



The Green Energy Transition: An Industrial Perspective PLM Market & Industry Forum A CIMdata Leadership Event

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#plm4um

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Strategic management consulting for competitive advantage in global markets

The leading independent authority on PLM and its digital transformation. We provide research, education, and strategic consulting to clients around the world.

**OUR MISSION:
Maximizing clients' ability to design, deliver, and support innovative products and services.**

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Sustainability & Green Energy

Practice Overview



Director: Mark Reisig

Mission

- Provide leadership to companies transitioning to sustainable carbon-free products and plants

Areas of Focus

- Provide management consulting services to enable clients to reduce their product carbon footprint
- Assist clients to design more sustainable eco-friendly products
- Enable clients to embed sustainability in PLM business strategies and enabling technologies through end of life, eliminating waste, increasing recyclability, reuse, and repurposing of materials and assets
- Evaluate new technologies and provide strategic management consulting services to help companies transform to meet the demands of a “net-zero” future

Mark Reisig

CIMdata



Professional background



- Over 40 years of experience in digital transformation, information technology, and engineering
- Led digital initiatives in PLM, plant design, CAD, ERP, SCM, and MDM for global businesses
- Prior to CIMdata, held executive and senior management positions at Aras, General Electric, Federation, Oracle, Auto-trol Technology, and Kraft Heinz
- Has worked with all the major PLM solution providers from both an industrial perspective responsible for large global deployments, as well as deploying those technologies from a solution provider and consulting perspective
- Industry experience includes energy, aerospace, defense, automotive, industrial, high-tech electronics, medical devices, and food & beverage

Key Takeaways



*Sustainability & the Green Energy Transition
is the defining issue of our time*

- We are on pace to reach 2.8°C warmer than the pre-industrial period
- Corporate net-zero emission pledges are gaining momentum, but few companies understand how to reduce their carbon footprint
- Greater visibility into the supply chain is required to reduce a companies product carbon footprint (PCF)
- Embedding sustainability in PLM is fundamental to reducing PCF
- Climate change is an existential threat and offers significant business opportunities

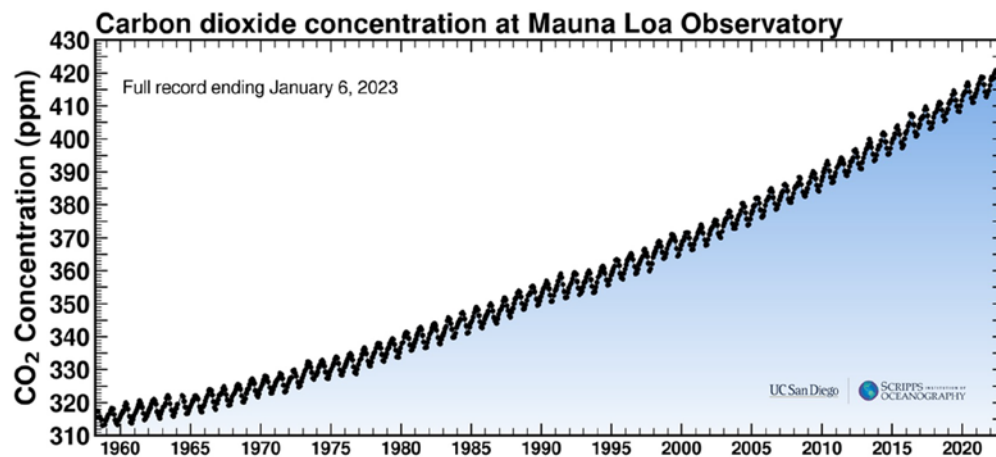
Agenda

- Earth Systems
- Sustainability & The Green Energy Transition
- The Green Energy Transition & Sustainability 2023 Survey Results
- Concluding Remarks

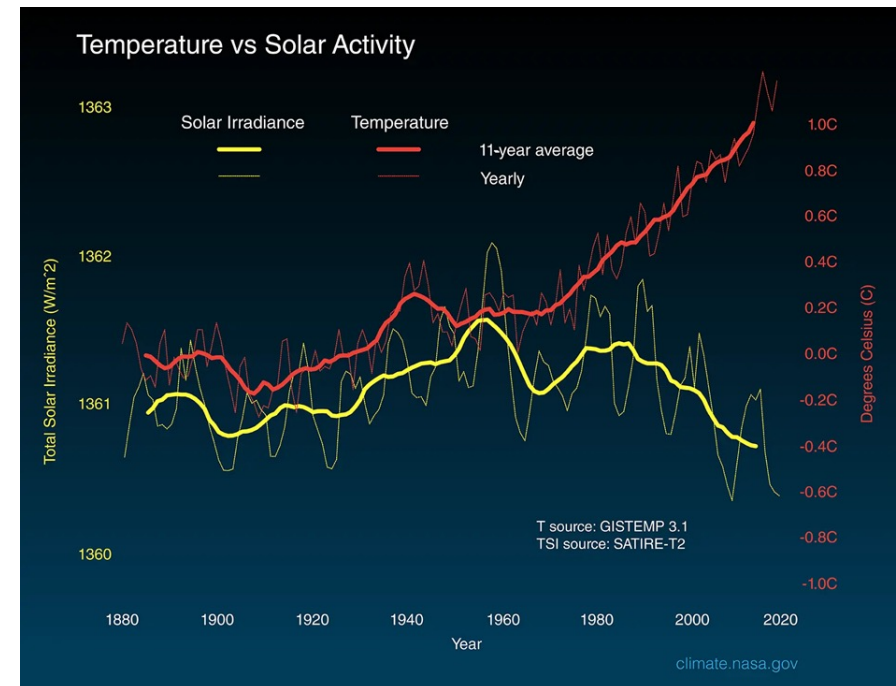
Global Warming & Climate Change



"Humans are changing Earth's climate, primarily through GHG emissions." - NASA



<https://keelingcurve.ucsd.edu/>



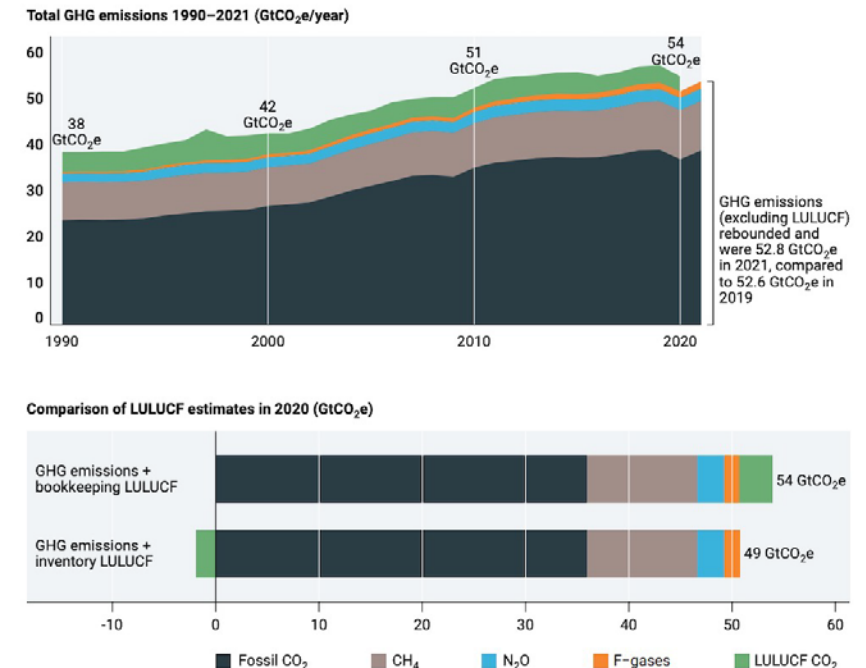
<https://climate.nasa.gov/faq/14/is-the-sun-causing-global-warming/>

Greenhouse Gasses Continue to Rise



Nothing that we have done to date appears to be stopping its rise

- GHG 2019 – 54.4 GtCO₂e
- GHG 2020 – 54.0 GtCO₂e
- GHG 2021 – 52.8 GtCO₂e
 - Excludes Land Use Change
- GHG 2030 – Est. 58 GtCO₂e



<https://www.unep.org/resources/emissions-gap-report-2022>

Greenhouse Gas Emissions by Industry

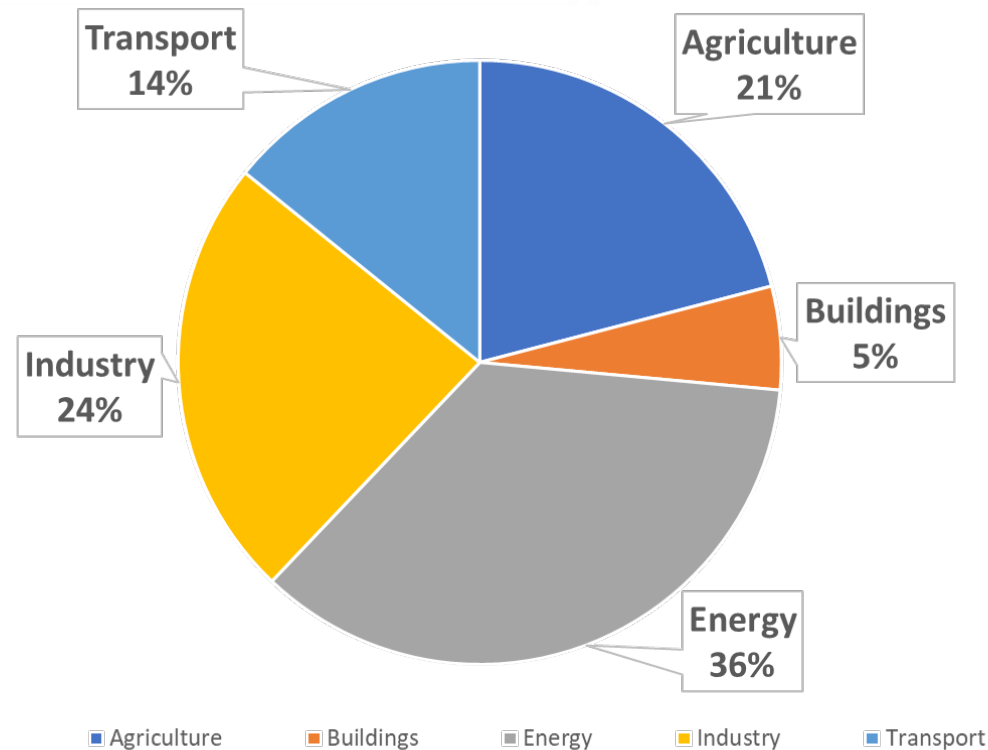


Just about all of these industries use PLM

Transport	8.2Gt
Cars	3.3Gt
Trucks/Buses	2.8Gt
Rail	730.4Mt
Shipping	652.1Mt
Air	342.0Mt
Ships	157.7Mt
Cooling	128.6Mt

Industry	13.7Gt
Other Industries	4.1Gt
Metals	3.0Gt
Waste	2.6Gt
Chemicals	2.6Gt
Cement	1.5Gt

Note: GHG Emissions in CO₂e



Agriculture	12.1Gt
Land Use Change	5.6Gt
Livestock	3.6Gt
Crops	2.9Gt

Buildings	3.2Gt
Heating Gas	1.0Gt
Coal Gas	867.2Mt
Cooling	703.8Mt

Energy	20.6Gt
Elec: Coal	10.3Gt
Other Use	3.9Gt
Elec: Gas	3.0Gt
Fossil Fuel Prod.	2.4Gt
Elec: Oil	538.6Mt

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UN Sustainability Goals



"The blueprint to achieve a better and more sustainable future for all"

- The 17 Goals were adopted by all UN Member States in 2015 as part of the 2030 Agenda for Sustainable Development, which set out a 15-year plan to achieve the Goals
- Paris Agreement - The goal is to strengthen the global response to the threat of climate change by limiting global warming to well below 2°C, preferable to 1.5°C, compared to pre-industrialized levels



<https://www.un.org/sustainabledevelopment/blog/2015/12/sustainable-development-goals-kick-off-with-start-of-new-year/>

Not on Track for 2030



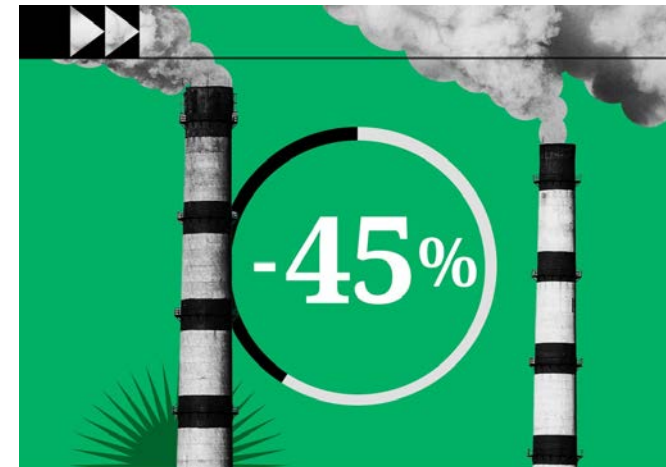
"We are in the fight of our lives, and we are losing" – Antonio Guterres



Increase in global greenhouse gas emissions **projected** by 2030, compared to 2010, based on available national action plans



Source: UNFCCC NDC synthesis report (Oct 2022)



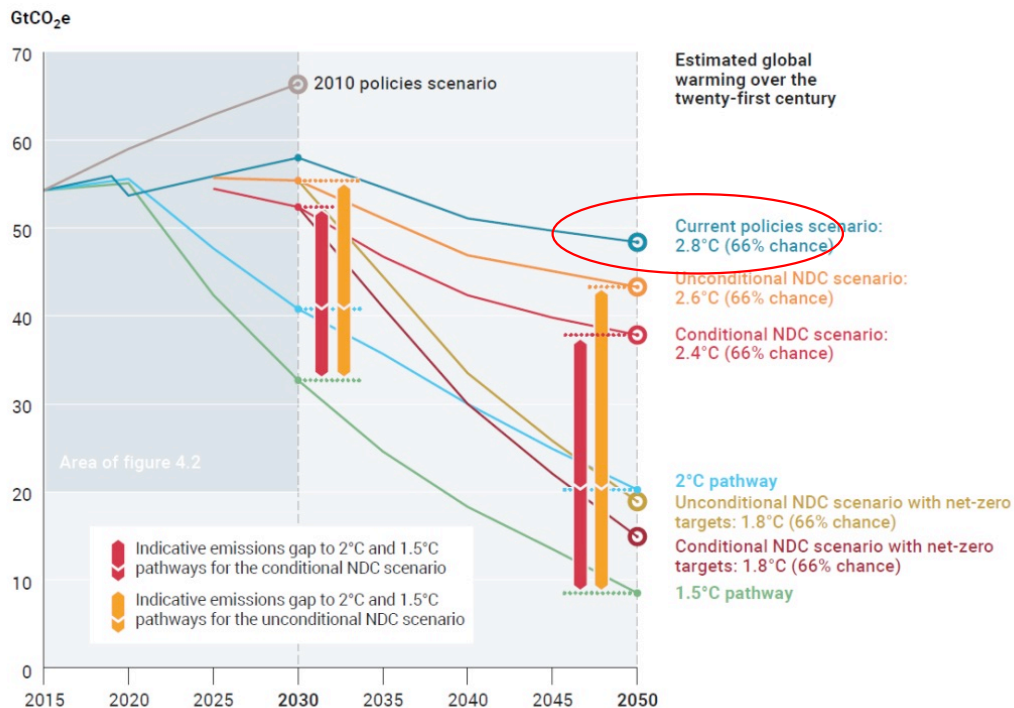
Reduction in global greenhouse gas emissions **needed** by 2030, from 2010 levels, to keep warming to no more than 1.5 degrees Celsius



Key Facts



"There's no credible pathway to 1.5°C in place" – UNEP Emissions Gap Report



- Global Warming 2022: 1.11°C
- Projection by 2100: 2.8°C
- CO₂ Concentration: 420.99 ppm
- Ocean Acidification: 0.01 pH (30%)
- Remaining Wilderness: 23%
- Biodiversity Loss: 0.01/yr. (200/yr.)
- Population: 8 billion people

Agenda

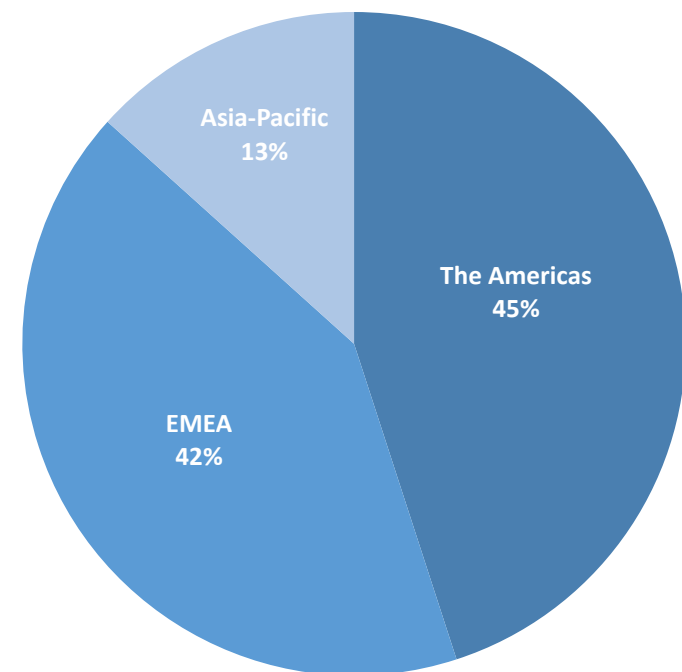
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Survey Demographics



*The Green Energy Transition Survey
Demographics*

- Respondents were historically comparable to previous CIMdata surveys in terms of geography, revenue size, industry, role, and work function
- Poll took place between January 5 – February 20, 2023
- Number of Respondents were 101



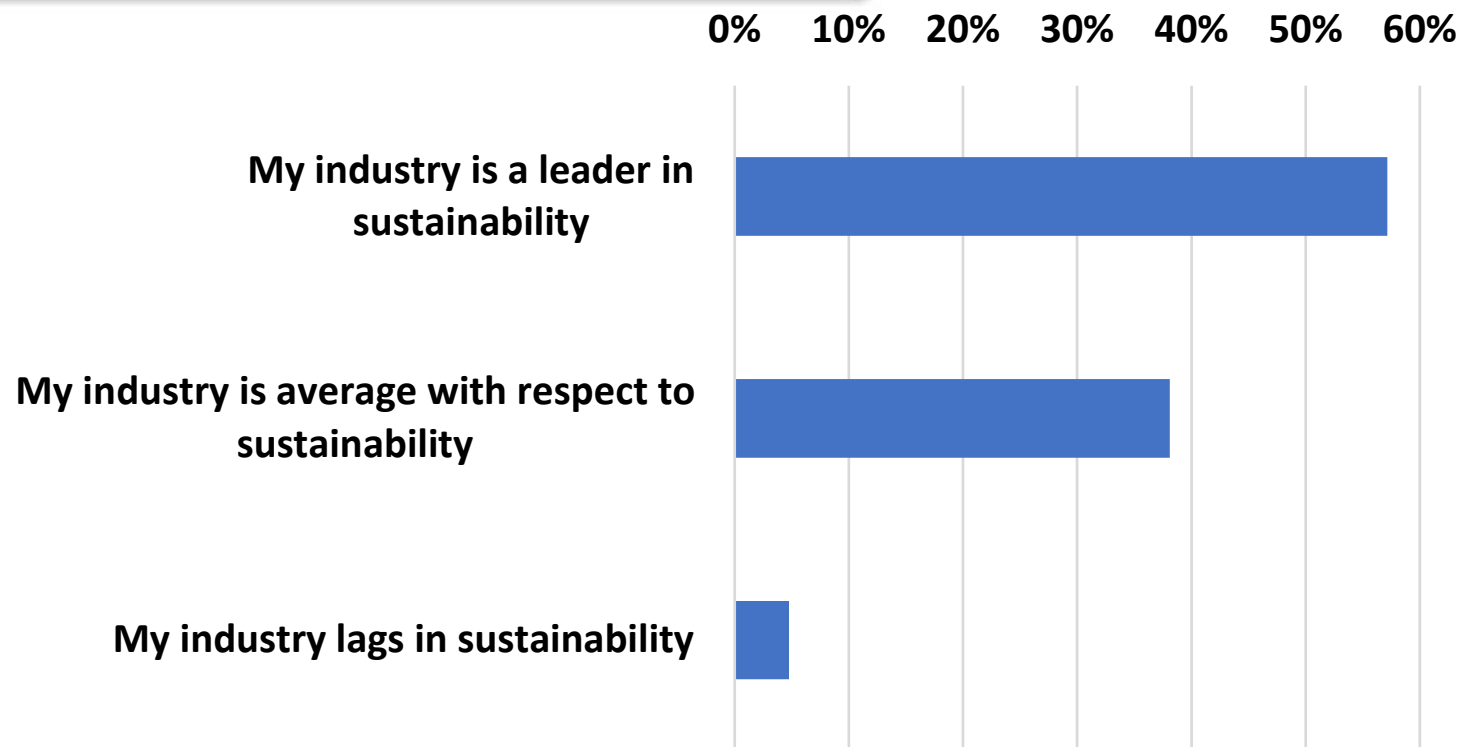
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Sustainability Industry Rating



Those rating their industry as a leader doubled since 2021 Survey



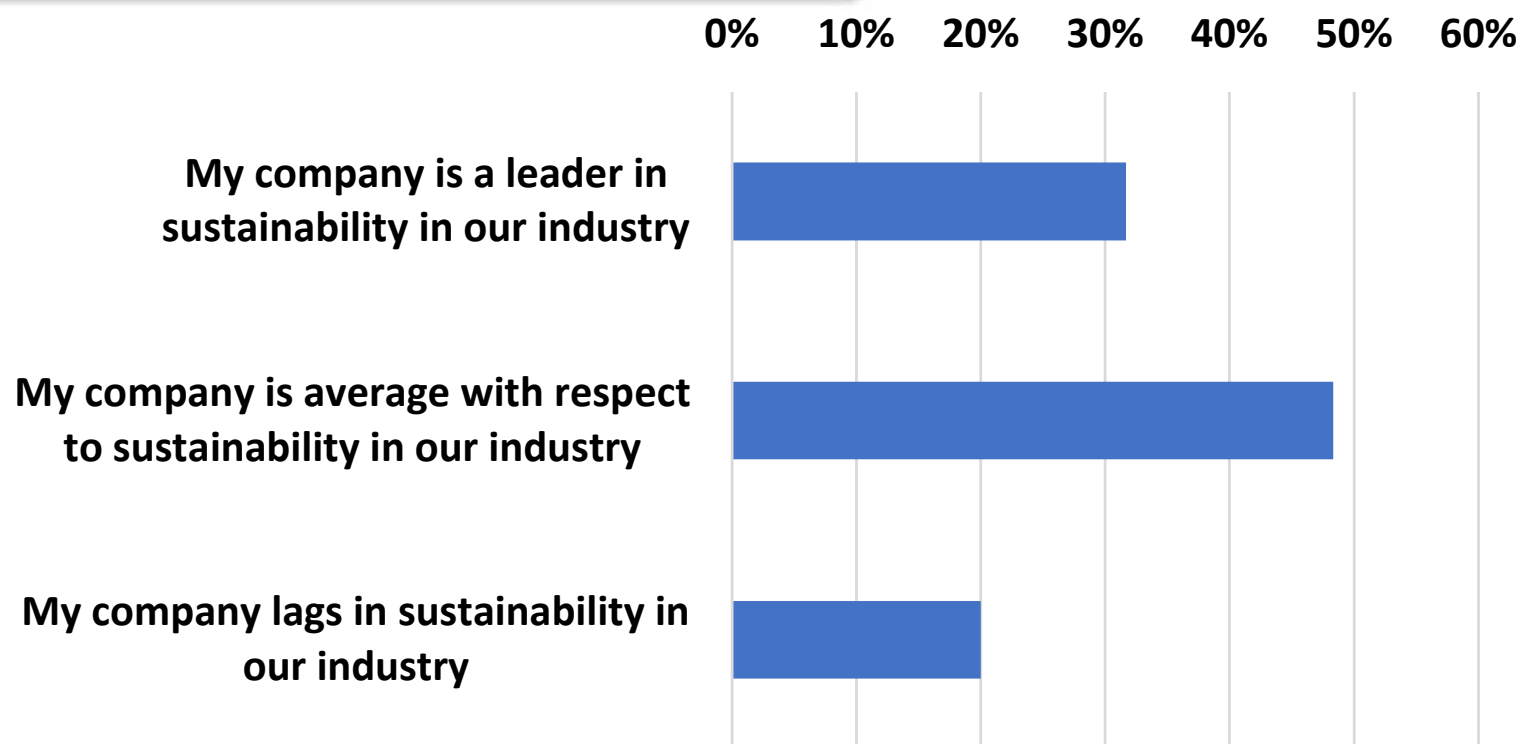
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Sustainability Company Comparison



Significantly less believe their own company is a leader



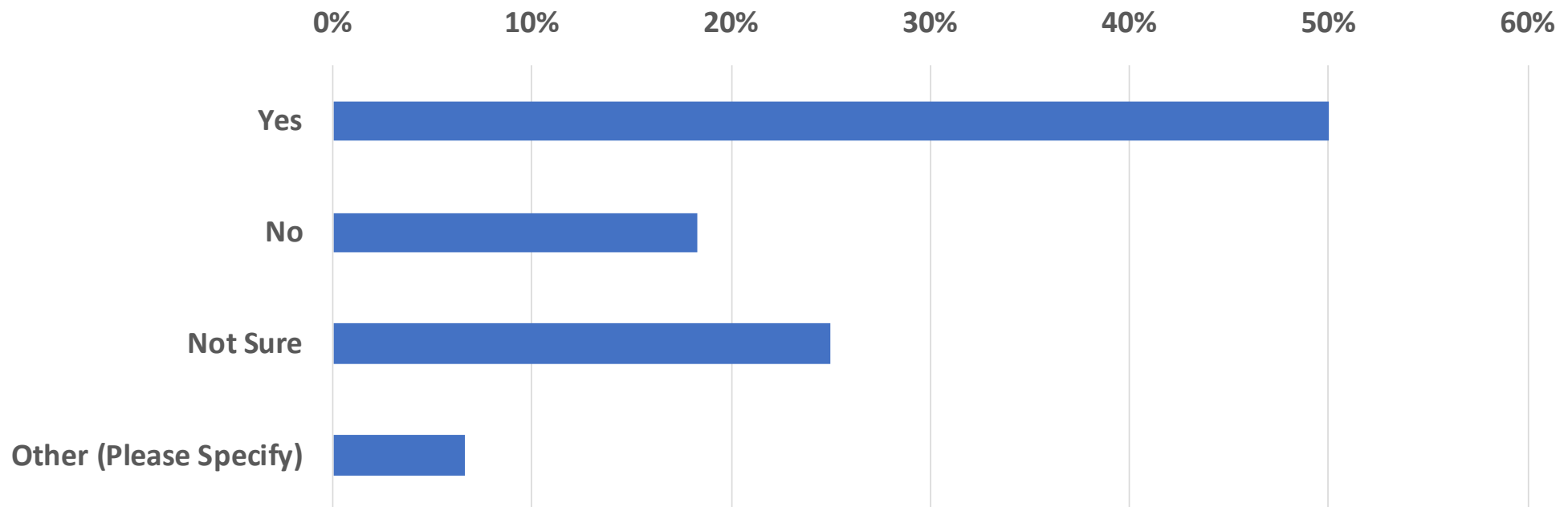
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Publish an ESG Report



Growing awareness that eventually ESG related disclosures will be mandatory



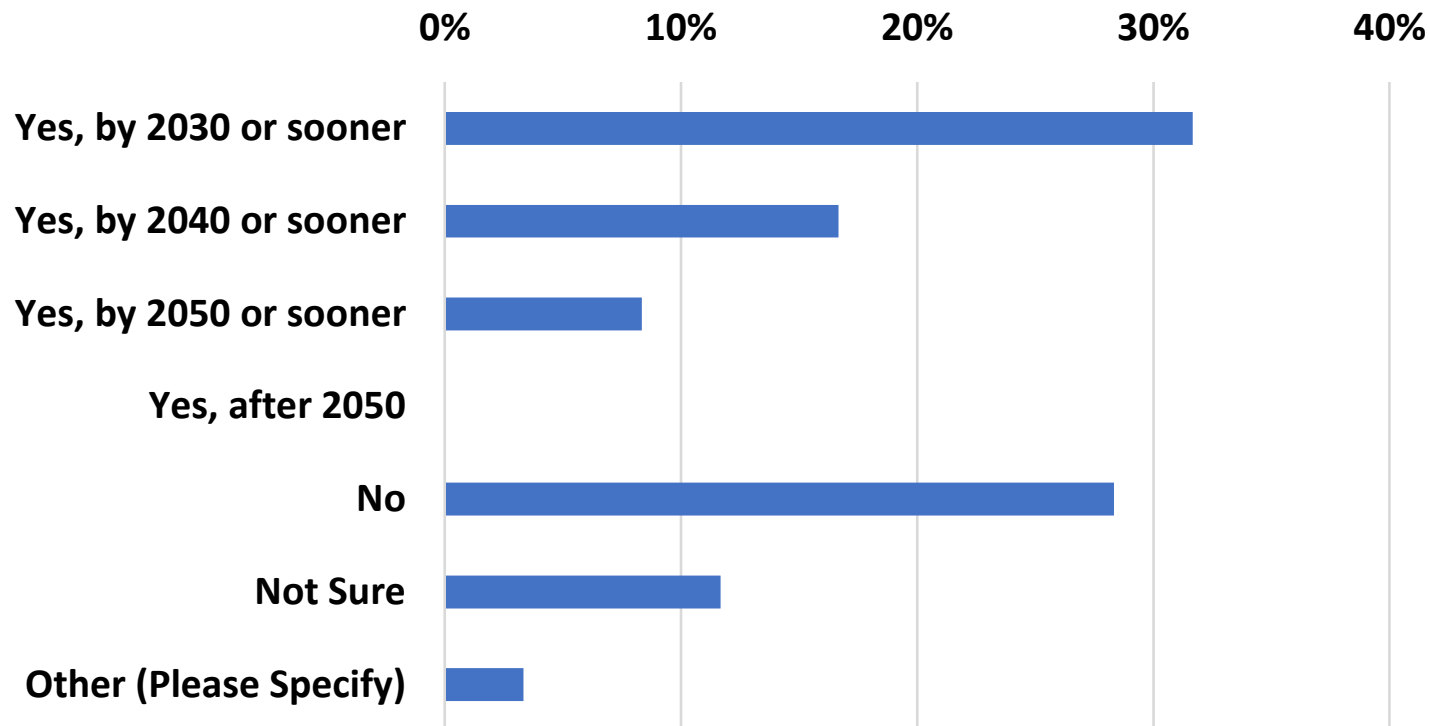
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Net-zero Pledge



57% by 2050 and 32% by 2030



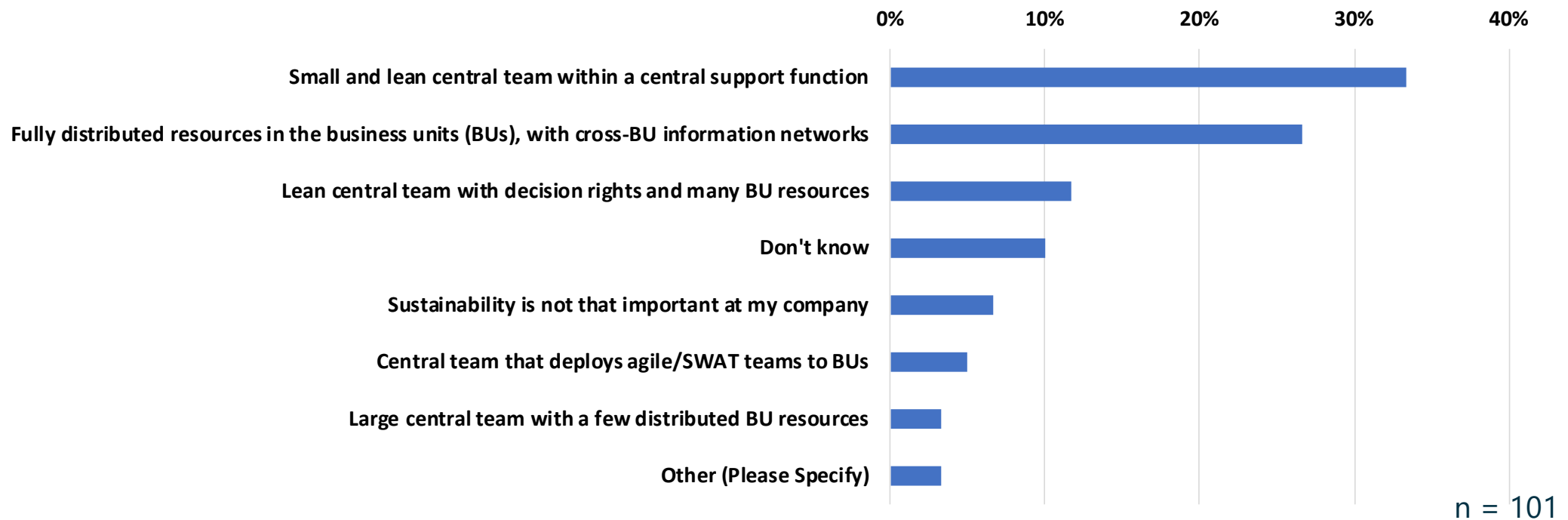
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Organization to Achieve Sustainability



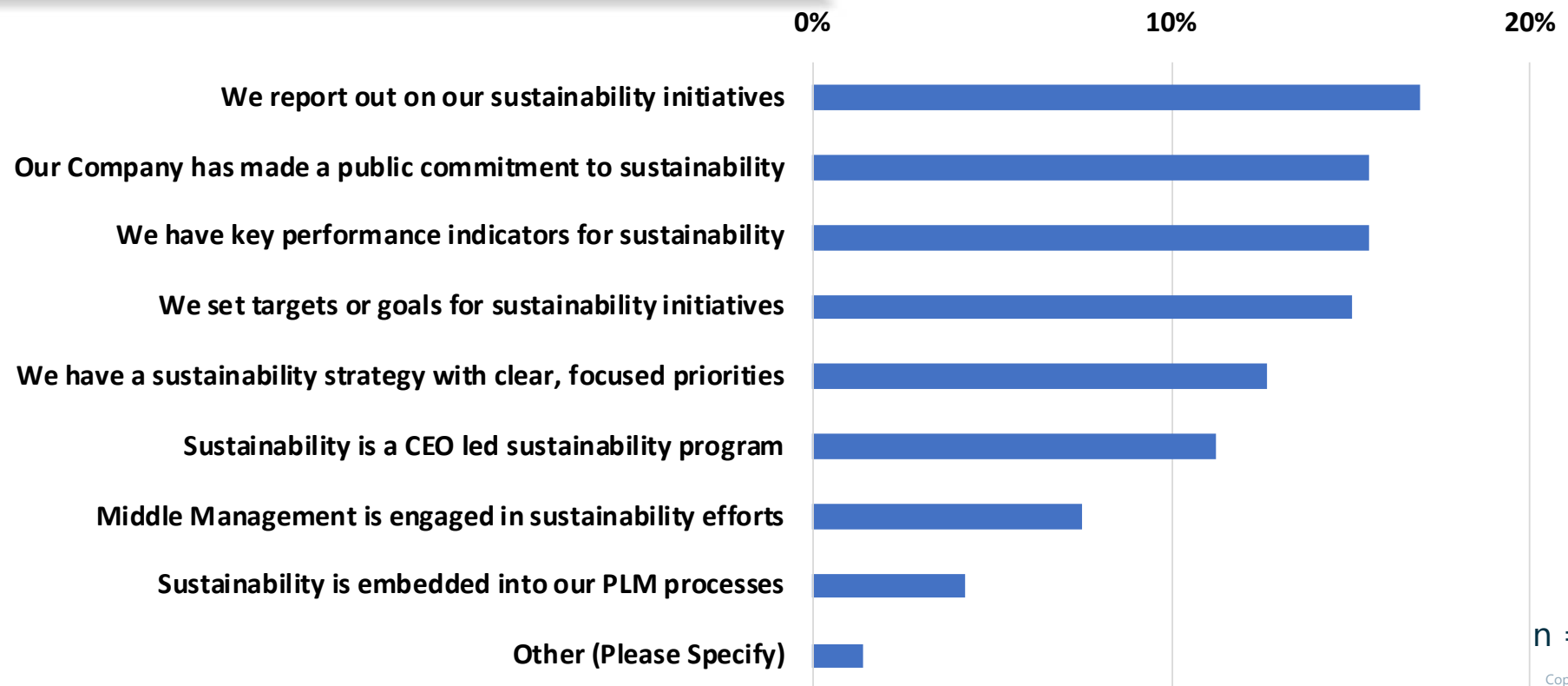
Lean centralized teams will result in weak adoption



Features of Sustainability Program



Very little action being taken on sustainability



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Corporate Sustainability Culture



Corporate culture lags far behind net-zero ambitions



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Motivation to Address Sustainability



Diversity of responses indicates a lack of strategy



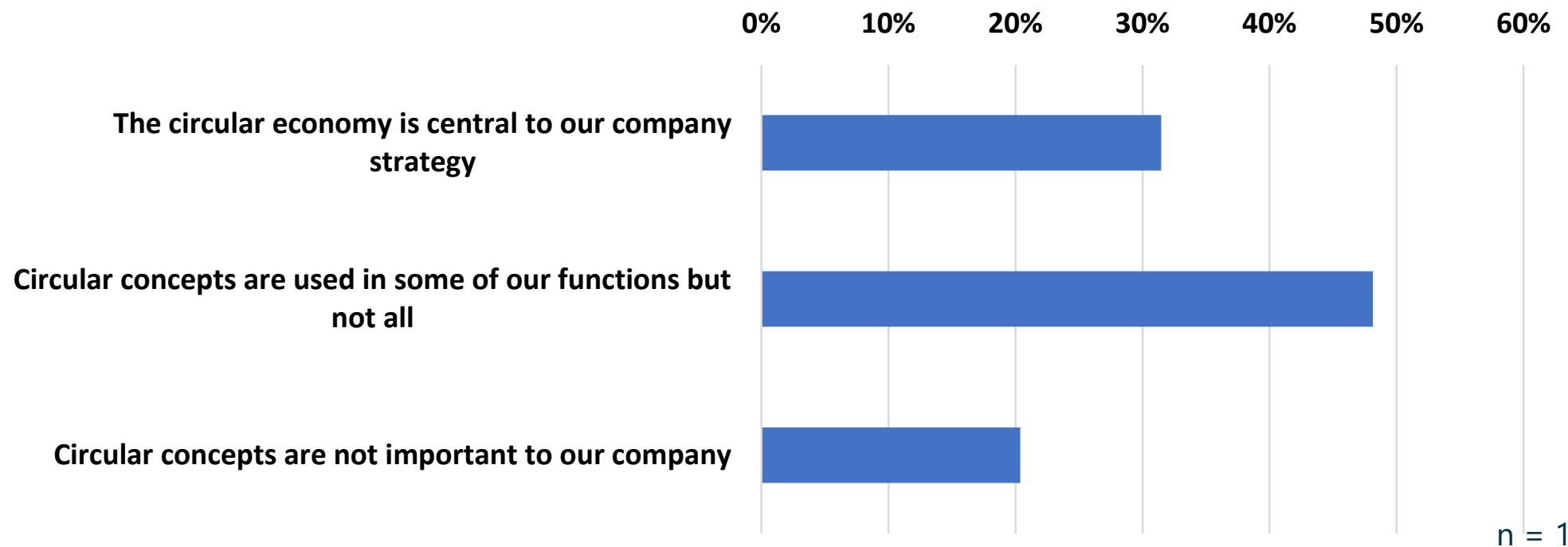
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Circular Concepts in Company's Strategy



Growing number of rate circular concepts as central to their company's strategy



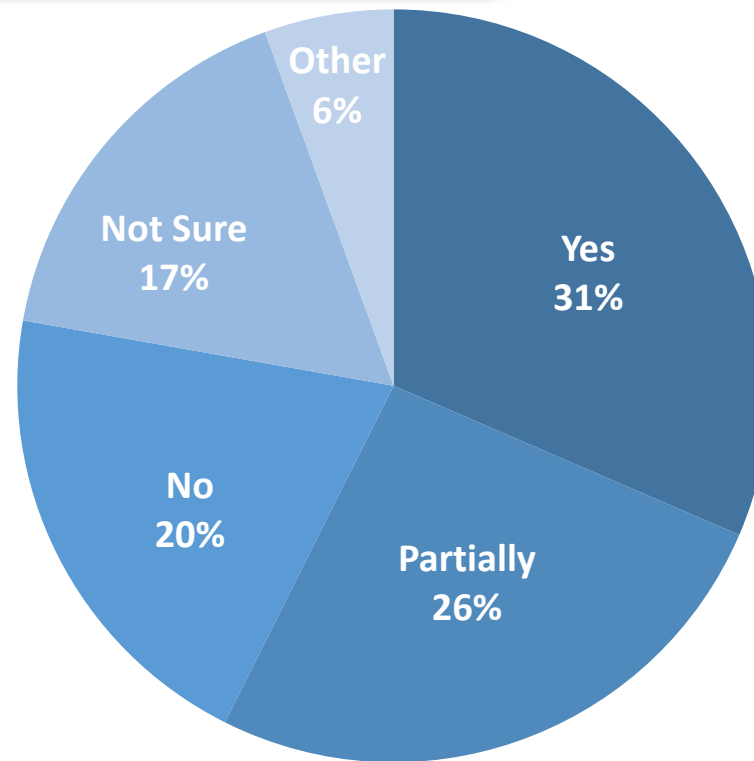
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Does your Company Perform LCAs?



57% of companies are performing some aspects of LCAs



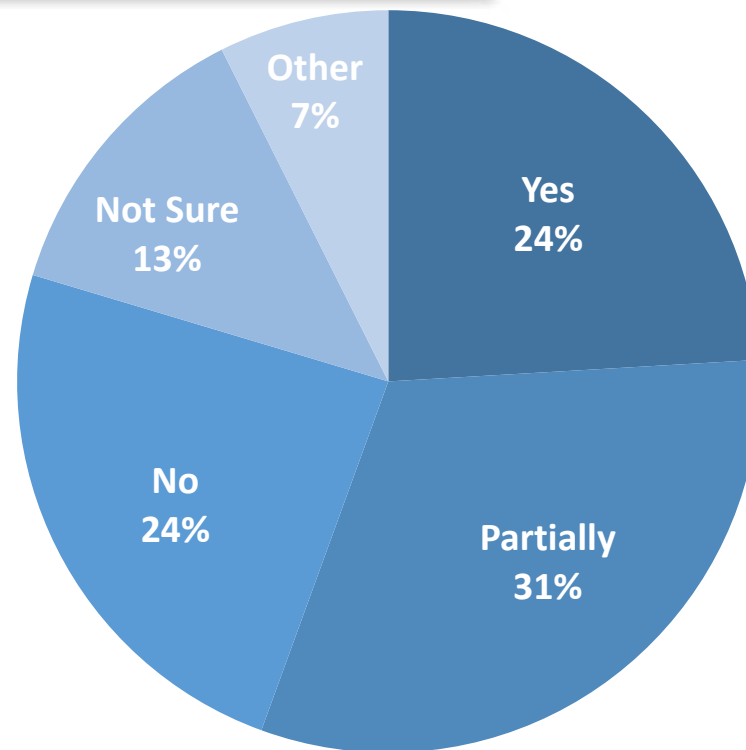
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Product Carbon Footprint During Design



80% of environmental impact is locked-in during design. PCF is not captured in design



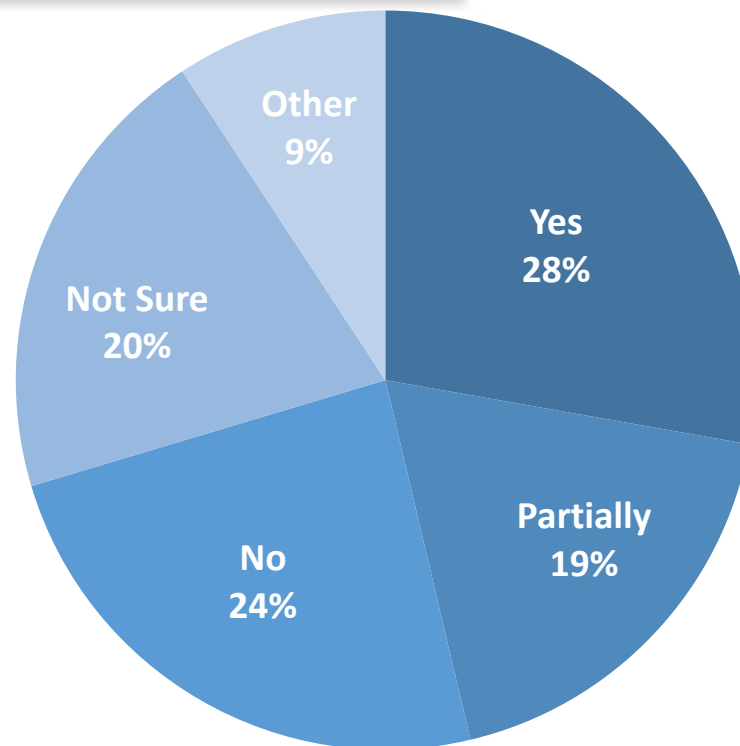
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Design Engineers Accessing Suppliers PCF



65-95% of the environmental impact is in the supply chain (Scope 3 emissions)



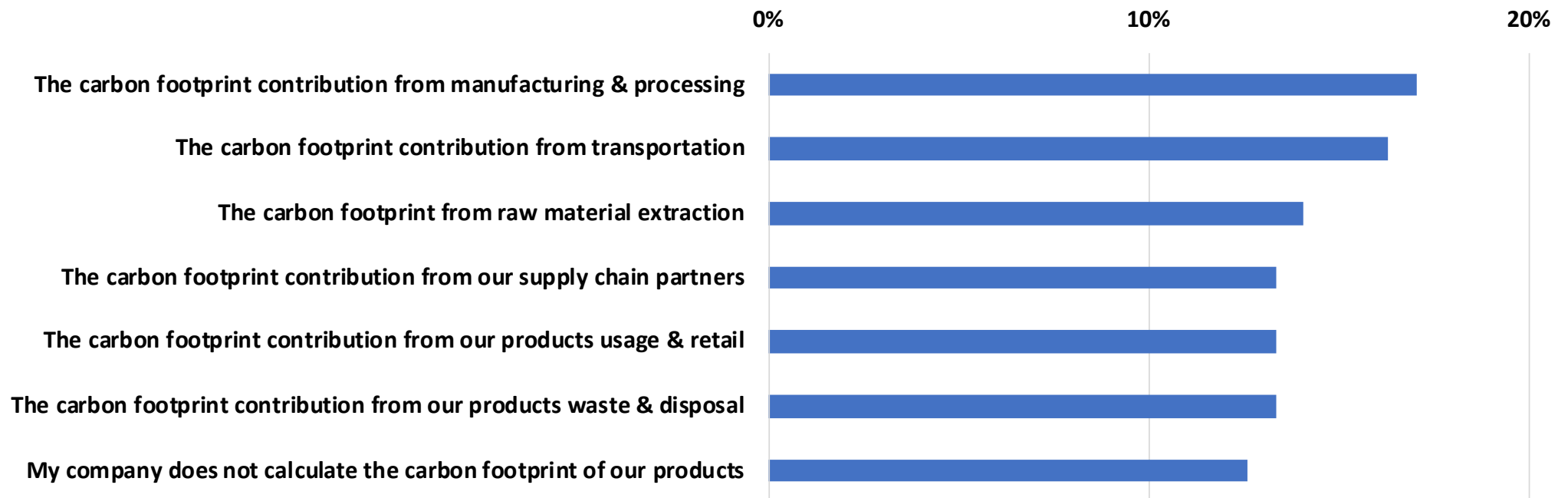
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Elements Included in Calculating PCF



Only 13-17% know their carbon footprint



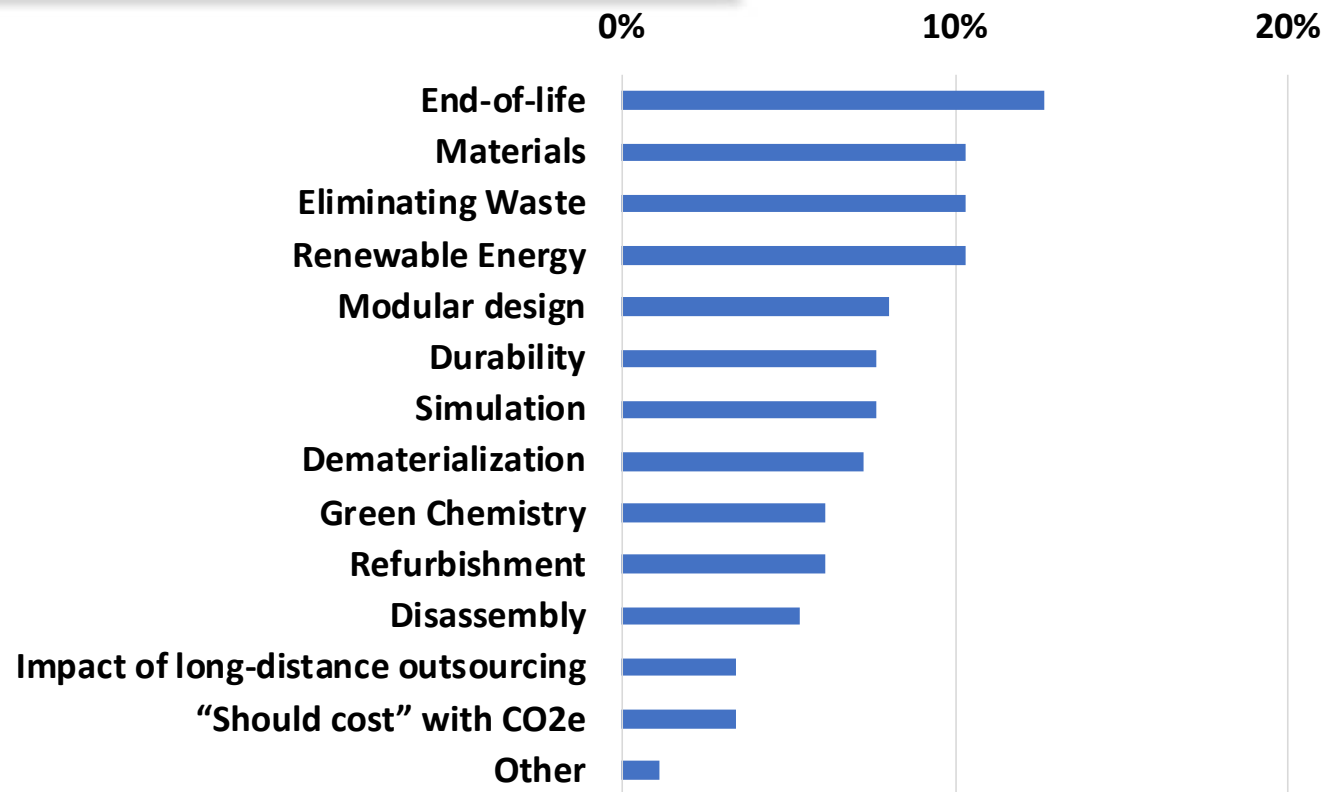
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Sustainable Design



Very few companies practice sustainable design



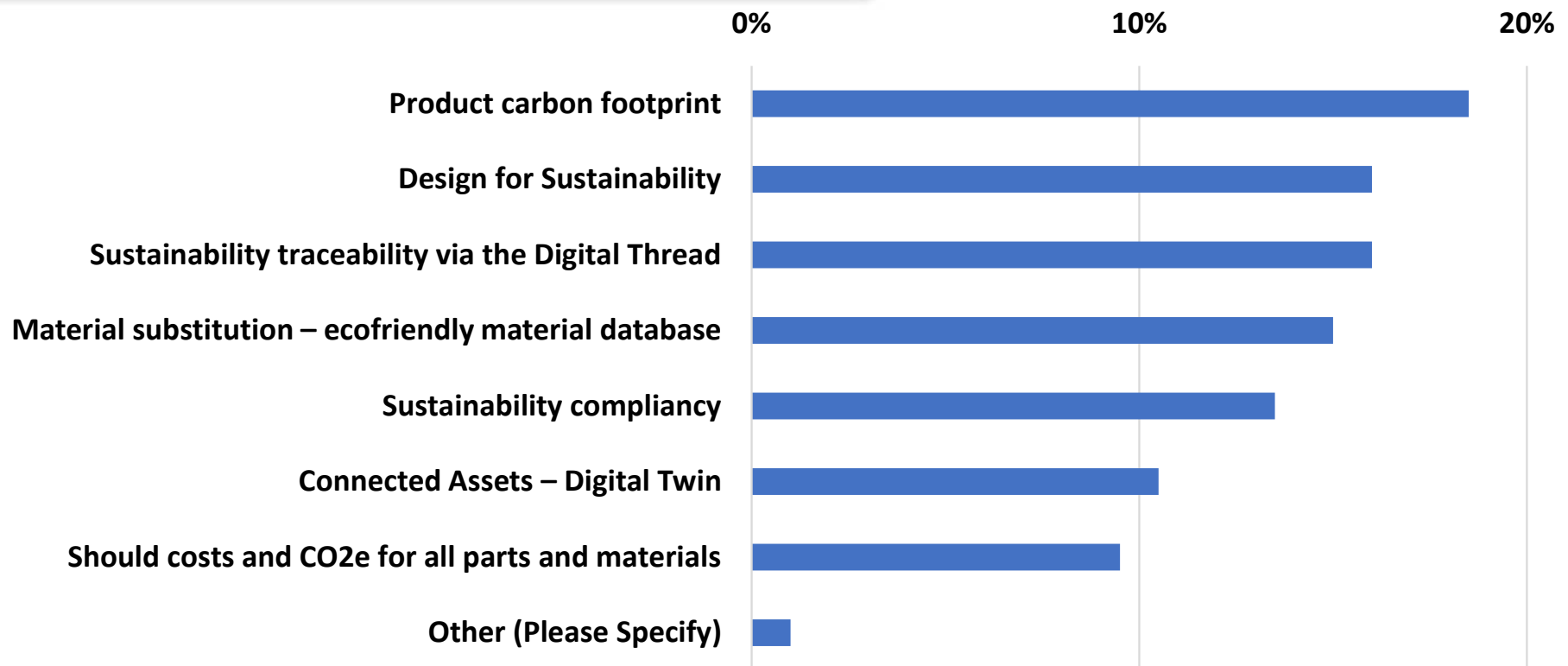
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Where PLM Can Help Sustainability Goals



Product Carbon Footprint was the leading use case



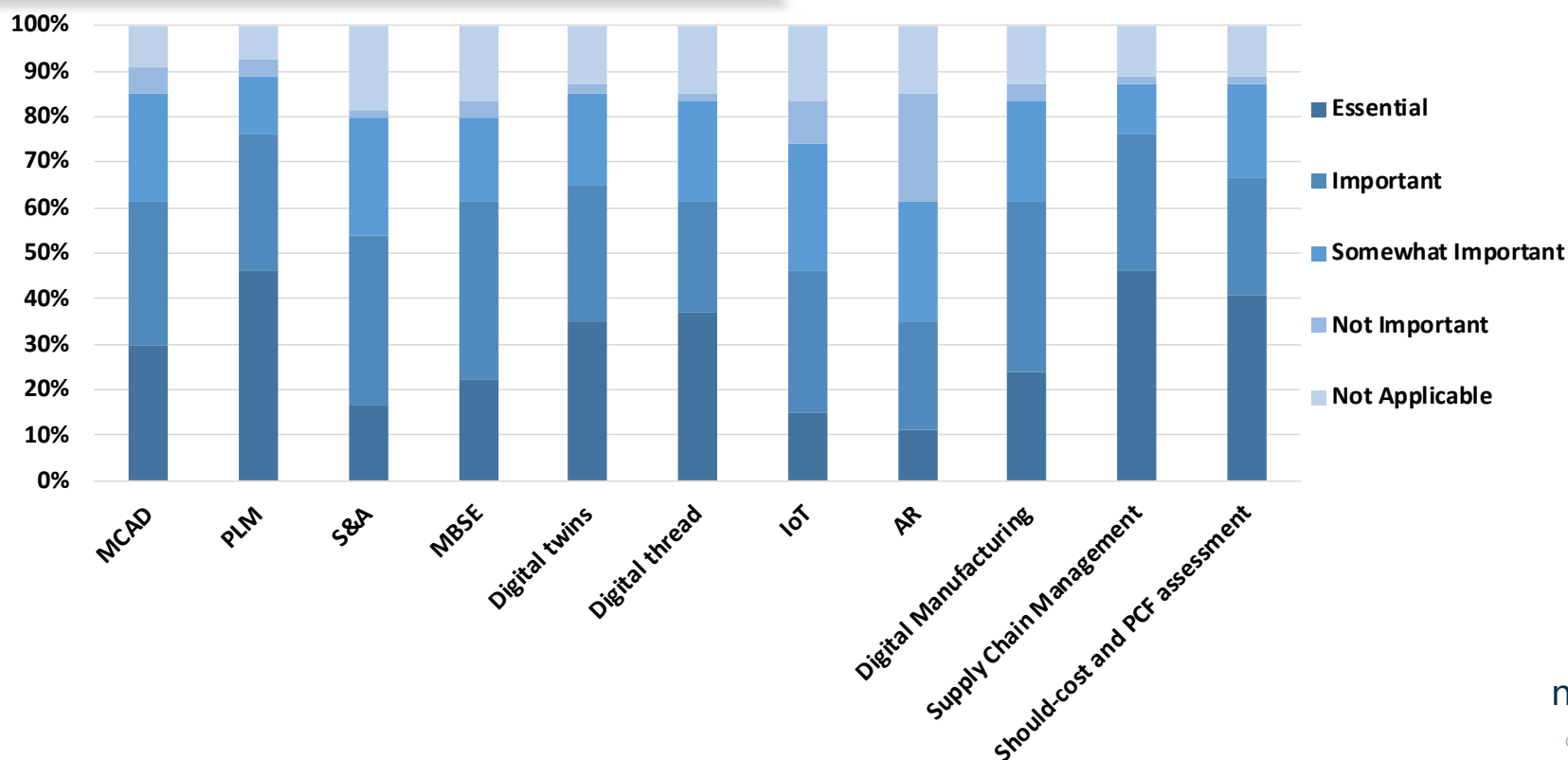
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Technologies Critical to Sustainability



PLM and Supply Chain are the most essential



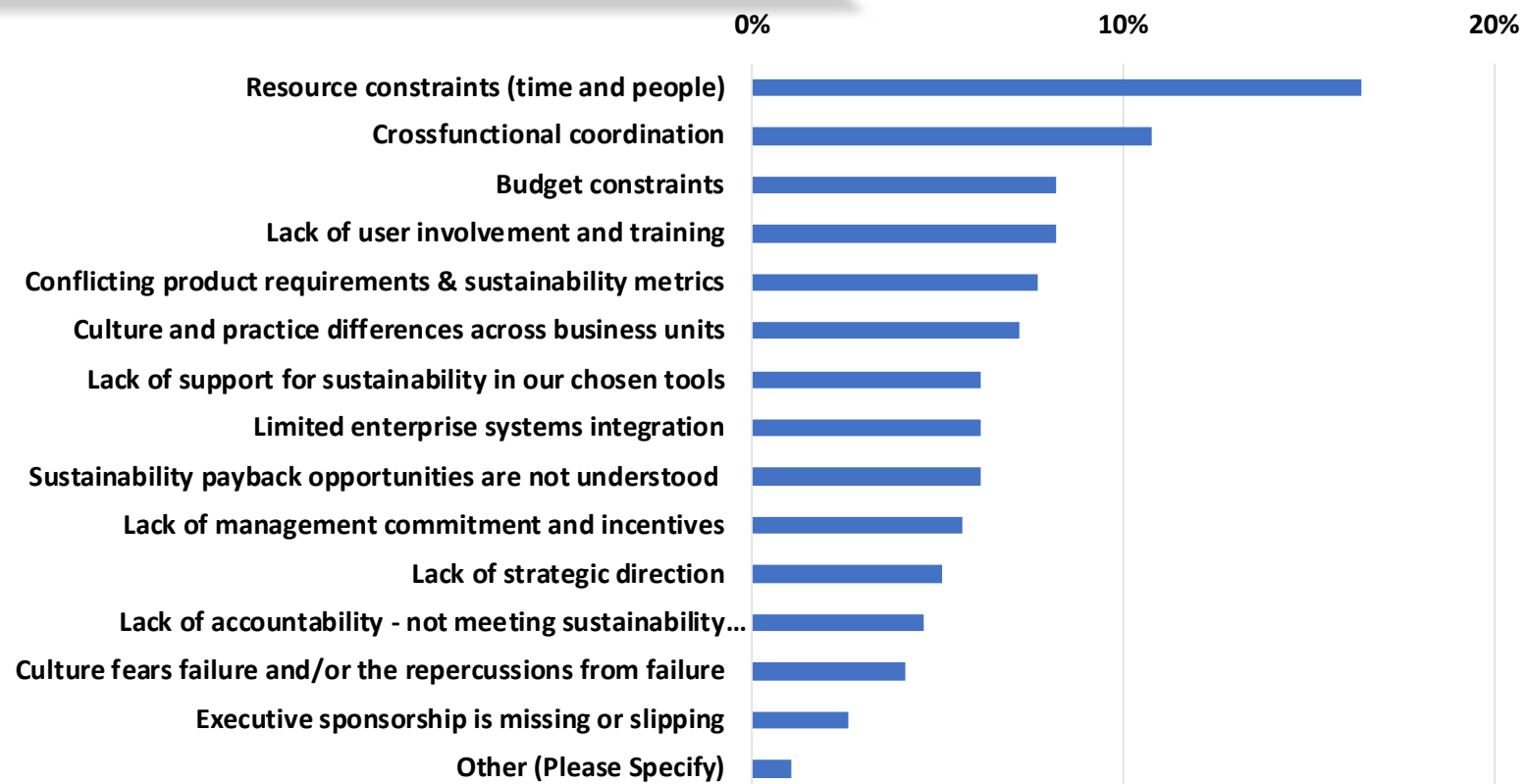
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Bottlenecks to Achieving Sustainability



PLM can overcome most of these barriers



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The Business Opportunity



How can PLM providers best support sustainability requirements

- Organizations need sustainability embedded in PLM to reduce their PCF, engage in sustainable design and the circular economy
- Just like PLM, this is a people, process, and technology issue
- ISVs and SIs et al. can help with all three, depending on their expertise and offerings
- Demands a systemic approach and needs to be supported by a business platform with supply chain visibility, a robust digital thread, and in many cases, digital twins
- PLM and SCM must be more symbiotic

Concluding Remarks



Climate change is an existential threat that offers significant business challenges

- All life on earth is vulnerable to global warming and climate change
- Sustainability requirements are being driven top-down in companies, but not yet ingrained in the corporate culture
- Industrial organizations have a gap between their ambition and actions required to meet their goals
- Advanced capabilities in PLM, supply chain, reducing PCF, and digital twin are seen as essential
- PLM is central to sustainability; industrials, ISVs, and SI/Reseller/VARs need to succeed together

To Learn More...

- Mark Reisig, Executive Consultant, and Sustainability & Green Energy Practice Director
- m.reisig@CIMdata.com
- Mobile: +1.864.320.7987
- CIMdata has several useful resources on this topic:
 - [Sustainability and Green Energy Consulting Practice](#) on this topic
 - Webinar: [The Green Energy Transition and Sustainability](#) January 23, 2023
 - Webinar: [Webinar: Meeting Sustainability and Green Energy Transition Objectives: The industrial Perspective](#), April 27, 2023, 11:00 AM EDT
 - Article: [Accelerating the Transition to Green Energy with Product Lifecycle Management](#) (www.powermag.com)
 - Article: [Climate Change is Transforming PLM Strategies](#) March 10, 2023, (<https://industrytoday.com/>)

Questions & Answers

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What's on your mind?



CIMdata Defining What Comes Next in Digital Transformation



*Strategic management consulting for
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