LLOYD'S
Underwriters

Ariel Green

GreenBridgeLLC
Bridging cleantech to the real world

Beyond the Liability Cap: TPI for FOAK



Tad Dritz & Poornima Sharma

October 2026

EPC/Licensor Contractual & Contingency cover - Why FOAK projects need more

1

Investors need bankable revenue

Equity returns and debt service depend on delivery on time, on budget and to specification, and on reliable long-term operation.

2

FOAK technology risk is hard to absorb

With proven oil & gas technology, investors accepted the residual risk above capped EPC and licensor liability. FOAK adds unproven performance, start-up failures, cost overruns and low reliability.

3

Performance wraps are scarce

EPC performance wraps for FOAK and biotech projects are largely unavailable; where offered, the cost makes them commercially impractical.

GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green

Contract guarantees are capped by contract value

EPC contractor

Guarantee · typical liability

Product quality & environmental specs	Unlimited if EPC-attributable; inside overall cap
Volumetric capacity	Capped, within overall cap
Utility consumption	Capped as % of contract value
Availability & reliability	Rarely offered for FOAK; suppliers warrant equipment
Project schedule	

15–30% **Overall limit of liability** as a share of **EPC contract value**

Technology licensor

Guarantee · typical liability

Product quality, yield & energy efficiency	Up to 100% of license fees
Availability & reliability	Capped as % of license fees

Lever: adding proprietary equipment supply to the licensor's scope raises contract value and, with it, the absolute liability cap.

100% **Overall limit of liability** of **license fees**, for all technology-performance issues

GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green

$750mm Capex scenario: EPC & Licensor have limited liability

Scenario assumptions

- $750mm biofuels / maritime fuels project
- EPC: lump-sum EP + construction management ≈ 50% of capex ($375mm)
- EPC overall cap: 15–30% of contract
- Licensor: license fee $10–15mm, capped at 100%
- ISBL ≈ 60% of TIC (~$450mm)

Performance guarantee	EPC contractor (if EPC-attributable)	Licensor	Total (rounded)
Volumetric capacity	10–20% of contract value	100% of LF	$48–90mm
Product quality & environmental specs	Unlimited, inside overall cap	100% of LF	$10–15mm + EPC (inside cap)
Yields / conversion	Not applicable	50–100% of LF	$5–15mm
Utility consumption	10–15% of contract value	20–30% of LF	$40–60mm
Reliability (continuous days of operation)	10% of contract value	20–30% of LF	$40–42mm
Overall limit of liability	**$56–112mm** 15–30% of contract	**$10–15mm** 100% of LF	**$66–127mm**

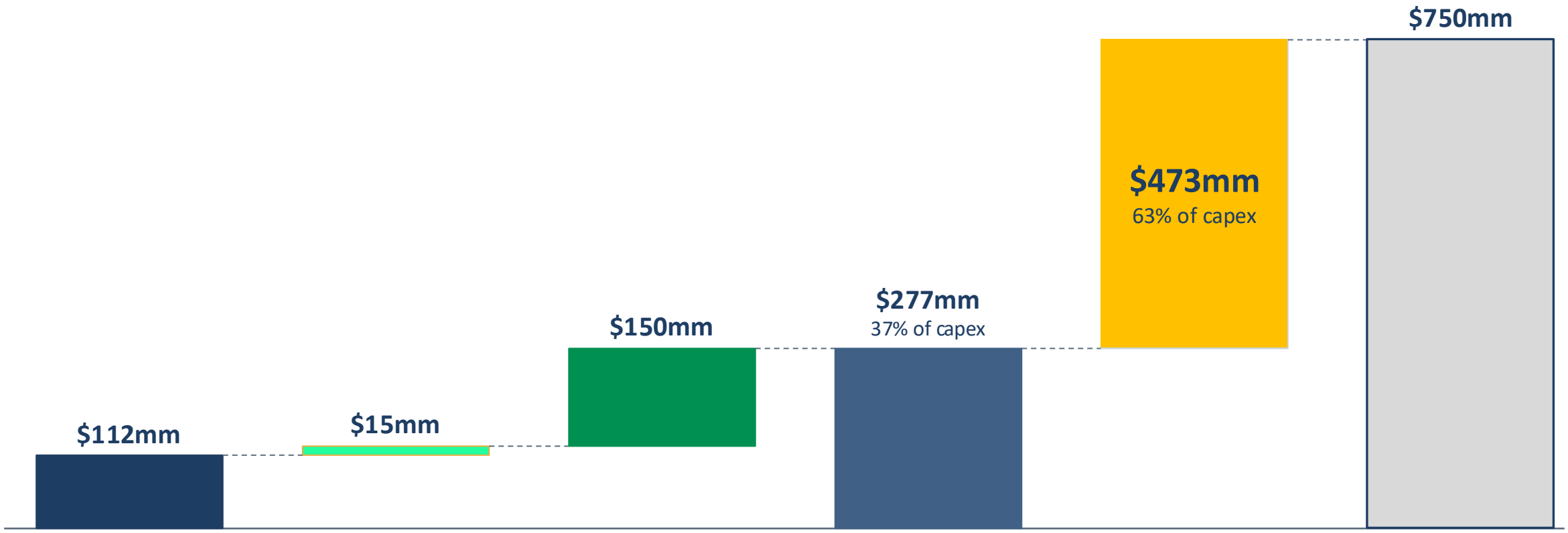
LF = license fee

GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green

$750mm Capex scenario: at high end, a $473mm gap remains



GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green

Technology Performance Insurance (TPI)

Performance Guarantees	Startup Repair	Long-term Output	Performance Guarantee Backstop
Volumetric capacity	Up to 30-50% of ISBL, after deductible is met*	Matches debt service, $50-$75mm/year	Augments licensor limit of liability by up to 5-10X, $50-150mm
Product quality & environmental specs	Up to 30-50% of ISBL, after deductible is met	Product meeting specs included, emissions are excluded	Augments licensor liability for KPIs, LDs, etc.
Yields / conversion	Up to 30-50% of ISBL, after deductible is met	Insures output over event period, which includes yield	Augments licensor liability for KPIs, LDs, etc.
Utility consumption	Typically not included	Typically not included	Augments licensor liability for KPIs, LDs, etc.
Reliability (continuous days of operation)	N/A, only for commissioning stage	Insures output over event period, which includes availability	Augments licensor liability for KPIs, LDs, etc.
Overall limit of liability	**$150-$225mm (limited by insurers capacity)**	**$50-$75mm/year**	**$50-$150mm**

** Deductibles for FOAK projects commonly range from 10%-20% of covered equipment.*

GreenBridgeLLC
Bridging cleantech to the real world

Ariel Green

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

TPI Example – Startup Repair Cover

Most Critical Time for All Projects

- Capital has been spent
- Push to begin commercial operations

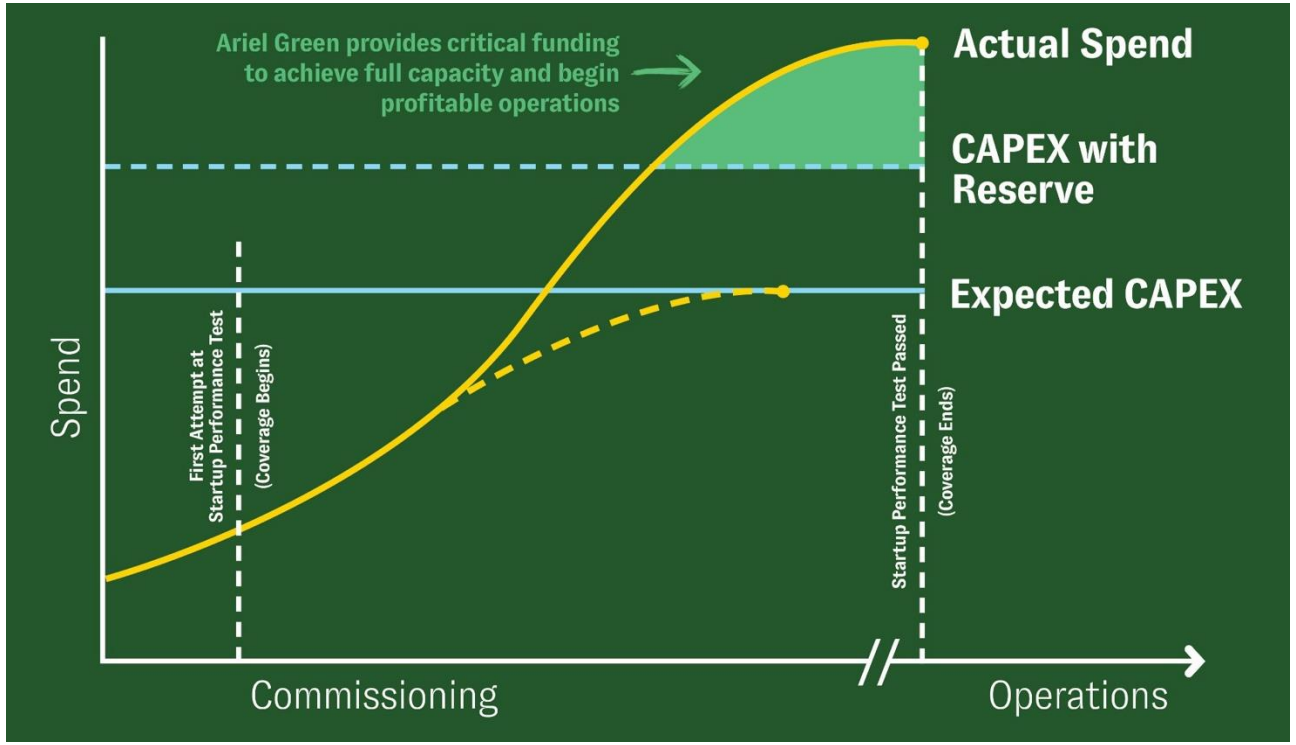
Risk Mitigation

- Contingent capital to overcome challenges

Policy Structure

- Covers repairs after deductible is met
  - On risk from first attempt at Startup Test
  - Off risk when capacity is validated
- Policy limit 30+% of covered capital
- Named Perils Policy
- Paired with Long-term Output

Startup Repair Cover

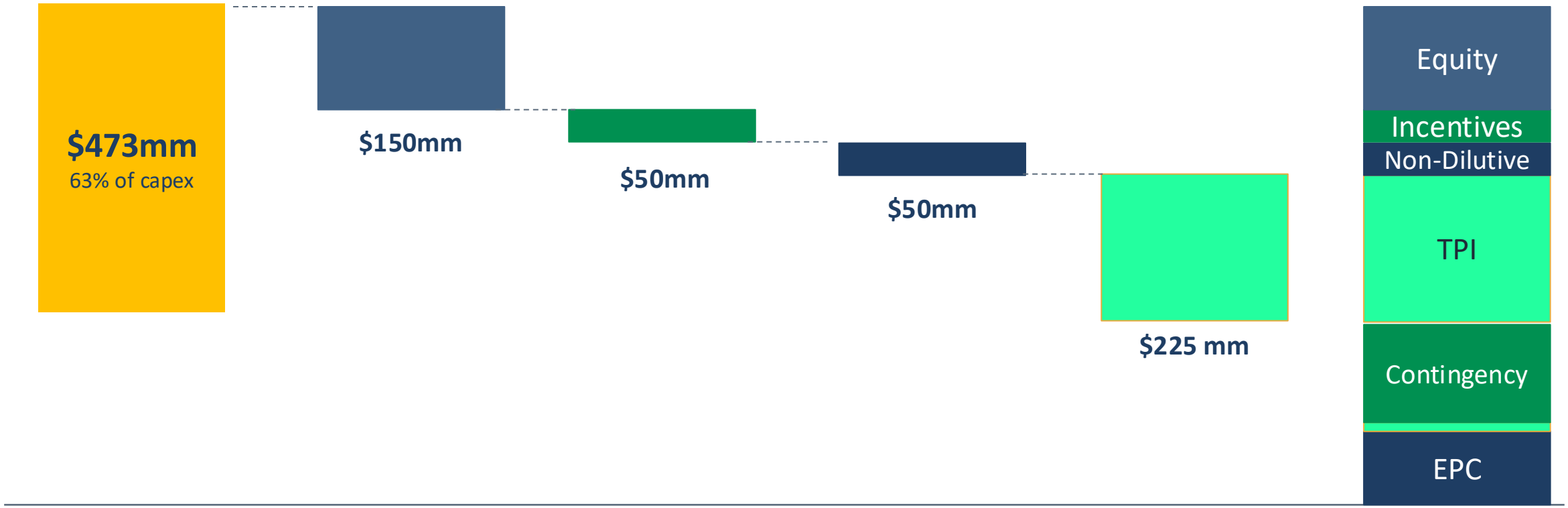


GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green

Narrowing the $473mm gap

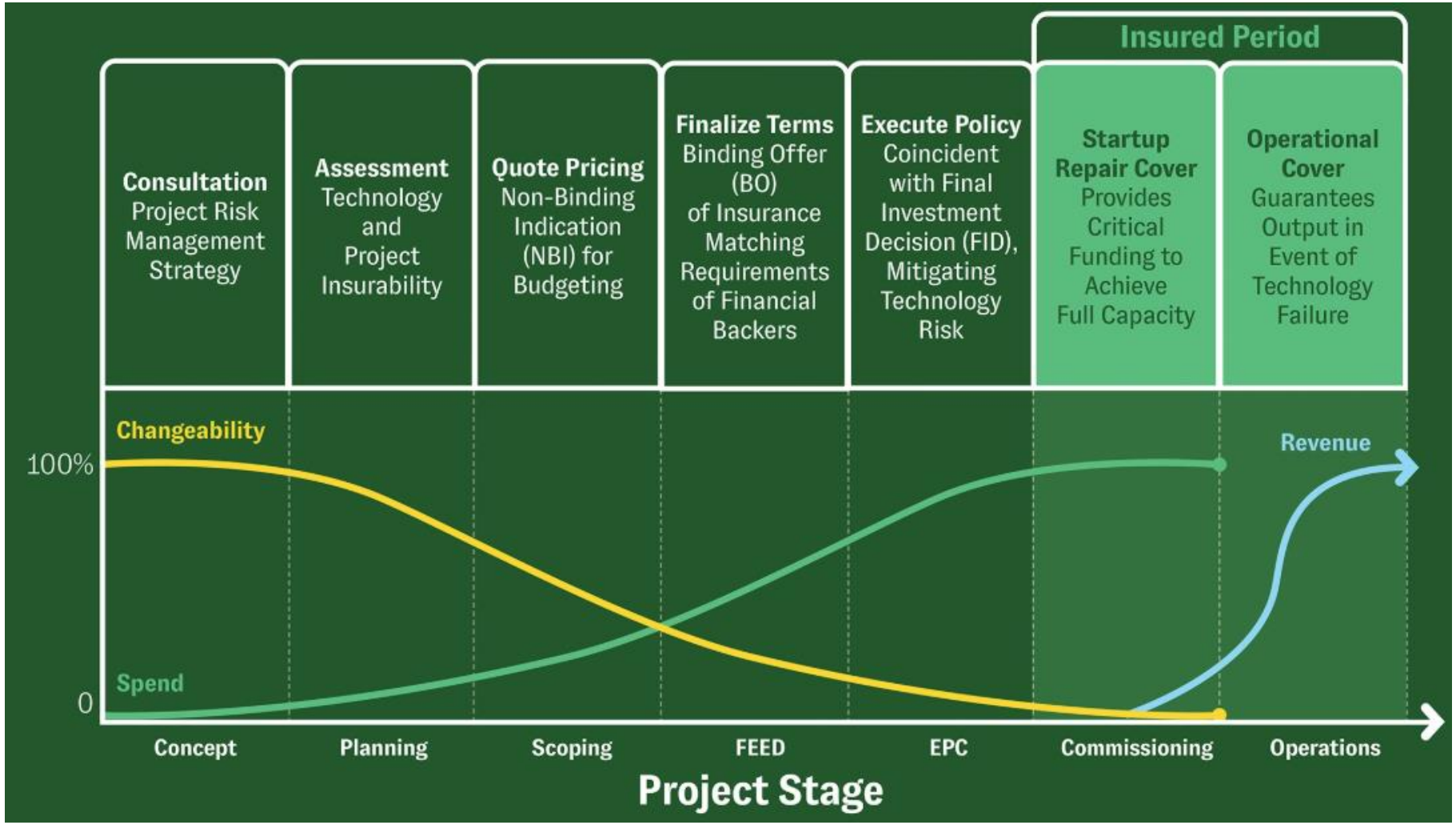


GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green

Support at Every Stage of Project Development



GreenBridgeLLC
Bridging cleantech to the real world

Source: Sharma & Dritz — Beyond the Liability Cap: Technology Performance Insurance for Cleantech FOAK Projects

Ariel Green



GreenBridgeLLC

Bridging cleantech to the real world

Poornima Sharma
President & Founder
poornimasharma@greenbridgellc.com



Ariel Green

Tad Dritz
Biocoversion & Hydrogen Lead
Tad.Dritz@arielgreen.com