



# **Solar Park Project 80 MW** **(Energy District Añelo)**



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## 1. EXECUTIVE SUMMARY

The Añelo Energy District, developed by TBSA Toro Brokers S.A., is conceived as an integrated hub of logistics, industrial, and energy infrastructure in the heart of Vaca Muerta. Its goal is to meet the growing demand for transport, storage, and energy services generated by hydrocarbon activity and its value chain.

Within this framework arises the 80 MW Solar Park Project, a strategic development that seeks to address one of the region's main current limitations: the electricity distribution network operated by EPEN (Provincial Energy Entity of Neuquén) has no additional transmission capacity and, therefore, cannot supply the energy required by new industries and services. This bottleneck has become a structural barrier to Añelo's growth and to the entire energy hub.

The solar park is conceived as the direct solution to this restriction. It will be developed within the Energy District, ensuring territorial integration, access to logistics infrastructure, and synergy with the overall masterplan. The project foresees the installation of 80 MWp of photovoltaic solar capacity, with an estimated annual generation of 170 GWh, through a dedicated 132/220 kV substation connected to the Argentine Interconnection System (SADI). In this way, dependence on EPEN's provincial grid is overcome, enabling a new sustainable source of supply for industrial, logistics, and energy companies.

The proposal addresses two fronts simultaneously. On one hand, it responds to the urgent need for more energy in Añelo to sustain productive expansion linked to Vaca Muerta. On the other, it diversifies the province's energy matrix with a large-scale renewable contribution, helping meet the national target of covering 20% of electricity demand with clean sources by 2025, according to Law 27.191.

With an estimated budget of USD 85 million, the financial model foresees contributions from TBSA (200 ha in the center of Vaca Muerta), international financing, and PPA contracts with private clients. The project projects an IRR of 12–14% and a payback period of seven years, with secured revenues both from sales to CAMMESA under the MATER regime (Renewable Energy Term Market) and from bilateral contracts with regional companies.

In conclusion, the 80 MW Solar Park is not only a renewable venture but also a concrete response to EPEN's inability to provide more energy in the area. Its construction will guarantee the energy security needed to sustain Vaca Muerta's industrial and logistics development, while positioning Añelo as an integrated, diversified, and sustainable energy hub.

## 2. MARKET STUDY

### 2.1 PRODUCT

The project consists of an 80 MWp photovoltaic solar park located within the Añelo Energy District, Neuquén. Its objective is to generate clean and reliable energy to meet the growing demand of the industrial, logistics, and residential sector of Vaca Muerta, where EPEN cannot deliver additional capacity. The main product is renewable electricity, injected into the SADI



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(Argentine Interconnection System) and marketed through the MATER regime and private energy purchase agreements (PPAs – Power Purchase Agreements).

## 2.2 ENERGY DEMAND

The Añelo region, the epicenter of Vaca Muerta's development, is undergoing an unprecedented process of economic and population expansion. Hydrocarbon activity, the establishment of logistics parks, and accelerated urbanization are driving a growing and sustained energy demand that already exceeds the capacity of the distribution network managed by EPEN (Ente Provincial de Energía del Neuquén). At present, the area's electrical system presents a structural supply deficit that limits the installation of new industrial ventures and generates additional costs for companies, which must resort to partial solutions such as diesel generation, gensets, and spot contracts.

Over the last five years, electricity demand in Añelo and its surroundings has grown at rates above eight percent annually, driven mainly by drilling, fracturing, and unconventional well exploitation operations. Projections indicate that in the next ten years, electricity consumption will double, rising from the current estimated level of around 400 GWh annually to approximately 800 GWh by 2035. Load peaks are concentrated in the winter months, when heating needs combine with pumping and industrial operation requirements.

The main energy consumers in the area are the oil and petrochemical industries, which require stable and reliable supply; oilfield service providers such as sand plants, pumping, transportation, and logistics; logistics complexes and industrial parks that concentrate consumption in cold storage, lighting, and loading/unloading processes around the clock; and finally, the urban growth of Añelo, which generates greater residential consumption and demand from public services such as schools, hospitals, and retail.

The current restrictions of the system are explained by the limitations of EPEN's distribution network, which lacks additional capacity, the absence of investments in new substations and transmission lines designed for a much smaller scale of consumption, and the reliance on thermal generation to cover demand peaks, which implies high costs and low environmental sustainability.

Faced with this deficit scenario, large consumers show a marked interest in obtaining reliable, dollarized supply contracts with predictable prices, in addition to sustainable solutions aligned with their environmental and governance commitments. The most attractive alternative is the development of renewable generation projects, especially solar or wind, which can even be integrated with storage systems. An 80 MW solar park in Añelo can cover a volume close to 170 GWh annually, which represents between twenty and twenty-five percent of the current demand of the area, with the potential to secure long-term contracts with industrial and logistics clients.

In conclusion, Añelo's electricity demand is growing, structural, and long-term. The current system is saturated and restricts new industrial investments. This creates a clear opportunity for



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local renewable generation projects that can provide clean, stable, and competitive energy, while also enabling the signing of power purchase agreements (PPAs) with large consumers. The combination of infrastructure deficit, pressure from economic growth, and sustainability needs makes the region a strategic case for the installation of a utility-scale solar park.

### **2.3 SUPPLY**

Renewable energy in Patagonia is concentrated in wind parks (Chubut, Santa Cruz). Neuquén has very low solar penetration. Thus, local competition is limited, and the Añelo Solar Park's strategic location near consumers is its key advantage. Substitutes (thermal fossil energy) are more costly and less sustainable.

### **2.4 PRICE**

The expected sales price of the energy is between 50 and 55 USD/MWh in the MATER market and between 60 and 65 USD/MWh in private contracts signed with companies in the area, depending on terms and credit risk. These values allow for attractive margins, considering the decrease in photovoltaic equipment costs over the past five years.

### **2.5 DISTRIBUTION AND COMMERCIALIZATION**

The energy generated will be injected directly into the SADI through a 132 kV step-up substation within the district. The commercialization strategy will focus on long-term power purchase agreements (PPAs) with oil, logistics, and industrial companies, ensuring stable income in U.S. dollars. At the same time, part of the production will be allocated to the MATER market, taking advantage of the obligation of large consumers to meet renewable consumption quotas.

The commercialization model of the energy produced by the 80 MW solar park in Añelo relies on a hybrid scheme that seeks to balance long-term contractual security with the flexibility to capture market opportunities. This strategy is key to guaranteeing stable revenues, covering project financing, and at the same time maximizing profitability in scenarios of price volatility.

#### **Renewable Energy Term Market (MATER)**

The MATER is one of the pillars of the commercial scheme, as it allows the energy produced to be injected into the Argentine Interconnection System (SADI) and sold to large users under contracts denominated in U.S. dollars. These users are required to comply with Law 27.191, which sets the goal of sourcing twenty percent of their consumption from renewable energies by 2025.

The average reference prices in this segment range between 50 and 55 USD/MWh, with the advantage of bankable, long-term contracts. Although competition for transmission capacity is high, Añelo holds a strategic advantage by being located in a region where demand is growing rapidly and structurally.

#### **Bilateral Contracts (PPA – Power Purchase Agreements)**



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Another fundamental avenue is bilateral agreements signed directly with industrial, energy, and logistics companies established in Vaca Muerta. These long-term contracts make it possible to set prices in a range higher than MATER, between 60 and 65 USD/MWh, thanks to the added value of physical proximity and the supply security provided by the solar park. PPAs contribute to income stability, reduce exposure to regulatory volatility, and build trust-based relationships with large consumers, who seek cost predictability and renewable origin certification of the energy. In addition, since these are actors with a strong presence in the hydrocarbon value chain, these contracts guarantee the placement of a significant portion of the park's production.

### **Wholesale Electricity Market (MEM)**

As a base alternative, the project can inject energy into the Wholesale Electricity Market. In this case, the average reference prices are around 48 USD/MWh, making it the most conservative scenario. The MEM is useful for placing surpluses not committed under bilateral contracts or when the park's commercial strategy requires additional flexibility. However, given its lower profitability, it does not constitute the main pillar of the strategy, but rather a complement to ensure the sale of all the energy generated.

### **Premium Segments**

The project also considers the possibility of accessing premium marketing segments. These include contracts with proximity premiums—valued by consumers who prioritize local supply and security of supply—agreements linked to ESG (Environmental, Social and Governance) criteria, and schemes indexed to inflation or to international energy prices. Such contracts can drive revenues to even higher levels, consolidating the solar park as a strategic and differentiated supplier in the region. In this segment, prices can exceed 65 USD/MWh and fall within the highest profitability range.

### **ENERGY PRICE**

The market references considered come from the MATER (Renewable Energy Term Market) and the MEM (Wholesale Electricity Market), as well as from the behavior of relevant variables (energy, capacity, transmission) published by CAMMESA.

Based on these frameworks, price bands in USD/MWh are modeled for both PPA and MATER scenarios, consistent with cost signals and the renewable consumption obligation of Large Users.



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PRICE SCENARIOS	PRICE (USD/MWh)	NET GENERATOR (GWh/año)	REVENUES (USD/año)	EBITDA ~ (USD/año)
Conservative (Seasonal MEM / Low MATER)	48	164.1	7876848	6526848
Base (Conservative MATER / PPA)	55	164.1	9025555	7675555
High (Local PPA with proximity premium)	62	164.1	10174262	8824262
Very High (Premium PPA, ESG + indexation)	65	164.1	10666565	9316565

### YEAR PROJECTION (BASE SCENARIO)

YEAR	NET GENERATOR (GWh)	REVENUES (USD)
1	164.1	9025555
2	163.28	8980427
3	162.46	8935525
4	161.65	8890847
5	160.84	8846393
6	160.04	8802161
7	159.24	8758150
8	158.44	8714359
9	157.65	8670787
10	156.86	8627433

### 3. CORPORATE STRUCTURES FOR PARTICIPATION

The 80 MW Solar Park in Añelo, developed by TBSA Toro Brokers S.A., is a project designed to address the structural electricity supply deficit in the Vaca Muerta area. With an annual projected generation of 164 to 170 GWh, the park will provide reliable renewable energy in one of the fastest-growing industrial regions of Argentina. The initial investment amounts to USD 85 million, with a financial structure based on 70% debt and 30% equity. The expected internal rate of return is between 12% and 14%, with payback periods ranging from seven to eleven years, depending on the commercialization and financing scheme adopted.

In terms of investment, the project offers several corporate and contractual structures to adapt to different investor profiles:



The first option is participation through direct equity in the Special Purpose Vehicle (SPV). In this scheme, investors subscribe shares in the company whose sole asset will be the Añelo Solar Park. The SPV is structured as an Argentine corporation with professional corporate governance, a transparent corporate charter, and audited accounts. The investor receives dividends proportional to their participation while also benefiting from the long-term revaluation of the asset. This format is the most straightforward for those wishing to be directly involved in the project's ownership.

The second option is strategic equity linked to PPAs, aimed at industrial and logistics companies operating in Vaca Muerta. Under this structure, the investor not only participates as a shareholder but also signs a long-term dollar-denominated electricity supply contract, securing their future consumption at predictable prices (USD 60–65/MWh) with proximity premiums. From a corporate standpoint, this investor may join the SPV's board of directors and have additional control rights over operations, aligning their financial investment with their interest as an anchor client.

The third option is convertible debt into equity, a hybrid structure in which the investor initially enters as a creditor of the SPV, financing part of the CAPEX with a structured loan. The issuance contract provides that, once certain conditions are met, this loan can be converted into equity. This mechanism reduces the investor's initial risk and offers the possibility of becoming a partner in the project once it is operational and generating stable cash flows.

A fourth alternative is a joint venture or strategic alliance, involving the formation of a new company together with TBSA for the development and operation of the park. In this format, the parties agree on capital contributions and define shared governance, distributing profits and responsibilities according to the shareholders' agreement. This scheme is particularly attractive for utilities, international energy companies, or infrastructure funds seeking an active presence in the region.

A fifth option is participation by infrastructure funds or private equity, which typically enter through investment vehicles structured as Limited Partnerships or financial trusts. These funds inject capital into the SPV or an intermediate holding and maintain their participation for a horizon of five to ten years, then exit by selling to strategic or institutional investors. This mechanism is accompanied by predefined exit clauses such as drag along, tag along, or buy-back mechanisms included in the shareholders' agreement.

Finally, financial or virtual PPAs are considered as a form of contractual investment. In this case, the investor acquires dollar-denominated renewable energy contracts backed by origin certificates (I-REC), without physically consuming the electricity. These contracts operate as indexed financial instruments, with resale or hedging value against spot prices, and constitute an asset that contributes to the ESG policy of participating companies.



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Each of these modalities can be structured within a flexible legal and corporate framework, adapted to Argentine jurisdiction but aligned with international corporate governance standards. The SPV may issue Class A and B shares to differentiate voting and dividend rights, issue subordinated convertible debt, and establish shareholders' agreements that guarantee minority rights, anti-dilution clauses, and clear exit mechanisms.

In conclusion, the 80 MW Solar Park in Añelo offers international investors a wide range of participation options: direct equity in the SPV, strategic equity linked to PPAs, convertible debt, joint ventures with shared governance, infrastructure fund participation with defined exit horizons, or contractual investment via financial PPAs. This range of alternatives ensures that both institutional and industrial investors can find the format that best suits their risk profile, strategic objectives, and return expectations, within a solid project with dollarized revenues, low operating risk, and strong appreciation potential in the context of Argentina's energy transition.

#### 4. SUPPLIERS

The main inputs are solar panels, inverters, transformers, mounting systems, and high-voltage electrical equipment. The suppliers come mainly from China, Europe, and the United States, with leading manufacturers such as Longi, Trina, and Jinko. The bargaining power of suppliers is medium: the market is broad and competitive, but it is subject to international fluctuations in prices and logistical availability.

#### 5. TECHNICAL AND OPERATIONAL ASSUMPTIONS

PARAMETER	VALUE
Installed capacity (MWp)	80
Annual generation P50 (GWh)	170
Operational availability	98.5%
Assumed curtailment	2.0%
Annual degradation	0.5%
Useful life (years)	25
Connection	Own substation 132/220 kV – SADI (Argentine Interconnection System)

#### 6. LEGAL AND REGULATORY ASPECTS

The project must comply with **National Law 27.191 on Renewable Energies**, which requires large companies to consume at least 20% renewable energy by 2025. It must also adhere to the environmental and land use regulations of the Province of Neuquén. There are fiscal and financial benefits associated with renewable energy promotion regimes, such as accelerated depreciation, tariff exemptions on equipment imports, and access to **FODER** (Renewable Energy Development Fund). In addition, authorization from **ENRE** (National Electricity



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Regulatory Agency) and **CAMMESA** (Wholesale Electricity Market Administrator) will be required for connection to the SADI.

## 7. MATERIAL AND HUMAN RESOURCES

The project is estimated to require around **320,000 solar panels of 500 W, 100 central inverters**, transformers, high-voltage cabling, and a 132 kV substation. The civil works will occupy approximately 160 hectares within the Energy District. During the construction phase, about **200 workers** will be employed, including engineers, technicians, operators, and logistics staff. In steady-state operation, **25 specialized employees** will be required for operation and maintenance. Training programs are planned in photovoltaic systems, SCADA, and environmental safety.

## 8. FINANCIAL PROFITABILITY

The 80 MW Solar Park Project in Añelo constitutes a strategic investment opportunity in one of the most dynamic economic and energy hubs in Argentina. The proposal combines scale, location, and market conditions that make it a highly attractive financial development with a strong impact on the transition toward clean energy within the Vaca Muerta region.

The project is based on an initial investment of approximately 85 million dollars of investment capital **CAPEX (Capital Expenditure)**. This amount includes the purchase of main equipment, such as photovoltaic modules and transformers, in addition to all costs associated with construction, civil works, interconnection to the **Argentine Interconnection System (SADI)**, the 132/220 kilovolt step-up substation, **SCADA (Supervisory Control and Data Acquisition)** remote monitoring and control systems, engineering, regulatory permits, and a contingency reserve for unforeseen events. It is a robust but balanced initial investment considering the magnitude of the park and the expected level of energy production.

This initial investment is complemented by a very low annual operating cost relative to the size of the project. The annual operating expense **OPEX (Operational Expenditure)** is estimated at around 1.35 million dollars. This expense covers preventive and corrective maintenance, replacement of critical spare parts, insurance, comprehensive operation of control systems, and site surveillance. The relationship between high CAPEX and reduced OPEX is highly advantageous, since it ensures that a significant portion of gross income is directly transformed into operating results, that is, into profits before interest, taxes, depreciation, and amortization **EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization)**, available for debt repayment and profit distribution to shareholders.

The net electricity production of the park, after discounting losses due to technical unavailability and dispatch cuts (curtailment), is estimated at around 164 gigawatt-hours (GWh) per year, equivalent to supplying tens of thousands of households in the region. This figure is calculated based on a technical availability of 98.5% and an estimated curtailment level of just 2%, which reflects both the reliability of the technology and the quality of solar resources in the Añelo area.



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In terms of revenue, the commercial strategy and the ability to secure energy sales contracts are decisive. In a conservative scenario, based on reference market prices similar to the **Seasonal Energy Price (MEM – Wholesale Electricity Market)** or the lower bands of the **Renewable Energy Term Market (MATER)**, values hover around 48 dollars per megawatt-hour (USD/MWh). In this case, the park would achieve annual revenues of 7.9 million dollars, with EBITDA close to 6.5 million.

In an intermediate or base scenario, representative of forward contracts signed under MATER or long-term dollar-denominated energy purchase agreements known as **Power Purchase Agreements (PPA)**, the selling price is around 55 USD/MWh. Under these conditions, revenues would reach 9 million dollars and EBITDA would stand at around 7.7 million.

Finally, in the most favorable or premium scenarios, which include private contracts with large industrial users in the Vaca Muerta and Añelo area, either through PPA with proximity premiums or contracts linked to **ESG (Environmental, Social and Governance)** objectives, projected prices range between 62 and 65 USD/MWh. Under this framework, revenues would exceed 10.5 million dollars and annual EBITDA would be around 9.3 million. This price range is what ensures differential profitability, since industrial users value both supply security and the sustainable component of the contracted energy.

The project's **LCOE (Levelized Cost of Energy)** is estimated at 65.3 USD/MWh, taking as reference a **WACC (Weighted Average Cost of Capital)** of 10% and a useful life of 25 years. This means that under low-price scenarios or even in the base scenario, financial margins are tight, since the selling price is at similar or lower levels than the levelized cost. However, when accessing premium contracts in the 62–65 USD/MWh range, the positive difference between selling price and LCOE translates into an attractive and sustainable **IRR (Internal Rate of Return)**.

In the base scenario, the annual EBITDA of 7.7 million dollars would lead to a simple payback of the investment in approximately 11 years. However, the financial model of the project contemplates a payback of around 7 years, which is feasible only under two conditions: first, securing private PPA contracts in the premium price range, and second, implementing a leveraged financing structure with debt that reduces the need for equity and accelerates returns on invested capital.

In a ten-year horizon, even without financial leverage or tax benefits, the base scenario accumulates an EBITDA close to 74 million dollars, which demonstrates the strength of the cash flow and the project's ability to sustain its operation throughout its entire useful life, even considering the progressive degradation of solar modules.

The financial indicators reinforce the attractiveness of the project. The projected IRR is in the range of 12 to 14%, fully competitive compared to renewable energy projects in Latin America.



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The net present value (NPV) reaches approximately 25 million dollars, confirming that, under high selling price assumptions, the investment generates consistent and additional value.

Sensitivity analyses show that a  $\pm 10\%$  variation in CAPEX impacts IRR by only 1 to 1.5 percentage points, while a change of  $\pm 5$  USD/MWh in the energy price implies an adjustment of  $\pm 0.8$  million dollars in annual EBITDA. This demonstrates that the most determining factor of profitability does not lie in the initial investment or in operating expenses, but in the capacity for commercial and contractual management, particularly in the negotiation of contracts with large users.

In conclusion, the 80 MW Solar Park in Añelo is a project with solid fundamentals and highly attractive profitability potential in premium contract scenarios. Under low MATER prices, the project remains viable, albeit with tighter returns and longer payback periods. However, by securing private dollar-denominated PPAs at competitive prices, and complementing the structure with international financing that optimizes leverage, the project becomes a safe, profitable, and strategic investment opportunity, with sustained returns over time and a privileged positioning within the Añelo Energy District, the core of Patagonia's energy expansion and the transition toward renewable sources in Argentina.

## 9. INVESTMENT (CAPEX) – BREAKDOWN

Table. CAPEX Structure (USD 85 million)

CONCEPT	SHARE %	AMOUNT (USD)
PV Modules (LONGi/Trina/Jinko)	38.0	32300000
Central Inverters	8.0	6800000
Structures and Trackers/Fixed	12.0	10200000
Civil Works (earthworks, roads)	6.0	5100000
Balance of System (DC/AC, cabling)	7.0000000000000001	5950000
Step-up Substation 132/220 kV	7.0000000000000001	5950000
Interconnection and SADI Protections	4.0	3400000
SCADA, Communications and Security	2.0	1700000
Engineering, Management and QA/QC	3.0	2550000
Development Expenses and Permits	2.0	1700000
Owner's Costs	2.0	1700000
Contingencies (7%)	7.0000000000000001	5950000
Interest During Construction (IDC)	1.0	850000
EPC Margin	1.0	850000

## 10. OPERATING COSTS – OPEX AND O&M (Operation and Maintenance)



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An annual reference cost for Operation and Maintenance (O&M) of approximately **USD 1,350,000** is projected, including preventive/corrective maintenance, critical spare parts, insurance, SCADA, and security.

The cost methodology and its monitoring are aligned with the average and variable cost criteria published by **CAMMESA** for the MEM, adapted to renewables and PPA/MATER schemes.

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## RISKS AND MITIGATION

The main risks are regulatory, exchange rate, and technical. At the regulatory level, possible changes in national energy policy could affect commercialization; this will be mitigated through long-term dollar-denominated contracts under the MATER regime. The exchange rate risk is naturally covered with dollarized revenues.

Regarding technical risks, dependence on international suppliers may cause delays; this will be mitigated by diversifying suppliers and maintaining strategic stock inventories. Climatic risks such as hailstorms are also considered, mitigated through specialized insurance, although in the area where the park would be installed, such weather phenomena are not common.

ACRONYM	MEANING
MATER	Renewable Energy Term Market
CAMMESA	Wholesale Electricity Market Administrator Company (Compañía Administradora del Mercado Mayorista Eléctrico S.A.)
MEM	Wholesale Electricity Market
SADI	Argentine Interconnection System
EPEN	Provincial Energy Entity of Neuquén
ENRE	National Electricity Regulatory Entity
PPA	Power Purchase Agreement (Energy Purchase Contract)
PDI	Interconnection Point
REF A	Referential A (dispatch capacity $\geq 92\%$ annually, Res. SE 360/2023)
BESS	Battery Energy Storage System
O&M	Operation and Maintenance
EPC	Engineering, Procurement and Construction
CAPEX	Capital Expenditure (Initial Investment)
OPEX	Operating Expenditure
SCADA	Supervisory Control And Data Acquisition
LCOE	Levelized Cost of Energy
WACC	Weighted Average Cost of Capital
IDC	Interest During Construction





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