

MIDYEAR TECH CHECK: WHAT'S RISING AND FALLING IN 2025



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AGENDA

1 | **Key themes driving innovation in 2025**

2 | What technologies are rising and falling in 2025?

3 | Outlook: Planning for uncertainty



Anti-ESG policy

A large container ship is shown from a low angle, sailing on the water. The ship's hull is dark grey, and its upper decks are filled with stacks of colorful shipping containers in shades of green, blue, and red. The ship is moving towards the right, leaving a wake in the water. The background features a calm sea and a distant shoreline under a warm, orange-hued sky, suggesting a sunset or sunrise.

①

**Anti-ESG
policy**

②

**Tariffs
and trade**



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DeepThink (R1)



Search

①

**Anti-ESG
policy**

②

**Tariffs
and trade**

③

**AI and
agents**

AGENDA

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1

**Ask the
analysts**

2

**Analyze
the data**

TECHNOLOGY: BLUE CARBON

Ocean-based CO₂ removal that either extracts CO₂ directly or improves the ocean's ability to absorb CO₂.

- Direct ocean capture (DOC) is the most promising blue carbon technology.
- Potential for lower removal costs compared with other engineered solutions when co-located with desalination.
- Clear rise in Lux's Tech Signal from 17 in 2021 to 50 in 2024, due to dramatic increases in patents and funding.

LUX TAKE

You should be engaged with blue carbon startups, either to explore partnerships and invest in companies or to understand where DOC fits into offset strategies.

Key Event: Project Midway



 **CarbonBlue**

TECHNOLOGY: SOLID-STATE TRANSFORMERS (SSTs)

SSTs use semiconductor devices, rather than conventional coil-based designs, to regulate power.

- SSTs enable greater control over power flows, natively supporting bidirectional power flows, and provide grid-forming capabilities.
- They can provide grid-forming capabilities to maintain frequency and voltage amid power fluctuations.
- Multiport designs can manage power between many devices, including both AC and DC.

LUX TAKE

Utilities should pilot SSTs immediately if concerned over the supply of conventional transformers; others should monitor the data center market for validation of durability and performance claims.

Key Event:
Heron Power's Series A

USD 38M



C>PRICORN
INVESTMENT GROUP



TECHNOLOGY: SYNTHETIC BIOLOGY

Chemical production via the manipulation of genetic material for use in biological or cell-free systems.

- Billions of dollars raised but little progress; plagued by high development costs, lack of scale-up infrastructure, regulatory roadblocks, and weak market demand.
- Supply chain vulnerability has emerged as a key driver for investment and innovation; may not equate to progress.
- Startups focused on bioprocess or infrastructure optimization are well positioned to gain traction.

LUX TAKE

Be realistic about near-term opportunities for synbio while investing or partnering with stakeholders critical for future technology deployment.

Key Event: Formation of AAB

“The launch of the American Alliance for Biomanufacturing is a bold step toward securing **America's leadership in the next industrial revolution.**”

Leticia Gonçalves
President
IFF Health & Biosciences



TECHNOLOGY: MATERIALS INFORMATICS

Using AI to accelerate development of chemicals and materials.

- MI has rapidly matured, attracting both startups and large corporations; steady growth in new MI initiatives.
- MI still faces data challenges related to quantity and quality; need for improved data generation, integration, and management.
- The performance of MI tools is not often questioned but rather their usability and integration into daily workflows.

LUX TAKE

Companies without internal MI initiatives should recognize that MI adoption is accelerating and should **invest in building MI capabilities through partnerships.**

Key Event: Orbital Materials & Substrate AI



substrate**AI**

TECHNOLOGY: FUNCTIONAL HEALTH INGREDIENTS

Bioactive ingredients that impact metabolic, cognitive, digestive, and immune health.

- Companies target growth through diversification aligned to enhancing health and avoiding harm.
- Claims are not clear-cut, and Poppi must update gut health claims following a California class action lawsuit.
- Acquisitions since November 2024 near USD 3 billion, and investments reach USD 1.4 billion in H1 2025.

LUX TAKE

Evaluate early stage innovators and identify product diversification targets, but focus on products that connect health to function, given the knowledge that additives are at regulatory inflection points.

Key Event:

Poppi acquired for USD 1.95 B

prebiotics

apple cider vinegar

5g sugar or less

35 calories or less



PEPSICO

poppi™



1

Ask the
analysts

2

Analyze
the data

THE LUX RUBRIC PRIORITIZES TECH

Innovation Prowess

Inherent potential
of the technology



NOVELTY



**SUSTAINABILITY
PROMISE**



**DISRUPTION
POTENTIAL**

Market Momentum

External signals
of progress



LUX CLIENT INTEREST



INNOVATION ACTIVITY

Lux Innovation Radar




The technologies that will change the world, according to Lux Research's analysts and data scientists.

[Download List as PDF](#)
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Overview

With thousands of emerging technologies and countless startups, deciding which innovations to pay attention to can be a daunting task. At Lux, we select innovations, based on a proprietary methodology called the Lux Rubric, which we believe will not only have the greatest business value impact but will also help you achieve your corporate sustainability goals. This Lux Technology Innovation Radar provides a list of the top technologies that our analysts are actively tracking — and that innovation leaders should be following to stay ahead of the curve.

The Lux Innovation Radar

Rank	Title	Innovation Prowess ¹	Market Momentum ²	Urgency ³
1	Synthetic Biology  Technologies to create new biological organisms, enzymes, and synthetic systems with valuable capabilities for various applications. RECENT RESEARCH: Researchers propose a novel molecular design approach using large language models	4	5	 Assess
2	Biofertilizers  Agricultural inputs that contain living microorganisms, which, when applied to seeds, plant	4	5	

THE LUX TECH SIGNAL

The Lux Tech Signal is based on our analysis of innovation data, including:

Patents

Academic papers

VC funding

Government funding

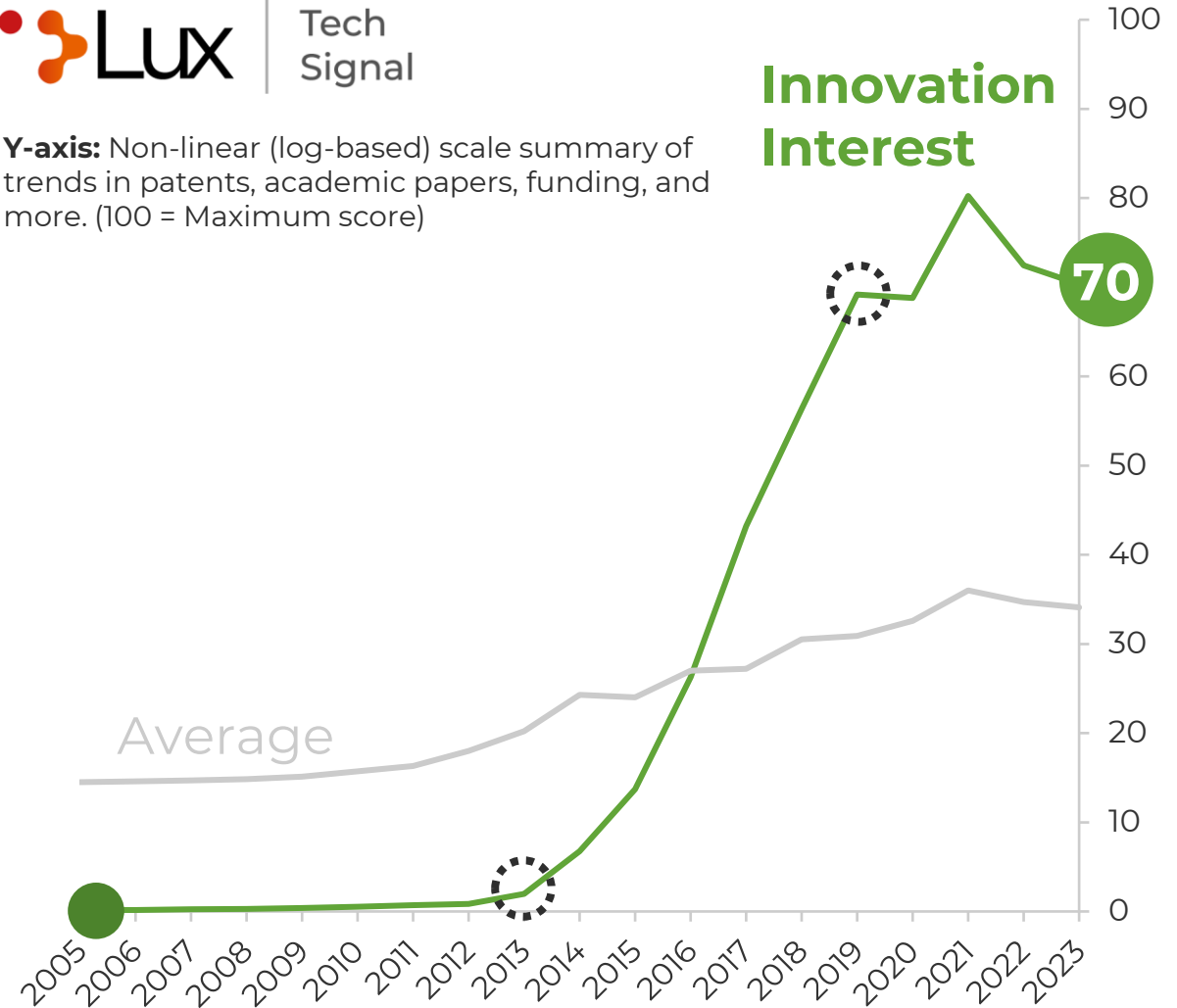
Lux proprietary data



Tech
Signal

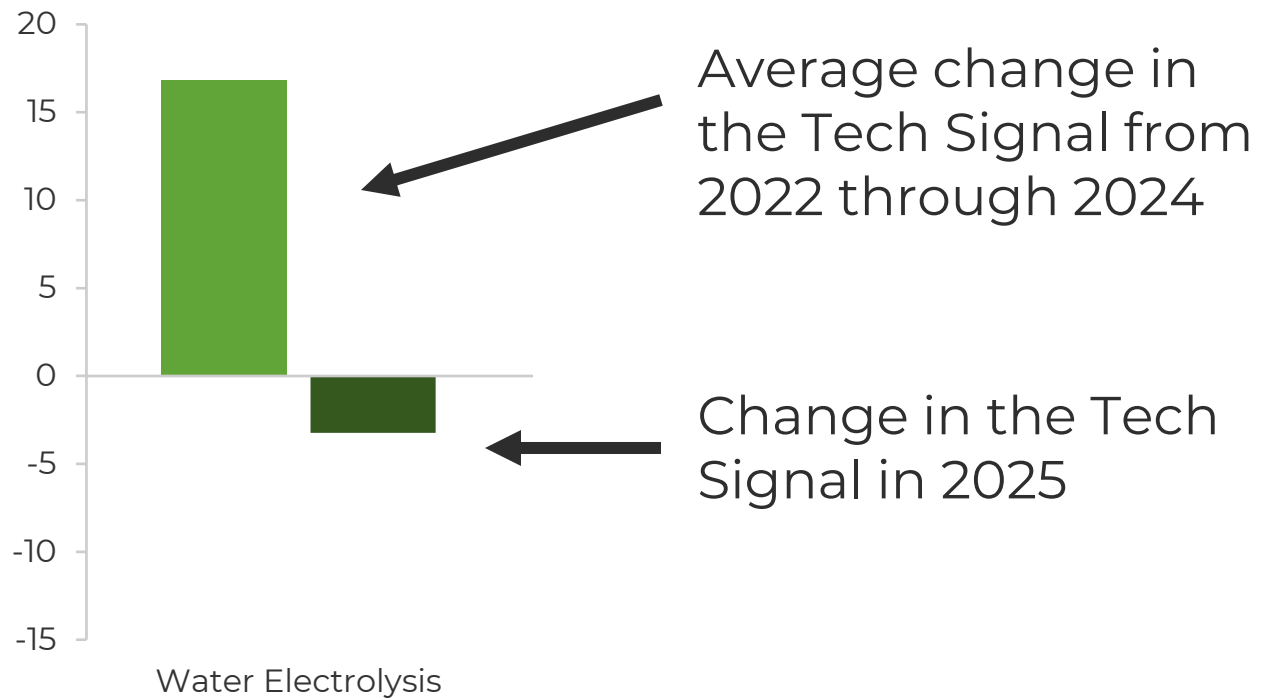
Y-axis: Non-linear (log-based) scale summary of trends in patents, academic papers, funding, and more. (100 = Maximum score)

**Innovation
Interest**



WHAT'S RISING AND FALLING?

Average Change in the Tech Signal



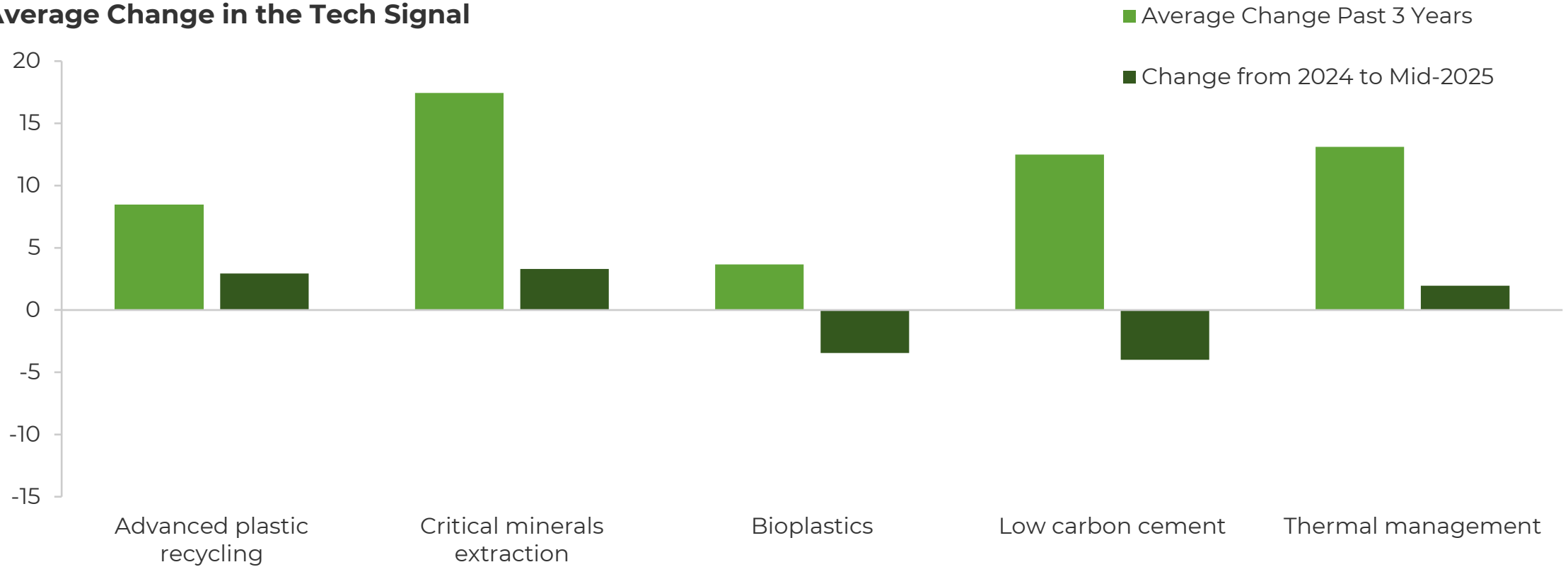
ENERGY

Average Change in the Tech Signal



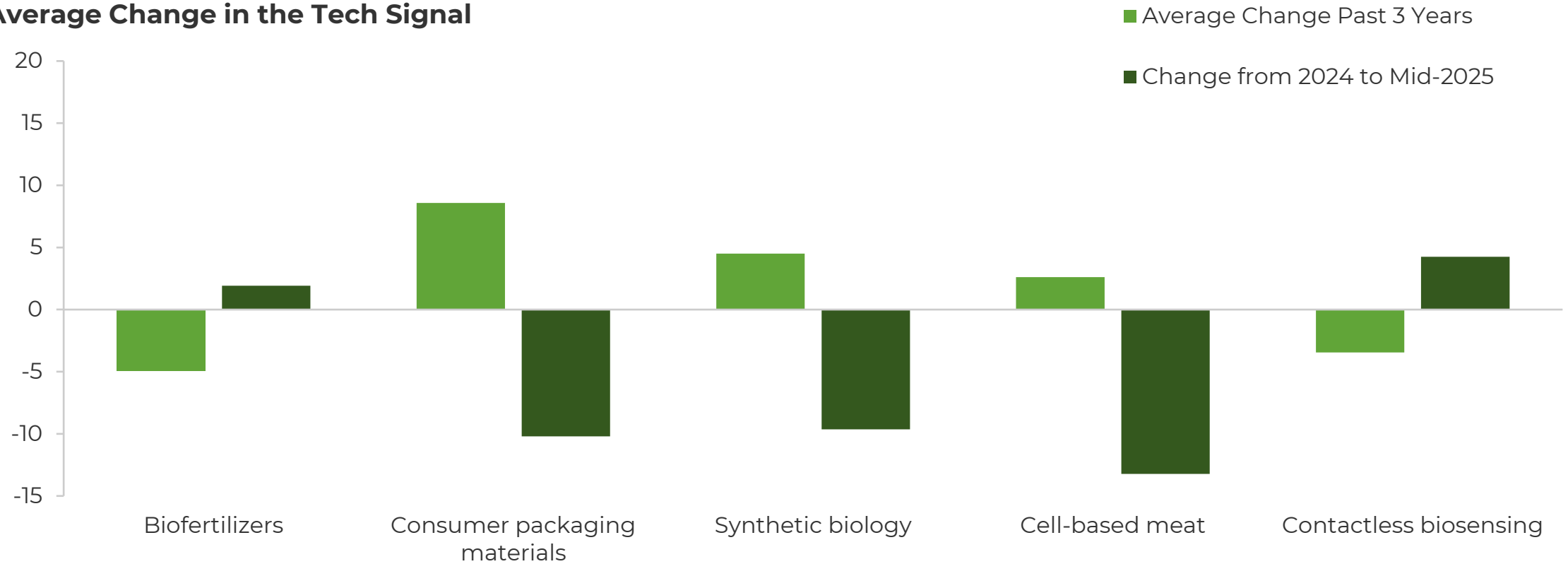
MANUFACTURING

Average Change in the Tech Signal



CONSUMER

Average Change in the Tech Signal



AGENDA

1

Key themes driving innovation in 2025

2

What technologies are rising and falling in 2025?

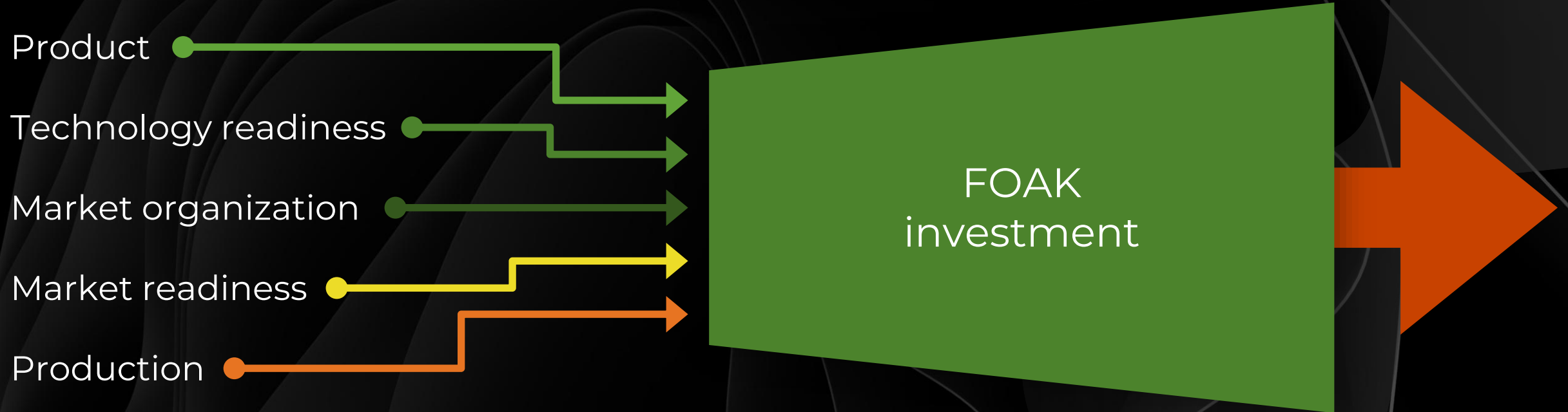
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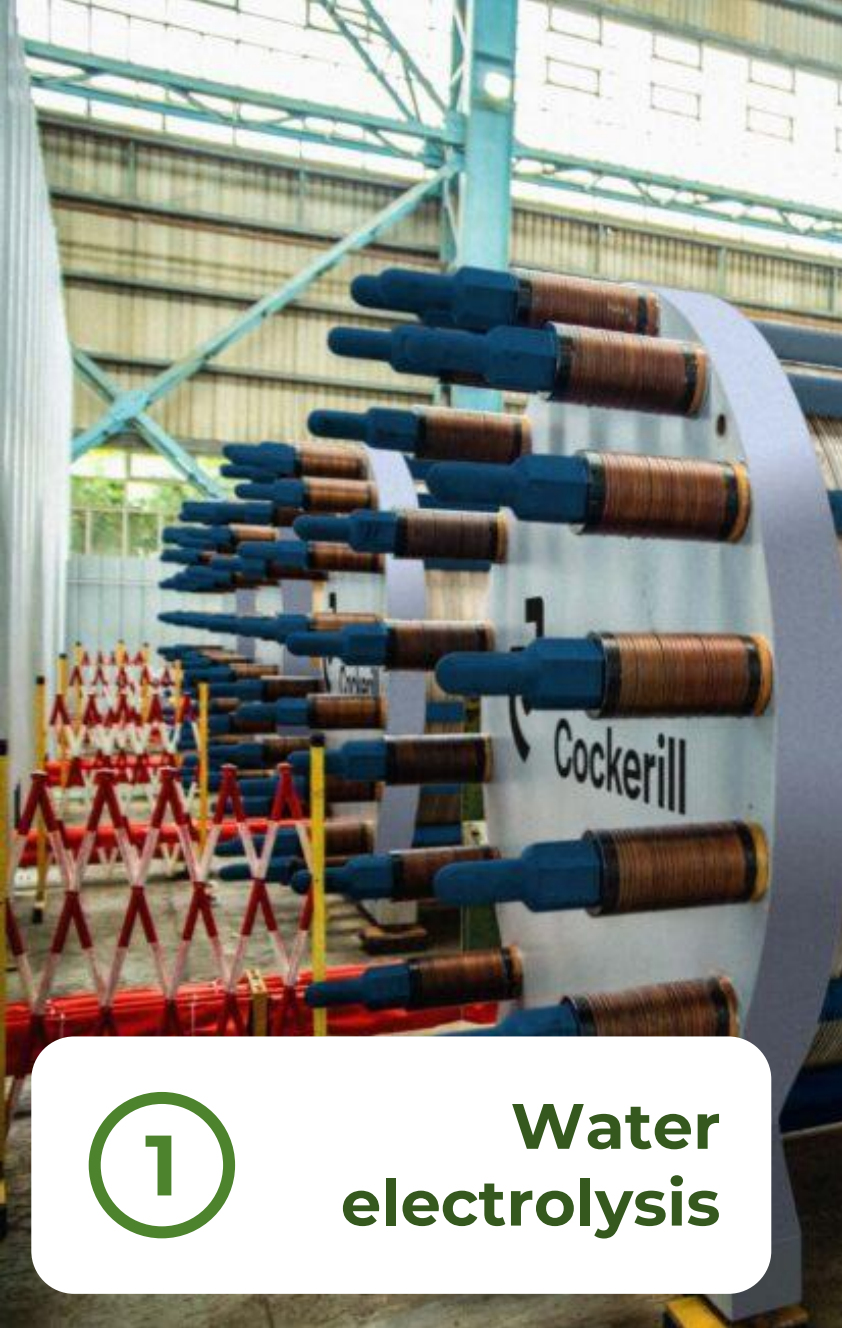
Outlook: Planning for uncertainty

MORE THAN TECHNOLOGY

Lux Research's innovation maturity indicator looks at five aspects that must converge to allow the first-of-a-kind (FOAK) investment decision.

TRL is just one of them.





①

**Water
electrolysis**



②

**Plastic
recycling**



③

**Cell-based
meat**

KEY TAKEAWAYS

1

We are in the middle of a tech ecosystem pivot.

Changing policy, increased economic constraints, and a renewed focus on supply chains mean that many of the technologies that saw strong growth in innovation interest over the past three years are now beginning to slow down.

2

Resilience and optimization are the new innovation drivers.

New pressures — like rising demand for data centers or new regulatory regimes driving consumer ingredients — are shaping demand for innovation.

3

Technology momentum is just one part of the story.

Technology deployment depends on five critical factors that must converge.

Mapping innovation interest is just one part of the technology roadmap.



THANK YOU



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Lux Research fuels innovators to not only imagine what's possible in the future but also operationalize innovation success in the near term. We deliver research and advisory services to inspire, illuminate, and ignite innovative thinking that reshapes and grows businesses. Using quality data derived from primary research, fact-based analysis, and opinions that challenge traditional thinking, our experts focus on finding truly disruptive innovations that are also realistic and make good business sense.



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