

— DECISION BRIEFING • DB1 —

Ocean Innovation: *Where to Look?*

Your R&D team has probably piloted an ocean-derived input. It likely stalled before procurement ever reviewed it. The World Economic Forum surveyed 850 ocean startups and found the same pattern: piloting isn't the barrier. Procurement pipelines are. This brief identifies which ocean inputs have passed that gate, why standard investment approaches guarantee they never will, and what companies locking in supply access right now are doing differently.

— EXECUTIVE SUMMARY

Key Findings

The ocean covers 70% of the planet and holds some of the most commercially valuable biological and energetic resources on Earth. Most of it remains underutilized — not because the opportunity is unclear, but because the path from ocean-derived input to manufacturing line keeps breaking at the same three points.

OCEAN ECONOMY VALUE ADDED \$1.3T → \$2.6T OECD, 2025 The ocean economy doubled over 25 years (1995–2020)	SDG 14 FUNDING GAP \$175B/yr JOHANSEN & VESTVIK, 2020 Annual investment required to meet ocean sustainability goals through 2030	OCEAN ECONOMY EMPLOYMENT 150M+ UNCTAD, 2022 People directly employed by the ocean economy globally	MARINE NBS FINANCE SHARE 9% UNEP, 2022 Share of total nature-based solution finance directed to marine in 2022
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- 01

Chemistry is no longer the bottleneck.

The WEF survey of 850+ ocean startups points to procurement, not lab performance, as the scale barrier. Pilots convert when procurement is involved before approval.
- 02

Not all ocean segments are investable today, and the difference is structural.

Certified sustainable seafood, near-shore aquaculture in optimal geographies, and specialty marine ingredients currently meet the bar. Cultivated seafood, open-ocean bioactives, and deep-sea extraction do not.
- 03

Corporate capital is aimed at the wrong outcome.

CPG investments in ocean funds have been structured primarily around ESG goals, not to build supply chain capacity. A Joint Development Agreement (JDA) is a more effective structure when the objective is commercial sourcing.

— SECTION 01

Who should own ocean innovation within your organization?

Ocean innovation initiatives are more likely to reach a product when the right internal stakeholders are involved from the start. A more effective approach brings C-suite leadership together with procurement, sustainability, and product development to evaluate the opportunity jointly.

A COMMON PATTERN TODAY

Siloed investment

- Nestlé Purina and IKEA invested in Ocean 14 Capital toward ESG goals, not necessarily to bolster a differentiated supply chain
- When ocean innovation sits only within sustainability, procurement teams often do not see a direct benefit and the initiative may not reach a product decision
- Without C-suite ownership and cross-functional alignment, budget allocation for ocean innovation rarely advances to execution

THE MORE EFFECTIVE MODEL

Integrated ownership

- C-suite, procurement, sustainability, and product development share ownership of the initiative from the outset
- The investment case spans multiple departments: a unique supply input, measurable ESG progress, and a product or packaging differentiator
- Ocean risk is treated as a financial and supply chain exposure, not only a sustainability narrative, which is what puts it on the executive agenda

"Corporates often still treat the ocean primarily as an ESG or compliance issue, something addressed through campaigns, reporting, or visible sustainability initiatives. But that misses the deeper question: how should companies allocate capital and resources in ways that reduce ocean-related risks and create value across their supply chains?"

Martin Koehring

HEAD OF THE CENTRE FOR PRIVATE FINANCE IN DEVELOPMENT, ODI GLOBAL

— SECTION 02

Investability follows proximity to shore

The diagnostic question is whether a segment has reached a self-sustaining capital cycle without subsidies or policy support. The answer tracks with distance from shore.

SEGMENT	ZONE	STATUS	RATIONALE
Certified sustainable wild-catch seafood	Near-shore	ACT NOW	Established capital cycle, certification infrastructure in place
Conventional marine finfish aquaculture	Near-shore	ACT NOW	Most investable near-term segment. Cascadia Seaweed is the current North American model
Seaweed specialty ingredients	Near-shore	ACT NOW	Corporate-grade returns with ESG optionality. The right investment case for large product companies
Alternative feeds & shellfish	Near/mid-shore	TRACK CLOSELY	Viable but some segments still early stage
Marine-derived packaging films	Near-shore	TRACK CLOSELY	Targeting specific system failures. Consideration 1 (system compatibility) applies
Lab-grown / cultivated seafood	Land-based	WAIT	Consumer acceptance outside Singapore and Israel is unresolved. Monitor in 2026
Deep-sea mining and extraction	Open ocean	AVOID	ESG exposure, litigation risk, and a global moratorium coalition make this highly challenging

"Certified sustainable wild-caught seafood and conventional marine finfish aquaculture in optimal geographies are some of the most investable today. Alternative feeds, seaweed ingredients, and shellfish are viable, though some are still early stage. Cultivated seafood and anything in the open ocean are further out."

Mark J. Spalding

PRESIDENT, THE OCEAN FOUNDATION

— SECTION 03

Where ocean innovation stalls

Three considerations worth examining before committing budget to an ocean innovation initiative. Each reflects a pattern that has consistently delayed or derailed promising projects — not at the science stage, but when moving from pilot to procurement.

01

SYSTEM COMPATIBILITY

System compatibility

Marine-derived films add material complexity without reducing it. Recyclability depends on the entire waste system, not just the new input. Evaluate the post-consumer collection path and sorting infrastructure in target markets prior to pilot approval.

EXAMPLE EXPOSED SEGMENT

CPG packaging teams evaluating marine-derived film alternatives

"Sorting is impossible. A lot of things become very challenging without more technology, more expense. You have a piece of film in your hand: how do you tell if it's marine-based or plastic? The whole system needs to work, not just the new input."

Mark J. Spalding

PRESIDENT, THE OCEAN FOUNDATION

02

CAPEX THRESHOLDS

Supplier scale gap

A 10-ton plant and a 100-ton plant are separated by a CapEx threshold most ocean startups cannot clear alone. Corporate investment can bridge that gap and offers the benefit of influencing product design, securing preferred supply access, and establishing early exclusivity. A JDA is one structure worth exploring.

EXAMPLE EXPOSED SEGMENT

F&B teams sourcing aquaculture inputs without a structured JDA

"The big company says, I will pay to build your 10-ton plant on the way to scaling up to the 100-ton plant, because none of these companies can get the CapEx for the 10-ton plant."

Adam de Sola Pool

INDEPENDENT INVESTOR IN OCEAN TECHNOLOGY

— SECTION 03 — CONTINUED

Consideration 03: Procurement pipeline failure

The most common and the least visible failure pattern. The technology clears R&D review, then disappears into the procurement pipeline — often without the team that approved the pilot ever knowing.

03

PIPELINE FAILURE — MOST CRITICAL

Procurement pipeline failure

The technology clears R&D review, then stalls in procurement, often invisibly to the team that approved the pilot. Sourcing rights, qualification requirements, and chain-of-custody gaps kill projects that looked viable on paper. Involve procurement leads during the R&D stage, creating a compliance and vendor-setup pre-approval framework before the pilot is greenlighted.

EXAMPLE EXPOSED SEGMENT

All sectors running ocean pilots without a procurement readiness review

"Piloting is really not the biggest barrier anymore, but rather procurement pipelines in these big companies are."

Ronald Tardiff

OCEAN INNOVATION LEAD, WORLD ECONOMIC FORUM

— SECTION 04

A new framework for ocean resource access

The Biodiversity Beyond National Jurisdiction (BBNJ) Agreement introduced the first binding international rules governing access to marine genetic resources. Experts suggest it may offer companies a clearer compliance path, though the practical impact depends on how implementation unfolds.

PRE-2026

THE GREY ERA

No rules, no pipeline

- No international framework for marine genetic resource (MGR) access
- Legal grey areas blocked multi-year ingredient pipelines
- Biopiracy exposure with no compliance path to de-risk investment

JANUARY 2026

THE CATALYST

BBNJ Agreement in force

- First binding rules on who accesses MGRs and on what terms
- Notification and benefit-sharing system activated via Clearing-House
- For companies developing products from MGRs, the agreement may offer greater predictability around access and use of those resources

2026 ONWARD

THE SCALE
PHASE

Certainty as infrastructure

- Major players (China, Chile, Belgium) competing for leadership positions
- Strong secretariat model providing long-term enforcement clarity
- Ocean-derived inputs may become more attractive to investors if a functioning compliance pathway takes shape over time

"The BBNJ Treaty is a great addition to our policy framework because it gives policy certainty. If you have a strong secretariat, they will set that regulatory certainty for the BBNJ. If you have a weak secretariat, it will keep floundering around and not get the certainty that everyone who would like to use the open ocean needs."

Adam de Sola Pool

INDEPENDENT INVESTOR IN OCEAN TECHNOLOGY

"Greater clarity around access, benefit-sharing and provenance can help reduce uncertainty for companies using marine genetic resources, but this remains an evolving regulatory area and should not be treated as fully settled."

Martin KoehringHEAD OF THE CENTRE FOR PRIVATE FINANCE IN
DEVELOPMENT, ODI GLOBAL

SECTION 05

Act now / track closely / wait / avoid

Each segment below has been assessed against the Three Considerations. Act Now segments have passed all three. Sector tags indicate primary commercial relevance.

● ACT NOW CPG SEAWEED SPECIALTY INGREDIENTS Fucoidan, cosmetic actives, salmon skin collagen. These deliver corporate-grade returns with ESG optionality — the right investment case for a large product company, not a fund. 92% COMMERCIAL VIABILITY	● ACT NOW F&B SEAWEED IN ANIMAL FEED Seaweed in cattle feed reduces methane output by approximately 90%. Ocean Rainforest already supplies European farmers. Cash-flow positive in coming years. 88% COMMERCIAL VIABILITY	● ACT NOW F&B NEAR-SHORE CERTIFIED AQUACULTURE Conventional marine finfish aquaculture in optimal geographies. Cascadia Seaweed in British Columbia is the current model for industrial scale in North America. 85% COMMERCIAL VIABILITY
● TRACK CLOSELY CPG MARINE-DERIVED PACKAGING FILMS Notpla, Sway, and Kelpi are targeting specific system failures: PFAS-free barrier layers, recyclability gaps. Consideration 1 (system compatibility) applies. Evaluate against your specific packaging infrastructure. 65% TECHNICAL FEASIBILITY	● WAIT F&B LAB-GROWN SEAFOOD Approved in Singapore and Israel. Consumer acceptance outside those markets is unresolved. Narrative momentum significantly exceeds commercial evidence. Monitor but do not commit resources in 2026. 40% MARKET ACCEPTANCE	● AVOID NR DEEP-SEA MINING AND EXTRACTION Expert verdict: "I wouldn't touch it with a 100-meter barge pole." A global moratorium coalition is active. ESG exposure, litigation risk, and governance uncertainty make this highly challenging for companies with public ESG commitments. 12% ESG READINESS SCALE
<i>"My universal advice to startups is to avoid entirely trying to develop pilots directly with large companies. The process with those companies will kill those companies. We see much better reception and much faster timelines with mid-cap companies, family businesses, regional scaled companies."</i> Ronald Tardiff OCEAN INNOVATION LEAD, WORLD ECONOMIC FORUM		

— BOTTOM LINE

What to do now

THE BOTTOM LINE

Ocean innovation is ready. *Procurement is not.*

The Three Considerations are not theoretical risks. They are active failure patterns in current pipelines at large product companies. Build a procurement readiness structure before the next pilot is greenlighted. Map the ocean-derived inputs already sitting in your cost structure. The companies that close the procurement gap first will set the sourcing terms for everyone that follows.

IMMEDIATE ACTION

Map ocean-derived inputs already in your cost structure across R&D, packaging, and food ingredients. Most companies cannot answer this question from their own procurement data. Closing that gap is a low-cost, high-value preparatory step.

THIS YEAR

Build one JDA with a named ocean supplier in an Act Now segment. That structure becomes the template for every sourcing relationship that follows. Exclusivity windows are closing.

CONTRIBUTORS

Authors & contributing experts

DECISION BRIEF AUTHORS

Daniel Morales, PhD Technical Director CPG Leads consumer packaged goods practice. PhD in Chemical Engineering from NC State University. Has led over 100 projects spanning innovation strategy, product development, sustainability, and technology trends across the CPG industry.	Garreth Wheaton, PhD Senior PA F&B and CPG PhD in Chemical and Biomolecular Engineering from NC State University. Specializes in packaging innovation and sustainability across food and beverage and consumer goods verticals.	Gareth Armanious, PhD Technical Director F&B Built and leads the F&B team. Expertise spans food, beverage, and life sciences, rooted in a research background in membrane protein biochemistry and prior coordination roles in oncology research.	Christian Salles Technical Director NR&E Technical Director for Energy Strategy with over 20 years of experience managing complex assets. Expert in secondary recovery implementation, infrastructure debottlenecking, and industrial project de-risking globally.
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CONTRIBUTING EXPERTS

Martin Koehring

Head of the Centre for Private Finance in Development, ODI Global

Martin Koehring is Head of the Centre for Private Finance in Development at ODI Global, a think tank focused on sustainable development policy and finance. He previously led blue finance work at UNEP FI and spent several years at The Economist Group heading the World Ocean Initiative, where he co-led the World Ocean Summit. His work sits at the intersection of financial materiality and ocean governance.

Mark J. Spalding

President, The Ocean Foundation

Mark J. Spalding is President of The Ocean Foundation, where he has led the organization for over 20 years. The Foundation operates across 40 countries on six continents. Spalding advises approximately 14 private equity firms at various stages of capital maturity and leads proprietary work on corporate KPI frameworks and blue economy taxonomy for institutional investment clients.

Adam de Sola Pool

Independent Investor in Ocean Technology

Adam de Sola Pool is a Cambridge, Massachusetts-based investor in ocean technology. He built and led what became the largest wind and solar developer in Central Europe, exiting the business for more than 2 billion euros. He has since focused on ocean tech investing, mentoring startups through MIT and Harvard, and backing companies including Ocean Rainforest.

Ronald Tardiff

Ocean Innovation Lead, World Economic Forum

Ronald Tardiff is based in Geneva at the World Economic Forum, where he leads all ocean innovation work and serves as executive for 1000 Ocean Startups, a coalition of 67 member organizations supporting over 850 ocean impact companies worldwide. His work covers broad blue economy strategy and specific innovation areas including pollution remediation and nature-positive transitions for corporates.
