

# OUTLOOK, TRENDS & FUTURE MARKETS FOR SINGLE-USE

*Collaboration, technology & innovation: shaping the  
future of single-use*

Tuesday July 11th 2023



Bio-Process Systems Alliance  
*Advancing Single-Use Worldwide*



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# Big Picture Outlook and Trends



SINGLE USE IS DEFINITELY  
MAINSTREAM



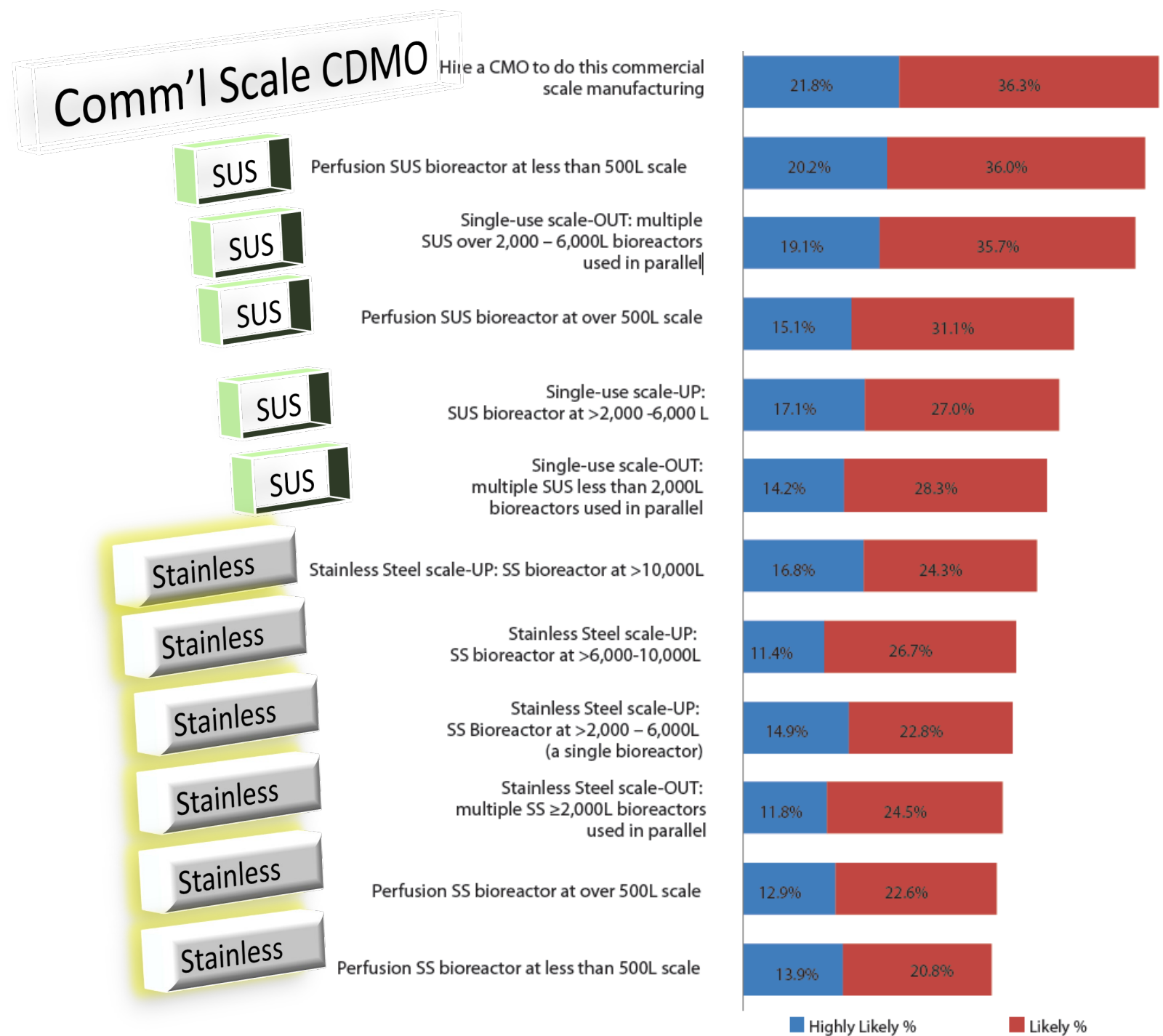
INDUSTRY IS MATURING,  
GETTING MORE EFFICIENT



EXPECTING ITS SUPPLIERS  
TO SUPPORT PRODUCTIVITY

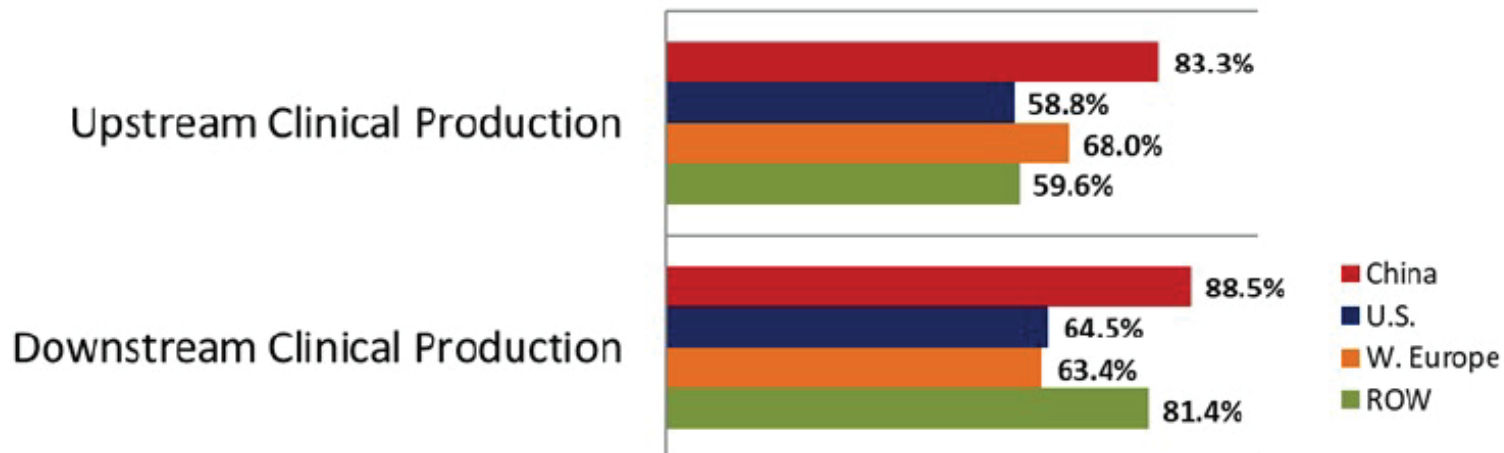


# Top Options for Bioreactor Platforms at Commercial Scale, 2023





# Estimated Percentage of Facilities' Unit Operations that are "Single-Use or Disposable" 2023

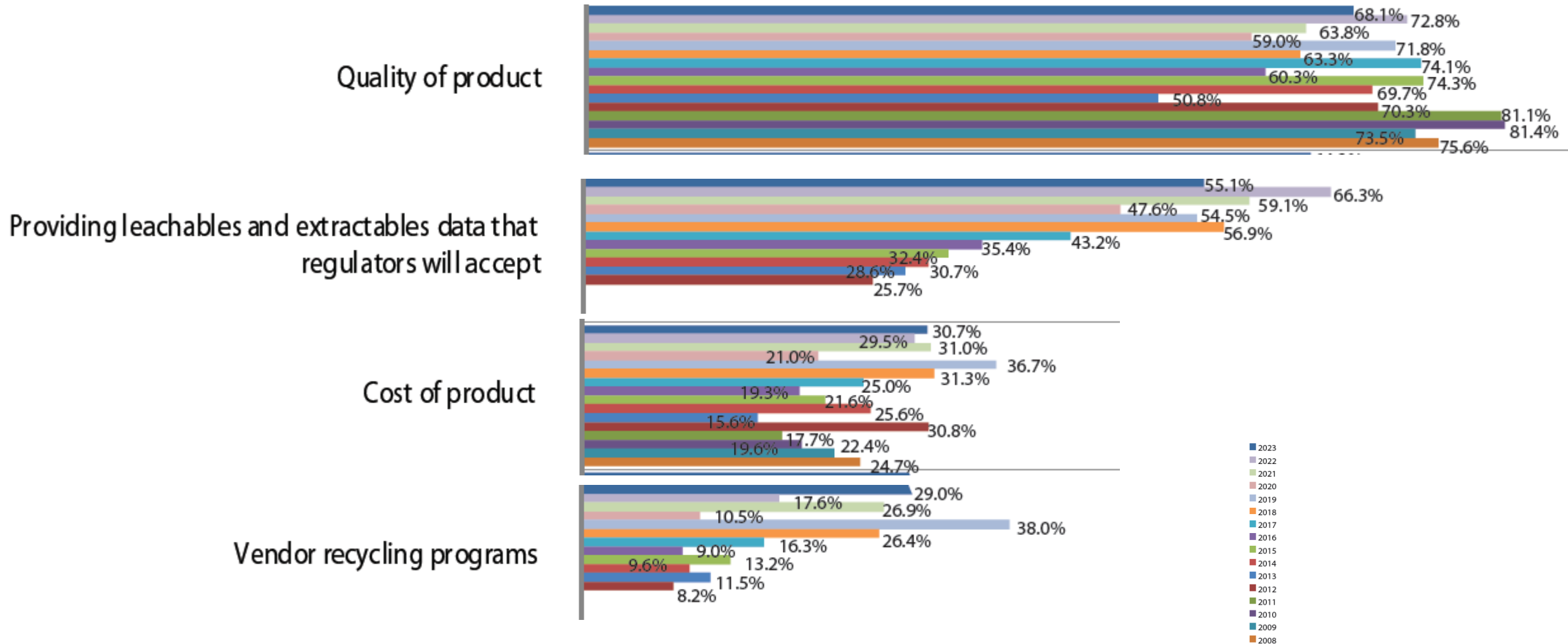


Source: BioPlan's 2nd Annual: China's Position in Global BioManufacturing A Comparison of China's Emerging Position vs Established Regions' Manufacturing Capacity and Production

- **83% of China's Upstream BioManufacturing is Single Use**
- ...New Bioprocessing is mostly SUS at clinical scale.
- *(China's bioprocess industry is mostly 'new').*



# Single-Use Vendor Satisfaction, 2008 - 2023

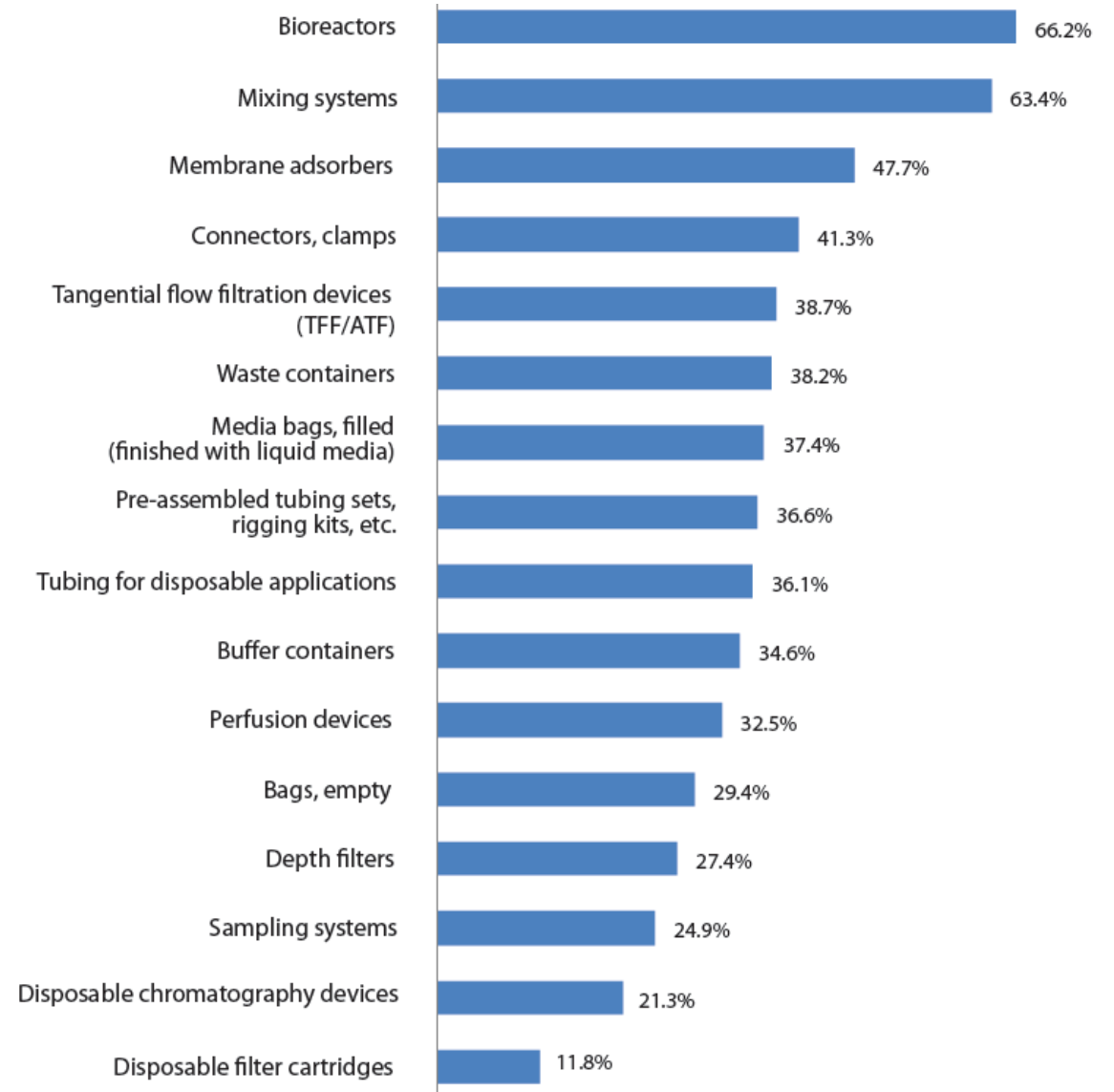




# *17-Year, Percentage-point Increase in Usage of Disposables*

*All Stages R&D & Manufacture, 2006-2023*

*(Note: Not growth in sales, this is growth in application first usage within a facility)*





# Post-COVID, What's Driving the Industry?



CAPACITY CONSTRAINTS ARE  
RETURNING TO NORMAL



LOOKING TO SINGLE USE TO  
ADDRESS CAPACITY CHALLENGES

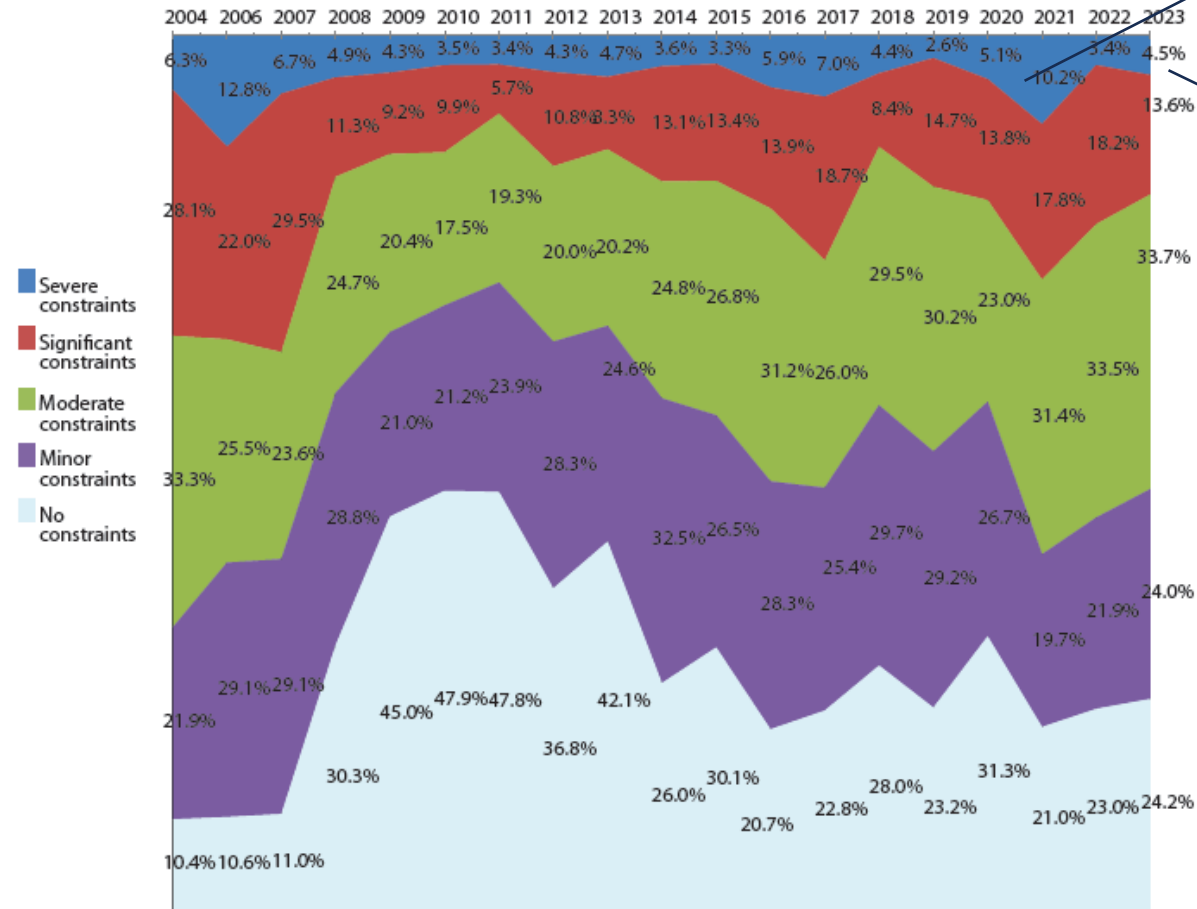


INCREASING EXPENDITURES ON  
SUS



# 20 Years: Capacity Constraints Trends (2004-2023)

*I believe our facility is experiencing production capacity constraints "today"*



COVID Severe  
Constraints  
2021-2022

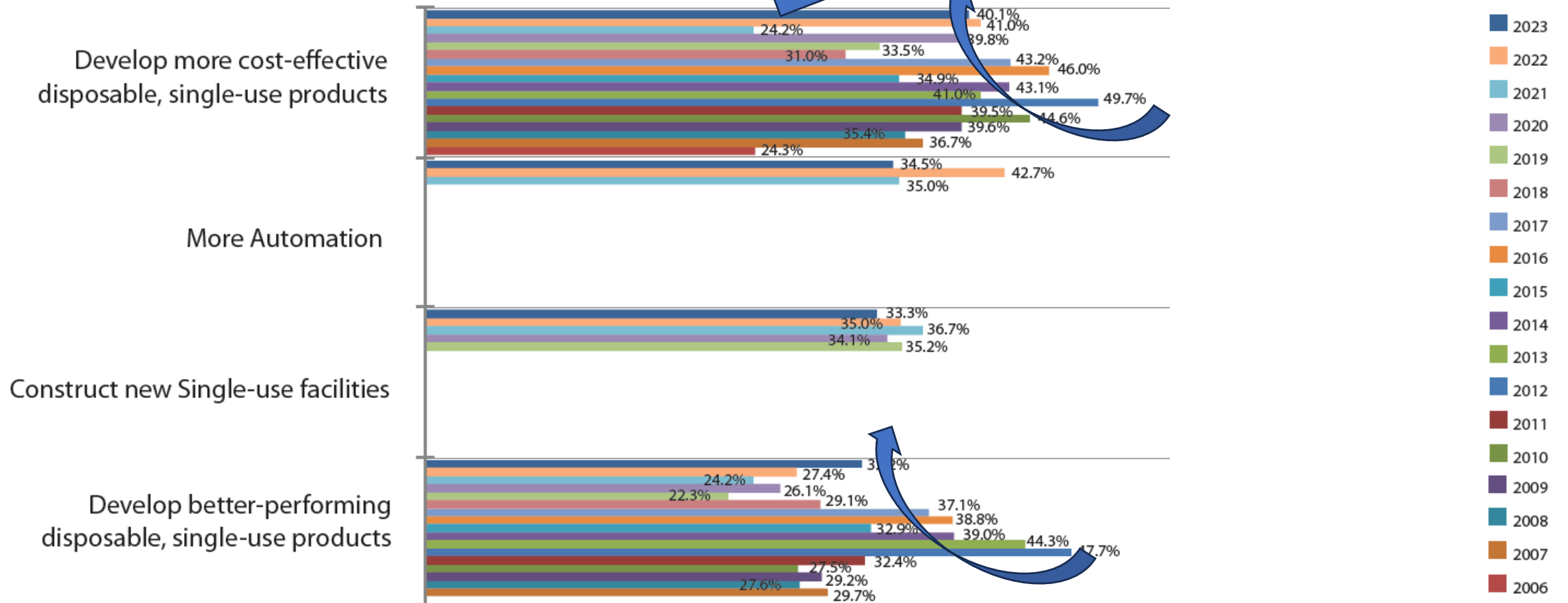
Post-COVID  
2023



# Key Areas to Address to Avoid Capacity Constraints (2006-2023)



*"If this industry is to avoid significant capacity constraints, the most important areas to address are:*







Changes in Bioprocess  
Consumables Ordering

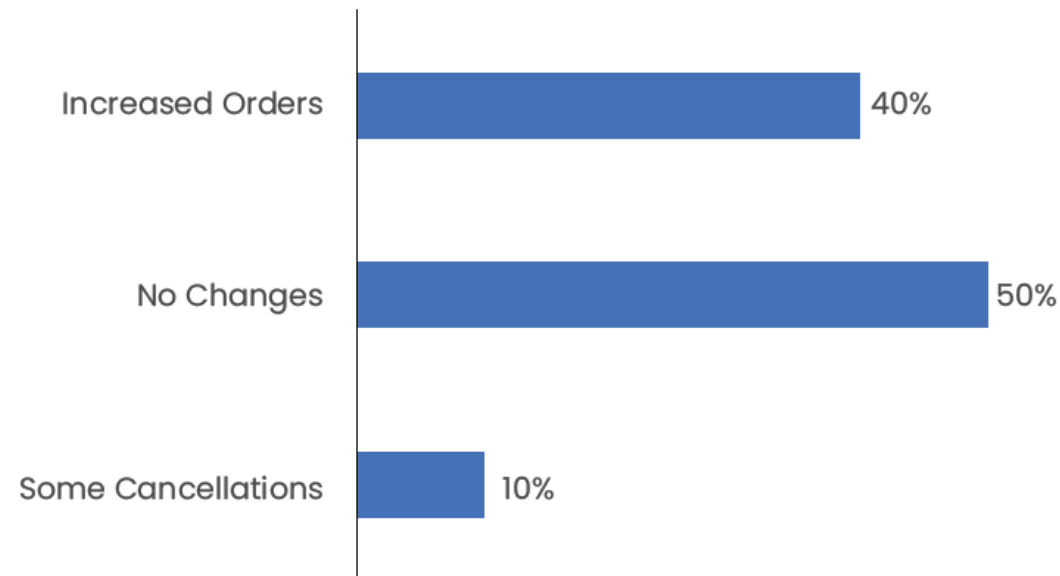


Suppliers' vs Biopharma's  
Perspectives

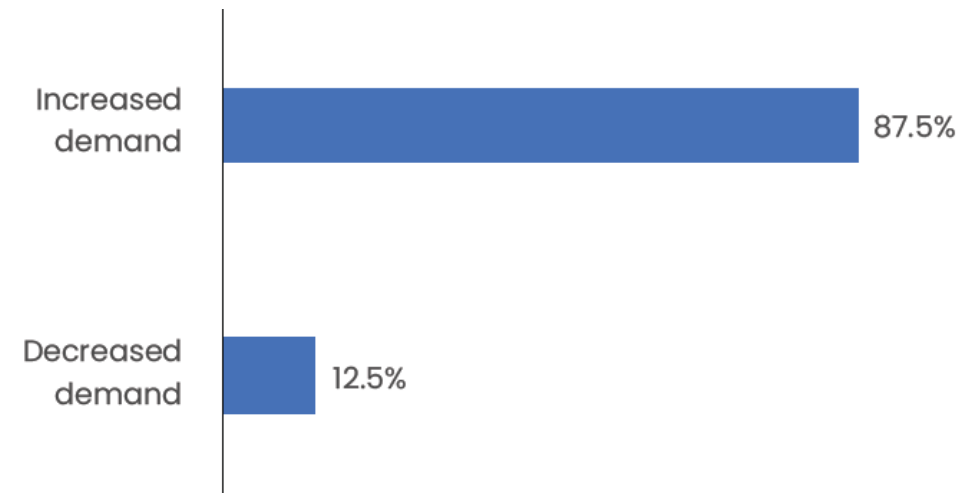


# Biomanufacturer Facility Changes in Ordering for Bioprocess Supplies 2022-2023

## End User (Biomanufacturer) Facility Changes in Ordering for Supplies and Consumables (Past 12 Mo)



## Expected Changes in Use of Bioprocessing Consumables (End Users)

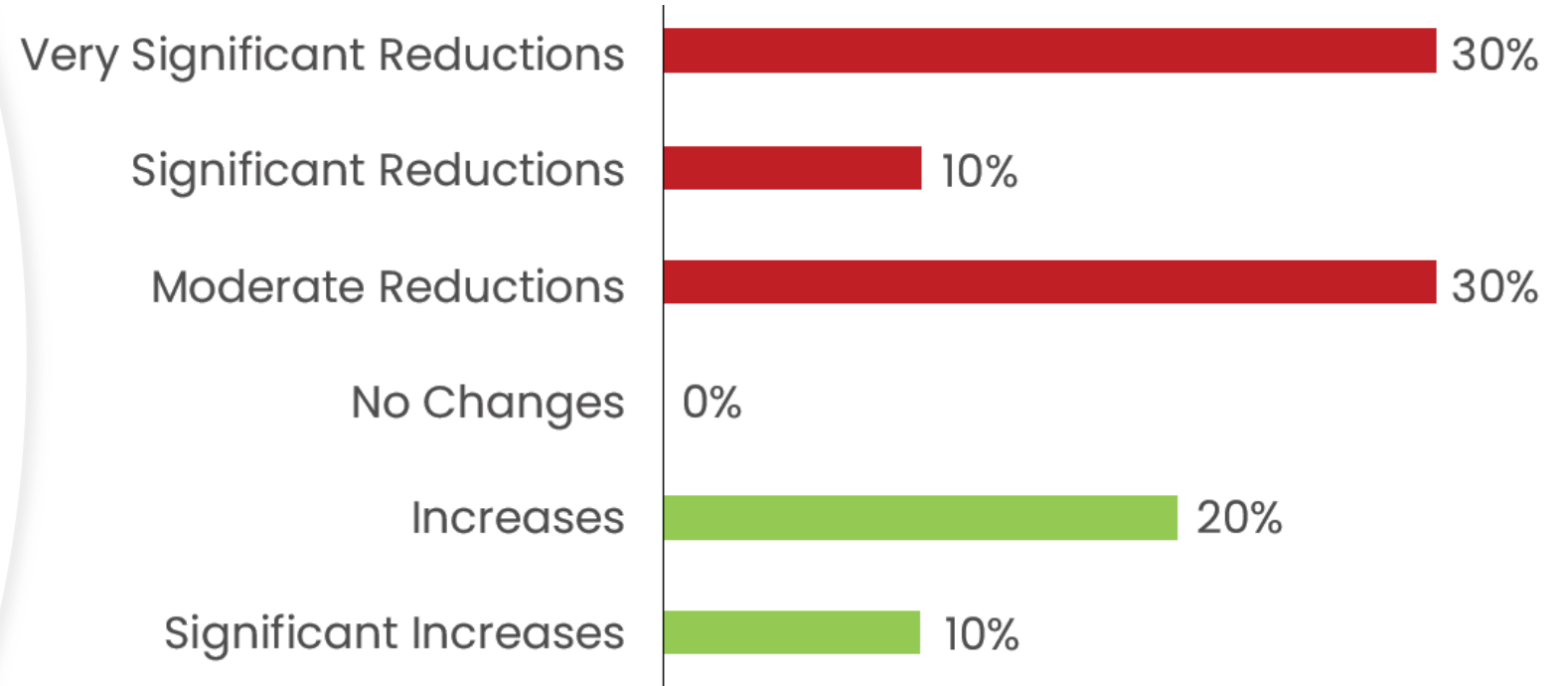


Source: BioPlan's White Paper, Impact Of Covid-19 On Bioprocessing Supply Chain Hiring, and Inventory, 2022 (Large and mid-Scale Facilities)



# SUPPLIERS' PERSPECTIVE: CHANGES IN ORDERING

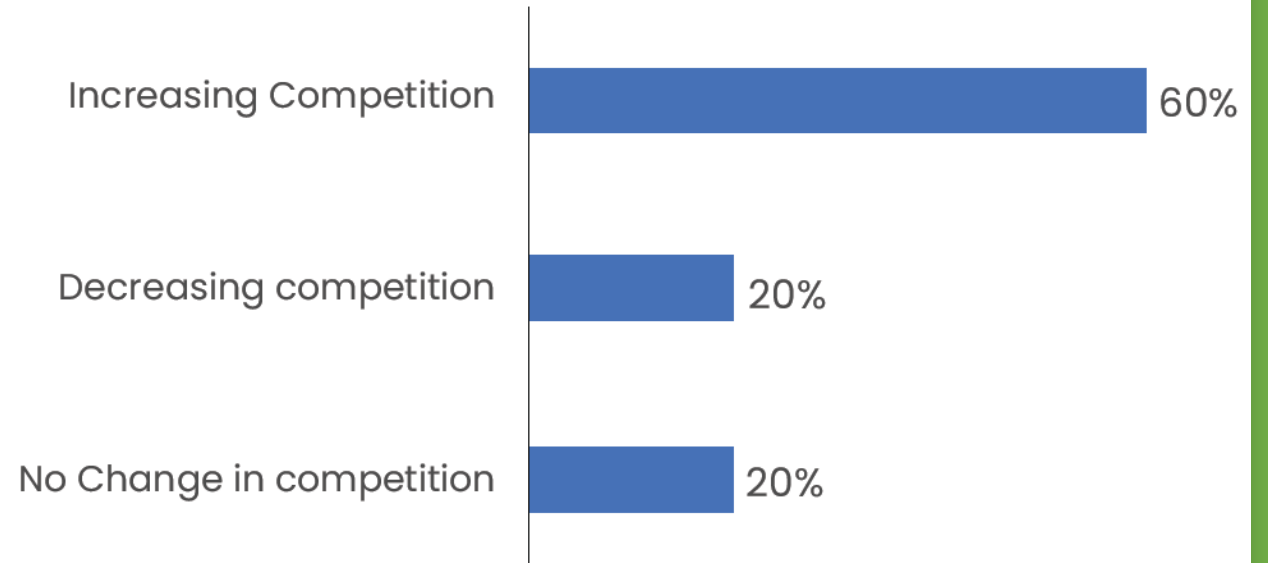
Source: BioPlan's White Paper, Impact Of Covid-19 On Bioprocessing Supply Chain Hiring, and Inventory, 2022 (Large and mid-Scale Suppliers)







## Suppliers Expecting Increased Competition

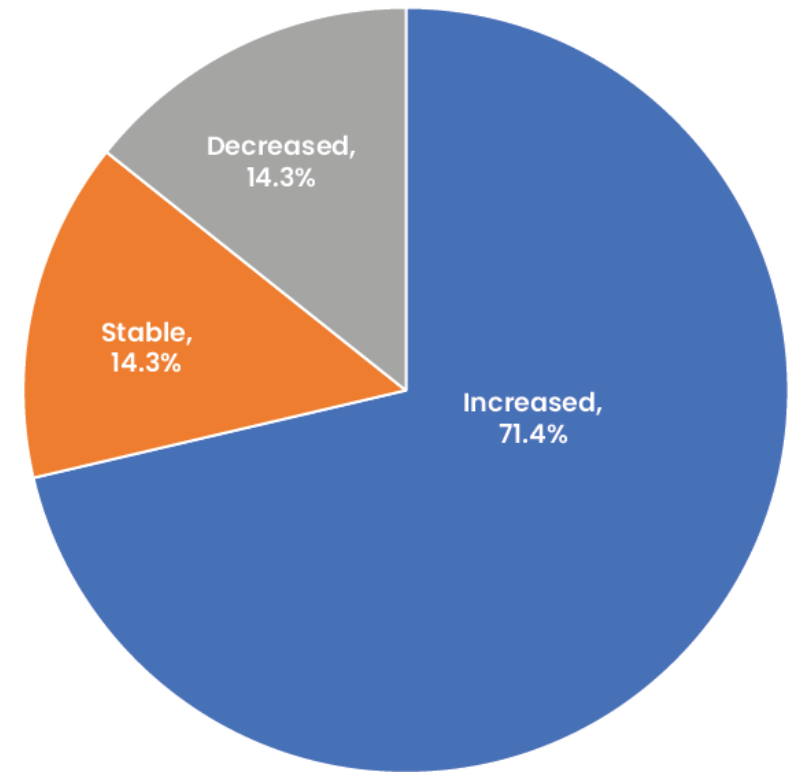




# End-users Expecting Competition Among Suppliers to Reduce Prices and Expenditures

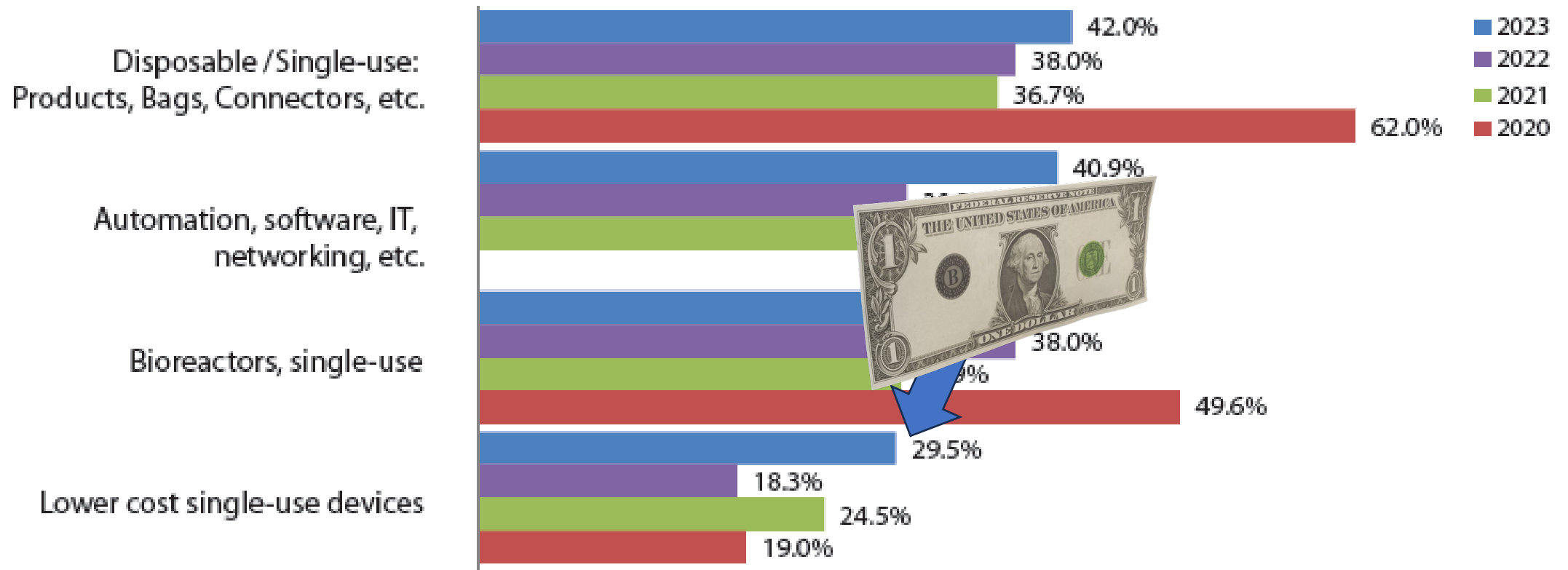
## Supply chain, availability, and lead-times problems during COVID created competitive opportunities:

- Secondary, 3<sup>rd</sup> and 4<sup>th</sup> tier suppliers saw successful market entry and growth.
- Additional competition = Potential to impact competitive pricing
- ***Over 71% of End-user respondents expect increased competition to continue, leading to reduced prices.***





# Top NEW Bioprocessing Expenditure Areas in 'Past Year' (2020-2023)





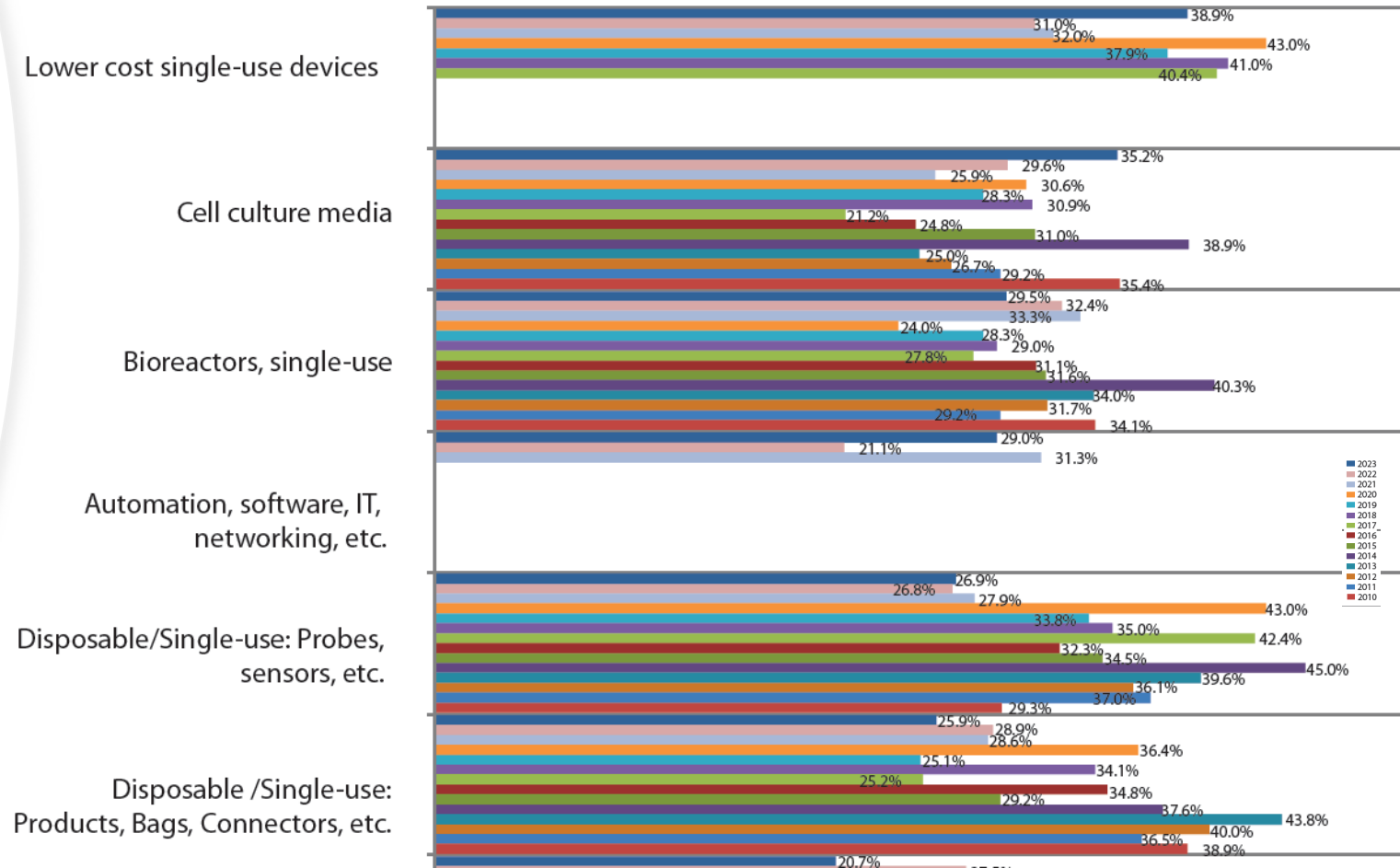


# Addressing Competition

- Competing on something other than price...

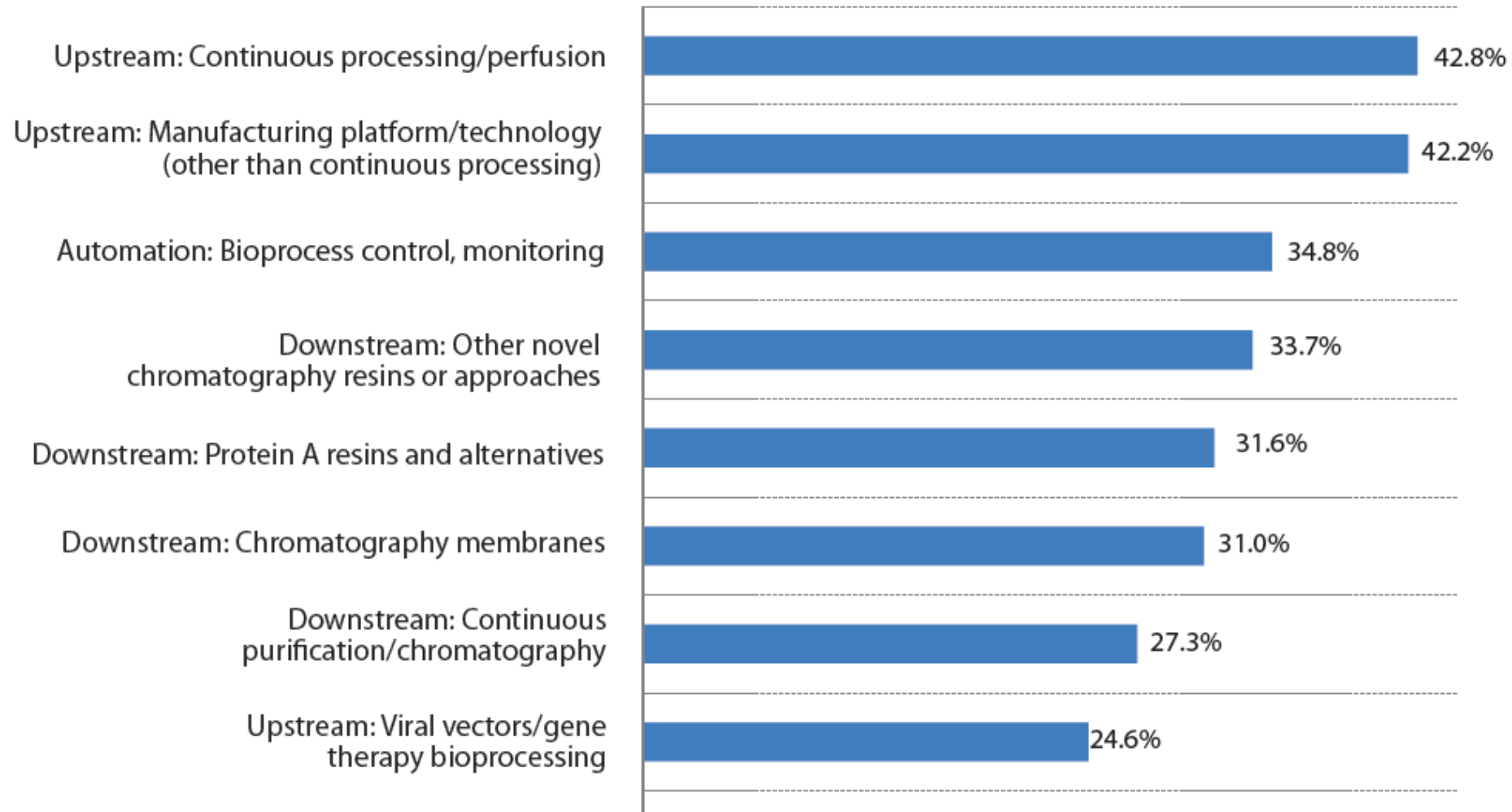


# Upstream NPD Areas Where Suppliers Should Focus Efforts (2010-2023)





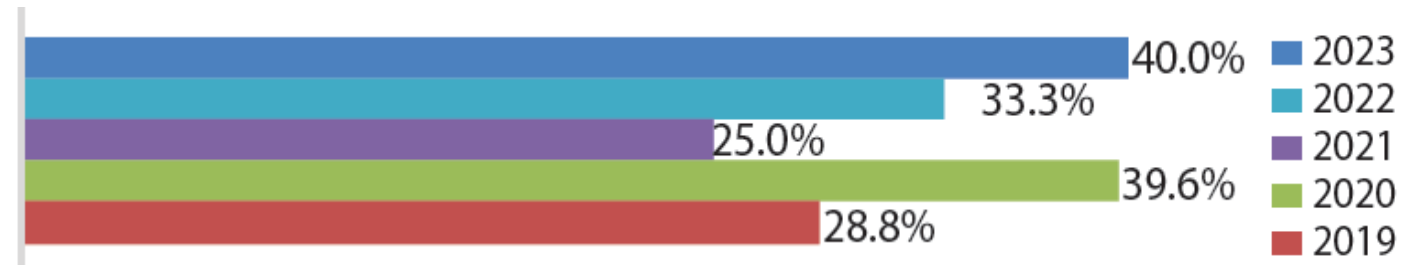
# Novel Bioprocessing Innovations to be Evaluated in Next 12 Mo, 2023





# Most Needed Improvement Area in Cell Therapy: Customized SUS CT systems is #1

More single-use systems for cell therapy



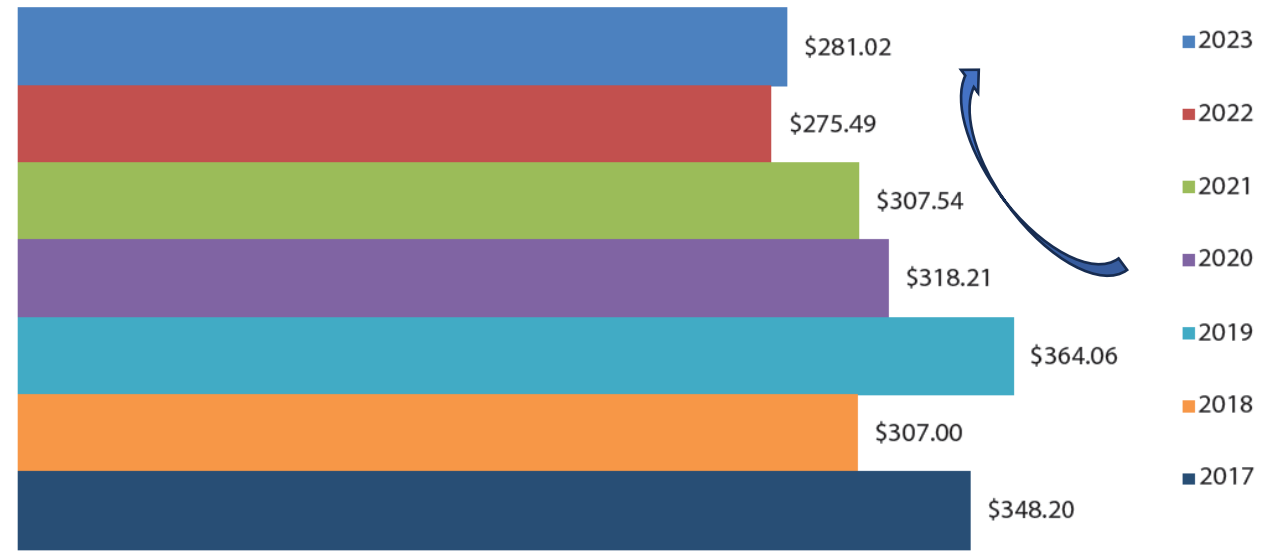


# Selected Operational Changes Due to Recent Global Economics (2010-2012, 2022-2023)





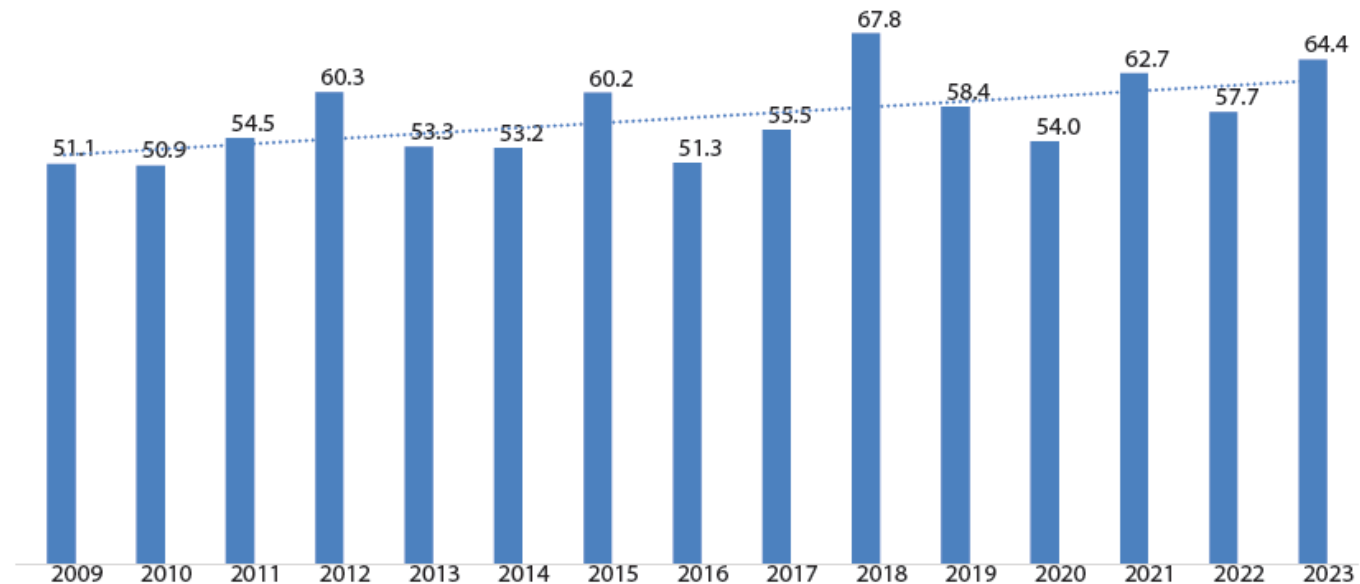
# Average Cost/Gram for Primary Recombinant Protein (2017- 2023)





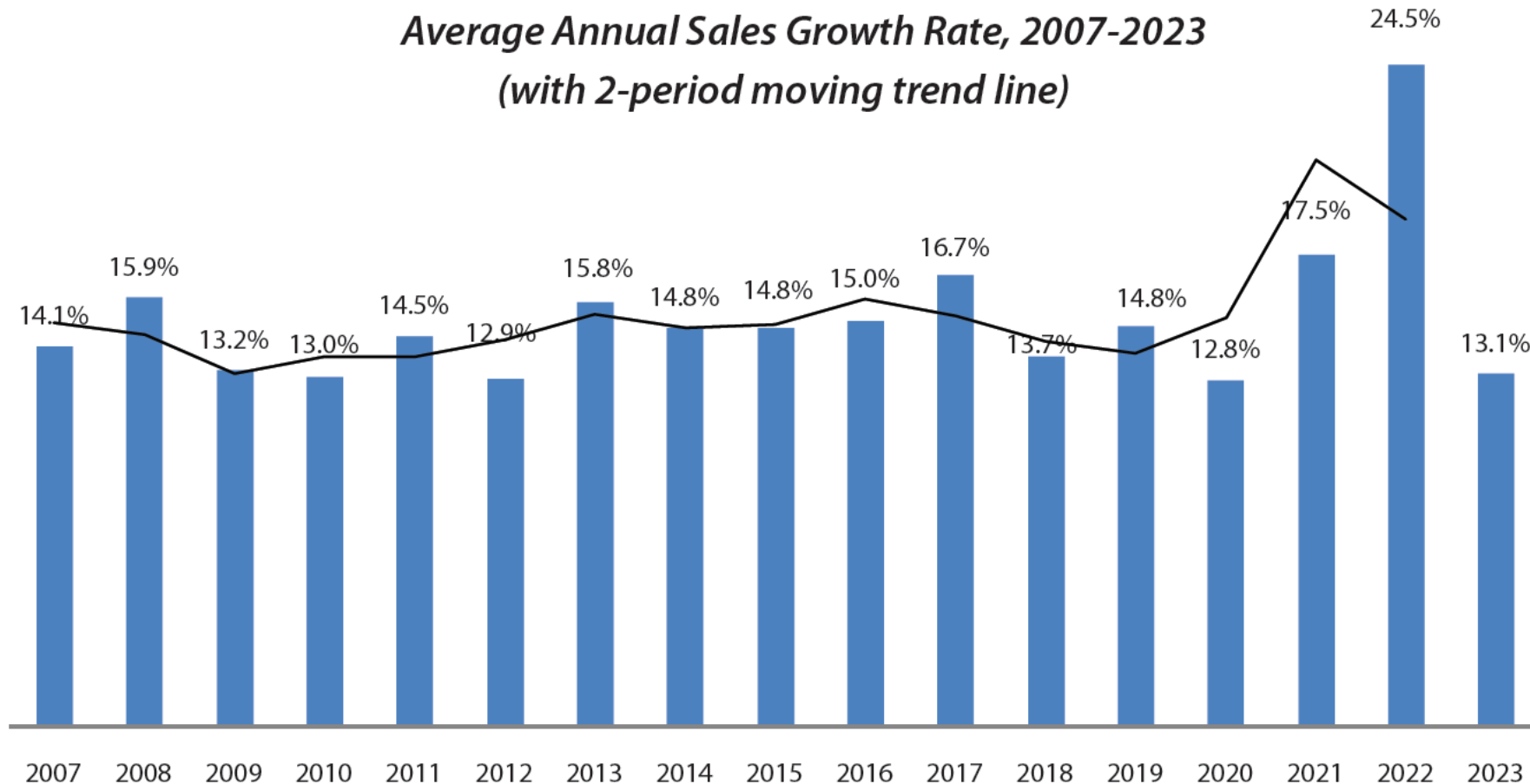
# Average Time (weeks) Between Batch Failures, 2009-2023

*"How long ago was the last batch failure at your facility (unit)?"*



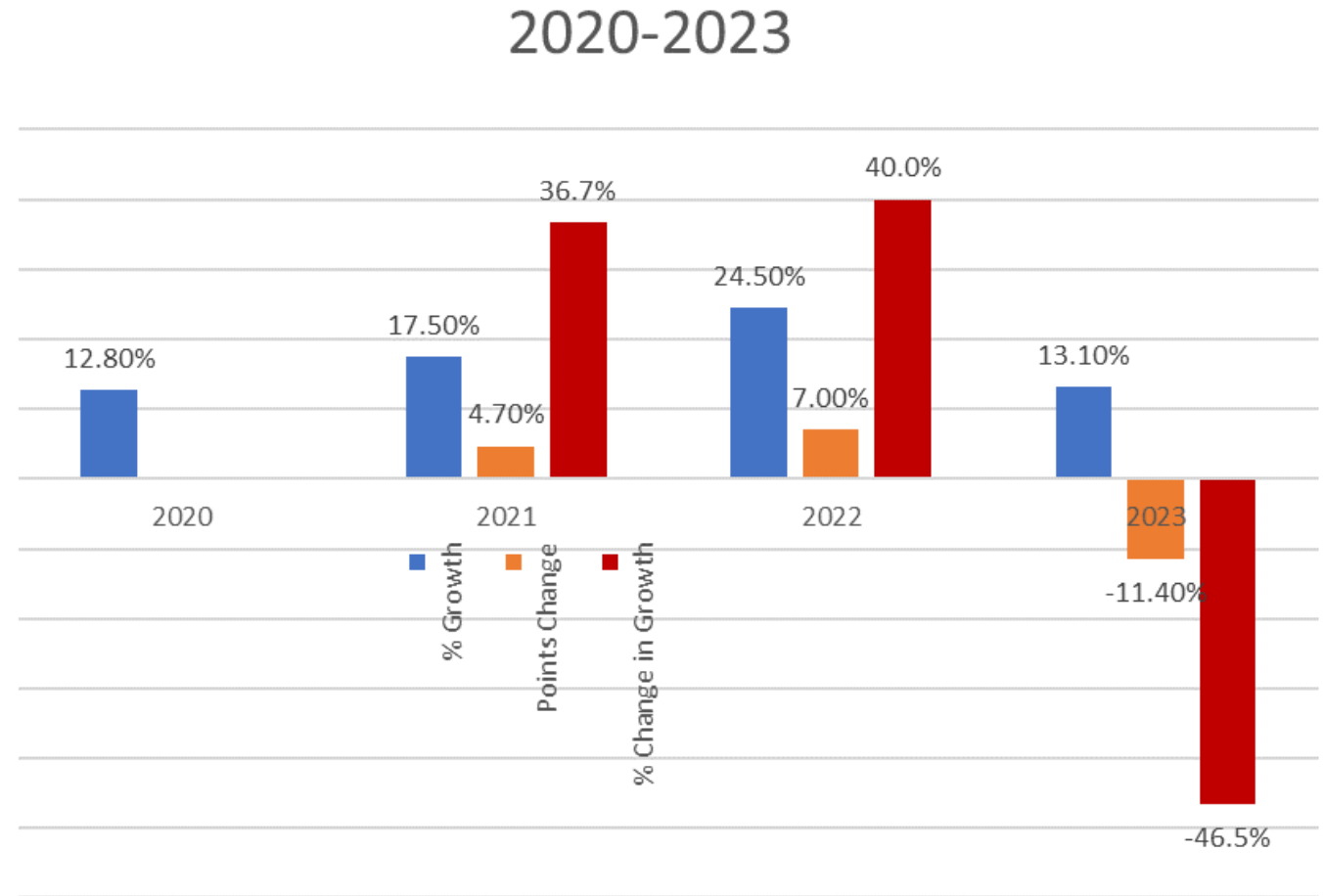


# Vendor Sales to BioManufacturers (*All segments*)





# Change in Revenue BioProcess Supplies Through COVID





# Summary

## **Biopharma continues its return to stable, consistent growth**

- **COVID challenged the industry, but it appears to be returning to consistent 20-year growth trends**
- **Overall demand for bioprocess supplies remains strong**
- **New competitors have arrived: COVID created a more competitive environment...deal with it.**





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# Outlook, Trends & Future Markets for Single-Use

By

Larry West

Publisher, Aspen Alert



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*Advancing Single-Use Worldwide*



BPSA International  
Single-Use Summit



# Introduction

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## Aspen Alert

- Introduced in 2008
- Distributed Daily to an Opt-In Audience of 50,000+ Subscribing Biotechnology and Bioprocessing Professionals
- Aspen Alert Survey Questions (ASQs) Introduced in 2009
  - 1,195 Questions Asked To Date, 200+ Specific to Single-Use



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# Outlook

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## Resilience Study 2023

- Cytiva & Longitude (Financial Times)
- Conducted in January and February 2023
- 1,250 Biopharma Executives, Representing 22 Countries

<https://cdn.cytivalifesciences.com/api/public/content/dfNVgLAYxEGcOE2XCy8Ydg-original?v=b0464463>



# Outlook

2023 Global Biopharma Resilience Index Scores

■ 2021 ■ 2023



Overall biopharma  
resilience score

Fig 1. Overall, global biopharma resilience has weakened since 2021.



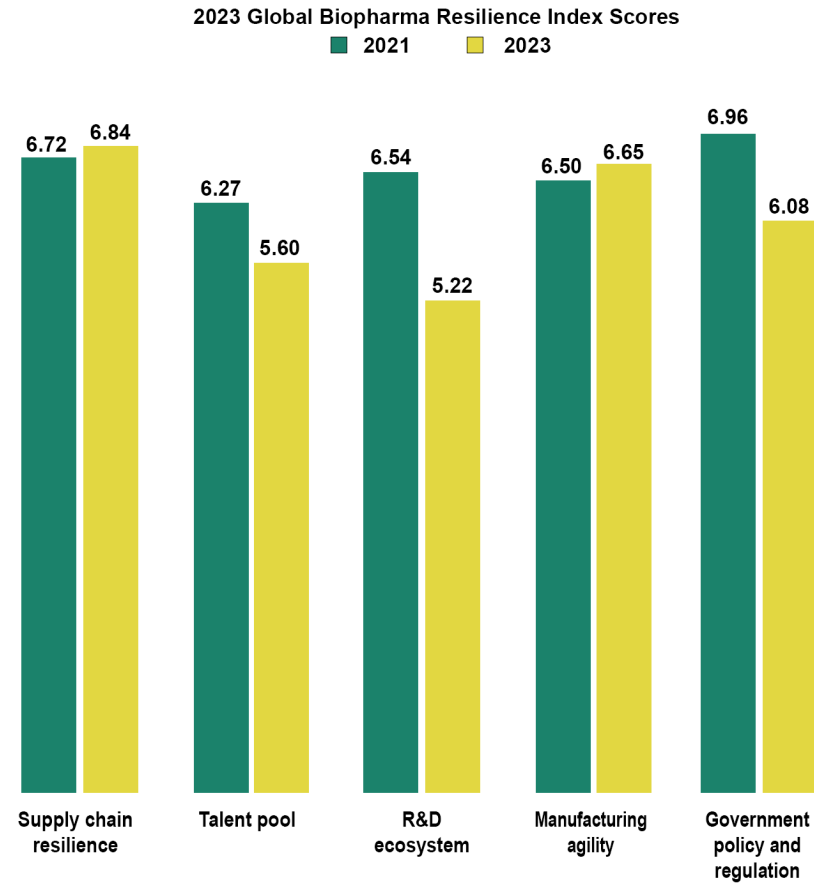
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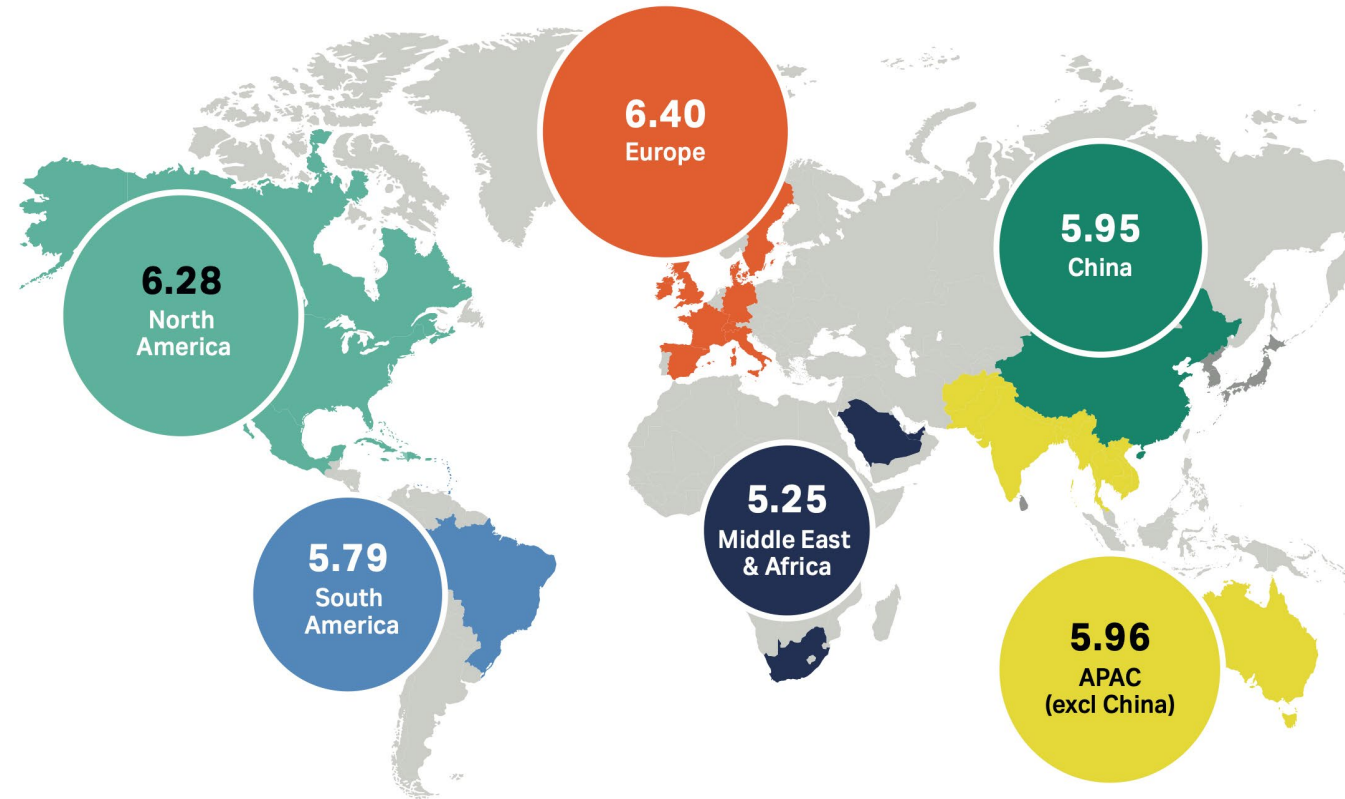
# Outlook





# Outlook

2023 Biopharma Resilience Index: Regional scores overall



**Fig 2.** Across all regions, Europe has the highest biopharma resilience score.



# Outlook

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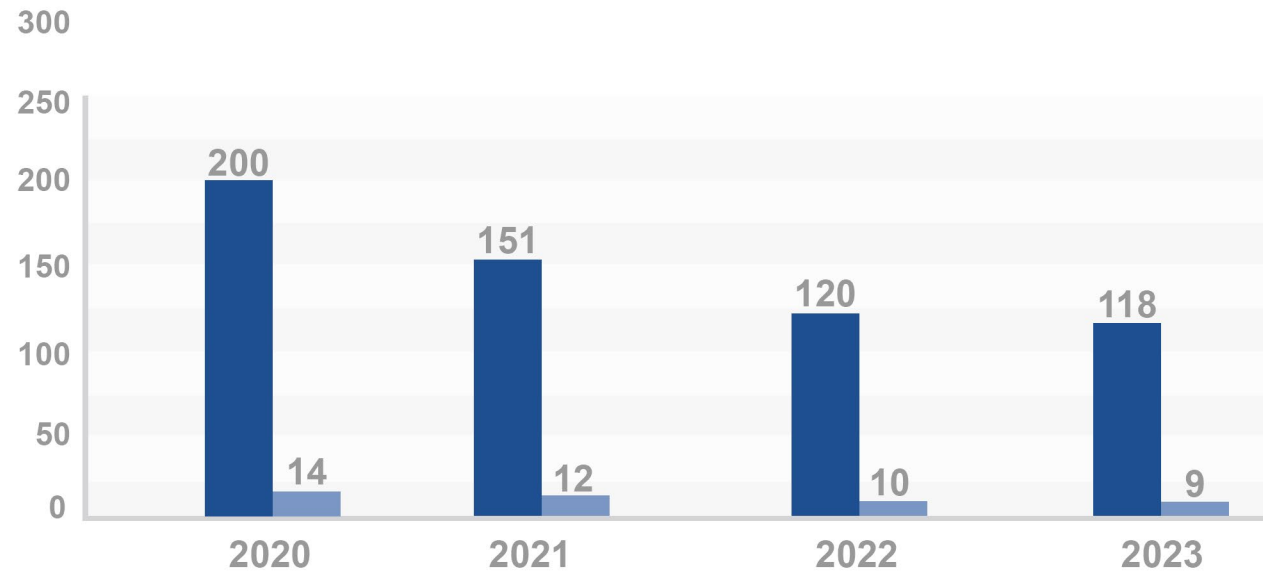
Aspen Alert has been Monitoring and Reporting Patent Activity Since 2020

- Focused on Bioprocess Patents Awarded by US PTO to Academic Institutions, End Users and Suppliers



# Outlook

## Single-Use IP



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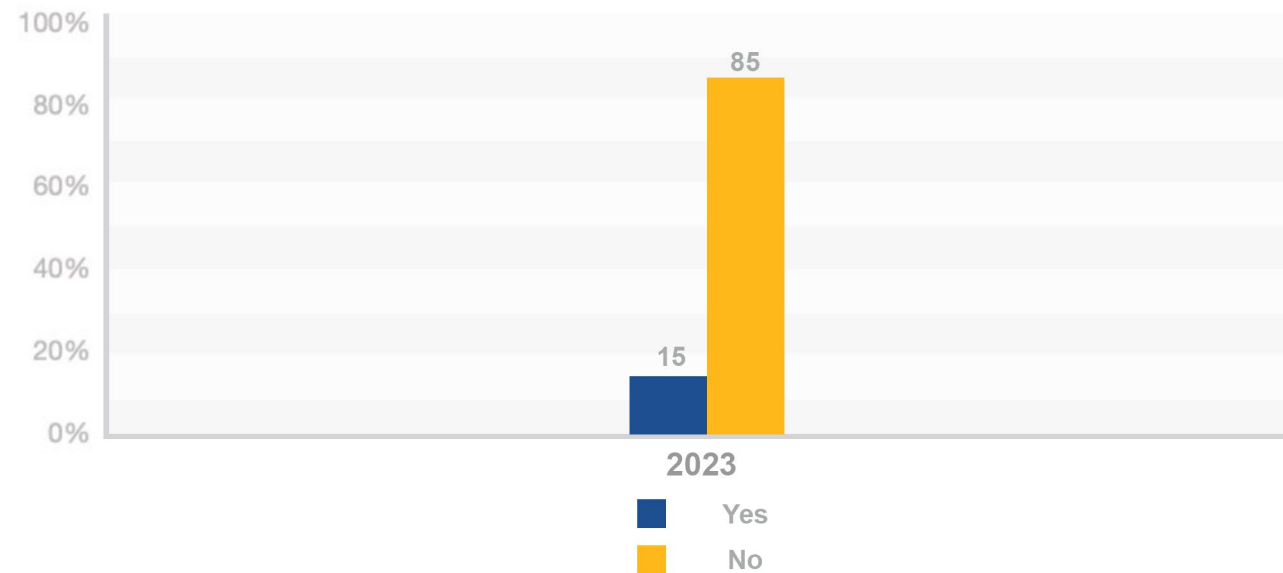


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# Outlook

Is the biopharma industry  
recession proof?



ASQ 1095 2023

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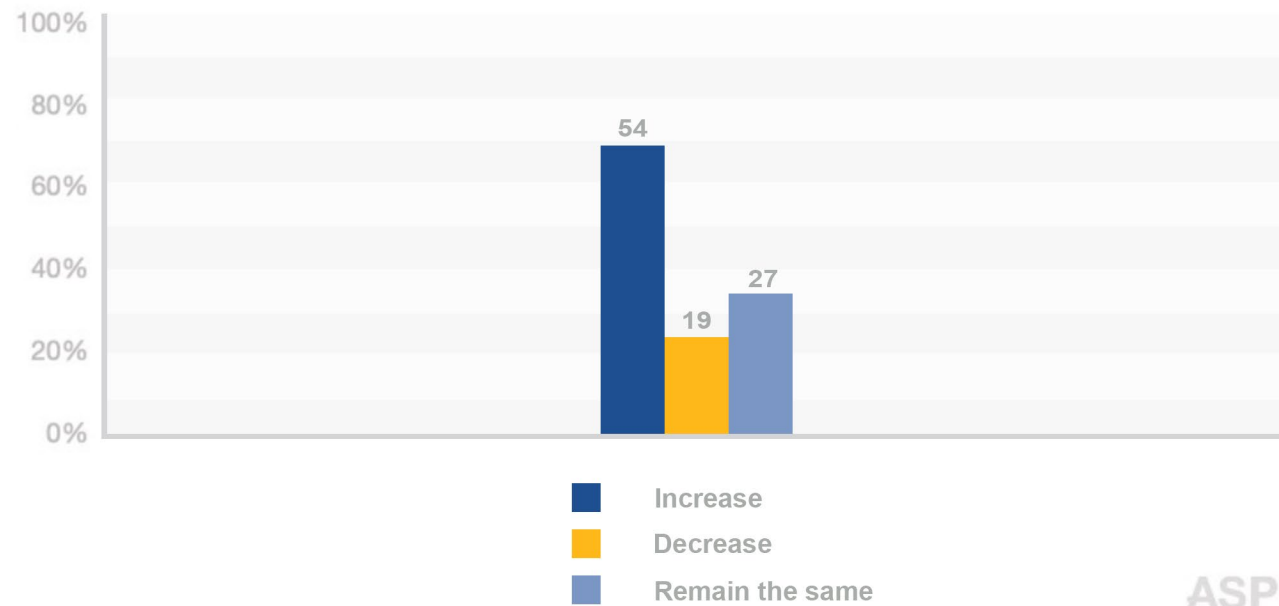


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# Outlook

Do you expect the rate of layoffs in our industry to increase, decrease or remain the same?



ASQ 1143 2023

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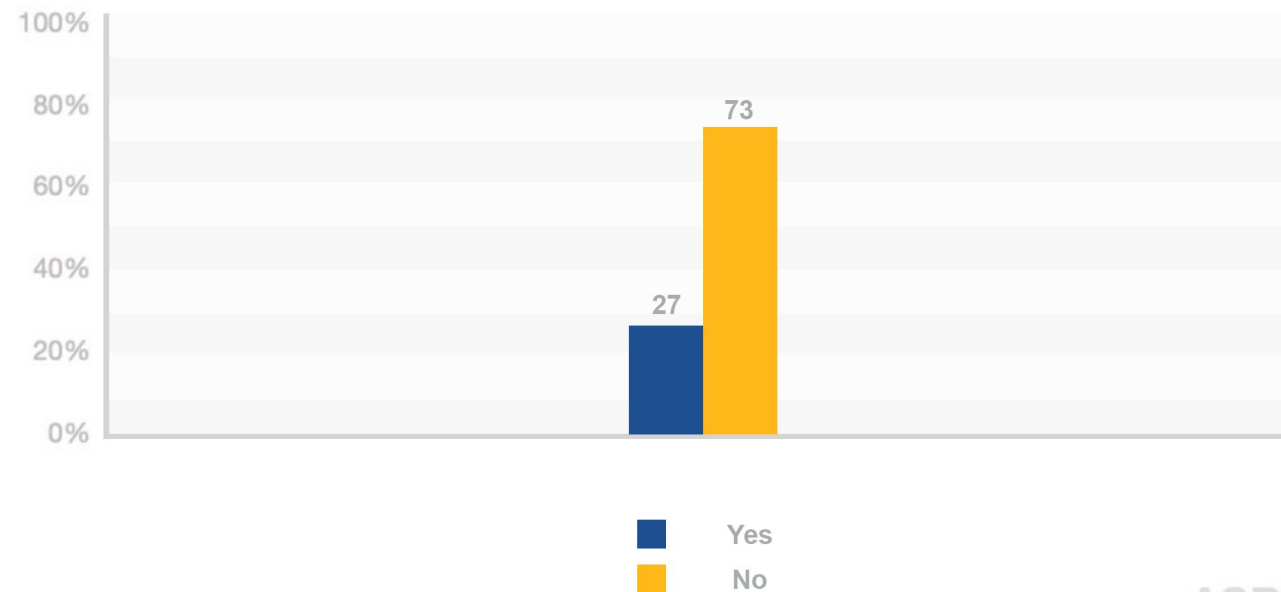


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# Outlook

Do you plan to look for a new job in 2023?



ASQ 1068 2023

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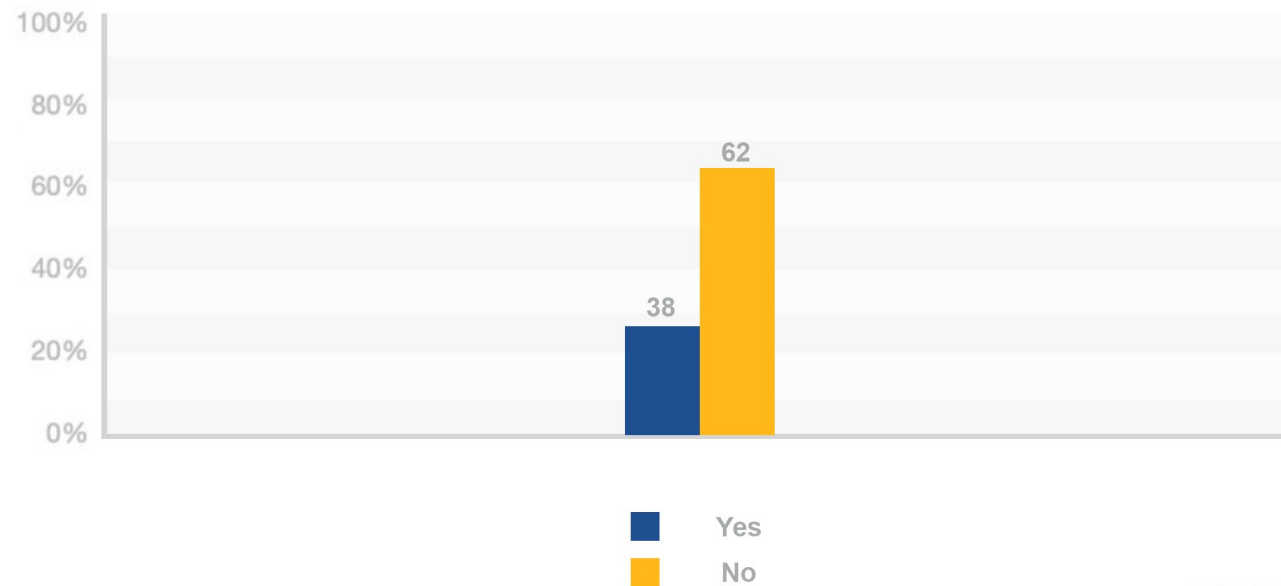


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# Outlook

Are you currently seeking or considering seeking new employment?



ASQ 1169 2023

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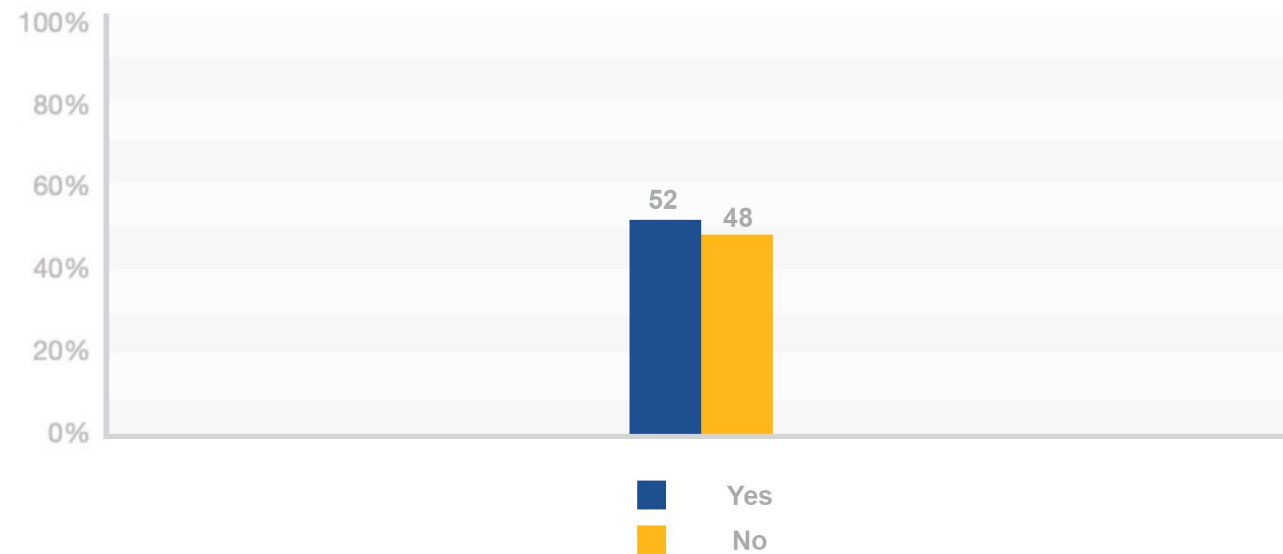


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# Outlook

Should we be concerned about the supply of new lab and manufacturing space outpacing demand?



ASQ 1161 2023

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# Outlook

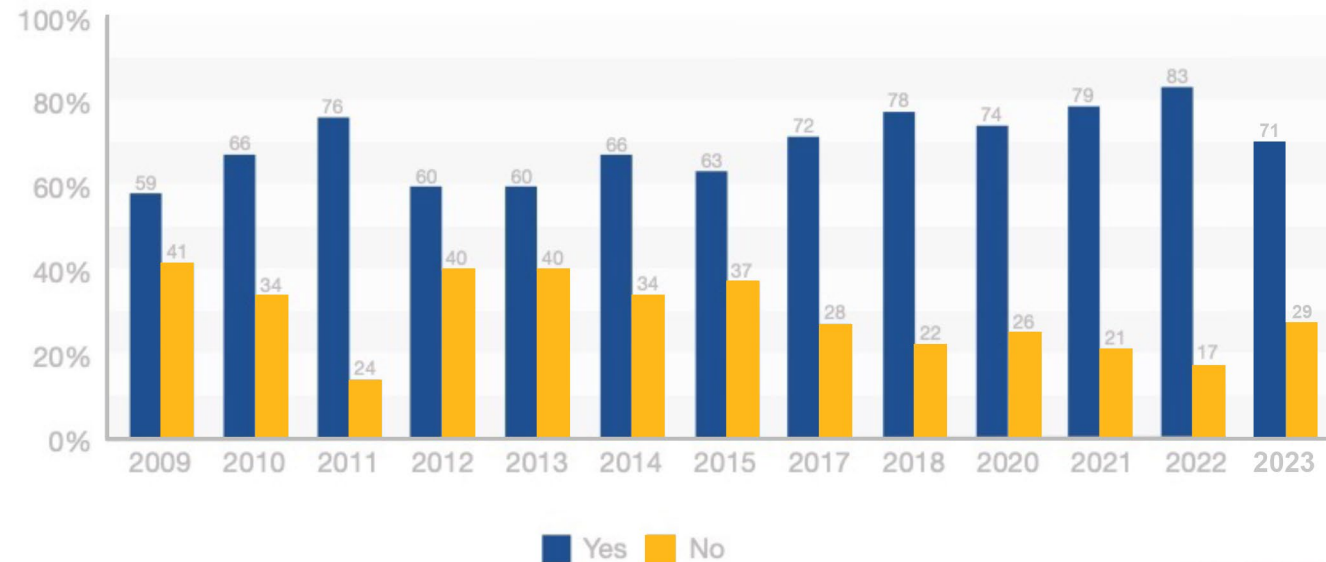
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- Yes
  - CRB, Genentech
- No
  - GSK, Pfizer



# Trends

**Are you concerned about the environmental impact of single-use technology?**



ASQ 6 2022

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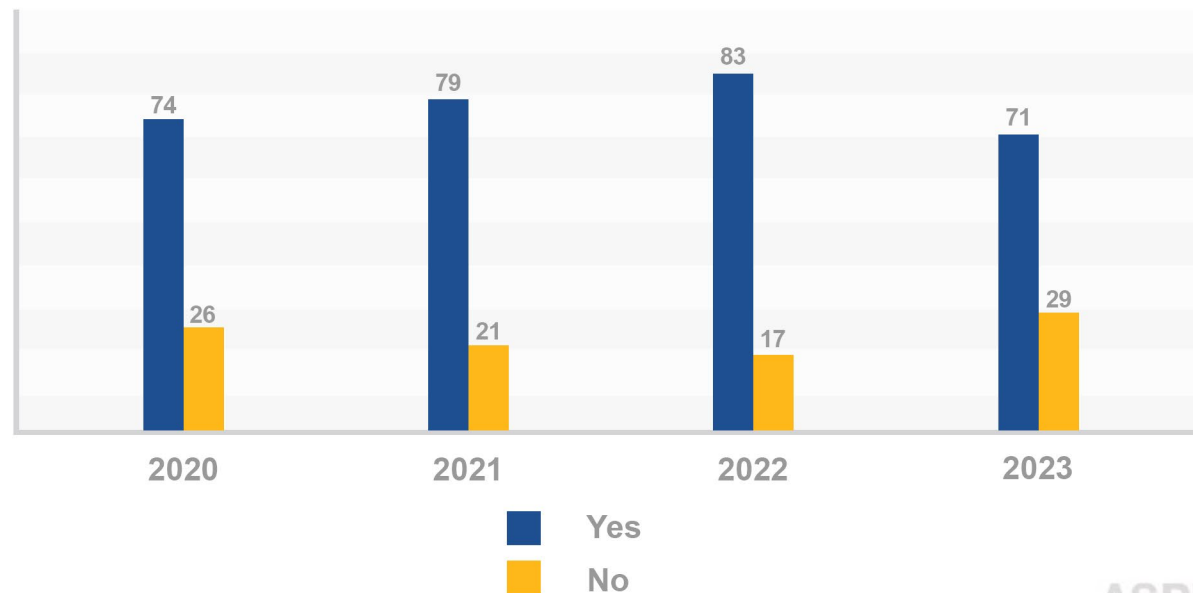


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# Trends

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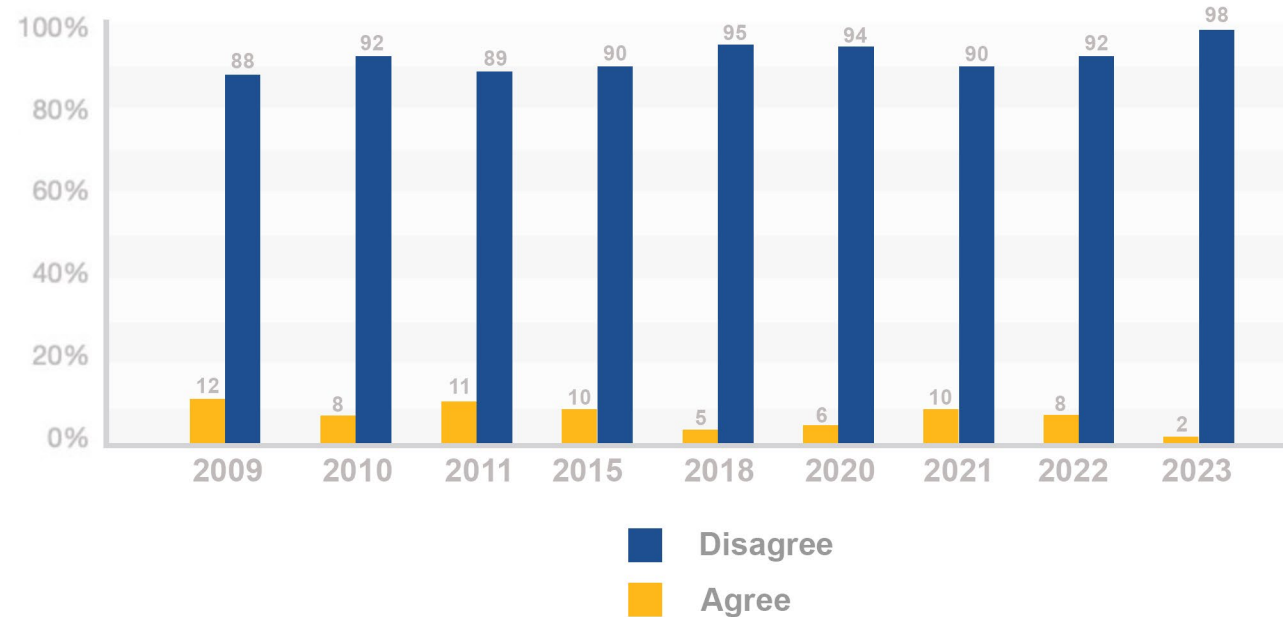


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# Trends

“Single-Use technology has achieved all the innovation that is possible.”



ASQ 8 2023

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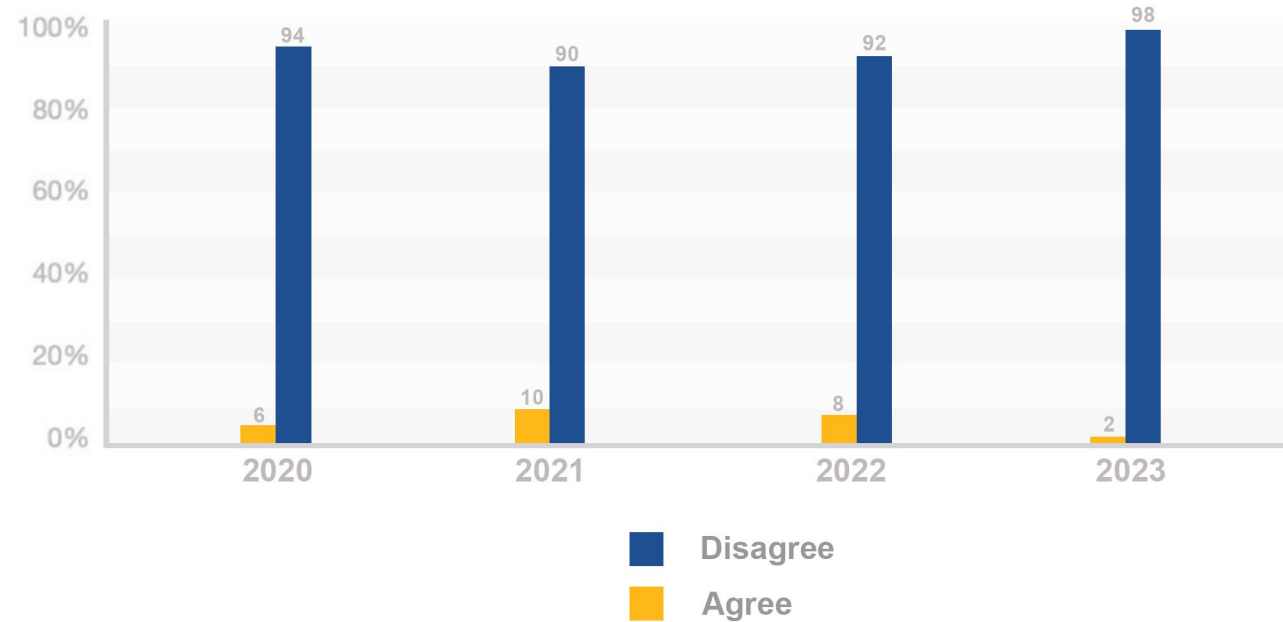


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# Trends

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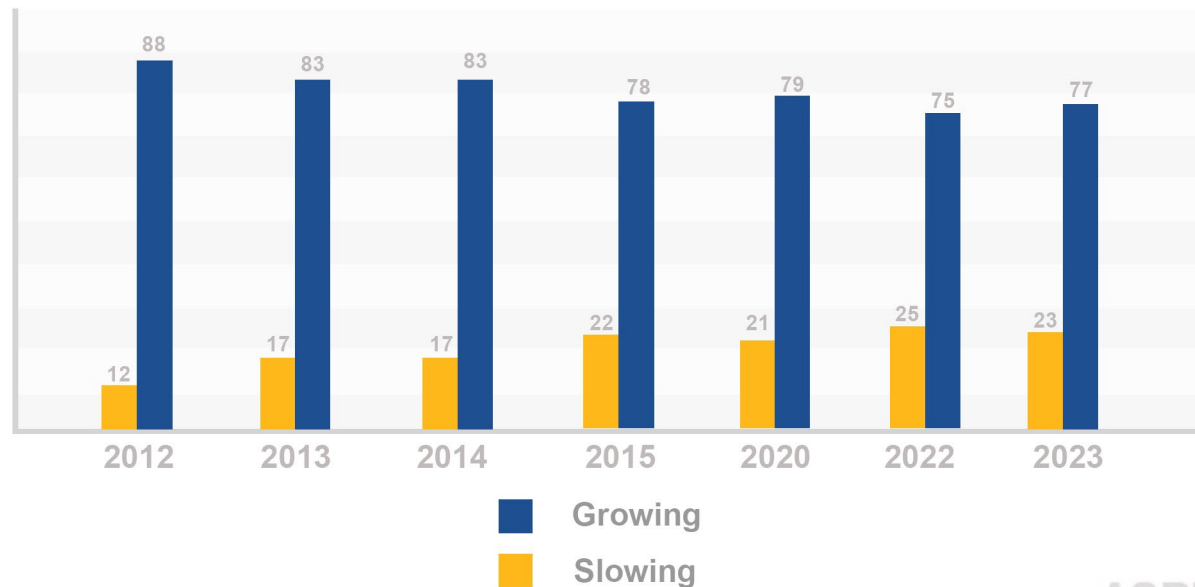


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# Trends

How do you perceive the industry adoption of single-use solutions currently?



ASQ 205 2023

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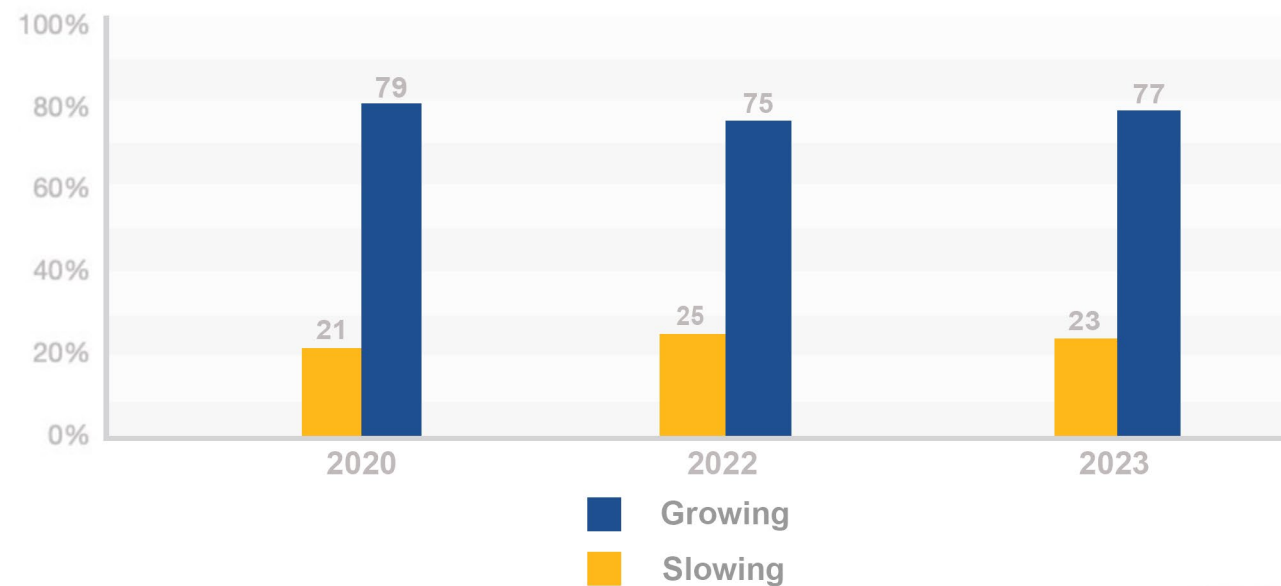


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# Trends

How do you perceive the industry adoption of single-use solutions currently?



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# Trends

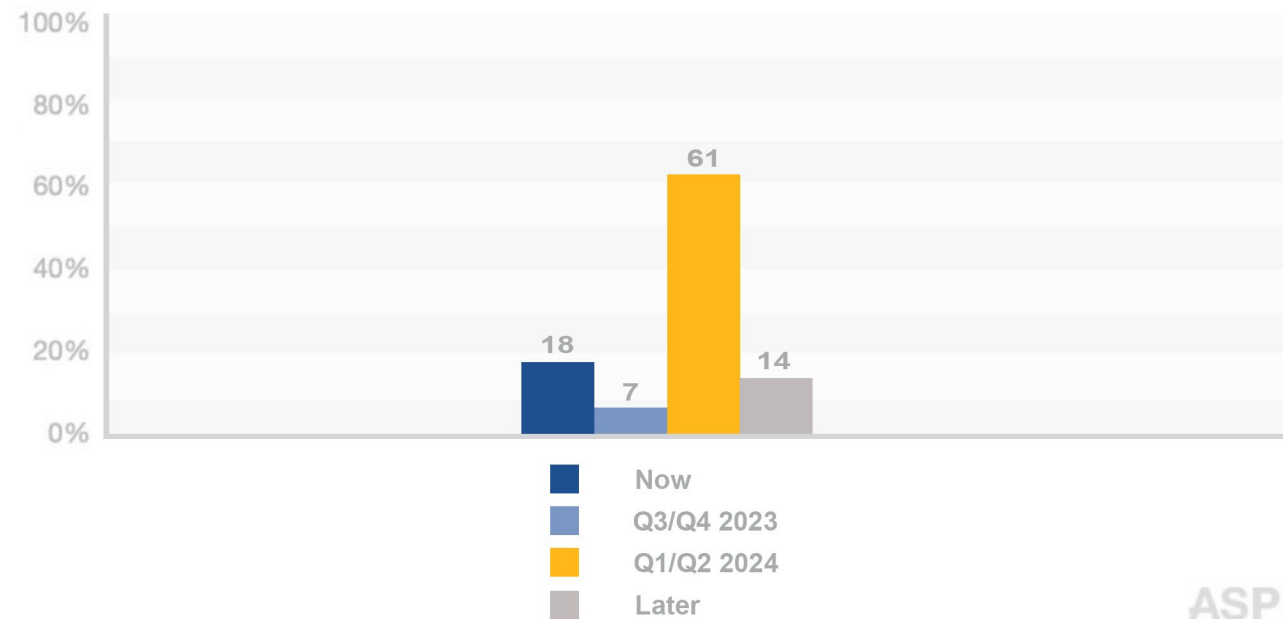
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- Growing
  - Alexion, Genentech, Pfizer
- Slowing
  - CRB, J&J, PTC Bio



# Future Markets

When do you anticipate a return to normalcy of demand for single-use solutions?



ASQ 1202 2023

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# Future Markets

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- Now
  - Pfizer
- Q1/Q2 2024
  - GSK
- Later
  - Sanofi



# Future Markets

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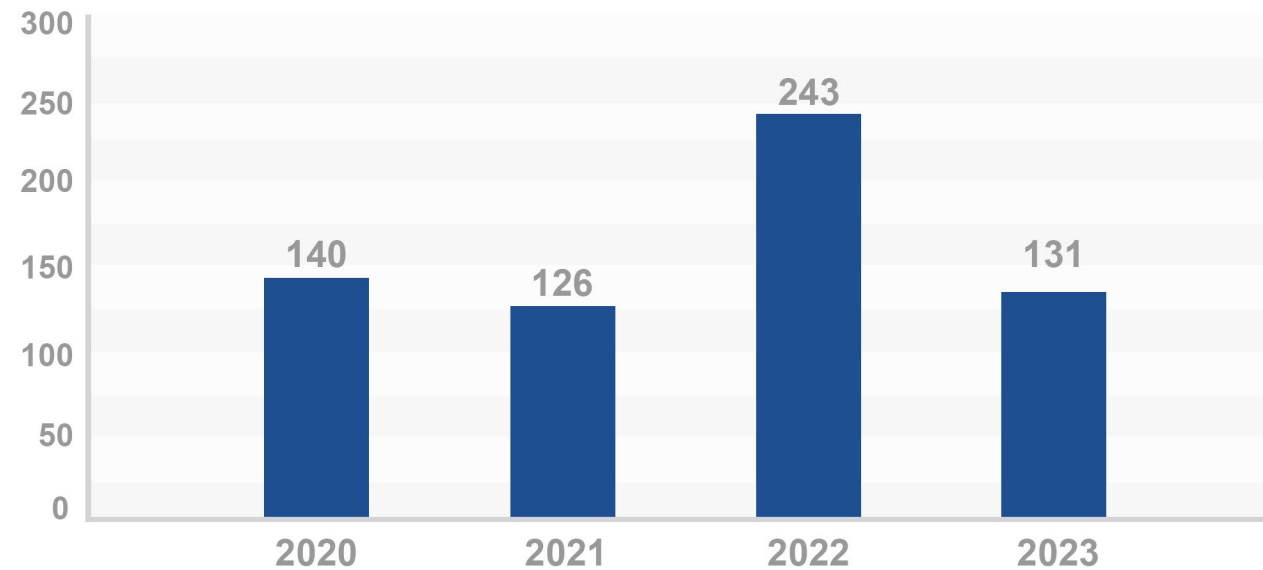
Aspen Alert has been Monitoring and Reporting Project Activity Since 2020

- Biopharma Projects of Academic Institutions, End Users and Suppliers, w/ Emphasis on Biologics



# Outlook

## Biopharma Projects



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Thank You.

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