Embedding sustainability capabilities in medicines manufacturing operations

1 July 2025
11:00 – 12:00
Webinar

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UKRI Innovate UK | Business Connect

BioPhorum

Introducing

Biopharmaceutical Environmental Excellence Maturity Model

Webinar

Speakers

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BioPhorum

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Vice President,
Sustainability and Innovation

cytiva

Agenda

- **Introduction to BioPhorum and why we are all together**
- **What was the gap that the BEEMM is filling**
- **What has been developed to fill the gap**
- **Use cases:**
  - Internal road mapping (single site or multi-site)
  - Industry picture and benchmarking
  - Conversations with LH/CM/suppliers
- **Current programme**
- **Ask: Do you want to get involved, use the model, or be involved with BioPhorum to support building the data set?**

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To accelerate industry-wide transformation we focus on five key areas.

Improved productivity and cost reduction
to bring more treatments to market profitably

Increased speed to market
to save hundreds of millions of dollars on treatments

Regulatory risk and simplification
identifying opportunities for streamlining

Sustainability
improving environmental performance by tackling key issues around energy, emissions and materials

Workforce enablement
supporting the recruitment, training and nurturing of skilled talent

The biopharmaceutical industry's most trusted collaborative environment for change

BioPhorum delivers truly collaborative outcomes which allow us to accelerate change by approaching industry agencies as **one authoritative voice**.

To find out more, visit **biophorum.com**

BioPhorum: a co-ordinated program of industry change

BioPhorum's mission is to create an environment where our members from the global biopharmaceutical and device industries connect, collaborate and accelerate progress – for the benefit of all.

Member-led

Safe and confidential

Cheaper, faster and better journeys

Consensus-driven

This allows for cost reduction, lower waste, improved productivity, better environmental performance across the value change, better investment decisions and the cost of poor decisions avoided.

There are currently 11 Phorums providing a wealth of opportunities for companies to align their interests with similarly committed organizations.

150+
member companies

200+
global programs for change

7500
leaders and subject matter experts

170+
published papers, presentations and resources in the last 12 months

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Environmental Sustainability Vision

Improving patient health by providing biopharmaceuticals while respecting the planet and responsibly using its resources

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QUIZ

What is biopharmaceuticals' impact on the environment

(True or False)

The healthcare industry's carbon footprint is higher than the commercial aviation industry.

True

Health care's climate footprint is equivalent to 4.4% of global net emissions (2 gigatons of carbon dioxide equivalent). If global healthcare was a country, it would be the 5th highest emitter.

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The biopharmaceutical industry is estimated to produce around 300 million tonnes of plastic waste every year.

True

The biopharmaceutical industry generates around 300 million tons of plastic waste annually. Much of this plastic is single-use, which poses significant challenges for waste disposal and handling.

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Global Environmental, Social and Governance (ESG) regulations have increased by 155% over the past decade.

True

This surge is driven by the rapid growth of sustainability-based policy interventions, which are shaping financial markets and increasing the complexity of the global reporting landscape.

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Out of 150 BioPhorum members, 54 have signed up to the Science Based Targets Initiative (SBTi).

False

86 members (which includes license holders, CDMOs and suppliers) have signed up to SBTi. As of 2024, nearly 10,000 companies have science-based climate targets validated by SBTi.

86

BioPhorum presentation BioPhorum Internal Sustainability Progress Report and Forward Plan (https://biophorum.sharepoint.com/:p:/r/sites/allcompany/_layouts/15/Doc.aspx?sourcedoc=%7B9D5825CF-A1E8-48D5-B71F-9CED14C03A4D%7D&file=BioPhorum%20Internal%20Sustainability%20Program%20Plan%20Sept%202024.pptx&action=edit&mobileredirect=true)
SBTi website https://sciencebasedtargets.org/

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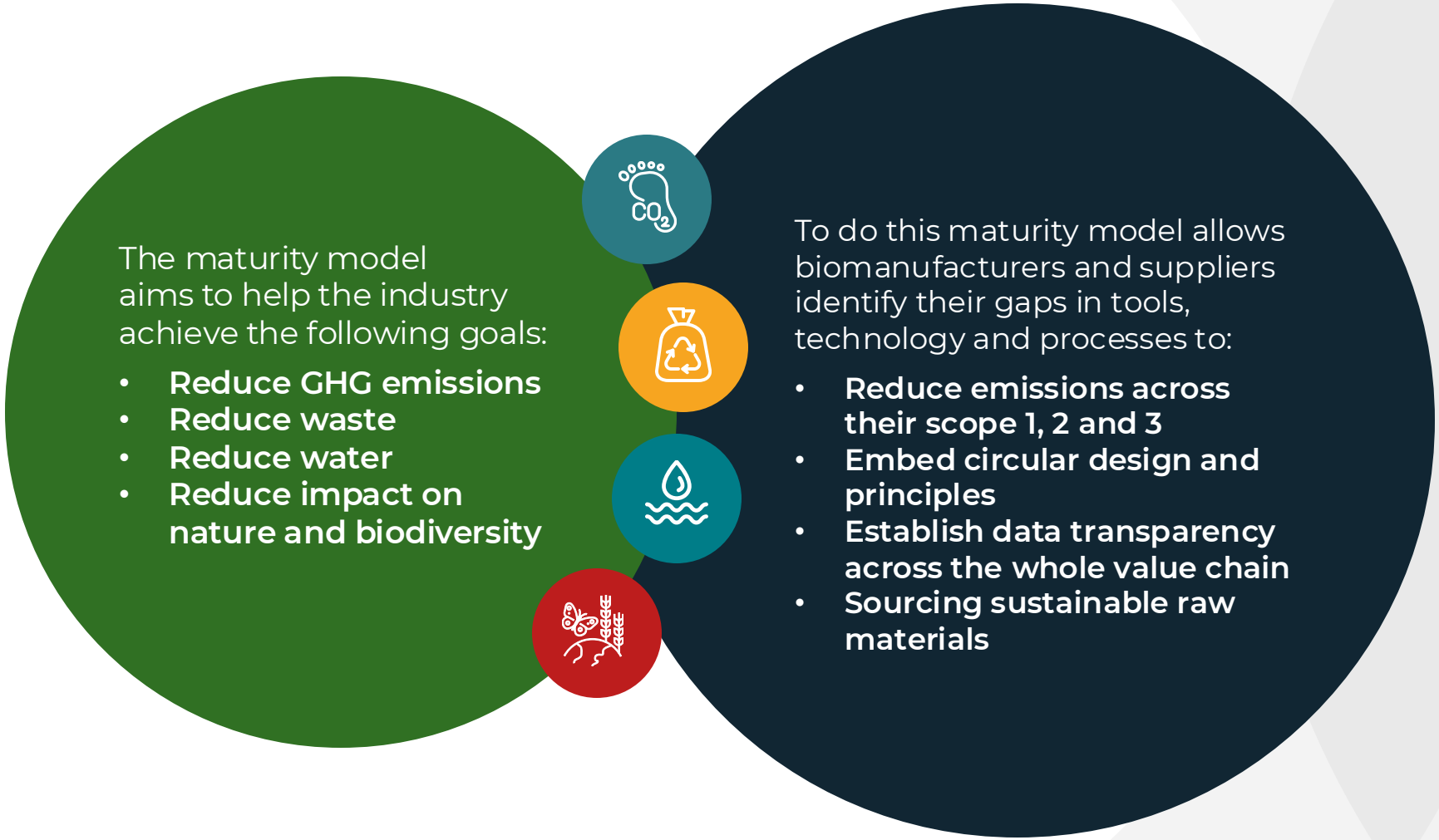
The Biopharmaceutical Environmental Excellence Maturity Model (BEEMM)

To achieve our vision, the BioPhorum Sustainability community have developed an Environmental Sustainability Maturity Model specifically for the biomanufacturing, providing a strategic framework to progressively minimize environmental impact.



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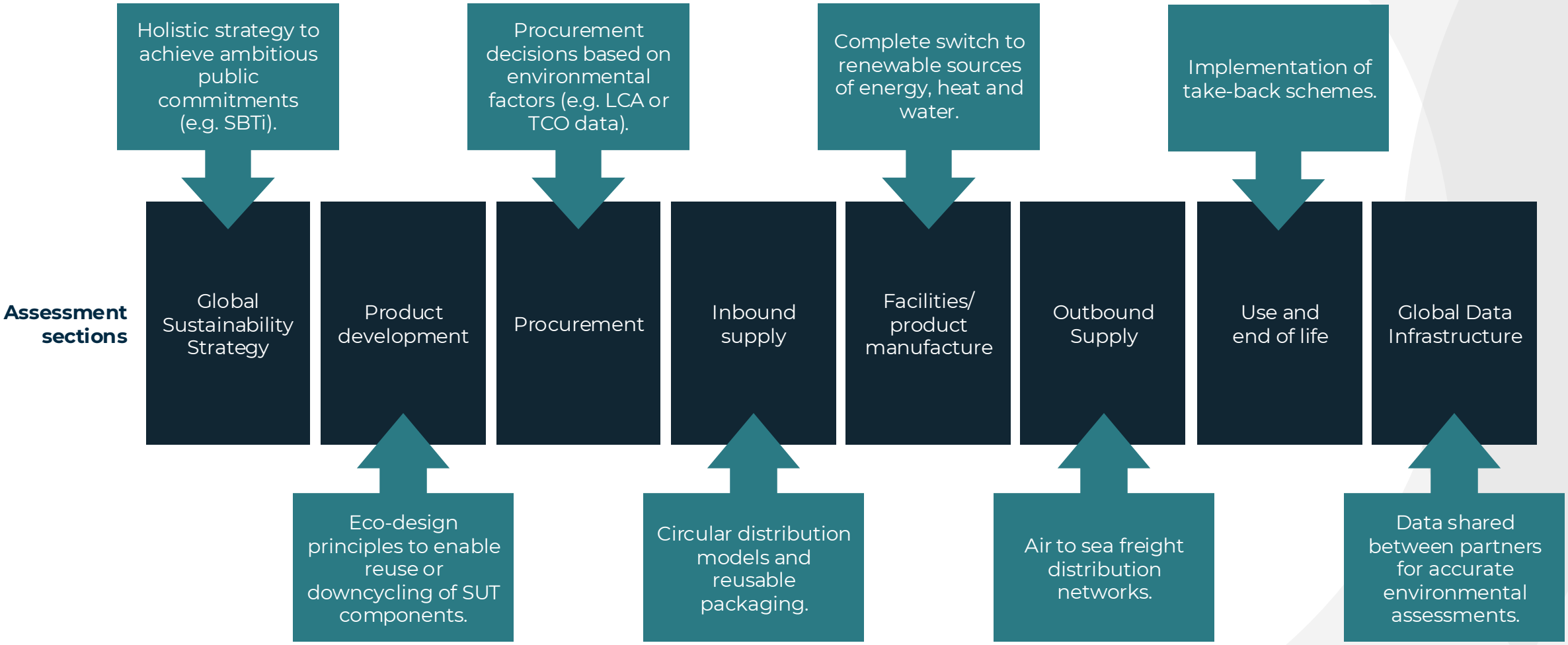
Structure of the model and example tracks



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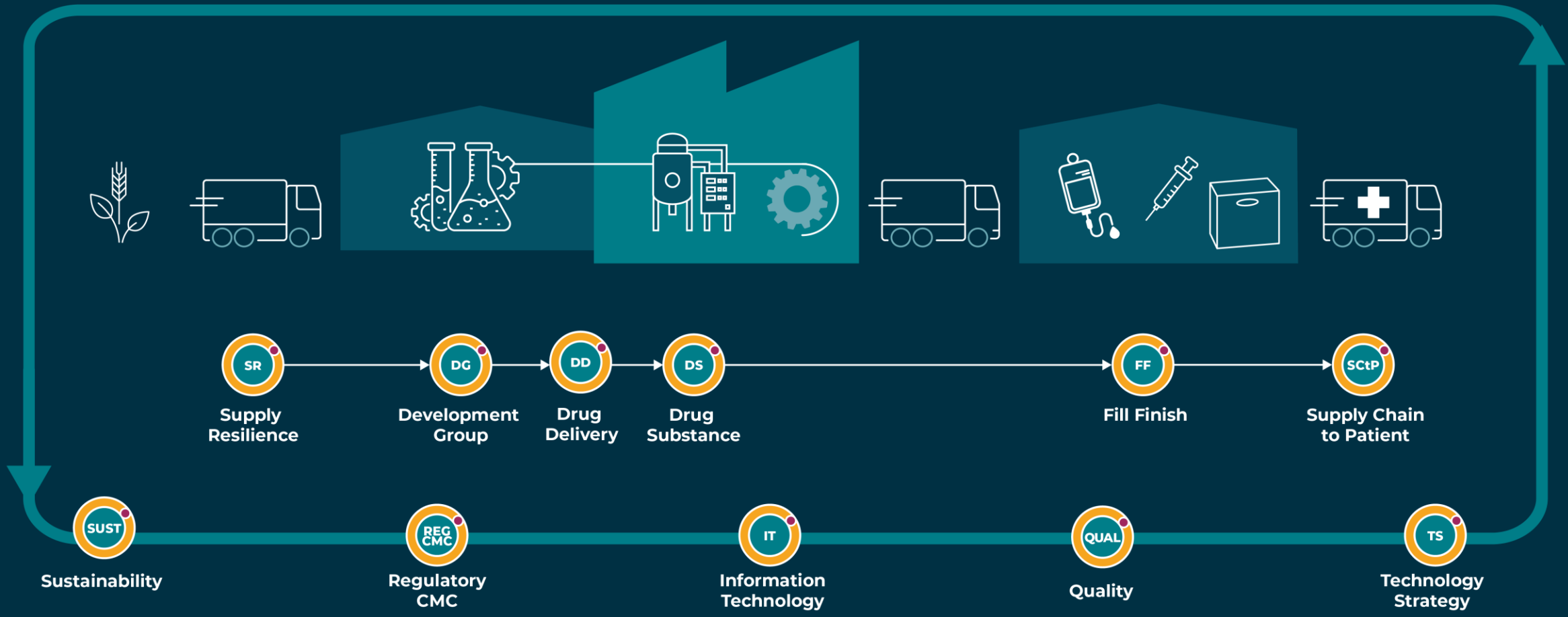
Activating sustainability at the heart of manufacturing

A **cross-value** chain community of license holders, CDMOs and suppliers

Driving environmental excellence of the biomanufacturing process from cradle to grave



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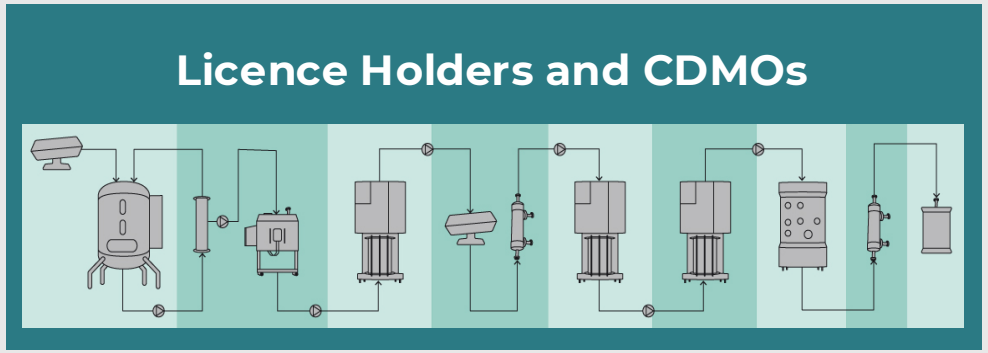
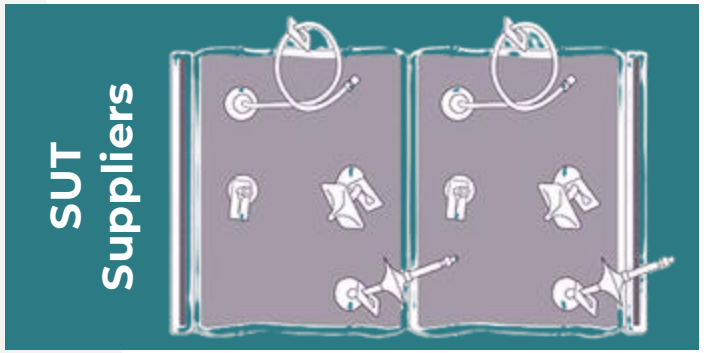
Use cases: End-to-end value chain and cross-organisation conversations

Bio-based plastics example

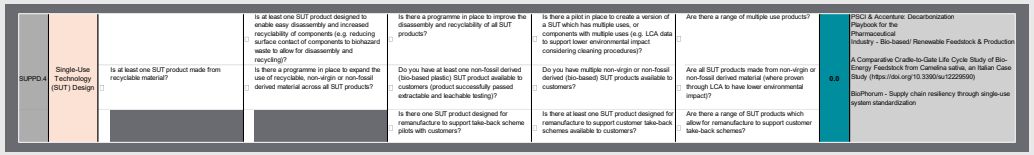


Source 1 - Cytiva

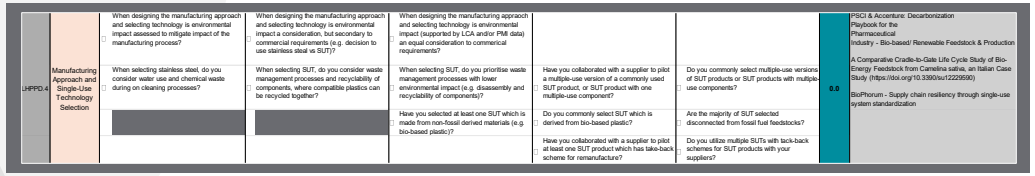


Source 2 - Cytiva

Product and process development: Manufacturing Approach and Single-Use Technology Selection



Product and process development: Single-Use Technology (SUT) Design



Source 1 – Cytiva: https://www.cytivalifesciences.com/en/us/knowledge-center/Process-considerations-for-closed-connected-processing?srsltid=AfmBOormO_D0oALpJ6zBdLlpSxYGmVq_gYMvHfbEsT3Z7kh2xY2qKdwR
Source 2 – Cytiva: https://www.cytivalifesciences.com/en/us/shop/cell-culture-and-fermentation/rocking-bioreactors/consumables-and-accessories/single-use-readytoprocess-wave-cellbag-bioreactors-p-00346/parts-and-accessories/28412268/accessories

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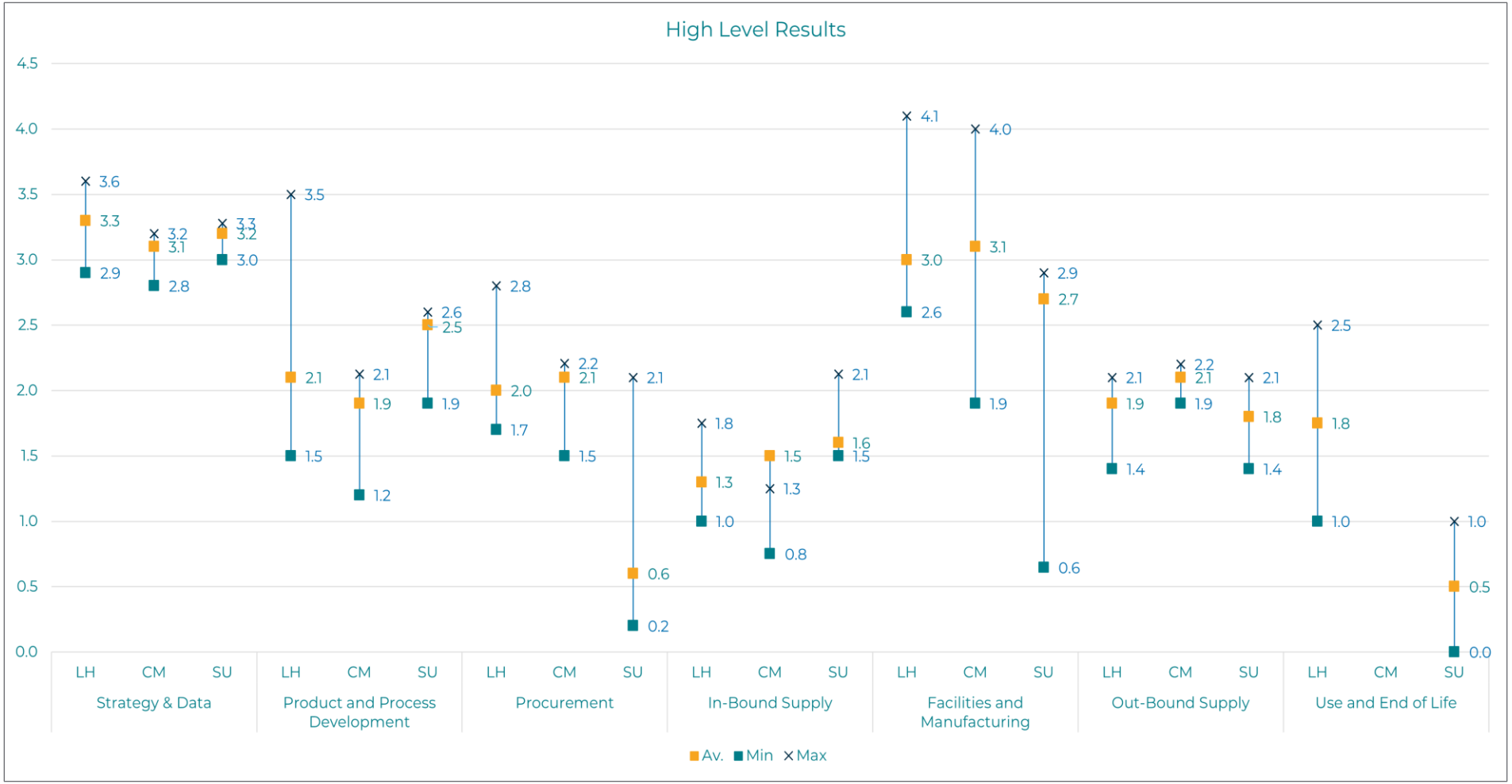
Use cases – Industry picture



Note: Test data for illustration only

Use cases – Industry picture

Overall Strategy & Data	Global Sustainability Strategy	Environmental Goals and Public Disclosure	Roadmaps	Metrics and Progress Reporting	Horizon Scanning	Collaborations	Regulation	People, Culture and Training	Data Storage
LH	4.2	3.8	3.9	3.8	3.4	4.5	4.1	2.1	0.3
CDMO	3.9	3.5	3.2	3.5	3.0	4.1	4.2	2.0	0.2
SU	3.8	3.1	3.3	3.6	3.5	4.3	3.7	2.5	0.8

Overall Product & Process Development	Eco-design culture	Environmental Impact Data and Tools	Chemicals	Manufacturing Approach and Single-Use Technology Selection	Process Intensification	Drug Delivery Device Design (specifically auto-injectors and pens)	Excess Product (Use of sold products (scope 3 category 11))	Single Use Technology Design
LH	1.7	1.3	2.2	1.4	2.2	0.9	1.7	
CDMO	0.8	0.3	1.9	1.0				
SU	2.0	2.4	1.4					1.1

Overall Procurement	Procurement strategy	Supplier Engagement (scope 3 category 1)	Localised supply	Packaging
LH	2.0	2.1	2.8	0.8
CDMO	1.3	1.9	1.5	0.3
SU	2.2	2.3	2.0	1.0

Overall Use and End of Life	End-of-life Treatment of Sold Products (scope 3 category 12)
LH	1.8
CDMO	
SU	0.3

Overall Out-Bound Supply	Downstream transportation and distribution decarbonization strategy (scope 3 category 9)	Downstream Supply Chain Network Optimization	Lower Carbon Transportation Options	Renewable Fuel Options	Cold Chain	Shipment Loads	Transportation and Distribution Packaging	Reverse Logistics
LH	1.3	0.8	1.3	1.3	2.0	2.0	0.5	0.7
CDMO	2.0	0.5	1.0	0.0	0.0	1.0	1.0	0.0
SU	2.3	0.5	2.3	0.5	0.8	2.3	1.1	0.4

Overall In-Bound Supply	Upstream Transportation and Distribution Decarbonization	Upstream Supply Chain Network Optimization	Inventory Management	Reverse Logistics
LH	1.0	0.8	1.0	2.0
CDMO	1.3	0.8	1.0	1.0
SU	2.0	0.9	2.8	2.5

Overall Facilities and Manufacturing	Facility Environmental Performance Strategy	Energy Source at Facilities (scope 1 and 2)	Heat generation	Facility design (scope 3 category 2)	Machinery and manufacturing processes (scope 3 category 2)	Heating, Ventilation, and Air Conditioning (HVAC) Optimization (scope 1 and 2)	Biomanufacturing chemicals	Waste Management (scope 3 category 5)	Single-Use Technology (SUT) Waste Management	Water Stewardship	Water Monitoring and Data	Water Reduction	Water Recycling
LH	1.8	2.9	2.6	0.0	1.4	1.2	0.4	1.9	0.8	2.6	1.6	1.5	1.2
CDMO	2.9	2.3	1.3	0.0	2.0	1.3	1.0	1.5	1.5	2.0	1.0	1.1	1.0
SU	2.8	2.1	2.8	0.0	1.5	1.0	1.0	1.8		0.8	1.3	1.8	0.5

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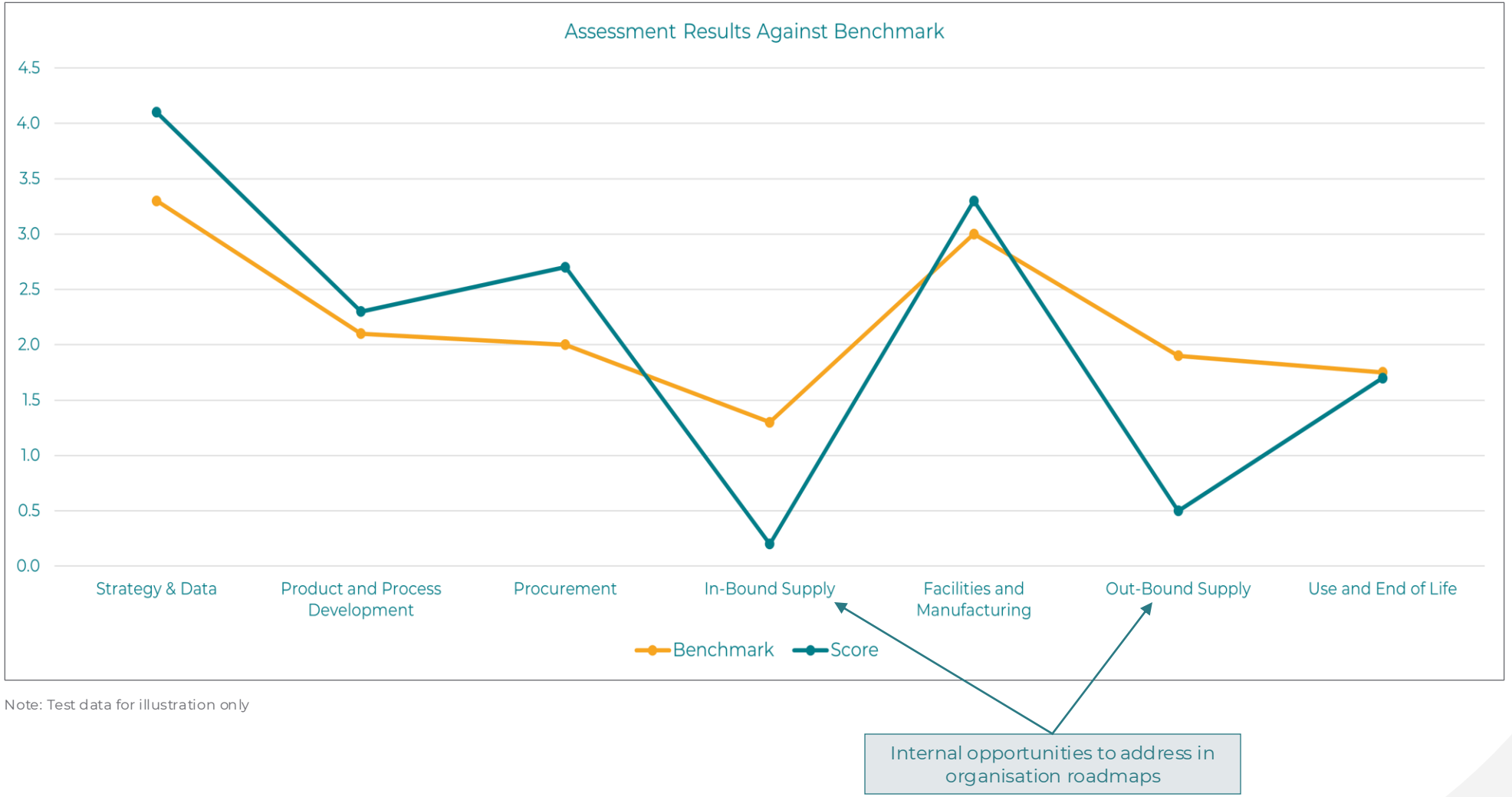
Use cases – Benchmarking and internal roadmaps



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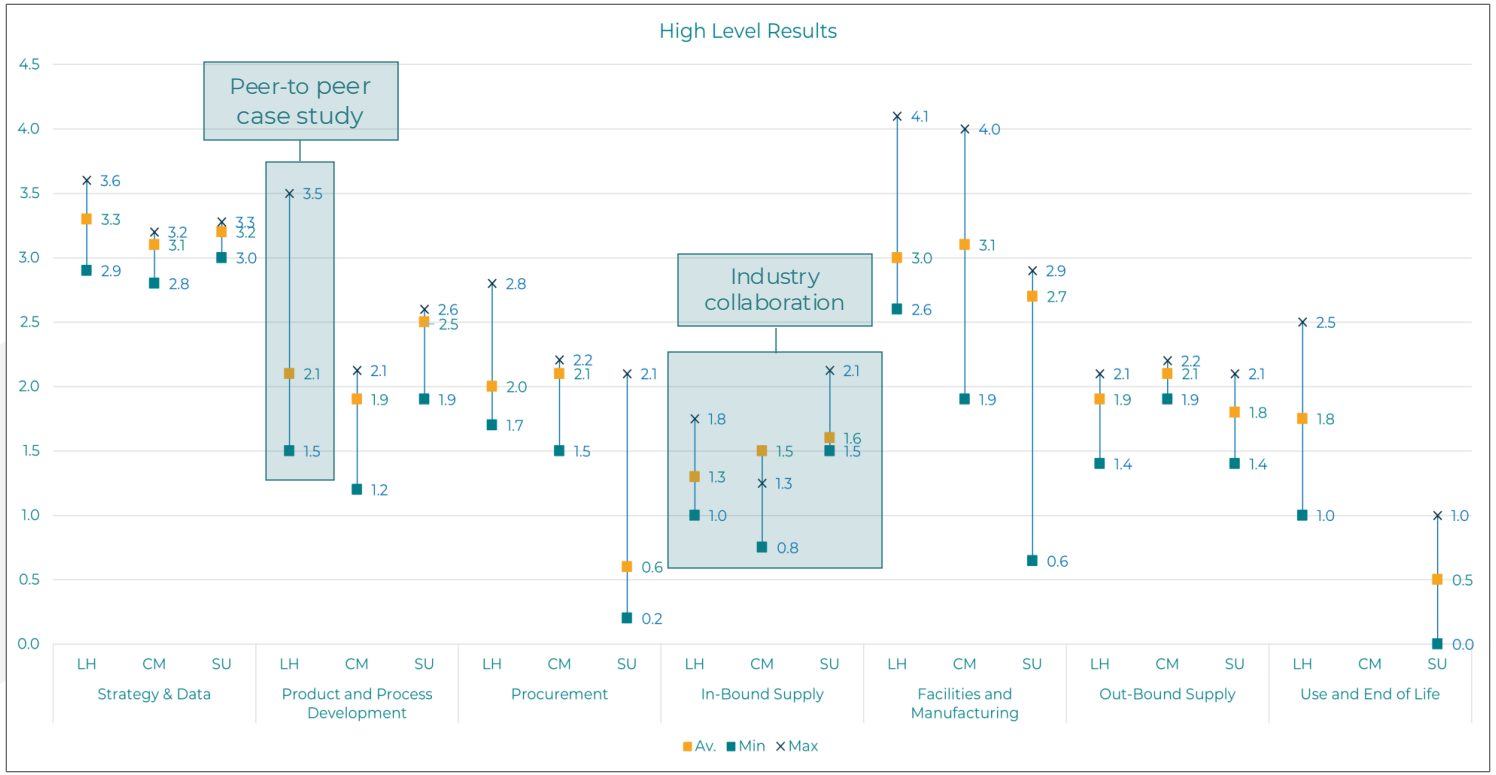
Use cases – Collaboration across the value chain



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SU	3.8	3.1	3.3	3.6	3.5	4.3	3.7	2.5	0.8

Industry collaboration

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BioPhorum Sustainability: Achievements to date

Sustainability Roadmap	Water	Emissions	USP88	Medical Devices	Plastics
• Environmental sustainability roadmap	• A case for shifting to water stewardship in the BioPharma sector	• Developing a harmonized approach to product carbon footprint for the biopharma industry (publication and webinar)	• Bioreactivity testing in single use system biomanufacturing: Industry position paper	• Sustainability for drug delivery devices. Recommendations for the industry across the value chain	• Quantification of SUT waste for MAB's production

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