Mining Business Plan

Helsinki Rock Aggregates

DOCUMENT GUIDE

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Conditional quarry investment plan • EUR • development 2027 and finite operations through 2035 with closure 2036.

The named business is hypothetical. Site rights, resource quality, permits, funding, buyer orders and credentials are unsecured. Public sources provide context only. Financial tables and charts use verified model version 1.0 / 4 October 2026, Base unless labelled as cases. Snapshot figures require refresh after input edits.

01 / OVERVIEW

Executive summary

Decision and scope

The proposal remains conditional on a viable site and enforceable permissions. Verified native model version 1.0 forecasts 1.900 million saleable tonnes over 2028–2035, with EUR 603,108 minimum signed free cash under Base. Proposed initial funding is EUR 3,600,000. These are scenario outputs from unverified assumptions, not secured operating results.

Evidence and operating implication

Downside produces an unsecured funding gap of EUR 5,008,677. Its weak volumes, higher costs and six-month delay make the proposal unsuitable on those assumptions without redesign or further funding. Base cash does not establish bankability: rights, independent rock quality/inventory, buyer trials and funded closure remain investment gates.

02 / BUSINESS

Business details

Decision and scope

The proposed trading name is Helsinki Rock Aggregates Oy. No company registration, business ID, address or ownership register has been verified. Incorporation, VAT registration, beneficial ownership filing, accounting system and banking are prerequisites. The plan is for prospective founders, lenders and environmental reviewers evaluating whether to commission site diligence.

Evidence and operating implication

The product is crushed construction granite rather than a metal concentrate. Buyers arrange and pay transport. The company does not assume waste reception, recovered industrial minerals, concrete manufacturing or public-road haulage. Those activities would change permits and economics. Conditional development begins in January 2027 with operation no earlier than January 2028. Twelve months is an assumed planning interval, not an assurance of approval.

Field	Status
Legal entity	Proposed Finnish Oy; not registered
Site / rights	Unnamed; unsecured
Period	2027 development; 2028–2035 operation; 2036 closure
Currency	EUR; financial tables net of VAT
Readers	Prospective founders, lenders and environmental reviewers

03 / STRATEGY

Business concept and objectives

Decision and scope

The concept is a small finite quarry using purchased mobile crushing and loading equipment and contracted drilling and blasting. A provisional 12 hectare footprint and 45 km road catchment are site-screening assumptions. Mining capacity is 300,000 tonnes of rock annually; saleable yield is provisionally 90%. Product quality and environmental safety are more important than maximum output.

Evidence and operating implication

The first development year must secure land access, independent rock inventory and test-crushing results, a credible extraction and reclamation design, enforceable permits, contractor tenders and buyers willing to trial graded product. The first operating year targets 70% of mature demand while monitoring grading, dispatch accuracy, rejected loads and complaints. Expansion is prohibited until these controls work and cash supports the additional tonnes.

04 / STRATEGY

Business model canvas

Decision and scope

Value comes from documented grading, predictable loading and transparent ex-quarry pricing for civil works. Core activities are permitted extraction, crushing, quality control, inventory management and dispatch. Core resources are land rights, a verified workable rock inventory, competent staff, plant and operating cash.

Evidence and operating implication

Revenue is invoiced by saleable tonne and grade. Costs follow extracted rock, payroll, environmental compliance, depreciation and closure. Key partners are the landowner, blasting contractor, laboratory, equipment service team, authority and customer hauliers. Buyer retention depends on conformity and availability rather than consumer loyalty marketing. No partnership or purchase order is secured.

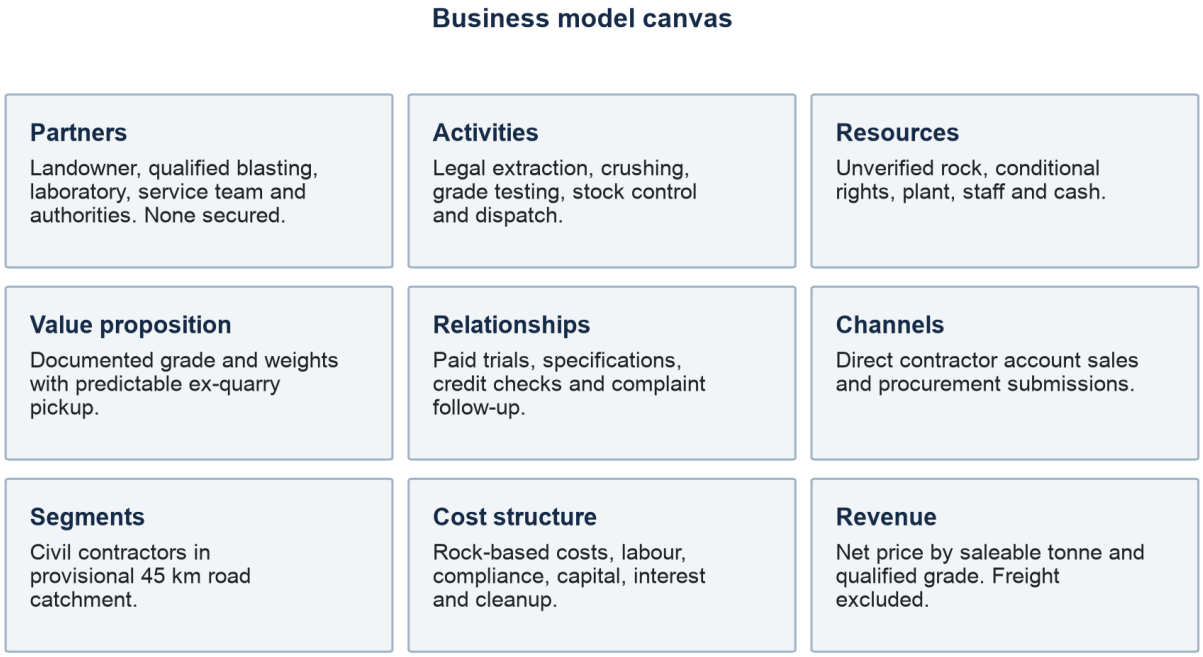


Figure: Business model canvas. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

05 / STRATEGY

SWOT and longer term goals

Decision and scope

Potential strengths are an explicitly finite operating plan, straightforward products and short-catchment supply. Weaknesses are the missing site, untested rock, limited scale and substantial capital before sales. Opportunities are civil maintenance and tested reuse of appropriate construction rock. Threats are entrenched quarry networks, weak building starts, permit challenges, diesel costs and substitute recycled material.

Evidence and operating implication

Years three to five should improve saleable yield and grade consistency, reduce fuel per tonne, maintain extraction limits and fund the closure obligation. A new site or deeper extraction is a separate investment case. No indefinite growth or terminal reserve extension supports the forecast. The board reviews profitability alongside safety, water quality and reclamation progress.

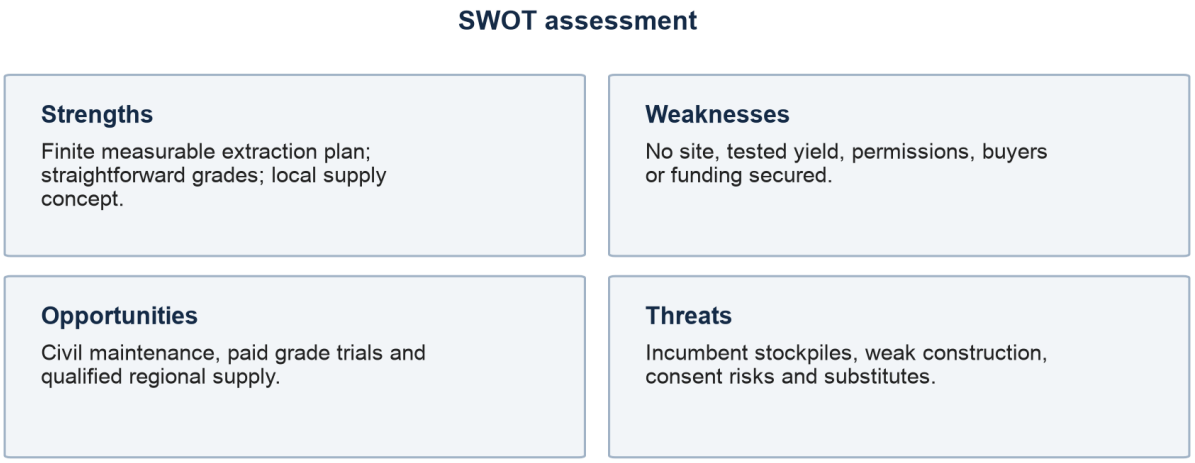


Figure: SWOT and longer term goals. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

06 / STRATEGY

TOWS strategy matrix

Decision and scope

Use the finite production plan and testable product specifications to approach contractors for paid trials. Counter limited scale by outsourcing specialist blasting and laboratory services rather than hiring unneeded specialists. Obtain equipment quotations after quality and permit gates.

Evidence and operating implication

Protect against the weak cycle with staged capex commitments, credit limits and orders by grade. Protect against depletion and landowner dispute with surveyed extraction reconciliation and a royalty audit trail. Stop extraction when an environmental limit, resource balance or cash constraint is breached; sales targets cannot override those constraints.

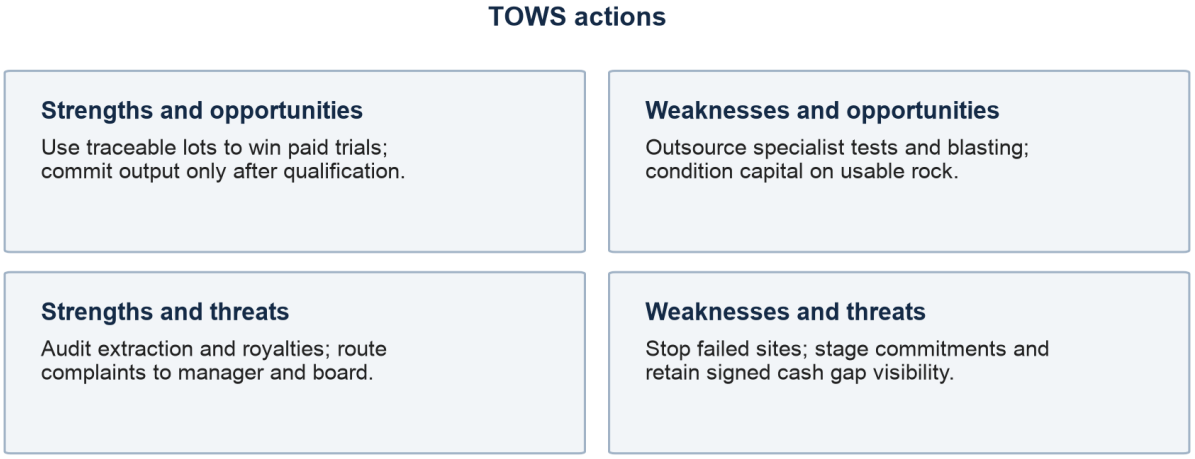


Figure: TOWS strategy matrix. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

07 / PEOPLE

Owner and management

Decision and scope

Ownership is hypothetical and founder identity is deliberately unspecified. The working owner would manage customer accounts, finances and supplier commitments. The quarry manager controls the operating plan, safety and production. Qualified external advisers assess rock, environment, blasting and statutory reporting.

Evidence and operating implication

Reserved board decisions include capex, lending, contracts with the landowner, changes to extraction areas and reclamation acceptance. Dual approval applies to major purchases and customer credit. The organisation chart distinguishes employed reporting lines from external professional support. A replacement manager and owner succession plan must exist before operation.

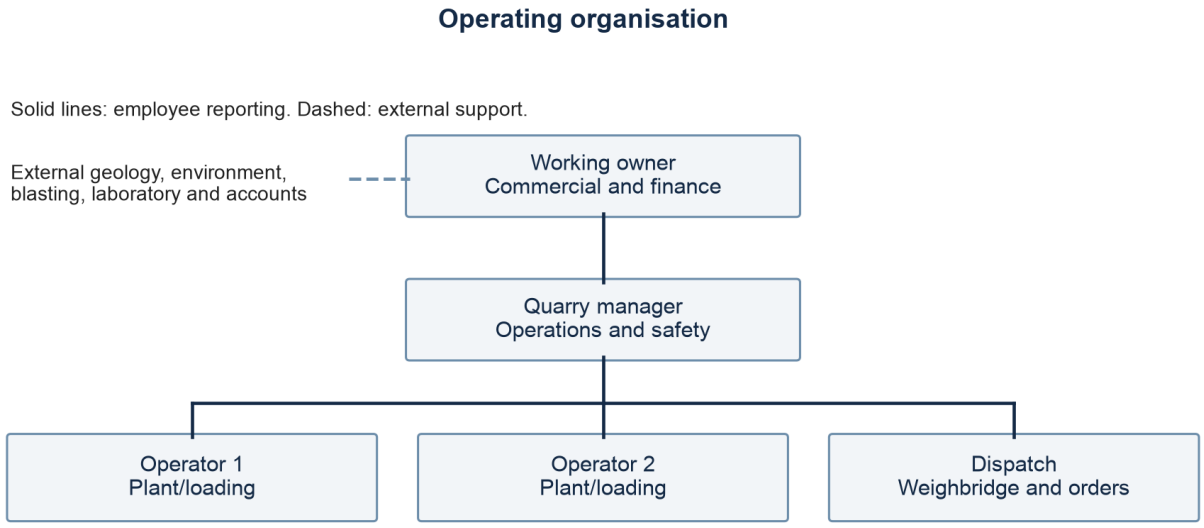


Figure: Owner and management. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

08 / PEOPLE

Owner and key personnel profiles

Decision and scope

No founder qualifications or track record are invented. Recruitment must document quarry management experience, machine competence, safety training, ability to interpret grade reports and environmental sampling procedures. Licensed drilling and blasting work stays with a qualified contractor whose insurance and permits are verified.

Evidence and operating implication

The proposed owner is remunerated at EUR60,000 gross annually during operation, with company employer cost included. The owner receives EUR3,000 gross monthly for part-time development project management; personal budget still needs separate funds. Personal savings, dependants and debts are unknown. Other shareholders, voting rights, guarantees and dilution remain to be agreed.

09 / MARKET

Target customers

Decision and scope

Priority buyers are small and medium civil contractors purchasing graded roadbase and drainage stone for projects within the road catchment. Larger framework contractors are a secondary segment because tender qualification, volume certainty and credit terms may exceed a new quarry’s capability. Retail landscaping is not the planned core.

Evidence and operating implication

Orders arise from project schedules, drainage, foundations, utility reinstatement and road maintenance. Customers need specification conformity, test certificates, availability, timely loading and clear invoice quantities. The plan assumes customer-arranged transport. A delivered quote must add route, truck payload, driver time, waiting and toll economics before it can be offered.

10 / MARKET

Segmentation targeting and positioning

Decision and scope

Segment by required grade, project distance, order frequency, credit quality and procurement constraints. Target repeat civil buyers able to take standard graded lots and arrange haulage. Defer concrete/asphalt-grade applications until specific performance tests and conformity documentation establish suitability.

Evidence and operating implication

Position as a measured and documented local aggregate source with predictable loading. This is a planned offer, not a claimed competitive advantage. Interview at least fifteen potential buyers, obtain specification and annual volume requests, and run paid trials. Record rejected tenders and conversion by grade rather than treat informal interest as demand.



Figure: Segmentation targeting and positioning. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

11 / MARKET

Value proposition canvas

Decision and scope

Buyer jobs are finishing works to specification and coordinating materials with site crews. Pains are variable grading, unavailable stock, vehicle queues, contamination and unclear ex-quarry versus delivered price. Gains are reliable certificates, loading slots, traceable weights and rapid correction of rejected material.

Evidence and operating implication

Proposed products are 0/32 roadbase, 8/16 screened stone and 0/4 fines, subject to tests. Pain relievers are grade-specific stockpiles, batch records, calibrated scales and a documented complaint process. Gain creators are advance availability notices and pickup slots. None implies the unidentified rock is suitable for any end use [S2].



Figure: Value proposition canvas. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

12 / MARKET

Market size and trends

Decision and scope

TAM means annual construction aggregate purchasing in the wider Helsinki metropolitan region. SAM means purchases of our qualified grades within the actual road catchment and permit-compatible dispatch hours. No verified aggregate-tonnage series or buyer takeoffs were obtained for either scope; their monetary totals are unavailable.

Evidence and operating implication

SOM is the model's capacity-capped saleable sales hypothesis, not a validated market share. Bottom-up sizing requires project takeoffs, grade requirements, haulier routes, substitute supply and buyer interviews. National or Nordic material demand cannot be proportionally allocated to an unnamed quarry. Recycled and construction-excavated rock can substitute where technical and environmental requirements are met [S2, S8].

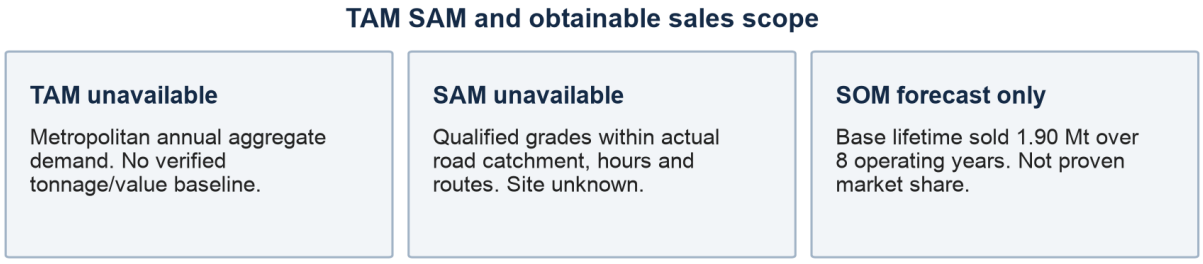


Figure: Market size and trends. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

13 / MARKET

PESTLE analysis

Decision and scope

Political decisions on infrastructure and land use affect buyer timing. Economic weakness in Helsinki construction limits near-term confidence. Social acceptance depends on credible noise, dust, blast and truck controls. Technology affects grading, weighing and equipment reliability.

Evidence and operating implication

Legal drivers are land-extraction/environmental approvals, water/nature screening and workplace/blasting requirements [S1]. Environmental drivers are runoff, groundwater, dust, habitat, fuel and finite rock depletion. A twelve-month development assumption cannot bypass consultation or appeals. Each factor has an assigned investigation before capital commitments.



Figure: PESTLE analysis. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

14 / MARKET

Local demand and evidence

Decision and scope

Helsinki reported 4,186 completions, 3,242 starts and 3,402 permitted dwellings for 2025 [S4]. Q2 2026 cumulative indicators were 2,294 completions, 1,643 starts and 1,865 permitted dwellings [S3]. These are separate full-year and half-year measures, so the chart must not compare them as equal periods.

Evidence and operating implication

These data demonstrate active but weak construction, not sufficient aggregate purchases. No site traffic count, customer survey, confirmed order or verified regional aggregate TAM exists. Before investing, build a geocoded project list, estimate grade-specific takeoffs with engineers and seek trial agreements. Maintenance demand and housing demand should be tracked separately.

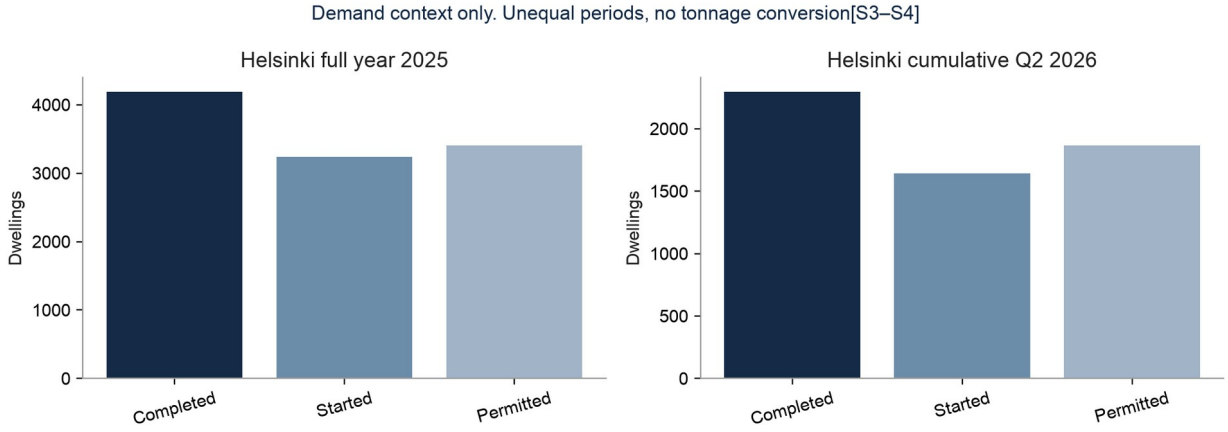


Figure: Local demand and evidence. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

15 / MARKET

Competitors and positioning

Decision and scope

Rudus lists Southern Finland aggregate sales and quarry operations [S7]. NCC discusses Nordic material-supply challenges and offers an incumbent perspective [S8]. Their networks, established stockpiles and qualification history are important competitive barriers. Independent local pits, recycled aggregates and rock from construction excavations are alternative sources.

Evidence and operating implication

No comparable competitor price, loading-time rating or environmental rating is verified. The proposed position is a design choice requiring customer evidence. Buyers will compare landed cost, grade suitability and availability. A 45 km radius does not guarantee a transport advantage when an incumbent has a closer stockpile.

16 / MARKET

Porter five forces

Decision and scope

Rivalry is high as incumbent networks and local quarries compete on landed cost and specification. Buyer power is high for large contractors and tendered projects. Supplier power is significant for site rights, blasting and specialised equipment support.

Evidence and operating implication

Entry requires suitable rock, land rights, permits, plant and working capital. Substitutes include recycled aggregate and construction-excavated rock where suitable. The response is qualification discipline, realistic credit terms and flexible commitments. The diagram is a qualitative business assessment based on cited industry context, not a numeric market score.

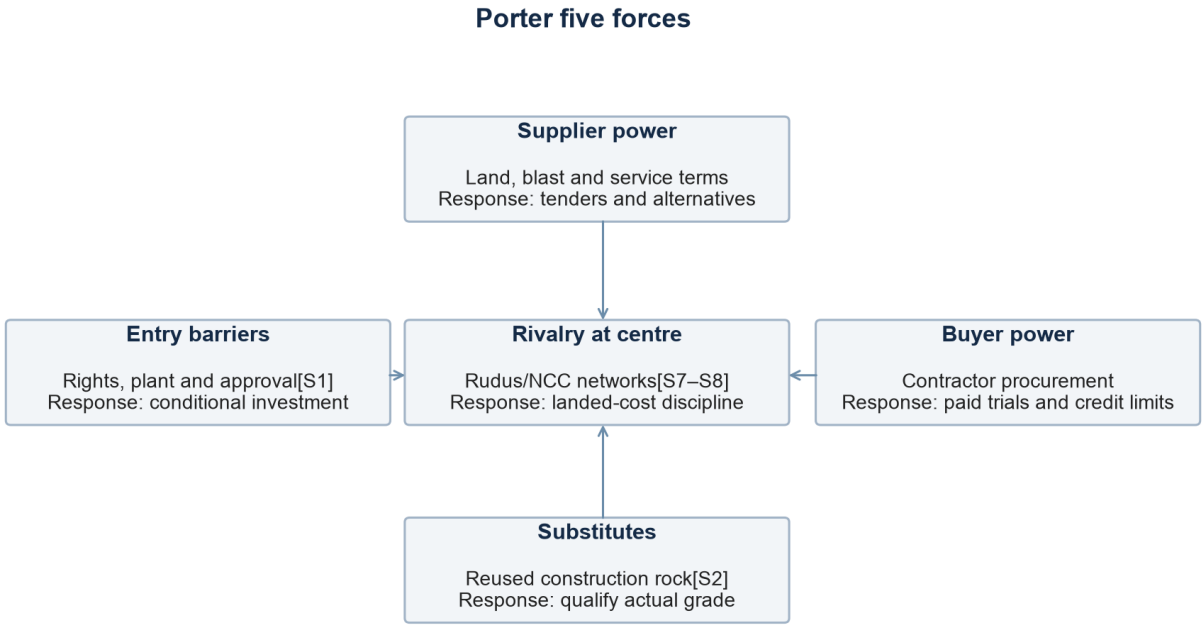


Figure: Porter five forces. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

17 / STRATEGY

Strategy canvas

Decision and scope

The strategy canvas shows planned emphasis on grade documentation, loading reliability, price transparency, local access and environmental controls. It does not score named competitors because observed evidence is unavailable. Any ratings are author-selected design priorities and must be labelled as such.

Evidence and operating implication

Customer interviews should determine which priorities command price or retention. The company cannot promise fastest loading or lowest delivered cost without measured trials. A low-price offer that fails to cover waste yield, paid labour and closure is rejected even if it appears attractive on a positioning chart.

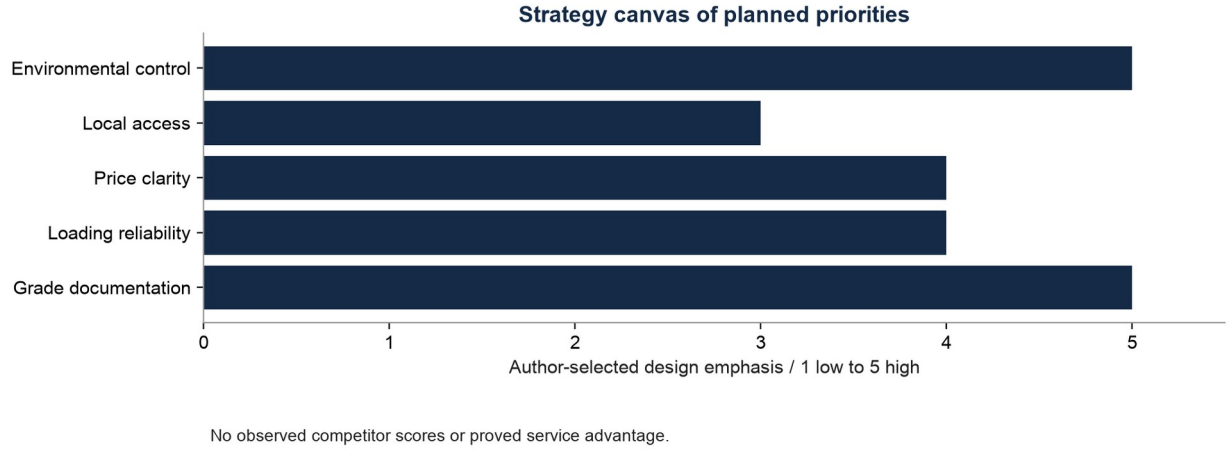


Figure: Strategy canvas. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

18 / OPERATIONS

Location and premises

Decision and scope

No parcel is selected. Screen an approximately 12 hectare quarry footprint within a provisional 45 km road catchment. Obtain ownership/title, access easements, planning status, habitat and water constraints, nearby receptors and heavy-vehicle routes. Verify rock geometry and quality independently.

Evidence and operating implication

The assumed annual 300,000 tonne feed at 2.65 tonnes per solid cubic metre is about 113,208 solid cubic metres. Density is unmeasured; this arithmetic does not establish EIA exemption. The 25 hectare / 200,000 solid cubic metre project-list triggers and case-specific assessment must be checked with the authority [S1]. A lawful route and receptor assessment can invalidate an otherwise attractive site.

19 / OPERATIONS

Equipment and resource plan

Decision and scope

The proposed purchased equipment is a mobile crusher/screen, excavator, loader, weighbridge and site infrastructure. Initial capital includes EUR350,000 finite site development and EUR200,000 equipment/civil contingency. All amounts are planning estimates. No operating lease or supplier finance is assumed.

Evidence and operating implication

Request comparable tenders for throughput, power/fuel, grading, wear parts, installation, maintenance and residual obligations. Confirm capacity at our rock hardness and feed distribution. Contract drilling and blasting; do not buy an explosive plant. Confirm the contractor's legal explosives supply/storage and site arrangements; no explosives store or licence is assumed [S16]. Reserve topsoil and suitable rejects for the approved reclamation design. Spare-part stock and preventive maintenance need a downtime schedule.

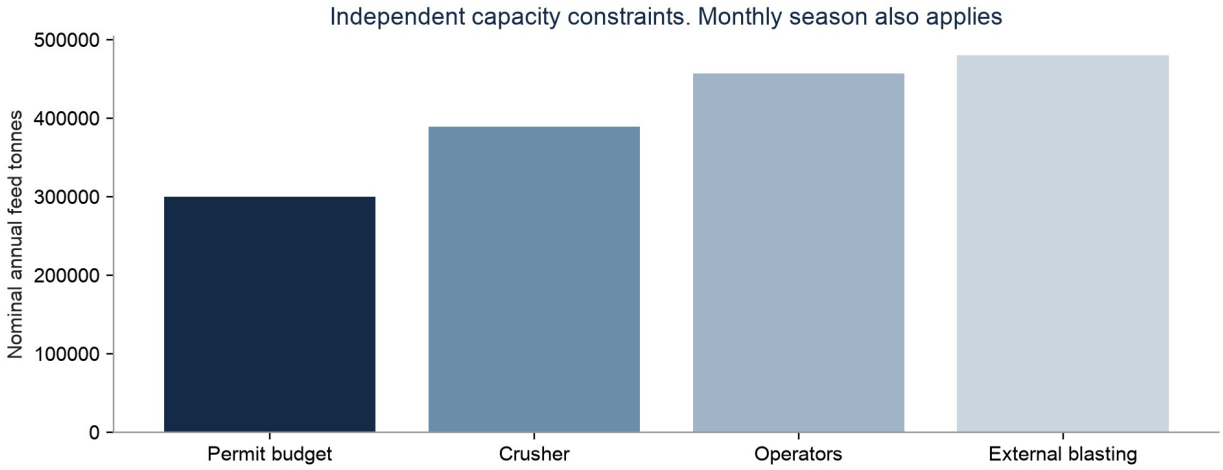


Figure: Equipment and resource plan. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

20 / OPERATIONS

Products and grade strategy

Decision and scope

The provisional saleable mix is 60% 0/32 base aggregate, 25% 8/16 screened stone and 15% 0/4 fines. Prices and yield assume every saleable grade meets buyer requirements. Test crushing must establish achievable mix, contamination and performance before contracts.

Evidence and operating implication

A 90% saleable yield leaves 10% rejects by mass. Rejects are not sold or assigned revenue. Their volume, stability and chemical suitability enter the reclamation plan. Finished product stock is separated by grade, labelled and tracked by scale weight. The financial model uses a weighted aggregate flow; grade-specific shortfalls require a more detailed schedule before lending.

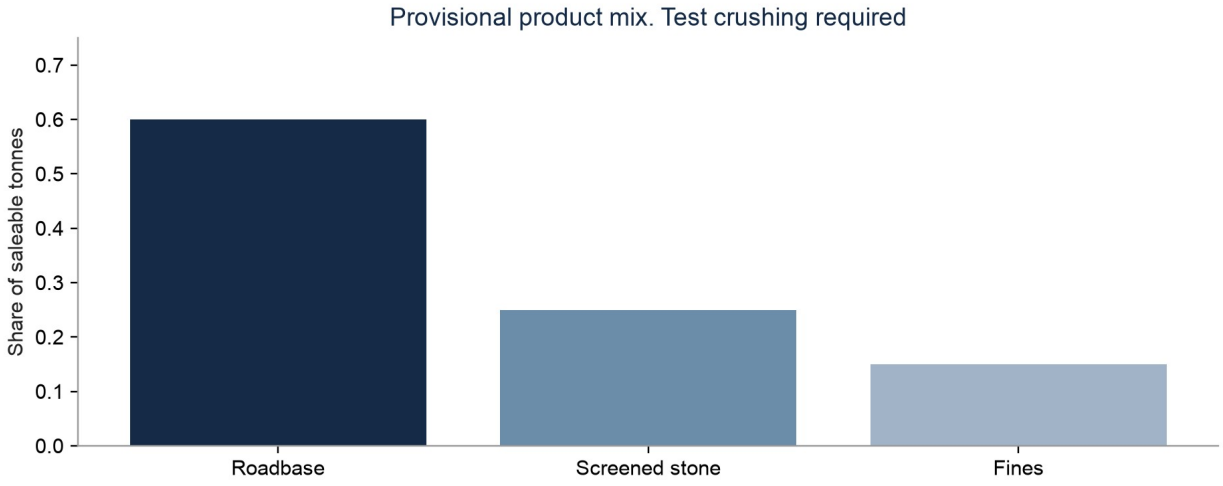


Figure: Products and grade strategy. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

21 / OPERATIONS

Pricing and tonne economics

Decision and scope

Proposed ex-VAT prices are EUR13 per tonne for base, EUR18 for screened stone and EUR8 for fines. The 60/25/15 mix yields EUR13.50 per saleable tonne. Drill/blast, loading, crushing and landowner royalty total EUR7.10 per extracted tonne, or EUR7.89 per saleable tonne at 90% yield. These figures are unquoted assumptions.

Evidence and operating implication

The resulting EUR5.61 contribution before payroll, fixed overhead, closure provision, depreciation, interest and tax is not net profit. Customers pay haulage directly. Quoting delivered material without adding freight would overstate margins. Annual price and cost escalation are planning assumptions; product yield and mix sensitivity are more important than a superficial unit margin.

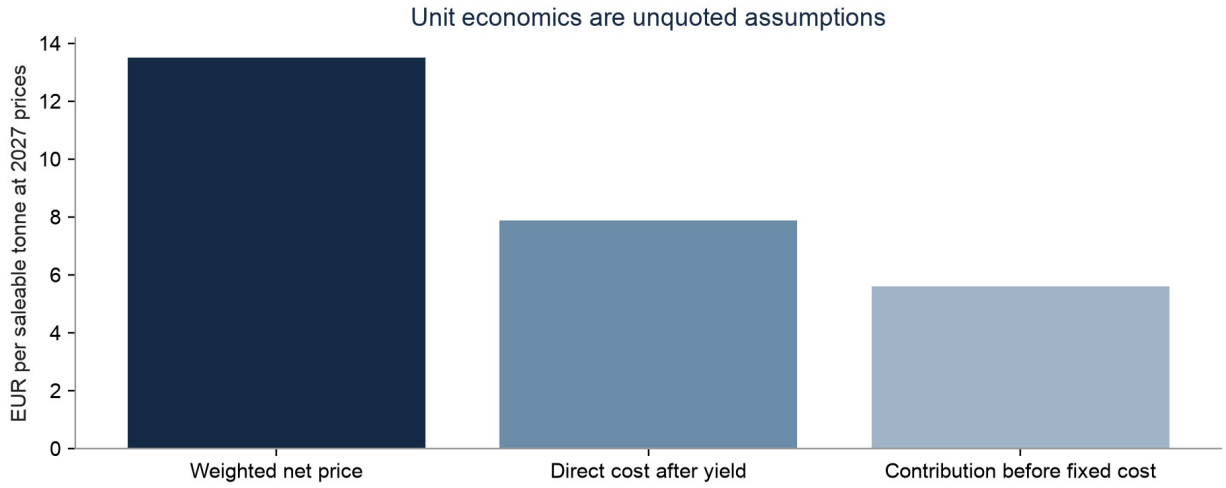


Figure: Pricing and tonne economics. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

22 / MARKET

Competitor price comparison

Decision and scope

No like-for-like wholesale ex-quarry competitor quotation was verified. Retail paving-stone prices are a different product and are not used. The comparison table should therefore show quote status, specification, VAT, loading and freight basis, with competitor price unavailable.

Evidence and operating implication

Obtain three contemporaneous quotes using identical grades, quality certificates, minimum load, payment terms and location. Compare landed net price using the actual route. Replace our indicative prices only after testing whether customers will pay them and whether the unit contribution still funds fixed cost and closure.

Provider	Comparable net ex-quarry quote
Our indicative proposal	Roadbase 13; screened 18; fines 8 EUR/t, unquoted
Rudus Southern Finland [S7]	Unavailable; request same-grade written quote
NCC/incumbent network [S8]	Unavailable; no verified location-specific quote
Recycled/construction rock [S2]	Project-specific suitability and landed price unknown

23 / SALES

Brand and customer experience

Decision and scope

The working name communicates geography and product only; no registered brand is claimed. Service standards are clear specification, pickup appointment, safety induction, accurate weight, invoice traceability and a response to nonconforming loads.

Evidence and operating implication

The dispatch operator records grade, batch, haulier, weight and purchase-order reference. Staff explain whether tax and freight are included. A rejected load is isolated and investigated; credit notes require manager approval. Certificates must reflect actual tests and cannot be copied from another quarry. Online information supports procurement rather than consumer lifestyle marketing.

24 / SALES

Sales channels and process

Decision and scope

The main channel is direct account sales to qualified contractors. Leads are screened for technical requirements, route, credit and annual volume. Quotes state ex-quarry price, VAT, grade, pickup conditions and expiry. Dispatch occurs only against approved credit or advance payment.

Evidence and operating implication

The model assumes 30-day receivables and 30-day eligible supplier credit; neither is agreed. New or financially weak buyers should pay before loading. Track enquiries, trial loads, technical approvals, repeat tonnes, invoices overdue and rejected deliveries. Tender volume is recognised only when actually delivered, not when an invitation or expression of interest arrives.

25 / SALES

Launch marketing

Decision and scope

Development marketing is a EUR10,000 allowance within development expense. Spend covers technical product sheets, buyer visits and controlled test loads after lawful test permission. Do not promote an opening date until the site and approvals are credible.

Evidence and operating implication

Ongoing account development is included within fixed overhead at an assumed EUR12,000 annually. The owner records opportunities and trial outcomes. Avoid broad consumer advertising. Publication of measured quality and real stock availability comes after qualification. No reference customer logo or testimonial is used without an actual relationship.

26 / SALES

Retention and ongoing sales

Decision and scope

Repeat sales should come from consistent grade and dispatch, timely paperwork and fair resolution of complaints. Review buyer profitability after credit loss, rejected loads and loading delays. Offer agreements with defined minimum orders rather than unrestricted discounts.

Evidence and operating implication

Test one improvement at a time: pickup slots, ordering cutoffs or stock notification. Measure repeat tonnes and contribution by buyer, not website visits alone. Quarterly credit review can reduce revenue deliberately when collection risk rises. Offtake is unsecured and no guaranteed minimum purchase supports the model.

27 / OPERATIONS

Daily operations and suppliers

Decision and scope

The manager plans compliant extraction and blast campaigns against permit limits. The contractor isolates blast areas and records explosive use and safety controls. Operators inspect equipment, crush to approved grading, segregate stock and log downtime. Dispatch checks truck safety, load grade and weight.

Evidence and operating implication

Daily logs reconcile rock extraction, saleable production, rejects, sales and stock. Laboratory tests and water/dust/noise monitoring follow actual permit and product duties. Vendor alternatives are required for blasting, wear parts, fuel and haulage disruptions. The model's operating seasonality is an assumed schedule and must be constrained by permitted hours and winter conditions.

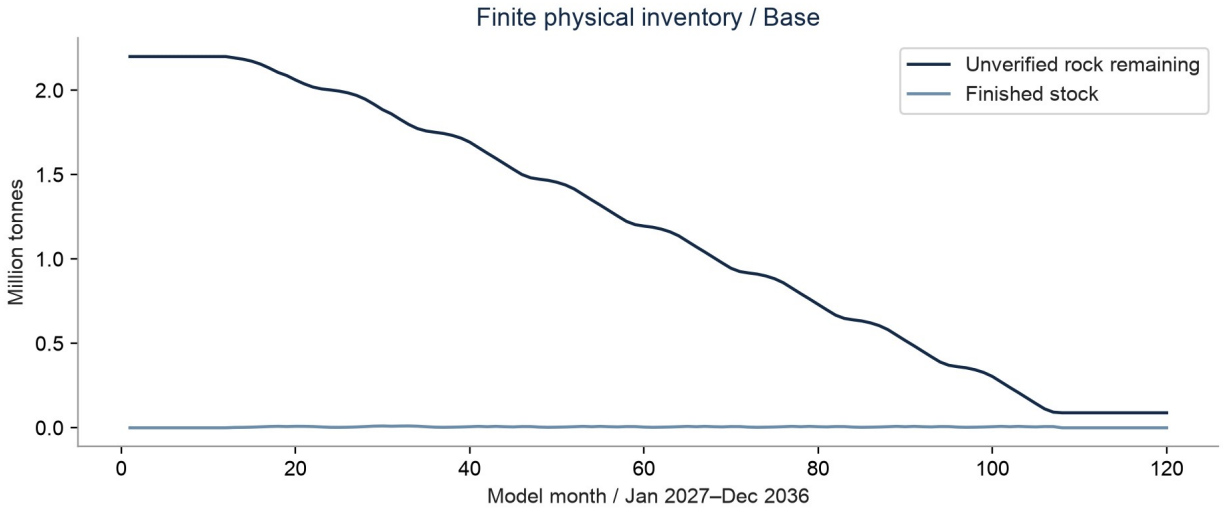


Figure: Daily operations and suppliers. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

28 / OPERATIONS

Sustainability practices

Decision and scope

Measure diesel per tonne, reject share, water quality, complaints, dust and disturbance area. Use settlement and drainage controls designed for the actual site. Preserve topsoil, reclaim exhausted sections progressively and control slope stability. No quantified carbon reduction is claimed without a baseline.

Evidence and operating implication

GTK identifies technical suitability and regional mass coordination as important to resource-efficient aggregates [S2]. This concept excludes waste reception and side-stream revenues until separately approved. A reclaimed quarry must satisfy the authority and landowner; leftover stock or equipment cannot substitute for remediation. Closure spending and the liability are explicit in the model.

29 / PEOPLE

Staffing and training

Decision and scope

Full operating payroll includes one working owner, one quarry manager, two equipment operators and one dispatch/weighbridge employee. The manager is funded for the last six development months, and owner/manager half-time duties continue during closure. The manager supervises three employees; the owner oversees the manager and commercial administration. External drilling/blasting, geology, environment, laboratory and accounting providers do not appear as employee FTE.

Evidence and operating implication

Annual gross remuneration assumptions total EUR254,000 before a 25% employer allowance. The allowance is unverified and must be replaced by Finnish payroll calculations, pension/insurance contributions and applicable collective terms. A controlling managing founder may need YEL based on work value [S15]; the owner cost allowance is not an asserted employee pension rate. Company-funded pension must not be deducted again in the household illustration. Training includes equipment safety, lockout, loading exclusion zones, dust exposure, first aid, emergency response and spill control. Leave and absence coverage must be priced in contractor tenders.

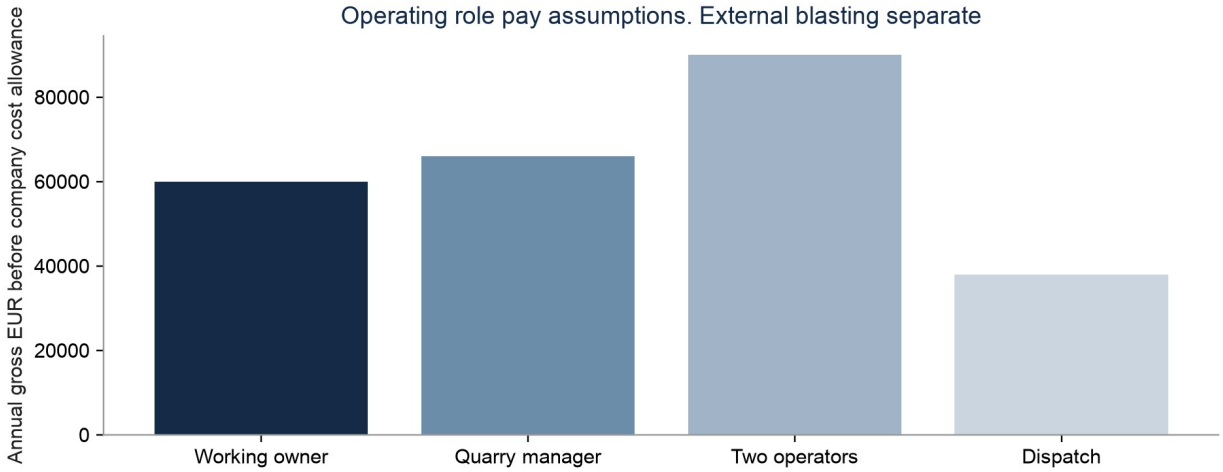


Figure: Staffing and training. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

30 / PEOPLE

Staff skills and fair work

Decision and scope

Require documented equipment and quarry competence, language capability for safety instructions and training appropriate to the role. Contracted blasting personnel must satisfy legal competence and insurance requirements. Manager recruitment is an evidence gate, not a credential assigned to a fictional founder.

Evidence and operating implication

Use written hours, overtime, leave, pension and insurance arrangements under applicable Finnish law and agreements. The owner cannot cover every shift indefinitely. Review noise, silica dust, vibration and ergonomics exposure with occupational specialists. Staff can stop unsafe work without a sales target overriding the decision. Payroll escalation is 3% annually, not a statement about statutory indexation.

31 / LEGAL

Legal and insurance requirements

Decision and scope

Commercial extraction requires municipal land-extraction approval and quarrying/crushing at the scoped duration requires environmental approval [S1]. Assess water, nature, planning, construction, roads, explosives, workplace and product conformity duties. Determine the applicable harmonised aggregate standard, factory production control, notified-body duties and declaration of performance before CE-marked sales. CE does not establish fitness for every use [S13]. Land access or exploration is not extraction permission. Start only when the permit is enforceable and all commencement conditions are met.

Evidence and operating implication

Use the actual municipality’s current fee tariff and annual supervision charge. Helsinki’s at-least-eight-month combined process is a comparator, not a promise [S11]. Granite aggregate mineral-excise input is zero based on scoped Land Extraction Act activity; obtain written confirmation before investment [S10]. Insure employer obligations, public liability, plant, pollution response and business interruption; no policy is secured.

32 / IMPLEMENTATION

Opening roadmap

Decision and scope

Before any capital commitment: secure the relevant land rights and legal authorisations, complete site and geological diligence, approve supplier contracts and obtain board funding approval. None of those gates has been met. The stress budget nevertheless front-loads EUR2.25 million of capital payments into January–June 2027; it exposes hypothetical committed-capital risk rather than recommending expenditure before approvals. Months seven to twelve cover installation, controls, qualification and commissioning ahead of commercial release.

Evidence and operating implication

The twelve-month development interval is a commissioning and commercial-release assumption, not permission to spend without legal gates. It can be insufficient for appeals or complex environmental issues. Downside delay moves sales while the front-loaded capital remains paid and interest and holding costs continue; the denial test retains this sunk-cash exposure. A final investment committee gate requires rights, usable inventory, tested grades, enforceable permits, closure security, cash funding and competent management. The editable commercial permission flag 0 prevents extraction and sales while retaining paid holding/core duties, debt service and cleanup obligations. No contract should force operation before that gate.

33 / RISK

Risks and management actions

Decision and scope

Major risks are unusable rock, reduced saleable yield, consent refusal, unsafe blasting, water impact, truck opposition, weak sales, receivable default, diesel/wear cost and insufficient closure funding. Each can change the physical or cash forecast. Site failure results in stopping development rather than drawing a fictitious reserve into revenue.

Evidence and operating implication

The board reviews signed free cash separately from collateral. Negative model cash signals a funding requirement, not a permitted overdraft. Delay, price, yield, capacity, wages, VAT refund timing and closure cost should be rerun together before investment. Specialist verification is required for resource classification and closure estimate. No grant or salvage value rescues the forecast.

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Research and evidence

Decision and scope

The research register distinguishes primary public sources, competitor statements and author assumptions. Finnish environmental administration supports permit requirements; GTK supports quality-testing and circularity context; Helsinki supports demand indicators; Vero supports current tax/VAT scope [S1–S12].

Evidence and operating implication

Public context cannot establish the unidentified site's reserves, viable grades, customer demand, costs or permissions. Evidence still needed includes surveyed inventory, tests, land agreement, actual authority fees, contractor/equipment tenders, payroll calculation, credit terms, loan approval and independent reclamation estimate. Retained research notes and model input notes identify the source or unresolved gate beside each driver.

S1 Finnish environmental administration, Maa ainesluvan hakeminen, updated 25 June 2026. https://www.ymparisto.fi/fi/luvat-ja-velvoitteet/maa-ainesten-ottamisen-luvat-ja-ilmoitus/maa-ainesluvan-hakeminen

Commercial extraction requires municipal land-extraction permission; quarrying/crushing for at least 50 days requires environmental permission. Joint handling ordinarily applies. Annual extraction reporting is required. The EIA project-list threshold is more than 25 ha or at least 200,000 solid m3 annually; case-specific assessment can also apply.

S2 GTK, Rock Aggregate Studies and Circular Economy of Aggregates. https://www.gtk.fi/en/services/rock-aggregate-studies-and-circular-economy-of-aggregates/

Geological quality, quarrying, transport, processing and storage all affect suitability; quality criteria vary by application. Local reuse of construction rock can reduce virgin extraction and transport burdens.

S3 City of Helsinki, Rakentaminen, Q2 2026. https://kaupunkitieto.hel.fi/fi/asuminen/asuntotuotanto-ja-rakentaminen/rakentaminen

At Q2 end 2026, 2,294 dwellings completed, 1,643 started and 1,865 permitted; 4,158 dwellings under construction.

S4 City of Helsinki, Asuntotuotanto. https://kaupunkitieto.hel.fi/en/node/201

2025 completions 4,186, starts 3,242, permits 3,402; construction remained weak.

S5 Finnish Tax Administration, corporate income rates. https://www.vero.fi/en/businesses-and-corporations/taxes-and-charges/tax-prepayment/additional-prepayment/calculator-for-additional-prepayments/ukk/yhteis%C3%B6jen-tuloveroprosentit-en/

2025/2026 limited-company tax 20%.

S6 Finnish Tax Administration, Rates of VAT. https://vero.fi/en/businesses-and-corporations/taxes-and-charges/vat/rates-of-vat/

General VAT 25.5%; building supplies included.

S7 Rudus, Southern Finland aggregate contacts. https://www.rudus.fi/yhteystiedot/kiviaines/kiviaines-etela-suomi

Existing regional aggregate supplier and quarry operations establish competition.

S8 NCC, aggregate supply article, 2025. https://blog.ncc.fi/kestava-kehitys/miten-turvataan-rakentamiselle-kriittisten-kiviainesten-saatavuus/

An incumbent reports long-term Nordic aggregate supply challenges.

S9 GTK, Kivireki project. https://www.gtk.fi/en/research-project/kivireki/

April 2026–March 2028 project investigates environmental suitability of mining waste rock and responsible aggregate use.

Additional primary sources: S10 Vero mined-mineral tax https://www.vero.fi/en/businesses-and-corporations/taxes-and-charges/excise-taxation/tax-on-mined-minerals/; S11 Helsinki permit timing https://www.hel.fi/fi/yritykset-ja-tyo/hae-lupia-ja-tiloja/ymparistolupa-ja-ilmoitukset; S12 joint-permit security guidance retained in source-checkpoint.md. S13 Tukes CE rules https://tukes.fi/en/construction-products/ce-marked-construction-products; S14 Vero confirmed-loss rules https://www.vero.fi/en/businesses-and-corporations/taxes-and-charges/limited-companies-and-cooperatives/income-tax/losses/. S15 ETK managing shareholder YEL https://www.etk.fi/suomen-elakejarjestelma/elaketurva/tyoelaketurvan-kattavuus-ja-vakuuttaminen/usein-kysyttya-yel-vakuuttamisesta/; S16 Tukes temporary storage https://tukes.fi/en/permit-for-temporary-storage-and-inspections. Accessed 4 October 2026. Primary facts provide context; no bankable site evidence is claimed.

35 / EVIDENCE

Quotes and assumptions

Decision and scope

No supplier quote, landowner agreement, equipment finance offer or customer order is verified. All prices, capex, payroll and production assumptions are hypotheses. The plan must be refreshed after tenders and fieldwork rather than treated as a bankable feasibility study.

Evidence and operating implication

Tender schedules should compare fuel, productivity, mobilisation, wear parts, quality tests, environmental monitoring and disposal/reclamation. Rights due diligence must identify easements, term, extraction volume, royalty measurement and closure obligations. The spreadsheet allows typed edits and Base/Downside/Upside selection; static document scenarios are labelled snapshots.

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Startup costs and funding

Decision and scope

Proposed initial sources are EUR 2.6 million owner equity and EUR 1.0 million loan, paid in January 2027. None is committed. The hypothetical stress budget pays EUR 2.25 million net capital in January –June 2027, conditional on prior rights, legal and board commitment gates. Base 2027 development also requires EUR 250,000 restricted collateral and funded diligence, holding/core payroll, fees and paid interest. VAT recovery has an assumed cash lag.

Evidence and operating implication

Base minimum signed free cash is EUR 603,108 across all 120 months. The model has no automatic equity topup. Downside requires EUR 5,008,677 additional unsecured funding to eliminate negative cash on its unchanged initial source assumptions. Collateral is separate from spendable cash.

Base development 2027	EUR
Owner equity	2,600,000
Proposed loan	1,000,000
Total sources	**3,600,000**
Net capital paid	2,250,000
Restricted collateral	250,000
Expense payroll overhead fees / interest	351,250
Closing signed free cash	746,710

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Itemized startup costs

Decision and scope

Initial PP&E assumptions total EUR2.25 million: crusher and screen EUR650,000; excavator EUR350,000; loader EUR250,000; infrastructure/weighbridge EUR450,000; site development EUR350,000; contingency EUR200,000. The full contingency is assumed spent on equipment/civil capital and must be replaced by actual approved additions.

Evidence and operating implication

Development expense EUR120,000 includes EUR15,000 application fee allowance, EUR10,000 launch work and EUR95,000 professional/site diligence. It excludes the refundable security and capital assets. Further holding overhead and paid interest continue during delay. Planned EUR75,000 sustaining capex at operating years four and six is distinct from routine maintenance.

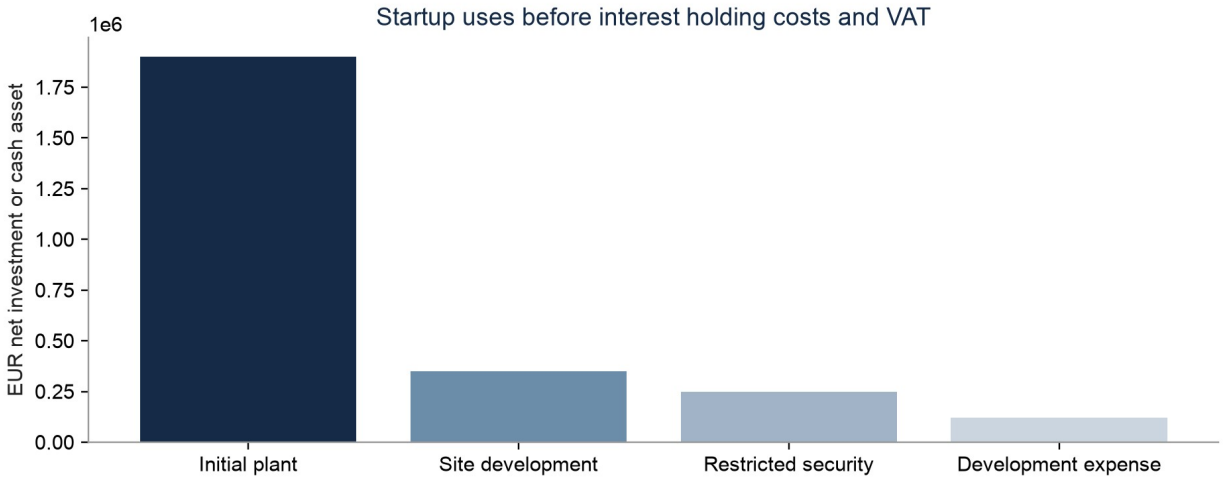


Figure: Itemized startup costs. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

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Owner personal survival budget

Decision and scope

Illustrative monthly household costs are housing/utilities EUR1,600, food EUR500, transport EUR350, insurance/health EUR200 and other spending EUR550: EUR3,200 total. Reliable outside income is assumed zero. This is not the founder's actual budget.

Evidence and operating implication

At an assumed 65% net/gross retention, EUR60,000 annual owner gross pay implies EUR3,250 monthly net and EUR50 monthly margin. Actual payroll tax, household liabilities and pension treatment can change this result. Development gross pay is EUR3,000 monthly for an assumed 20 hours/week. At 65% retention this gives EUR1,950 net, leaving EUR1,250 monthly household shortfall. Twelve Base development months require EUR15,000 and eighteen Downside months EUR22,500 personal funds outside company equity. Those funds are not claimed available.

Illustrative requirement	Monthly EUR
Household spending	3,200
Development gross company pay	3,000
Assumed development net at 65%	1,950
Personal development shortfall	1,250
Operating gross company pay	5,000
Assumed operating net at 65%	3,250
Operating household margin	50

Separate unsecured personal funds required: EUR 15,000 for 12 Base development months or EUR 22,500 for 18 Downside months. Company equity is not household cash. Actual tax, dependants and reliable outside income are unknown.

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Financing terms and security

Decision and scope

The proposed EUR1 million loan has 6.5% nominal annual interest paid monthly and equal principal over 84 months beginning at the proposed scheduled operating date even if permission remains denied. A 2% arrangement fee is expensed and paid at drawdown. No facility, interest rate, security ranking or grace period is agreed.

Evidence and operating implication

Land rights and plant may be subject to security if legally enforceable and lender-approved. The EUR250,000 restricted deposit is separate from lender collateral and the EUR450,000 2027-price closure estimate. It is assumed released only at final authority acceptance in month120. Do not assume a refundable bond pays closure expense or substitute collateral release for revenue.

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Revenue forecast and capacity

Decision and scope

Revenue equals saleable tonnes sold times the mix-weighted net price. Monthly demand uses seasonal indices and ramps at 70% and 90% for operating years one and two before maturity. Extracted rock is capped by remaining design inventory and physical feed capacity; grade mix and price affect revenue.

Evidence and operating implication

Production, rejected rock, sales and finished stock reconcile each month. The final operating month unwinds stock and no revenue is assumed during development or closure. Demand is not automatically production; saleable output can remain in stock. Integrated tables and charts use the model's actual capped series, not unconstrained targets.

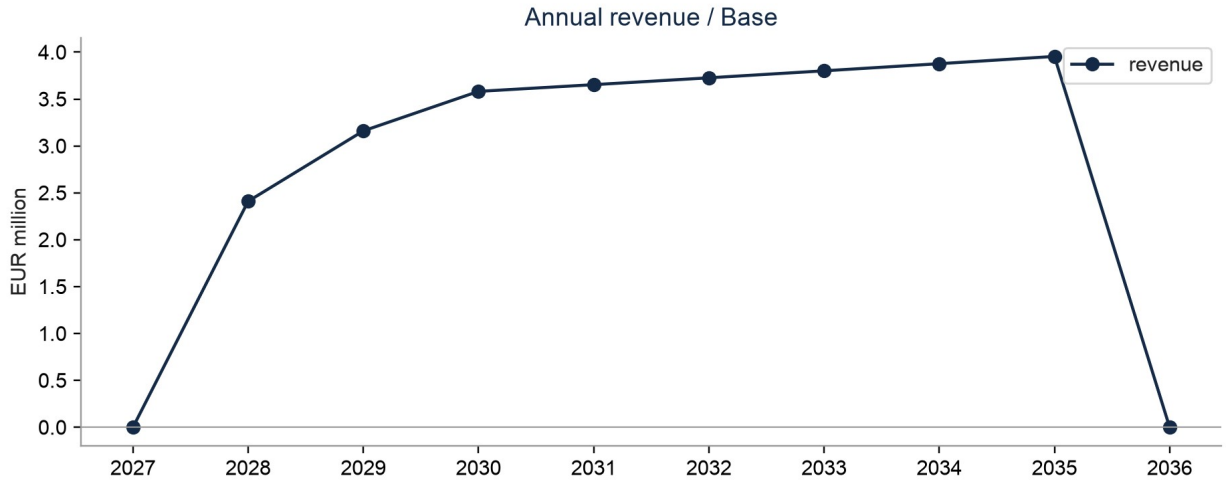


Figure: Revenue forecast and capacity. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

Year	Sold tonnes	Revenue EUR thousands	Remaining rock tonnes
2027	0	0	2,200,000
2028	175,000	2,410	2,002,315
2029	225,000	3,160	1,751,389
2030	250,000	3,582	1,473,148
2031	250,000	3,653	1,195,370
2032	250,000	3,726	917,593
2033	250,000	3,801	639,815
2034	250,000	3,877	362,037
2035	250,000	3,954	88,889
2036	0	0	88,889

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Costs and projected profit

Decision and scope

Direct production cost follows extracted tonnes and is carried into finished inventory until sale. Payroll includes owner compensation and employer allowance. Fixed overhead includes insurance, administration, account development EUR12,000 and routine maintenance. Public supervision is separately assumed at EUR0.08 per actual solid cubic metre plus EUR1,000 annual base fee; the actual municipal tariff is unresolved.

Evidence and operating implication

Finite site development depletes against original inventory; plant depreciates straight-line after operation begins. A nominal closure provision accrues with extraction; final closure true-up charges the full estimated obligation even when rock remains unextracted. Interest is an expense and a cash payment. Paid initial capital is assumed construction/installation not yet available for intended use until the permission gate and commissioning; tests are outsourced. Book/tax depreciation and depletion deductibility are explicit adviser gates, not verified tax positions. Closure provision tax deduction is deferred to actual payment in this conservative planning model.

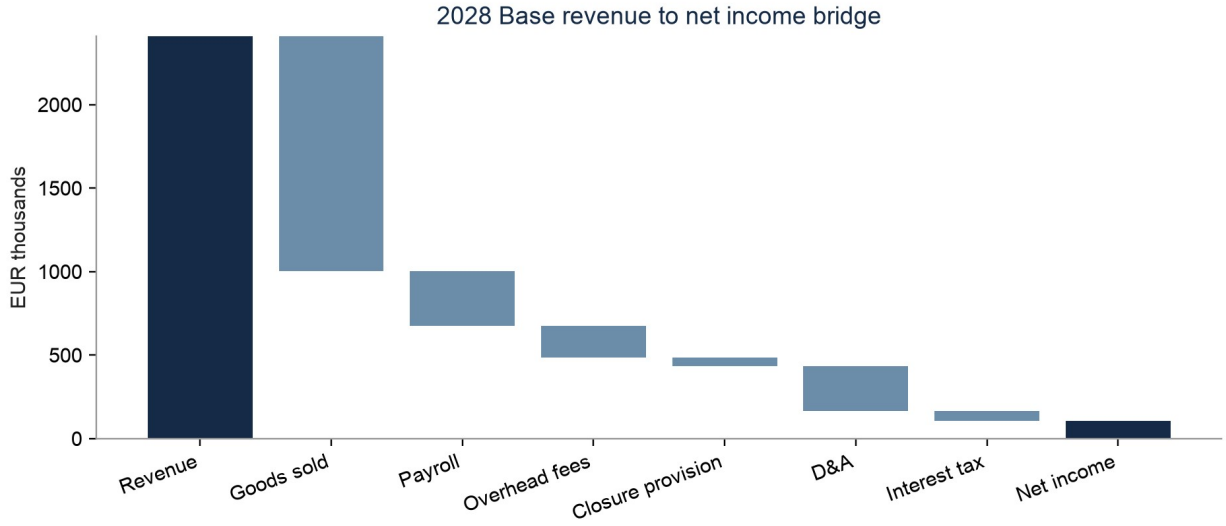


Figure: Costs and projected profit. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

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Profit and loss forecast

Decision and scope

All figures are EUR thousands, net of VAT. The linked 120-month forecast shows 2027 development net loss EUR 351,250, 2028 first-operation revenue EUR 2,409,750 and net income EUR 105,833. The table shows selected calendar years; the workbook retains every month and all ten years.

Evidence and operating implication

Corporate tax is a 20% future planning proxy based on the verified 2026 rate. Taxable profit adds back the nominal closure provision and deducts paid cleanup; loss carryforward is explicit. Book/tax depreciation, depletion, writeoff deductions and future rate must be confirmed. Confirmed tax losses require authority allowance and can be lost after qualifying ownership changes [S14]. No deferred tax asset improves equity.

EUR '000	2027	2028	2030	2035	2036
Net sales	0	2,410	3,582	3,954	0
Cost of goods sold	0	1,408	2,092	2,310	0
Payroll incl owner	86	327	347	402	103
Overhead	60	184	191	211	43
Public fees	0	7	10	11	0
Development expense	120	0	0	0	0
Arrangement fee	20	0	0	0	0
Redundancy	0	0	0	0	24
Closure expense	0	48	68	67	22
EBITDA	**(286)**	**436**	**873**	**954**	**(191)**
Depreciation	0	237	237	266	0
Depletion	0	31	44	43	0
Closure asset writeoff	0	0	0	0	14
Interest paid	65	61	42	0	0
Tax paid	0	0	122	142	0
Net profit / loss	**(351)**	**106**	**427**	**502**	**(206)**

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Cash flow and financial position

Decision and scope

The native monthly model reconciles paid interest, principal, VAT, receivables, finished stock, trade payables, capital, restricted collateral and closure. First-year cash is development cash; operation begins no earlier than January 2028 after the assumed gate.

Evidence and operating implication

Nominal cleanup EUR450,000 at 2027 prices escalates to EUR 537,792 in 2036. The full amount is paid over 12 closure months. Extraction-based provision accrual includes genuine EUR 21,729 cessation shortfall expense, then releases against actual cleanup payments. Security EUR 250,000 is assumed released only after final authority acceptance in month 120.

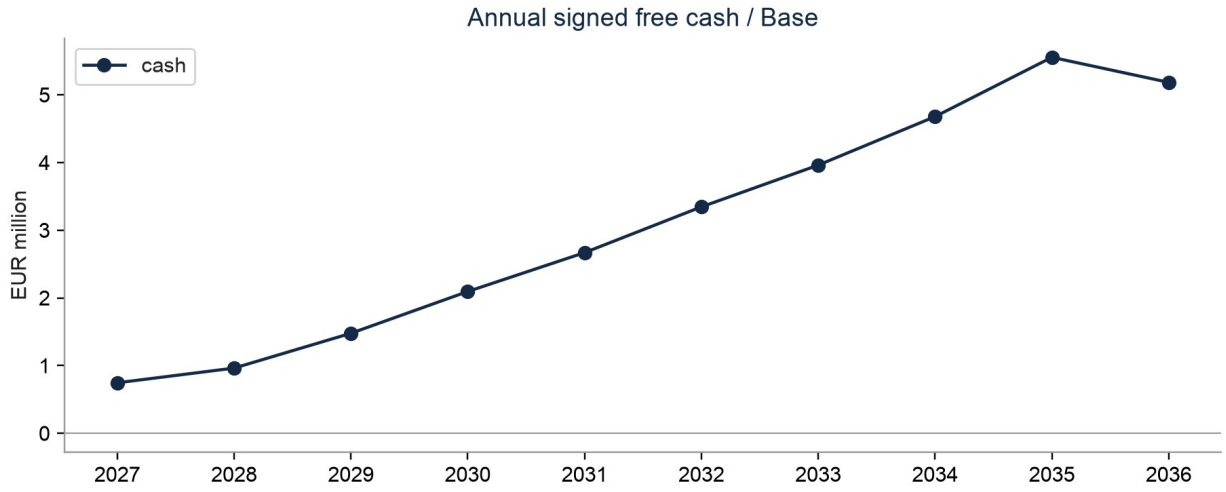


Figure: Cash flow and financial position. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.

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Cash flow forecast months one to six

Decision and scope

The first six model months are development, not trading. Initial funding is assumed month one; initial capital is paid across months one to six, while diligence expense and interest consume cash. VAT input credits can create a cash lag before recovery.

Evidence and operating implication

The table shows opening cash, operating flow, capex/security, funding/debt flow and signed closing balance from native recalculated outputs. This view must disclose the assumed VAT recovery timing. Failed permits do not create sales in development and no customer deposit finances a quarry that has not qualified.

EUR thousands	2027-01	2027-02	2027-03	2027-04	2027-05	2027-06
Opening cash	0	2,820	2,309	1,900	1,491	1,082
Operating flow incl paid interest	(155)	(135)	(34)	(34)	(34)	(34)
Investing flow incl collateral	(625)	(375)	(375)	(375)	(375)	(375)
Financing flow	3,600	0	0	0	0	0
CLOSING SIGNED CASH	2,820	2,309	1,900	1,491	1,082	673
Memo: interest paid (in OCF)	5	5	5	5	5	5

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Cash flow forecast months seven to twelve

Decision and scope

The second half of development continues holding costs and paid interest. Base operation starts month13 after the assumed permit gate. A downside delay extends holding costs and shifts principal commencement and sales within the fixed forecast horizon.

Evidence and operating implication

Cash values come from the same model version as all charts. A positive year-end cash figure does not remove an earlier monthly gap. Review minimum cash across all 120 months, VAT settlement lag and closure cash separately. No unsecured overdraft is represented as an agreed credit line.

EUR thousands	2027-07	2027-08	2027-09	2027-10	2027-11	2027-12
Opening cash	673	752	831	810	789	768
Operating flow incl paid interest	79	79	(21)	(21)	(21)	(21)
Investing flow incl collateral	0	0	0	0	0	0
Financing flow	0	0	0	0	0	0
CLOSING SIGNED CASH	752	831	810	789	768	747
Memo: interest paid (in OCF)	5	5	5	5	5	5

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Financial position summary

Decision and scope

Amounts are EUR thousands at 31 December of selected years, not annual flow totals. The table explicitly shows signed free cash separately from restricted collateral. Negative cash in an adverse case requires financing; it is not an agreed overdraft.

Evidence and operating implication

Base ends 2036 with EUR 5,185,041 free cash, zero scheduled debt and effectively zero closure provision. 88,889 tonnes of unverified design inventory remain stranded without further rights/permission. Remaining site development cost EUR 14,141 is written off at cessation; no terminal reserve or salvage revenue is assumed.

EUR '000	2027	2028	2030	2035	2036
SIGNED FREE CASH	747	963	2,095	5,555	5,185
Restricted cash	250	250	250	250	0
Receivables	0	126	187	207	0
Finished stock	0	23	35	0	0
Net plant and site	2,250	1,981	1,422	14	0
VAT credit	2	0	0	0	24
Total assets	**3,249**	**3,344**	**3,989**	**6,026**	**5,209**
Debt	1,000	857	571	0	0
Supplier payables	0	53	79	39	0
VAT payable	0	31	42	57	0
Closure liability	0	48	178	516	0
Total liabilities	**1,000**	**989**	**870**	**611**	**0**
Total equity	**2,249**	**2,355**	**3,119**	**5,415**	**5,209**
Balance difference	0	0	0	0	0

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Break even and scenarios

Decision and scope

Case comparisons are snapshots of the verified model version 1.0 inputs dated 4 October 2026. The workbook has a live case selector and a type-sensitive snapshot edit warning. Edited inputs require regenerating these document charts and tables.

Evidence and operating implication

Base minimum free cash EUR 603,108; Downside EUR -5,008,677; Upside EUR 672,785. Upside sales are capped by finite rock at 2.046 million saleable tonnes. Operating break-even excludes debt, tax, capex and cleanup; full cash flow includes them.

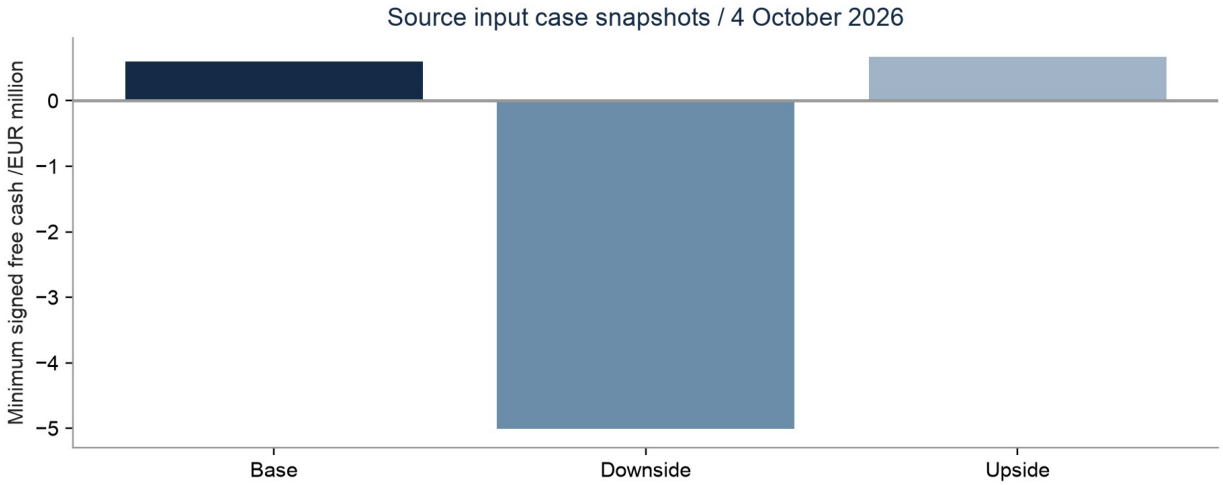
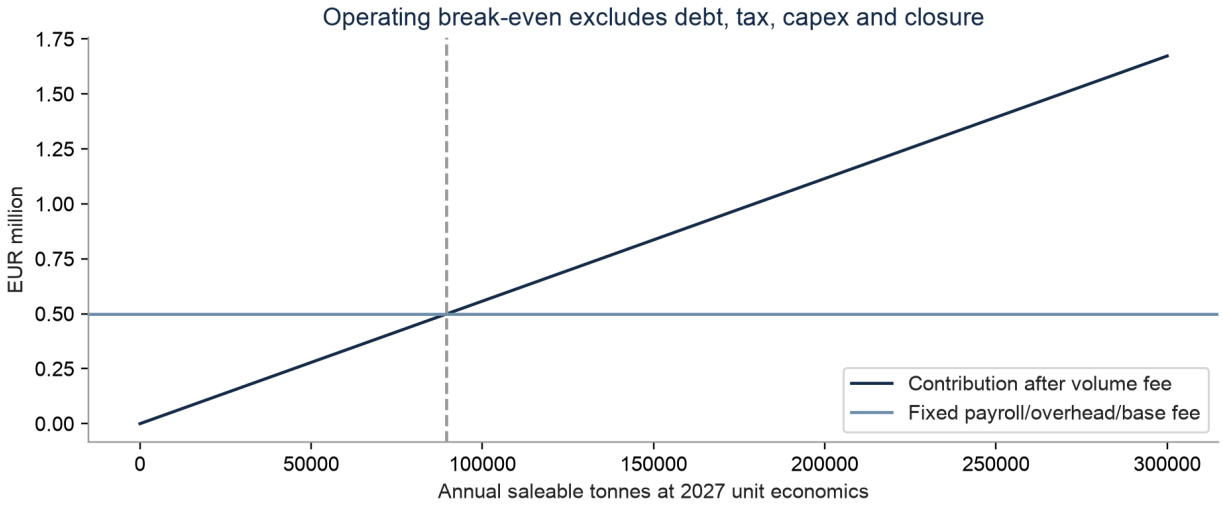


Figure: Break even and scenarios. Financial figures, where present, use Base model version 1.0; framework statements and design priorities are assessments, not observed claims.



Operating break-even at 2027 unit economics before debt, tax, capital and cleanup. Not a complete liquidity threshold.

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Model guide and completion

Decision and scope

Edit typed blue assumptions, select one of three cases and review the resulting monthly schedules and annual summaries. The January 2027 start and fixed operating/closure endpoints are part of this scoped horizon. Development delay and seasonality are editable and validated. Native charts link to output ranges. Retained build_model.mjs and model-results.json reproduce the workbook and document figures.

Evidence and operating implication

Before use, replace hypothetical rights, inventory, grades, costs and terms with independently supported inputs. Rerun the model after any scope or tax change, review minimum free cash and physical/financial reconciliations, and refresh document tables and snapshot charts. Before financing, obtain independent accounting, technical and legal review of the evidence and updated model.