perylene Diimide Derived Electron Carriers with Different Molecular Conformations for Perovskite Solar Cells- TUBITAK 1001

Researcher: Ceylan Zafer
Polyoxometalate Based Perovskite Solar Cell Production - TUBITAK 1001

Project Coordinator: Hayati Olgun
Heating Induced Air Pollution Regulation Project - T.C. Environment and Urban Ministry

Project Coordinator: Ceylan Zafer
Production and Characterization Infastructure 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

Number of Students

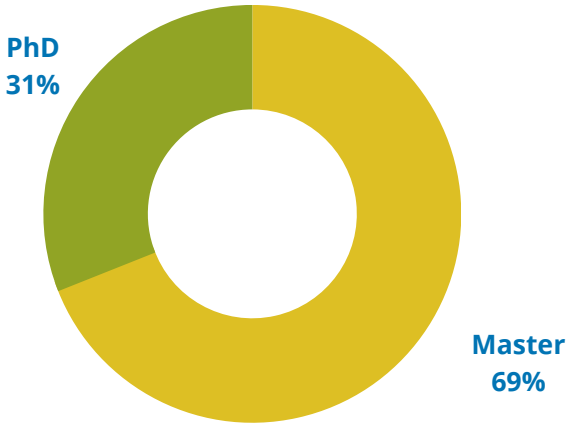
Master.....89
PhD.....84

There were:
89 students and
20 alumnis
in Masters Program,

77 students and
9 alumnis
in PhD Program
2022

Number of 2022 Alumni

Master.....20
PhD.....9



INFRASTRUCTURE

Multiscale Glovebox

Class 1000 Clean Room

Characterization Lab

Concentrated Solar Power System

Geothermal Greenhouse

Experimental Rooftop Photovoltaic System

INFRASTRUCTURE

Chemistry Lab

Advanced Smart Biomaterials Lab

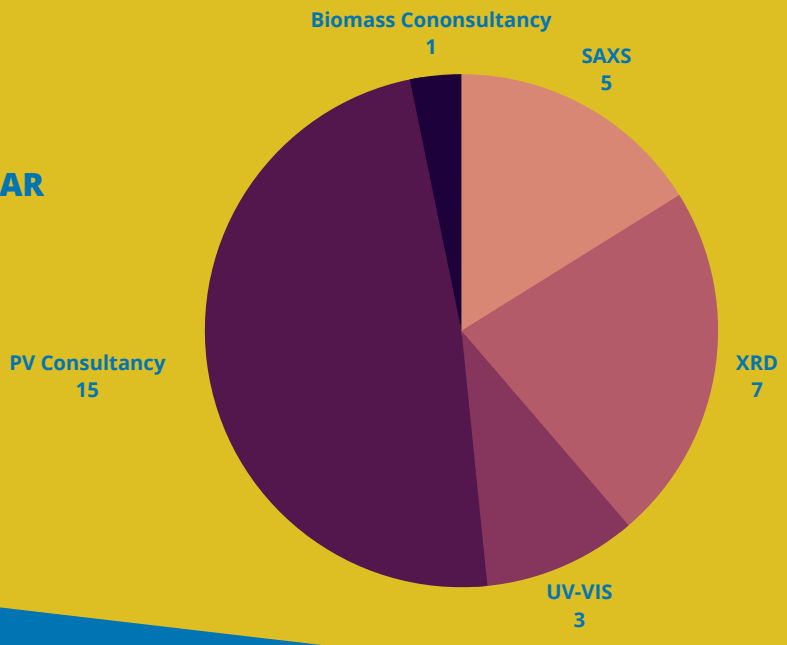
Food Drying Lab

As a graduate research establishment of engineering and science, Solar Energy Institute always looks forward to getting in touch with industrial associations. Academic knowledge and engineering experience of our staff, linked with installed laboratories, have the capability to examine nearby plants and projects. Hence, 18 total analysis and consultancy projects were driven by the Solar Energy Institute in 2022.

ANALYSIS CARRIED OUT BY EUSOLAR IN 2022

5 Small Angle X-Ray Scattering
7 X-Ray Diffractometry
3 Ultraviolet – Visible – Near Infrared Spectroscopy
15 Solar Power Plant Examination & Consultancy
1 Biomass Consultancy

ANALYSIS CARRIED OUT BY EUSOLAR IN 2022



Our students came in first place at the BEST For Solar Ideathon!

We congratulate our students, Aslı Birtürk, Ecem, Sadık Can Karagöz and Betül Aksoy for their outstanding achievement. PVRefaCE Team from the EU Solar Energy Institute was chosen to be the best team at Ideathon Best for Solar. The Ideathon was organized for the "Boosting Effective and Sustainable Transformation for Energy Project" conducted by İzmir Development Agency (İZKA). 15 teams from 11 universities in different cities of Turkey participated in the event. The PVReFace Team won the first prize with their project named "Recycling of Crystal Silicon Photovoltaic Panels".

Prof. Dr. Nurhan Dunford who is a guest researcher at our Institute within the scope of TÜBİTAK 2221 "Guest or Sabbatical Scientist Program" made a presentation. In her presentation, she gave information about Oklahoma State University and her studies. She mentioned the cooperation between the university and the agricultural producers in Oklahoma State. Her studies are on biofuel production by processing oilseeds and biomass wastes with the biorefinery method, and the evaluation of products in sustainable processes.

Assoc. Prof. Dr. Cenk Sevim from AERO Rüzgâr Endüstrisi A.Ş. and Dr. Beyhan Erdoğan from DYO Boya Fabrikaları San. ve Tic. A.Ş. made presentations. Both speakers have academic and private sector experiences which made these presentations even more interesting.

Sun Rising from the West

EU Solar Energy Institute made an organization titled as “Sun Rising from the West” to increase the energy awareness of the young people. The students from Karşıyaka Atakent Anatolian High School were trained about the renewable energies and new generation solar cells.

Prof. Dr. Asghar Asgari from Tabriz University is also a part-time professor at the University of Western Australia. In his presentation, Mr. Asgari gave information about the city of Tabriz, the University of Tabriz and his work on translucent organic solar cells. He explained the effects of differences in the active layer and metal layer thicknesses of the cell to the radiation transmittance, efficiency, and colour in the visible spectrum.

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.

We held our 2022 career planning event.

As a part of career planning activities, on March 10, 2022, at 10.00, for an online seminar led by our institute director, Professor Dr. Ceylan Zafer Hoca, we have hosted Res. Assist. Murat Can Sarıhan who is a PhD student in the Department of Electrical and Computer Engineering at the University of California-Los Angeles (UCLA). In his presentation titled "Fullbrigh Experiences", Mr. Sarıhan shared his Fullbright process and experiences. The presentation, which was open to Ege University employees and students, was watched with interest for more than an hour with the questions of the participants. We would like to thank Mr. Sarıhan for making this beautiful presentation.

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

THESIS

2022

MASTER THESIS

Solar powered RC model plane design and production
Writer: Ahmet Cengiz
Supervisor: Prof. Dr. Şule Erten Ela

A grid-connected renewable energy system design, optimisation, techno-economic and environmental impact analysis
Writer: Mustafa Garip
Supervisor: Assoc. Prof. Dr. Melih Soner Çeliktaş

The examination of the crystal kinetics and photovoltaic performance of light annealed perovskite thin films
Writer: Sevdiye Başak Turgut
Supervisor: Assoc. Prof. Dr. Burak Gültekin

Improving the stability of perovskite precursor solution by using additives
Writer: Dilek Çırak
Supervisor: Assoc. Prof. Dr. Burak Gültekin

Synthesis of perovsike, fabrication and characterization of perovskite and dye sensitized solar cell
Writer: Burak Şen
Supervisor: Prof. Dr. Şule Erten Ela

Electric vehicles wireless charging while running
Writer: Hakan Özen
Supervisor: Prof. Dr. Orhan Ekren

Electrical energy generation from wind energy by vortex-induced vibrations
Writer: Utku Aybey
Supervisor: Assoc. Prof. Dr. Koray Ülgen

Thermodynamics analysis of the cardan shaft production line
Writer: Zeynep Naz Ayvalı
Supervisor: Prof. Dr. Önder Özgener

Synthesis, photophysical and electrochemical characterization of carbozle derivatives acceptor molecules for non-fullerene organic solar cells
Writer: Gülay Zeynep Günel
Supervisor: Prof. Dr. Ceylan Zafer

Wearable solar technologies supported by sensors and software infrastructure
Writer: Ali Çakmak
Supervisor: Prof. Dr. Şule Erten Ela

MASTER THESIS

Parametric design of photovoltaic power system over parking lot
Writer: Ege Batu Eltez
Supervisor: Assoc. Prof. Dr. Koray Ülgen

Writer: Gülşah Yılmaz
Supervisor: Asist. Prof. Bircan Dindar
Photocatalytic performance of doped ZnO and its application in dyesensitized solar cell (DSSC) as photoanode

Writer: Berkan Polat
Supervisor: Assoc. Prof. Dr. Koray Ülgen
Parametric design and energy analysis of buildings

Writer: Kadriye Avcü
Supervisor: Prof. Dr. Ceylan Zafer
Design of carport photovoltaic system in accordance with national regulation: Ege University campus case

Writer: Ömer Faruk Kurt
Supervisor: Prof. Dr. Mustafa Güneş
Energy simulation and assessment of energy performance improvement strategies of an existing library building with energyplus

Writer: Onur Bilgilioğlu
Supervisor: Assist. Prof. Neslihan Çolak Güneş
Performance assessment of a photovoltaic/thermal (PV/T) assisted heat pump system

Writer: Banu Aslan
Supervisor: Assist. Prof. Ahmet Eryaşar
Comparing removal methods of hydrogen sulphur that contents in biogas

PHD THESIS

Writer: Oğuzhan Çimen
Supervisor:Assoc. Prof. Dr. Koray Ülgen
Synthesis and characterization of polyurethane/acrylate encapsulation materials for organic photonic systems

THESIS 2022

THESIS

2022

PHD THESIS

Writer: Bahar Tosun Ercan
Supervisor: Prof. Dr. Ceylan Zafer
Synthesis and application of new photosensitizer as the encapsulation material for epoxy resin to be used encapsulation materials in photovoltaic solar cell

Writer: Kerem Odabaşı
Supervisor: Assoc. Prof. Dr. Mehmet Sarıkanat
Manufacturing composite structure with different fiber reinforced polymers containing photovoltaic cells and application in a transportation vehicle

Writer: Şerife Çamcı
Supervisor: Assoc. Prof. Dr. Koray Ülgen
System design for the usage of supercapacitors in solar powered unmanned aerial vehicles

Writer: Hakan Çelik
Supervisor: Assoc. Prof. Dr. Numat Sabit Çetin
Outer rotor induction generator design for small power wind turbines

Writer: MOHAMMAD SUTAIF
Supervisor: Assist. Prof. Bircan Dindar
Synthesis of metal/nonmetal doped ZnO nanoparticles, their performances in photocatalytic activity and in dye sensitized solar cells

Writer: Çağdaş Yavuz
Supervisor: Prof. Dr. Şule Erten Ela
Utilization of semiconductor nanomaterials in photocatalytic - electrochemical hydrogen production and dye sensitized solar cells

Writer: Ali Reza ZERAATIBONAB
Supervisor: Assoc. Prof. Dr. Numat Sabit Çetin
The analaysis and reduction of flicker effect in grid-connected wind turbines

MASTER SEMINARS

Speaker: Atakan Canatan
Supervisor: Prof. Dr. Şule Erten Ela
Applications of Carbon Nanomaterials in Perovskite Solar Cells

Speaker: Yusuf Karaköse
Supervisor: Assoc. Prof. Dr. Burak Gültekin
A Review on Electrode Materials for Super Capacitors

Speaker: Hataycan Özgür
Supervisor: Assoc. Prof. Dr. Ahmet Yılancı
Investigation of Solar Energy Absorption Cooling Systems

Speaker: Seda Yahşi
Supervisor: Assist. Prof. Neslihan Çolak Güneş
Life Cycle Analysis Studies of Corn-Based Products

Speaker: Zeynep Naz Ayvalı
Supervisor: Prof. Dr. Önder Özgener
Enhanced Geothermal Systems

Speaker: Müge Öztürk
Supervisor: Prof. Dr. Ceylan Zafer
Synthesis and Characterization of CsSnxPb1-xBr3 Quantum Dots as Active Layer for Perovskite Solar Cells

Speaker: Huriye Acar
Supervisor: Prof. Dr. Şule Erten Ela
Recent Developments in Organic Solar Cells

Speaker: Duygu Şahin
Supervisor: Prof. Dr. Hayati Olgun
Moving Grate Types and Usage Areas

Speaker: Göksu Işık
Supervisor: Assist. Prof. Bircan Dindar
Chemical Energy Storage Systems and Evaluation of Their Performance

Speaker: Kerim Aydın
Supervisor: Assist. Prof. Neslihan Çolak Güneş
Energy Management in Combi Boiler Production

SEMINARS 2022

SEMINARS 2022

MASTER SEMINARS

Speaker: Kadir Aktaş
Supervisor: Prof. Dr. Önder Özgener
Lindal Diagram and Application Areas of Geothermal Energy: Aegean Region

Speaker: Metehan Güngörmüş
Supervisor: Prof. Dr. Önder Özgener
Hybrid Vehicle Usage in Turkey

Speaker: Lütfi Aydoğan
Supervisor: Assoc. Prof. Dr. Ahmet Yılancı
Maintenance Processes of Wind Turbines

Speaker: Hasan Alper Gucin
Supervisor: Prof. Dr. Günnur Koçar
Use of Photovoltaic Systems in Agricultural Irrigation

Speaker: Yiğit Ersan
Supervisor: Assoc. Prof. Dr. Koray Ülgen
Techno-Economic Analysis of Hybrid Energy Systems for a Campus

Speaker: Sadık Can Karagöz
Supervisor: Assoc. Prof. Melih Soner Çeliktaş
Enzyme Use in Biofuel Production

PHD SEMINARS

Speaker: Celalettin Bakır
Supervisor: Assoc. Prof. Dr. Ahmet Yılancı
Technical-Economic Analysis of Grid Connected Unlicensed Photovoltaic Power Plants

Speaker: İlknur Perçin
Supervisor: Assist. Prof. Hasan Sarptaş
Energy Efficiency in Wastewater Treatment Plants

Speaker: Şerife Çamcı
Supervisor: Assoc. Prof. Dr. Koray Ülgen
System Design for the Use of Supercapacitors in Solar Powered UAVs

PHD SEMINARS

Speaker: Barış Kıyak
Supervisor: Assist. Prof. Neslihan Çolak Güneş
Life Cycle Assessment of Various Foods Special for İzmir

Speaker: Gülçin Orakcı
Supervisor: Prof. Dr. Mustafa Güneş
Using Building Energy Modeling in Operation Scenario Optimization and Integration into Building Automation System: Concepts, Current Situation, Requirements and Opportunities

Speaker: İsmail Paçacı
Supervisor: Assoc. Prof. Dr. Koray Ülgen
Performance Evaluation of a Nanofluid Additive Solar Collector

Speaker: Şadiye Birce Bakan
Supervisor: Prof. Dr. Mustafa Güneş
An Overview of Software Used for Energy Assessment in Buildings

Speaker: Emrah Güngör
Supervisor: Prof. Dr. Mustafa Güneş
A Study on Micro Solar Power Plants

Speaker: Zeynep Özkan
Supervisor: Prof. Dr. Günnur Koçar
Use of Artificial Neural Networks in Renewable Energy

Speaker: Aziz Kaan Doğru
Supervisor: Prof. Dr. Önder Özgener
Green Factories in Turkey

Speaker: Selen Çekinir
Supervisor: Prof. Dr. Önder Özgener
Work Safety in Wind Farms

Speaker: Anıl Badem
Supervisor: Prof. Dr. Hayati Olgun
Investigation of Drying Effects and Dry Matter Losses in Field Conditions During Seasonal Storage of 5 Different Biomass Raw Materials in an Industrial Combustion Plant

Speaker: Erşan Olcay Işın
Supervisor: Assist. Prof. Hasan Sarptaş
GIS-assisted Planning for Biomass Power Plants

SEMINARS 2022

COURSES

Spring Term Master Courses

ENERGY TECHNOLOGIES

- Renewable Energy Fundamentals
- Smart System Applications in Energy Systems
- Use of Renewable Energy Resources in Agriculture
- Performance Review of Photovoltaic Power Systems
- Biorefinery Applications
- Electrical Machines Used in Wind Energy Cycle Systems II
- Solar Electricity II
- Wind-Photovoltaic Hybrid Power Systems
- Technology Foresight
- Energy Recovery from Urban Solid Waste
- Solar Power Plants
- 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

ENERGY TECHNOLOGIES

- Geothermal energy applications
- Biofuels
- Heat pumps and applications
- Bioenergy generation and applications
- Organic semiconductor based PV systems
- Energy Economics
- Wind Energy Conversion Systems II
- Solar Architecture
- Biogas Production Technologies II
- Sustainable Energy and Climate Action Plan Preparation Techniques
- Underground heat exchangers applications
- Energy Production and Storage Techniques of Electric Vehicles
- 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
- Graphene and Graphene Oxides: Electronics/Optoelectronics Applications

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
- Electrical Machines Used in Wind Energy Cycle Systems I
- Exergy Analysis of Renewable Energies I
- Renewable Energy Applications of Geographic Information Systems
- 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
- Optimization of Electrical Energy Systems
- Basics of lighting

ENERGY

- Introduction to Energy Conversion Systems
- Sustainable Production in Industry I
- Laboratory Techniques
- Energy Storage Systems
- Evaluation of Energy Investment Projects
- 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
- Solar Architecture
- Sustainable Energy and Climate Action Plan Preparation Techniques

ENERGY

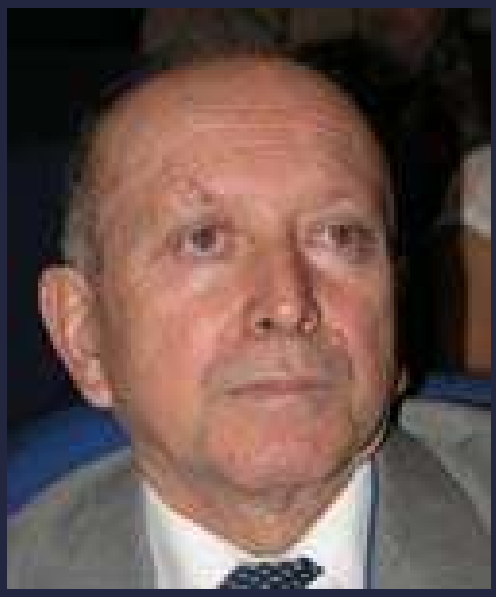
- Computational Heat Transfer – I
- Conjugated Polymers
- Field Effect Transistors (FETs, MOSFETs, OFETs, photOFETs)
- Chemistry of Semiconductors
- Macromolecules for Nanoscience-Nanotechnology
- Solar Radiation Photochemistry and Technologies
- Renewable Energy Project Preparation Techniques

COURSES

Fall Term Phd Courses

IN MEMORY OF...

Prof. Dr. Gürbüz ATAGÜNDÜZ (1936)



Our esteemed professor Gürbüz ATAGÜNDÜZ was born in Nazilli district of Aydın in 1936. He completed his master's degree at Braunschweig University of Technology in Germany in 1961 and his doctoral degree in 1965. He was appointed as a Thermodynamics Instructor at the Middle East Technical University (METU) Engineering Faculty's Chemical Engineering Department in 1966 and promoted to Assistant Professor in 1967. In 1970, he received the title of Associate Professor and transferred to the Chemical Engineering Department of Ege University's Engineering Faculty the same year. Throughout his tenure as Associate Professor, our esteemed professor held many academic and administrative positions and received the title of Professor in 1975.

In 1977, his report on renewable energy sources aimed at finding solutions to the country's energy problems was deemed valuable by the Ege University Senate. As a result, he led the establishment of the Solar Energy Institute to conduct research that would guide the country's energy initiatives. Our esteemed professor served as the founding director of the Solar Energy Institute from 1978 to 1991. He continued his academic career at the Istanbul Technical University (ITU) Engineering Faculty's Mechanical Engineering Department in 1995 and at the Izmir Institute of Technology's (IYTE) Engineering Faculty's Mechanical Engineering Department from 1996 until his retirement in 2003 due to age.

Our esteemed professor, who devoted his life to science and its leadership, emphasized the importance of renewable energy sources for this country by supervising numerous graduate theses and is one of the leading academicians in this field in our country. He also served as the founding president of the Humboldt Fellows Association, the Solar Energy and Environment Association, and the German-Turkish Association. He is married and has three children, and speaks English and German. The most valuable award he received throughout his life, which was full of scholarships and awards, was the German Order of Merit awarded by German President Karl CARSTENS in 1980.