1) Executive Summary

Bottom line: Wollemi’s flagship climate bets are strategically important, impact-rich, and overwhelmingly pre-profit. They are capital-intensive, policy-dependent, and milestone-driven. If Kalfresh can evidence nearer-term cash flow and lower policy/scale risk than these assets, negotiating leverage is strong: push for a higher valuation, lighter preferences, and milestone-linked structures.

Cross-cutting portfolio read-through

* Cash today vs. cash tomorrow: Fortera, Samsara, Kanin, and Loam are all pre-scale with 3–5+ year runways to material profitability (asset CODs, first-of-a-kind (FOAK) plants, or verified credit issuances).
* Cost of capital & capex drag: Each thesis requires significant incremental capex and/or development capital to unlock scale (cement decarb modules, enzymatic plants, waste-heat sites, MRV for soil carbon). Rising rates magnify hurdle IRRs.
* Policy exposure: Revenue visibility is anchored in mandates, credits, procurement, and specifications (Buy Clean / ASTM / ACCU/Safeguard). Policy stability is the single most important non-technical variable.
* Adoption inertia: Conservative buyers (cement, construction, industrials, broadacre farmers) require cost parity and standard-spec acceptance; adoption cycles are long.
* What this means for Kalfresh: If you present a de-risked offtake, validated unit economics, and shorter cash cycles, you are the portfolio balancer Wollemi needs. Price the risk you’re absorbing; trade impact alignment for economics.

2) Negotiation Posture for Kalfresh (with Wollemi)

Ask architecture (anchor high; concede selectively):

* Valuation: Price off *near-term profitability* and *contracted offtake* rather than distant optionality. Benchmark against Wollemi’s long-dated, capex-heavy positions.
* Structure: Milestone-tranche equity; valuation ratchets tied to bankable events (offtake execution, project NTP/COD, MRV-verified credits, GP%/ha).
* Investor protections: Light liquidation prefs; cap participating prefs; anti-dilution only broad-based; redemption off-limits.
* Downside risk-share: Floor pricing (ACCUs), take-or-pay/availability constructs, cost-sharing on MRV or interconnection where relevant.
* Upside: Performance warrants for exceeding yield/credit/uptime thresholds; co-brand rights tied to verified outcomes.
* Control: Board observer (not control); consent rights limited to debt, M&A, related-party, not operations.

Leverage themes (tailored to Wollemi’s portfolio reality):

* Wollemi’s existing assets are future-dated; Kalfresh can pull forward portfolio cash yield.
* Offer impact per dollar sooner (carbon-literate operations, credible offtakes), while highlighting lower execution risk vs FOAK industrial tech.
* Trade exclusivity/scale commitments for economics (pricing, prefs, floors).

3) Sector Deep Dives & Company Scorecards

A) Low-/Zero-CO₂ Cement (Fortera)

Industry economics today

* OPC sells on thin margins at US$100–150/t; customers are price-sensitive. “Green premiums” are not durable; cost parity is the bar.

Policy tailwinds (California)

* SB 596: net-zero cement by 2045; DOE commitments (~US$700m into CA cement projects) + Caltrans low-carbon specs (US$32m pilots).
* Implementation gap: PLC penetration <8% in CA vs >90% in some states; spec inertia is real. SB 1073 forward offtakes failed—ambition > execution.

Capital intensity & timing

* DOE: US$5–20B by 2030, US$60–120B by 2050 required to decarb U.S. cement—long-lead, capex-heavy road.
* Profitability: unlikely near term; grant/procurement bridges needed until NOAK cost curves arrive.

Fortera company snapshot

* Tech: “ReCarb” captures kiln CO₂, mineralizes to “ReAct” cement; ~70% CO₂ reduction vs OPC; retrofit-friendly (no new kiln).
* Status: Redding, CA pilot ~15k t/yr (2024); ASTM pathway secured; early non-structural pours.
* Scale plan: Commercial modules 0.5–1.0 Mt/yr, US$150–200m capex per site; profitability 3–5+ yrs away contingent on multi-site ramp.
* Funding/Valuation: ~US$140–145m raised, incl. US$85m Series C (Aug-2024) (Khosla, Temasek; strategics Saint-Gobain, Sumitomo, Wollemi). Implied post ≈ US$350m. Headcount ~145.
* Commercial: 3 global cement MOUs; Graymont 2025 deployment JV; license/partner model.

Key risks

1. FOAK→NOAK scale-up (throughput/uptime/quality).
2. Adoption/ASTM/specs; cement buyers require parity proven in contracts.
3. Policy dependence (mandates, credits, procurement).
4. Capex & partner commitment; multi-year development cycles.
5. Permitting/supply chain delays.

Base/Downside

* Base: 2–3 sites financed/under EPC by 2026–27; cost parity evidenced; revenue ramps late-decade.
* Downside: FOAK delays + uneven policy support → follow-on equity, valuation compression.

Kalfresh leverage: If you show faster unit-economics and lower policy risk than green cement, ask for higher price / lighter prefs as a risk diversifier in Wollemi’s book.

B) Enzymatic Recycling (Samsara Eco)

What it is

* Enzymatic depolymerisation of PET/polyesters & certain nylons to virgin-grade monomers; not PE/PP today.

Market & peers

* 2023 market ~US$45–50m → ~US$130m+ by 2030 (~16–17% CAGR).
* Peers: Carbios (FR, PET; ~50 kt/yr plant ~€230m capex, startup slipped 6–9 months), Protein Evolution, DOE BOTTLE.

Tech & economics

* Viable for PET/nylon; kinetics/enzyme cost & reuse, feedstock sorting, and continuous ops drive COGS.
* NREL/DOE models suggest recycled PET ~US$1.51/kg vs virgin ~US$1.87/kg (paper economics—needs plant proof).
* Capex heavy FOAKs; virgin price weakness squeezes margins absent mandates/premiums.

Samsara snapshot

* Stage: First commercial Jerrabomberra (AU) 2025; pre-meaningful revenue; lululemon 10-yr offtake (fibre).
* Scale plan: SE Asia nylon-6,6 20 kt/yr by ~2028 (slipped from 2026; KBR FEED).
* Funding/holders: A$150m+ raised (A$54m 2022; A$100m 2024 led by Temasek/Main Sequence). Stakes: Main Sequence ~25%, Temasek ~12%, Woolworths ~10%; plus CEFC/Virescent, Wollemi, lululemon, Hitachi Ventures, Titanium, DCVC, Breakthrough Vic, ANU.
* Economics: Single 20 kt unit at full run-rate ⇒ A$40–80m/yr revenue; company-level break-even late-2020s/2030s.

Key risks

1. Capital intensity & financing for multi-plant buildout.
2. Unit economics (enzyme $/t, yields, uptime).
3. Scale execution (bioprocess).
4. Feedstock logistics.
5. Policy/virgin price headwinds.
6. Scope limit (no PE/PP).
7. Timeline slips (already pushed).

12–24m watch-outs

* Jerrabomberra output/quality; SE Asia FEED + capex package; diversified offtakes; enzyme productivity trend; policy reinforcement.

Kalfresh leverage: Highlight your near-term cash visibility vs Samsara’s pre-profit, capex-heavy arc. Use that delta to negotiate valuation and prefs; anchor downside protection with milestones.

C) Industrial Waste-Heat-to-Power (Kanin Energy)

Sector

* Converts industrial waste heat (steel/cement/O&G/chemicals) to 24/7 carbon-free power (ORC/steam).
* EaaS model: developer finances/owns/operates; host buys power or shares savings on 10–20-yr contracts.

Market & demand

* Global market ~US$25.2B (2023), ~10.8% CAGR to 2032.
* US: IRA 30% ITC materially boosts IRR; PPAs common.
* EU: Tight policy & €80–100/t CO₂ pricing; cement sub-segment >10.5% CAGR.
* AU: Large latent potential; ARENA/CEFC supportive; market nascent.

Economics

* Many projects NPV-positive; historically blocked by 4–8+ yr paybacks and bespoke engineering soft costs.
* Today’s power/CO₂ prices + ITC shorten paybacks; EaaS yields infrastructure-like cash flows once online.

Kanin snapshot

* Founded 2020 (Calgary/Houston). Pre-revenue; first revenue 2025–26.
* Funding: US$7–9m equity; US$5.2m Wollemi note (board seat); PaceZero development debt. Implied value US$50–100m post-Tallgrass.
* Pipeline: Tallgrass 4 projects (OH/IN) ~48 MW, ~410,000 MWh/yr; flagship 9.2 MW UD→AES Ohio (COD early-2026; ~71% campus CO₂ cut). 1 GW LT pipeline.
* Capex reality: $50–100m+ for first 48 MW (mostly partner-funded).

Key risks

* Schedule/Execution: 2024→2026 slippage; EPC/interconnect/permitting.
* Capital intensity: Reliance on external project finance; rates/inflation squeeze returns.
* Concentration: Tallgrass/AES/UD exposure.
* Ops ramp: Fleet-level uptime/O&M at industrial standards.
* Policy/competition: Incentive shifts; ORC OEMs/ESCOs can compete.

Kalfresh leverage: Treat as infrastructure with project-by-project risk—acknowledge quality counterparts yet discount for execution drag; secure milestone-linked terms.

D) Soil Carbon / Carbon Farming (Loam Bio, AU focus)

Market status

* ACCU soil issuances: ~2k total pre-2023 → ~253k in 2023 (first real uptick) — still small share of total ACCUs.
* Projects carry 25–100-yr permanence obligations; 2–5-yr lag to first credits.

Science & integrity (critical)

* Loam claims ~0.75–2.0 tCO₂/acre/yr vs ~0.2–0.7 from practice-only; needs broad independent validation.
* Weather attribution risk: Early AU gains aligned with La Niña rainfall; durability/additionality questioned when weather normalises.
* MRV cost & variability: High sampling costs and spatial variance erode value; buffers (25%) may be tight in a volatile climate.
* Permanence risk: Drought/fire/tillage reversals.

Unit economics (today)

* Product price: A$20–28/ha inoculant.
* Farm-gate: At A$40/t, 1 tCO₂/ha ⇒ ~A$40/ha/yr; MRV/admin can consume much of that.
* Revenue timing: 2–5 yrs to first issuance; cash costs now, credits later.

Demand & price outlook

* Safeguard Mechanism: Compliance demand ramps from <1 Mt (2022) → ~26 Mt by 2030; peak ~31 Mt 2031; market tightens.
* Price: A$30–40/t spot late-2024; ≥A$60/t by 2030 plausible; premium for high-integrity credits (~+40%).
* Voluntary market: ~8× growth to 2030 expected; buyers increasingly quality-sensitive.

Loam Bio snapshot

* Founded 2019; microbial seed coatings (CarbonBuilder) + carbon project platform (SecondCrop).
* Funding: ~A$150m raised (A$40m 2021; A$105m 2023 co-led by Lowercarbon/Wollemi; CEFC A$15m total).
* Traction: 2023 pilots ~20–40k ha; low-single-digit A$-m product revenue; no credit revenue yet; first issuances ~2025–26.
* Expansion: AU grains; US 2024 soybean pilots (6 states); Brazil targeted next; GrainCorp 1,500 ha pilot.

Key risks

1. Revenue delay & WC drag (2–3 yrs to issuance).
2. High MRV costs (Loam often fronts).
3. Carbon price/policy volatility.
4. Scale execution (manufacturing microbes, nationwide MRV logistics, data QA).
5. Adoption (crossing the chasm beyond innovators).
6. IP/competition (ag-chem majors).
7. Funding need (likely Series C before break-even).

Kalfresh leverage: Use the integrity/lag/price overhang to shift risk (Loam-funded inputs & MRV; ≥85% credit share in pilots; floors; performance triggers); ask for exclusivity/perks and warrants for scale commitments.

4) Comparative Scorecard (R/A/G)

| Dimension | Fortera | Samsara Eco | Kanin Energy | Loam Bio |
| --- | --- | --- | --- | --- |
| Time to Cash | 🔴 3–5+ yrs | 🔴 3–5+ yrs | 🟠 1–2 yrs (first CODs) | 🔴 2–3 yrs (first issuances) |
| Capex Intensity | 🔴 Site US$150–200m | 🔴 20–50 kt plants €100–230m | 🟠 Project-level multi-$m/MW (partner-funded) | 🟠 Corporate burn + MRV opex |
| Policy Dependence | 🟠/🔴 High (mandates/procurement) | 🟠 High (PCR mandates) | 🟢/🟠 Moderate (ITC helps; PPAs) | 🟠/🔴 High (ACCU/Safeguard, integrity) |
| Spec/Market Inertia | 🔴 Cement standards/buyer conservatism | 🟠 Brand pull but cost-sensitive | 🟠 Bespoke engineering slows | 🟠 Farmer adoption + MRV friction |
| Unit-Economics Proof | 🟠 Pilot; parity unproven at scale | 🟠 Modelled; plant proof pending | 🟢 Tech-proven; project returns site-specific | 🟠 Early data; MRV cost drag |
| Balance-Sheet Risk to Wollemi | 🟠 Minority stake; long horizon | 🟠 Significant follow-on likely | 🟠 Follow-on as projects mature | 🟠 Lead check; further capital probable |

*🟢 lower risk / 🟠 moderate / 🔴 higher risk (relative within portfolio).*

5) Kalfresh Term Sheet Playbook (by asset archetype)

For policy-dependent credits (Loam):

* Economics: ≥85% credit share on pilots; Loam-funded inputs + MRV; ACCUs price floor via offtake backstop.
* Milestones: Scale tranches only after verified issuance; exit ramp if credits <X t/ha by Y date.
* Upside: Warrants for exceeding tCO₂/ha or premium pricing.

For FOAK industrial (Fortera, Samsara):

* Governance: Information rights; EPC/NTP/COD milestone reporting.
* Economics: Milestone-tranche capital; ratchets if NTP/COD dates slip; cap prefs.
* Risk-share: Procurement/credit pass-through clauses; liquidated damages or contingency buffers.

For infrastructure-like (Kanin):

* Revenue quality: Counterparty credit filters (utility/IG), minimum offtake/availability; cost pass-through on interconnection.
* Portfolio: Diversify hosts; cap single-counterparty exposure; step-down risk if host throughput falls.

6) At-a-Glance Metrics (for reference)

Fortera — CO₂↓ ~70% vs OPC • Pilot ~15k t/yr • Commercial module 0.5–1.0 Mt/yr @ US$150–200m • Raised ~US$140–145m (US$85m C-round 2024) • Valuation ~US$350m post • Profit 3–5+ yrs.

Samsara Eco — First plant 2025 (AU) • SE Asia 20 kt/yr nylon-6,6 ~2028 • A$150m+ raised • 10-yr lululemon offtake • Single-plant revenue A$40–80m/yr at full run-rate • Company break-even late-2020s/2030s.

Kanin Energy — 48 MW Tallgrass (OH/IN) ~410 GWh/yr • Flagship 9.2 MW UD→AES (COD early-2026) • Equity US$7–9m; US$5.2m Wollemi note; Dev debt (PaceZero) • Implied value US$50–100m • First revenue 2025–26.

Loam Bio — ~A$150m raised (A$105m B-round 2023) • Product A$20–28/ha • 2023 pilots ~20–40k ha; small product revenue • No credit revenue yet; first issuances ~2025–26 • ACCUs ~A$30–40/t now; ≥A$60/t plausible by 2030; ~+40% premium target.

7) Conclusion

Wollemi’s portfolio is credible and catalytic, but returns are predominantly back-ended and execution-sensitive. That dynamic strengthens Kalfresh’s hand if you can demonstrate bankable near-term economics, measurable impact, and disciplined risk controls. Lead with contracts and cost curves, price the policy and scale risk visibly, and insist on milestone-linked terms. Offer impact; demand economics.