

BLACKTECHSTARTUP EDUCATION

Deep-Tech Commercialization Readiness

Turn a technical breakthrough into a commercial de-risking plan that connects performance evidence, customer discovery, regulatory/procurement gates, partners, milestones and the right form of capital.

Deep-tech companies often fail diligence by presenting technical maturity as commercial maturity. NSF I-Corps is built around the opposite idea: customer and industry discovery must inform the technology-development and venture strategy. DOE's Adoption Readiness Levels similarly emphasize nontechnical adoption risks. Investors need a map of what is proven technically, what remains uncertain commercially, and which milestone retires each risk.

Know what weak and strong look like

READINESS AREA	WEAK / DILIGENCE RISK	STRONG / INVESTOR-READY
Technical proof	Best lab result shown without test conditions or repeatability.	Performance claims have protocol, baseline, sample size, repeatability and third-party evidence where material.
Customer proof	Letters of "interest" substitute for workflow/economic discovery.	Named use case, buyer, adoption barrier, budget path and quantified value hypothesis tested.
Regulatory/procurement	Treated as paperwork after product completion.	Gates, standards, approvals, procurement lead time and decision owners mapped.
Partners	Logos on slide with no role.	Partner contribution, dependency, economics, obligations and next decision milestone documented.
Capital	VC expected to fund every development phase.	Grant, strategic, project/debt and equity capital matched to risk type and asset stage.

Build a risk-retirement matrix

List technical, manufacturing, regulatory, customer, procurement, supply, unit-cost and financing risks. For each, define current evidence, next experiment/deal, pass criterion, cost, time and financing source.

Quantify the customer's adoption problem

A 30% technical improvement may not matter if switching requires a 24-month validation, plant shutdown or new certification. Interview users, technical evaluators, procurement, finance and the economic buyer—not just innovation teams.

Separate technology readiness from adoption readiness

A technically mature solution can be commercially immature if integration, infrastructure, workforce, policy, permitting, market structure or financing is unresolved. Track both tracks explicitly.

Design milestones investors can underwrite

Replace “complete R&D” with evidence such as third-party validation at target operating conditions, paid pilot with success criteria, regulatory submission, signed offtake/MOU with economic terms, or verified unit-cost curve at pilot scale.

Match capital to the risk

Use nondilutive research funding where appropriate for technical uncertainty, customer/strategic capital for validation, equity for company-building risk, and project/asset finance only when cash flows and counterparties can support it. Do not burn expensive equity solving a risk that another capital source is designed to fund.

Run the diligence stress test before investors do

Do not rehearse an answer. Rehearse the evidence. Give yourself a short diligence window and try to produce the underlying records without rebuilding the story from memory. A clean result is reproducible, tied to a source system or signed document, and consistent with the numbers elsewhere in the company.

→ **Technical proof:** Put the underlying records on screen and prove this standard: Performance claims have protocol, baseline, sample size, repeatability and third-party evidence where

material. If the evidence still looks like this weak state—Best lab result shown without test conditions or repeatability.—record the gap, name an owner and give it a due date instead of explaining it away.

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 - **Partners:** Put the underlying records on screen and prove this standard: Partner contribution, dependency, economics, obligations and next decision milestone documented. If the evidence still looks like this weak state—Logos on slide with no role.—record the gap, name an owner and give it a due date instead of explaining it away.
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Do the math investors will do

Commercialization scorecard: each major risk gets 0 = hypothesis, 1 = internal evidence, 2 = external/partner evidence, 3 = repeatable commercial evidence. The company does not become “ready” because the average score rises; the gating risk matters. A single unresolved regulatory or manufacturing gate can dominate ten well-developed customer interviews.

Build the evidence investors can verify

- ✓ Technical validation dossier
 - ✓ Customer-discovery interview map with buying/adoption evidence
 - ✓ Risk-retirement matrix
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- ✓ Regulatory/standards/procurement map
- ✓ Partner dependency and economics matrix
- ✓ Milestone-based 24-month plan
- ✓ Capital-stack map tied to specific risks

Questions an investor may ask

- ? What must be true for a customer to adopt at commercial scale?
- ? Which result has been independently validated?
- ? What is the current gating risk—not the most exciting risk?
- ? Which milestones unlock a different class of capital?
- ? What partner can stop the commercialization path if it withdraws?

30-day repair sprint

- 1 Days 1–5: inventory all technical and adoption risks.
- 2 Days 6–10: score current evidence and identify the gating three.
- 3 Days 11–15: map buyer/procurement/regulatory path.
- 4 Days 16–20: rewrite milestones as pass/fail evidence.
- 5 Days 21–25: match capital source to each milestone.
- 6 Days 26–30: produce one integrated commercialization roadmap and kill claims not supported by evidence.

SOURCE DESK

Research behind this guide

Use the primary and authoritative sources below to verify current rules, market conditions and technical guidance. Terms and regulations can change.

NSF — I-Corps Commercialization Program



NSF — 2025 I-Corps Biennial Report



U.S. Department of Energy — Adoption Readiness Levels



SEC — Ready to Raise CAPITAL



Important: This guide is educational information, not individualized legal, tax, investment, employment, security or compliance advice. For decisions with material legal or financial consequences, use a qualified professional who can review your facts.

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