eFinancialModels

FINANCIAL MODEL CASE STUDY

Solar Park Valuation Case Study

How we prepared a fair market valuation of a Utility-Scale Solar Park to answer a Tax Authority request

A solar park loses value every year, because the years in which it can still earn money get fewer. A fair market valuation has to show that. A multiple of EBITDA (earnings before interest, tax, depreciation and amortisation) cannot.

KEY TAKEAWAYS

- A utility-scale solar park needed a professional fair market valuation to answer a request from a tax authority.
- What mattered most: the remaining PPA years and the PPA price, and a market discount rate set as an independent party would set it.
- Turning point: a solar park's fair value is a function of its remaining life, so a market multiple cannot stand in for a DCF.
- Outcome: a DCF valuation to the end of the park's lifetime, a cost estimate backed by the park's own operating data, and a valuation report.

At a glance

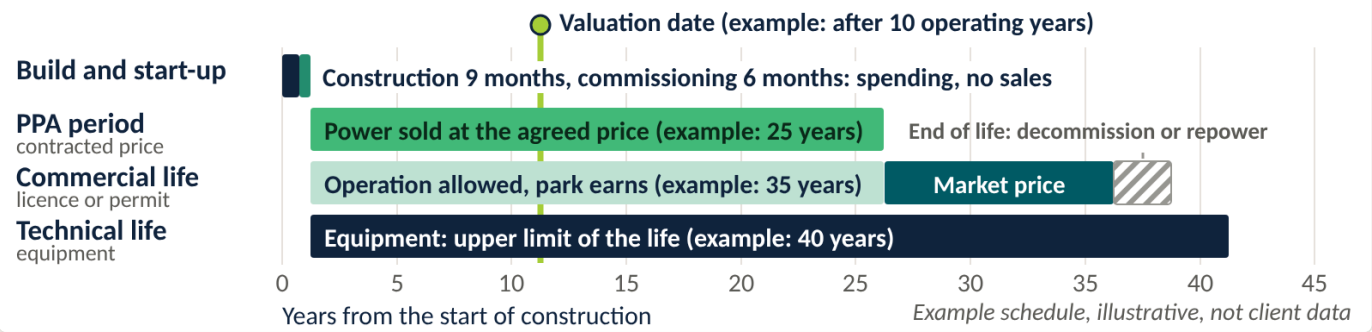
INDUSTRY	Solar energy (utility-scale)
CLIENT	Project developer who built the park
PURPOSE	Professional fair market valuation of an operating solar park, to answer a request from a tax authority
MODEL SCOPE	Free cash flows to the end of the lifetime; PPA revenue, market prices afterwards; tax incentives; market discount rate
DELIVERABLES	Valuation calculation and report

The situation

A project developer had built a utility-scale solar park. The park sells its electricity to a utility company under a long-term power purchase agreement (PPA) with a fixed price. A tax authority had made a request, and the answer needed a professional fair market valuation of the park. We collected all data of the park and the terms of the PPA, and built the valuation from there.

The life of the park on one timeline

Every valuation sits inside the schedule of the park, and each period earns differently. Construction (9 months) and commissioning (6 months) come first: money is spent and nothing is sold. The PPA period follows, for example 25 years, in which the contract sells the power at an agreed price. The licence or permit sets the commercial life, and the park earns until it ends. The equipment sets the technical life, the upper limit. After the commercial life comes the end of life: the park is decommissioned or repowered.



Lifetime timeline: bars on one time axis. The marker shows an example valuation date; the lifetimes are examples (illustrative, not client data).

What was at stake: Why a fair market view mattered

The valuation follows a fair market view: for each parameter, how an independent party would set it. It rests on the PPA terms, the park's own operating data and a market discount rate.

How a DCF values a solar park, and where the model comes in

A DCF values the park on the free cash it can still generate, discounted for risk, year by year to the end of its life.

1
Energy yield
The yield of the park, backed by its operating data, falling by 0.5% a year in the model through ageing.

2
Revenue
Electricity sold at the fixed PPA price for the remaining PPA years, then at market prices on the open market.

3
Costs and incentives
Operating costs, and tax incentives for the years they remain valid.

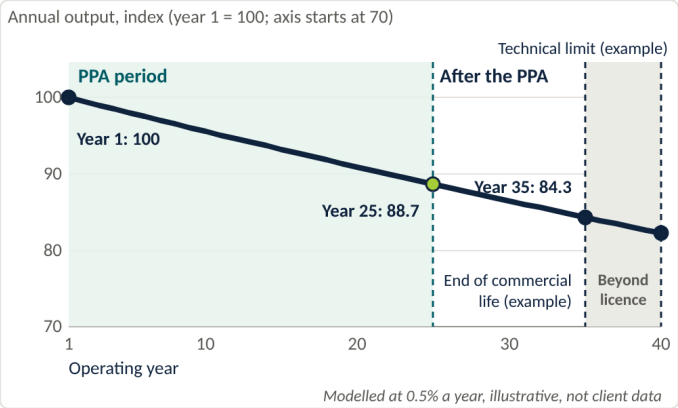
4
Free cash flow
The cash left each year until the end of the lifetime.

5
Fair value
The cash flows discounted at a market rate that reflects the risk and the opportunity cost of the asset.

Expected output: highest in year 1

The model assumes that panels age: output is highest in the first operating year and a little lower every year after. It reduces output by 0.5% a year; this is a modelling assumption, checked against the park's own yield data.

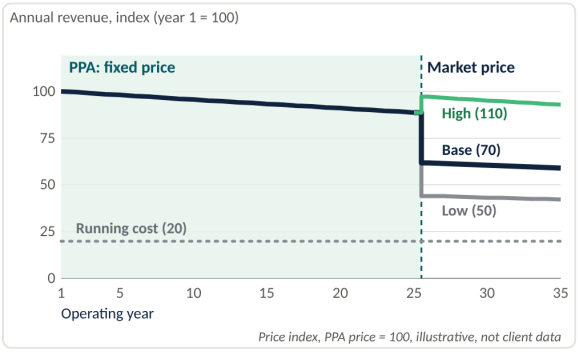
Over the 25 PPA years, output falls to about 89% of year 1. Running costs do not fall in step, so free cash flow falls faster than revenue. In this illustration, ageing lowers the value by about 5% compared with flat output.



Annual output, index (year 1 = 100), modelled at 0.5% a year; PPA period shaded (illustrative).

After the PPA: market prices, shown separately

After the PPA the park can still sell electricity, on the wholesale market at a forecast price. The model needs an explicit assumption for these years: a low, base and high price path, set as an index to the PPA price (100), with the running cost of the park deducted (index 20). The valuation shows PPA years and post-PPA years separately, so a buyer sees how much value rests on the contract and how much on market prices.



Revenue steps at PPA end; three market price paths (illustrative).

Scenario	Price index	First post-PPA revenue	Value: PPA years	Value: post-PPA years	Rests on market
Low	50	44	621	49	7%
Base	70	62	621	86	12%
High	110	97	621	159	20%

Fictional index values, 8% discount rate; 25 years remain, 15 under the PPA (illustrative, not client data).

What drives the value?

Two drivers move the value most: the remaining PPA years with the PPA price, and the discount rate. Four more follow, and the model tests each of them.

- **PPA years and price** decide how much revenue is contracted.
- **Discount rate** sets how much a later year is worth today.
- **Energy yield and ageing** 0.5% a year in the model.
- **Post-PPA price** low, base and high market price path.
- **Operating costs** backed by the park's own cost data.
- **Tax incentives** counted only for the years they stay valid.

What made it hard to model?

1 A valuation for a tax authority

DIFFICULTY A tax authority asks for a fair market value. The valuation has to follow a fair market view, with every parameter set the way an independent party would set it.

OUR SOLUTION For each parameter, we asked how an independent party would set it, so the value is a fair market view and not the view of a buyer or a seller.

2 A long-term fixed price

DIFFICULTY The PPA fixes the price for a long period. Its terms and the years still remaining decide most of the revenue, so every term has to be read and reflected correctly.

OUR SOLUTION We collected the PPA terms together with all data of the park, and built the revenue from the fixed price for the remaining PPA years and the park's yields.

3 A value that shrinks with age

DIFFICULTY Value depends on future free cash flows, and each year the remaining operating years get fewer. The model has to cover the whole life, not one year.

OUR SOLUTION We modelled the free cash flows year by year until the end of the lifetime, so that the value reflects the age and the remaining life of the park.

4 A market discount rate

DIFFICULTY There is no single correct discount rate. For a fair market view, it must reflect the risk of the asset and the opportunity cost of the capital invested in it.

OUR SOLUTION We analysed country and project risks and estimated a market discount rate, asking for each parameter how an independent party would set it.

5 Yields and operating costs need evidence

DIFFICULTY A forecast over the full lifetime is only as good as the evidence behind it. Both the yields and the operating costs have to be supported.

OUR SOLUTION The park had several years of operating data. We compared yields to substantiate the forecast, and used the park's own cost data to better support the estimated operating costs.

6 Tax incentives with an end date

DIFFICULTY The tax incentives are valid for a certain number of further years only, so they affect the cash flows for part of the period.

OUR SOLUTION We factored the tax incentives into the cash flows for the years in which they are still valid, and not for any year after that.

7 The period after the PPA

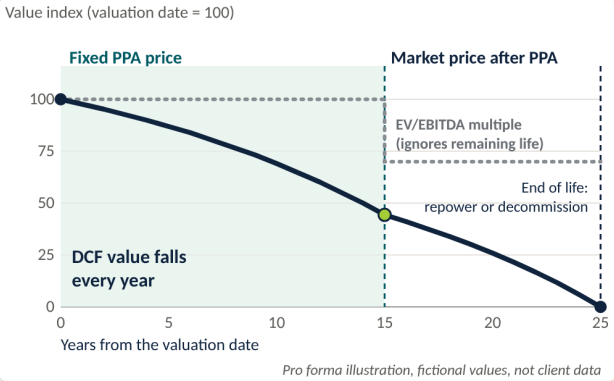
DIFFICULTY After the PPA ends, there is no contracted price. Because the park is connected to the electricity grid, it can sell on the open market, so the model needs an explicit price assumption for those years.

OUR SOLUTION From the year the PPA ends, we assumed sales at forecast market prices on the wholesale market, with a low, base and high price path and the running cost of the park, shown separately from the PPA years.

THE TURNING POINT

A solar park's value is a function of its remaining life

The key insight for the tax authority's question was that the fair value of a solar park depends on its remaining life. Each year removes one operating year, so under a DCF the park loses value every year. At the end of life, the park is decommissioned or repowered with new panels and a renewed licence. A market multiple cannot stand in for a DCF, because it does not know how many years are left. The park's own operating data also raised the quality of the cost estimate.



Pro forma illustration: DCF value falls with remaining life, an EV/EBITDA multiple does not (fictional values, not client data).

Why the assumptions belong next to the value

A valuation is only as strong as its weakest explained input. Showing the value next to the discount rate and the remaining life shows which assumption carries the result, and where a different view would change it.

What we built

INPUTS	CALCULATION MODULES	OUTPUTS
Park data and operating history	Revenue: PPA, then market	Free cash flows by year
PPA terms: price and term	Costs and tax incentives	Fair market value
Solar yields and degradation	Free cash flow to end of lifetime	Discount rate and its basis
Operating costs	Market discount rate	Valuation calculation and report
Tax incentive terms and market prices	Valuation and checks	

How we worked together

Step 1

Analyse and discuss

Analysed the data of the park and the PPA terms, and led the opening discussion.

Step 2

Plan yields and costs

Discussed solar yields and the cost structure, and checked the park's own operating data.

Step 3

Discount rate

Analysed country and project risks and set a market discount rate.

Step 4

Check and report

Double-checked the calculation and wrote the valuation report.

What came out of it?

The client has a fair market valuation built on the PPA terms, the remaining life, the operating data and a market discount rate.

- A fair market value of the solar park, based on free cash flows until the end of its lifetime.
- A yield forecast substantiated by several years of operating data, and a better supported cost estimate, with tax incentives and the post-PPA market price reflected.
- A split of the value into PPA years and post-PPA years, with a low, base and high market price path after the PPA.
- A market discount rate that reflects the risk and the opportunity cost of the asset.
- A valuation report with the analysis behind the numbers.

Lessons for solar park valuations

1. Read the PPA first. Its price and the years remaining decide most of the revenue.
2. Check the park's own operating data. It supports the yield forecast and gives the cost estimate better support.
3. Set the discount rate as a market view. For each parameter, ask how an independent party would set it.
4. Show PPA years and post-PPA years separately. A buyer then sees how much of the value rests on the contract and how much on market prices.

Questions your model must answer

1. How many PPA years remain, and at what price?
2. What price applies after the PPA ends?
3. How many operating years remain until panels must be replaced?
4. When does the operating licence have to be renewed?
5. What discount rate would an independent party set, and why?
6. Do the park's own yields and costs match the forecast?
7. How much does the output degrade per year?
8. Which tax incentives are still valid, and for how long?

Client details are anonymised to protect confidentiality. Charts, schematics and worked examples are illustrative and contain no client data.

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