



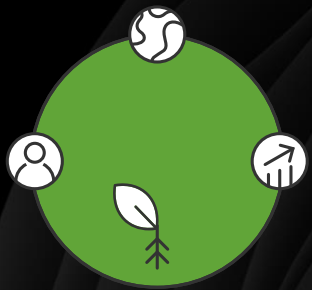
THE NEXT ERA OF CHEMICALS INNOVATION



Yuan-Sheng Yu
Senior Director, Research

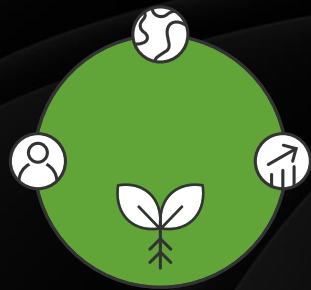
DIALING BACK SUSTAINABILITY GOALS

The Lux Sustainable Organization Transition Model



RESISTING

3%



REALIZING

20%



REACTING

48%



REINVENTING

25%

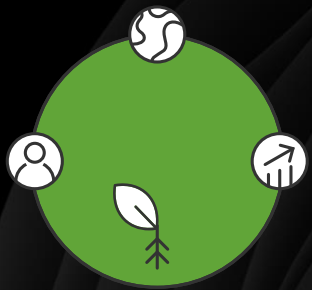


REAPING

4%

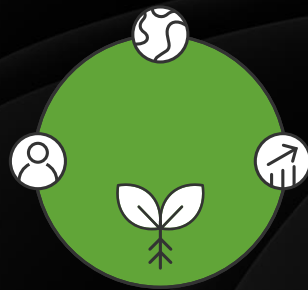
DIALING BACK SUSTAINABILITY GOALS

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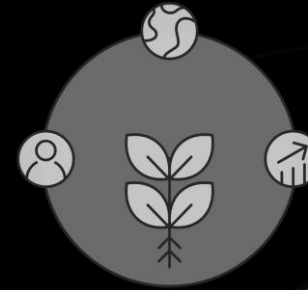
REALIZING

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Getting to the core of the most critical innovation priorities

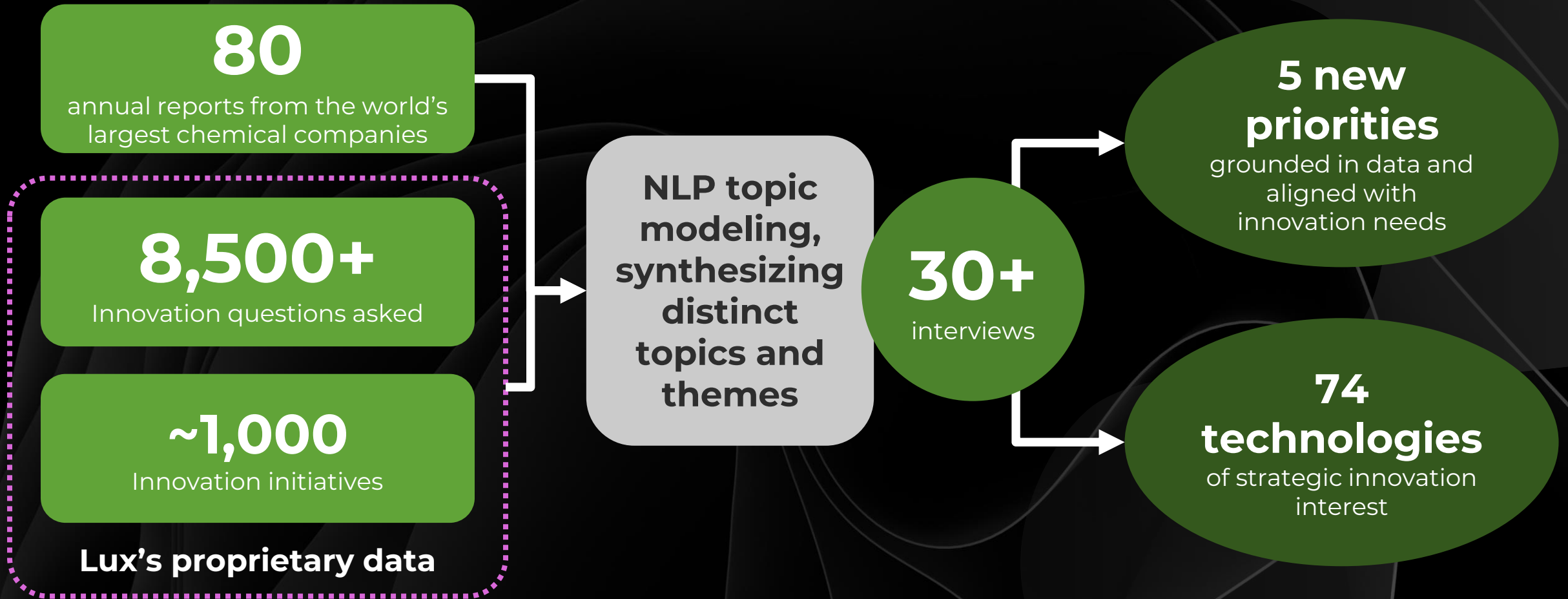
AGENDA

01 | Unbiased, customer-centric methodology

02 | Lux Client Priorities for Chemicals Innovation Leaders

03 | Capitalizing on the next era of chemicals innovation

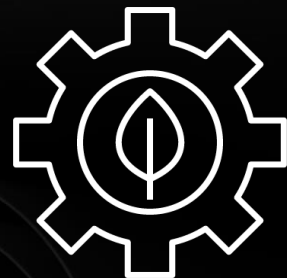
UNBIASED, CUSTOMER-CENTRIC



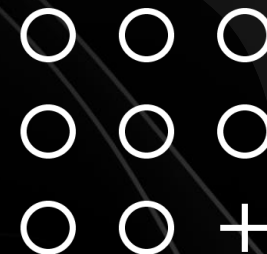
CHEMICALS LUX CLIENT PRIORITIES



Defossilization of Raw Materials



Decarbonization of Operations



Future Materials



Uncovering New Market Opportunities



Harmless Chemicals



Policy and Regulations

CHEMICALS LUX CLIENT PRIORITIES



77%

Defossilization of Raw
Materials



93%

Decarbonization of
Operations



40%

Future Materials



53%

Uncovering New Market
Opportunities



74%

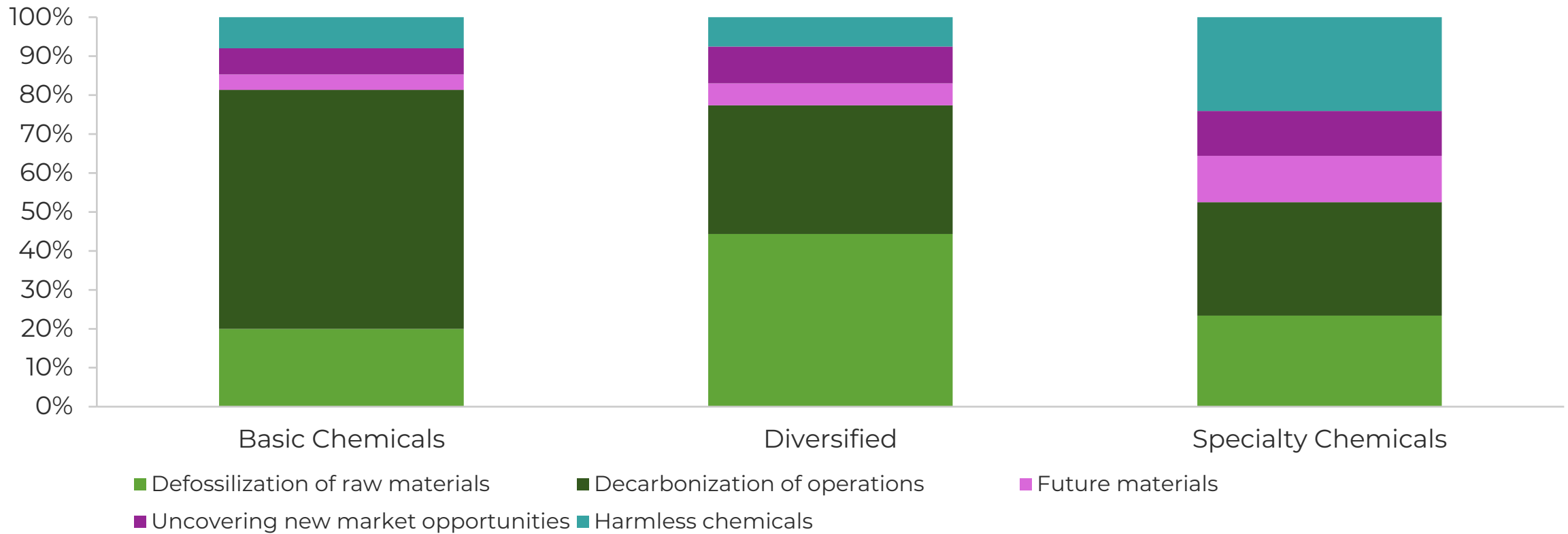
Harmless Chemicals



Policy and Regulations

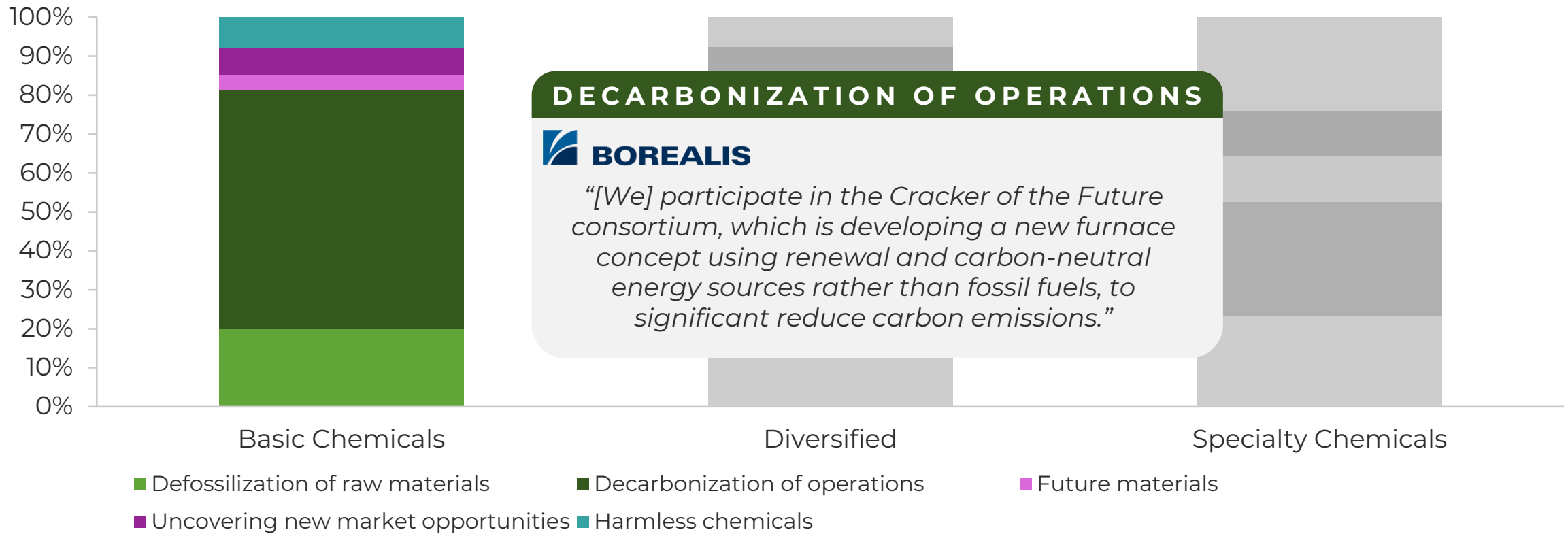
DISTINCT PRIORITIES IN SUBINDUSTRIES

Chemicals Lux Client Priorities by Subindustry



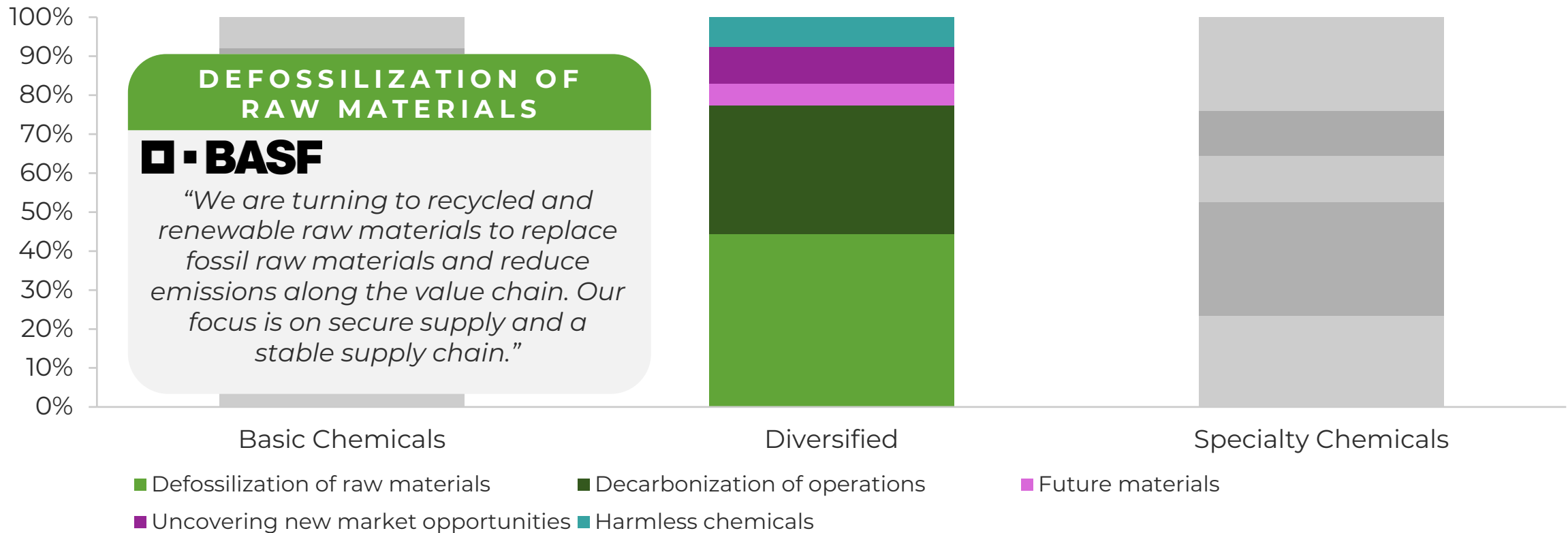
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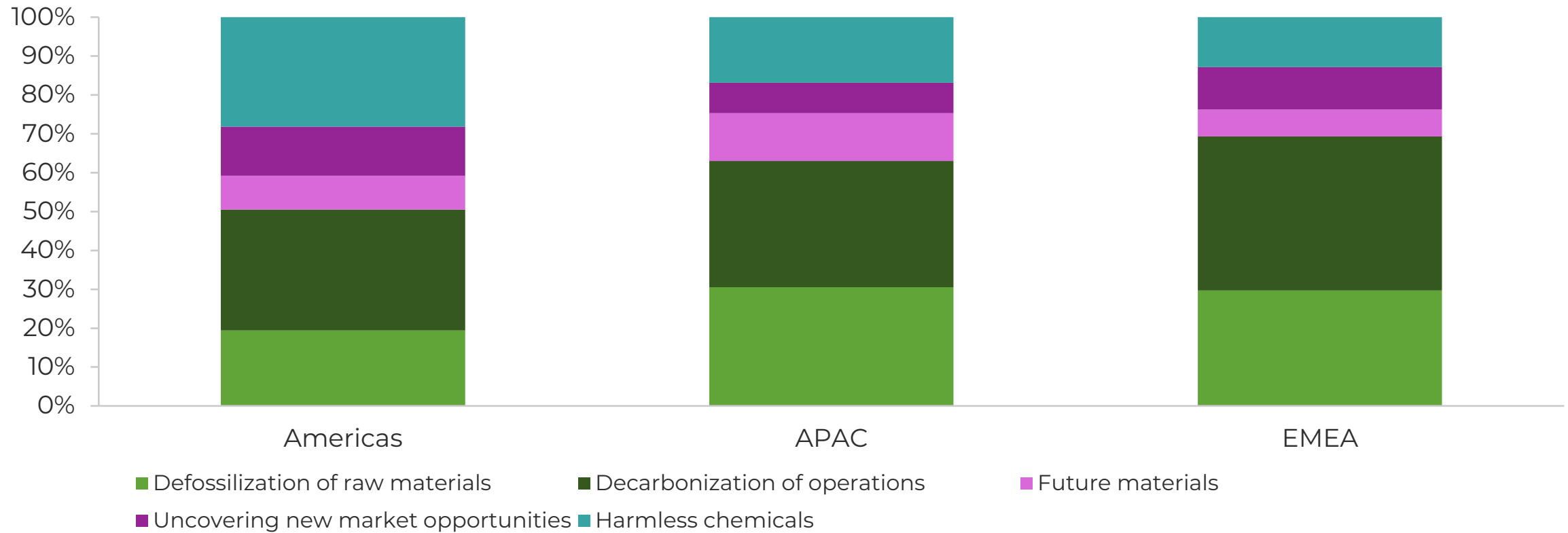
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Chemicals Lux Client Priorities by Subindustry



REGIONAL VARIATION MORE NUANCED

Chemicals Lux Client Priorities by Geographic Region



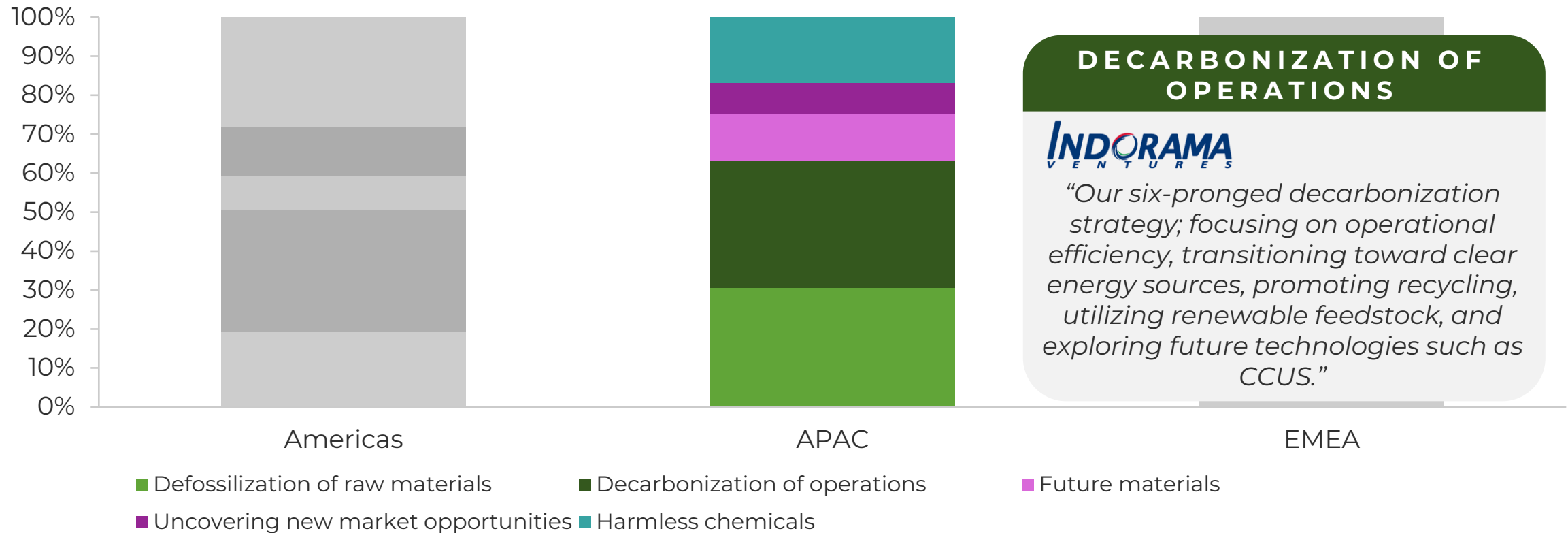
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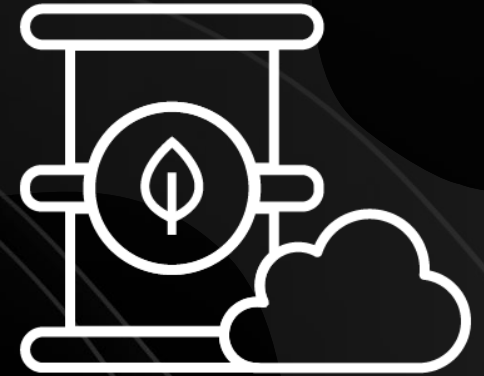
Chemicals Lux Client Priorities by Geographic Region



LUX CLIENT PRIORITIES FOR CHEMICALS INNOVATION LEADERS

DEFOSSILIZATION OF RAW MATERIALS

Transforming existing value chains through the integration of new sources of carbon to continuously meet product demand.



Adopting alternative carbon sources and diversifying feedstocks is critical for **long-term resilience** and **mitigating supply chain risk**.

Develop and deploy emerging technologies to further diversify carbon sources and **build more localized, resilient supply chains**.

“

*What innovations in **advanced plastic recycling** are emerging to tackle diverse feedstocks?*

”

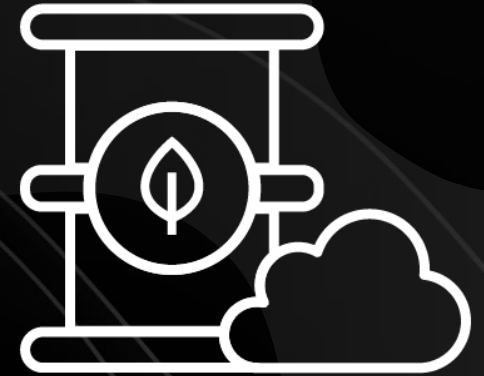
“

*What is the current trend in **biobased chemicals**, and how can companies scale these technologies effectively?*

”

DEFOSSILIZATION OF RAW MATERIALS

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INNOVATION IN ACTION

In 2023, **SK Geo Centric** began construction of its **advanced recycling** cluster in South Korea. This complex targets a wide range of waste plastic feedstocks and will have a capacity of **320,000 tonne/y**.

DECARBONIZATION OF OPERATIONS

Propelling operations toward zero-emissions and zero-waste with innovative technologies and processes.

Zero-emissions operations is essential for both **future-proofing** capital-intensive assets and **extending operational life** in the face of regulations and consumers demands.

Develop a robust decarbonization roadmap combining near-term **retrofits** with long-term investments in **transformational** technologies.



“
*How can chemicals companies integrate **emerging decarbonization technologies** into their operations?*”

“
*What innovations in **carbon capture** and **low-carbon heat** are most promising in overcoming economic challenges?*”

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INNOVATION IN ACTION

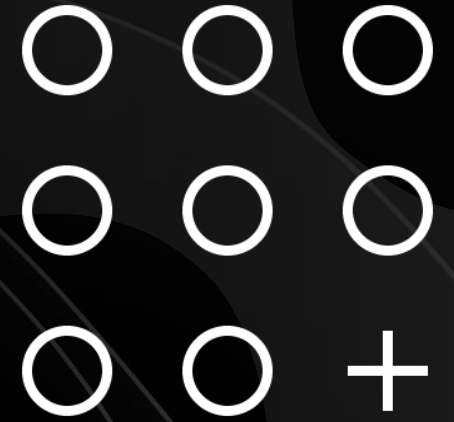
In 2023, **Dow** selected its Seadrift Operations site in Texas to host **X-energy**'s 320 MW high-temperature gas-cooled reactor as part of the U.S. DOE's USD 1.2 billion project to demonstrate **nuclear-powered decarbonization**.

FUTURE MATERIALS

Acceleration the discovery, design, development, and deployment of future materials to enable new technologies and applications.

Future materials will unlock new technologies and applications, enabling companies to **stay ahead of fast-evolving industries.**

Build a portfolio of **future platform materials** to capitalize on new technologies and applications as they emerge.



“

*Which innovations in **thermal management materials** driving change in sectors like EVs and data centers?*

”

“

*What are the latest trends in **materials informatics** with the recent developments in AI capabilities?*

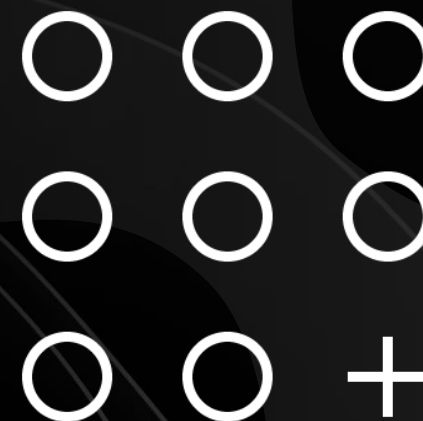
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INNOVATION IN ACTION

In 2023, **BASF** announced the commercial-scale production of MOFs to supply **Svante** at a scale of several hundred metric tons/year to address technical limitations of **CO₂ capture** efficiency of incumbent technologies.

UNCOVERING NEW MARKET OPPORTUNITIES

Discovering and capitalizing on the unmet materials needs of technologies and solutions on the rise.



Stay **agile and proactive** in supporting the innovation strategies of your core customers as they embrace new technological advancements.

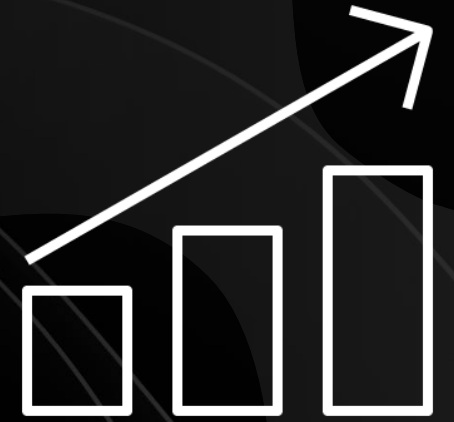
Develop **dynamic product strategies** that can pivot and scale in response to evolving customer needs and new market trends.

“
*What are the materials needs emerging from **novel battery chemistries** poised to replace Li-ion?*
”

“
*How can chemicals companies capitalize on demand for sustainable **consumer packaging materials**?*
”

UNCOVERING NEW MARKET OPPORTUNITIES

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INNOVATION IN ACTION

In 2023, **Umicore** opened a large-scale prototyping facility for **solid-state battery** materials to secure a leading role in next-generation battery technology and capitalize on the potential evolution of Li-ion batteries.

HARMLESS CHEMICALS

Designing products minimizing health and environmental impacts while aligning to human-centric needs.

Harmless chemicals are critical for maintaining **consumer trust, avoiding financial penalties,** and responding **evolving regulations.**

Gain a deeper understanding of **consumer insights** to capitalize to emerging consumer sentiments.



“ Which innovations in **industrial wastewater management** can reduce harmful effluents from chemical processes? ”

“ What are the latest advances and target markets being explored in **green chemistry**? ”

HARMLESS CHEMICALS

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INNOVATION IN ACTION

In 2024, **3M** agreed to a USD 10.3 billion settlement for U.S. public water suppliers to address its past PFAS production. 3M can potentially leverage its expertise in **filtration technologies,** turning a legal setback into a new business opportunity.

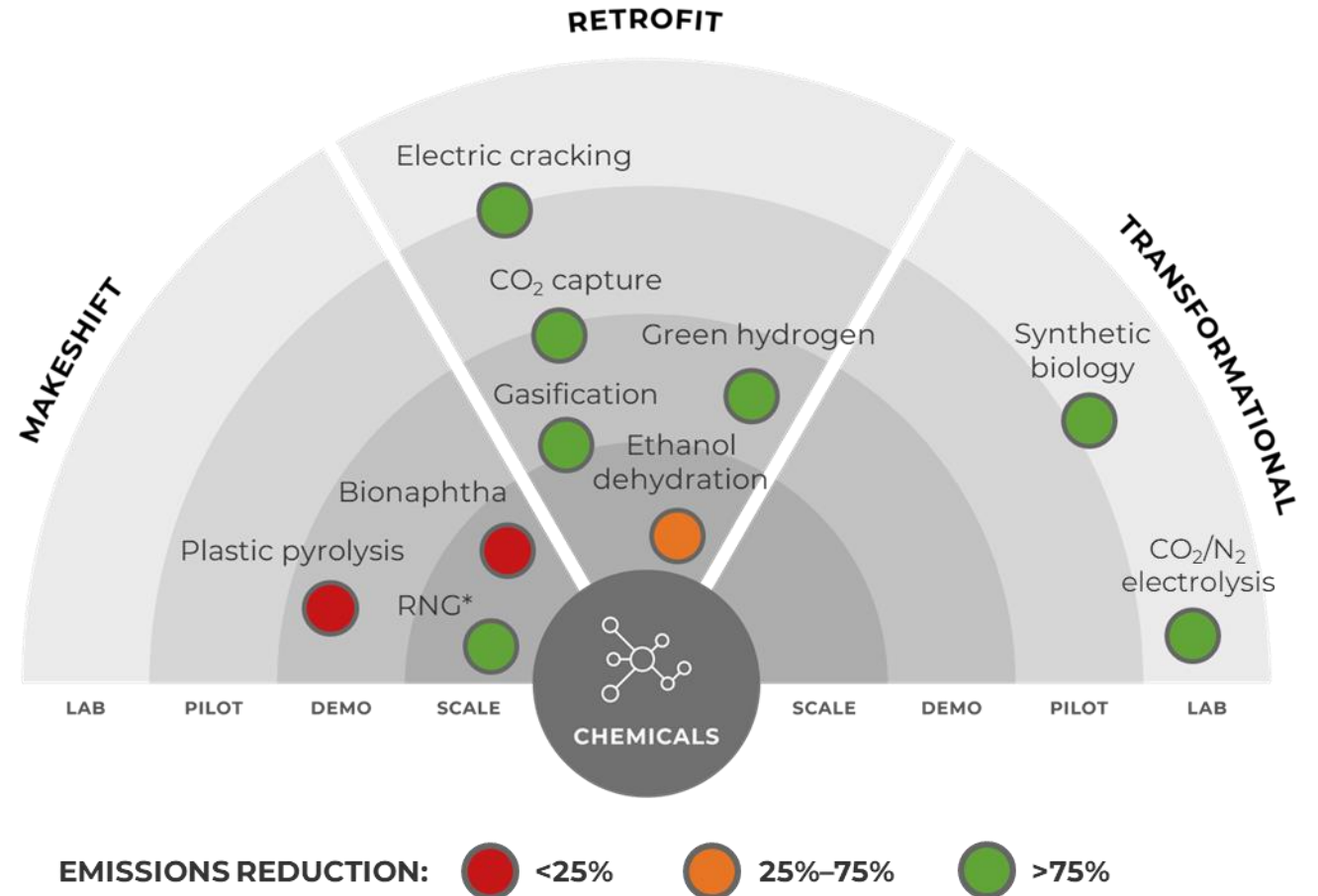
CAPITALIZING ON THE NEXT ERA OF CHEMICALS INNOVATION

TECHNOLOGY PORTFOLIO

Build a robust technology and product portfolio.

Collaborate — internally and externally — to accelerate innovation and quickly adapt to shifting market demands and regulatory changes.

The Lux Decarbonization Radar: Chemicals



INNOVATOR ACTIVITY

Benchmark to identify innovation gaps and opportunities.

Uncover hidden opportunities and assess your innovation priorities and technology strategies with industry peers.

LUX Research | PLASTIC RECYCLING TECHNOLOGY LANDSCAPE

1 PYROLYSIS

From top to bottom: corporates, startups

2 SOLVOLYSIS

From top to bottom: corporates, startups

3 THERMOCHEMICAL DEPOLYMERIZATION

From top to bottom: corporates, startups

4 DISSOLUTION

From top to bottom: corporates, startups

CONSUMER INSIGHTS

Enhance visibility into consumer insights.

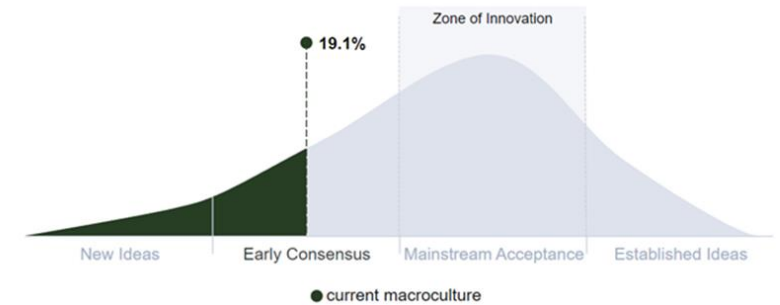
Stay ahead of trends by integrating data-driven insights into your R&D pipeline to develop product strategies that resonate with customer needs.

Finding the Sweet Spot of Packaging Innovation

1

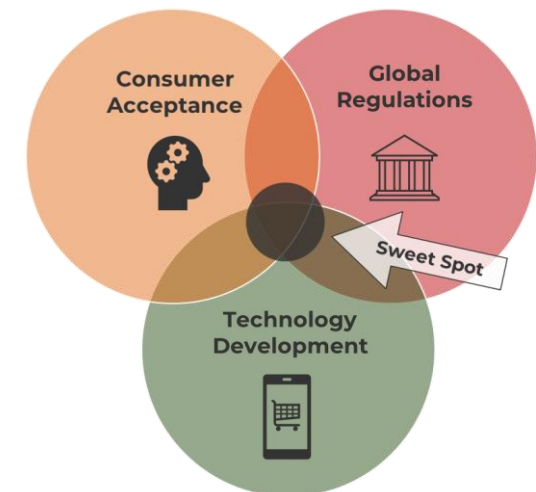
Understand the maturity of consumer sentiments to discern from niche ideas and mainstream beliefs

Maturity Curve
19.1%
current



2

Identify opportunities for innovation on the foundation of consumer sentiments moving to mainstream acceptance





THANK YOU



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