

Building the Biobased Future of the Chemicals Industry



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The
Deciding
Factor

“ ”

Due to raw material extraction, long supply chains and energy-intensive production, the fashion industry is responsible for 2% to 8% of global carbon emissions.

United Nations



BRANDS PRESSURING SUPPLIERS

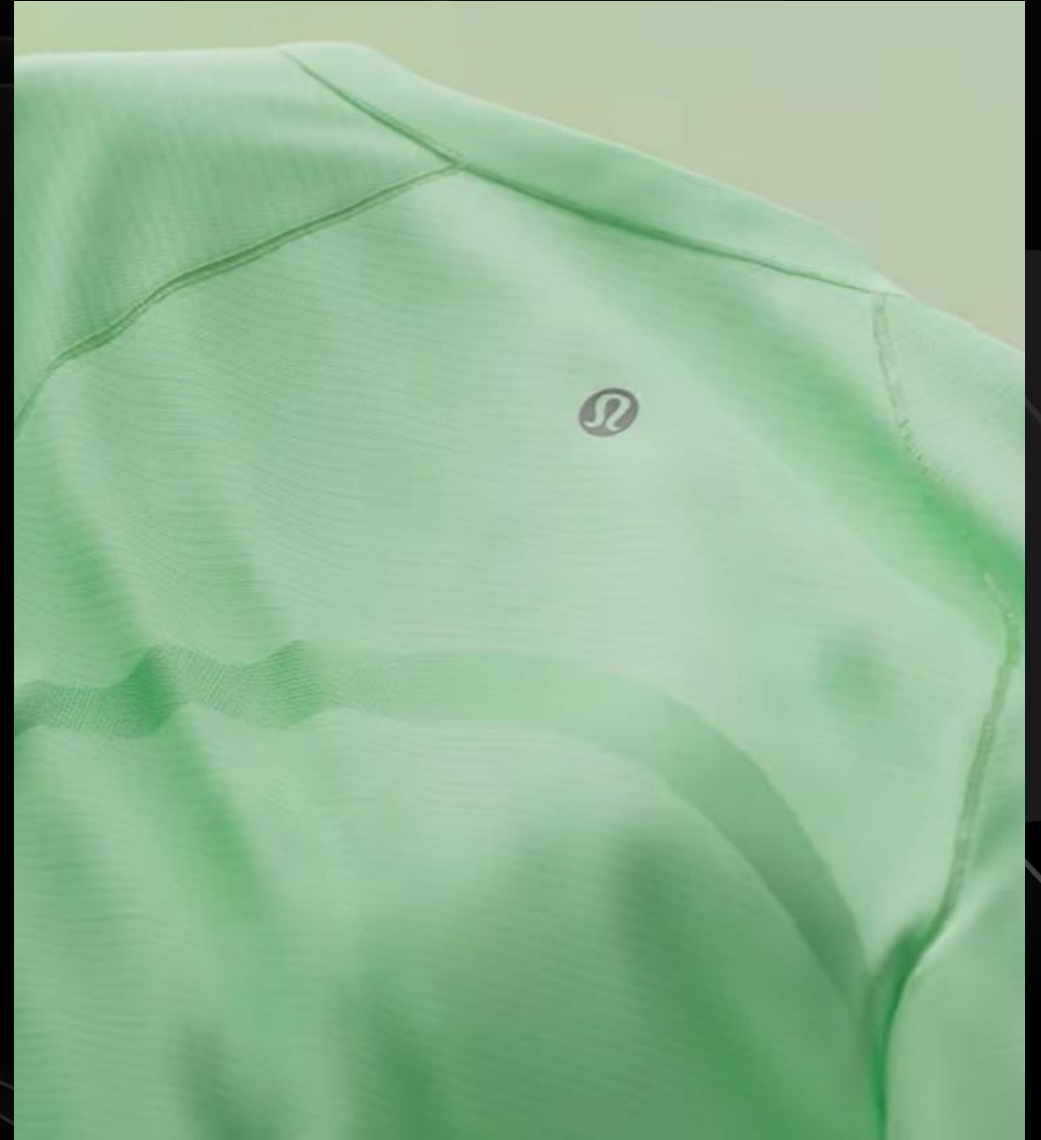
patagonia[®]

 **lululemon**



 **PANGAIA**

LULULEMON AND GENO



BIOBASED CHEMICALS

World's biggest spandex maker is going biobased

Hyosung is planning a \$1 billion fermentation facility to make the spandex precursor 1,4-butanediol

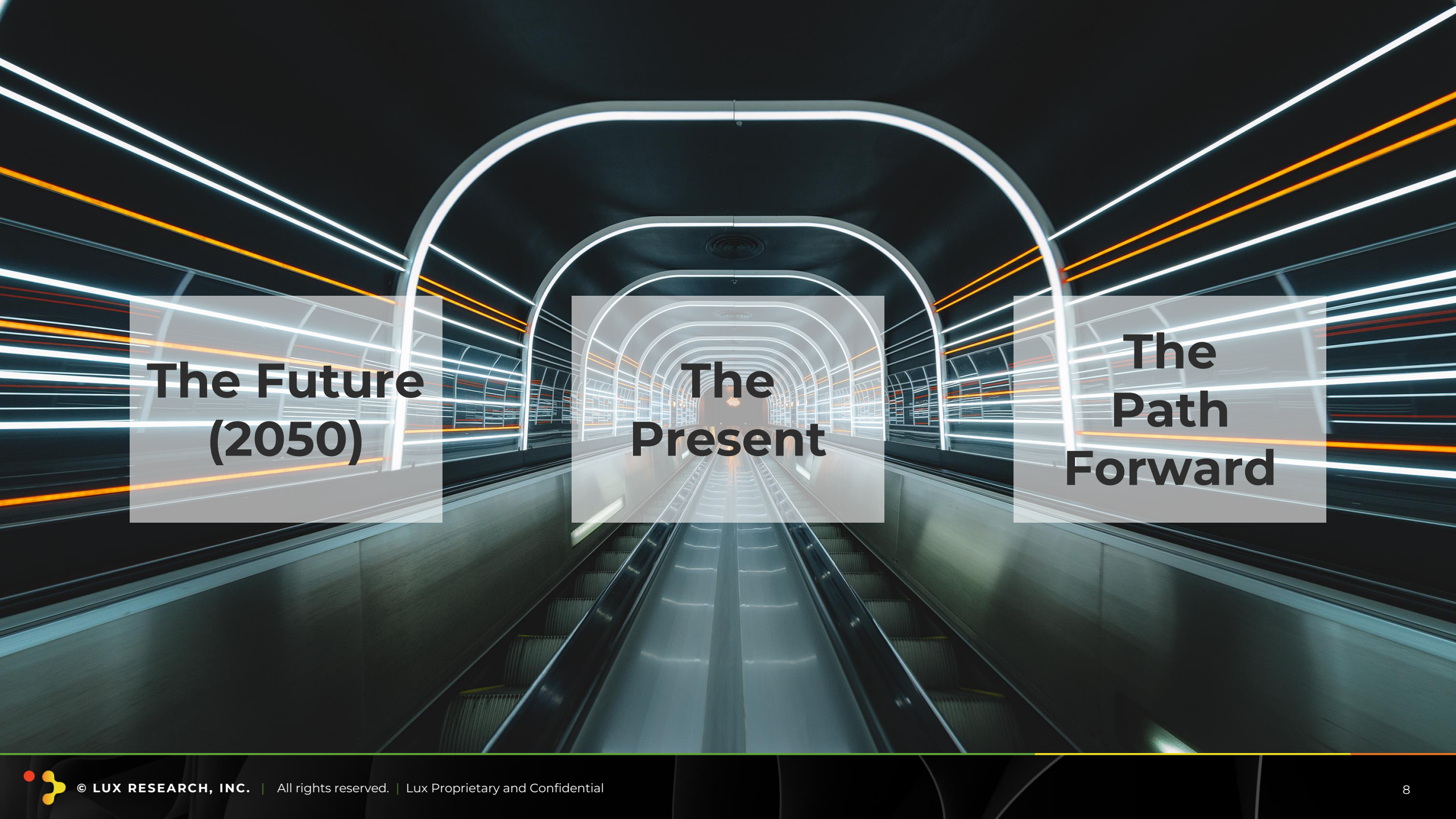
by **Matt Blois**

April 2, 2024

c&en
CHEMICAL & ENGINEERING NEWS



COULD THE FUTURE OF THE CHEMICALS INDUSTRY BE BIOBASED?



**The Future
(2050)**

**The
Present**

**The
Path
Forward**



Come with me to 2050









HARVARD
UNIVERSITY



BOSTON
UNIVERSITY

FOSSIL BASED



LARGE SCALE



UNINSPIRED



RENEWABLE



LARGE SCALE



UNINSPIRED



RENEWABLE



RIGHT SIZED



UNINSPIRED



RENEWABLE



RIGHT SIZED



INSPIRED





**Biomanufacturing *has* unlocked a
new future for the chemicals
industry.**

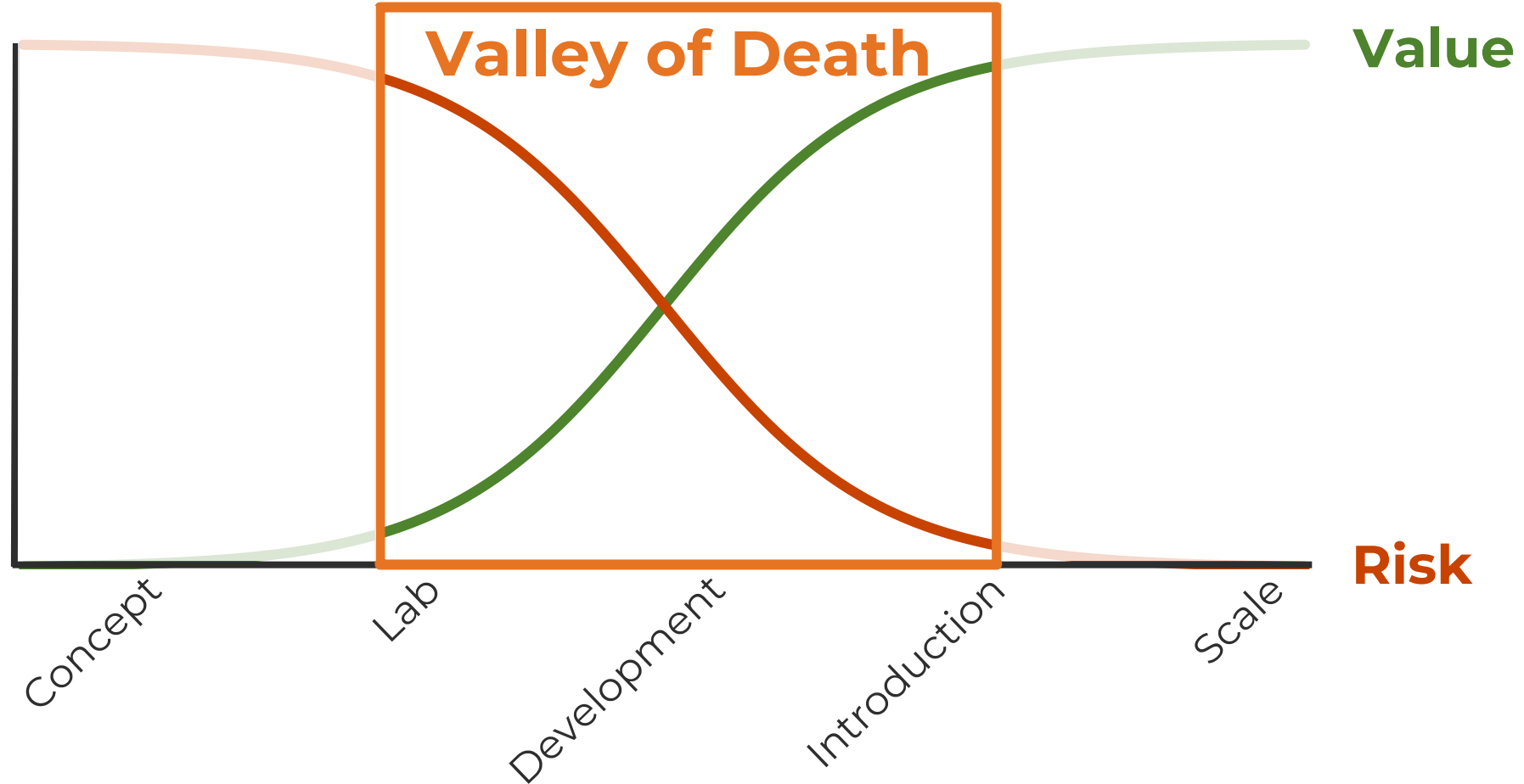


Back to today

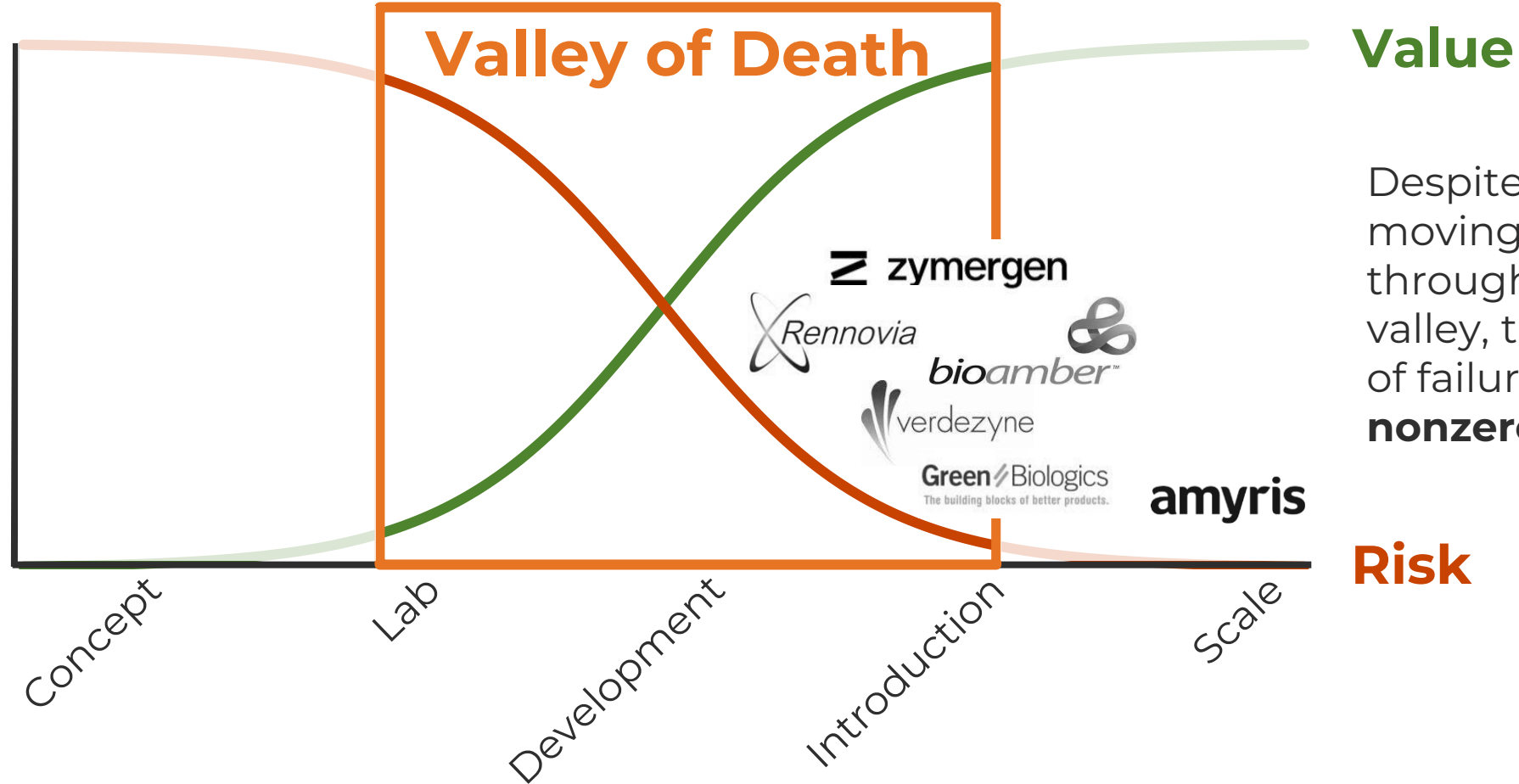


**Biomanufacturing *has yet* to unlock
a new future for the chemicals
industry.**

SCALE VALLEY OF DEATH

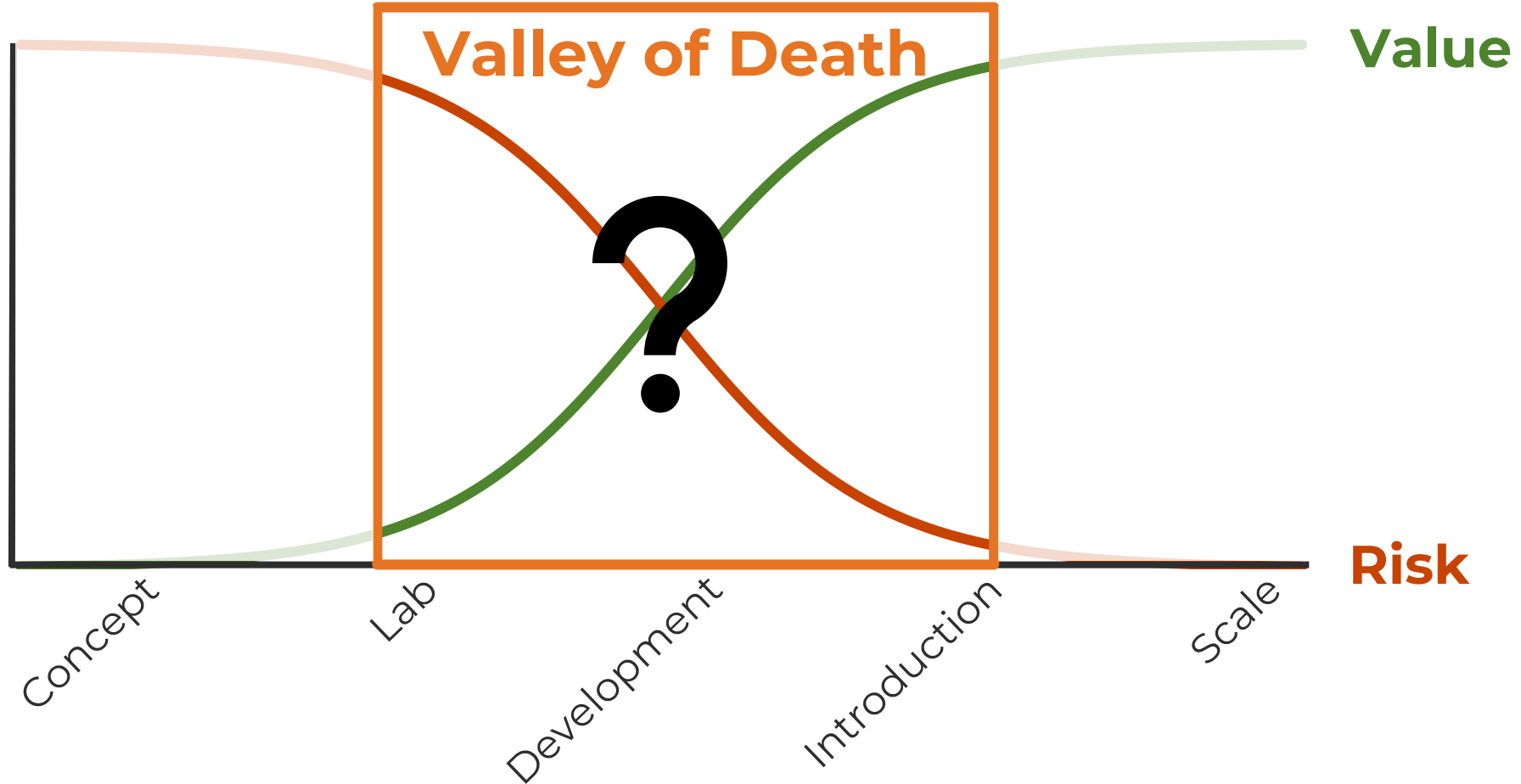


BIOBASED AS A BUSINESS



Despite moving through the valley, the risk of failure is still **nonzero**.

BUT WHY?



LOW CRUDE OIL PRICES



WEAK POLICY INCENTIVES



IMPATIENT INVESTORS



LEARNINGS FROM THE PAST

Some of the biobased developers
Lux has interviewed



KEY LESSONS FROM THE PAST

01 Finding near-term opportunities.

02 Application development for novel products.

03 Focus on feedstock inputs.

04 Large players (or large player intervention) needed.

COSMETICS FOR BIO-ISOBUTENE

Global Bioenergies first targeted fuels, but now focuses on bio-isododecane for the cosmetics industry, generating near-term revenue.



KEY LESSONS FROM THE PAST

- 01 Finding near-term opportunities.
- 02 **Application development for novel products.**
- 03 Focus on feedstock inputs.
- 04 Large players (or large player intervention) needed.

PHAS FOR MICROFIBERS

Mango Materials produces polyhydroxybutyrate using methane as a carbon source, initially targeting fibers to replace polyester fibers.

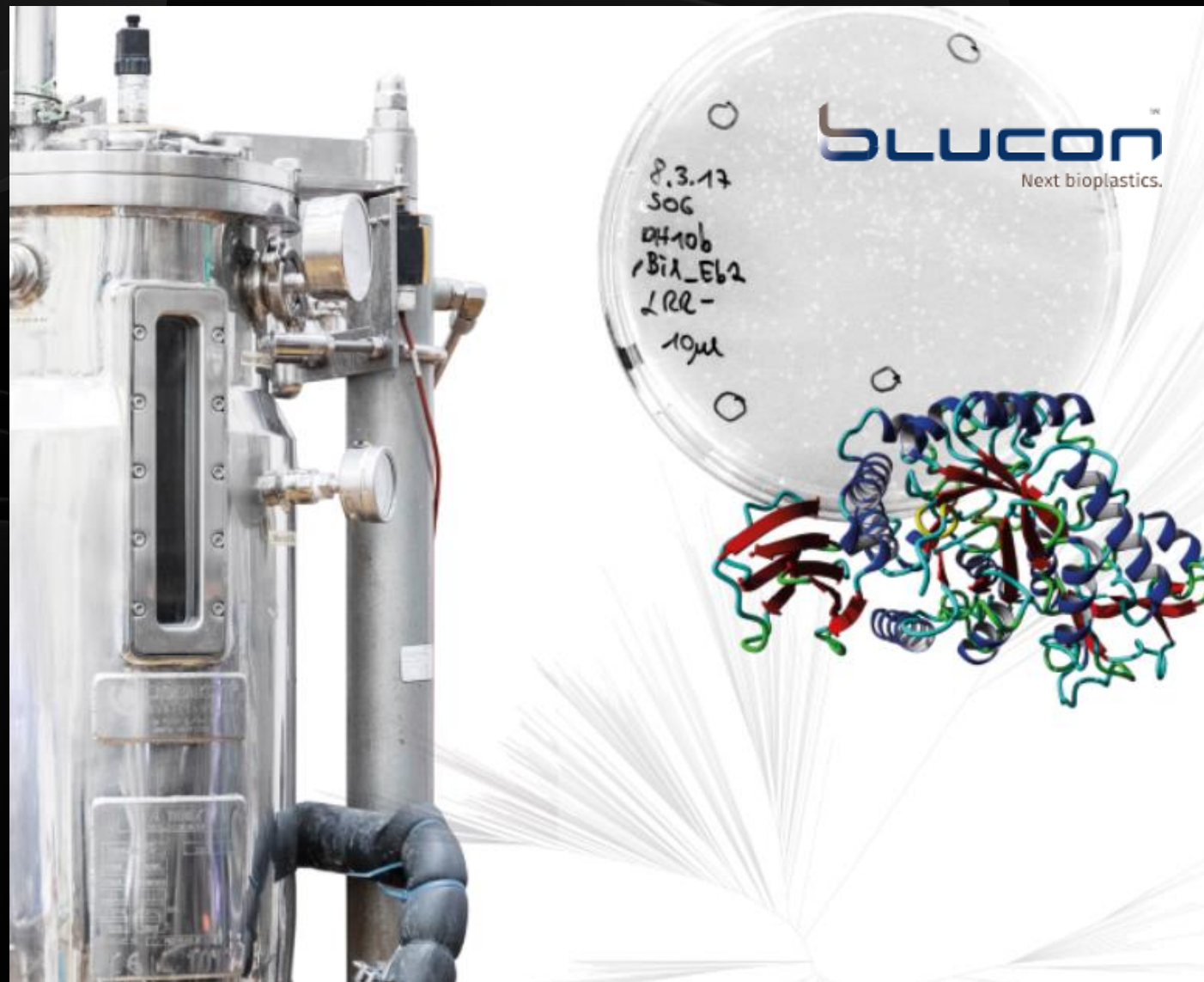


KEY LESSONS FROM THE PAST

- 01 Finding near-term opportunities.
- 02 Application development for novel products.
- 03 **Focus on feedstock inputs.**
- 04 Large players (or large player intervention) needed.

LACTIC ACID FOR PLA

BluCon Biotech uses ag waste feedstock to improve carbon and environmental footprints and lower costs.



KEY LESSONS FROM THE PAST

- 01 Finding near-term opportunities.
- 02 Application development for novel products.
- 03 Focus on feedstock inputs.
- 04 **Large players (or large player intervention) needed.**

A LICENSING APPROACH

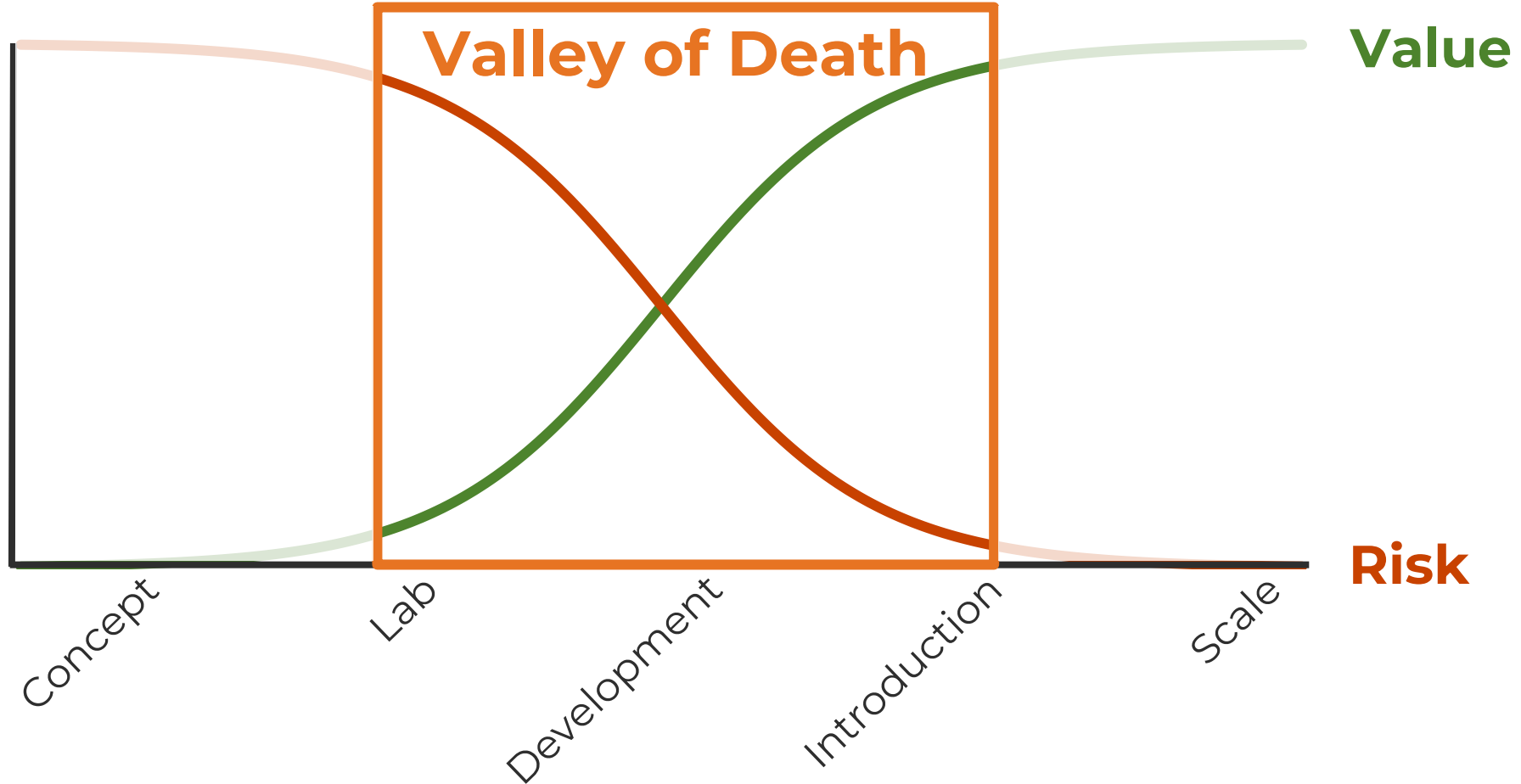
Genomatica has licensed its BDO technology to Qore to build a 65,000-tonne/y production plant.



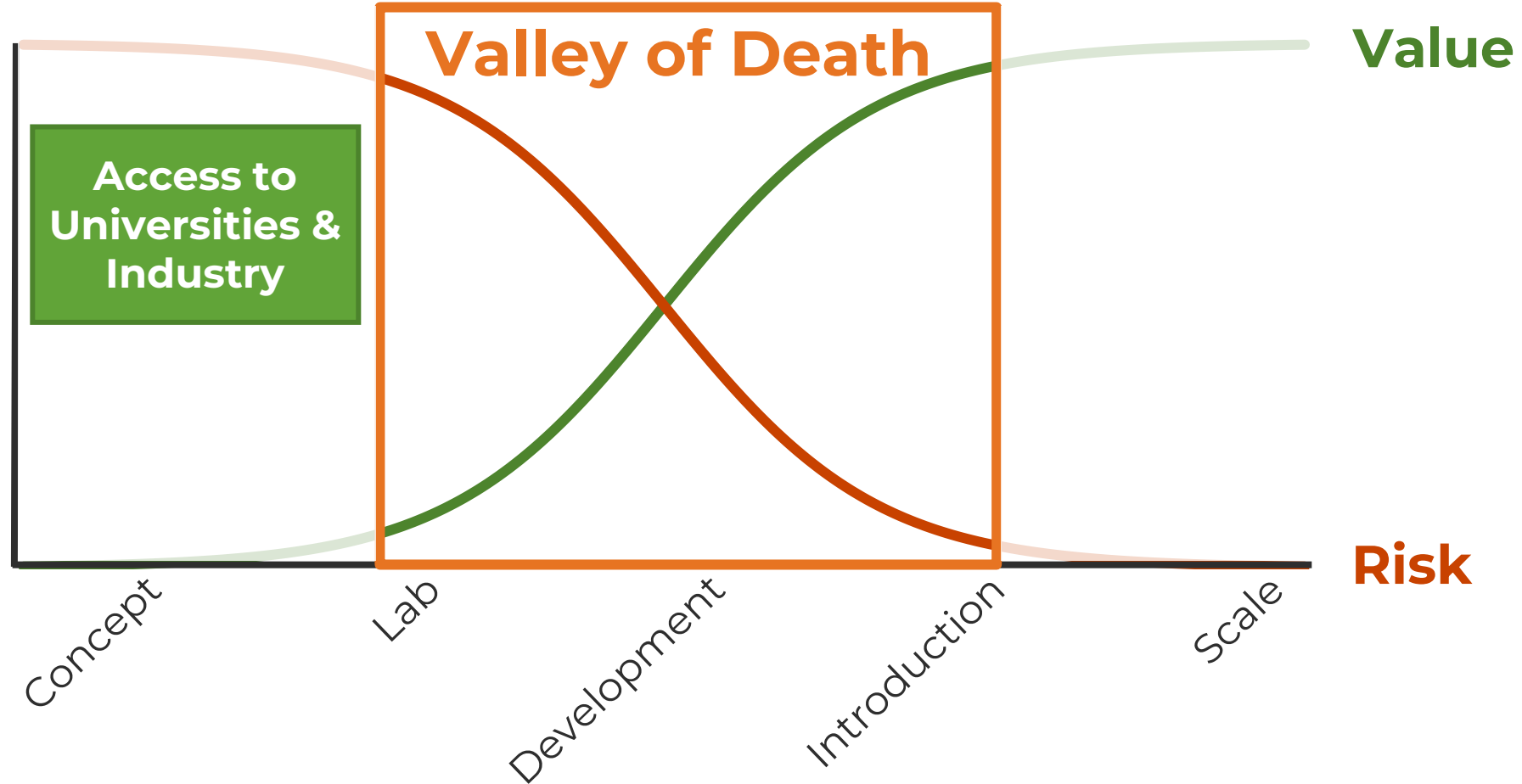


Moving forward

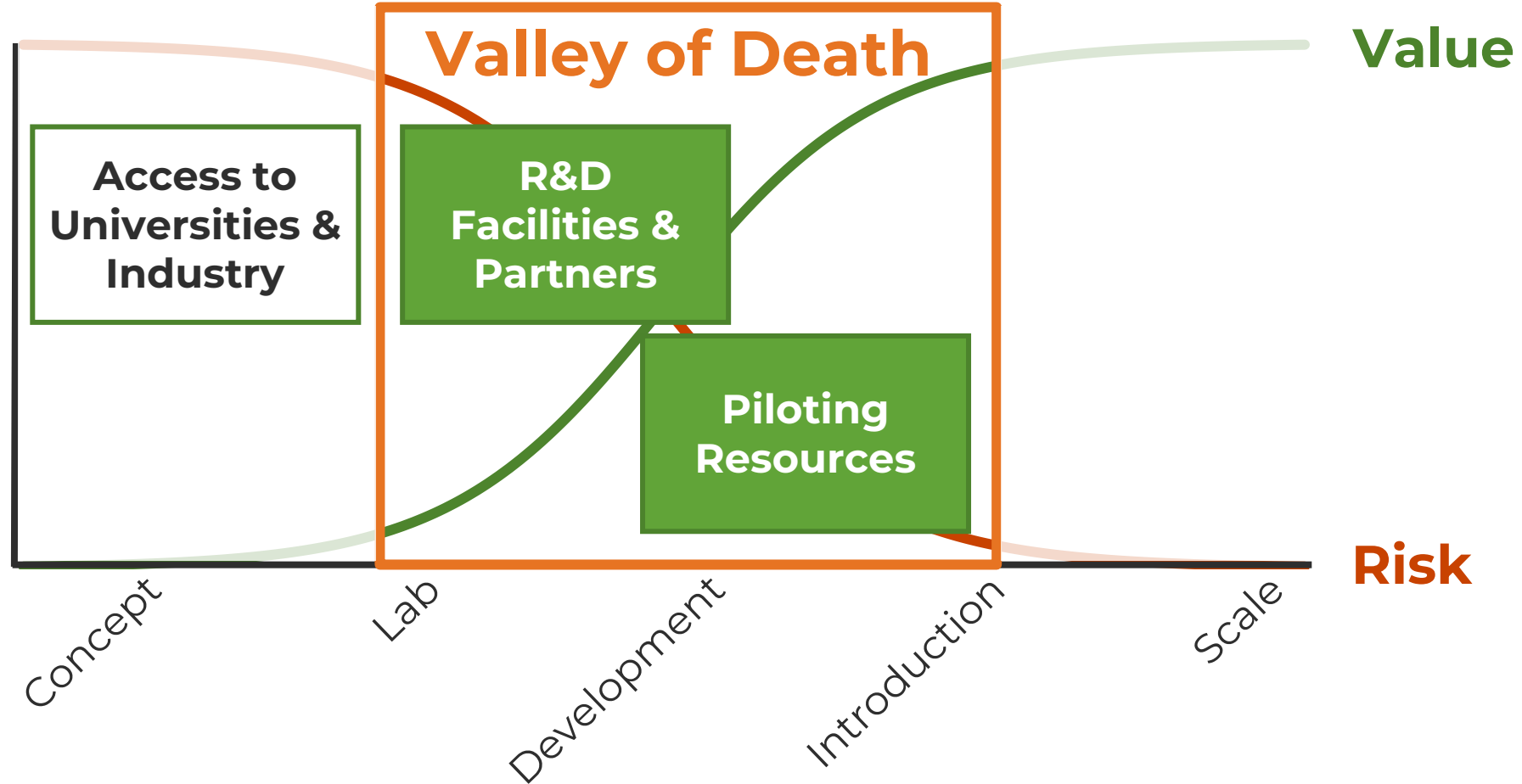
SCALE VALLEY OF DEATH



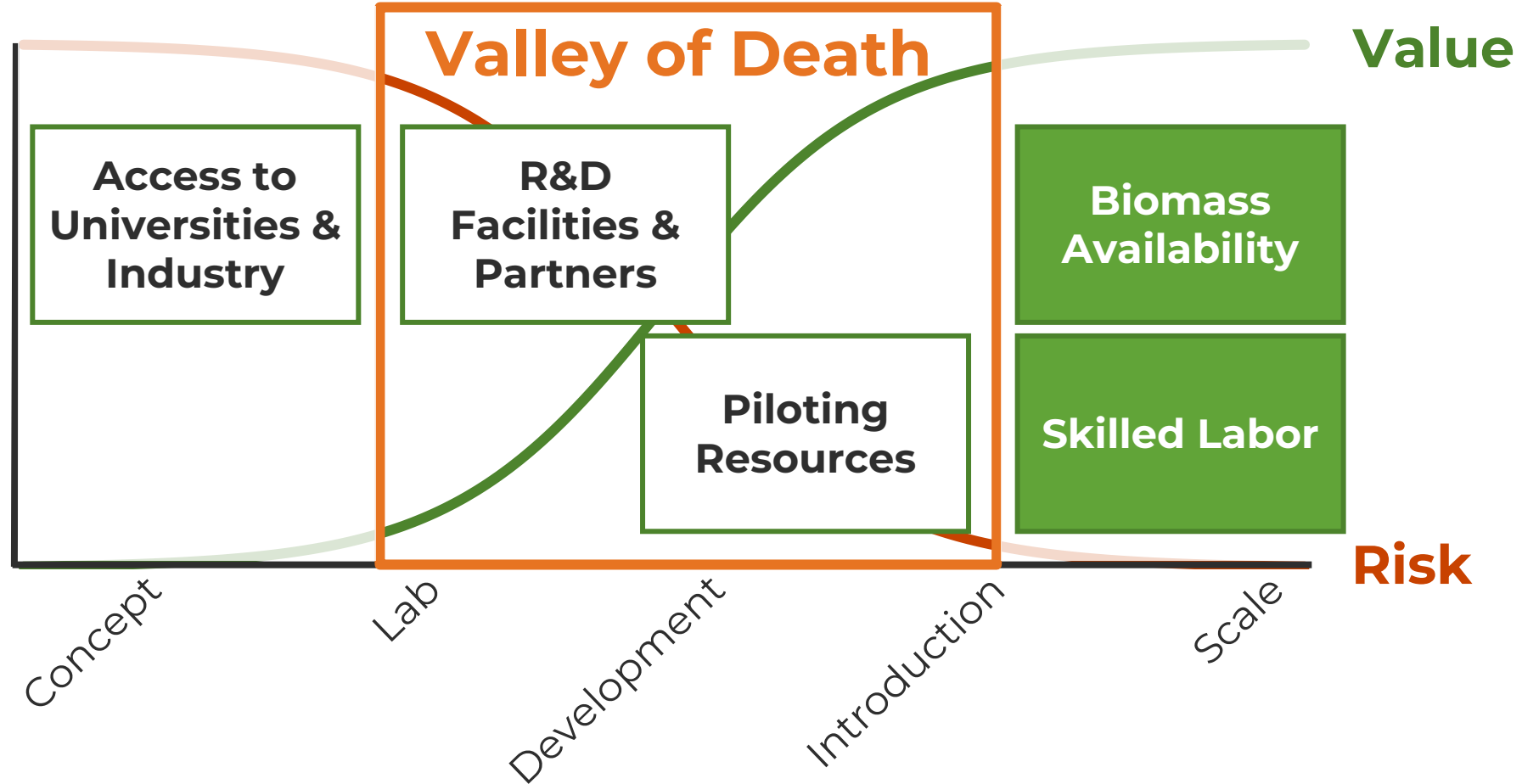
GENERATING IDEAS



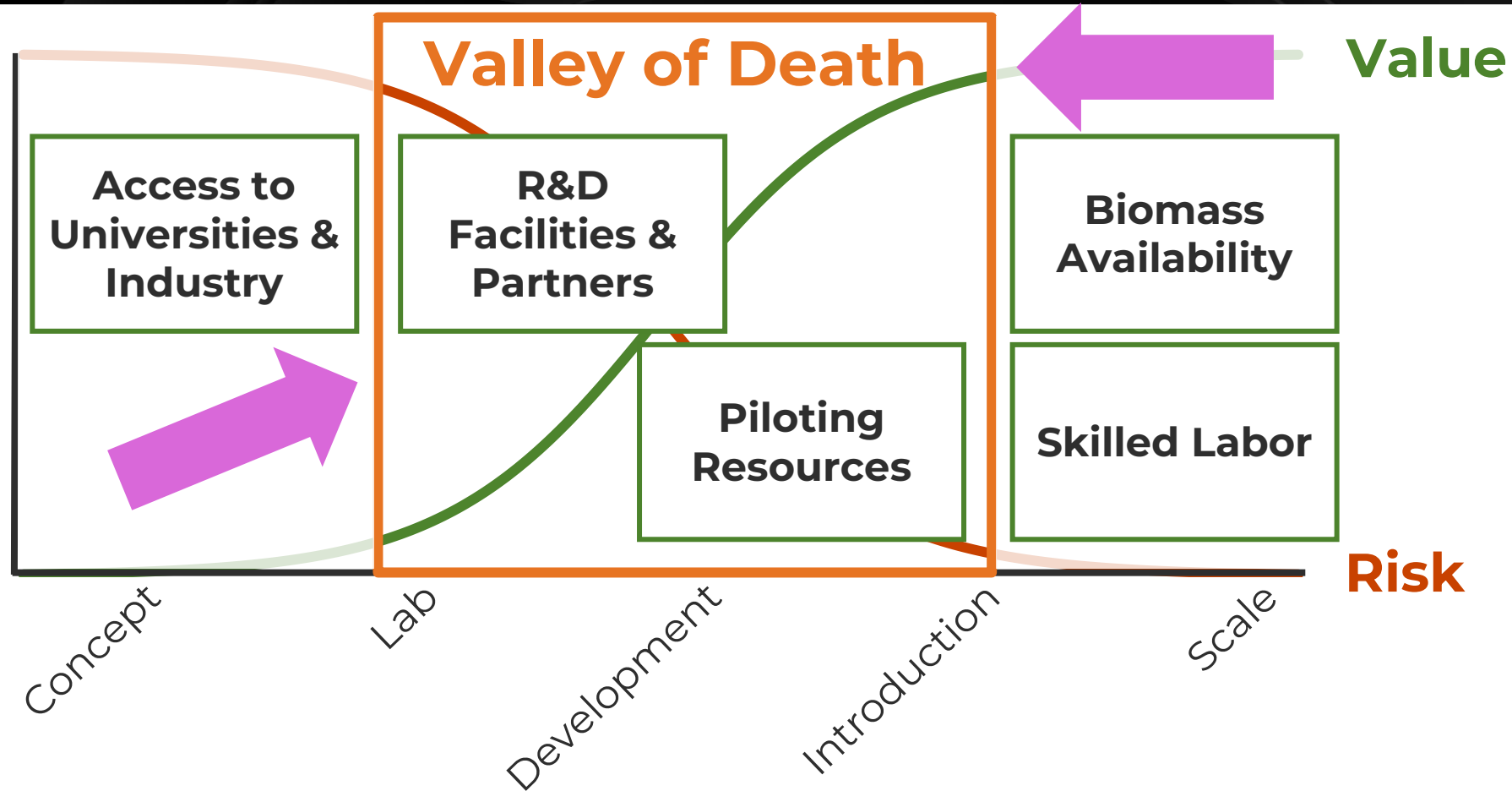
DEVELOPMENT & SCALE-UP



CONTINUED GROWTH



FAILURES COULD BE AVOIDED EARLY



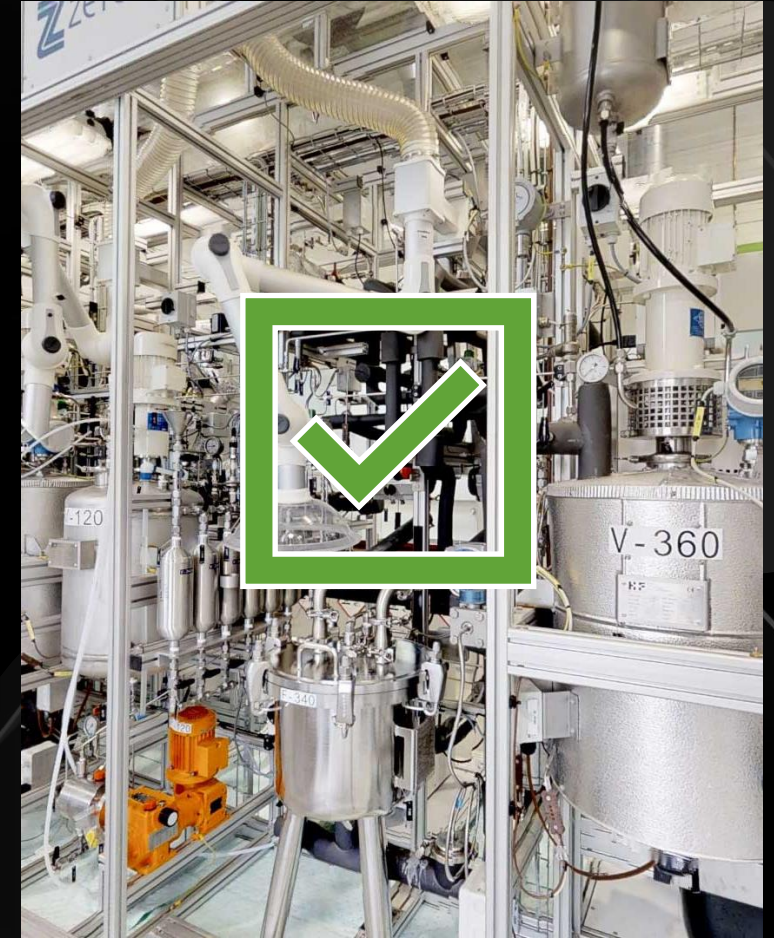
RENEWABLE CARBON



STRONG POLICY INCENTIVES



PUBLIC & PRIVATE FUNDS





KEY TAKEAWAYS

1

Biomanufacturing can unlock new possibilities for how chemicals are produced.

New production routes and materials align with the energy transition and emerging policies on emissions, waste, and materials of concern.

2

Companies need to be strategic about near- and long-term opportunities.

Success has been limited as biobased alone is not enough of a value proposition to drive adoption.

3

Corporations should engage startups early to support better decision making.

Startups with good ideas or technologies can fail because of the wrong go-to-market strategy or a lack of resources to scale.

Thank you

A link of the webinar recording will be emailed within 24–48 hours.

UPCOMING WEBINARS

JUNE 6

Cutting Costs for Cutting Carbon: Low-Cost Pathways for Direct Air Capture

JUNE 27

How to Implement AI in your CPG Innovation Workflow to Maximize Outcomes



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The
Deciding
Factor

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