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GENERAL DESCRIPTION OF THE SYSTEM LARGE-SCALE SELF-GENERATION SOLAR PV - VEOLIA

3.757 MWp / 3.000 MWac



August 2026

Version 1.1

Consolidated Technical Document | Rural area of Los Palmitos-Corozal, Sucre



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DOCUMENT CONTROL

Field	Information
Version	1.1
Date	August 2026
Project	AGGE Veolia - Polygon A
Location	Rural area of Los Palmitos-Corozal, Sucre 9°23'12.94"N 75°12'39.86"W
Installation Type	Large-Scale Self-Generation (AGGE) connected to Veolia's internal network
Capacity	3.7572 MWp DC / 3.000 MWac
Connection Voltage	13.8 kV
Status	Consolidated Technical Document

1. INTRODUCTION

This document consolidates the general technical description of the Veolia - Polygon A Large-Scale Self-Generation (AGGE) solar photovoltaic system, located in the Department of Sucre. The solution supplies renewable energy to the client's internal medium-voltage network and incorporates power monitoring and control from the commercial metering boundary.

The adopted configuration consists of 6,060 Jinko Solar bifacial modules rated at 620 Wp, equivalent to 3,757.2 kWp DC; ten Huawei SUN2000-330KTL-H1 inverters rated at 330 kVA each; and one Huawei JUPITER-3000K-H1 Power Station rated at 3,300 kVA, with voltage transformation from 800 V to 13.8 kV. The active power delivered by the plant is limited to 3.000 MWac.

The system configuration comprises 6,060 Jinko modules, 303 fixed 2Vx10 tables, ten Huawei inverters and the 3,300 kVA Power Station. Values from energy models using different equipment or quantities are not incorporated as official project results, thereby avoiding inconsistencies among the layout, single-line diagram and energy-production estimate.

Parameter	Consolidated Configuration
Installation Type	Large-Scale Self-Generation for Veolia's internal network
DC Installed Capacity	3,757.2 kWp (6,060 modules rated at 620 Wp)
AC Active Power	3.000 MWac
Modules	Jinko Solar JKM-620N-66HL4M-BDV, bifacial, 620 Wp
Inverters	10 × Huawei SUN2000-330KTL-H1, 330 kVA
Transformer Station	Huawei JUPITER-3000K-H1, 3,300 kVA, 800 V / 13.8 kV
Structure	Fixed 2Vx10, 303 tables, 3.0 m N-S spacing and 7.804 m pitch



Parameter	Consolidated Configuration
Internal Road	≈580 m, 4.00 m wide, 2% crossfall, C3-S3 vehicle
Drainage	≈135 m of concrete ditch and ≈640 m of HDPE geomembrane-lined ditch
Control and Communications	PPC/SmartLogger, SCADA and ≈16 km fiber-optic link
Energization	Three stages: 30% + 30% + 40%

Key Strength	Benefit to the Project
Favorable Solar Resource	Annual GHI of 1,919.9 kWh/m ² and year-round energy generation.
Modular Architecture	Ten inverters facilitate sectionalization, diagnostics and progressive energization.
Integrated Power Station	Integrates transformation, switching, protection and auxiliary services in a compact solution.
Selected Logistics Route	Reduces heavy-load traffic through the urban area of Los Palmitos.
Boundary-Based Control	Enables active-power limitation and coordination with consumption on the internal network.
Bifacial Fixed Structure	Combines mechanical simplicity, lower maintenance and utilization of rear-side irradiation.

2. GENERAL INFORMATION

2.1. Location

The project is located in the Department of Sucre, in the rural area between Los Palmitos and Corozal. The Solargis report places the site at coordinates 9.386728° N and 75.210633° W, at an approximate elevation of 194 m above sea level. The predominant land cover is dryland cropland, and the overall slope is estimated at 3%, which is favorable for a layout requiring only localized earthworks.



Figure 2.1: Project location



Figure 2.2: Detailed map view

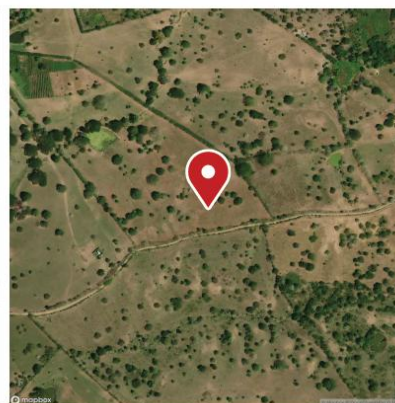


Figure 2.3: Project horizon and sunpath

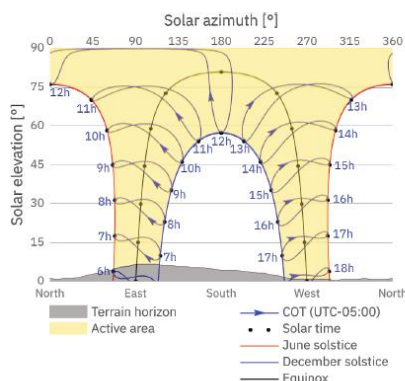


Figure 2.4: Day length and solar zenith angle

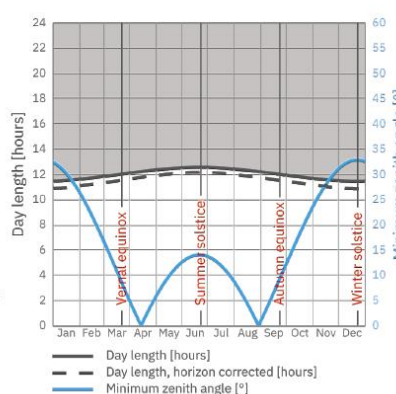


Figure 1. General site location and solar-horizon conditions.

Source: Solargis Prospect, report generated on August 4, 2026.

2.2. Accessibility and Logistics

Logistics access follows the red route, with an approximate length of 9.01 km. The route takes the diversion along Carrera 3B, connects to the Los Palmitos-Sabanas de Pedro road and subsequently to National Route 25, avoiding direct heavy-vehicle traffic through the municipality's main streets.

The selected alternative reduces interference with urban mobility, limits community exposure to special-load transport and facilitates the delivery of modules, structures, inverters and the Power Station. The mobilization plan includes prior verification of turning radii, crossing structures, road-surface conditions and maneuvering areas.



Figure 2. Selected logistics route for project access.

Source: Veolia 3.75 MWp KoM presentation.

2.3. Climate and Site Conditions

The site has a warm climate, with an average annual temperature of 26.4 °C and monthly values ranging from 25.3 °C to 28.0 °C. The average annual wind speed is 1.6 m/s. These conditions are favorable for continuous system operation and are reflected in the thermal losses included in the available energy assessments.

Solargis identifies an optimum energy tilt of 12° with south-facing orientation. The adopted fixed structure uses a 15° tilt, which is close to the optimum and compatible with the topography, water drainage from the modules and the constructability of the photovoltaic field.

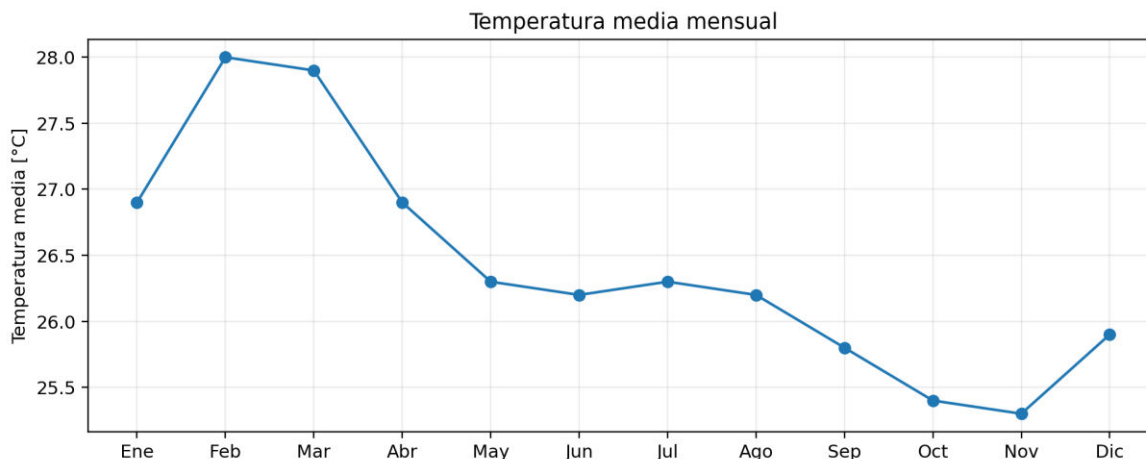


Figure 3. Estimated average monthly temperature at the site.

Source: Solargis Prospect 2026.

2.4. Solar Resource

The site has a favorable solar resource for photovoltaic development. Annual global horizontal irradiation reaches 1,919.9 kWh/m², direct normal irradiation reaches 1,353.3 kWh/m² and diffuse horizontal irradiation reaches 944.3 kWh/m². At the optimum tilt, global tilted irradiation reaches 1,942.3 kWh/m².

Monthly GHI values range from 140.1 kWh/m² in November to 174.7 kWh/m² in July. This distribution shows moderate seasonality and supports stable energy production throughout the year.

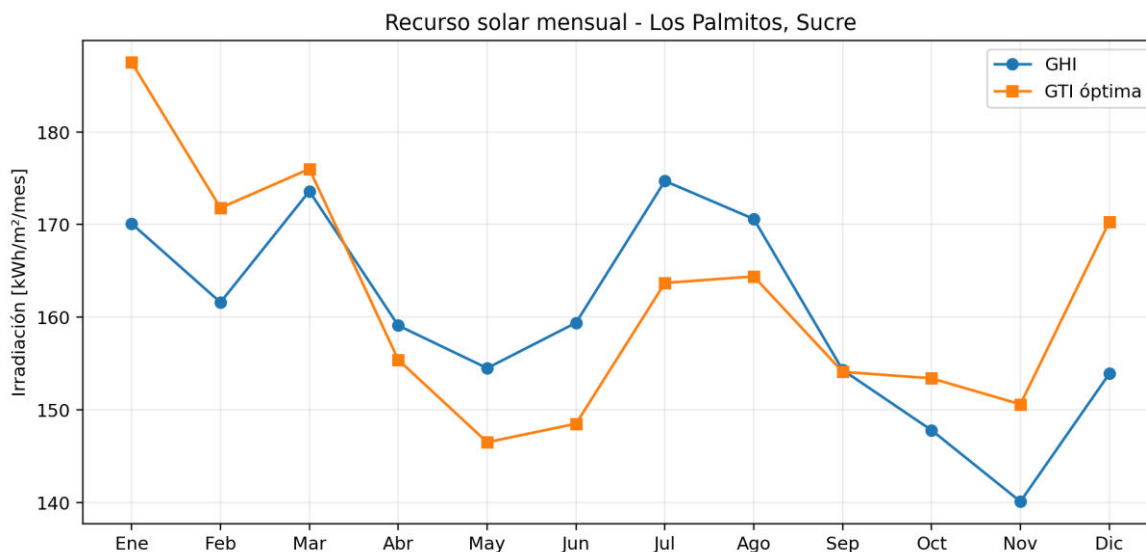


Figure 4. Monthly global horizontal irradiation and optimum global tilted irradiation.

Source: prepared in-house using data from the supplied Solargis report.



3. CIVIL AND MECHANICAL DESIGN

3.1. General Layout

The layout distributes 6,060 modules across 303 fixed 2Vx10 tables adapted to the irregular geometry of the site. The blocks are concentrated in the northern, eastern and southwestern areas, while the central area retains internal corridors and open spaces associated with the topography.

The Power Station is located near the main access point on the southeastern side. This location reduces internal transport distances, facilitates installation maneuvers and positions the transformer station close to the outlet toward the 13.8 kV internal network.



Figure 5. General layout of the photovoltaic system - Polygon A.

Source: Annex 4 - Project Designs and Drawings, drawing dated June 24, 2026.

3.2. Site Preparation

Civil works focus on improving access, constructing the internal road, localized earthworks, perimeter fencing, foundations and drainage works. The solution preserves natural drainage channels and runoff corridors and limits cuts and fills to strictly necessary areas.



Pull-Out Tests form part of the acceptance-control process for the structure foundations.

3.3. Internal Roads

The road infrastructure includes approximately 580 m of Type A2 internal road, 4.00 m wide, with a design speed of 20 km/h, 2% crossfall and expected traffic of no more than 15 vehicles per day. The design vehicle corresponds to a heavy C3-S3 configuration suitable for transporting the Power Station and the main supplies.

The road section facilitates traffic during construction and maintains permanent access for operation and maintenance activities. The crossfall promotes water drainage and reduces deterioration of the road surface.



Figure 6. Project internal-road parameters.

Source: AGneo technical proposal for Polygon A.

3.4. Drainage and Runoff Control

The drainage system includes approximately 135 m of concrete-lined ditch and 640 m of ditch protected with HDPE geomembrane. The alignment follows the natural runoff corridors and directs discharges to controlled points, reducing the risk of erosion and standing water in module and equipment areas.

The combination of rigid ditches and geomembrane protection adapts the solution to different site conditions, improves the durability of the works and facilitates periodic maintenance.

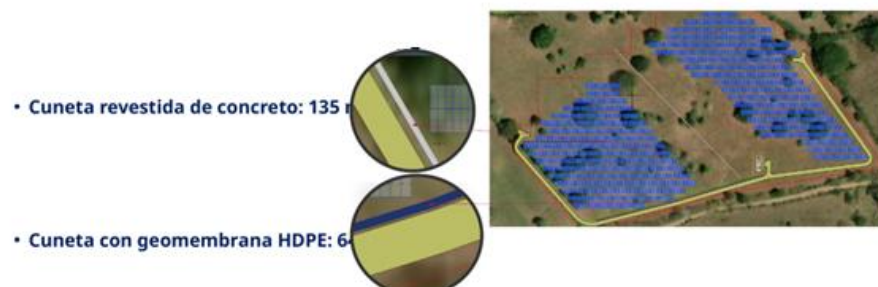


Figure 7. Drainage and runoff-control works.

Source: AGneo technical proposal for Polygon A.



3.5. Perimeter Fencing, Foundations and Structures

The site includes perimeter fencing and controlled access points. Metallic elements are bonded to the equipotential grounding network and maintain electrical continuity across gates and sectionalized segments, strengthening both the physical and electrical safety of the installation.

The mechanical configuration consists of 303 fixed 2Vx10 tables, with 20 modules per table, 3.0 m north-south spacing and an approximate pitch of 7.804 m. The fixed structure reduces moving components, simplifies maintenance and provides a robust basis for utilizing the bifacial capability of the modules.

4. ELECTRICAL DESIGN

The electrical architecture integrates the photovoltaic field, ten string inverters, low-voltage switchboards, one 3,300 kVA Power Station, medium-voltage switchgear, metering and protection systems, a recloser, communications and the connection to Veolia's 13.8 kV internal network.

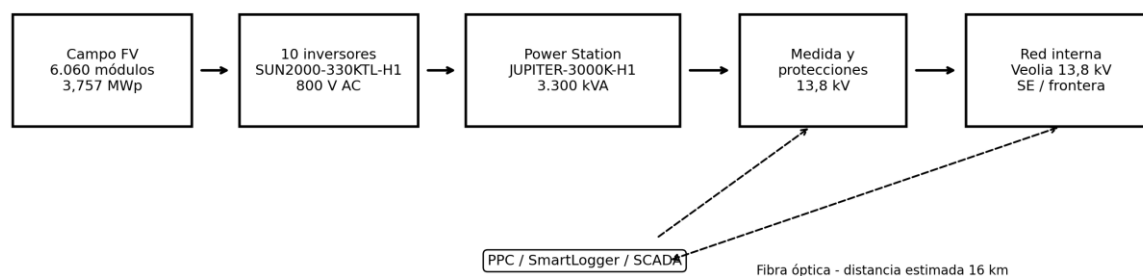


Figure 8. Functional diagram of the electrical and control system.

Source: prepared in-house based on the supplied single-line diagram, proposal and KoM presentation.

4.1. Direct Current (DC) Configuration

4.1.1. Photovoltaic Modules

The photovoltaic field uses 6,060 Jinko Solar JKM-620N-66HL4M-BDV bifacial modules rated at 620 Wp, for a total installed capacity of 3,757.2 kWp. Bifacial technology captures rear-side irradiation and improves utilization of the site's available solar resource.

Row spacing, installation height and table distribution enhance rear-side irradiance capture and reduce structural shading while maintaining adequate corridors for inspection and maintenance.



4.1.2. String Configuration

The PV array is configured with strings of 30 Jinko Solar JKM-620N-66HL4M-BDV 620 Wp modules connected in series, evenly distributed among the ten Huawei SUN2000-330KTL-H1 inverters and their respective MPPT inputs. Considering a total of 6,060 modules, the plant comprises 202 strings. This configuration is intended to optimize energy harvesting, facilitate DC circuit segmentation, and ensure that the operating voltages remain within the allowable inverter limits.

4.1.3. DC Conduits and Cabling

The EPC scope includes solar cable, conduits, duct banks and inspection boxes. Routing is arranged along structure-mounted sections, underground conduits and inverter approaches, with mechanical protection, UV resistance, controlled bending radii, circuit segregation and voltage-drop limitation.

4.2. Inverters

The system includes ten Huawei SUN2000-330KTL-H1 inverters, each rated at 330 kVA apparent power. The aggregate capacity is 3.3 MVA, while the plant's active power is limited to 3.000 MWac at the control point.

Locating the ten units near the photovoltaic blocks reduces DC cable runs, facilitates sectional isolation and allows partial generation capacity to be maintained during scheduled maintenance on an inverter.

SUN2000-330KTL-H1
Smart String Inverter

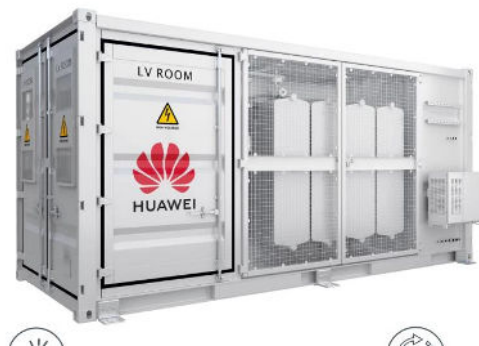


Figure 9. Huawei SUN2000-330KTL-H1 inverter and Huawei JUPITER-3000K-H1 Power Station.

4.3. Voltage Transformation and Step-Up

The Huawei JUPITER-3000K-H1 Power Station integrates the low-voltage switchboards, step-up transformer, medium-voltage compartments and auxiliary services. Energy is collected at 800 V and stepped up to 13.8 kV for connection to Veolia's internal network.

The single-line diagram includes two low-voltage switchboards, a transformer compartment, H2.1, H2.2 and H2.3 switchgear cubicles, a vacuum circuit breaker, an auxiliary-services transformer, an auxiliary-services switchboard and UPS-backed supply. This integration reduces installation interfaces and centralizes switching and protection in a compact solution.



4.4. Medium-Voltage Network and Point of Connection

The Power Station output is connected to Veolia's internal 13.8 kV network. The point of connection includes visible isolation, surge protection, a pole-mounted recloser, metering system and interface with the existing infrastructure.

The control architecture uses an approximately 16 km fiber-optic link between the plant and the commercial metering boundary or control substation. The route follows the medium-voltage network right-of-way and uses spans of up to 200 m, enabling metering, control and monitoring integration without relying on wireless links.

4.5. Connection, Protection and Metering Equipment

The connection equipment includes a 15 kV pole-mounted recloser, 300/310 series, with voltage and current sensors; 600 A to 630 A blade-type disconnect switches; a bypass arrangement using single-pole fuse cutouts; and 15 kV, 10 kA polymeric surge arresters with a 10.2 kV MCOV.

The outdoor metering system uses three voltage transformers with a $13,800/\sqrt{3}$ V to $120/\sqrt{3}$ V ratio, accuracy class 0.5 and 25 VA burden, and three 20-40/5 A current transformers, accuracy class 0.5S and 10 VA burden. The solution provides an accurate metering boundary compatible with bidirectional energy control.

ANSI Function	Project Application	Reference Document
27 / 59 / 59N	Undervoltage, overvoltage and residual-voltage supervision.	KoM and single-line diagram
50 / 50N / 51 / 51N	Instantaneous and time-overcurrent phase and ground protection.	Single-line diagram and KoM
25	Synchronism check before closing.	KoM and single-line diagram
32	Active-power supervision and control.	KoM presentation
79	Reclosing logic integrated into the recloser.	Single-line diagram
81U / 81O / 81R	Underfrequency, overfrequency and ROCOF.	KoM and single-line diagram
Anti-Islanding	Disconnection upon loss of the reference grid.	KoM presentation

4.6. Control, Power Limitation and Communications

The control system is based on PPC/SmartLogger, SCADA integration and communication with the ten inverters. The metering signal at the commercial metering boundary is transmitted through fiber optics and governs active-power limitation according to consumption and internal-network conditions.

The platform records active and reactive power, voltages, currents, frequency, breaker status, alarms, inverter availability and meteorological variables. The end-to-end test sequence includes loss of communication, controller failure, recloser opening and safe system recovery.

This architecture provides centralized supervision, event traceability and coordinated response to demand changes, preventing unauthorized exports and improving operational stability.



4.7. Grounding System

The grounding system uses a main grid of bare 1/0 AWG copper conductor, exothermically welded connections and 5/8-inch × 2.4 m Copperweld electrodes. Switchboards, transformers, auxiliary services, structures and perimeter fencing are connected to the equipotential network through branch conductors and local grounding bars.

For consistency throughout the description, bare 2 AWG copper conductor is adopted for equipotential bonding of the structures.

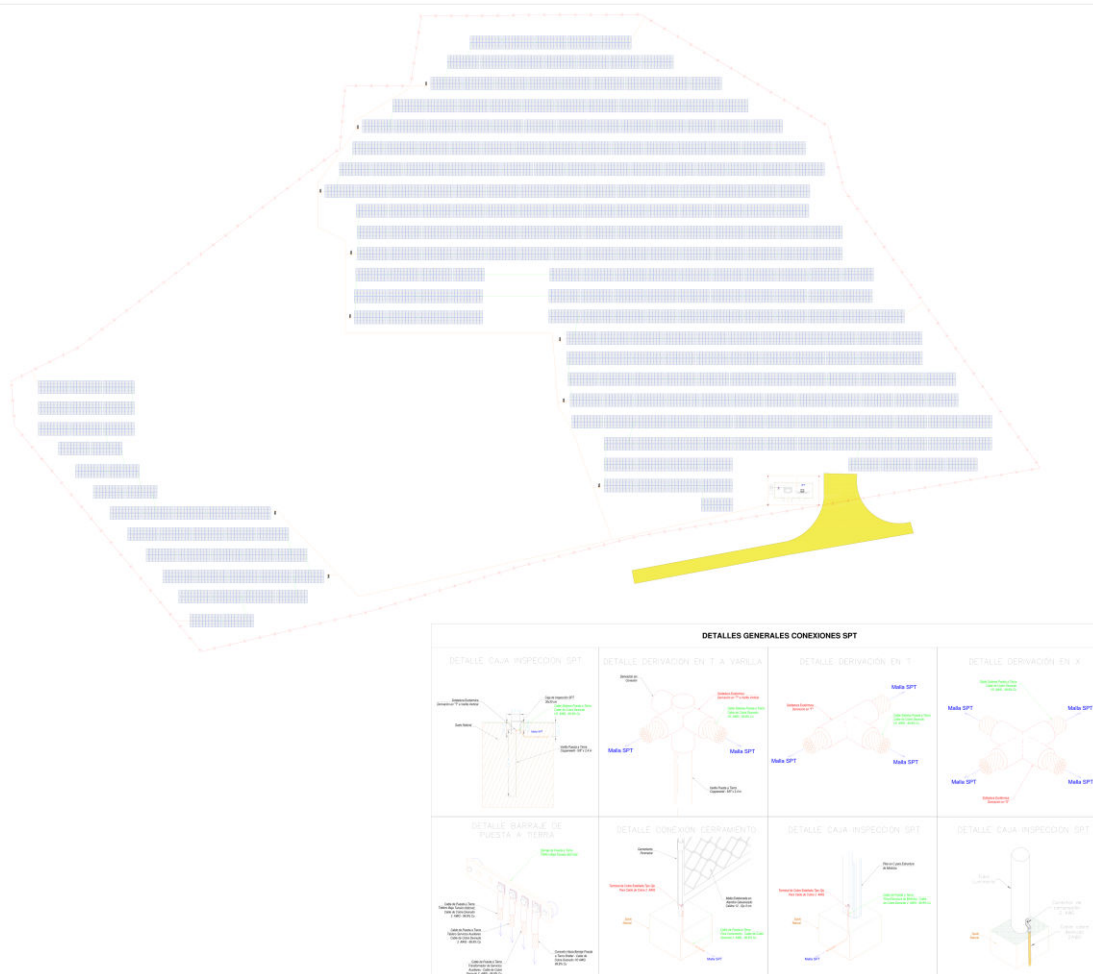


Figure 10. General layout and details of the grounding system.

Source: Annex 4 - Grounding System Drawing, June 24, 2026.

4.8. Auxiliary Services, UPS, CCTV and Weather Station

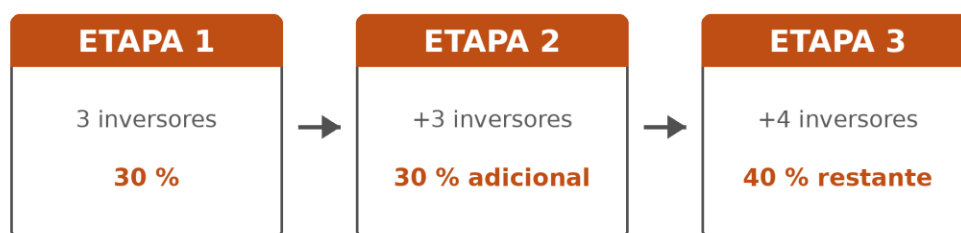
The Power Station includes an auxiliary-services transformer and switchboard, together with UPS-backed supply for the control panels. At the outdoor point, a 0.5 kVA oil-immersed auxiliary transformer with a 13.8 kV/220 V ratio is included to supply local metering, protection and control equipment.



The scope includes SCADA, fiber optics, metering, protection, CCTV and a weather station. The combination of backed-up power supply, video surveillance and environmental monitoring strengthens operational continuity, asset security and ongoing assessment of plant performance.

5. ENERGIZATION STRATEGY

Energization is performed in three successive stages of 30% + 30% + 40%, corresponding to three inverters in the first stage, three additional inverters in the second stage and four inverters in the final stage. This sequence enables controlled start-up under partial operation and reduces commissioning risk.



Secuencia de energización: 30 % + 30 % + 40 %

Figure 11. Distribution of partial energization across three stages.

Source: Veolia 3.75 MWp KoM presentation.

5.1. Enabling Conditions

- Medium-voltage network constructed, inspected and with satisfactory test results.
- Power Station installed, grounded, pre-commissioned and satisfactorily tested.
- Low-voltage switchboards, auxiliary services, UPS, protection and communications operational.
- Inverters for each stage installed, configured and with AC/DC tests completed.
- Modules and DC circuits identified and tested for polarity, insulation and continuity.
- Metering system, PPC/SmartLogger, SCADA and fiber-optic link operational.
- Electrical safety clearances, LOTO and switching coordination with Veolia approved.

5.2. Operating Sequence

1. Confirm that circuit breakers and disconnect switches are in the open position, that no temporary grounding connections remain in place, and that all work areas have been released.
2. Energize the 13.8 kV network and verify voltage, frequency, phase sequence and protection status.
3. Energize the Power Station without generation and verify the transformer, switchgear, switchboards and auxiliary services.
4. Enable Stage 1 with three inverters and monitor power, current, voltage, alarms and power limitation.



5. Add Stage 2 with three additional inverters after completing all Stage 1 verifications.
6. Enable the four remaining inverters, perform integrated tests and consolidate commissioning records.

5.3. Stage Distribution

Stage	Enabled Inverters	Capacity Share
1	3	30 %
2	3 additional	30% additional
3	4 additional	40% remaining
Total	10	100 %

6. TECHNICAL AND OPERATIONAL FEASIBILITY

6.1. Construction Feasibility

Construction feasibility is favorable. The overall 3% slope, solar resource, available space and distribution across 303 tables allow the layout to be adapted to the site geometry with localized earthworks.

The selected access route, 4.00 m internal road, maneuvering areas and location of the Power Station next to the entrance provide a clear logistics solution for installation and maintenance. Drainage works protect the technical areas and reduce project exposure to erosion and standing water.

6.2. Electrical and Control Feasibility

The electrical architecture is technically suitable for a plant limited to 3.000 MWac. The combination of ten inverters, an integrated Power Station and a 13.8 kV connection provides modularity, sectionalization capability and a compact interface with Veolia's internal network.

The recloser, ANSI functions, surge arresters, Class 0.5S metering and grounding system provide a robust protection basis. The fiber-optic link and PPC/SCADA control allow generation to be coordinated with metering at the commercial metering boundary.

6.3. Operation, Maintenance and HSEQ

The fixed structure and modular arrangement simplify inspections, cleaning, vegetation control and fault response. The operation and maintenance scope includes cleaning, inspection, vegetation clearing and environmental monitoring, with up to four scheduled visits according to the supplied proposal.

HSEQ management includes access control, signage, LOTO procedures, waste management, wildlife protection, community engagement and personnel training. These measures strengthen safety during construction, energization and operation.



7. ENERGY ESTIMATE

The energy simulation indicates outstanding performance, with an estimated annual production of 6,329 MWh, equivalent to a specific yield of 1,690 kWh/kWp-year. The analyzed system has an installed capacity of 3,745 kWp, ten inverters and an export limitation of 3,000 kWac, achieving a Performance Ratio of 86.91% and a bifacial PR of 83.59%. These results demonstrate strong utilization of the available solar resource and efficient conversion of the available energy.

The plant shows stable generation throughout the year, with monthly production ranging from approximately 479 MWh to 622 MWh. This consistency reduces dependence on specific seasonal periods and supports a continuous renewable-energy supply for Veolia's facilities. The high specific yield is complemented by strong bifacial-system performance, which additionally captures irradiation received on the rear side of the modules.

The energy balance also shows controlled losses: DC cabling losses are approximately 0.4%, AC losses 0.6%, inverter operating losses 1.2%, and medium-voltage transformer losses 1.2%. In addition, the assumed annual unavailability is only 0.7%, supporting the reliability and operational continuity of the solution.

Production is reported at P90 as 6,162 MWh/year and at P95 as 6,115 MWh/year, with an overall variability of only 2.1%. Taken together, these indicators confirm that the project provides strong energy productivity, stable annual generation, low electrical losses and a low level of uncertainty, supporting its technical suitability.

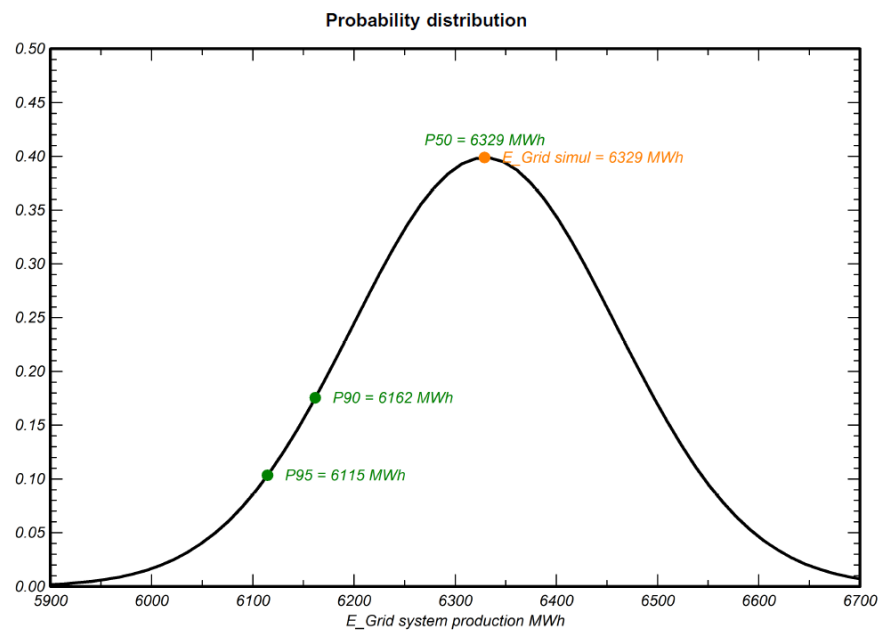


Figure 11. Estimated Generation - Project P51



8. CONCLUSIONS

- The AGGE Veolia - Polygon A project provides a technically configured solution of 3,757.2 kWp DC and 3.000 MWac, based on 6,060 bifacial modules, ten Huawei inverters and one 3,300 kVA Power Station.
- The solar resource is favorable and shows moderate seasonality, with annual GHI of 1,919.9 kWh/m² and optimum GTI of 1,942.3 kWh/m², supporting year-round generation.
- The layout of 303 fixed 2Vx10 tables adapts to the site geometry, reduces mechanical complexity and facilitates operation and maintenance activities.
- The selected logistics route avoids direct transit through the urban area of Los Palmitos and, together with the 4.00 m internal road, facilitates mobilization of the Power Station and main equipment.
- The drainage system, consisting of concrete ditches and HDPE geomembrane protection, improves runoff management and protects the infrastructure against erosion and standing water.
- The electrical and control architecture integrates accurate metering, a recloser, ANSI functions, PPC/Smart Logger, SCADA and approximately 16 km of fiber optics, enabling supervision and power limitation from the commercial metering boundary.

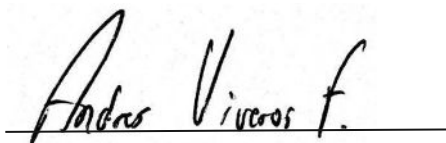


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9. ANNEXES

- The **solar resource assessment report**, prepared using data from Solargis, is attached.
- The **project general layout and location layout** are attached.
- The technical datasheets for the project's main equipment and components are attached.
- The project's single-line diagram is attached for reference.



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