



# SolarARMS

Autonomous Robotic Mounting  
System for Solar Panel Installation



## ORGANISATION PROFILE

Turkish SME, MND İzolasyon ve Teknoloji A.Ş., or simply **MND**, is based in Manisa, Türkiye. Our company operates in two separate business sectors: the first is industrial **isolation**, and the second is **autonomous robotics**. Since 1999, we have been manufacturing industrial isolation parts for the white goods, air conditioning, heat pumps, automotive, and defense industries. In all, MND employs 246 people, of whom 52% are women and 48% are men.

Our recent focus has been on robotics. In 2017, we acquired an academic spin-off firm called "**Bilims**" that creates cyber-secured real-time embedded systems for **renewable** energy monitoring and forecasting. MND established its own R&D department with the assistance of this acquisition. By 2020, they will be one of the few **R&D centers** in Turkey with a distinct focus from their parent company.

We collaborate with the field of **Mechatronics** Engineering in our R&D center. 22 researchers and technicians from different engineering disciplines make up our team.

We build **cooperative** and autonomous robotic cells that serve as the "matrix" for our isolation manufacturing. We develop autonomous mobile robots with payloads ranging from 1 to 10 tons with skid-steering and omnidirectional drives. Municipal sweepers with articulated drives have been converted into remotely and automatically operated. In 2022, we filed 6 patent applications related to these R&D projects. Our skill set begins with simulation and mechanical design. merging them with the design, construction, and installations of electrical and electronic systems. With a focus on **cyber security**, we develop software stack for **tele-operated**, autonomous, and **swarm** robotics.

## PROPOSAL INTRODUCTION (I)

**Vision:** The primary goal of our research is to design an autonomous robotic mounting system that will change the process of solar panel installation in large-scale energy farms. Our goal is to provide a highly efficient and cost-effective solution that simplifies installation, boosts renewable energy generation, and contributes to a more sustainable future.

**Motivation:** The project is required for a number of reasons. To begin with, there is a growing demand for renewable energy, and solar energy farms play a critical part in supplying this demand. Traditional manual techniques of solar panel installation, on the other hand, are time-consuming, labor-intensive, and costly. We hope to overcome these difficulties by developing autonomous robotic devices that improve the efficiency, cost-effectiveness, and safety of solar panel installations.

**Content:** The project's future developments will take an integrated approach. To begin, we will design and develop an autonomous robotic mounting system that will include advanced sensors, computer vision technologies, and accurate navigation capabilities. Based on parameters such as solar exposure and structural soundness, the system will be able to find suitable spots for installation poles. Furthermore, we will create clever software algorithms for real-time data collection and processing, which will allow the system to make informed judgments and adapt to changing environmental conditions.

## PROPOSAL INTRODUCTION (II)

**Expected outcome:** The project's output will comprise a fully functional autonomous robotic mounting mechanism for solar panel installation. The system is expected to significantly enhance the efficiency and output of solar energy farms. Reduced installation time, lower costs due to reduced manpower requirements, higher precision in pole positioning, and improved overall project deadlines are all projected outcomes. Furthermore, the autonomous system will improve safety by reducing human involvement in potentially hazardous operations.

**Impacts:** According to "EU solar energy strategy" from Bloomberg and McKinsey, the EU region has announced a 750 GWDC target of installed solar-PV capacity by 2030, up from 224 GW of installed capacity in 2022. We hope to revolutionise the solar energy business by making solar panel installation more accessible and efficient by creating an autonomous robotic mounting technology. The idea will pique the interest of energy farm developers and investors looking for cost-effective and long-term solutions. The growing use of renewable energy made possible by our technology will help to reduce carbon emissions and promote environmental sustainability on a global scale.

**Schedule:** The project is projected to be finished in 18 months, taking into account the many stages of development such as system design, engineering, prototyping, testing, and refining. It also provides for any future obstacles or iterations that may be necessary to assure the system's effectiveness and reliability.

## PARTNERS

### Current Consortium:

*Discovering the power of collaboration, we embrace the words of Johann Wolfgang von Goethe: '**In union there is strength.**' Join us on a transformative journey towards a sustainable future in solar energy, where our collective efforts will illuminate the path to success.*

**Partner search:** type of partner searched and countries of origin, *Including but not limited to:*

- Manufacturers of tracked/wheeled farm vehicles or parts
- Companies with solar farm construction experience
- Research institutes, universities in the field of low latency communication, autonomous fleet control
- All partners from eligible are highly welcomed. EU 🤝

## CONTACT INFO

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