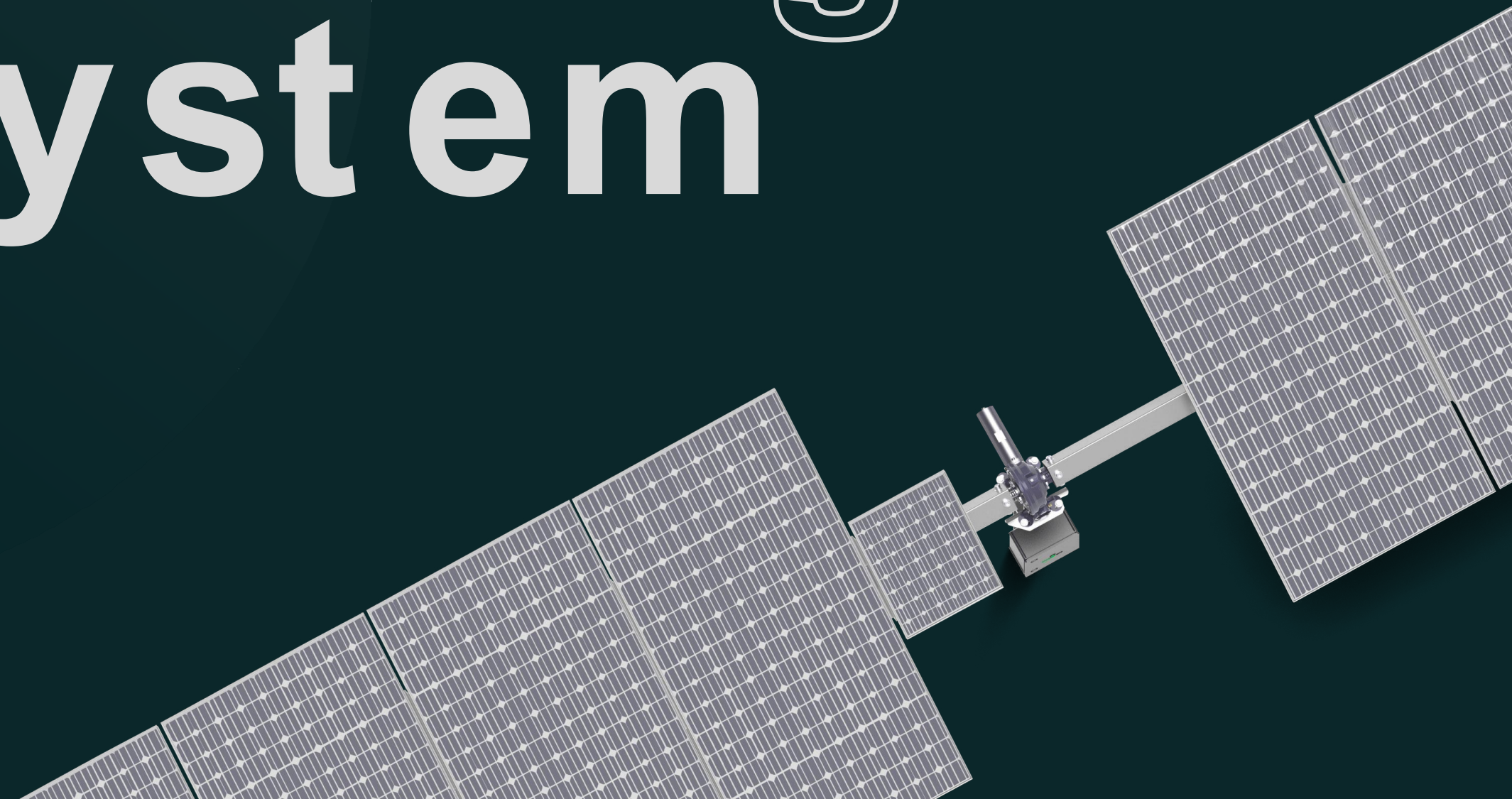


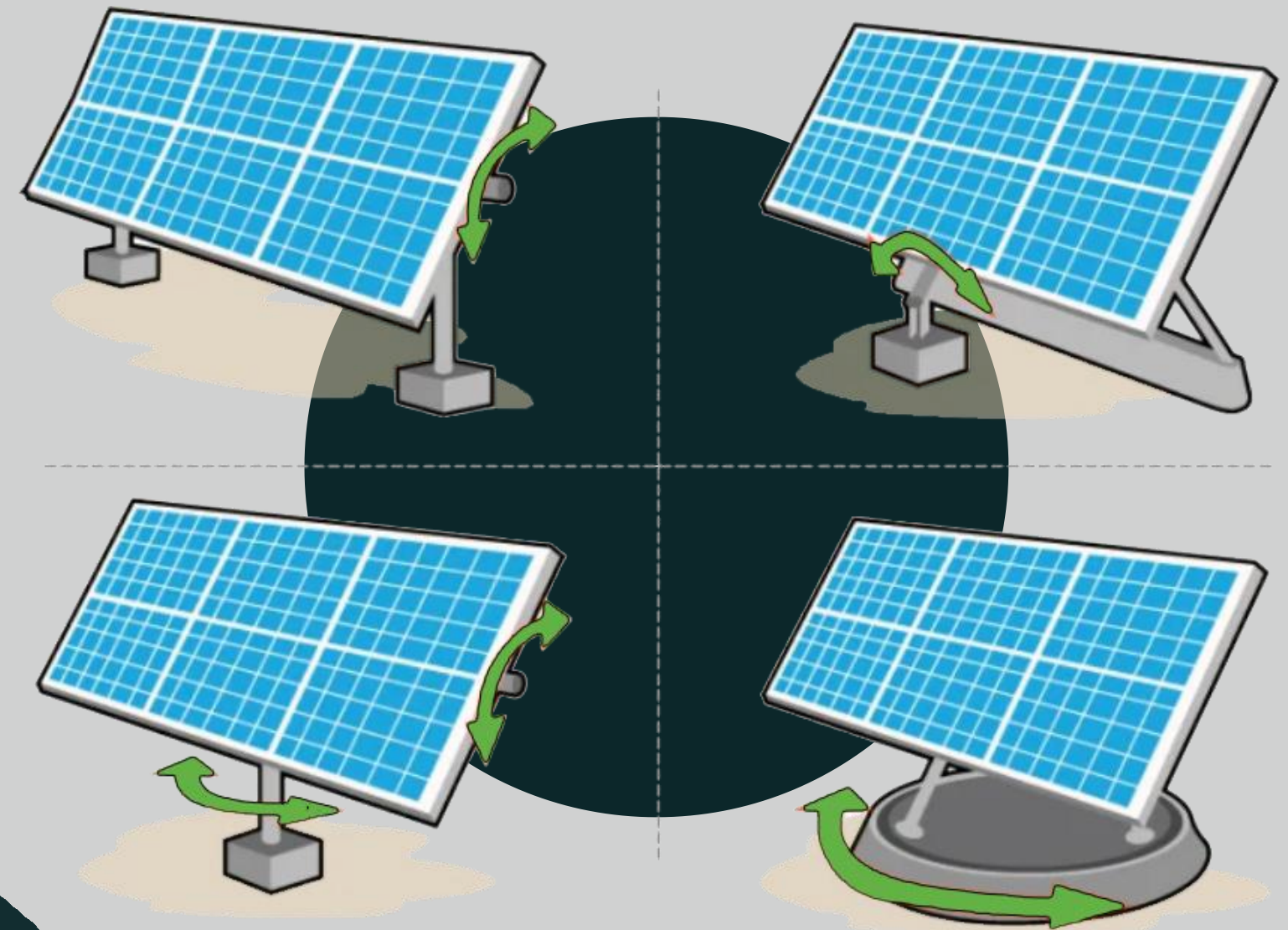
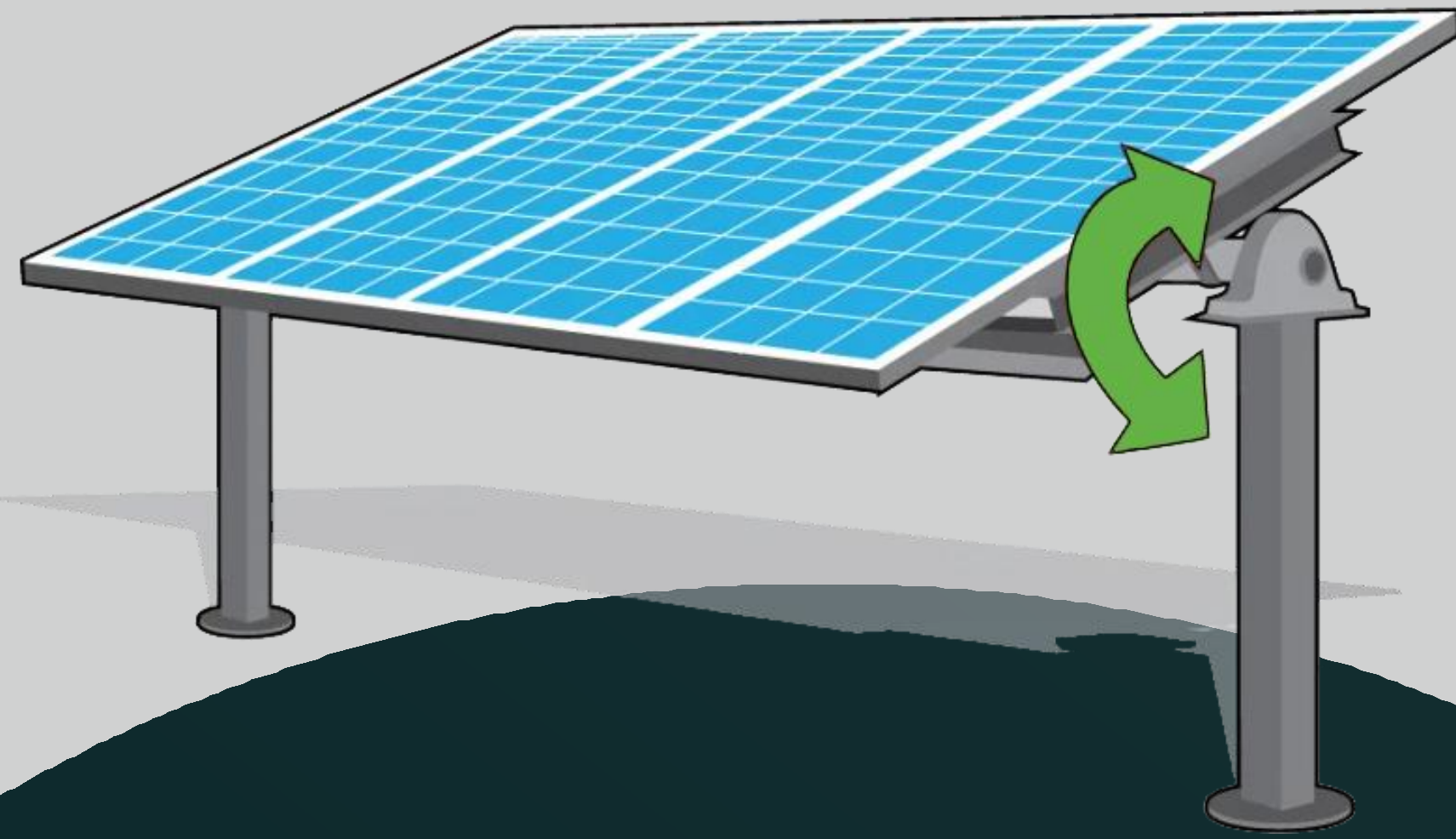


OXOTRACKER

# Solar Tracking System



# What is Solar Tracker?



Single-Axis Solar Tracking System



Dual-Axis Solar Tracking System

# Solar Tracker Market



**\$6.94  
Billion**  
2022

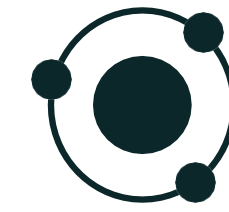
**\$7.88  
Billion**  
2023

**\$19.6  
Billion**  
2030

**CAGR 13.9%**  
2023-2030

2022 Tracker Installations Reached 46 GW  
According to NREL, the Lowest LCOE  
Achieved Through Tracker Investments

# Why Choose Trackers?



**OXOTRACKER**



Higher Energy Production

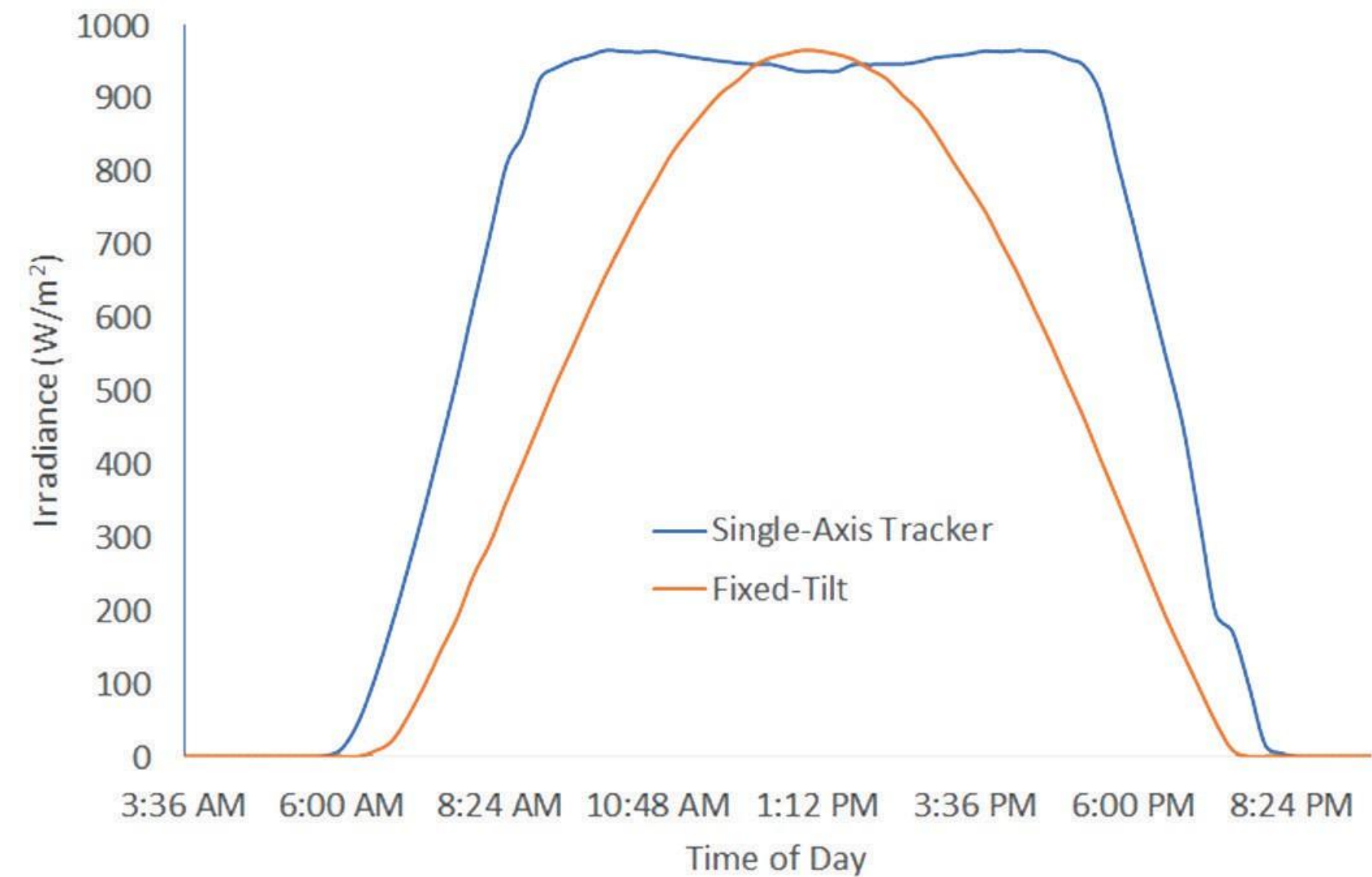


Longer Production Duration



20% Increase In Production

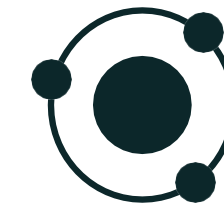
Single-Axis Tracker vs Fixed-Tilt Irradiance



# Why Choose Trackers?

Higher energy production

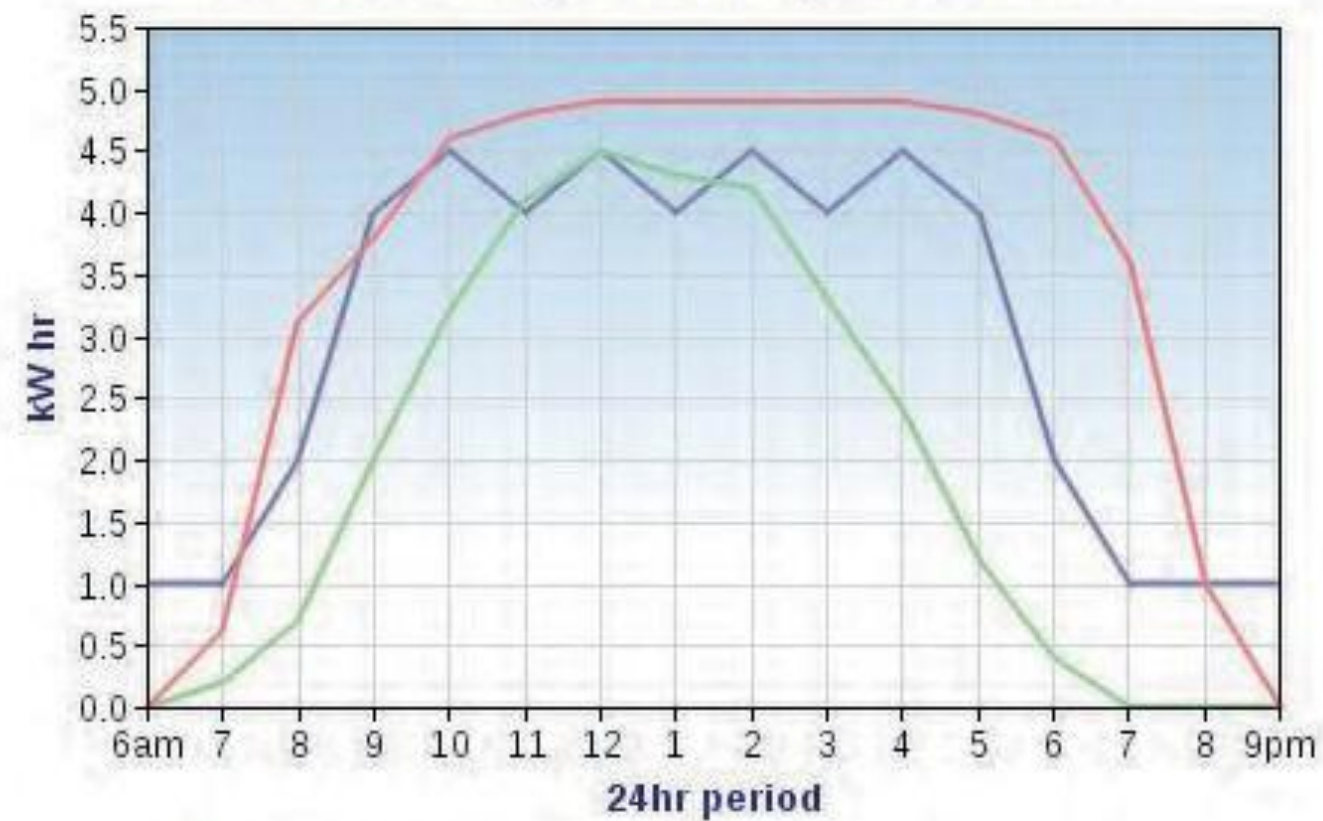
Longer production duration



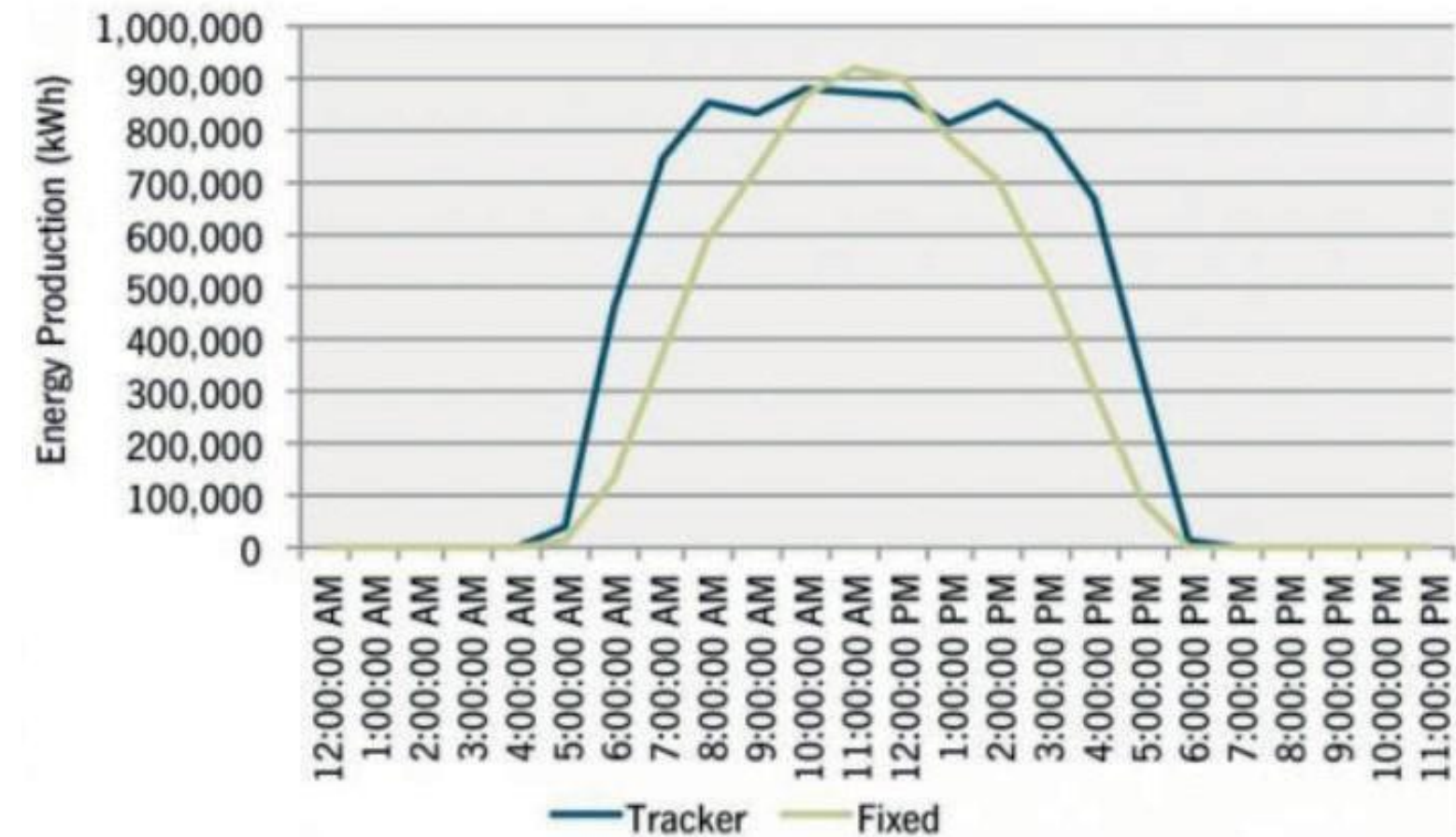
OXOTRACKER

## Solar Tracker vs Fixed Panel comparison

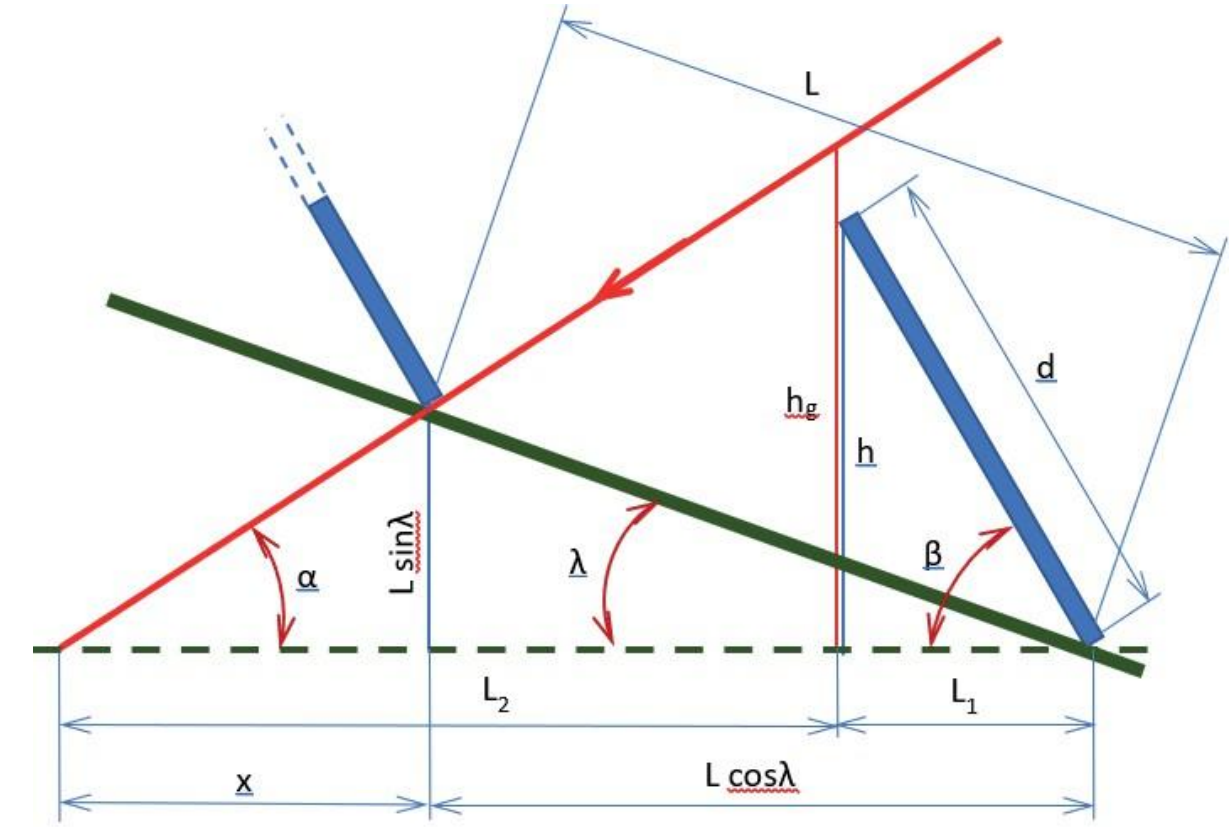
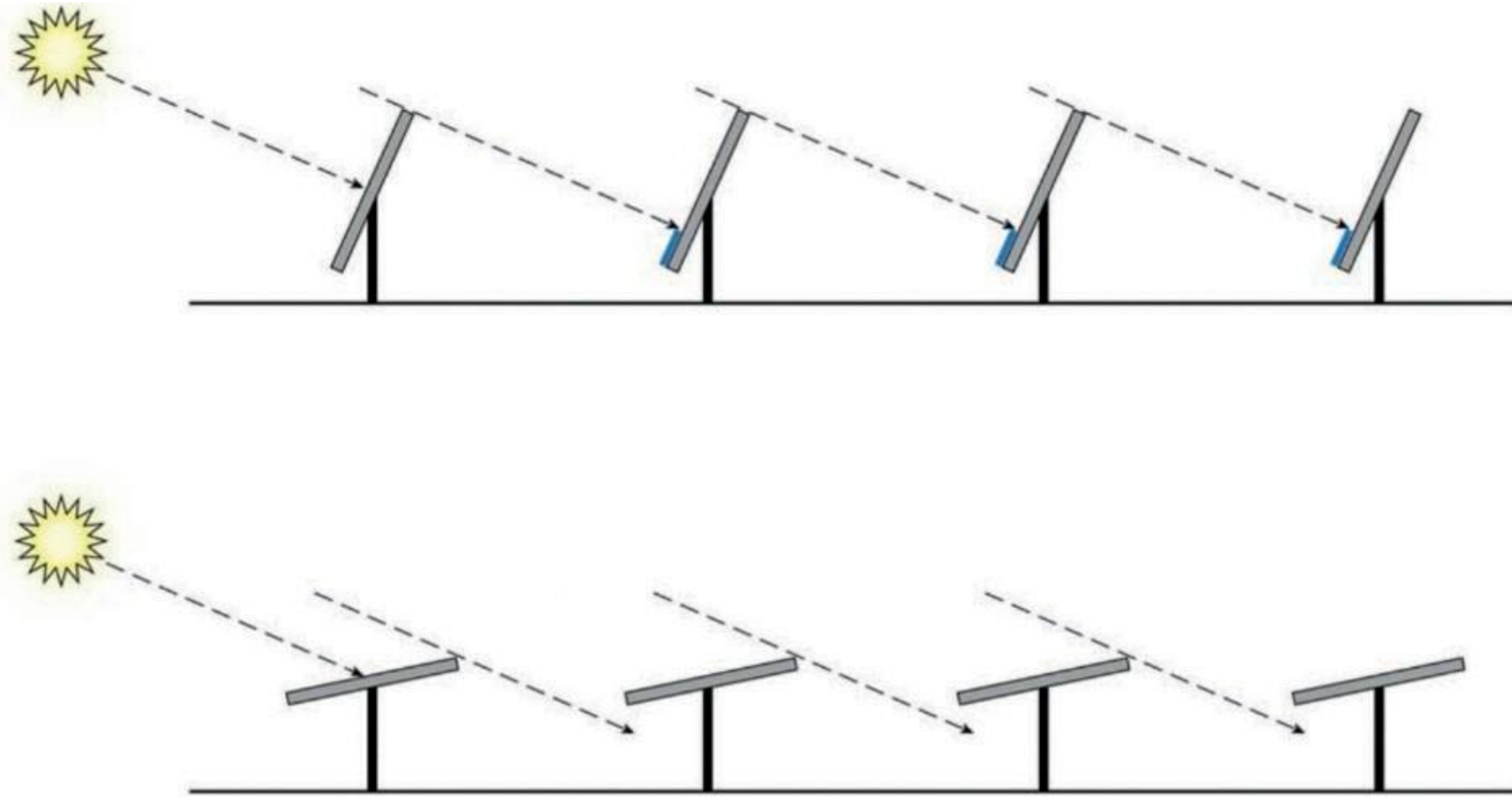
\*true & actual comparison of outputs 12/08/2011



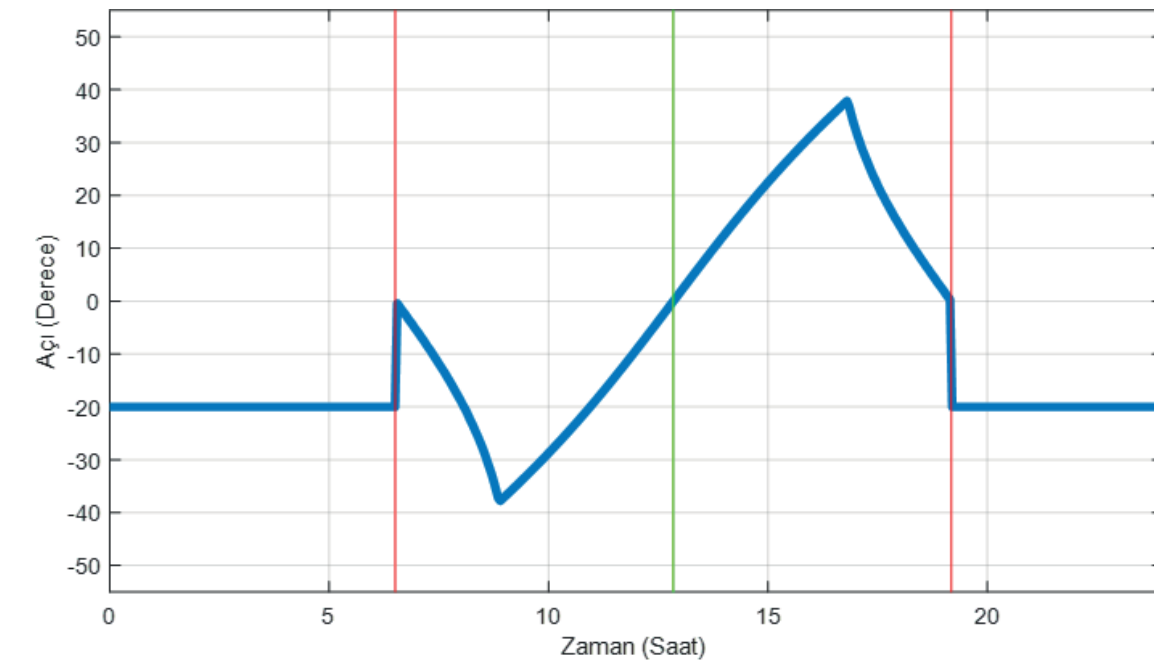
5kW tracker output    5kW fixed solar output  
Typical factory power usage



# Solar Tracking Algorithm (Backtracking)

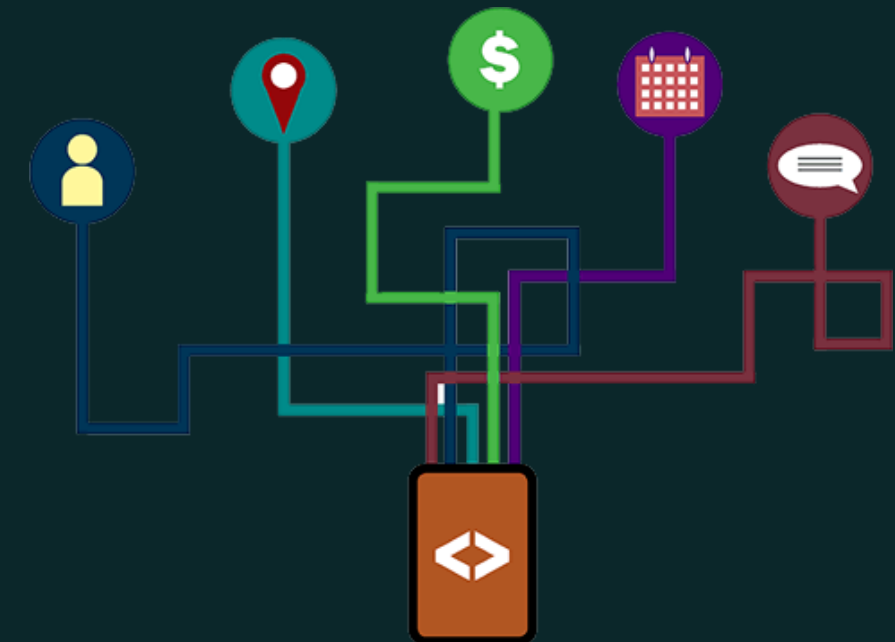
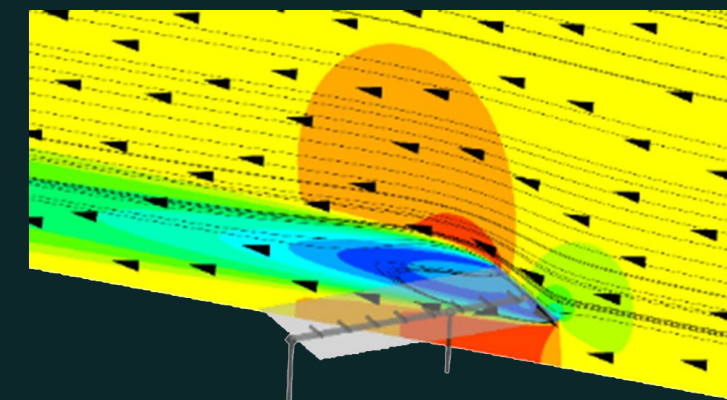
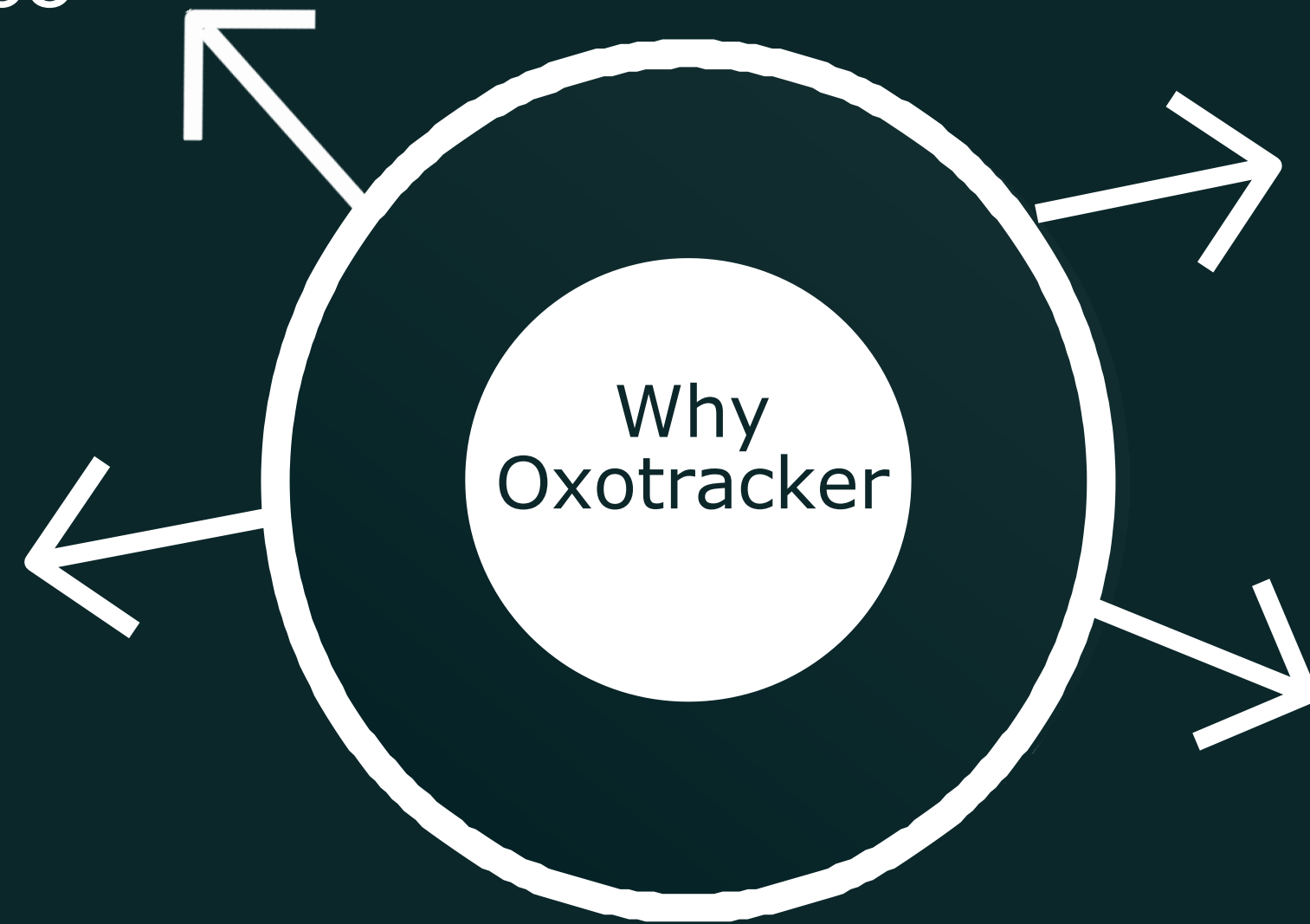


Batıya doğru eğimli zemin üzerine kurulan sistem



Panel dizisi eğim açısının ( $\beta$ ) 24 saat için değişimi (BT=1, 24 Mayıs)

Fast service &  
Easy Maintenance



Why  
Oxotracker



OXOTracker

Certified with IEC 62817

**cere** by US Solutions

GPa\_PGU\_CM\_rev.7

Product Certificate Number	70022-CER
Applicant	Gumbel Group Ümit Mah. 2532. Cad. No: 6 06810, Çankaya, Ankara, T.C.
Models	OXOV1.1
Type of generating unit	Tracker control unit
Technical Data	See page 2
Software version	Oxotracker V1.2.1
Hardware version	Oxotracker CU V2.1
Standard	IEC 62817:2014 + A1:2017 trackers. Chapter 9

Having assessed the report number: 70022-TR performed by DEKRA based on the requirements of IEC 62817:2014 + A1:2017 Photovoltaic systems – Design qualification.

The above-mentioned generating unit complies with the requirements of IEC 62817:2014 + A1:2017 Photovoltaic systems – Design qualification.

This certification is according to the CERE internal process for product certification, based on the requirements of the EN ISO/IEC 17065 assessment activities were based on:

- Audit of quality system according to ISO 9001 with the body accredited according to EN ISO/IEC 17021.

Madrid, February 21, 2024. This certificate is valid until February 21, 2025.

Certification Entity for Renewable Energies, S.L. c/ Monturiol 15, 28901 Madrid, Spain. This document cannot be reproduced partially. [www.cerecert.com](http://www.cerecert.com)

**CERTIFICATE**

**belcert** Uluslararası Belgelendirme

**GUMBEL ENERJİ ANONİM ŞİRKETİ**  
ÜMIT MAH. 2532 CAD. NO: 6 İÇ KAPI NO: 1  
ÇANKAYA/ ANKARA/TÜRKİYE

**Kuruluşunun "ELEKTRİK ENERJİ ÜRETİMİ VE GÜNEŞ TAKIP SİSTEMİ ÜRETİMİ" Kapsamı için**

**For scope "ELECTRIC ENERGY GENERATION AND SOLAR TRACKER SYSTEM MANUFACTURING"**

**KALİTE YÖNETİM SİSTEMİ**  
**QUALITY MANAGEMENT SYSTEM**

Kuruluşunu ve uyguladığı belgeleme ve BEL tarafından gerçekleştirilen denetim bu yönetimin aşağıdaki standartların şartlarını karşıladığını doğrulamaktadır.

It certifies that it is established and implemented, and the audit performed by BEL confirms that this management system meets the requirements of the following standard:

**ISO 9001:2015**

Sertifika Numarası / Certificate Number : A1548406  
Sertifika Kodu / Certificate Code : GUMBEL ENERJİ  
Sertifika Yayın Tarihi / Certificate Issue Date : 12.02.2024  
Sertifika Geçerlilik Tarihi / Certificate Validity Date : 12.02.2025  
Sertifika Periyodu / Certificate Period : 1 Yıl / 1 Year

Sistem için bir periyot kontrol ziyareti ve güncellenen belgelerin zamanında yenileri ile değiştirilmesini sağlamak üzere 1 yıl geçerlidir. BEL, denetim yükümlülüklerini genel firma ve yerel risk değerlendirme raporu büyük ölçekli denetimlerde dahil sunumları kabul etmektedir. Bu belgeyi inceleme tarihi BEL sitesinde yayınlanmaktadır.

**009789** BELCERT ULUSLARARASI BELGELENDİRME  
Hürriyet Bulvarı, No:45, Türkseken Apt. K.1-D.7, Yakuplu, Beşikdüzü  
Telefon: 0212 438 04 76 - E-mail: info@bb  
Belgenin geçerlilik durumu: <https://www.belcert.com> adresinden kontrol

[www.belcert.com](http://www.belcert.com)

**CAC**  
**ATTESTATION OF CONFORMITY**  
**UYGUNLUK ONAYI**

Certificate Number : CAC-M.ST.1286.01  
Sertifika Numarası : CAC-M.ST.1286.01  
Manufacturer : Gumbel Enerji Anonim Şirketi  
Üretici : Gumbel Enerji Anonim Şirketi  
Manufacturer Address : Ümit Mahallesi 2532 Cad. No:6/1 Çankaya ANKARA / TÜRKİYE  
Üretici Adresi : Ümit Mahallesi 2532 Cad. No:6/1 Çankaya ANKARA / TÜRKİYE  
Related Directives : 2006/42/EC Machinery Directive/Annex VIII  
İlgili direktifler : 2006/42/AT Makine Emniyeti Yönetmeliği/EK VIII  
Product Description : Single Axis Solar Tracking System  
Ürün Tanımı : Tek Eksenli Güneş Takip Sistemi  
Type / Model : OXOTRACKER Branded OXOV1.1  
Tip / Model : OXOTRACKER Markalı OXOV1.1  
Related Standards : EN ISO 12100, EN 60204-1  
İlgili Standartlar : EN ISO 12100, EN 60204-1

CAC Conformity Assessment Center d.o.o. confirms by examining technical documents presented on the part of company which stated title and address below that product is conformable to 2006/42/EC Annex VIII Machinery Directive regulations, could attach CE marking on the product with EC Declaration of Conformity prepared by manufacturer in the charge of company. In case of changing this certificate design regarding to product examined, certificate will be expired. Please check validity of this certificate by website [www.conasce.com](http://www.conasce.com). This certificate is valid just for the product type/model stated below. CAC and Company above mentioned must retain a copy of these certificates for 15 years since the day of registration. This certificate property belongs to CAC Conformity Assessment Center d.o.o. and if required it must be returned.

CAC Conformity Assessment Center d.o.o. adı ve adresi yukarıda belirtilen firmadan sunduğu teknik dokümanları inceleyerek, belirlenen ürünün Makine Emniyeti Yönetmeliği 2006/42/AT Ek VIII kurallarına uygunluğunu onaylar. Yukarıda belirtilen listedeki ürün üzerine CE işaretini, üreticinin kendi sorumluluğunda hazırlayacağı AT Değerlendirme Beyanı ile ilgili olarak, inceleme raporu ürüne ek olan bu belge kapsamında değerlendirilmiştir. Bu belgeyi değiştirilmesini istemeyiniz. Bu belgeyi güncelleme için [www.conasce.com](http://www.conasce.com) internet sayfasından kontrol edebilirsiniz. Bu belge sadece yukarıda adı geçen ürün tip/modeli için geçerlidir. Yukarıda adı geçen firma ve CAC bu belgenin bir kopyasını tescil tarihinden itibaren 15 yıl süreyle muhafaza etmelidir. Bu belgeyi mülkiyeti hakkı CAC Conformity Assessment Center d.o.o.'ya aittir ve istenildiğinde iade edilmelidir.

Issue date : 26.09.2023  
Yayın tarihi : 26.09.2023  
Re-issue date : -  
Yeniden belgelendirme tarihi : -  
Validity date : 25.09.2024  
Geçerlilik tarihi : 25.09.2024

*mep*

**CAC APPROVED**

CAC Conformity Assessment Center d.o.o.  
Radnička cesta 54/83 10000 Zagreb Croatia  
info@conasce.com +385 (1) 4819 601

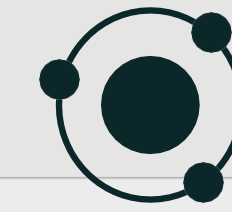
FRM.147/00-00/13.10.2020.

Why Oxotracker

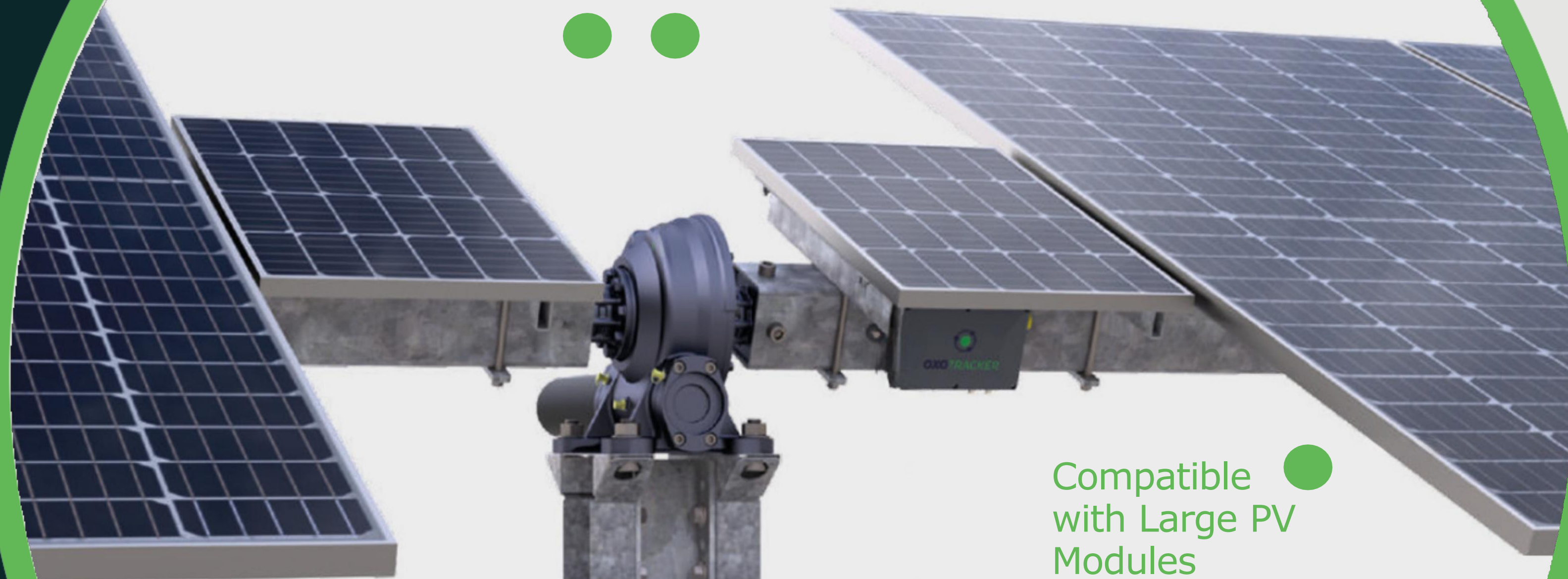


Durable and Simple  
Design with Easy  
Installation

Slew Drive,  
4800 Nm  
24 V DC Motor



**OXOTRACKER**



Compatible  
with Large PV  
Modules



OPU  
**Oxotracker** Power  
Unit: AC or PV Power  
Supply Option



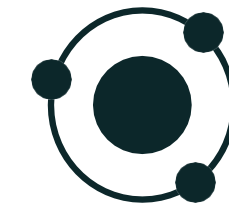
OCU  
**Oxotracker** Control Unit:  
Microcontroller-Based Tilt  
Sensor Control Unit



# Technical Specifications



<b>Tracking Method</b>	Single-Axis, Single-Row Panel, Astronomical Algorithm	<b>Wind Protection</b>	Automatic/Manual Park Position + 2-Way Damper
<b>Tracking Range</b>	±55°	<b>Snow Protection</b>	Snow Park Position
<b>Tracking Accuracy</b>	<0.5°	<b>Hail Protection</b>	Hail Park Position
<b>Operating Temperature</b>	Electronic: -40°C - +85°C	<b>Night Park Position</b>	Otomatic
	Slew Drive: -20°C - +65°C	<b>Backtracking</b>	Adaptable Algorithm for Different Layouts
	Battery: -20°C - +60°C	<b>Ground Slope</b>	South-North Orientation: 9°
<b>Protection Class</b>	IP65		East-West: Unlimited
<b>Power Consumption</b>	<0.3 kWh günlük	<b>Electronic</b>	Autonomous - Microcontroller with Tilt Sensor Support
<b>Drive System</b>	Slew Drive, 4800 Nm, 24 V DC Motor	<b>Communication</b>	MODBUS RS485
<b>Row Length</b>	70 Module		Zigbee Wireless Mesh
<b>Online Monitoring</b>	Tracking via Oxotracker Cloud System	<b>Power</b>	Battery with AC or PV Power Supply, 24VDC

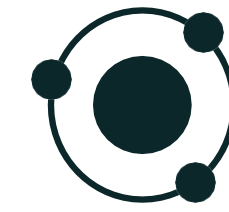


**OXOTRACKER**

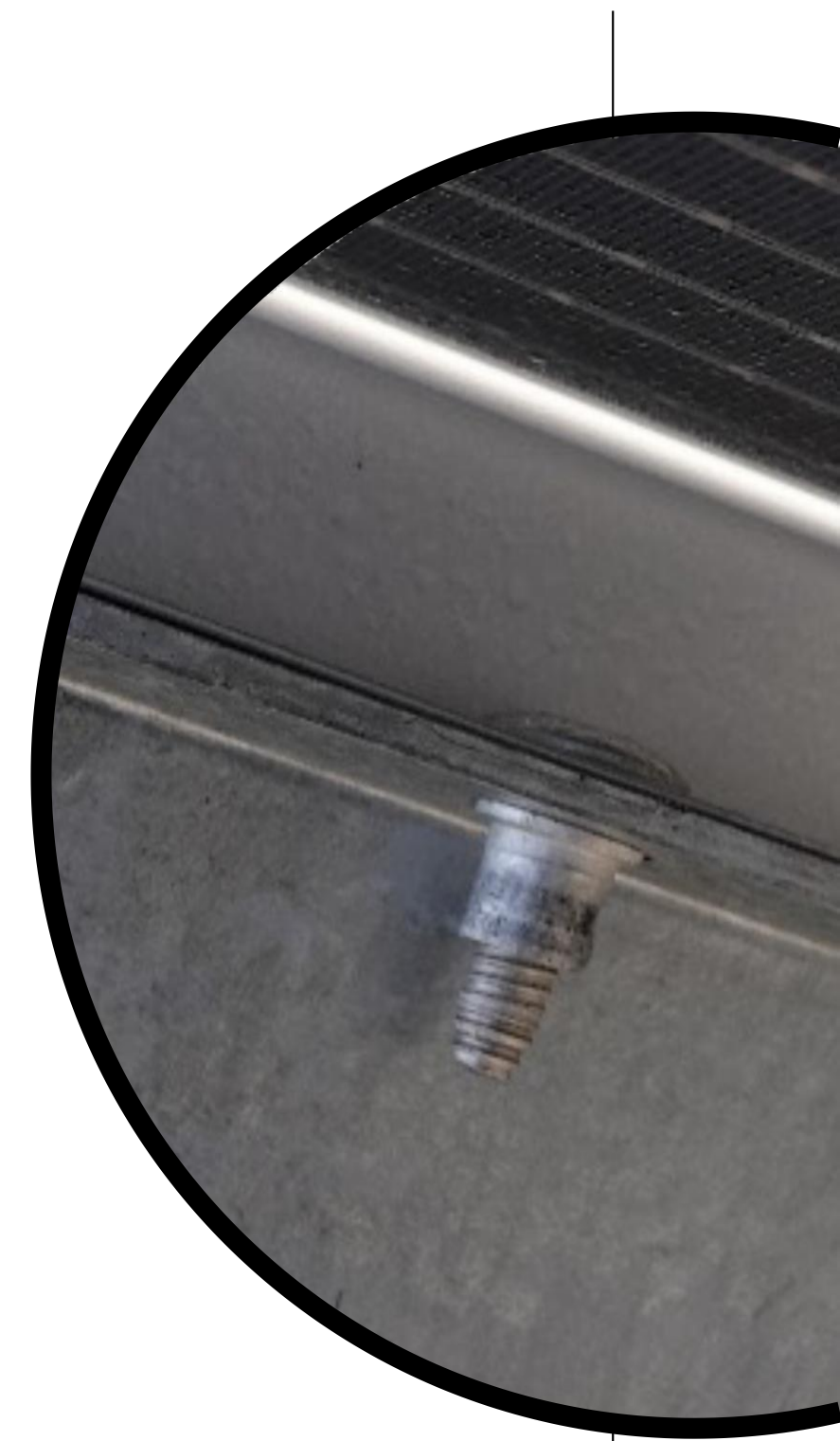
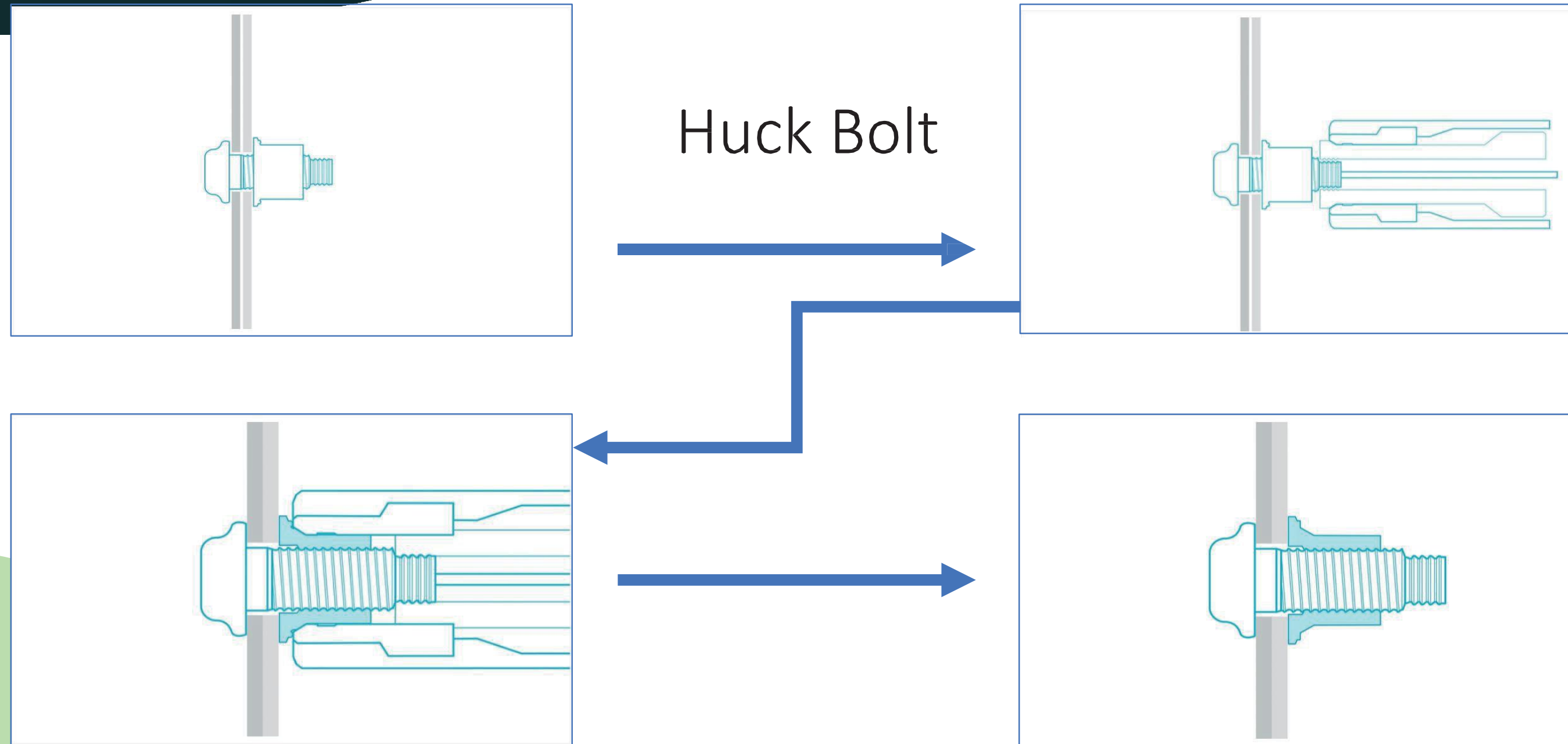


Uninterrupted production and communication in challenging conditions, enabled by the LIFEP04 battery system operating across a wide temperature range.

# Installation

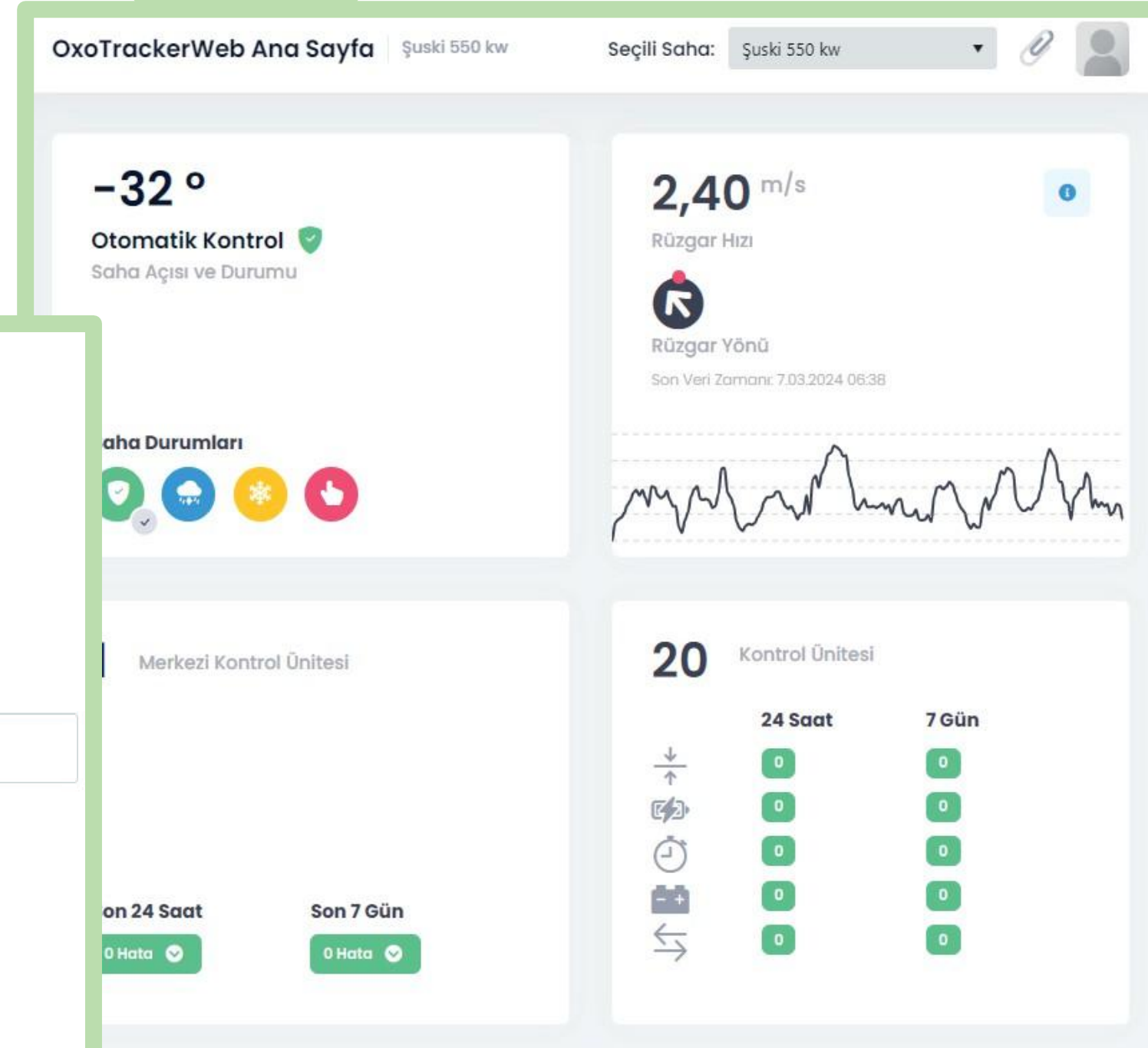


OXOTRACKER

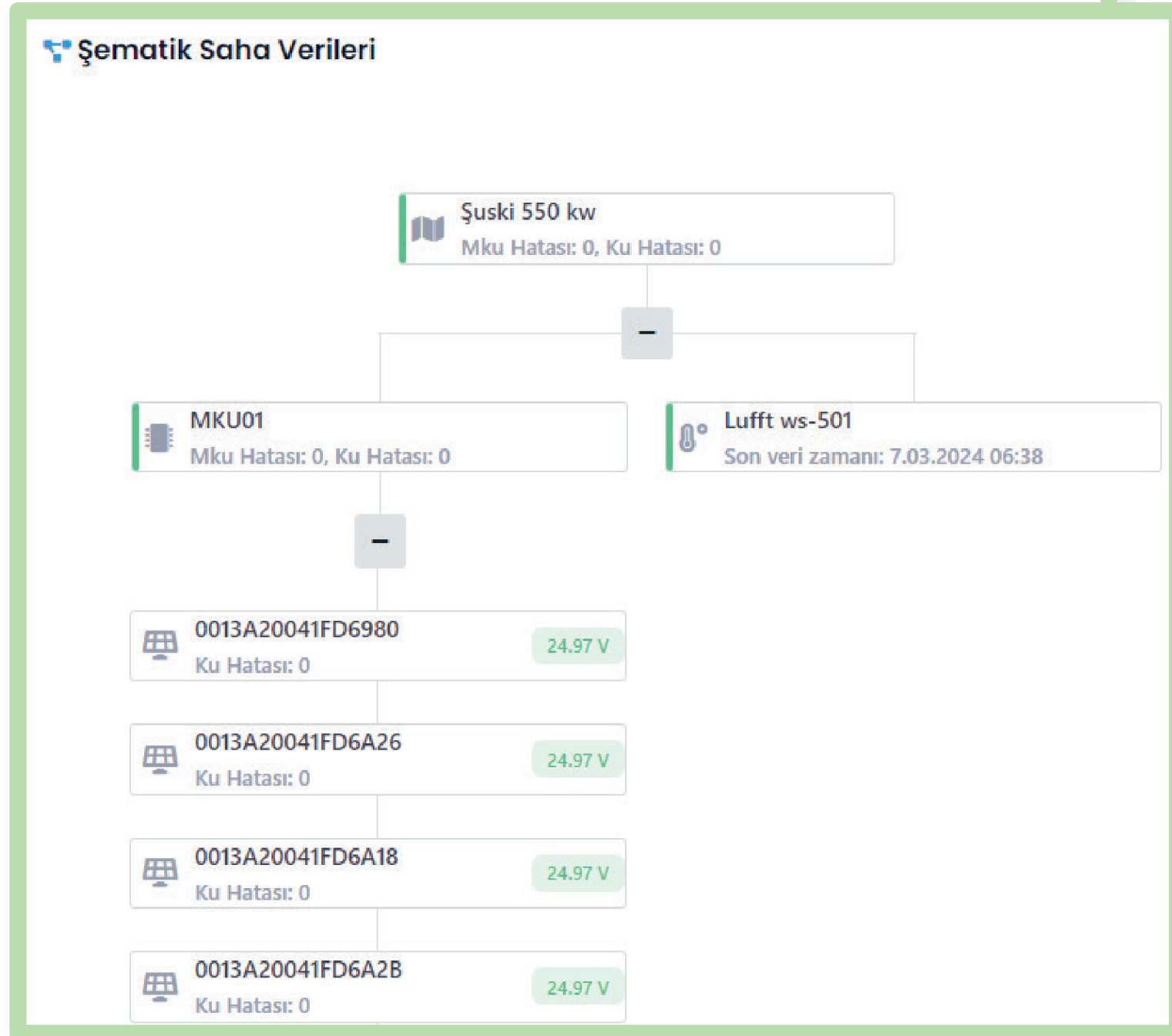


*Practical installation requiring no lifetime torque control  
Up to 70% savings on maintenance costs  
Enhanced security against theft*

# Online Monitoring



Wireless access to all stands via the Zigbee network



Monitor the entire system live with the online monitoring system and receive notifications before any faults occur

# Our Security Systems



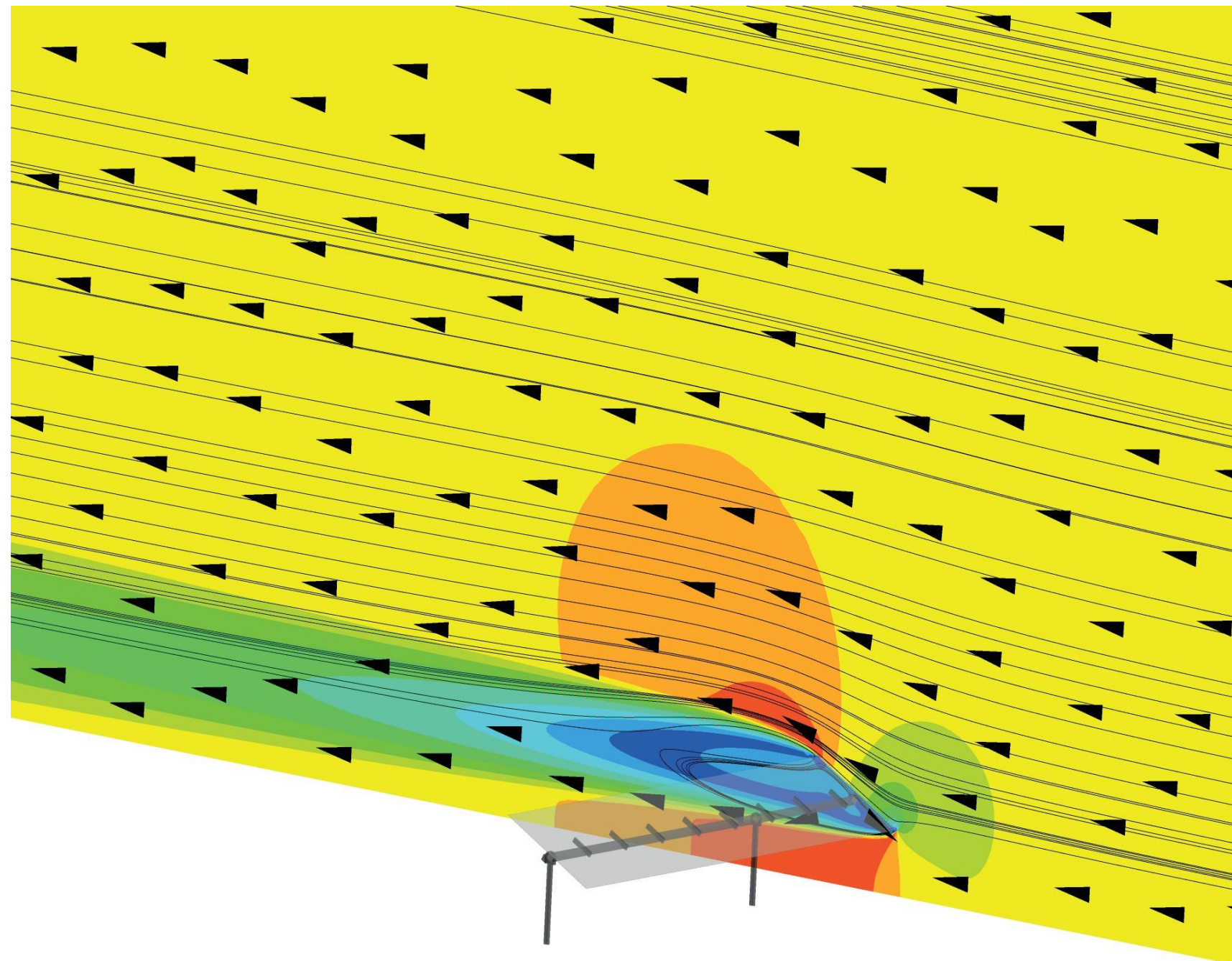
Priceless protection advantages to safeguard your investment against challenging conditions such as storms, snow, and hail.



# Wind Simulations



## Standard 140 km/h Wind Resistance



All system components have been analyzed for static and dynamic loads.

Based on test results, I and H poles were preferred over C poles.



# Warranty & Maintenance



<b>Standard Warranty :</b>	<b>Standard Maintenance :</b>
Steel Construction - 10 Years	Annual Motor Lubrication
Mechanical Moving Parts - 5 Years	Clamp-Free Technology for Reduced Torque Control
Electronic Control Unit - 5 Years	Instant Fault Notifications with Online Monitoring System
Battery Power Unit - 3 Years	

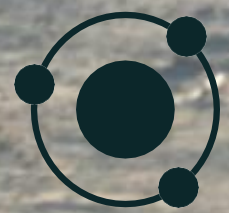
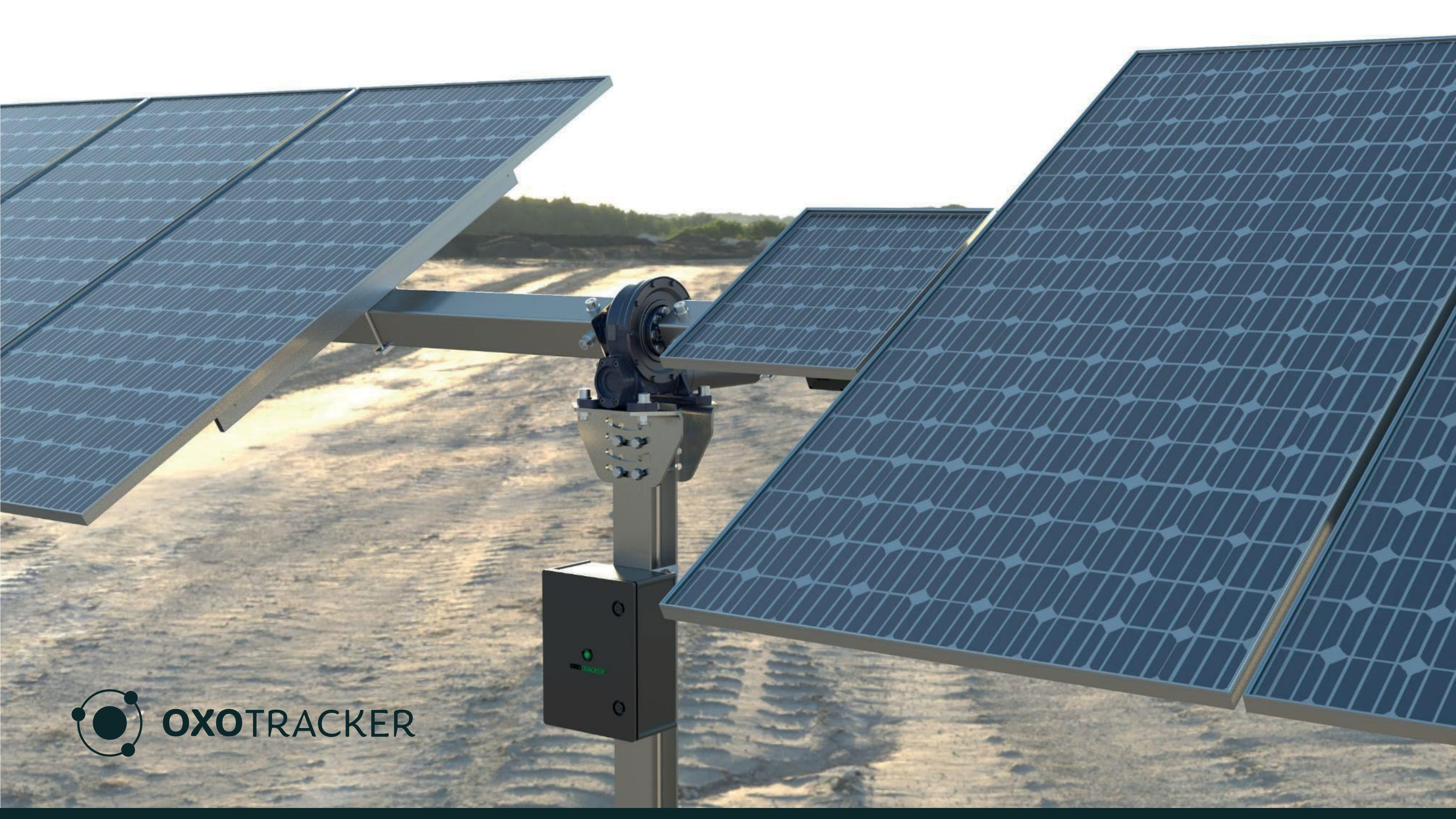


# Warranty & Maintenance

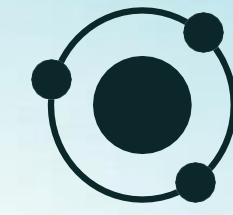


**We guarantee on-site/online support within 24/48 hours across Europe through our contracted service partners.**





**OXOTRACKER**



**OXOTRACKER**



Oxotracker continues to operate successfully in challenging terrain and climate conditions...





OXOTRACKER

Thank You

