WHITE PAPER

Turning Venture-Backed Innovation into Bankable Climate Infrastructure

A Capital Stack & Scale-Up Playbook for Climate-Tech Ventures Moving from Series B to Repeatable NOAK Deployment

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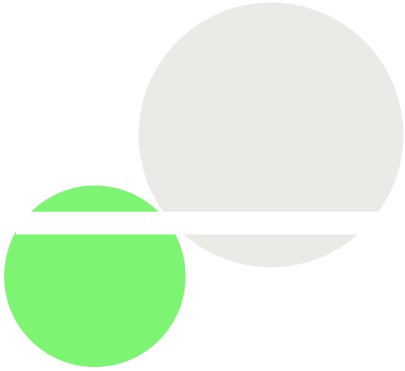
Context

In April 2026, Winterfest convened BCG, HSBC, and the climate-tech ecosystem in Zermatt (CH) around a critical bottleneck: validated climate technologies are reaching commercial readiness, but the financing architecture needed to deploy them is not yet fit for scale. This paper translates the workshop discussions into a playbook for the three groups that will determine deployment: founders building bankable businesses, capital providers sequencing risk from First-of-a-Kind (FOAK) to repeatable projects, and policymakers shaping durable demand.



Executive Summary

The green economy is heading to $7 trillion by 2030[i]—yet $90 billion[ii] in dry powder sits uninvested alongside a $150 billion scale-up gap. iii FOAK[1] projects are stuck between venture and infrastructure because the risk-transition layer remains fragmented and has yet to be translated into bankable structures.

Three frictions need to be solved in order to unlock value and build new climate technologies at the speed and scale the energy transition demands:

Building companies that can deliver (chapter II). Founders must build for financeability and repeatability, from day one, across five imperatives: end state vision, integrated system proof, company-building for delivery, capital matched to risk at each stage of the commercialization journey, and systematic FOAK de-risking before FID.[2]

Financing tools and delivery (chapter III). The gap persists because today's tools are difficult to coordinate at scale. A private-sector-led, independently managed FOAK Finance Facility capitalized by catalytic investors, banks, infrastructure funds, sovereign funds, and Development Finance Institutions would help close it by integrating existing instruments into a repeatable model: technical underwriting, standardized diligence and contracting, milestone-based capital deployment, and aligned catalytic instruments.

Policies (chapter IV). Fragmented, complex, and uncertain rules make demand harder to underwrite. To attract scale-up capital, policy must translate climate ambition into durable, bankable demand signals. Public-private alignment across policymakers, corporates, startups, and investors is also needed to create demand and turn climate-tech scale-up into a source of national competitiveness, resilience, and sovereignty.

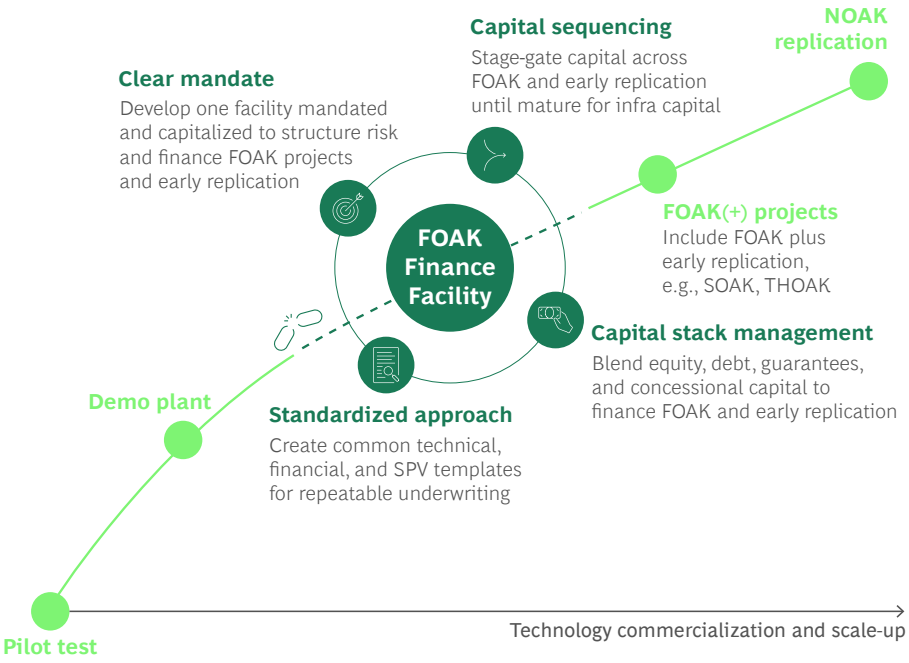
1. FOAK ("First-of-a-Kind") is the first commercial-scale project that converts a proven technology into a bankable, repeatable industrial asset.
2. Final Investment Decision: crucial/formal moment when project owners or investors officially sanction a budget and approve a binding commitment of capital to proceed with the more CAPEX-intensive execution phase of a major project (engineering procurement and construction).

Exhibit. New Privately-Managed FOAK Finance Facility Bridges Scale-Up Financing Gap

Scaling climate tech requires a proven first project—the FOAK—where technology and commercial risks become financeable. Yet abundant dry powder sits undeployed: FOAK projects are too risky for infrastructure capital and too capital intensive for venture capital.

The gap is not capital availability, but coordination: voluntary coordination alone cannot deploy financing tools at the speed and scale the energy transition demands.

A privately-managed FOAK Finance Facility, backed by catalytic investors, banks, infrastructure funds, SWFs,[1] and aligned DFI2 participation, provides the missing risk-translation layer to turn first projects into bankable, repeatable infrastructure.



Source: BCG analysis.
Note: SOAK = Second-of-a-Kind, THOAK – Third-of-a-Kind; NOAK ("Nth-of-a-Kind") refers to the repeatable, standardized commercial-scale deployment that follows a successful FOAK project.
1. Sovereign Wealth Funds (SWFs).
2. Development Finance Institution (DFI).

The Burning Platform: From Proof of Concept to Proof of Scale

The green economy is expected to reach $7 trillion by 2030, but many hard-tech climate scale-ups still stall at the first commercial-scale project, the FOAK. Today, $90 billion in climate dry powder—overwhelmingly concentrated in infrastructure vehicles—sits uninvested alongside a $150 billion scale-up gap. The result is a paradox: capital exists and technologies are maturing, but they struggle to become bankable, repeatable infrastructure.

Exhibit 1. FOAK Turns Validated Technology into Bankable, Repeatable Infrastructure

Illustrative only, for a typical SAF project

	R&D/lab	Pilot	Demo	FOAK[1]	NOAK
Gaps covered	Science-to-company	Process scale-up	System integration	Bankability, risk allocation, and financing	Repeatability, refinancing, and portfolio liquidity
Core proof	Chemistry/ mechanism works	Process works	System works	Asset performs commercially	Standardized, repeatable asset class emerges
TRL & ARL[2]	TRL 1–3/ARL 1	TRL 4–5/ARL 2–3	TRL 6–7/ARL 3–4	TRL 7–8/ARL 5–7	TRL 9/ARL 8–9
Typical scale[3]	<0.01 ktpa	0.05–0.5 ktpa	1–5 ktpa	10–50 ktpa	100–500+ ktpa
Typical project CAPEX[4]	<$1M–$5M	$1M–$10M	$25M–$100M	$100M–$500M	$500M–$2.5B
Infrastructure development period	1–3 yrs	0.5–1 yr	1–2 yrs	3–4 yrs to COD	3–5 yrs per plant
Testing and validation period	A few months	1–2 yrs process validation	2–3 yrs process validation	1–3 yrs performance proof, 15–25 yrs ops	20–25 yrs ops
Ownership	TopCo	TopCo/partner site	TopCo-led/ project wrapper	SPV/ProjectCo[6] (limited TopCo full ownership cases)	Platform HoldCo/DevCo + repeat SPVs
Capital unlocked[5]	Grants, seed	Grants, venture equity, strategic/corp. funding	Grants, phil. & catalytic equity/debt, sponsor equity	Concessional debt, first-loss capital, guarantees	Senior debt, infra equity, portfolio debt, refinancing

FOAK is where technical risk is translated into infrastructure risk so that the asset can eventually become repeatable and refinanceable

Focus of this paper

Sources: US DOE; BCG analysis.
1. SOAK/THOAK bridge FOAK and NOAK steady-state capital.
2. TRL = technical maturity; ARL = adoption readiness (market fit, supply chain, capital, regulation).
3. Ranges in ktpa; actual CF may be lower at R&D/pilot; scale-up ~5-20× per step.
4. CAPEX ranges are illustrative; varies by tech pathway, scale, location, brownfield vs. greenfield, and modularity.
5. Capital types non-exhaustive; see subsequent exhibits.
6. Typically SPV project financing, not TopCo balance-sheet.

Three frictions are challenging climate tech scale-up:

The bridge from venture capital to project finance remains underdeveloped. FOAK projects sit between two asset classes: too capital-intensive for venture equity, too novel and risky for traditional infrastructure capital. Recent recalibration among specialized FOAK funders[iv] and more selective public-finance programs[v] could widen the project-finance gap just as more technologies reach commercial scale, pushing companies back toward expensive, dilutive venture equity.

Liquidity pressure is reshaping investor appetite and exit design. Climate-tech exits[vi] remain narrow (fell 5% YoY in 2025) and concentrated in M&A (89% of 2025 exits, with IPOs up 17% YoY but still limited). Select public-market signals are visible (X-Energy[vii], Fervo[viii]), but startups cannot build for a theoretical IPO window; they need to structure early around the most credible exit routes.

Policy volatility and geographic fragmentation are now scalability risks. US and EU policy pathways are diverging, making cross-border capital raising and FOAK replication increasingly difficult. US climate-tech venture and growth funding grew 27% in 2025, while Europe's fell 13%, with Series C investment down 32%.[viii] Outside the US, Europe, and China (which has a state-enabled, private-sector-led model), climate-tech momentum is visible in Asia,[ix] but financing tools and ecosystems remain limited.

Closing the FOAK-to-NOAK gap requires action across three fronts, each of which the rest of this paper examines in turn: how founders build for bankability (chapter 2), how capital providers finance scale-up (chapter 3), and how policy creates the conditions for climate-tech innovation to scale (chapter 4).

> **"We are using 2010 venture equity models to fund 2030 industrial infrastructure."**
> **— Winterfest 2026**

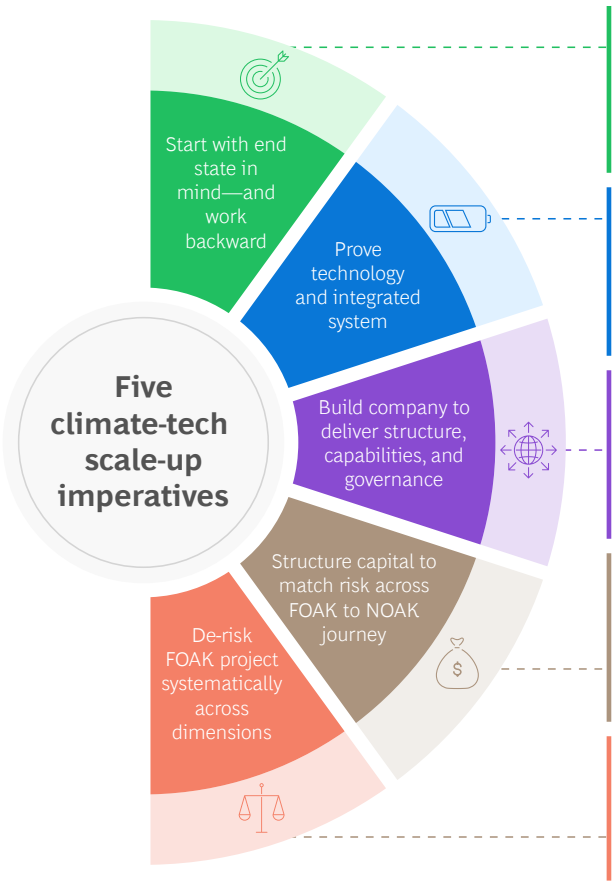
The Founder Playbook: Crossing the FOAK Bridge

II.

Climate-tech companies do not scale when the first asset works once; they scale when the first asset proves to be a repeatable infrastructure model. The journey from FOAK to Nth-of-a-Kind[3] (NOAK) is therefore about turning a validated technology into a project model that can be built, operated, contracted, insured, financed, and repeated. FOAK sits at the center of this journey; it is where technical credibility must translate into bankability at industrial scale, giving investors the evidence they need to fund the next projects.[x]

For many hard-tech climate technologies, licensing is rarely feasible at FOAK. Startups often need to build and operate the first asset—or first few assets—themselves to control execution, generate operating data, close the technology feedback loop, and prove bankability. That turns scale-up into a company-building, project-delivery, and financing challenge—not just a technology challenge.

Exhibit 2A. From Early Scale-Up To Repeatable Deployment, Climate-Tech Startups Need Five Commercialization Imperatives in Parallel



ROADMAP
- Define market-back roadmap: Target customers and offtake segments, develop NOAK business model, and map exit pathways
- Set techno-economic cost-down path: Standardize/modularize design, supply chain, and integration
- Preserve repeatability: Avoid bespoke choices in scale-up journey (design, suppliers, EPC model, etc.)

TECHNOLOGY
- Validate before scaling: Follow engineering scale-up discipline (~10x jumps from demo to FOAK to NOAK)
- Build financeable package: Validate performance and engineering[1] before locking in next project design
- Operate demo as a Center of Excellence: Keep demo running as a flexible learning engine for FOAK/NOAK

PROCESSES
- Structure TopCo / ProjectCo interface: Clarify ownership, liabilities, decision rights, and partner roles
- Define capability architecture: Internalize critical capabilities; partner or procure to fill gaps
- Evolve governance for scale-up: Align decision rights, reporting, and controls across key stakeholders

FUNDING
- Map investor requirements: Define return, risk, diligence, and bankability needs across FOAK/NOAK stages
- Match capital to residual risk: Sequence grants, equity, catalytic capital, guarantees, and debt around remaining risks
- Plan capital transitions: Enable shift from higher-cost early capital to lower-cost project/infra capital as risks reduce

EXECUTION
- Map risks before FID: Identify, quantify, and assign key project risks early on[2]
- De-risk project development/execution: Transfer, share, mitigate, insure, guarantee, or retain risks deliberately
- Close bankability blockers: Resolve single-point-of-failure risks before FID, not during lender diligence

Source: BCG analysis.
1. Uptime, degradation, feedstock tolerance, safety, operating envelope, and mass/energy balance.
2. Tech, scale-up, construction, feedstock, offtake, permitting, commissioning, O&M, insurance, ramp-up, and interface risks early.

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3. NOAK ("Nth-of-a-Kind") refers to the repeatable, standardized commercial-scale deployment that follows one or more successful FOAK/early commercial projects.

To move from first-asset delivery to repeatable NOAK scale, climate-tech startups need to act on five imperatives in parallel:

1 **Start with the end state commercial model.** Founders need to define early what the company should become at scale, then work backward to the FOAK capabilities and proof points required to make that model credible. At FOAK, even companies aiming to be asset light later may need to act as developer, integrator, operator, or balance-sheet sponsor to generate the evidence customers, financiers, partners, and licensees require. Rondo Energy illustrates this commercially: by developing both equipment-led and heat-as-a-service models, it made early projects easier to underwrite.[xi] Commonwealth Fusion Systems treated SPARC[4] (FOAK) as part of the path to ARC (commercial), using the demonstration phase to build toward the commercial plant, capital model, supply chain, and partnerships required at scale.[xii]

2 **Prove the technology and the integrated system.** Each scale-up step should validate not only the core technology but also the full system under increasingly realistic operating conditions. Scaling requires sequenced step-ups—often around one order of magnitude as per best engineering practices—large enough to prove the next scale, but not so large that technical, execution, or capital risk becomes unmanageable. Climeworks' progression[xiii] from single-module pilots to the fully-integrated 4 ktpa Orca facility and then to the 36 ktpa Mammoth plant illustrates staged learning through progressively larger operating assets. Fervo Energy[xiv] follows a similar staged-scaling logic, with Project Red informing the design and scale-up of its larger Cape Station development. Infinium's Pathfinder[xv] similarly provides an early commercial reference for its Roadrunner commercial-scale project.

4. SPARC is the FOAK Tokamak reactor under construction—designed to produce up to 140 MW of power and achieve net energy (Q>1), with first plasma targeted for 2027. ARC is a 400 MWe commercial fusion plant planned for the early 2030s, which has already secured financial backing and offtakes commitments.

3 **Build the company to deliver.** Most startups underestimate the rigor required to access project finance. As scale-up moves from demo to FOAK and early repeat projects, the company must evolve from an R&D-led startup into a credible project sponsor. That requires a clear Top-Company (TopCo) and Special Purpose Vehicle (SPV) structure, project-delivery capabilities, and governance designed for later-stage capital. Electric Hydrogen reflects this shift, moving beyond electrolyzer development and manufacturing into project development and financing through the Ambient Fuels acquisition and a strategic relationship with Generate Capital to offer up to $400 million in hydrogen project-finance solutions.[xvi]

4 **Structure capital to match the risk.** The capital stack should be designed around the risks each instrument is best placed to absorb, and evolve the stack as risk progressively retires from FOAK to NOAK. Infinium[xvii] shows the model: FOAK Roadrunner assembled contracted offtakes from American Airlines and IAG, catalytic project equity from Breakthrough Energy Catalyst, HSBC project debt, and Brookfield equity. Brookfield also committed up to $850 million of infrastructure equity to future Infinium plants, transforming FOAK economics before the second plant breaks ground.

5 **De-risk the FOAK project systematically across eight key workstreams.** Founders often over-invest in familiar areas—technology, engineering, or customer traction—while under-building the evidence required for FID. Financing decisions depend on the full project risk profile; strong technology can still stall on permitting, signed offtake can be weakened by feedstock exposure, and credible economics can fail if EPC risk sits on the wrong balance sheet. In FOAK, the least-resolved risk often sets the pace. By FID, eight FOAK risk gates must be sufficiently addressed (Exhibit 2.b). The objective is not to eliminate all risk, but to make each material risk visible, owned, and financeable[xviii] through validation, contracts, counterparties, guarantees, insurance, reserves, or financing structures. Energy Dome illustrates the logic: first-deployment risk was reduced not by technology validation alone, but by combining Breakthrough Energy Catalyst and European Investment Bank[xix] capital with storage offtake,[xx] making the project more financeable and repeatable.

Exhibit 2B. Deep Dive on FOAK Project De-Risking—the Eight Gates to FID

1 Technology, IP & system readiness

Prove integrated system before FOAK: Validate full process performance at relevant scale through pilot/demo, not core components only

Scale in disciplined steps: Limit each scale-up jump to ~10x unless evidence supports a larger leap

Operate demo as a learning CoE[1]: Keep demo running to feed lessons into FOAK design, operations, and TEA[2] before FEED/FID

2 Site, permitting & regulatory

Select executable FOAK site: Validate land, utilities, logistics, grid, community, and constructability

Start permitting early: Advance key permits and incentive-eligibility workstreams before design freeze

Build policy resilience: Underwrite confirmed rules and stress-test downside policy risk before FID

3 Commercial: Offtake, feedstock & utilities

Manage project-on-project risk[3]: Map dependencies, early-warnings, and contingency levers

Design bankable yet flexible commercial model: Secure lender-grade offtake, feedstock, and utility term sheets while preserving FOAK ramp-up flexibility

Align tenor and pass-through: Match input/offtake terms with indexation, reopeners, and change-in-law clauses

4 EPC & supply chain

Define contracting model and scope split: Match EPC, EPCM, or hybrid structure to realistic FOAK risk allocation

Select scale-up delivery partners: Choose EPCs, OEMs, and integrators with FOAK appetite and relevant references

Manage interfaces and supply chain: Clarify scope, guarantees, and handovers and de-risk critical equipment before FID

5 Bankable project economics & TEA

Build lender-grade TEA: Validate M/E[4] balance, CAPEX/OPEX, up-time, yield, degradation, ramp-up, green-premium gap

Include FOAK buffers: Reflect demo learnings in contingency, ramp-up, reserves, and downside cases

Show credible cost-down path[5]: Show FOAK-to-NOAK gains from scale, learning, uptime, standardization, and lower WACC

6 Commissioning, O&M & safety

Build operational readiness early: Define O&M model, staffing, training, procedures, spares, controls, and pre-FID readiness checklist

Define commissioning gates: Define completion, startup, performance test, reliability run, and handover criteria

Embed safety culture: Establish HAZID/HAZOP, LOPA, safety case, emergency response, and operability risk processes

7 SPV structure, governance & legal

Design ProjectCo/TopCo boundary: Clarify ownership, liabilities, rights, sponsor support, and parent guarantees

Pre-agree downside waterfall: Define asset, contract, reserve, debt, and sponsor treatment under stress

Set governance controls: Establish reserved matters, approvals, reporting, covenants, and dispute mechanisms

8 Finance planning & capital stack

Allocate capital by risk layer: Match grants, equity, guarantees, concessional debt, and commercial debt to the risks that remain

Structure capital around residual risk: Use catalytic, concessional, and commercial capital where each can absorb risk most efficiently

Define take-out triggers: Set post-COD proof points for guarantees for step-down and lower-cost capital to enter

Technology and project proof | Commercial bankability | Execution readiness | Financing architecture

Source: BCG analysis.
1. Center of Excellence.
2. Technoeconomic assessment.
3. Project-on-project risk can impact both commercial as well as technical interfaces.
4. Mass & Energy.
5. To balance bankability, upside sharing and downside protection.

The five imperatives define the broader FOAK-to-NOAK scale-up journey; the eight gates define what must be solved before the first commercial-scale (FOAK) project can cross FID. The examples above show that startups can build investor conviction when they address these workstreams in parallel—not only by proving the technology, but also by translating project risk into structures that capital providers can underwrite.[xxi]

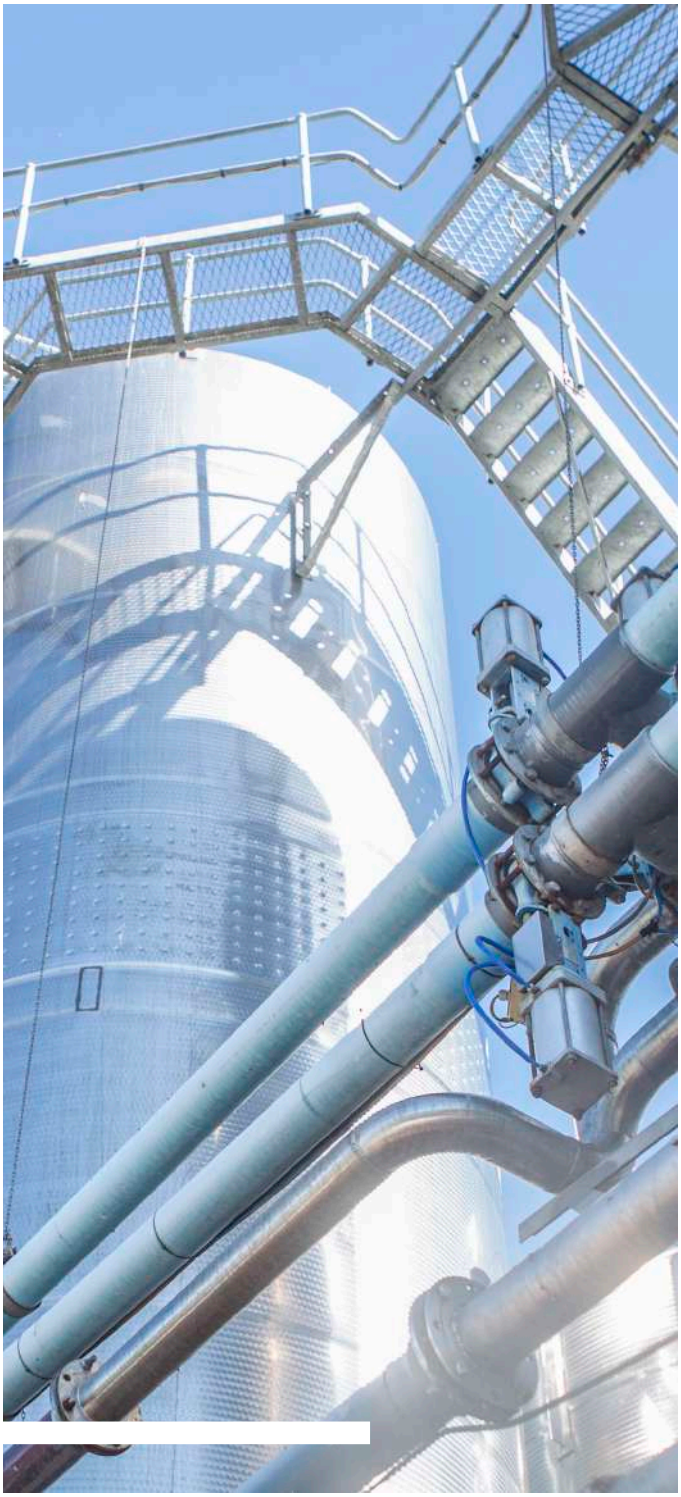
The same logic applies to capital allocators: a bank or infrastructure investor is unlikely to build internal conviction, absorb diligence costs, and underwrite FOAK risk for a single transaction with no clear follow-on role. The incentive is the pipeline: early participation in FOAK can create privileged visibility into billions of dollars of future financing needs for second-, third-, and n-th-of-a-kind projects, where risks are lower, structures are more standardized, and capital can be deployed at scale. FOAK bankability therefore depends not only on reducing risk, but also on aligning the commercial incentives of the capital providers needed for repeat deployment.

> **"Unlocking debt requires not just technical proof, but bankable certainty across multiple dimensions." — Winterfest 2026**

Financing the Risk-Translation Gap: A Capital Stack and Facility for FOAK Scale-Up

III.

The next question is not only how FOAK risks are resolved, but also how capital is sequenced so the first project can unlock subsequent ones. Financing breaks down when risks are allocated to the wrong capital—venture equity absorbing project execution exposure, senior debt entering before downside is bounded, or infrastructure capital arriving before operating proof exists.



Several tools are emerging to address this sequencing challenge, but the risk-transition layer remains fragmented and inconsistent—too dependent on bespoke instruments, project-specific structuring, and a limited number of precedent transactions to close the FOAK gap at scale. Elemental's D-SAFE[xxii] has unlocked $70+ million from less than $7 million deployed; Trellis Climate[xxiii] provides risk-tolerant catalytic capital for FOAK infrastructure; Vensurety[xxiv] is piloting a new category of surety bonds tailored for climate-tech/climate-hard-tech startups; DOE LPO's loan guarantees have supported projects such as Advanced Clean Energy Storage and Monolith[xxv]; Breakthrough Energy Catalyst/EIB have helped trailblaze blended finance for multiple FOAK projects, including Energy Dome,[xxvi] Rondo,[xxvii] etc.; Frontier's $925 million advanced market commitments,[xxviii] together with demand-aggregation platforms such as SABA and ZEMBA, improve revenue visibility by pooling demand and creating bankable offtake signals.

The ScaleUp Europe Fund[xxix] offers a useful emerging reference model for private-sector-led capital mobilization—an EU Commission-supported effort to pool institutional capital into low-carbon and deep technology, but with a different mandate focused on venture and growth

equity rather than FOAK concessional capital and project-level risk translation.

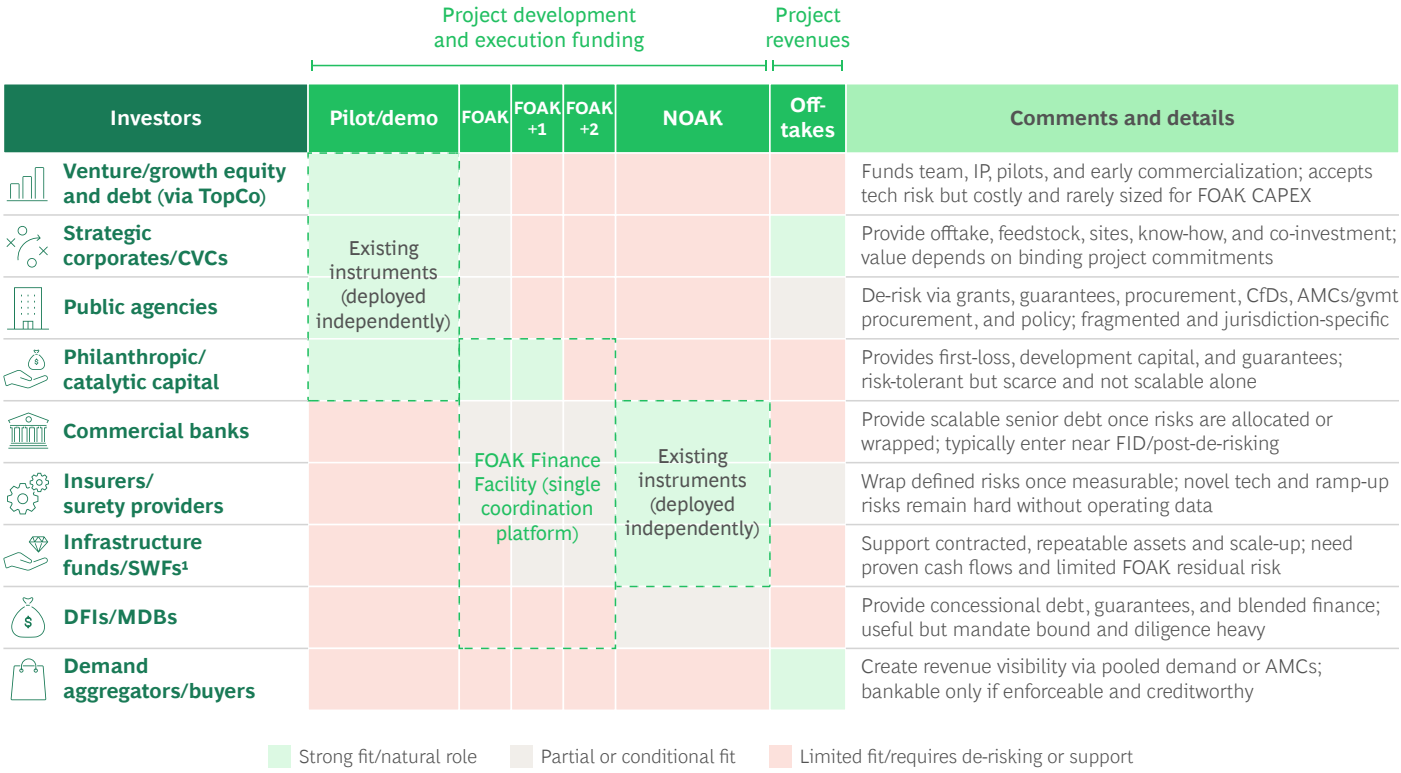
Together, these examples show that the ingredients exist: catalytic capital, risk transfer, and aggregated demand can reduce early risk so commercial debt and infrastructure equity can enter. But today they remain fragmented, inconsistently available, and difficult to assemble repeatedly.

The FOAK financing ecosystem is unlikely to self-organize at the speed and scale required for the energy transition. Coordination among investors, lenders, insurers, catalytic capital providers, and public-finance institutions remains difficult to standardize—especially when projects also depend on startups, offtakers, corporates, and policymakers aligning around demand, risk allocation, and execution. Closing the gap requires a private-sector-led, independently managed blended-finance facility with its own mandate, balance sheet, and committed capital. Capitalized by catalytic investors, banks, infrastructure funds, sovereign wealth funds, DFIs/MDBs, and other institutional investors, the facility would pool capital and risk-sharing instruments into a dedicated platform able to deploy across FOAK and early replication projects until risks are sufficiently retired for infrastructure take-out. Precedents show that project-level catalytic capital and public-private co-investment can unlock FOAK financing within institutional mandates, albeit mostly through bespoke transactions rather than a repeatable market architecture. The proposed facility would extend that model across a broader portfolio, larger scale, and multi-instrument toolkit spanning development, construction, operations, and refinancing/take-out readiness.

The FOAK Finance Facility could operate through five functional/capital sleeves: development capital (FEED, permitting, offtake, SPV setup); catalytic project capital (junior/first-loss equity, subordinated debt, preferred equity); guarantees tied to milestone triggers; insurance and surety for selected ramp-up and O&M risks; and refinancing/take-out capital once operating milestones are achieved. The FOAK Finance Facility would operate separately but alongside public capital, VC/TopCo investors, and corporate strategics providing equity, offtakes, or project partnerships. Public-sector actors and instruments could be aligned with the facility where they strengthen bankability, expand participation, or accelerate risk retirement, while preserving independent management and private-sector execution discipline. Its advantage would come not necessarily from creating new instruments, but from integrating existing tools into a repeatable model: technical underwriting, standardized diligence and SPV processes, milestone-based deployment, and portfolio-level performance data that help create investable platforms for scale and speed.

Five structural advantages characterize this FOAK Finance Facility: pre-committed capital and risk sharing capacity; standardized diligence and SPV documentation; early involvement of follow-on investors ready to increase exposure as FOAK/SOAK/THOAK risks are retired; shared performance data and learnings; and a dedicated technical underwriting function potentially combining engineering, finance, and insurance expertise. The target-state vision is not a single perfect vehicle on day one, but a practical platform that can start narrow, prove the model, and add tools, investors, geographies, and mandates over time.

Exhibit 3. A Dedicated Finance Facility Creates the Missing Risk-Transition Layer from FOAK to NOAK



Source: BCG analysis.
1. Sovereign Wealth Funds with climate/industrial policy mandates may also participate in the subordinated or catalytic sleeve alongside DFIs.

The Facility should start focused, with a small set of underwritable archetypes or a regional platform where local tailoring is needed. The immediate priority is to define the founding coalition, mandate, priority markets and technologies, and two to three proof-of-concept transactions. It can begin with an operating budget and anchor commitments, then target first close once governance, pipeline, and risk-retirement tools are agreed. The goal is not to close the full FOAK gap at once, but to make each next transaction faster, cheaper, and more bankable.

Exhibit 4. Create a Dedicated FOAK Finance Facility to Coordinate Capital, Retire Risk, and Unlock Follow-On Investment

Target-state vision for a privately managed vehicle investing in platforms through FOAK and early follow-on projects

Illustrative

Purpose, Vision, and Mandate

- Translate FOAK tech and project risk into bankable, insurable & refinanceable infrastructure risk
- Standardize processes, build tech capabilities, and create shared performance data commons
- Invest across FOAK and early repeats with decreasing intensity as risk retires and conventional capital steps in

⚠ **Does NOT:** Replace policy support, act as developer, originate demand, or fund full capital stack

⚠ **Does:** Finance catalytic risk layers that unlock private capital

Approach and Regional Focus

- Pre-committed catalytic capital deployed against defined risk-retirement milestones
- Milestone-based risk retirement—capital released on evidence, not time
- Co-invest at ProjectCo/SPV[1] alongside TopCo equity, strategic investors, catalytic capital, and other lenders where bankable
- Technology-agnostic criteria: gigaton-scale potential, bankability pathway, and repeat-project potential
- Launch as global vehicle, US & EU focus; staged approach to regional chapters

Structure, Organization, and Governance

- Private-sector-led vehicle with independent management and clear fiduciary accountability
- Ring-fenced capital sleeves by stage, risk type, and return profile
- Clear decision rights for investment approval, risk allocation, and follow-on deployment
- Aligned governance across catalytic, commercial, and public-capital objectives
- Technical underwriting function combining engineering, finance, and insurance expertise

Financing Vehicles by Stage

- Pre-FID: Development capital for FEED, permitting, offtake, SPV setup
- FID/construction: First-loss equity absorbed by philanthropic/DFI capital, subordinated debt, guarantees with commercial LP tranches protected through subordination
- Ramp-up: Insurance/surety backstops, reserves, milestone funding
- Post-proof: Progressive handover to senior debt/infrastructure equity as risks retire

Capitalization Structure and Plan

- Fund 1: $5 Bn target (first close $1.5 Bn–$2.5 Bn)
- Fund 2+: $8 Bn–$10 Bn target with 5–10× mobilization
- Sleeves: Development, catalytic equity, guarantees, insurance/surety, take-out pathway
- Return profile tiered by sleeve: Concessional for catalytic/first-loss capital (philanthropy/DFIs), market-rate for commercial debt/equity; subordination preserves LP returns

Source: BCG analysis.
1. Special Purpose Vehicle (SPV).

> **"The missing middle is not one missing check; it is the absence of a sequenced capital stack that moves risk to the right balance sheet as evidence improves."**
> **— Winterfest 2026**

Government and Policymakers: Building the Market Conditions for FOAK Scale

IV.

Scaling climate technologies from first commercial projects to repeatable deployment requires more than project finance. Startups need routes to market, corporates need confidence to commit demand, and investors need underwritable cash flows. Policy can help create these conditions through market-shaping tools such as public procurement, CfDs,[5] advance market commitments, product standards, demand aggregation, book-and-claim systems, and offtake-backed tenders. Public procurement alone represents around 15% of GDP in Europe and, alongside targeted support, can provide the early demand pull that first commercial projects need.

Countries are also taking different approaches to climate tech scale-up. Europe has a deep policy architecture, though implementation differs across member states (for example, RED III[xxx]); the US has more direct fiscal tools, with program design and administrative requirements continuing to evolve. China has successfully deployed a public-sector-enabled and private-sector-led commercialization model, combining local demand formation, industrial ecosystems, financial policy, and platform-scale industrialization to accelerate commercialization and scale domestic champions. Rest of Asia and the Middle East are emerging as important scale-up markets, but will need stronger ecosystems—across policy, demand formation, project finance, industrial capabilities, infrastructure, and execution partners—to support **FOAK-to-NOAK deployment** at the required scale and speed.

Complex or uncertain rules, shifting timelines, and fragmented implementation can deter investment and keep technologies trapped in pilot markets. Harmonized, durable, and simple frameworks expand addressable markets, improve liquidity, and strengthen exit and fundraising pathways. Early scale-up successes are critical, as they prove that climate-tech can generate returns, enable exits, and give institutional investors confidence to follow.

For startups and investors, the implications are clear: policy should be treated as an underwriting input and bridge to commercial competitiveness, not as permanent support. Projects should be structured around clear eligibility, durable demand, and a credible path to viability. In fragmented policy environments, startups should design for resilience: avoid dependence on a single subsidy regime and build commercial structures that are resilient to declining support.

For policymakers, the implication is broader: climate-tech commercialization is increasingly linked to competitiveness, security, resilience, and sovereignty. Recognizing this strategic importance—and working with investors, startups, and corporates through public-private partnerships—is vital to translate innovation into scalable markets, industrial capability, and long-term competitiveness.

> **"The most useful policy instrument is not always the largest subsidy; it is the one that turns policy value into bankable cash before FID." — Winterfest 2026**

5. CfD = Contracts for Difference

Conclusions and Recommendations

V.

Climate technologies have moved beyond the lab. The financing architecture has not kept pace; tools exist, but the risk-transition layer remains fragmented, inconsistent, and too dependent on bespoke coordination. Progress is visible, but uneven. Scaling with the speed and resilience the energy transition requires will take all stakeholders moving in the same direction: startups built for bankability and repeatability; policymakers providing clear, harmonized and durable demand signals; and capital providers developing repeatable ways to underwrite first commercial projects.

Closing the gap requires alignment at two levels: first, public-private alignment among startups, corporates, policymakers, and investors to create bankable demand and project pipelines; second, financial-sector alignment among investors, lenders, insurers, catalytic capital, and DFIs/MDBs to sequence instruments around risks as they are progressively reduced.

In finance, coordination across investors, instruments, and risk layers is unlikely to emerge voluntarily at scale. At the center of the next phase could be a capitalized FOAK Finance Facility: a dedicated vehicle, backed by the financial investors needed across the scale-up journey, with the mandate and balance sheet to deploy into FOAK and early replication projects until risks are sufficiently retired for infrastructure-grade capital to take the platform forward. By moving from ad hoc transactions to a dedicated delivery model that can deploy capital directly and catalytically, such a facility could help unlock the existing ~$90 billion of VC/infrastructure climate-tech dry powder and close the current $150 billion FOAK financing gap.

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