

**Sustainable Water Management
Doctoral Programme (Water4All)**



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Title of the PhD Project	Adaptation of wind farm occupied land for intensive crop farming
Acronym	ENE-2
Research Fields of the Project	The innovative integration of intensive crop farming with wind farm operations
Keywords	Crop farming, wind farm, adaptation, sustainable agricultural practices
Host Institution, Department and Campus Location	Izmir Institute of Technology, Energy Engineering Department, Urla, Izmir
PhD Awarding Institution and Graduate Programme	Izmir Institute of Technology, Graduate School, PhD in Energy Engineering
Name and Affiliation of Main Supervisor	Ferhat BİNGÖL, Associate professor (IZTECH)
Name and Affiliation of Co-Supervisors	Başar Çağlar, Assistant professor (IZTECH)
Research Environment and Infrastructure	<p>The Izmir Institute of Technology (IZTECH) has been distinguished as “one of the Top 5 Research Universities” out of 200+ higher education institutions in Türkiye, ranking first in terms of the number of peer-reviewed articles per faculty member.</p> <p>One of the strategic goals of IZTECH is to advance its position to a leading academic institution in water research in European Research Area. IZTECH Campus is in Urla, Izmir and has an area of 232.30 hectares of land (the third largest campus area in Türkiye).</p>



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	<p>Being an English medium university, IZTECH currently has Engineering, Science, and Architecture faculties with 19 departments (engineering 10, science 5 and architecture 5), with 18 undergraduate, 29 master’s (9 interdisciplinary) and 15 doctorate (4 interdisciplinary) programs in 19 majors. IZTECH has 354 laboratories, 80% of which are for R&D purposes and 20% of which are for educational purposes. All laboratories contain the appropriate technology for education, teaching and research in various fields. Importantly, the Integrated Research Center (IRC) of IZTECH is one of the most-equipped and competent research centers in Türkiye, located on 6,250 m2 area. IRC incorporates eight different Application and Research Centers (ARCs) including Environmental Development ARC, Geothermal Energy ARC, Biotechnology and Bioengineering ARC, National Mass Spectrometry ARC, Wind Energy Meteorology ARC and Continuing Education Center. The equipment and analysis portfolio are accessible through a website that was designed considering online-shopping perspective.</p> <p>Furthermore, the academic supervisor of ENE-2 is the head of Wind Energy Research Center; IZTECH-Wind.</p>
<p>Scientific Context of the Project</p>	<p>The scientific context is the focusing on the innovative integration of intensive crop farming with wind farm operations. This research aims to explore and develop sustainable agricultural practices on land occupied by wind farms, promoting a harmonious coexistence of renewable energy generation and food production.</p>
<p>Brief Workplan</p>	<p>0 – 2 years: PhD candidate will take classes from partner universities</p> <p>Analysis of the state of the art</p> <p>Investigate the potential for intensive crop farming within wind farm sites</p> <p>0.5 – 2.5 years: Develop strategies for optimizing land use while ensuring the efficiency of wind farms</p> <p>1.0 – 3 years: Conduct field experiments and data analysis to assess the impact of wind turbines on crop growth and yield</p> <p>Collaborate with experts in renewable energy, agriculture, and environmental engineering</p>

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	<p>Congress and article publishing.</p> <p>Analyze data to optimize water and energy use and publish research findings in leading journals.</p> <p>Present research outcomes at international conferences and workshops.</p> <p>3 – 4 years: Thesis report, dissemination activities.</p>
Innovative Aspects of the Project	<p>Innovative aspect of the project is design for the integration of the intensive crop farming to wind farm occupied land. The project will help to understand the applicability of farming on the wind farm areas. This research aims to explore and develop sustainable agricultural practices on land occupied by wind farms, promoting a harmonious coexistence of renewable energy generation and food production.</p>
Training Opportunities of the Project	<p>Doctoral schools and courses from the leading academic institutions in Türkiye, namely, Izmir Institute of Technology (IZTECH-beneficiary) in İzmir, İstanbul Technical University (İTÜ) in İstanbul, Gebze Technical University (GTU) in Kocaeli, and Middle East Technical University (METU) in Ankara.</p>
Interdisciplinary Aspects	<p>The main modules of the Water4All project are identified as Environment, Electronics, Planning, Material Science and Energy, and each has different angles of training on research and expected outcomes. In this respect, academic training of PhD student in Water4All is constructed in a modular approach that is interdisciplinary by nature. ENE-1 project will be at the intersection of renewable energy systems and innovative irrigation systems for sustainable environment.</p>
<p>Intersectoral Mobility</p> <p><input checked="" type="checkbox"/> Short Visit</p> <p><input type="checkbox"/> Secondment</p>	<p>TBD</p>

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Intersectoral Mobility <input checked="" type="checkbox"/> Short Visit <input type="checkbox"/> Secondment	TBD
International Academic Secondment	-



Main Supervisor							
Brief CV	<p>Assoc. Prof. Dr. Ferhat BİNGÖL</p> <p>E-mail: ferhatbingol@iyte.edu.tr</p> <p>Academic Degrees</p> <table><tr><td>Ph.D. Wind Energy, Technical University of Denmark, Denmark</td><td>2010</td></tr><tr><td>M.Sc. Wind Energy, Technical University of Denmark, Denmark</td><td>2005</td></tr><tr><td>B.Sc. Aeronautical Engineering , Istanbul Technical University, Türkiye</td><td>1998</td></tr></table> <p>Professional Networks</p> <p>Google Scholar:</p> <p>https://scholar.google.com/citations?user=7O-gHPMAAAAJ&hl=tr&oi=ao</p> <p>ORCID:</p> <p>https://orcid.org/0000-0002-8071-3814</p>	Ph.D. Wind Energy, Technical University of Denmark, Denmark	2010	M.Sc. Wind Energy, Technical University of Denmark, Denmark	2005	B.Sc. Aeronautical Engineering , Istanbul Technical University, Türkiye	1998
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Brief CV	<p>Asst. Prof Dr. Başar ÇAĞLAR</p> <p>E-mail: basarcaglar@iyte.edu.tr</p> <p>Academic Degrees</p> <table><tr><td>Ph.D. Chemistry and Chemical Engineering, Eindhoven University of Technology, The Netherlands</td><td>2014</td></tr><tr><td>M.Sc. Chemical Engineering, Middle East Technical University, Türkiye</td><td>2009</td></tr><tr><td>B.S. Chemical Engineering, Middle East Technical University, Türkiye</td><td>2006</td></tr></table> <p>Professional Networks</p> <p>Google Scholar:</p> <p>https://scholar.google.com.tr/citations?user=aVCnZHwAAAAJ&hl=en</p> <p>ORCID:</p> <p>https://orcid.org/0000-0001-8732-6772</p>	Ph.D. Chemistry and Chemical Engineering, Eindhoven University of Technology, The Netherlands	2014	M.Sc. Chemical Engineering, Middle East Technical University, Türkiye	2009	B.S. Chemical Engineering, Middle East Technical University, Türkiye	2006
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