



1,000MW Solar Power Plant

March 2022

Kalyon 1,000MW Solar Power Plant

Europe's Largest Solar Power Plant with €6.99/kWh PPA



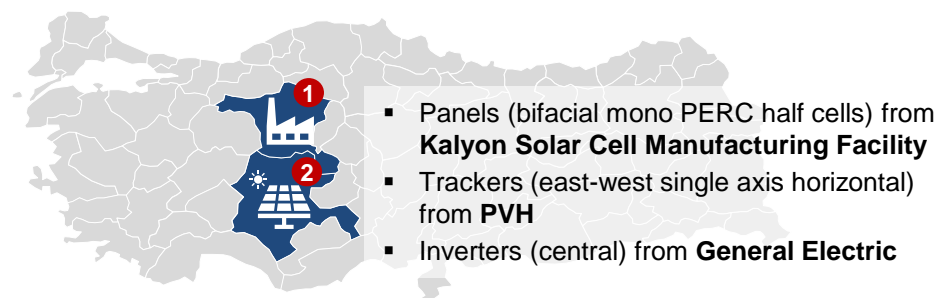
Business Overview

- In 2017, **Kalyon Group** won the tender for Turkey's **first Renewable Energy Designated Area ("YEKA") project**, development and operation of a **1,000 MW_{ac} solar power plant**¹ and a **solar cell manufacturing facility** with minimum annual capacity of 500 MW
- Solar cell manufacturing facility commenced its operations in Aug-20 and manufactured **1m solar panels** in one year
- As of Mar-22, Kalyon SPP has **590MW_{dc}** installed capacity
- Expected to reach **1,000 MW_{ac} installed capacity** in **Jan-23**²
- As of today, solar cell manufacturing facility has an **annual production capacity of 1000 MW**
- 15-years **Power Purchase Agreement** at a fixed price of €6.99/kWh (ending in Sep-35)
- After Sep-2035, electricity to be sold at the market price³

Key Figures

2.6 TWh Annual generation capacity ⁴	€6.99/kWh Fixed price guarantee through PPA ⁵	~\$200-210m Guaranteed annual income ^{4,5}
Meets ~1% of Turkey electricity demand ^{4,6}	~2% of Turkey's installed renewable capacity ⁷	~10% of Turkey's installed solar capacity ⁸
\$0.4b Investment for manufacturing facility	\$1.1b Investment for solar power plant	30 + 2 years Generation license (ends in Sep-2052)

PV Module Factory & Solar Power Plant



	1 Solar Cell Manufacturing Facility and R&D Center	2 Solar Power Plant
Type	Greenfield	Greenfield
Location	Ankara	Konya
Capacity	1,000 MW module/year	1,000 MW _{ac} / 1,348 MW _{dc}
Status	Completed 500MW operational since Jul-20 and full operation by Dec-21	Already has 414 Mw _{ac} / 506 MW _{dc} installed capacity
Capex	\$403m	\$1,117m ⁹
EPC & O&M	CETC O&M for the first 2 years after CoD	Kalyon Company
License	-	Until Sep-2052
Sales	Sales to Kalyon SPP for the first 3 years and then to the market	15-years PPA at a fixed price of €6.99/kWh until Sep-2035

Source: Company

¹ 60% local content requirement for first 500MW and 70% for second 500 MW, hence procurement from Kalyon PV manufacturing facility

² Base case in the financial model assumes full operational capacity by Sep-23

³ 2021 YTD average price is €7.4/kWh as of 5-Nov-21

⁴ Once all phases are completed (2023) based on P50 assumptions

⁵ PPA ends in Sep-35

⁶ Assuming electricity demand of 300TWh

⁷ Assuming total installed renewable capacity of 56GW by 2023

⁸ Assuming total installed solar capacity of 10GW by 2023

⁹ Includes interest during construction, financing costs and taxes

Key Investment Highlights



1	Europe's Largest Solar Power Plant	<ul style="list-style-type: none"> ▪ Largest solar power plant project in Europe and amongst the top 10¹ in the world
2	Highly Favorable Location	<ul style="list-style-type: none"> ▪ Located in high irradiation area (~2,000 kWh/m²/year) ▪ Turkey has the second highest solar energy capacity in Europe following Spain
3	Extensive Government Support in the Renewable Energy Sector	<ul style="list-style-type: none"> ▪ Among the world's largest growing renewable energy markets (11.1% CAGR between 2011-2020 vs. 9.7% global CAGR²) ▪ Supported by government incentives (eg. FiT policy, YEKA projects), Turkey's total installed renewable capacity increased to 48.1GW in 2020 up from 19.0GW in 2015 ▪ Turkey plans to increase installed capacity of solar power to 10GW until 2030 (7.8GW as of Dec-21)
4	Proven Technology	<ul style="list-style-type: none"> ▪ Proven end-to-end solar module manufacturing technology (+22% cell efficiency) ▪ Panel (bifacial mono PERC half cells) and tracker (single axis system tracker) technology approved by TUV Rheinland and Fichtner ▪ Blue-chip suppliers including General Electric (inverters), PVH (trackers), Prysmian (cable systems) and ABB (substations)
5	Strong Contractual Structure	<ul style="list-style-type: none"> ▪ 15-years power purchase guarantee provided by EPIAS (market operator), payable by end users ▪ Ministry of Energy and Natural Resources (MENR) guarantee provided for EPIAS' payment obligations ▪ Curtailment by the system operator (exceeding 2% of production) to be compensated by EPIAS ▪ EPC and O&M contracts are back-to-back with the relevant obligations under the project agreements
6	Stable and Predictable Cash Flows	<ul style="list-style-type: none"> ▪ Stable and predictable cash flows supported by 15-years fixed-price power purchase guarantee ▪ Naturally immune to FX and spot market price³ fluctuations thanks to USD-denominated PPA (¢6.99/kWh) ▪ Major construction and operational risks are eliminated with the successful completion of the first 590 MW_{dc}
7	Secured Financing Structure	<ul style="list-style-type: none"> ▪ \$791.5m financing secured by UK Export Finance (37% ECA portion) and 6 local banks ▪ 2+10 years amortizing facility with weighted average life of of 7.5 years ▪ Investor friendly financing structure with minimal distribution covenants ▪ Design and construction following Equator Principles, IFC and EBRD Performance Standards

¹ Following Bhadla Solar Park, India (2,245 MW), Huanghe Hydropower Hainan Solar Park, China (2,200 MW), Pavagada Solar Park, India (2,050 MW), Benban Solar Park, Egypt (1,650 MW), Tengger Desert Solar Park, China (1,547 MW), Noor Abu Dhabi, United Arab Emirates (1,177 MW) and Mohammed bin Rashid Al Maktoum Solar Park, United Arab Emirates (1,013 MW)

² Based on installed capacity

³ Spot market price in Turkey is highly dependant on natural gas prices and FX, since natural gas is mainly imported. Coal PPs are mainly the price-setters in the market.

Kalyon Solar Power Plant

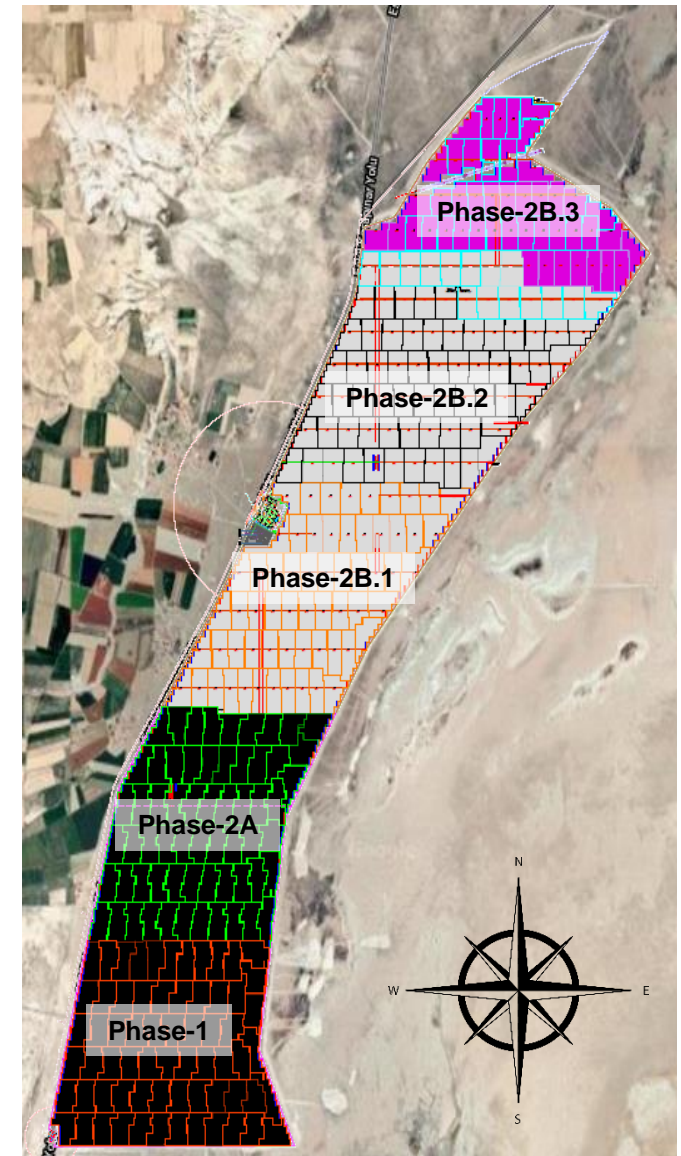
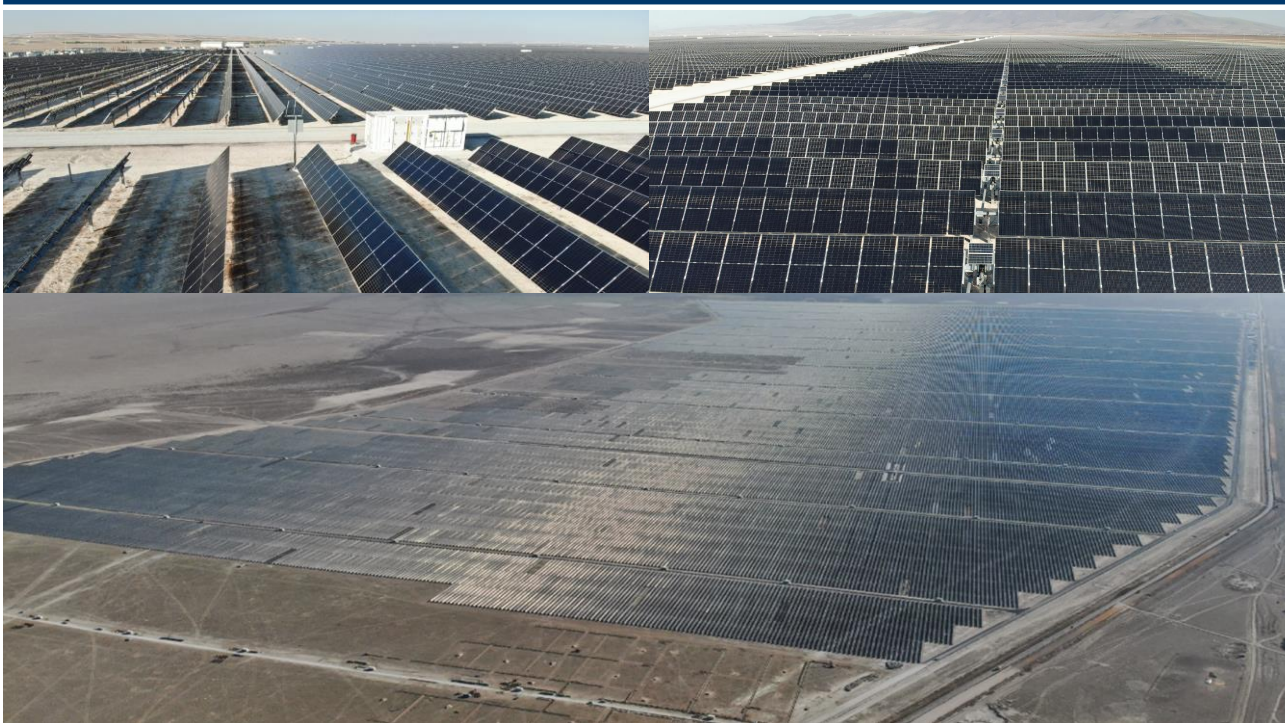
Overview and Status



Status



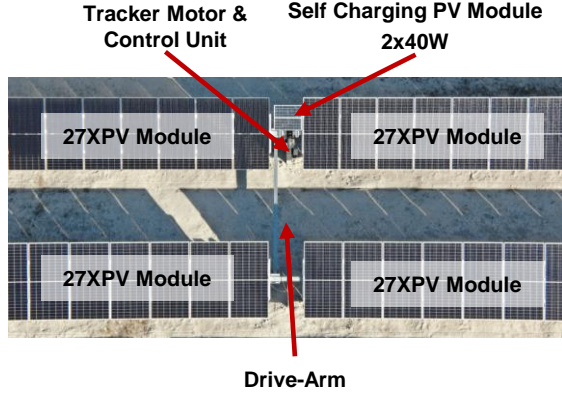



- **Current installed capacity of 590MW_{dc} and expected to reach 1,000 MW_{ac} by Jan-23**
- **Project completion rate of 44%**
- **+758GWh of electricity generated to date** (since Sep-20)
- **143 of 312 planned inverters** are in operation
- **Total project area of 20m sqm**

Snapshot



Kalyon Solar Power Plant Technology



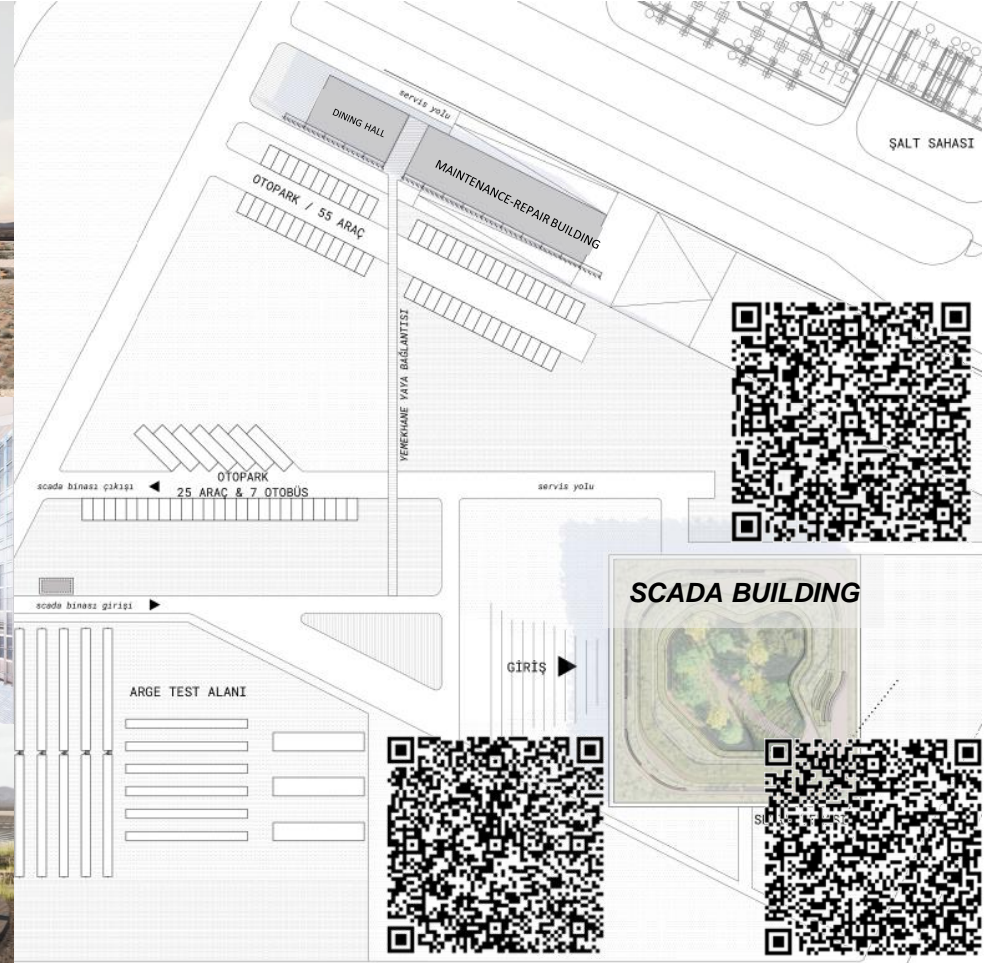
	PV Module	Inverter	Single Axis Tracker
			
Details	<ul style="list-style-type: none"> ▪ Mono PERC PV module ▪ G9 (400W) – M10 (525W) PV modules <ul style="list-style-type: none"> – Bifacial – Half cut ▪ Module efficiency of 19.6% (G9) and 20.6% (M10) 	<ul style="list-style-type: none"> ▪ Centralized inverter station ▪ 3.4 MVA / 3.7 MVA / 3.7 MVA (DC coupled) inverters <ul style="list-style-type: none"> – Inverter efficiency of 98.8% – Air-cooled system – Plug & play 	<ul style="list-style-type: none"> ▪ 2x2x27PV Module Structure Design
Supplier			

Kalyon Solar Power Plant

SCADA Building



Designed through an architecture competition held in 2020-21 and awarded by Turkey's leading architects



Kalyon Solar Power Plant

SCADA Building

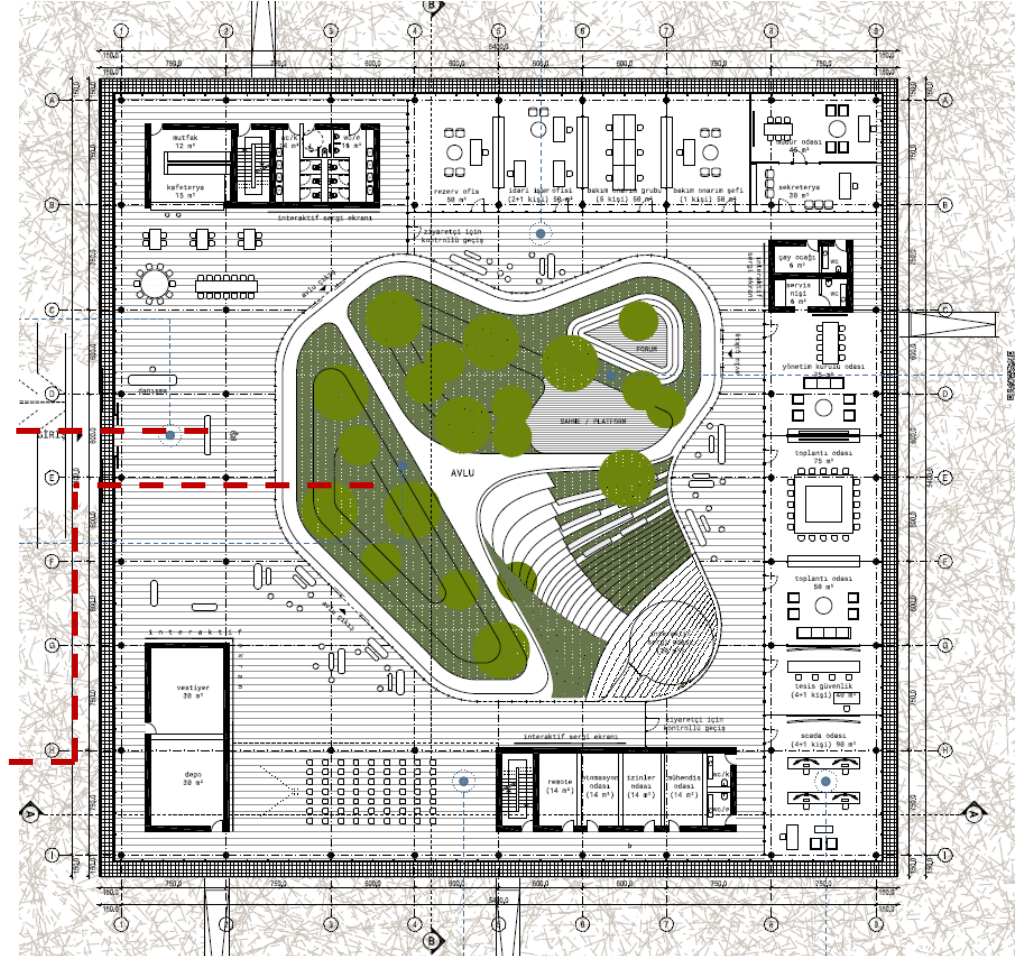


Illustration from Karapinar Site Photos



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Appendix

Kalyon Holding

Kalyon Holding at a Glance

One of the Leading Conglomerates in Turkey



Established as a construction company in 1974, Kalyon, has become one of the leading conglomerates in Turkey

Infrastructure

- Operating activities of the BOT projects completed by Kalyon
- ✓ **200m** pax Istanbul Airport
- ✓ **400km** North Marmara Motorway
- ✓ **96km** North Aegean Motorway



 NORTH MARMARA MOTORWAY

 NORTH AEGEAN MOTORWAY

Construction

- Active in infrastructure, superstructure, rail systems, sea transition pipeline, natural gas and petroleum pipeline, energy and environmental projects
- ✓ **678.8km** Road Projects
- ✓ **356.8km** Rail Systems
- ✓ Istanbul Metrobus Line
- ✓ **106km** Water Pipeline
- ✓ **2.6m m³** Water Projects
- ✓ TANAP Lot 4 and 5
- ✓ Northern Marmara Natural Gas Storage
- ✓ **16** superstructure projects

Energy

- Operation of renewable energy power plants and LNG gasification facility
- ✓ **1,000MW** YEKA SPP
- ✓ **1,000MW** YEKA WPP
- ✓ **345MW** HPPs (5 HPPs)
- ✓ Etki Port LNG Gasification Facility

Industry

- Manufacturing of solar panels
- ✓ Kalyon PV Solar Technologies Factory (**1,000 MW module / year**)




Real Estate

- Real estate project management and development
- ✓ Nevcarsi Uskudar (shopping mall)
- ✓ Nevbahar Uskudar (residential units)
- ✓ Ankara Balgat (shopping mall and residential units)



Social Services

- Hasan Kalyoncu University
- Kalyon Kultur
- Afforestation projects
- Kalyon Memorial Forest
- Van Trauma Center
- Sakine Kalyoncu Special Education Training School

 **HASAN KALYONCU UNIVERSITY**



KALYON KÜLTÜR

Contact Us



Kübra Kalyoncu Şeherli

Kalyon Holding
Board Member

kkalyoncuseherli@kalyonholding.com

Mustafa Koçar

Kalyon Holding
CFO

mkocar@kalyonholding.com

Murtaza Ata

Kalyon Holding
Energy Group President
mata@kalyonholding.com

Mehmet Yasir Koca

Kalyon Holding
Corporate Finance Manager
mykoca@kalyonholding.com