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Recover, Reuse or Refine?

A battery routing and investment decision for Caplexus Capital

The Margin Masters

Indian Institute of Foreign Trade · IIFT Kakinada

Decision dashboard
Offline dashboard

Excel audit model
Annexures

Model evidence
Python lab

ANK GANIT 2026 • IIM VISAKHAPATNAM × CAPLEXUS CAPITAL

Routing Decision Scorecard

Improve selection first. Extra monthly capacity adds only ₹19.59 lakh over the same 18-month intake.

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Policy or evidence	Capacity t/mo	Warranty risk	Demand cap	Reuse tonnes	Value ₹ cr	Delta ₹ cr	Decision signal
Observed intake (836 lots)	14	Actual	Actual	223.52	8.01	—	Reported cohorts
Optimizer vs 70% replay	14	0.80×	1.25× P75	171.82	8.40	+0.97	Claims stress
Optimizer vs 70% replay	14	1.00×	1.25× P75	171.82	8.27	+1.40	Base decision
Optimizer vs 70% replay	14	1.30×	1.25× P75	171.82	8.08	+2.05	Claims stress
Optimizer vs 70% replay	21	0.80×	1.25× P75	176.16	8.60	+0.83	Claims stress
Optimizer vs 70% replay	21	1.00×	1.25× P75	176.16	8.47	+1.29	Capacity check
Optimizer vs 70% replay	21	1.30×	1.25× P75	176.16	8.27	+1.99	Claims stress
Optimizer vs 70% replay	28	0.80×	1.25× P75	176.16	8.60	+0.83	Claims stress
Optimizer vs 70% replay	28	1.00×	1.25× P75	176.16	8.47	+1.29	Capacity check
Optimizer vs 70% replay	28	1.30×	1.25× P75	176.16	8.27	+1.99	Claims stress
70% legacy replay at 14 t	14	1.00×	1.25× P75	209.73	6.87	—	Policy baseline
Matched 14 28 t uplift	14 28	1.00×	1.25× P75	+4.34	+0.20	+0.20	Defer expansion
Paired 14 28 t stress	14 28	1.00×	1.00× P75	+1.61	+0.04	Annualised	Demand evidence
Paired 14 28 t stress	14 28	1.00×	1.25× P75	+4.34	+0.13	Annualised	Demand evidence
Paired 14 28 t stress	14 28	1.00×	1.75× P75	+7.67	+0.24	Annualised	Demand evidence
Paired 14 28 t stress	14 28	1.00×	2.50× P75	+14.12	+0.44	Annualised	Demand evidence
3W ≥85% SoH cohort	—	3.50%	16 / 457	—	—	—	Grade A pilot
3W 70–<80% SoH cohort	—	26.14%	69 / 264	—	—	—	Hold from fleet
All mature commercial packs	—	9.19%	666 / 7,247	—	—	—	Price claims
Flagged capacity diverts	—	11 ≥85%	55 lots	95.59	—	—	Grade before scale

Capital Allocation & Risk

Compare incremental cash, reserve the ₹15 cr envelope and release a capped pilot against evidence.

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Financial Impact Analysis

Financial metric	A: Refine	B: Expand	C: 3 hubs	Basis	Board gate
Initial capex	15.00	11.00	10.50	₹ crore	Keep on hold
FY28 cash	+0.25	-0.45	-0.72	Ramp 1	Start pilot
FY29 cash	+1.27	-0.33	-0.55	Ramp 2	Review orders
FY30 cash	+2.00	-0.26	-0.43	Ramp 3	Reprice risk
Base NPV	-12.34	-11.85	-11.89	12% rate	All below zero
Downside NPV	-15.44	-12.44	-12.84	Same horizon	Protect cash
Upside NPV	-10.16	-10.88	-10.57	Same horizon	No full release
3-year payback	No	No	No	Cash flow	No terminal
Flat annual hurdle	6.25	4.58	4.37	₹ crore	Test demand
End FY30 cash	-11.48	-12.04	-12.21	Cumulative	Retain option
Recommendation	Toll assay	Pilot only	Test lane	Staged	₹0.50 cr cap

Pilot Budget & Release Conditions

Workstream	Spend gate	Budget L	Owner	Release proof
Grade and routing	Stage 1	10	COO	Matched margin
Fleet / service test	Stage 1	10	Sales	Paid fleet orders
Tolling and QA	Stage 1	5	Finance	Assay and terms
Dealer and grading	Stage 2	15	QA + Sales	Eligible orders
Controlled repeat	Stage 2	10	Board	SLA and claims
Total pilot cap	Two gates	50	CFO	Hold ₹14.50 cr

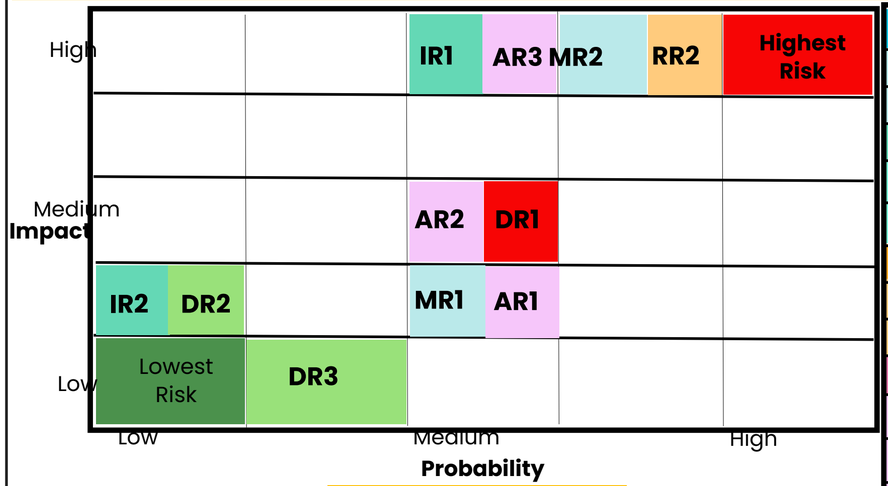
Assumptions

- • ₹ crore cash flows are pre-tax and discounted at 12%; no terminal value or working-capital release.
- • Compare expansion with optimized routing at 14 t, the same demand ceiling and the same warranty case.
- • Refining includes eligible feed, scale-up, realization and fixed charges.
- • Hubs add incremental contribution and verified lane savings after cash costs.

Key Inference

- • All base NPVs are negative. A pays back in ~8.19 years only if FY30 cash continues.
- • The 14 t routing gain is ₹1.405 cr. Additional 28 t capacity yields ₹0.196 cr over 18 months.
- • Reserve ₹14.50 cr and release ₹25 lakh for the first gate.
- • Terminate scale plans if safety, paid demand or downside cash evidence fails.

Risk Analysis



MARKET RISKS
- MR1 – Order shortfall
- MR2 – Price pressure

INDUSTRY RISKS
- IR1 – Safety incident
- IR2 – Toll quality

MACRO RISKS
- RR1 – Refining spread
- RR2 – Freight shock

COMPANY-SPECIFIC RISKS
- AR1 – Poor fitment
- AR2 – Grade leakage
- AR3 – Warranty tail

DATA & SYSTEM RISKS
- DR1 – Missing genealogy
- DR2 – Late build record
- DR3 – Manual override

Mitigation Strategy

- • Audit lot genealogy, reserves and warranty maturity before committing.
- • Require approved fitment and stop on any serious safety event.
- • Tie margin and service to paid orders and assay acceptance.
- • Confirm qualified material and keep EPR evidence separate.

Six-Month Pilot & Release Plan

Test routing at 14 t/month. Release capital against paid demand and mature claims.

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RELEASE PLAN	PHASE 1 (0–2 Months) VALIDATE ROUTING & SIGN PILOT PARTNERS	PHASE 2 (3–4 Months) RUN THE PAID FLEET PILOT & TOLLING TEST	PHASE 3 (5–6 Months) REVIEW THE PILOT & RELEASE CAPITAL
MARKET FOOTPRINT & FLEET FOCUS	• Choose one NCR dealer and compatible 3W fleets with documented vehicle duty. • Use Grade A LFP packs at ≥85% SoH and record actual paid demand. • Obtain comparable fitted new-pack quotes and log expected service costs.	• Begin paid NCR installations only after documented fitment approval. • Track matching duty, grade and use. • Compare six-to-twelve-month offers with funded reserves and swap cost limits.	• Expand through proven dealers only. • Demand must repeatedly fill qualified 14 t slots at positive contribution. • Hold 2W scale until more independent fleet lots reach warranty maturity.
LAUNCH SCOPE & ENABLEMENT	• Freeze the 70% replay to compare both rules on the same intake. • Capture lot genealogy, fitment checks, pack yield, claims and purchase price. • Reconcile outcomes with finance and sign release limits with quality.	• Review warranties by mature cohort and track claims through the service partner. • Run qualified NMC/LCO toll assays and obtain domestic buyer acceptance terms. • Rate actual margins and freight on matched lots, including rejects.	• Stop on serious safety incidents. • Verify accepted assay and floor prices. • Require carrier bids and profitable new tonnes before funding hubs.
ROUTE-TO-USER & ACTIVATION	• Shadow-route each week at 14 t while keeping approved plant decisions. • Track expected contribution net of claims and allocated tonnes by application. • Release up to ₹25 lakh for baseline work, partner onboarding and controlled tests.	• Track paid orders and service costs. • Measure response SLA, warranty accrual and potential fitment exceptions. • Release the second ₹25 lakh only after orders, assays and controls pass.	• Compare A/B/C with verified FY28 costs and paid order volumes. • Track contribution/kg, mature claims, paid conversion, SLA and safety incidents. • Hold ₹14.50 cr until investment tests clear downside and cash hurdles.

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THANK YOU

Which evidence would release the next tranche?

Evidence for questions

- Case brief and operating data • Exhibits 1–5, Lots, Second_Life_Packs, Assumptions
- Interactive dashboard • original rule, optimized scenarios, fleet cohorts and investment
- Model evidence and source notes
- Excel audit and Python lab • formulas, cash flows, whole-lot replay and reproducibility

Annexures • sensitivities, operating milestones, risks and data controls →