Invitation to Chinese EPCF partners

Inside the solar plant 100 MWp

Explore an Iranian solar project from module to grid. We invite a priced turnkey proposal covering engineering, procurement, construction and finance.



Isometric view

Site status

Regional screening

Delivery basis

Financed turnkey delivery

Engineering and finance concept

Energy Model Studio



100 MWp DC

Plant model

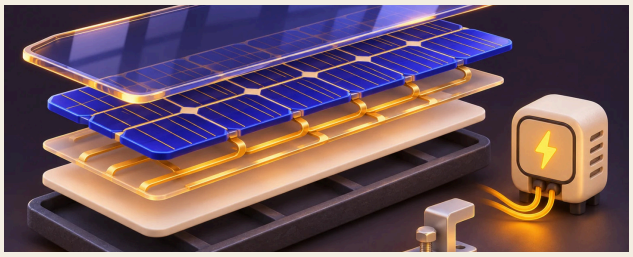
Concept model; the final site has yet to be selected.



DC array

Modules

Modules produce DC power. Their nameplate rating uses standard test conditions; actual power varies with irradiance and cell temperature.



DC/AC conversion

Inverter

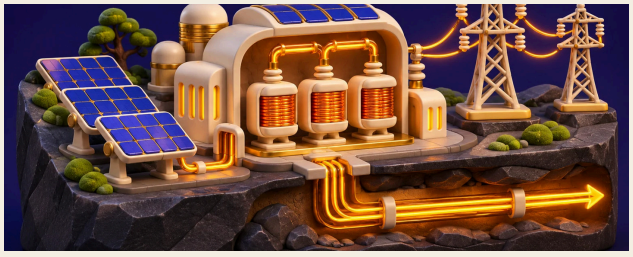
The inverter converts DC to AC. Output clips when the available input exceeds the inverter limit.



Power and energy

Storage

Power is rated in MW and energy in MWh. Quote usable energy, degradation and round-trip efficiency.



Delivery point

Substation

The transformer and line carry power to the delivery point. Metering, export limits and curtailment instructions determine the energy eligible for settlement.



Availability

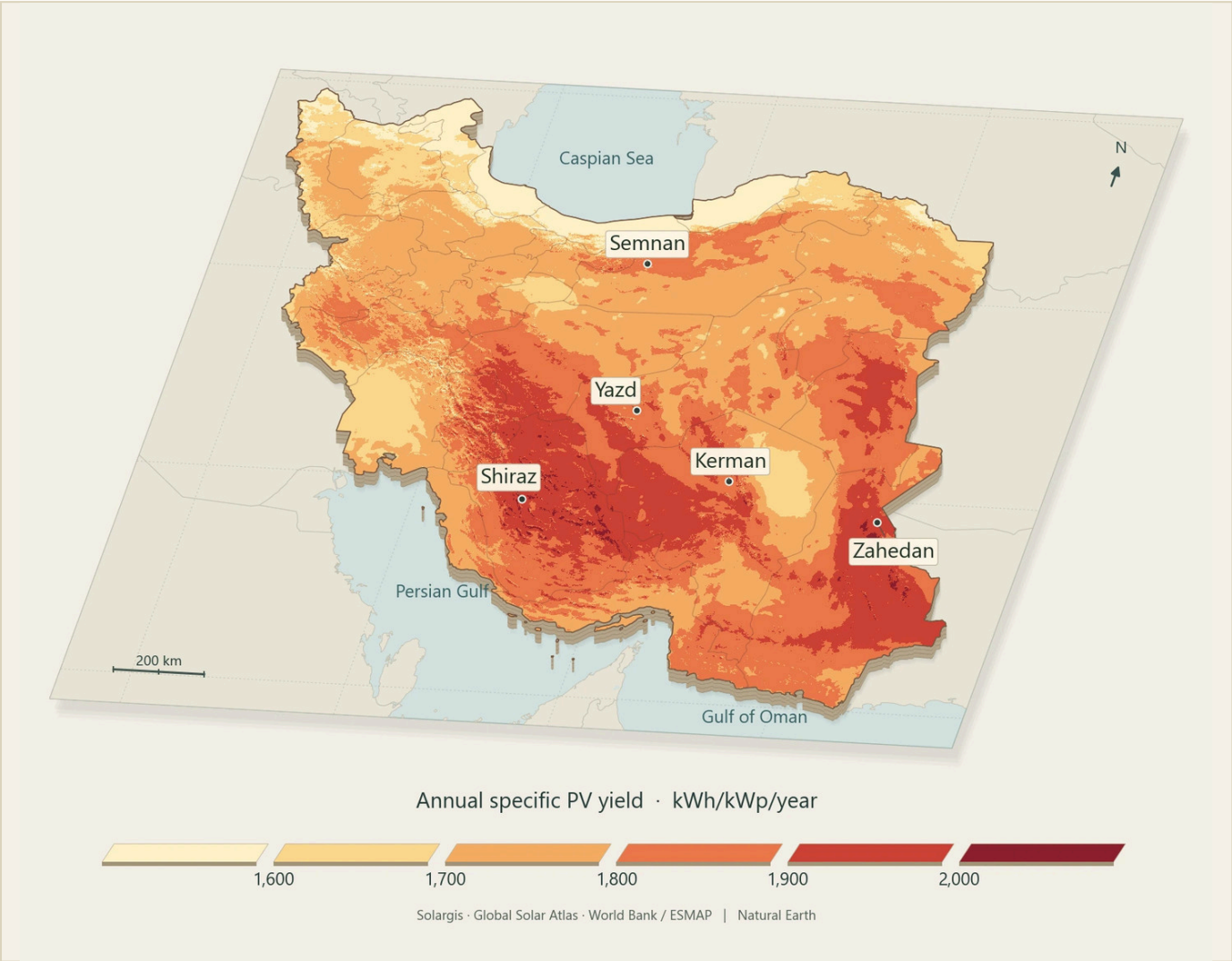
Field service

Cleaning and loss monitoring are adjusted to site conditions.

Solar resource atlas

Where could it be built?

The red scale maps modelled specific PV yield from the Global Solar Atlas. Compare regions at this stage. A parcel will be selected after the partner's technical and financial response.



Yazd	Kerman	Fars	Semnan	Sistan and Baluchestan
1,813	1,873	1,940	1,815	1,938

Values correspond to sample cells near the reference cities. Final design requires land, grid, dust and water assessments.

Solargis / Global Solar Atlas, World Bank–ESMAP. Long-term average for 1999–2018, released October 2019. Natural Earth boundaries. The constant thickness of the tilted model is purely illustrative.

Iran dataset · World Bank Boundaries · Natural Earth Data licence

Irradiance and performance

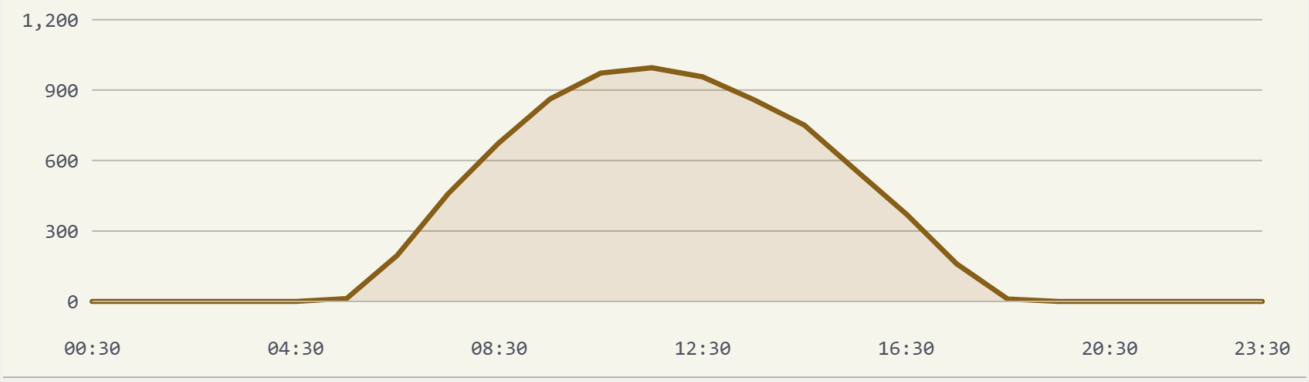
From sunlight to grid export

Select a month to see mean hourly global horizontal irradiance in a typical meteorological year and how daylight varies through the day.

June

Hourly irradiance

Monthly mean profile in the typical year, W/m²



995.4W/m² · 11:30Monthly irradiation 235.3 kWh/m² · Iran standard time · UTC+3:30



Dust and water in the operating budget

Navoi's appraisal estimated 4,620 m³ of water per year for wet cleaning. Choose a cleaning schedule using measured losses, rainfall, available water and the value of recovered output. Maintenance helps preserve performance; output still varies.

Primary source ↗

Power model

From module glass to the grid meter

Effective irradiance	800 W/m²	Cell temperature	50 °C

Panel output	73 MW
After inverter conversion	71.5 MW
After the line	70.5 MW
At the export meter	70.5 MW

The array is operating below both limits

Teaching scenario with 100 MWp of panels, −0.35%/°C temperature coefficient, 98% inverter efficiency, 80 MWac inverter capacity, 1.5% line losses and a 75 MW export limit.

This is instantaneous power. Energy sold depends on how long each operating condition persists.

PV model method · Sandia National Laboratories ↗

Select a component in this example with AC-coupled storage to see what it does.

Trace the power path

PV array
Modules produce DC power. Their nameplate rating uses standard test conditions; actual power varies with irradiance and cell temperature.

Inverter
The inverter converts DC to AC. Output clips when the available input exceeds the inverter limit.

AC bus
The inverter feeds the AC bus. In this example a separate storage branch can charge or discharge at the same bus.

Grid export
The transformer and line carry power to the delivery point. Metering, export limits and curtailment instructions determine the energy eligible for settlement.



Connection and power delivery

What does storage deliver?

SATBA reported a large-plant connection requirement of at least twenty per cent of capacity for two hours. On a 100 MW connection basis, the example gives 20 MW and 40 MWh. The connection approval determines the final basis.

SATBA connection requirements

Electricity sales in Iran

Who buys the electricity?

Choose a sales route to compare its pricing basis, contractual commitments and payment risk.

Delivery in Aug–Sep 2026 · Reported October 2026

Sell power on the green market

SATBA recorded an average market price of 66,452 IRR/kWh and over 479 million kWh traded. Revenue modelling requires a delivery month, contracted volume, fees and the short-delivery terms.

View source document

Article 16 · Iranian year 1405

A bilateral industrial contract

For eligible industrial users above 1 MW, the 1405 renewable obligation is 4%. SATBA set the Aban shortfall billing rate at 125,426 IRR/kWh. The plant's sale price depends on its contract and delivery terms.

View source document

Historical tender · July 2023

Pricing follows the specific tender

A specific SATBA call for private sites under the 4,000 MW programme cited a base tender price of 6.888 US cents/kWh. A new project needs its own valid call, payment period, settlement currency and contractual security.

View source document

Ministry directive · March 2026

Read the tariff capacity limits

The base PV tariff is 58,540 IRR/kWh up to 200 kW and 46,386 IRR/kWh above 200 kW through 1 MW. This table contains no row for the 100 MWp reference plant. Pricing at that scale requires the applicable ruling or contract.

View source document

Three prices, three uses

All figures are in IRR/kWh. The billing rate is a consumer charge. The other two values are historical market averages.

Green electricity · Aug–Sep 2026	66,452
Renewable certificate · Aug–Sep 2026	58,048
Industrial shortfall bill · Oct–Nov 2026	125,426

SATBA · Shahrivar 1405 market data SATBA · Industrial billing, Aban 1405

Project economics

Navoi's operating record

The contract used a 100 MW benchmark. The completed plant had 132 MWdc of modules and 115 MWac of installed equipment. Construction took one year.

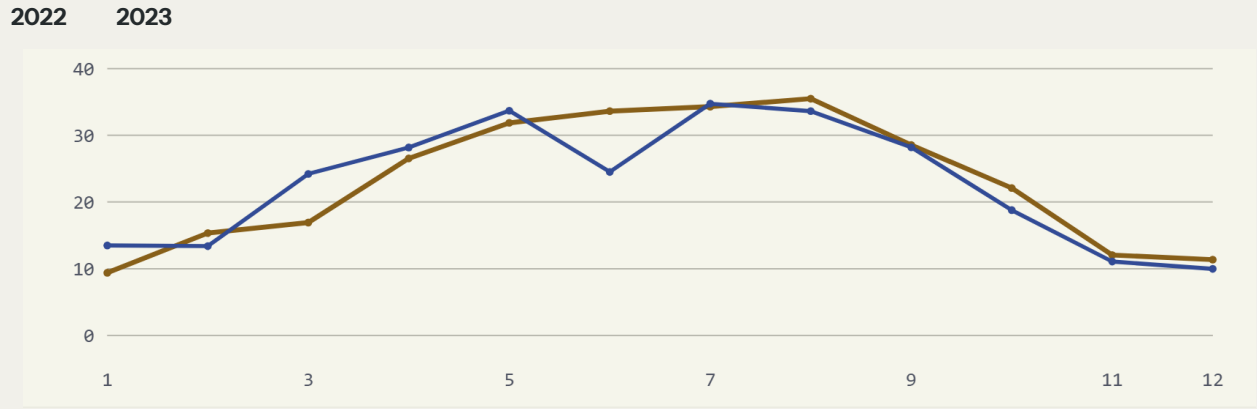


Engineering, procurement, construction	79.43
Financing costs	4.93
Other project costs	26.57

Historical completion-report figures. The residual is calculated from the total after EPC and disclosed finance costs.

Navoi annual net output

GWh delivered to the grid



July · 2022 — 34.29 / 2023 — 34.74 GWh

Completion report · World Bank, 2024

Opening position for negotiation

Capital and repayment

Use these proposed terms to price the offer. Land rights, the cash contribution and bank acceptance each require supporting documentation.

20%

Indicative cash contribution

Approximately one fifth in cash, with land costs on the Iranian side. Agree the percentage base, land value, remaining sources and equity split.

80%

Proposed cash sweep

Allocate four fifths of cash after costs and taxes until the USD debt is fully repaid. Define eligible costs, reserves and the account waterfall.

2%

Proposed annual rate

Two per cent per year on the outstanding balance. No fixed five-year maturity has been set. Submit your proposed tenor and principal and interest schedule.

Chinese export buyer's credit

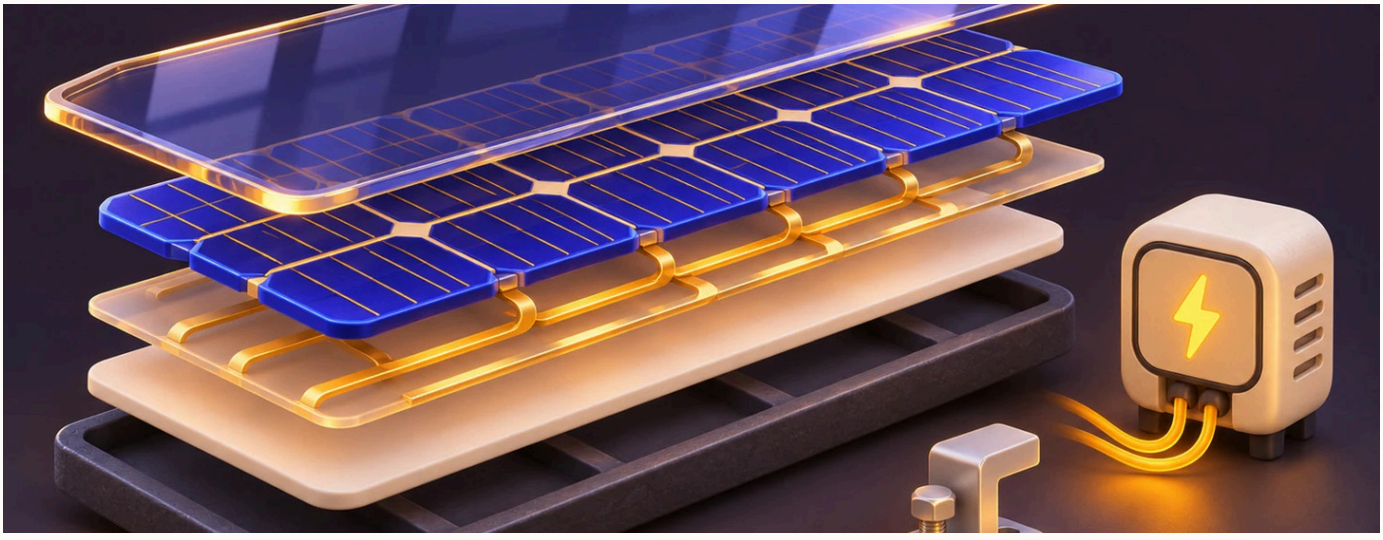
Agricultural Bank of China describes an initial letter of interest, followed by buyer review, agreement on the financed share, and signed loan and insurance contracts. Drawdown depends on conditions and documents. Acceptance of a specific Iranian project requires transaction-specific evidence.

Primary source ↗

Storage and offtake in Bukhara

Bukhara paired 250 MW of solar with a 63 MW / 126 MWh battery, equivalent to two hours at rated power. The agreement covers electricity sales for 25 years and pays for storage availability over 10 years.

Primary source ↗



Plant technology

On the component bench

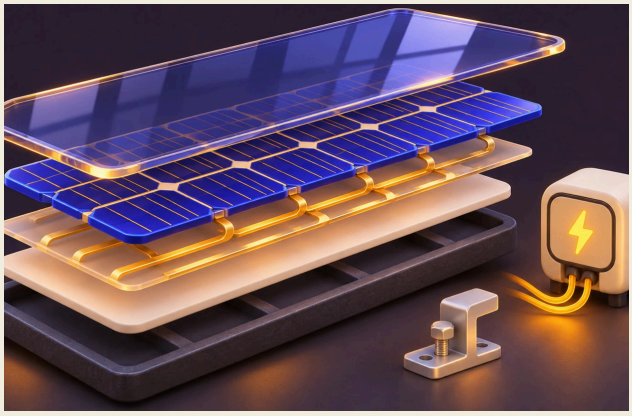
Two examples for comparing datasheets. Check module power, string voltage compatibility and AC output at site temperature for the chosen design.



LONGi · Hi-MO 9

List manufacturer, model, production year, traceability and enforceable warranty terms.

Primary source ↗



SUNGROW · SG350HX

Two examples for comparing datasheets. Check module power, string voltage compatibility and AC output at site temperature for the chosen design.

Primary source ↗



Storage and cell replacement

Specify power, usable energy, guarantor, efficiency, cycling limits and replacement cost.

Primary source ↗

Research dossier

Who pays for electricity in Iran?

For a 100 MWp solar plant, a revenue model starts with a buyer, a product and a delivery period. An industrial power purchase agreement, an exchange sale and an award under a government call each create different obligations. The industrial buyer's qualifying consumption determines its obligation; the generator's module capacity does not establish it.



Route and price basis	Evidence and application
Article 61 feed-in tariff	The 30 March 2026 circular (10 Farvardin 1405) set base prices of IRR 58,540/kWh for solar up to 200 kW, IRR 91,169/kWh for the qualifying storage-equipped category at that size, and IRR 46,386/kWh above 200 kW through 1 MW. The table contains no 100 MW category.
Green power and certificates	In Shahrivar 1405 (August–September 2026), green electricity traded at an average IRR 66,452/kWh on volume exceeding 479 million kWh. The same report put renewable-generation certificates at IRR 58,048/kWh. Identify the instrument and delivery period when comparing prices.
Industrial bill and bilateral sale	SATBA set IRR 125,426/kWh for the shortfall against the 4% renewable obligation in the Aban 1405 bills (October–November 2026) of qualifying industrial customers above 1 MW. The seller's proceeds depend on its contract price, delivered volume and network charges.
Article 12 fuel savings	A SATBA call for privately owned land on 3 Mordad 1402 quoted 6.888 US cents/kWh. Conversion into local currency, the repayment period and subsequent payments follow the terms of that specific award.

For each settlement period, base revenue on net energy accepted by the actual buyer. Assign ownership of the power, the certificate and the bill saving before combining cash flows, so the same benefit enters the model once.

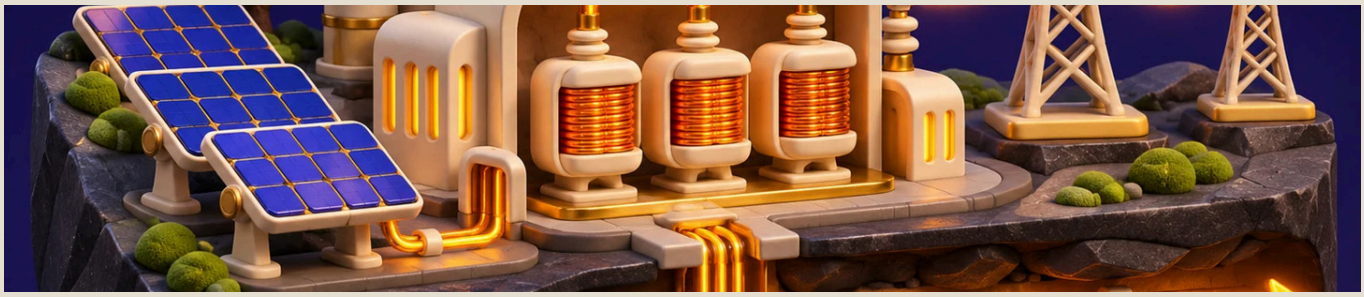
Sources for this section

Ministry of Energy · tariff circular · SATBA · Shahrivar market results · SATBA · Aban industrial bill · SATBA · 2023 Article 12 call

Research dossier

From a resource map to a buildable parcel

The World Bank's solar atlas can screen regions and compare solar resource and specific yield. A buildable layout requires the parcel's legal boundary, drainage channels, slope, flood exposure, heavy-vehicle access, line easements and substation capacity on a common plan.



Question	Effect on selection and cost
Gross and usable land	Reserve setbacks, drainage, roads, the substation and row spacing. Navoi's appraisal allocated 268 hectares to a planned 130 MWp; 2.06 ha/MWp describes that plan and its site boundary.
Public land in Iran	Cabinet rules approved on 30 Ordibehesht 1405 require a qualification assessment and a performance guarantee. Covered land remains state-owned. During scheduled construction, annual rent is 20% of the assessed transaction value or regional price.
Export line and substation	Compare actual routes, lengths, voltages, available bays, substation upgrades and grid readiness dates for each candidate. A cheaper parcel can carry a more expensive grid connection.

Three records make a site comparison usable for procurement: a buildable-area plan, evidence of land and corridor rights, and the network operator's written position on the point and capacity of connection.

Sources for this section

World Bank · Iran solar resource maps Cabinet · land and equipment rules IFC · Navoi appraisal

Research dossier

How an annual energy estimate is built

In a worked example, 100 MWp equals 100,000 kWp. If net specific yield at the contractual meter is 1,650 kWh/kWp per year, expected production is 165 GWh per year. Deducting losses already included in that yield would understate production.



Quantity	Definition and check
MWp, MWac and the export limit	Module nameplate capacity under standard test conditions, inverter AC rating and permitted grid export are distinct inputs. Hourly output is constrained at the inverter and at the delivery point.
From irradiance to the meter	Transpose horizontal irradiance to the module plane. Apply temperature, shading, soiling, reflectance, wiring, inverter and transformer losses, outages and curtailment at the appropriate stage. Bifacial yield also depends on geometry and ground albedo.
Performance ratio and uncertainty	PR is final specific yield divided by the reference yield derived from plane-of-array irradiation. P50 and P90 are energy levels with 50% and 90% probability of exceedance, respectively. Specify a single-year or multi-year averaging period.

Monthly production and sensitivities to dust, curtailment and delayed grid access reveal repayment stresses that an annual total conceals. A reproducible estimate needs the model file, multi-year resource data, meter boundary and independent review.

Sources for this section

World Bank · Iran solar resource maps IFC · solar developer's guide Sandia · performance ratio

Research dossier

Grid connection, storage and acceptance tests

On 17 Aban 1405, SATBA's storage programme lead reported that grid-connection requirements for large solar plants include storage equal to at least 20% of plant capacity for two hours. The project-specific agreement must define the reference capacity, guaranteed usable energy and responsibility for network upgrades.



Test or asset	Evidence and acceptance condition
BESS sizing	If the operator confirms 100 MW as the reference, the sizing example is 20 MW of power and 40 MWh of usable energy. An 80 MWac reference produces 16 MW and 32 MWh. Obtain written agreement on the AC or DC basis and meter location.
Battery operation	Price the state-of-charge window, round-trip losses, degradation, cycle life, end-of-warranty capacity, safety systems and replacement. The contract should allocate charging-energy costs and define payment for energy or grid services.
Studies and handover	Assess peak and light load flow, a single equipment outage, short circuit, protection, harmonics and inverter dynamics. At handover, the capacity, availability and PR tests need agreed reference conditions and calibrated meters.

Operator-approved reference (MW) **100** Illustrative storage power and energy **20 MW / 40 MWh**

The calculation shows the effect of the selected assumption.

On 2 Aban 1405, SATBA described the detailed storage grid code as under development. Before ordering equipment, obtain the operator's latest written requirements, connection agreement and accepted manufacturer models.

Sources for this section

SATBA · storage power and duration SATBA · grid-code development IFC · solar developer's guide

Research dossier

What belongs in an EPCF budget?

EPC covers engineering, procurement and construction. The F can describe lending, deferred payment, equity or a duty to approach a bank. The agreements should identify the amount, debtor, security, drawdown date and consequence for construction if the financing is declined.



Financial item	Comparable scope
Construction and owner's costs	Itemise modules, inverters, structures, civil works, substation, export line, battery and commissioning. Add land and easements, studies, insurance, taxes and customs, owner's costs, contingency and interest during construction.
International benchmark	IRENA's July 2026 report gives a global weighted average installed cost of USD 667/kW and levelised cost of electricity of USD 44/MWh for utility-scale PV commissioned in 2025, both in 2025 dollars. Establish local scope and pricing independently.
Debt repayment	CFADS is cash flow available for debt service. The debt-service coverage ratio for a period is CFADS divided by the principal and interest due in that period. A late payment from the buyer or an inverter replacement can weaken the lowest monthly ratio.

FIDIC's Silver Book addresses turnkey EPC contracts. The lender's obligation comes from credit documents with their own effectiveness and drawdown conditions. Align quotation date, currency, capacity basis, taxes and work boundaries across bidders.

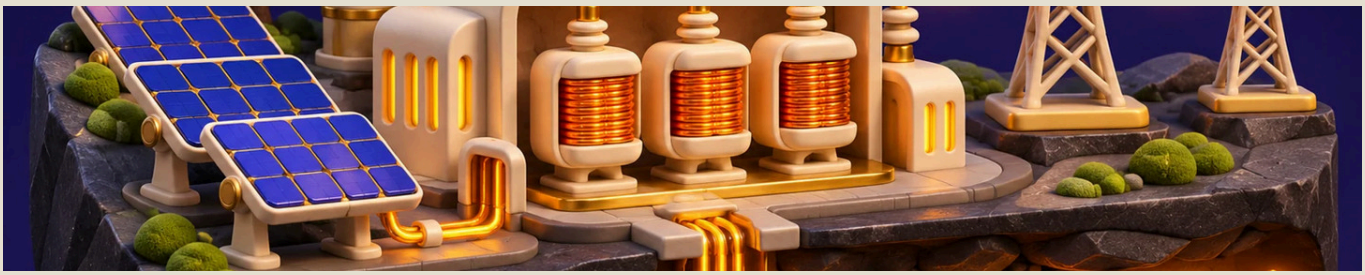
Sources for this section

FIDIC · Silver Book for EPC IRENA · 2025 cost report, figure S1 World Bank · power purchase agreements

Research dossier

Chinese lenders, export insurance and currency risk

With buyer's credit, a bank lends to an eligible importer, its bank or a sovereign borrower and pays the exporter against documents. With supplier's credit, the buyer pays later and the exporter may finance its receivables separately.



Document or exposure	How to evaluate it
Interest letter and bank commitment	Agricultural Bank of China describes its initial interest letter to an exporter as non-binding. Record the conditional offer, executed agreement, effectiveness, satisfaction of conditions precedent and first drawdown as separately evidenced events.
SINOSURE indemnity limits	The medium- and long-term product normally covers 2–15 years. The published maximum covers 95% for buyer's credit and 90% for supplier's credit, applied to the insured loss. The financing agreement determines the share of total project cost funded by debt.
Rial revenue and foreign-currency debt	If rial revenue is constant and the number of rials per unit of foreign currency rises 25%, the foreign-currency value of the revenue falls to 80% of its starting value. Model insurance, exchange-rate movement, transferability and collection timing separately.

Increase in rials per unit of foreign currency (%) **25** Foreign-currency revenue, % of starting value **80%**

The calculation shows the effect of the selected assumption.

On 6 Aban 1405, SATBA required an agent-bank letter to begin reviewing domestic funding requests. For an international structure, have the lender, insurer and counsel check the actual owners and counterparties, correspondent banks, currency, applicable restrictions, licences and repayment route as of the transaction date.

Sources for this section

Agricultural Bank of China · buyer's credit · SINOSURE · medium- and long-term cover · SATBA · domestic bank procedure · SATBA · FX repayment arrangements · US Treasury · Iran sanctions programme

Research dossier

Two projects with an auditable sequence of evidence

Navoi illustrates how contracted capacity and installed capacity can diverge. Cauchari documents the sequence from government approval to an actual export-credit disbursement.



Project and stage	Amount and evidence
Navoi, Uzbekistan	The World Bank completion report records 132 MWdc and 115 MWac installed against a contractual project indicator of 100 MW. The PPA was signed in November 2019. The buyer accepted 10 December 2021 as the commercial operation date.
Navoi, actual cost and energy	Reported total expenditure was USD 110.93 million including USD 79.43 million for EPC. Net electricity delivered reached 277.485 GWh in 2022 and 273.830 GWh in 2023. Comparisons with Iran need matching meter boundaries, technology, grid costs and PPA terms.
Cauchari, Argentina	A November 2017 decree approved the model USD 331.5 million China Exim loan agreement with the Argentine Republic. The government's Senate report records a first disbursement of USD 58.5 million on 18 May 2018. The contractor reports commercial authorisation in September 2020.

For a proposed Iranian 100 MWp project, seek four equivalent records: land and grid rights held by the project company, a collectable sales contract, reproducible costs and energy estimates, and credit documentation showing signature, effectiveness and drawdown status.

Sources for this section

IFC · Navoi appraisal | World Bank · Navoi completion report | Navoi project company · financial statements | Argentina · Decree 922/2017 | Argentina · government report to the Senate | POWERCHINA · Cauchari project record

Invitation to Chinese EPCF partners

Request for an EPCF proposal

The offer should let the buyer compare price, performance, delivery dates and the effective cost of finance on a consistent basis.

Bidder identity and role

Identify each manufacturer, contractor, financier and guarantor. Attach signing authority, consortium roles, comparable projects and verifiable references.

Technical scope and turnkey handover

For 100 MWp DC, price design, modules, structures, inverters, storage, transformers, substation, line, freight, installation, testing, connection, training and support. Specify AC capacity, export cap, scope interfaces and exclusions.

Itemised prices and specifications

For each item list manufacturer, model, production year, origin, rating or capacity, quantity, unit, unit and total prices, currency, delivery basis, lead time, validity and datasheet. Separate equipment, installation, grid and service costs.

Region, Iranian-side inputs and schedule

Assess provinces or regions at this stage. Land cost is allocated to the Iranian side. List required documents, permits, access, temporary utilities, taxes, customs and other Iranian actions. Schedule design, construction, shipping, connection and acceptance from a defined start point.

Production estimate, O&M and warranty

Use the atlas for regional screening. State resource, temperature, degradation, soiling, availability and curtailment assumptions. Define any performance guarantee by meter, test, exclusions and remedy. Price water, cleaning, spares, response times, training and local support separately.

Invitation to Chinese EPCF partners

Request for an EPCF proposal

Power sales and net returns

Consider all legally available sales routes. Compare collectible net cash after costs, payment delays, buyer risk and grid limits. Do not count a consumer billing tariff or avoided outage cost as project revenue without a contractual basis.

Contribution and settlement currency

The opening position is land at Iranian cost plus around 20% cash. Define the denominator, land valuation, ownership split, remaining sources and responsibility for any shortfall. Convert flows to one comparison currency, with rate, date and source. Obtain written bank confirmation of convertibility and transfer.

Repayment and USD debt balance

The proposed sweep is 80% of cash after costs and taxes until USD debt is extinguished, at a proposed 2% annually on the outstanding balance. Quote effective rate, fees, premium, grace period, proposed tenor and a principal/interest schedule for base and downside cases. There is no agreed five-year maturity.

Ownership, security and release

The preferred structure for discussion is temporary title to assets until the last instalment, followed by documented transfer. A share or receivables pledge is an alternative. Identify land and equipment title, revenue rights, lender rights, default, transfer and release under applicable law.

Detailed offer package

Attach a signed offer, priced bill of quantities, scope boundary drawing, schedule, guarantees, bank and insurer evidence, verifiable references and all conditions required of Iran. Identify each letter's binding status, drawdown conditions and quote validity.

Separate land rights from eligible equipment title. Confirm foreign-currency remittance with the bank and competent authorities.

Primary source ↗

Open the downloaded form on your computer, add equipment lines and save the completed copy for return through your business correspondence.

Sources and methods

Sources and methodology

Irradiance and typical-year method

European Commission · PVGIS TMY methodology
joint-research-centre.ec.europa.eu

PVGIS hourly data for Yazd city
re.jrc.ec.europa.eu

Iranian market and regulations

SATBA · Shahrivar 1405 market data
news.satba.gov.ir

SATBA · Industrial billing, Aban 1405
news.satba.gov.ir

Cabinet of Iran · Land and sales rules, 1405
media.dotic.ir

Ministry of Energy · Feed-in tariff, Farvardin 1405
media.dotic.ir

SATBA · Article 12 call, Mordad 1402
www.satba.gov.ir

Costs, contracts and financing

IRENA · Renewable power costs in 2025, figure S1
www.irena.org

Completion report · World Bank, 2024
worldbank.org

World Bank · Bukhara appraisal, 2023
worldbank.org

Agricultural Bank of China · Export buyer's credit
www.abchina.com.cn

Equipment datasheets

LONGi
www.longi.com

SUNGROW
info-support.sungrowpower.com