

One ordinary solar deal, built properly

Most project finance content is about structure: how clever a capital stack can get. This series is about the build. Over ten posts I take one deliberately ordinary solar deal through the mechanics a lender-ready model has to get right, from the first kilowatt-hour to the term sheet, one mechanic at a time. This first post sets out the deal, the order the engine works in, how long it takes, where the deal lands, and the terms the series uses.

01 THE DEAL

Riverbend Solar is a private solar deal of the kind South African commercial banks see often. One plant, one creditworthy industrial offtaker on a wheeled PPA, one senior bank loan on standard terms. There is no DFI, no mezzanine and no holding-company structure, because none of those is the point. The point is the plumbing every deal of this kind shares. Financial close is set for 1 September 2027 and commercial operation for 1 March 2029.

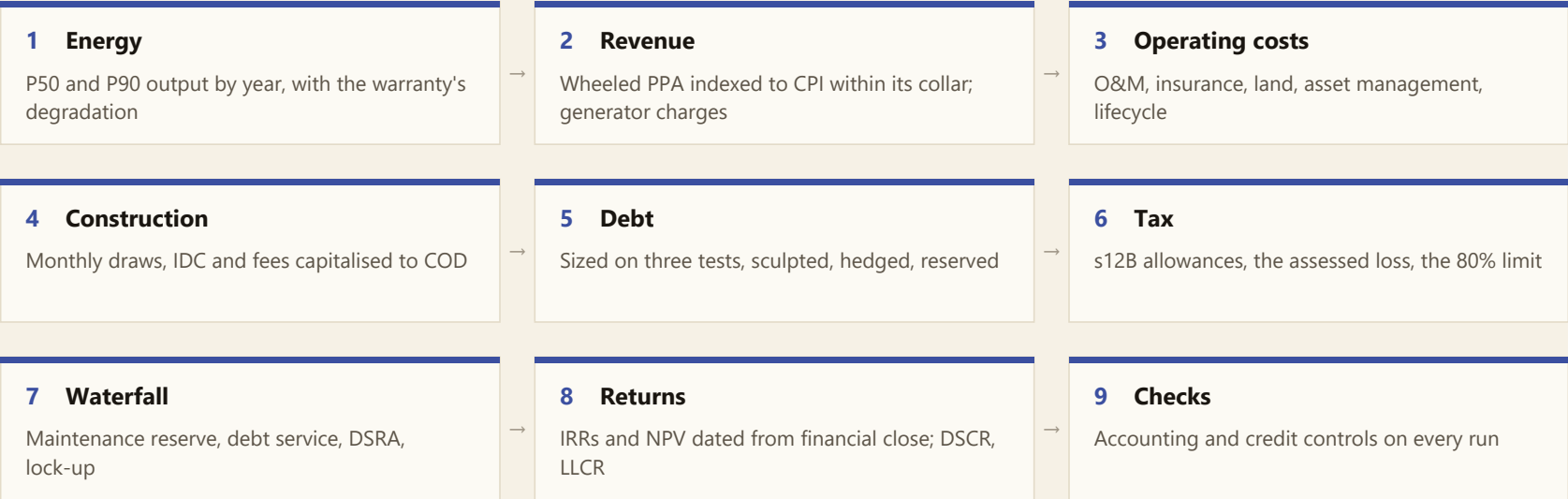
TABLE 1.1 Riverbend's inputs

AREA	INPUT
Timeline	Financial close 1 September 2027; 18-month build; commercial operation (COD) 1 March 2029
Plant	62.5 MWp / 50 MW AC single-axis tracker PV with N-type TOPCon bifacial modules, Northern Cape
Energy	P50 2,350 kWh/kWp at nameplate (146,875 MWh); the module warranty's degradation, 1% in year 1, then 0.4% of nameplate a year, linear; one-year P90 92.5% of P50
Cost	R650m capital cost, R13.0m per MW AC: EPC, grid connection, development, owner's costs and contingency
Offtake	20-year wheeled PPA with an industrial manufacturer at R0.95/kWh (2029 rand), rising each year with CPI, by at least 3% and at most 6%; take-or-pay on 90% of forecast output
Network	Eskom's generator use-of-system charges, borne by the project: no network charge in the Karoo zone, a 0.44 c/kWh ancillary service charge and R0.54m a year of service and administration charges (2029 rand), rising at CPI + 2%
Senior debt	15-year sculpted term loan, ZARONIA + 285 bps, 75% swapped to fixed at 8.40%: 11.04% all-in, 8.06% after tax. Sized at the lowest of the lender's 75% maximum gearing, 1.30x DSCR on P50 and 1.20x on one-year P90
Reserves	6-month DSRA; maintenance reserve built over the three years before the year-12 inverter overhaul
Covenants	Distribution lock-up below 1.15x DSCR or LLCR; event of default below 1.05x
Tax	27%; section 12B allowances 50/30/20; standalone SPV, so tax losses are carried forward and may cover at most 80% of a later year's profit
Equity	Cost of equity 16.0% nominal: the 10-year government bond (9.0% on 5 October 2026) plus about 7 points for a contracted private solar project
Capital	WACC 10.0% after tax: 75% debt at 8.06% and 25% equity at 16.0%
Price	Between the sponsor's floor (R0.84/kWh, where the equity just earns its cost) and the offtaker's Eskom wheeling credit (R1.64/kWh): the offtaker saves 42%

Source: *showcase/riverbend.py*, where every input states its basis.

02 HOW THE ENGINE WORKS THROUGH IT

A project finance model is a chain. Each stage takes the one before it as given, so an error early on flows into every ratio a lender reads. The engine runs the chain in the order a credit analyst would check it, and solves the loops that make a spreadsheet circular (debt depends on fees and interest during construction; tax depends on interest; CFADS depends on tax) by iteration, not by Excel's iterative calculation.



03 HOW LONG IT TAKES

Speed is only worth having when the mechanics underneath are right, which is what the next nine posts test. But it changes what a model can be used for: a structure can be tested in the meeting, not the following week.

TABLE 1.2 Timings on a laptop

STEP	TIME
One full engine run (energy to checks)	0.54 seconds
Lender stress pack: 14 runs on the financial-close debt	0.90 seconds
Workbook and every document, each read back against the model	49 seconds

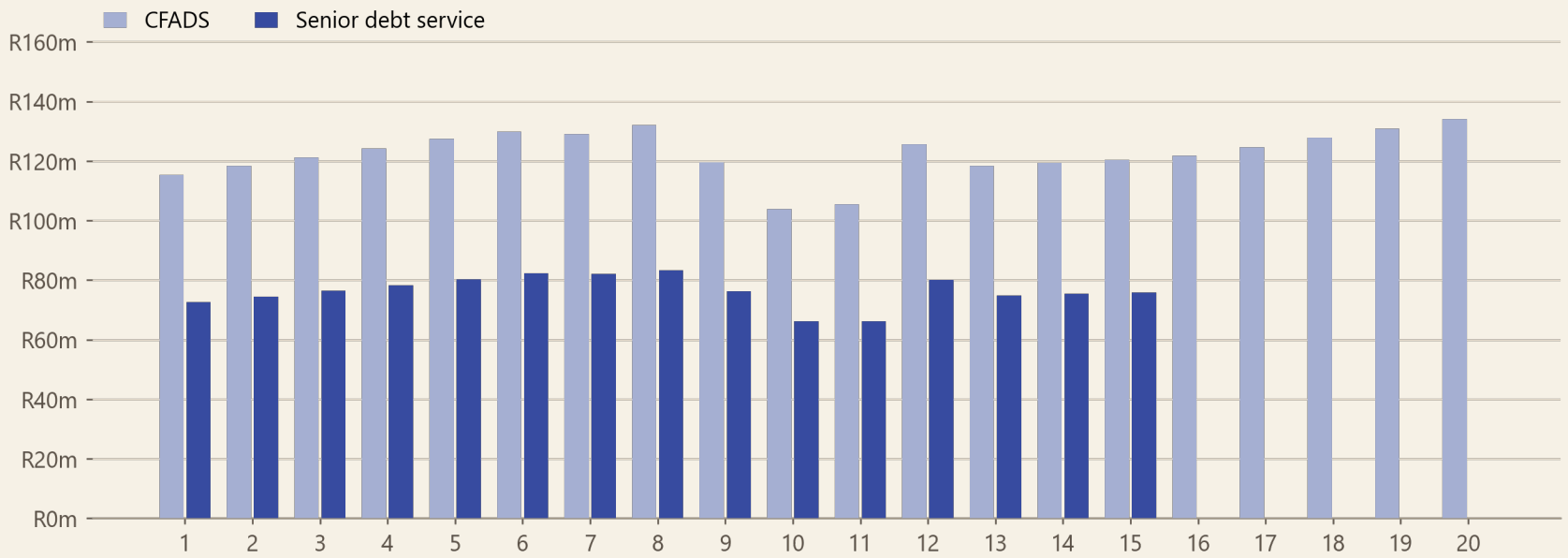
Measured by the build scripts on every run.

04 WHERE IT LANDS

EQUITY IRR 21.6% vs 16.0% cost of equity	PROJECT IRR 14.6% post-tax, vs 10.0% WACC	MINIMUM DSCR 1.57x P90 one-year 1.45x	SENIOR DEBT R554.9m 75% of total project costs
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The loan is R554.9m, and it is the lender's 75% gearing limit that sets it: the cash flows alone would support R681m. That leaves cover of 1.57x on P50 against a 1.30x sizing target. The equity clears its 16.0% cost by 5.6 points, and the project IRR clears the 10.0% WACC by 4.6 points: the plant earns more than the blended cost of the money that builds it. Post 4 shows why the gearing test binds first.

EXHIBIT 1.3 CFADS and senior debt service by operating year



Debt service follows CFADS at 1.57x to 1.59x through the 15-year tenor. CFADS is lower in years 9 to 11, while the maintenance reserve is built for the year-12 inverter overhaul and cash tax steps up; years 16 to 20 are debt-free.

05 THE SERIES

TABLE 1.4 The ten posts

#	MECHANIC	WHAT THE POST SHOWS
02	Energy, price and revenue	Generation, the price against the offtaker's Eskom credit, generator charges, opex and degradation
03	Construction	18 months of draws, IDC, fees, the DSRA, sources and uses, dated IRRs
04	Sizing the loan	Gearing against P50 and P90 cash flows; sculpting
05	Interest and the swap	The blended rate; hedged against unhedged under rate shocks
06	The waterfall	Maintenance reserve, debt service, DSRA, lock-up, distributions
07	Tax	s12B, the assessed loss and the 80% limit, row by row
08	Lender stress	Twelve cases on the financial-close debt; breakevens
09	Checking the model	The workbook's own checks; NREL SAM; a published SA case
10	One run to the documents	Ten outputs, read back against the model

06 TERMS THE SERIES USES

TABLE 1.5 Terms used in this series

TERM	WHAT IT MEANS
P50, P90	The annual output the plant beats in half of all years, and in nine years out of ten, from the energy yield report
CFADS	Cash flow available for debt service: revenue less operating costs, tax and the maintenance reserve's contributions
DSCR	Debt service cover ratio: a period's CFADS divided by the debt service due in it
LLCR	Loan life cover ratio: the present value of CFADS over the loan's life, divided by the loan
DSRA	Debt service reserve account: cash held to pay the next six months of debt service
CPI collar	The tariff rises with inflation, but by no less than 3% and no more than 6% in any year
Section 12B	A tax allowance that writes off qualifying solar plant over three years: 50%, 30%, 20%
Assessed loss	A tax loss carried forward, to reduce the company's taxable profit in later years
80% limit	A carried-forward loss may reduce a year's taxable profit by at most 80% (or R1m, if greater): South Africa's rule for years of assessment ending from 31 March 2023
WACC	Weighted average cost of capital: the cost of the debt (after tax) and of the equity, in the proportions that fund the project

07 CONCLUSION

Riverbend is unremarkable on purpose. If the engine gets an ordinary deal right, line by line and in the order a lender reads it, the same mechanics carry to every deal built on them. The next post starts where every ratio starts: with energy and revenue.