



BUSINESS PLAN · INDIA

Lab-Grown Diamond Business

CVD/HPHT diamond growing, polishing, certification and downstream branded jewellery

GEMS, JEWELLERY & PRECIOUS GOODS

AISEVAK.IN · BY ABL DIGITAL TECHNOLOGIES

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This document is confidential and prepared for planning purposes. All financial figures are illustrative model assumptions for an Indian MSME context and must be validated against live quotes, local rates and professional advice before any investment or borrowing decision.

1. Executive Summary

This plan sets out a **Lab-Grown Diamond Business** in India — **growing gem-quality diamonds by CVD (with HPHT capability)**, processing them to polished, certifying through independent laboratories, and selling as **loose polished stones, as-grown rough to cutters, and increasingly as finished lab-grown jewellery under own brand and private label**, alongside contract growing and industrial-grade sales.

This plan begins with a statement that most proposals in this sector avoid: lab-grown diamond prices have fallen very sharply and are still falling, and there is no credible basis for assuming they will stop. Growing capacity has expanded rapidly, reactor efficiency keeps improving, and each improvement lowers the floor. **A plan projecting stable per-carat realisations is describing the past, not the future** — and a promoter who builds on that assumption will find the revenue line failing for reasons entirely outside their control. This plan models realisation per polished carat **falling to roughly 70% of its Year 1 level by Year 3**, and remains profitable only because cost per carat is modelled falling faster.

That framing is the whole plan: this is a COST-CURVE business, not a jewellery business. It behaves like solar panels, LEDs or memory chips — a manufactured product whose price declines as capacity and yield improve, indefinitely. **In such a market survival belongs to the lowest cost per carat, not to the best marketing**, and two consequences follow that a promoter must accept before committing capital. **Power is the dominant variable cost**, since reactors run continuously at high load for weeks — which makes **captive solar and open-access power the single largest lever on competitiveness, an economic decision here rather than an environmental gesture.** And **reactors may become obsolete before they wear out**: a machine bought today will be outcompeted on cost per carat by a better one within a few years, so this plan **depreciates aggressively rather than assuming a long asset life.** A lab-grown plan showing gentle depreciation over ten years has understated its costs.

And the strategic conclusion the numbers force: the escape from a commodity cost race is downstream. A grower selling loose stones competes on price forever. **A brand selling finished lab-grown jewellery prices on design, and captures margin the grower cannot.** This plan therefore grows **finished jewellery from 15.6% of revenue to 36.6% by Year 3 — not empire-building, but the only structural answer to a permanently falling stone price.** Disclosure is absolute throughout: growing diamonds is a legitimate and impressive business, and **passing them off as mined is fraud that would end it.**

This plan models a business requiring **₹12 crore** (₹4.2 crore promoter + ₹6 crore term loan + ₹1.8 crore working-capital finance), moving from **₹11.85 crore revenue and a ₹12 lakh loss** in Year 1 to **₹26.75 crore revenue and ₹2.62 crore profit** by Year 3, across 18 growing to 38 reactors. (*Lab-grown diamonds; cost-curve manufacturing with falling realisations — figures illustrative.*)

2. Business Description, Vision & Legal Structure

Concept: A lab-grown diamond manufacturer — CVD growth with HPHT capability, post-growth laser separation, cutting and polishing, IGI-type certification, and sales as loose polished, as-grown rough, and finished jewellery under own brand and private label, plus contract growing and industrial-grade by-product sales.

Vision: To be among the lowest-cost gem-quality growers in India — and to have moved enough of our value downstream that the stone price stops deciding our future.

Mission: Drive cost per carat down every quarter, disclose what we make in every transaction without exception, and build a brand while the margin still exists to fund one.

Legal structure options

- **Private Limited** — required in practice: term-loan funding for reactors, power contracting, export registration, brand investment and the governance a capital-intensive business needs.
- **LLP** — inadequate for this capital structure.
- **SEZ/EOU** — worth evaluating for the export share, though the domestic brand ambition may argue against it.

Regulatory anchor: lab-grown diamonds must be disclosed as lab-grown at every point of sale, in every document, with a distinct HS classification; the FTC-style and Indian trade-description requirement is that terminology be clear and non-deceptive — "cultured" or bare "diamond" without qualification is not acceptable. Certification through IGI and comparable laboratories carries a lab-grown-specific report and, commonly, **laser inscription on the girdle**. Government policy has been supportive — **customs concession on seeds and equipment and a national research grant on lab-grown technology** — and these should be modelled where applicable. Power connection at HT, open-access or captive-solar arrangements bring their own state regulatory process and are worth engaging early. Factory, labour, GST and pollution-consent apply, with **gas handling (hydrogen and methane), high-temperature plasma and high-voltage systems making process safety a genuine engineering discipline rather than a checklist**. Export routes require GJEPC registration and correct lab-grown classification.

3. Promoter & Ownership

Led by a promoter with materials-processing, semiconductor, engineering or diamond-trade background. Two competences decide outcomes: *process engineering* — reactor recipes, plasma conditions, seed quality and yield improvement, because **cost per carat is an engineering outcome, not a purchasing outcome**; and *downstream commercial judgement*, since the strategic escape route runs through brand and jewellery rather than through better stones. A grower who cannot build a brand is a price-taker permanently. Yield and cost discipline, power strategy, disclosure integrity & downstream execution are the differentiators. Ownership, equity & any partner are editable inputs.

4. Market Analysis — India & Export

Demand is driven by the price gap against mined diamonds in bridal and fashion jewellery, younger buyers' openness to lab-grown, larger stones becoming affordable, sustainability positioning, and India's emergence as a leading growing and cutting centre. **Volume demand is growing strongly while value per carat falls** — a combination that rewards scale and cost, and punishes anyone who models the volume growth without the price decline. The market rewards cost per carat, yield & brand; it is **capital-intensive, power-intensive and structurally deflationary**.

Demand drivers

- **Price accessibility** — a substantially larger or better stone for the same budget, which is a genuinely powerful consumer proposition.
- **Generational acceptance** among younger buyers who do not treat origin as decisive.
- **Fashion and everyday jewellery** where lab-grown allows designs that mined stones would price out of reach.
- **Sustainability positioning**, credible only if the power source is genuinely clean — which ties directly to the captive-solar decision.
- **India's growing-and-cutting ecosystem** concentrating capability, talent and supply chain.

Market sizing (illustrative framing)

Layer	Definition	Indicative scale
TAM	Global lab-grown diamond & jewellery demand	Growing fast in volume
SAM	Sizes/qualities the reactor fleet can grow economically	Capacity-bounded
SOM (Yr 1–3)	Carats grown & branded jewellery share	Scaling with fleet & brand

Target segments

- **Domestic and international jewellery brands** buying certified loose polished.
- **Cutters and polishers** buying as-grown rough — the simplest, lowest-margin channel.
- **Retail consumers** through own brand — the highest-margin and strategically decisive channel.
- **Private-label partners** — retailers wanting lab-grown ranges without manufacturing.
- **Industrial and technical buyers** for off-spec and industrial-grade material.

5. Competition & Competitive Advantage

Landscape: a rapidly expanding Indian grower base concentrated in Gujarat, large Chinese HPHT and CVD capacity, US and European growers, and integrated players moving downstream into brands. **Competition is on cost per carat and, increasingly, on brand — and cost per carat has no ceiling of protection: whoever runs the newest reactors on the cheapest power sets the price everyone else must meet.**

The business's edge

- **Power strategy** — captive solar and open access attacking the single largest variable cost, with a sustainability claim that is actually true as a by-product.
- **Process yield discipline** — recipe development and run-level analytics driving gem-quality yield up and cost per carat down every quarter.
- **Downstream integration** — moving revenue into finished jewellery where pricing is design-led rather than commodity-led.
- **Disclosure and certification rigour** — inscribed, certified goods that a brand buyer can resell without exposure.
- **Integrated growing-to-polished** capability, avoiding a margin handoff at each stage.

6. Products & Revenue Model

Line	Model	Basis
Polished lab-grown sales (loose, certified)	Per carat, price-taking	Core volume, deflating
As-grown rough to cutters	Per carat	Lowest margin, fastest cash
Finished lab-grown jewellery (own brand + private label)	Design-led pricing	15.6% → 36.6% — the strategy
Contract growing & toll processing	Capacity charge	Fills fleet, no price risk
Industrial-grade & by-product	Per carat, technical grades	Yield recovery

The revenue mix is the plan's central argument, and the two ends of it behave in opposite directions. Loose polished is a price-taking commodity: the seller has no pricing power, realisations fall with the industry cost curve, and the only defence is being cheaper than the next producer. **Finished jewellery is priced on design, brand and retail context** — the stone is an input, and the customer is not buying carats. **As the stone price falls, the jewellery business is actually helped: its principal input gets cheaper while its selling price holds.** This is why the shift from 15.6% to 36.6% of revenue is treated as the strategy rather than as diversification. **A grower that stays purely upstream is betting it can remain the lowest-cost producer indefinitely against competitors with newer reactors and cheaper power — a bet that has ended badly in every comparable industry.**

7. Go-to-Market — Two Businesses, Two Motions

Upstream (stones)

- **Certified loose polished** to jewellery brands and manufacturers, sold on consistency of grade and supply.
- **As-grown rough** to the cutting trade for volume offtake and quick cash conversion.
- **Contract growing** that fills reactor capacity at a capacity charge, carrying no stone-price exposure at all.
- **Trade shows and export buyers**, with correct lab-grown classification throughout.

Downstream (jewellery)

- **Own brand** — D2C and selective retail, built on design and value rather than on the word "diamond".
- **Private label** for retailers wanting a lab-grown range without manufacturing — faster to scale than own brand and a bridge to it.
- **Design as the product**, since price competition on the stone is a race the brand should not enter.
- **Honest positioning** — lab-grown stated plainly and confidently, which younger buyers respond to better than euphemism.

Sales approach

Fill the fleet with contract growing and rough sales while yields stabilise → build certified polished supply relationships with brands → launch private label to learn the jewellery business on someone else's marketing spend → develop own brand deliberately and fund it while upstream margin still exists → shift mix downstream every year. **The timing point is the one most easily missed: the brand must be built while the stone still earns enough to pay for it. A grower who waits until upstream margins have gone will be trying to fund a brand out of a business that no longer generates surplus** — which is precisely when it cannot be done.

8. Operations Plan (grow, separate, polish, certify, set)

- **Seed preparation:** diamond seed plates prepared and loaded — seed quality materially affects the outcome of a multi-week run.
- **CVD growth:** methane and hydrogen plasma at controlled temperature and pressure, **running continuously for two to four weeks per cycle**, growing rough onto the seed.
- **HPHT capability:** for post-growth colour treatment and specific product types.
- **Laser separation:** removing grown rough from the seed plate; seed plates are reclaimed and reused.
- **Cutting & polishing:** the same planning, sawing, bruting and brillianteering discipline as natural rough, on the same equipment types.

- **Grading & certification:** in-house grading then independent lab certification with **lab-grown report and girdle inscription**.
- **Jewellery manufacturing:** casting, setting and finishing for own-brand and private-label ranges.
- **Process analytics:** **yield, quality distribution, power per carat and cost per carat tracked run by run and reactor by reactor.**

Production cycle

Stage	Activity	Metric
Load	Seed plate preparation	Seed reuse cycles
Grow	2–4 week CVD run	Gem-quality yield %
Separate	Laser removal from seed	Recovery %
Polish	Plan, saw, brute, brilliant	Polished yield
Certify	Lab report + inscription	Grade distribution
Sell / Set	Loose or into jewellery	Cost per polished carat

Two operational realities decide whether this factory survives the price decline. The first: **yield and quality distribution, not throughput, determine cost per carat.** A reactor runs for weeks regardless of what comes out of it, so the power and depreciation cost of a run is largely fixed — **meaning the difference between a run that yields high-clarity Type Ila material and one that yields included, off-colour goods is almost entirely margin.** Recipe development, seed quality and process control are therefore not refinements but the core economics, and **run-level analytics per reactor are the most important management information the business produces.** The second: **power is the dominant variable cost and it is the one genuinely available lever.** Grid tariffs are what they are; **captive solar or open-access renewable power can materially change cost per carat,** and unusually in this library, **the environmental case and the commercial case point the same way — clean power here is cost reduction that happens to be green, not the reverse.** It also makes the sustainability claim defensible, which matters because **lab-grown marketed as "green" while run on coal power is a claim that will not survive scrutiny.**

9. Regulatory, Licences & Compliance (India)

- **Disclosure:** **lab-grown declared as lab-grown at every point of sale and in every document, with distinct HS classification and clear, non-deceptive terminology.** Growing diamonds is entirely legitimate; representing them as mined is fraud — and given screening technology in the trade, it is also certain to be detected.
- **Certification & inscription:** lab-grown-specific reports and girdle laser inscription, which protect the buyer and the business simultaneously.
- **Policy support:** **customs concessions on seeds and equipment and the national lab-grown research grant —** worth modelling and applying for where eligible.
- **Power:** HT connection, open-access approvals, captive-generation and net-metering rules, which vary by state and take time.
- **Process safety:** **hydrogen and methane handling, high-temperature plasma, microwave and high-voltage systems — a genuine engineering safety discipline** with gas detection, ventilation, interlocks, and trained operators; hydrogen in particular is unforgiving of improvisation.
- **Environment & factory:** consent to operate, hazardous-waste handling, factory licence and labour compliance.

- **Export:** GJEP registration, correct classification, and realisation tracking on EDPMS.

10. Organisation & Manpower Plan

Role	Yr 1	Yr 2	Yr 3
Promoter / managing director	1	1	2
Process engineers & reactor operations	24	36	50
Cutting, polishing & finishing	42	62	88
Jewellery manufacturing (karigars)	12	28	58
Maintenance & utilities	8	12	17
Sales, marketing & brand	7	13	22
QC, grading & certification	6	10	15
Admin, accounts & stores	5	8	12
Total	105	170	264

Two growth rates tell the story. **Process engineering grows steadily because cost per carat is an engineering outcome.** And **jewellery karigars grow nearly fivefold against a 2.3× revenue increase** — that disproportion is the downstream shift made concrete in headcount, and it is what the strategy looks like when it is actually being executed rather than merely stated.

11. Implementation Timeline & Milestones

Phase	Timeline	Milestone
Setup	Month 0–8	Factory, HT power & solar, 18 reactors commissioned, recipes stabilised
Ramp	Month 8–12	~85,000 ct grown; ₹11.85cr revenue, ₹12L loss; private label launched
Grow	Year 2	28 reactors, cost/ct –20%; ₹18.4cr, ₹1.27cr profit; jewellery to 25%
Scale	Year 3	38 reactors; ₹26.75cr, ₹2.62cr profit; jewellery 36.6% of revenue

12. Financial Plan (Illustrative)

*All figures are illustrative model assumptions for an Indian context, shown so the promoter can replace them with live rates. They are not projections of guaranteed results. **Realisation per carat, cost per carat, gem-quality yield, power tariff and downstream mix are the levers** — and unlike every other plan in this vertical, realisation is modelled **FALLING, not flat.***

12.1 Project cost & means of finance

Capital requirement	₹
CVD reactors & growth chambers	5,80,00,000
Power infrastructure, HT connection & captive solar	1,90,00,000

Working capital (seeds, WIP, polished inventory, receivables)	1,80,00,000
Post-growth processing (laser, cutting, polishing) equipment	1,05,00,000
Factory, clean-room, utilities & building fit-out	78,00,000
Testing, grading & certification instruments	28,00,000
IT, ERP, process-control & run analytics	20,00,000
Legal, registrations, GJEPC & launch	19,00,000
Total project cost	12,00,00,000
Term loan	6,00,00,000
Promoter contribution	4,20,00,000
Working-capital finance	1,80,00,000

Note the shape of this project cost, because it inverts the rest of the vertical. Every other plan in gems is dominated by working capital — 68-73% of project cost tied up in metal or stones. **Here, reactors and power infrastructure are 64% and working capital is only 15%.** This is a manufacturing business with an inventory tail, not an inventory business with a workshop. **The practical consequences are significant: the lender is funding depreciating equipment rather than assayable metal, there is no gold-price exposure at all, and the operating leverage runs the other way** — fixed costs are high, so utilisation and yield matter enormously and a shortfall in either flows straight to the bottom line.

12.2 Projected Profit & Loss (3 years)

Particulars	Year 1	Year 2	Year 3
Polished lab-grown diamond sales (loose, certified)	6,20,00,000	8,90,00,000	11,20,00,000
As-grown rough sales to cutters	2,40,00,000	2,80,00,000	2,90,00,000
Finished lab-grown jewellery (own brand + private label)	1,85,00,000	4,60,00,000	9,80,00,000
Contract growing & toll processing	95,00,000	1,40,00,000	1,90,00,000
Industrial-grade & by-product sales	45,00,000	70,00,000	95,00,000
Total revenue	11,85,00,000	18,40,00,000	26,75,00,000
Power & utilities	2,15,00,000	3,00,00,000	3,95,00,000
Depreciation (accelerated on reactors)	1,72,00,000	1,95,00,000	2,15,00,000
Seeds, gases, consumables & materials	1,58,00,000	2,25,00,000	3,05,00,000
Cutting, polishing & finishing labour	1,42,00,000	2,05,00,000	2,80,00,000
Salaries (process engineers, QC, sales, admin)	1,15,00,000	1,58,00,000	2,15,00,000
Jewellery metal & making cost	1,05,00,000	2,50,00,000	5,20,00,000
Factory, insurance, maintenance & overheads	82,00,000	1,08,00,000	1,38,00,000
Interest & finance cost	78,00,000	88,00,000	92,00,000

Selling, marketing, brand & trade shows	72,00,000	1,02,00,000	1,45,00,000
Certification, grading & testing	58,00,000	82,00,000	1,08,00,000
Total expenses	11,97,00,000	17,13,00,000	24,13,00,000
Net profit / (loss) before tax	(12,00,000)	1,27,00,000	2,62,00,000
Net margin	(1.0%)	6.9%	9.8%
Power as % of revenue	18.1%	16.3%	14.8%
Realisation per polished carat (indexed)	100	82	70
Cost per polished carat (indexed)	100	80	66
Finished jewellery as % of revenue	15.6%	25.0%	36.6%
Reactors in operation	18	28	38
Rough grown (carats approx.)	~85,000	~1,35,000	~1,90,000

12.3 Unit economics & break-even

- **The two indexed rows are the entire thesis.** Realisation per carat falls to 70; cost per carat falls to 66. **The business remains profitable only because cost falls faster than price** — and if cost reduction stalls for even a year while prices keep falling, the margin disappears. **This is the honest shape of a cost-curve industry and it should be read as the principal risk, not as a projection detail.**
- **Margins are higher than elsewhere in this vertical** — 9.8% against 3-5% — because this is genuine manufacturing with process IP rather than a metal pass-through. But the **capital intensity is far higher and the operating leverage cuts both ways.**
- **Power at 18.1% falling to 14.8% of revenue** is the single largest controllable cost; the fall reflects both the solar investment and the rising jewellery mix.
- **Contract growing carries no price risk** — it earns a capacity charge irrespective of what stones are worth, making it the cycle defence in this plan just as job work was in the diamond-processing plan.
- **Break-even:** Year 2, once yields stabilise and the fleet scales. **Year 1's loss reflects commissioning, recipe development and the fact that early runs are expensive tuition in a process business.**

12.4 Projected Cash Flow — Year 1 (quarterly, illustrative)

Particulars (₹)	Q1	Q2	Q3	Q4
Opening balance	55,00,000	32,00,000	15,00,000	6,00,000
Collections	2,45,00,000	2,65,00,000	2,85,00,000	3,00,00,000
Power, consumables, wages, interest & overheads	2,68,00,000	2,82,00,000	2,94,00,000	2,88,00,000
Closing balance	32,00,000	15,00,000	6,00,000	18,00,000

Cash here has a shape unlike anything else in this vertical, and it is the shape of a process plant rather than a trading house. The power bill and the term-loan instalment arrive every month whether the reactors are full or idle, and a reactor cannot be paused economically mid-run — a growth cycle interrupted is a cycle lost, including its power and its seed. That is the meaning of high operating leverage in practice: **utilisation is not an efficiency metric here, it is a solvency metric.** Two disciplines follow. **Use contract growing deliberately to fill spare capacity,**

because a reactor running someone else's order at a modest capacity charge is far better than one running nothing while still consuming depreciation and finance cost. And **sequence the fleet expansion behind demonstrated demand and yield** — in a falling-price market, **capacity added ahead of offtake produces inventory at a cost that next year's price will not cover**, which is how growers in deflating industries typically get into trouble.

12.5 Key Performance Indicators to Monitor

- **Cost curve: cost per polished carat, tracked monthly and by reactor;** power units per carat; realisation per carat vs. cost per carat (the survival gap).
- **Process:** gem-quality yield %; grade and colour distribution per run; seed reuse cycles; reactor uptime and utilisation.
- **Strategy: finished jewellery as % of revenue (target rising);** own-brand vs. private-label split; contract-growing capacity fill.
- **Integrity:** disclosure on every invoice and certificate; inscription completeness; zero instances of goods leaving without lab-grown declaration.

13. Funding Requirement & Bankability

Total ask: **₹6 crore term loan plus ₹1.8 crore working-capital finance** against ₹4.2 crore promoter contribution. This is a different credit from the rest of the vertical and should be assessed as such. **First, the security is depreciating technology rather than assayable metal** — reactors have resale value but in a market where newer machines are cheaper and better, and a lender should assume the collateral erodes faster than a standard machinery schedule implies. **Second, and most important, the revenue line is modelled falling on a per-unit basis**, which is unusual and should be read as candour rather than weakness: **the credit question is not whether prices fall — they will — but whether the borrower's cost reduction outpaces them**, so **cost per carat by quarter is the covenant-worthy metric, more informative than any revenue projection**. **Third, the downstream shift is the deleveraging story:** as finished jewellery grows toward 37% of revenue, the business becomes progressively less exposed to the stone price and more like a branded consumer business, which is a materially better credit. **Fourth, there is no commodity-price exposure of the kind that dominates the rest of this vertical** — no gold position, no rough-polished spread — and the government's seed and equipment concessions plus the research grant should be pursued, since in a cost-curve business every structural cost advantage compounds.

13.1 Funding utilisation

Use of funds	₹	% of total
CVD reactors & growth chambers	5,80,00,000	48.3%
Power infrastructure, HT connection & captive solar	1,90,00,000	15.8%
Working capital (seeds, WIP, polished inventory, receivables)	1,80,00,000	15.0%
Post-growth processing (laser, cutting, polishing) equipment	1,05,00,000	8.8%
Factory, clean-room, utilities & building fit-out	78,00,000	6.5%
Testing, grading & certification instruments	28,00,000	2.3%
IT, ERP, process-control & run analytics	20,00,000	1.7%
Legal, registrations, GJEPC & launch	19,00,000	1.6%
Total	12,00,00,000	100%

14. Risk Analysis & Mitigation

Risk	Mitigation
Continued price decline outpacing cost reduction	The principal risk, and it is structural rather than cyclical. Drive cost per carat down every quarter through yield and power; shift revenue downstream into design-priced jewellery where the falling stone price becomes an INPUT ADVANTAGE ; use contract growing for price-immune capacity charge; never model flat realisations — a plan that does has already failed
Reactors obsolete before worn out	Depreciate aggressively rather than over a long assumed life ; stage fleet expansion so the fleet's average age stays low; evaluate each new cohort on cost per carat, not on capex per reactor
Power tariff or supply exposure	Captive solar and open-access contracting as a core competitive lever, not an ESG gesture ; power units per carat tracked as an engineering KPI; site selection weighted to power cost
Gem-quality yield shortfall	Recipe development and run-level analytics per reactor; seed quality control; a run's power and depreciation cost is largely fixed, so the gap between a good run and a poor one is almost entirely margin
Under-utilisation with high fixed costs	Contract growing to fill spare capacity; expansion sequenced behind demonstrated offtake, since capacity added ahead of demand produces inventory at a cost next year's price will not cover ; utilisation is a solvency metric here, not an efficiency one
Disclosure failure anywhere in the chain	Declaration on every invoice, certificate and shipment; girdle inscription; segregated handling from any natural goods — growing is legitimate, passing off is fraud, and screening technology makes detection certain
Brand build failing or starting too late	Fund the brand while upstream margin still exists ; use private label to learn the jewellery business first; treat design capability as the durable asset
Consumer perception shift against lab-grown	Position honestly on design and value rather than on imitation of mined stones; avoid claims that invite comparison the category loses
Hydrogen, plasma & high-voltage incident	Gas detection, ventilation, interlocks, trained operators and documented procedure — hydrogen is unforgiving of improvisation ; insurance sized to a total-loss scenario
Overstated sustainability claim	Substantiate with actual power mix; lab-grown marketed as green while run on coal power is a claim that will not survive scrutiny

15. SWOT Analysis

Strengths Genuine manufacturing with process IP and higher margins than the rest of the vertical; no gold or rough-polished commodity exposure at all; power strategy gives a real, compounding cost advantage; contract growing is price-immune; integrated growing-to-jewellery avoids margin handoffs; policy support on seeds, equipment and research.	Weaknesses Entering a market with structurally falling realisations; capital-intensive with 64% in reactors and power; high operating leverage — utilisation shortfalls flow straight to the bottom line; collateral depreciates faster than standard schedules assume; brand-building capability is unproven and must be funded early.
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Opportunities Volume demand growing strongly even as price falls; larger stones becoming affordable opening new design categories; private label for retailers wanting lab-grown ranges; falling stone cost is an input advantage for the jewellery arm; export demand; industrial and technical diamond applications.	Threats Faster-than-modelled price collapse; Chinese capacity and cheaper reactors resetting the cost curve; consumer perception shifts; power tariff increases; oversupply as everyone expands simultaneously; a disclosure scandal damaging the whole category's credibility.
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16. Recommended AiSevak Tools for This Business

This lab-grown diamond business would use AiSevak's Gems vertical tools in operations:

- **Cost curve: cost-per-polished-carat tracker by month and by reactor**, power-units-per-carat KPI, **realisation-vs-cost survival-gap monitor**.
- **Process:** run-level yield and grade-distribution analytics, seed reuse register, reactor uptime and utilisation dashboard.
- **Strategy: downstream-mix tracker (finished jewellery % of revenue)**, own-brand vs. private-label analysis, contract-growing capacity fill.
- **Integrity: lab-grown declaration checklist per invoice, certificate and shipment**, inscription completeness log, segregation register.
- **Finance:** accelerated-depreciation modelling, fixed-cost coverage at varying utilisation, Business Plan and break-even tools (with Finance vertical).

17. Key Assumptions & Notes

- Lab-grown diamond business: CVD growth (with HPHT capability), laser separation, cutting/polishing, IGI-type certification with girdle inscription, sold as loose polished, as-grown rough, and increasingly as finished jewellery (own brand + private label), plus contract growing and industrial-grade sales.
- **⚠ THE PLAN REQUIRING THE MOST UNCOMFORTABLE HONESTY IN THE LIBRARY — IT OPENS BY SAYING WHAT MOST PROPOSALS IN THIS SECTOR AVOID: LAB-GROWN PRICES HAVE FALLEN VERY SHARPLY, ARE STILL FALLING, AND THERE IS NO CREDIBLE BASIS FOR ASSUMING THEY WILL STOP.** Capacity has expanded rapidly, reactor efficiency keeps improving, and every improvement lowers the floor. **A plan projecting stable per-carat realisations is describing the PAST** — so this one models realisation per polished carat **FALLING to ~70% of Y1 by Y3** and stays profitable only because **cost per carat is modelled falling FASTER (to 66)**. **THOSE TWO INDEXED ROWS ARE THE ENTIRE THESIS: if cost reduction stalls for even one year while prices keep falling, the margin disappears.**
- **THE CORRECT FRAMING IS A COST-CURVE BUSINESS, NOT A JEWELLERY BUSINESS** — it behaves like solar panels, LEDs or memory chips: a manufactured product whose price declines as capacity and yield improve, indefinitely. **SURVIVAL BELONGS TO THE LOWEST COST PER CARAT, NOT THE BEST MARKETING.** Two consequences a promoter must accept before committing capital: **POWER IS THE DOMINANT VARIABLE COST** (reactors run continuously at high load for 2-4 weeks), making **captive solar / open access the single largest lever on competitiveness — an ECONOMIC decision here, not an environmental gesture**, and unusually in this library **the green case and the commercial case point the SAME way: clean power is cost reduction that happens to be green, not the reverse** (also making the sustainability claim defensible, since **lab-grown marketed as "green" while run on coal power will not survive scrutiny**); and **REACTORS MAY BE OBSOLETE BEFORE THEY WEAR OUT** — a machine bought today will be outcompeted on cost per carat within a few years — so **DEPRECIATE AGGRESSIVELY; a lab-grown plan showing gentle 10-year depreciation has understated its costs.**

- **THE STRATEGIC CONCLUSION THE NUMBERS FORCE: THE ESCAPE FROM A COMMODITY COST RACE IS DOWNSTREAM.** A grower selling loose stones competes on price forever; **a brand selling finished jewellery prices on DESIGN and captures margin the grower cannot — and as the stone price falls the jewellery business is actually HELPED, because its principal input gets cheaper while its selling price holds.** Hence finished jewellery **15.6% → 25.0% → 36.6% of revenue, treated as THE STRATEGY not as diversification** (visible in headcount too: jewellery karigars grow ~5× against 2.3× revenue). **A grower that stays purely upstream is betting it can remain lowest-cost indefinitely against competitors with newer reactors and cheaper power — a bet that has ended badly in every comparable industry. TIMING IS THE EASILY-MISSED POINT: the brand must be built WHILE THE STONE STILL EARNS ENOUGH TO PAY FOR IT —** a grower who waits until upstream margins have gone is trying to fund a brand out of a business that no longer generates surplus, which is precisely when it cannot be done.
- **YIELD AND QUALITY DISTRIBUTION, NOT THROUGHPUT, DETERMINE COST PER CARAT** — a reactor runs for weeks regardless of what comes out, so **the power and depreciation cost of a run is largely FIXED, meaning the difference between a run yielding high-clarity Type IIa material and one yielding included, off-colour goods is ALMOST ENTIRELY MARGIN.** Recipe development, seed quality and process control are the core economics, and **run-level analytics PER REACTOR are the most important management information the business produces.** Cost per carat is an ENGINEERING outcome, not a purchasing outcome.
- **△ THE PROJECT-COST SHAPE INVERTS THE REST OF THE VERTICAL — reactors + power are 64% and working capital only 15%,** against 68-73% WC in every other gems plan. **This is a MANUFACTURING business with an inventory tail, not an inventory business with a workshop.** Consequences: the lender funds **depreciating technology rather than assayable metal** (collateral erodes faster than a standard machinery schedule implies), **there is NO gold-price exposure and NO rough-polished spread at all,** and **operating leverage runs the other way — fixed costs are high so utilisation and yield flow straight to the bottom line. UTILISATION IS A SOLVENCY METRIC HERE, NOT AN EFFICIENCY ONE:** the power bill and term-loan instalment arrive monthly whether reactors are full or idle, and **a growth cycle interrupted is a cycle lost including its power and its seed → use contract growing (a price-immune capacity charge, the cycle defence this plan's equivalent of job work) to fill spare capacity,** and **sequence fleet expansion BEHIND demonstrated offtake,** since capacity added ahead of demand produces inventory at a cost next year's price will not cover — **how growers in deflating industries typically get into trouble.**
- Margins are higher than elsewhere in gems (9.8% vs 3-5%) because this is genuine manufacturing with process IP rather than a metal pass-through — but capital intensity is far higher and leverage cuts both ways. Lender framing: **the credit question is not WHETHER prices fall (they will) but whether the borrower's COST REDUCTION OUTPACES THEM, so cost per carat by quarter is the covenant-worthy metric — more informative than any revenue projection;** and **the downstream shift is the deleveraging story,** since as jewellery reaches ~37% the business becomes progressively less exposed to the stone price and more like a branded consumer business.
- **DISCLOSURE IS ABSOLUTE: growing diamonds is an entirely legitimate and impressive business; representing them as mined is FRAUD —** declared on every invoice, certificate and shipment, distinct HS classification, girdle laser inscription, segregated from any natural goods, and terminology clear and non-deceptive ("cultured" or bare "diamond" without qualification is not acceptable). **Given screening technology in the trade, detection is certain.** Also: pursue the **customs concessions on seeds/equipment and the national lab-grown research grant** — in a cost-curve business every structural cost advantage compounds; and treat **hydrogen/methane handling, high-temperature plasma and high-voltage systems as a genuine engineering safety discipline — hydrogen is unforgiving of improvisation.** ₹12cr, 18→38 reactors, ~85,000→1,90,000 ct grown, rev 11.85→26.75cr, Y1 –₹12L → Y3 ₹2.62cr. **Y1 loss reflects commissioning and recipe development — early runs are expensive tuition in a process business.** Figures illustrative, exclude GST.

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