

Two-Roof Solar Bond

EUR 2M tokenised bond at 6.5% over 15 years, repaid only from two roofs' power sales and not guaranteed. The plan needs no premium; the bond is issued only once both roofs win it (October 2026 tender), then pays on time in the model even if both hosts leave in year 5, if output holds.

Manuel Suhrcke · October 2026 · FICTIONAL: company, roofs, hosts, contracts; market data real and dated · (A) = my assumption · Not advice

EUR 2M

6.5% fixed, 15 years; EUR 212,706 due each year

1.50x

lowest cover in the plan (cover: cash available after costs and tax / payment due; lenders say DSCR)

0.94x

lowest cover if both hosts leave in year 5; in the model still paid on time, if the premium is won and output holds

EUR 200k

to raise the bond, plus EUR 20k a year to run it

1 Summary

Who	Hosts: two businesses buying 70% of their roofs' power. Owners: their holding, which owns the issuer.
Investors get	EUR 53.18 a year for 15 years per EUR 500 token, interest plus capital back. Not guaranteed.
Owners do it for	Cheaper power on site, priced 20 years ahead.
Why tokens	Local investors fund a roof programme from EUR 500; for one project a bank loan is cheaper.
If it goes wrong	Owner payouts stop, then held-back cash and the reserve pay (Exhibit 1); then payments are late, maybe never paid in full.
Before issue	The tender award for both roofs (the state market premium) and its EUR 210,000 completion security (Exhibit 12).

2 Financing journey

Investors fund no construction, but depend on the plant performing.

Owners build with equity and a bridge loan; at completion (month 9) the bond raises EUR 2M and repays the bridge. I sized it at 1.30x cover on cash before the tax saving on interest: the roofs carry EUR 2.25M, so EUR 2M fits, ahead of EUR 3.1M owner equity (Exhibit 2). Owners accept its lower return (Exhibit 3) to open a roof programme to local investors.

3 The bond: rights, repayment, costs

Paid only from the roofs' power sales, and not guaranteed.

Payment	One equal yearly EUR payment for 15 years, interest plus capital, the same for every investor, only from the roofs' power sales, premium included. Not guaranteed by STOKR, the bank, the owners or the state.
If missed	Stays owed with interest and is paid first from later cash, but may never be paid in full. Owners get nothing meanwhile.
Votes	Two thirds of the amount owed can change payment amounts or dates for all investors and have the pledge enforced, which may not recover all (A).
Selling	Only to approved investors; maybe no buyer, or only below what you paid.
Security	Pledge over shares, accounts and contracts for a bondholder representative, who must approve host contract changes; no new debt; insurance assigned; host contracts run 5 years past the bond; the premium ends with it (A).
Costs	Raising EUR 200,000 (placement 5% for bank and STOKR, legal EUR 60,000, register and token EUR 40,000); running EUR 20,000 a year, paid before investors (A). Other assumptions: Exhibit 4.

Exhibit 1: Order of payment, each paid before the next

1 Power buyers	70% to the hosts, the rest to the grid
2 Project account	Pledged; all income lands here
3 Costs and tax	Running costs, income tax
4 Bond payment	Yearly, in EUR, to investors' banks
5 Reserve (DSRA)	Topped up to half a yearly payment
6 Owners	Lock-up: nothing below 1.10x or while owed

Exhibit 2: Sources and uses at completion

Uses	EUR
Build (EUR 800/kWp)	4,800,000
Raising the bond	200,000
Cash reserve	106,353
Total	5,106,353
Sources	
Bond (39.2%)	2,000,000
Equity (60.8%)	3,106,353
Total	5,106,353

Bridge interest (not modelled) and refinancing if the offer fails are the owners' risk.

Exhibit 3: The bond lowers the owners' return after tax

Yearly return incl. the hosts' power savings at the H1 2026 grid price (EUR 121.9/MWh); 70% used on site

No debt	4.6%
With a bank loan	4.2-4.9%
With the bond	3.1%
Payback, no debt	about 13 years

The project earns less than the coupon.

Exhibit 4: Key assumptions on revenue, opex, taxes, interest and maturity

Area	Assumption	Basis
Revenue: output	Two 3 MWp roofs; 1,000 kWh/kWp in year 1; 99% available; 0.4% loss a year	PVGIS; the rest (A)
Revenue: hosts	70% of output at EUR 110/MWh, +1% a year, 20 years	My price (A); arm's-length check
Revenue: export	Market EUR 45/MWh flat, less EUR 3/MWh fee; premium allowed while hosts buy, not counted	2025 value; tender rules
Revenue: host gone	Premium tops up to EUR 92.5/MWh until year 15; 15% lost to negative prices	Award 89.75, cap 95; ZSW (A)
Opex	EUR/kWp a year: O&M 10, insurance 2.5, roof 4, inverters 4; grid 2,000/roof; admin, bond 20,000 each	German studies, Creos (A); +2% a year
Taxes	Income tax 23.87%; net wealth tax 0.5% of net assets, at least EUR 4,815	PwC; Grant Thornton, EY
Interest and maturity	6.5% fixed; 15-year maturity, equal yearly payments	KfW 270, retail bonds; terms (A)

4 Tokenisation vs conventional

A bank loan is cheaper for one project; tokens can pay off across a programme.

Against a plain bond from the same bank, a token on Liquid (the blockchain STOKR uses) adds cheaper repeat servicing and transfers between approved investors, which the pilot has to prove (Exhibit 5). Exhibit 6 sets it against a bank loan and crowdfunding.

Exhibit 5: Tokens add value when

- documents and token set-up are reused for further roofs;
- many investors from EUR 500 need cheap servicing (running cost about EUR 67 each a year at 300, A);
- investors want transfers to other approved investors, which the pilot must prove.

Exhibit 6: Tokenised bond vs bank loan vs crowdfunding bond

	Bank loan (15 years)	Crowdfunding bond (3-5 years)	Tokenised bond (this case)
Cost of money	5.00-6.80%	7.5% (A); offers 6.5-9%	6.5% (range 6.0-7.5%); Dutch peer 7.0%
All-in cost a year	5.1-7.0% (+1% fee, A)	Coupon + platform fees (not public)	9.9% (8.2% without the running cost)
Who can invest	Only the bank	Retail via a licensed platform, from EUR 10-50	Retail and professional via a licensed bank, from EUR 500
Repayment	Matches the asset	Year 4: EUR 1.35M (68%) to refinance	Matches the asset if the project earns enough
Servicing	Bank does it	Platform's own books	Record on Liquid kept by the bank as control agent; one payout provider

Source: bank, German KfW 270 (no public Luxembourg rate); crowdfunding, French solar offers; peer, a 2024 Dutch 15-year junior solar bond.

5 Issuance flow

A licensed bank sells and records the bond; STOKR runs the portal and pays out.

Exhibit 7: Who does what, and what is checked

1 Prepare	2 Document	3 Subscribe	4 Issue	5 Operate, pay	6 Report
Power contracts, tender bid (closes 30 Oct 2026), build with a bridge.	Terms, factsheet, target market; CSSF notice.	Identity and appropriateness checks; EUR into a blocked account.	Account opened on Liquid; tokens to the custodian; bridge repaid.	Income paid out in the order of Exhibit 1.	Output, cover and reserve quarterly; audited accounts yearly.
Who: ProjectCo, owners, contractor	Who: Counsel, placing bank, STOKR	Who: Placing bank, STOKR (portal)	Who: Control agent (a bank), STOKR	Who: ProjectCo, STOKR as paying agent	Who: ProjectCo, bondholder representative
Check: Engineer; arm's-length price	Check: Legal opinion, PRIIPs, token audit	Check: No award or under EUR 2M: no issue, money returned	Check: Issued and held bonds reconciled	Check: Cover tested yearly	Check: Sales to approved investors only

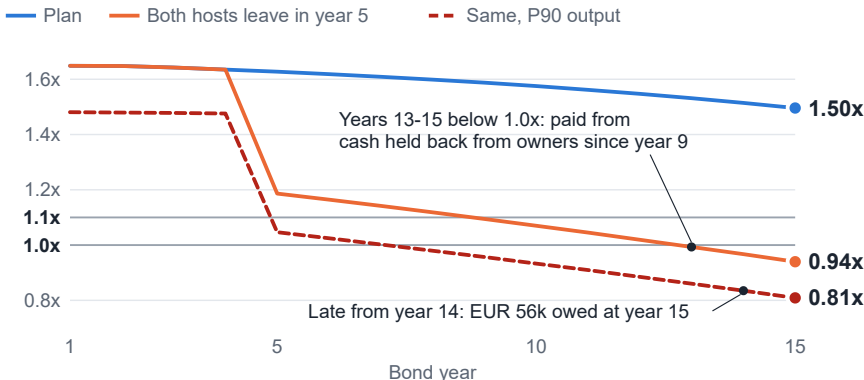
6 Downside on repayment

Both hosts leave in year 5: paid in the model only if the premium is won and output holds.

If the premium is won, all power is sold under it from year 5, and cash held back from the owners pays the gap in years 13-15 (Exhibit 8). In the model, output can then be 5.5% below the central estimate before a payment is late. Exhibit 9 shows where it breaks; Exhibit 10 varies sunshine, prices and hosts leaving at random.

Exhibit 8: Cover ratio by year: plan, both hosts leave in year 5, and the same with P90 output

In the model. Cover = cash available / payment due; below 1.1x owners get nothing; at 1.0x cash just pays. P90: the 10-year P90 yield, 93.3% of the central estimate, every year.



On-site sale: allowed by the tender rules

On 16 Oct 2026 the Ministry of the Economy sent me the tender rules: any use the electricity law allows is accepted, and the premium is paid only on power sent to the grid. Counting it on the hosts' surplus lifts plan cover to 1.70x; I leave it out. Open: the negative-price rule (asked) and the sale's legal form. One bid per roof.

Exhibit 9: Where it breaks, in the model

Cover: lowest in the 15 years; amounts in EUR.

Case	Cover	Reserve	Late or owed
Plan	1.50x	none	none
Hosts pay EUR 100/MWh	1.33x	none	none
Both hosts leave	0.94x	none	none
Both leave + P90 output	0.81x	all	55,900 owed at yr 15
Both leave, 20% negative prices (base 15%)	0.82x	all	16,700 owed at yr 15, repaid yr 16

Exhibit 10: If the premium is won, 2.3% of 20,000 simulated paths miss a payment (base)

	Paid from cash	Reserve used, all paid	Payment missed
Yearly chance a host leaves		reserve / missed	
0%		0.5% / 0.0%	
1%		6.9% / 1.1%	
2% (base)		13.3% / 2.3%	
4%		25.1% / 4.5%	

Monte Carlo: a test of my assumptions, not a forecast. Random: sunshine, a lasting error in the sunshine estimate, market prices, and hosts leaving at 2% a year each, half as a shared shock (likely too kind: both sit in one group) (A). Not in it: long breakdowns, cost overruns, rule changes, fraud.

7 Legal classification, approvals and specialist checks

An ordinary bond outside MiCAR. Not a legal opinion; one is needed.

Who sells	A licensed bank or investment firm places it, runs the appropriateness test and is control agent; STOKR's licences (CASP, June 2026; payment institution) do not cover investment services.
Classification	Likely a transferable security under MiFID II, so outside MiCAR.
Approvals	Luxembourg-only offer below the EU prospectus threshold (EUR 12M) and the EUR 5M information-note trigger; CSSF notice expected (to confirm); likely not a PRIIP unless payments track output.
Form	Dematerialised bond; the control agent keeps the issuance account on Liquid (Blockchain Law IV), so the chain is the legal record (to confirm). A licensed custodian holds it (A) unless STOKR is licensed to hold securities. No control agent: a plain bond, no tokens. Checks: Exhibit 11.

8 Risks, fairness, access and error correction

Payouts run in EUR through banks; a Liquid failure could delay them.

Security	On 6 Sep 2026 a bug let about 4,000 BTC leave Liquid wrongly and blocks stopped for about three days (STOKR's incident post). EUR payouts run via banks but could be delayed.
Privacy	No names or KYC data on the chain; KYC stays with the bank under GDPR; the issuer sees balances; no investor data goes to AI.
Legal, ethics	Retail money in one related-party project, so the host price gets an arm's-length check; green claims use measured output.
Fairness, access	One class, same terms; plain-language factsheet; EUR to a bank account; a custodian holds the tokens, so no keys to handle; help through the bank.
Errors	Reconciled after every transfer and payment; lost logins and tokens reset or reissued after an identity check (A); fixes within 5 business days (A); complaints to the bank, then the CSSF.

9 Pilot plan and impact indicators

Professionals first, then retail; more roofs only if repeating is cheaper.

Exhibit 12 sets out who does each step, what it costs and the check before the next one. Exhibit 13 lists three impact indicators, all my assumptions, each reported yearly.

10 AI approach and tools used

Every number traces to a source; a person approves each change.

A claim checker matches each number to a model cell or dated source, flags words such as "guaranteed" unless negated, and has Claude Opus 5.5 flag implied promises. Audit agents (facts, defensibility, clarity, a lay reader) catch sentences that misdescribe the model. A monitor reruns the model on new public prices and lists sentences that would change (Exhibit 14). After issue it would run quarterly on meter and payment data.

Tools used: Excel, Python and Claude Opus 5.5 in Claude Code.

Exhibit 11: Specialist checks and conditions before launch

Gates: tender award for both roofs (bid closes 30 Oct 2026) and its completion security; legal opinion and exemption memo; placement and control-agent deal; a registered 25-year roof right that survives a sale or the landlord's insolvency.

Checks: PRIIPs; KYC; custody; token audit; tax; GDPR; engineer; arm's-length power price; supply licence for on-site sale; grid sized for full export.

Exhibit 12: Pilot plan, by month

0-3	Tender bid, power contracts, engineer, legal opinion; test issue on the Liquid test network. Who: owners, counsel, STOKR. Check: opinion received; test balances match.
3-9	Build; documents and CSSF notice. Who: owners, contractor, bank. Check: engineer signs off output.
9-11	Professional first close up to EUR 500k, same terms (A), then retail from EUR 500. Who: bank, STOKR. Check: first close reconciled; EUR 2M or money returned.
Yr 1	Reports, first payment, cost per investor. Who: owners, representative. Check: paid on time; more roofs only if cheaper to repeat.
Costs	Owners' risk: opinion, engineer, bid, EUR 210,000 completion security (lost if not built in 24 months). Raising: EUR 200,000.

Exhibit 13: Impact indicators (A)

Clean power	5,940 MWh in year 1 (4,200 on site); about 1,800 t CO2 at 0.3 t per MWh
Under-standing	Share of retail buyers who answer three factsheet questions right at purchase: who pays, how to sell, if hosts leave
Local reach	At least 300 investors, half with EUR 2,000 or less

Exhibit 14: Monitor run, 14 Oct 2026

Solar price, last 12 months	about EUR 61
Official 2025 value (premium)	EUR 45, kept
Plan cover at 61	1.59x

I kept 45 because the window includes the 2026 gas shock and only the 30% export depends on it.

Investor factsheet (extract)

You lend to a small Luxembourg company with solar panels on two roofs. It plans to repay you over 15 years from power sales; payments can be late or lower, and you could lose money.

Key terms

Amount, interest	EUR 2,000,000; 6.5% fixed, 15 years; one equal yearly payment of interest and principal
Per EUR 500	EUR 53.18 a year if all goes to plan; EUR 797.65 in total if every payment is made
Minimum	EUR 500 (one token), after the bank's identity and appropriateness checks
Security	Only debt, ahead of EUR 3.1M of owner money; pledge held for all investors by a bondholder representative (A); a failing project's assets may be worth little
Fees for you	None planned; the company pays custody (A); your bank may charge its own

FICTIONAL mock-up · not an offer · full version on the demo page

Where the money to pay you comes from

Only from the two roofs' electricity: 70% to the businesses in the buildings (the hosts) at EUR 110 per MWh, +1% a year; the rest to the grid at about EUR 45. If a host stops buying, the state premium tops up grid sales; the bond is issued only once it is won (bids close 30 Oct 2026). The hosts own the company, so if they struggle, both its income and support weaken.

If both hosts stop buying in year 5

In the model every payment is still made, from cash held back from the owners, only if the premium is won and output stays near the central estimate; with years of weak sunshine (P90) payments fall behind. The next buffer is a reserve of EUR 106,353.

What this bond is not

- Not a bank deposit, and not guaranteed by STOKR, the selling bank, the hosts or the state.
- Hard to sell: approved buyers only, maybe at a loss or not at all.