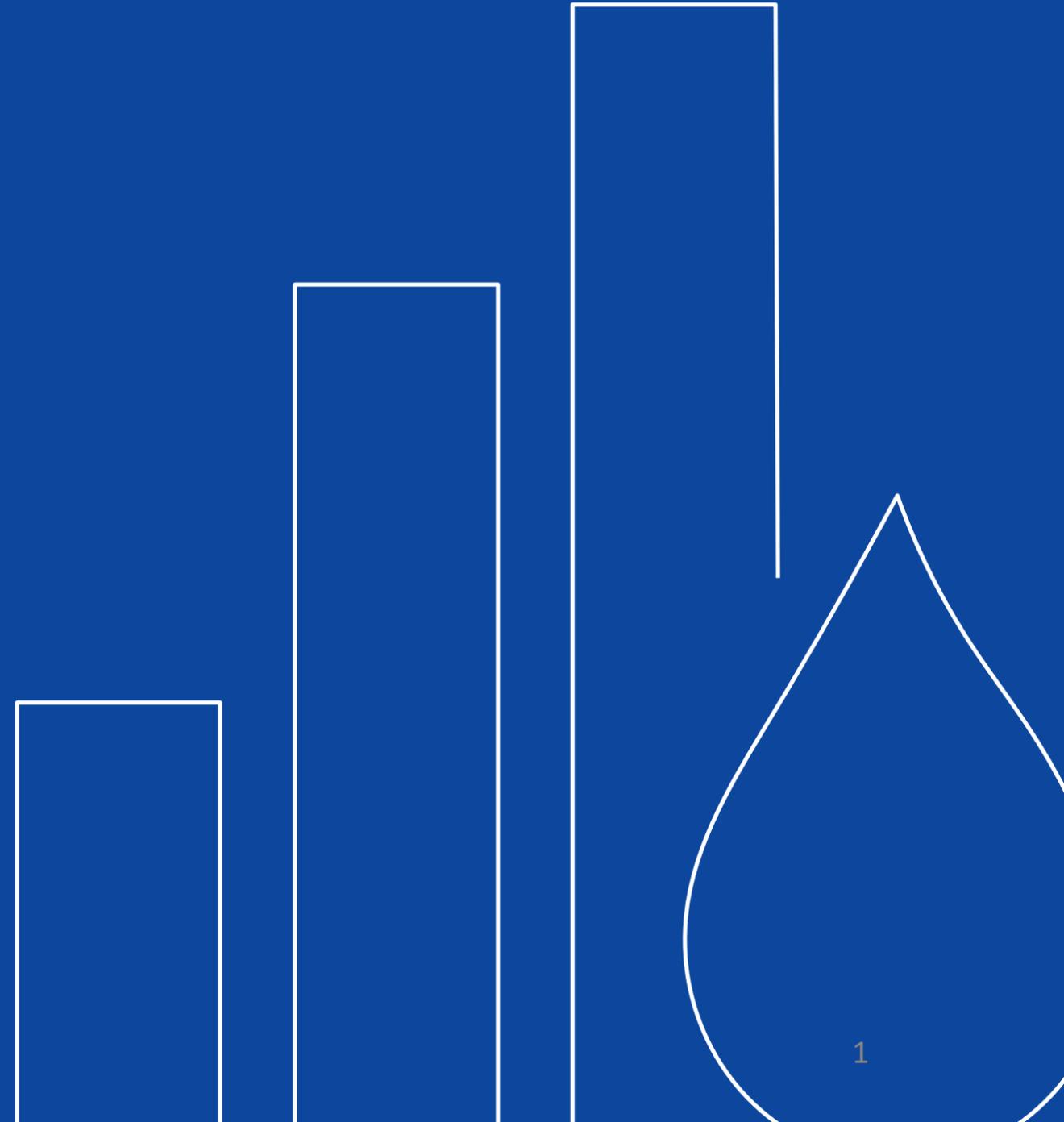


# ExxonMobil Basestocks

2018 Industry Pulse Report

 KRC RESEARCH

**ExxonMobil**



# The base oils industry is ever evolving...

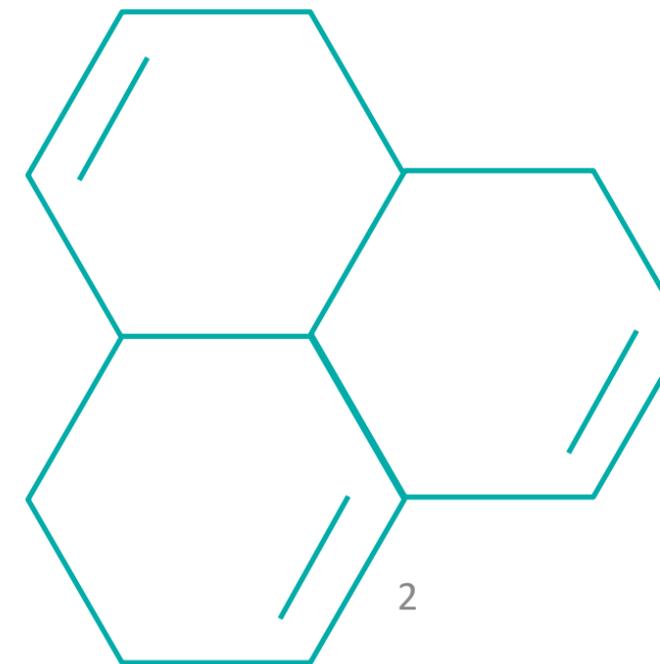
While Group I, Group II and Group III base oils all undeniably have a valued place in the market, the way they're viewed differs.

How so, exactly? That's what the ExxonMobil Basestocks team set out to learn more about.

- What are the overall trends driving the industry?
- How are companies adapting to the decline of Group I?
- What base oil attributes are most valued?
- How is the rapidly changing automotive industry impacting the base oil industry?
- What does the future hold for Group III?

Those are just a few of the areas where we worked to dig a bit deeper – and, to hear directly from those in the industry.

The ExxonMobil Basestocks 2018 Industry Pulse Report is based on conversations with hundreds of formulators, blenders and key decision makers to measure their viewpoints. We ensured an even split of respondents from APAC, the Americas, and EMEA to ensure results encompassed a global perspective. The report was developed in partnership with KRC Research, a global research consultancy.



# Survey Highlights

## BASE OIL GROUP OVERVIEW





## GROUP I

- Compared to other base oils, those interviewed said demand for Group I base oils has decreased (33%) at the highest rate. 65% are using Group I base oils less now than in previous years as only 18% are currently using Group I base oils, and 10% plan to do so in the next ten years.
- A majority (72%) believe the decline in Group I base oils has had a significant impact on the industry and 50% say it has been difficult to adapt. In order to do so, companies have been changing work techniques (37%), working with new manufacturers (36%), and changing equipment (28%).
- Despite the decline, **respondents still see certain benefits of Group I base oils** – its viscosity (54%), solvency (49%), and low cost (46%).



## GROUP II

- Nearly 3 in 4 (72%) see Group II base oils as the “heart” of the market. It’s currently the most used base oil group (34%) but is slightly less likely than Group III base oils (33% vs. 36%) to be used in the next 10 years.
- Group II base oils are seen as the most important to all industries discussed, including the automotive (34%), marine (31%), industrial (37%), and commercial vehicle (41%) industries. Group III base oils are viewed as second most important to these industries.
- A nearly equal number of respondents view Group II/II+ (47%) and Group III/III+ (45%) base oils as the oils best suited to handle the increase in fuel economy and emissions regulations, a chief concern among respondents.
- APAC countries (43%) are more likely than EMEA (31%) and the Americas (29%) to currently use Group II base oils. They (84%) are also more likely than both the Americas (73%) and EMEA (60%) to believe that Group II base oils are the “heart” of the market.
- **Respondents in EMEA are least likely to say that Group II base oils are the heart of the market** (60%). That being said, more than half (52%) said they would likely transition away from Group I and/or Group III base oils if they had access to a Group II manufacturer.

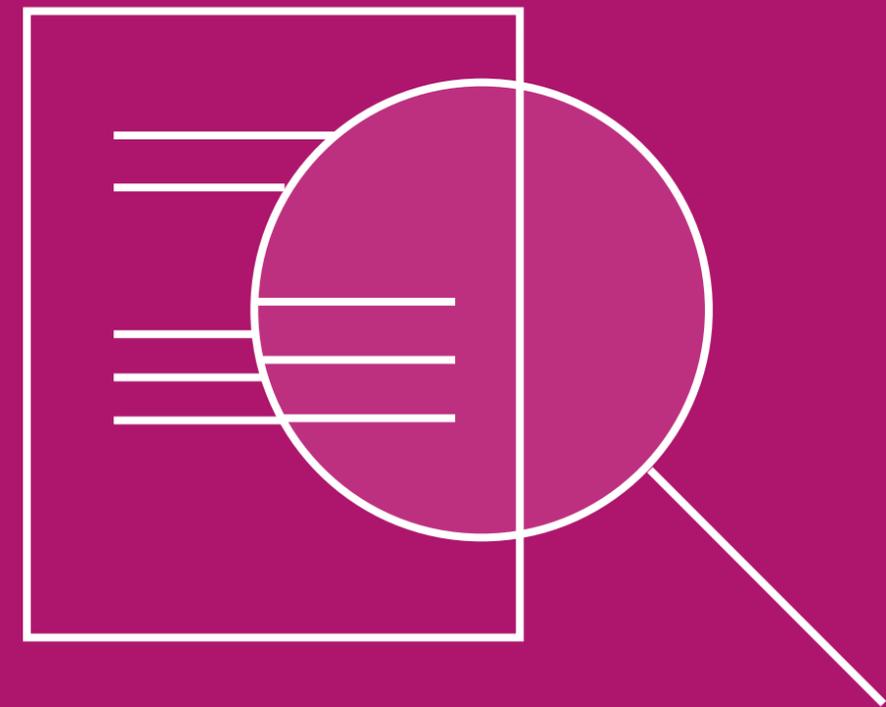


## GROUP III

- While currently the second most used base oil group (32%), demand for Group III base oils is on the rise (56%) as respondents say **they will use them the most in the next 10 years (36%) over any other base oil.**
- They are also second to Group II in importance to the automotive (29%), marine (25%), industrial (27%), and commercial vehicle (23%) industries.
- Along with EMEA (41%), the Americas (41%) are more likely than APAC (25%) to use Group III base oils in the next 10 years.

# Survey Highlights

## KEY FINDINGS



## Base oil industry trends

 In discussing overall trends the primary theme is that, as a whole, the industry is both growing and improving.

 While demand for Group I base oils is low, Group II (52%) and Group III (56%) demand grew at a high rate over the last ten years and the base oils within these groups are the most likely to be used now (Group II - 34%, Group III - 32%), and in the next 10 years (Group II - 33%, Group III - 36%).

 If they plan on switching to a new base oil, respondents are doing so because other base oils enable better fuel efficiency (49%), are higher quality (48%), and are cleaner and more environmentally friendly (44%).

 A majority (61%) believe the current API base oil groups are sufficient.

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## Base oil attributes, industry importance, and benefits

 In choosing a base oil, respondents look at viscosity index (37%), product availability (37%), and viscosity specification range (36%).

 Group II base oils are seen as the most important to all industries discussed, including the automotive (34%), marine (31%), industrial (37%), and commercial vehicle (41%) industries.

 Not surprisingly, nearly 3 in 4 (72%) view Group II as the heart of the market considering how important they are to a variety of sectors.

 However, bio-based lubricants are also on the rise with benefits such as being biodegradable (47%), having lower toxicity levels (46%), and being produced with environmentally friendly methods (45%).

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## Adapting to the decline of Group I base oils

 Nearly 2 in 3 (65%) are using Group I base oils less than in previous years.

 Most (72%) view this decline of Group I base oils as having a significant impact on the industry and half (50%) feel it has been difficult for their company to adapt.

 Companies are having to change their work techniques (37%), work with new base oil manufacturers (36%), change their equipment (28%), and rely heavily on other group base oils (27%) in response.

 Despite bright stock being manufactured from Group I base oils, most bright stock users (82%) feel they have been able to adapt well to Group I's decline, and 4 in 10 (41%) users successfully switching to a new bright stock supplier. However, an equal number (43%) are struggling to find a manufacturer to meet their needs.

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## Automotive industry

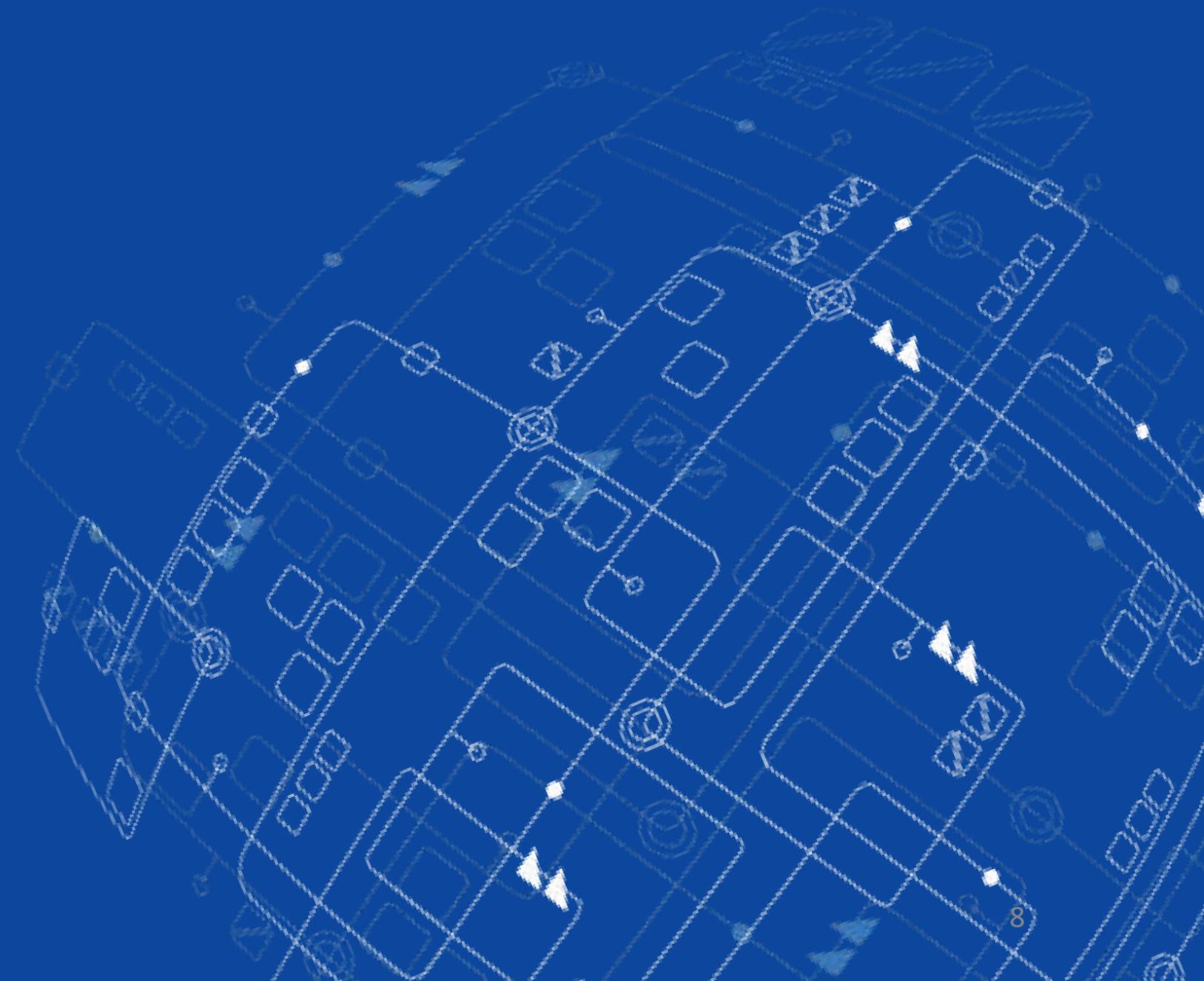
 Respondents are concerned (77%) about the increase of fuel economy and emissions regulations, but most (80%) are certain the industry can keep up – particularly with the use of Group II and III base oils.

 They are also confident (83%) the industry can adapt to the increase of electric or autonomous cars, despite their concerns about declining usage of base oils (30%), job loss (28%), and lower availability of needed base oils (27%).

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# Deep Dive Contents

- 1 Base oil industry trends
- 2 Base oil attributes, industry importance, and benefits
- 3 Adapting to the decline of Group I base oils
- 4 Automotive industry

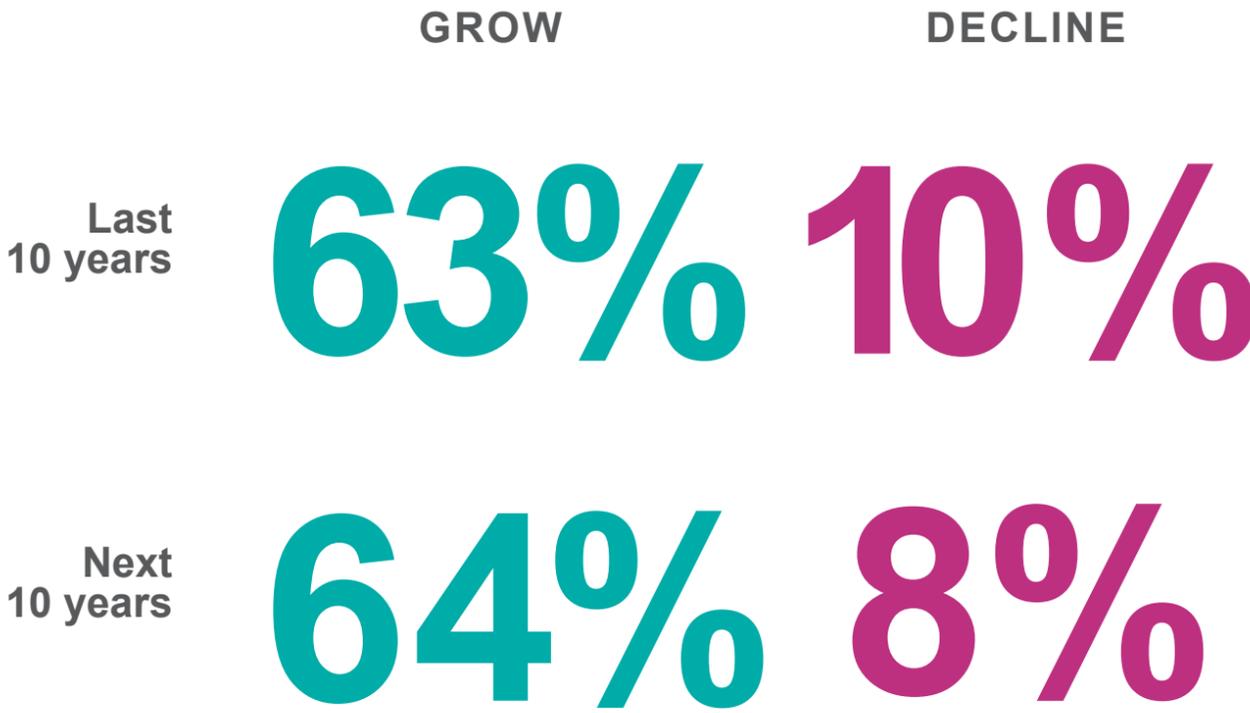




# Base oil industry trends

The majority of respondents (63%) believe that the base oil industry has grown in the past ten years, and most (64%) believe the industry will continue to grow in the next ten years.

APAC is particularly likely to believe the industry grew (73%) and will grow (74%) in the future.



	Total	REGION		
		APAC	Americas	EMEA
Base	n=306	n=100	n=101	n=105
LAST 10 YEARS				
Grow	63%	73%	62%	54%
Decline	10%	6%	14%	10%
Steady	25%	19%	24%	30%
NEXT 10 YEARS				
Grow	64%	74%	71%	47%
Decline	8%	8%	8%	9%
Steady	25%	15%	20%	39%



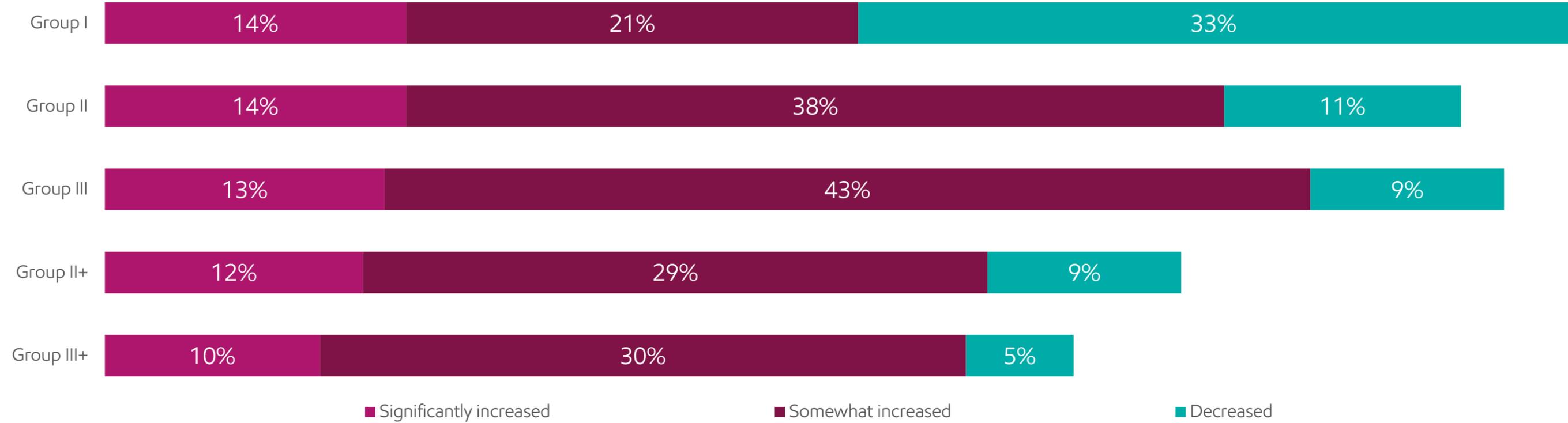
# Industry trends *(continued)*

Groups II (52%) and III (56%) are seeing the largest increase in demand in the last ten years followed by Groups II+ (41%) and III+ (41%).

Not surprisingly, Group I is seeing the largest decrease in demand (33%) over the last ten years.



**Change in Demand by Group over Last Ten Years**  
(n=306)





# Industry trends *(continued)*

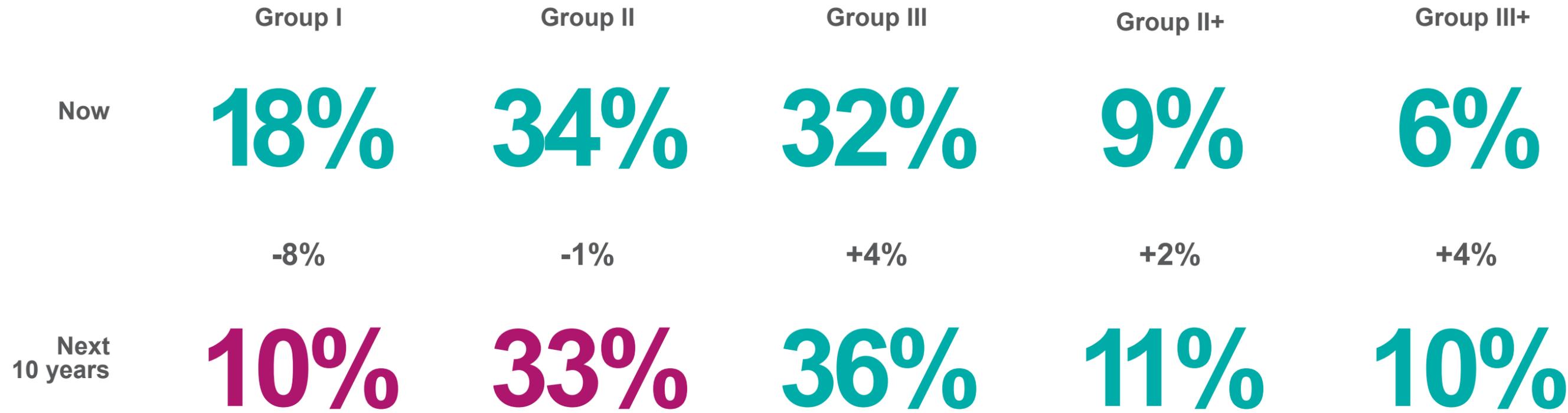
Most companies are using Group II (34%) and Group III (32%) base oils currently and most will continue to do so in the next ten years.

Group I base oils will experience the largest decline in the next ten years (-8%), while Group II+ (+2%) and III+ (+4%) will experience small increases.

EMEA (41%) and Americas (41%) are more likely than APAC countries (25%) to use Group III base oils in the next ten years.



Current and Future Base Oil Usage  
(n=306)



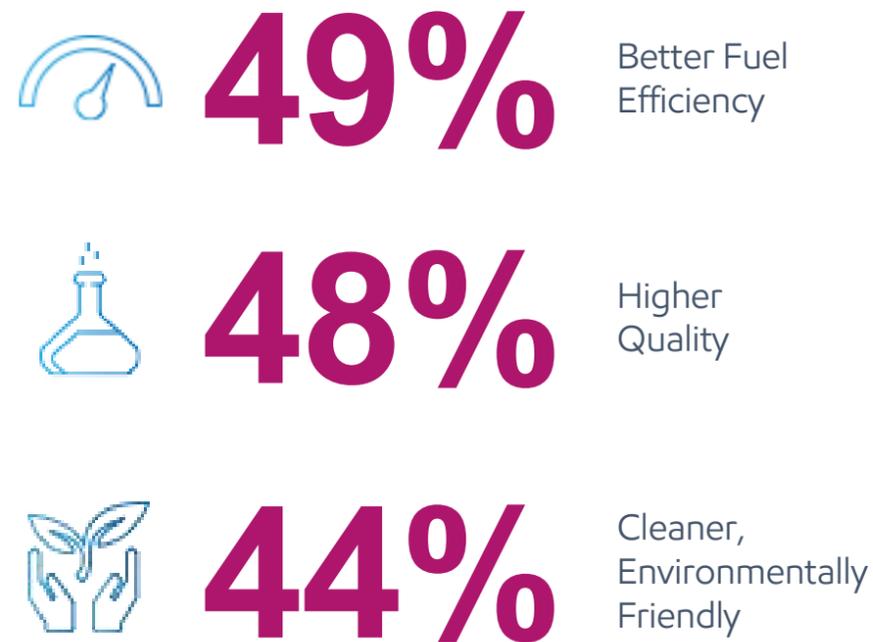


## Industry trends *(continued)*

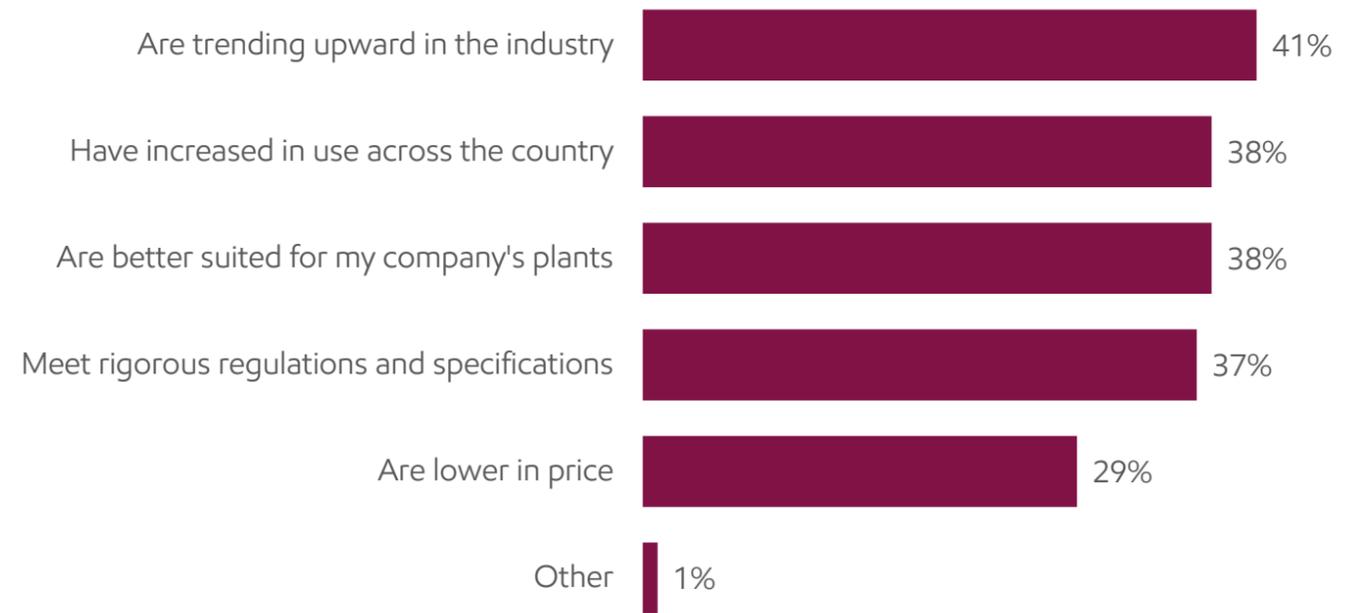
The reasoning behind changing base oils in the next ten years is primarily due to the ability of other base oils to enable better fuel efficiency (49%), their higher quality (48%), and being cleaner and more environmentally friendly (44%).

APAC countries are significantly more likely to focus on fuel efficiency (70%) and environmental considerations (60%) than those in the Americas and EMEA.

**Top Three Reasons for Changing Base Oil Usage in the Next Ten Years (Changed Group Only)**  
(n=117)



**Remaining Reasons for Changing Base Oil Usage in the Next Ten Years (Changed Group Only)**  
(n=117)





# Industry trends *(continued)*

Most (61%) believe that the API base oil groups are sufficient for formulating and manufacturing engine oil.

Slightly more than one-quarter (27%) of respondents believe they should be adjusted now and approximately 1 in 10 (12%) say they should be adjusted in the next ten years.

**61%**

**Yes, they are sufficient**

*"The limitation set by API is quite good as it does not limit us in meeting our needs without compromising with the environmental factors."*

*"They have been sufficient for a number of years and will continue to be."*

*"All the policies and regulations of API are covering each aspect that it should focus upon without compromising on any parameters."*

*"The demarcation set by API are very well suited for our industry requirements."*

**27%**

**No, I think now is the time to adjust them**

*"API standards are outdated and need a sudden improvement with respect to guidelines and should consider environmental issues as well."*

*"They should come with a new set of regulations keeping in mind the current scenario and environmental issues."*

*"Should be reviewed and adjusted to keep up with the latest technology available."*

*"I think the definition of the base oil groups are too big and the way that it is based on sulfur, acetates, viscosity index there are some more needs now a days specially on volatility, it should be bit more well defined."*

**12%**

**I think the time to adjust them is within the next 10 years**

*"Newer engine and transmission technologies put a lot more stress on oils during use so the oils need to be improved concurrently to keep up with the demand."*

*"The advanced technology is increasingly setting new requirements, which should be taken into account with a future adjustment of the base oil groups."*

*"New technology continues to develop, the original standard needs to be modified."*

*"Adjust accordingly to change within the coming years."*

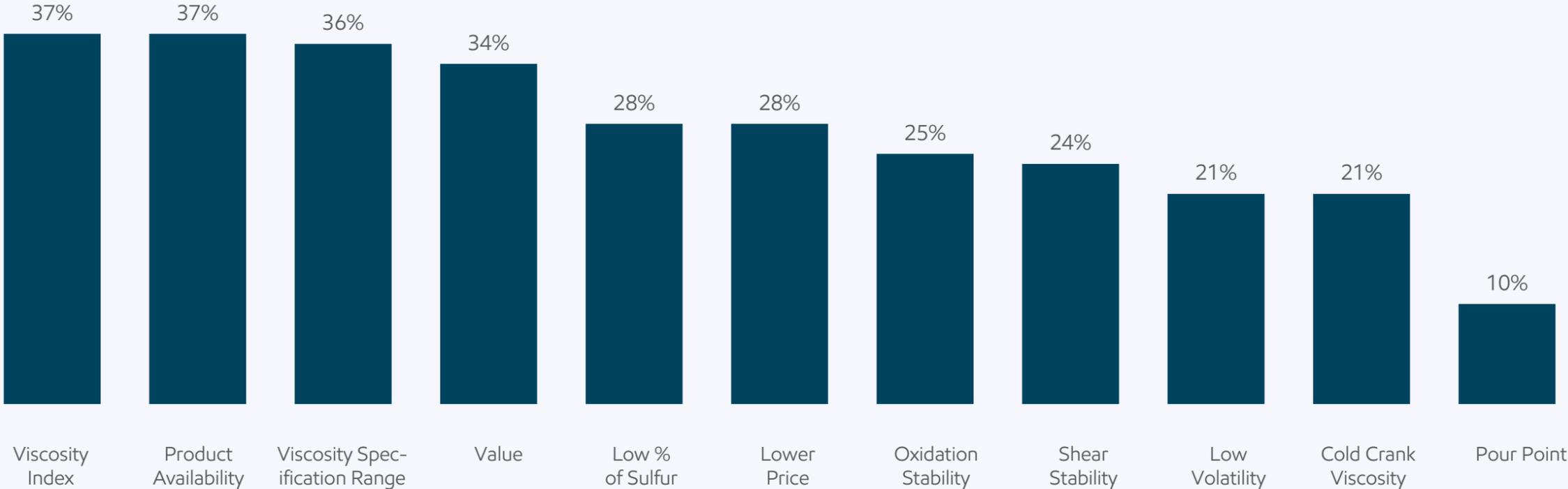


# Base oil attributes, industry importance, and benefits

Respondents are primarily looking at viscosity index (37%), product availability (37%), viscosity specification range (36%), and value (34%) in choosing a base oil.

EMEA respondents (47%) are significantly more interested in viscosity index (47%) than APAC (32%) and Americas (31%).

**Desirable Attributes for a Base Oil**  
Combined Ranks 1, 2, 3  
(n=306)



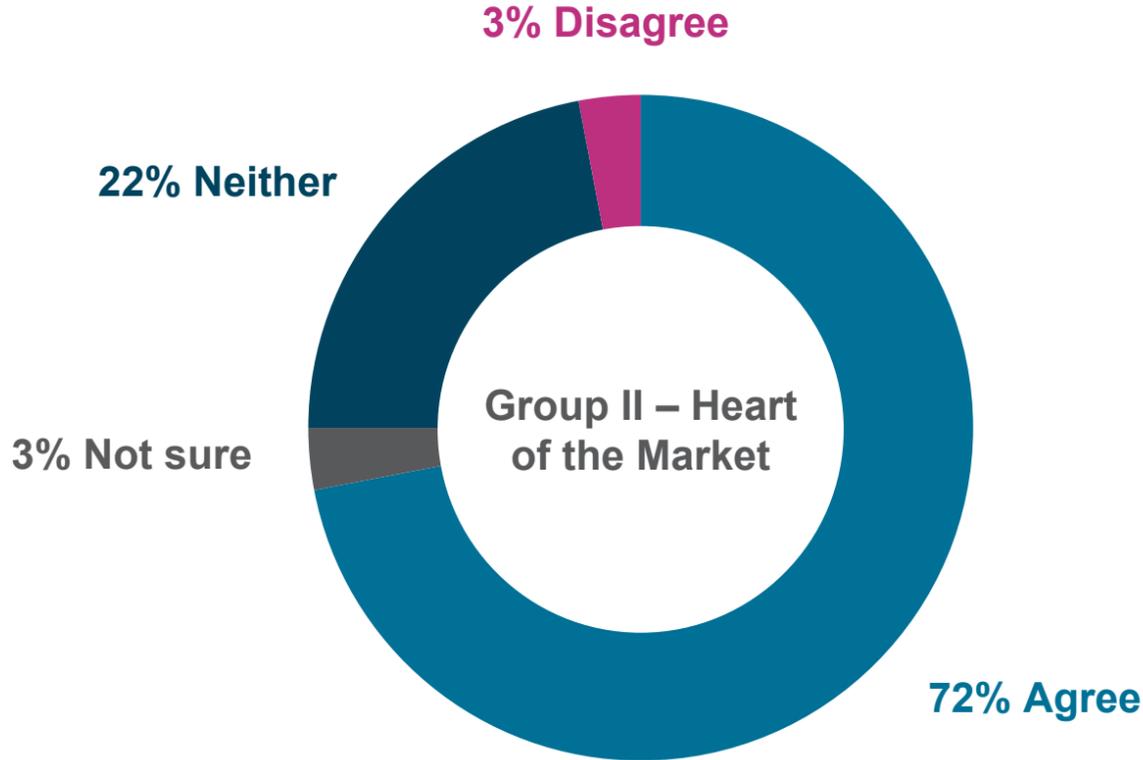


# Base oil attributes, industry importance, and benefits *(continued)*

Almost three in four (72%) agree that Group II base oils are at the center of the base oil market.

APAC countries (84%) are more likely than the Americas (73%) and EMEA (60%) to agree, but they are also more likely to be currently using Group II base oils (43%) than the other regions.

**Group II Base Oils are the “Heart” of the Market**  
(n=306)



	Total	REGION		
		APAC	Americas	EMEA
<b>Base</b>	<b>n=306</b>	<b>n=100</b>	<b>n=101</b>	<b>n=105</b>
Agree	72%	84%	73%	60%
Disagree	3%	-	2%	7%
Neither	22%	14%	25%	28%
Not sure	3%	2%	-	6%



# Base oil attributes, industry importance, and benefits *(continued)*

Bio-based lubricants are seen as beneficial primarily because they are biodegradable (47%), they have lower toxicity levels (46%), and are produced through environmentally friendly methods (45%).

APAC, which is more likely to switch to a new base oil that is more fuel efficient and more environmentally friendly, is more likely to believe in all of the benefits of bio-based lubricants than the Americas and EMEA.

**Benefits of Bio-Based Lubricants over Oil-Based Lubricants**  
(n=306)

	Total	REGION		
		APAC	Americas	EMEA
<b>Base</b>	<b>n=306</b>	<b>n=100</b>	<b>n=101</b>	<b>n=105</b>
They are biodegradable	47%	53%	42%	46%
They have lower toxicity levels	46%	51%	42%	47%
They are produced through environmentally friendly methods	45%	62%	41%	33%
They are made up of cleaner materials	41%	49%	35%	40%
They are less likely to cause air pollution	39%	51%	41%	25%
They require less maintenance	31%	38%	31%	25%
I do not believe there are any benefits to bio-based lubricants	4%	2%	4%	7%



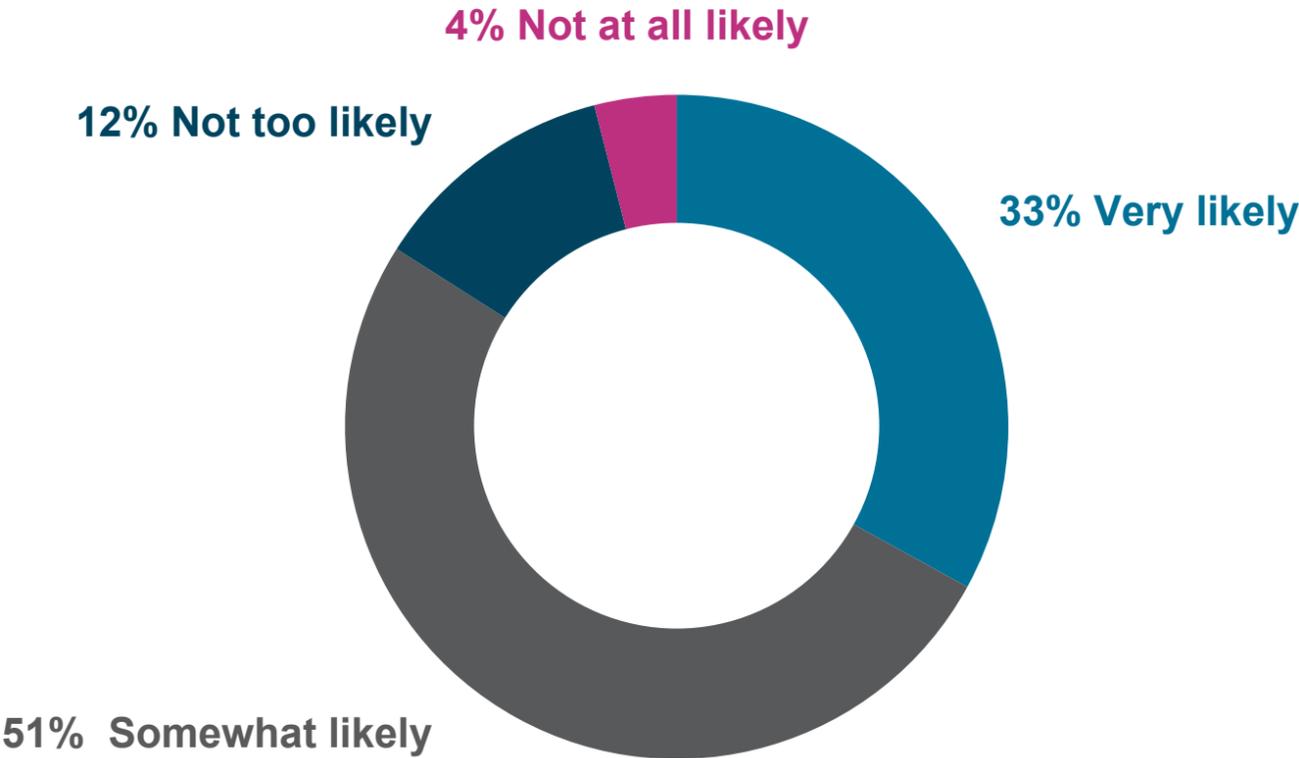
# Base oil attributes, industry importance, and benefits *(continued)*

87% of respondents believe bio-based lubricants have a positive impact on the base oil industry.

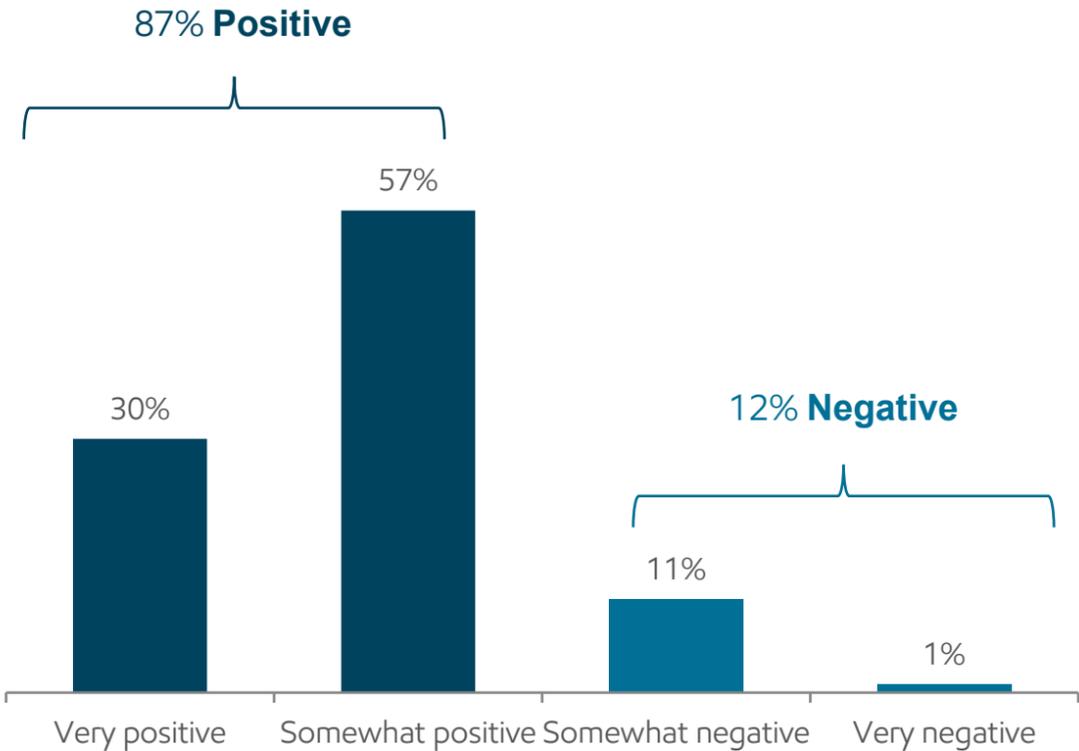
Additionally, 84% are likely to use bio-based lubricants in the future.

APAC is more likely to believe in the positive impact of bio-based lubricants (93%) and to be likely to use them in the future (89%).

Likelihood of Using Bio-Based Lubricants in the Future  
(n=306)



Impact of Bio-Based Lubricants on Base Oil Industry  
(n=306)





# Decline of Group I base oils

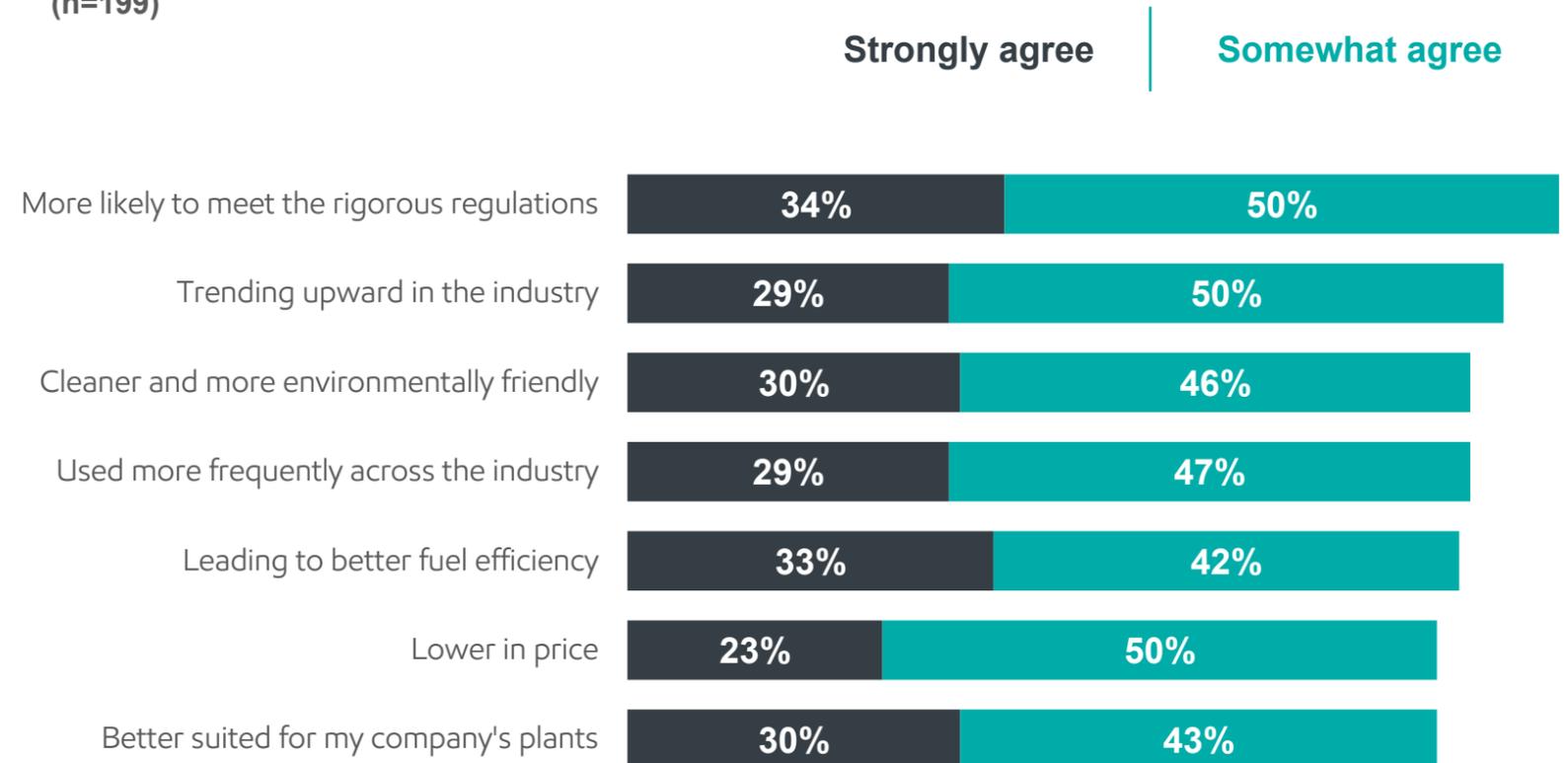
Compared to Group I, other base oils are viewed as more likely to be meeting regulations (84%), trending upward (79%), and being cleaner and more environmentally friendly (76%).

APAC countries are particularly interested in the environmental benefits of other base oils, such as their ability to enable better fuel efficiency (87%) and being clean and more environmentally friendly (81%).

## Reasons for Using Group I Base Oils Less – Other Base Oils are... (Using Group I Less Only) (n=199)

# 65%

of companies are using **Group I base oils less**



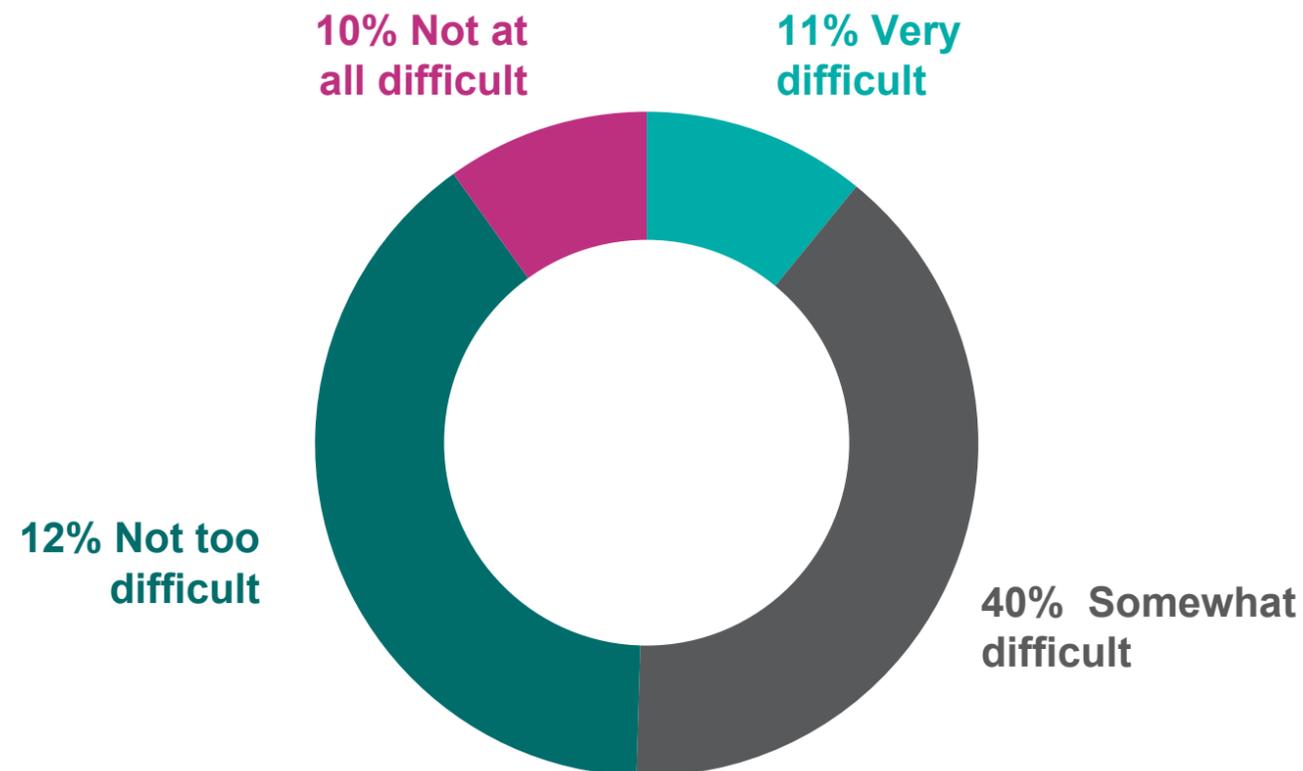


## Decline of Group I base oils *(continued)*

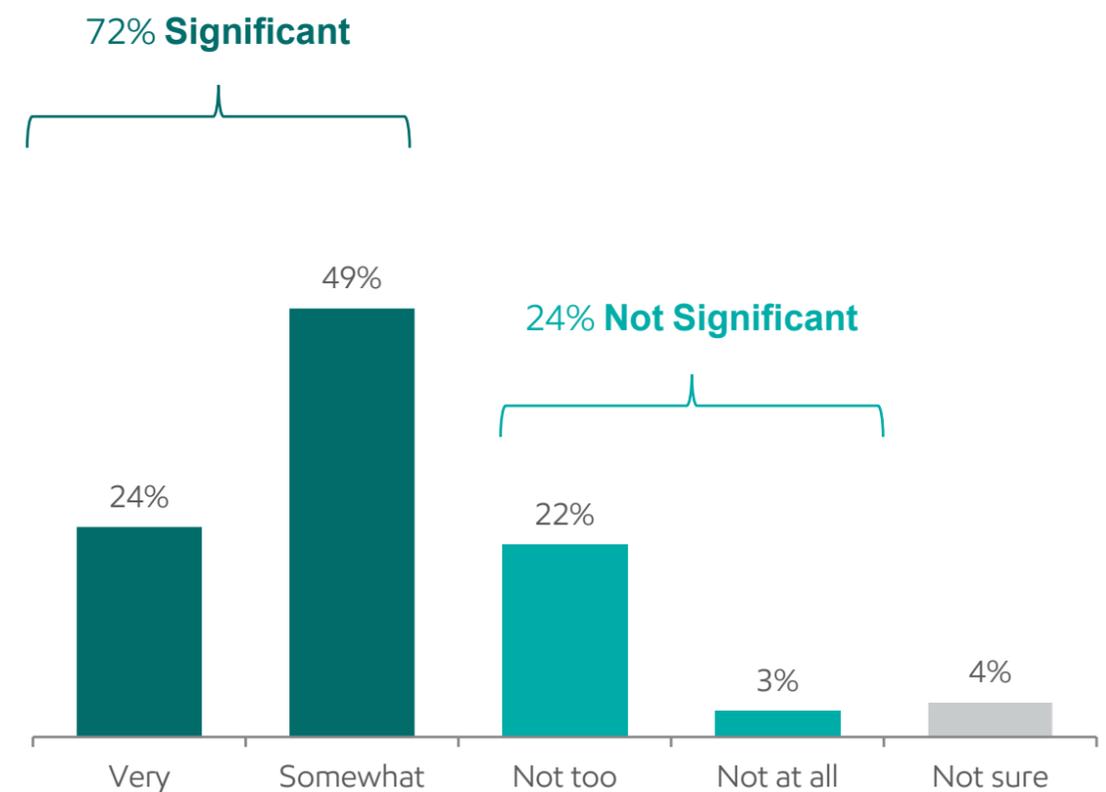
The majority (72%) agree that the decline in use of Group I base oils has had a significant impact on the industry.

There is an even split among those who believe adapting to Group I's decline has been difficult or not, while those in APAC (56%) are slightly more likely than those in the Americas (48%), and EMEA (47%) to believe adapting has been difficult.

**Difficulty in Adapting to Group I Decline for Individual's Company  
(Using Group I Less Only)**  
(n=199)



**Significance of Impact in Group I Decline for Industry  
(Using Group I Less Only)**  
(n=199)



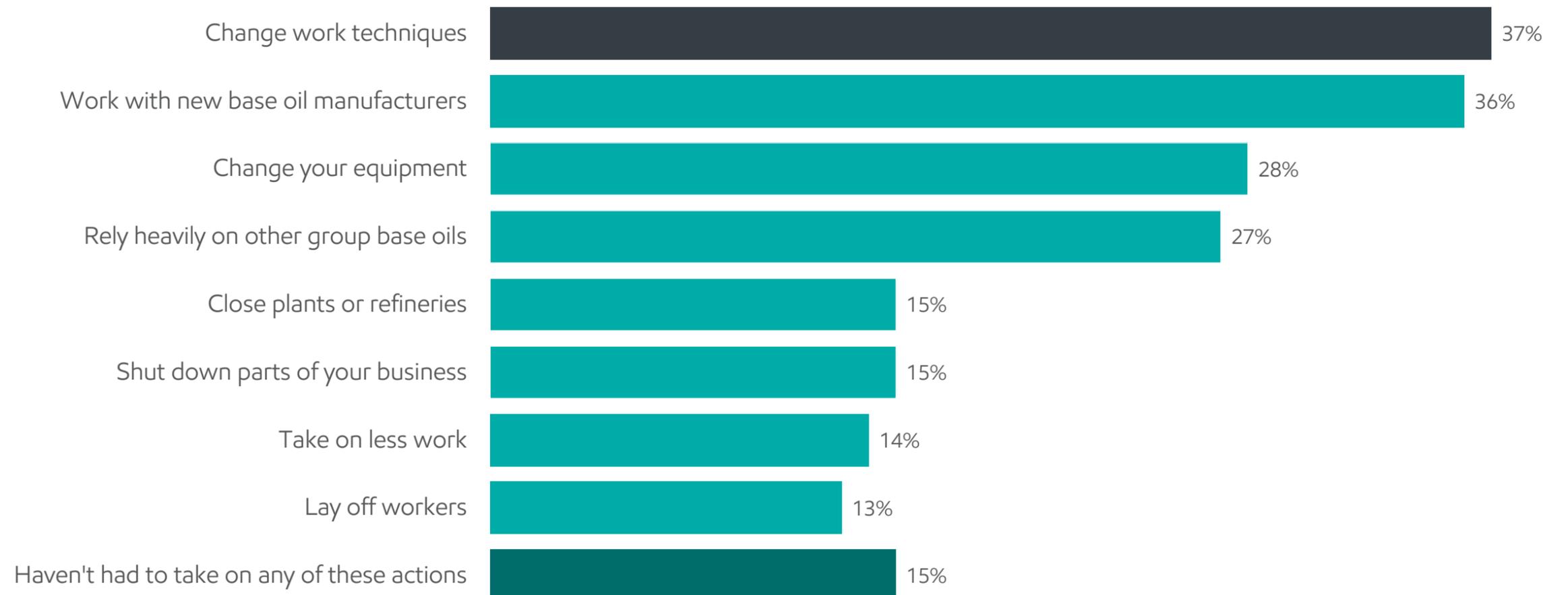


## Decline of Group I base oils *(continued)*

Changing work techniques (37%), working with new base oil manufacturers (36%), and changing equipment (28%) are the most common methods of adapting due to the decline in Group I base oils.

Companies are primarily having to make smaller changes as opposed to more drastic measures like closing plants or refineries (15%), shutting down parts of their business (15%), taking on less work (14%), or laying off workers (13%).

### Actions Taken Due to Group I Decline (Using Group I Less Only) (n=199)





## Decline of Group I base oils *(continued)*

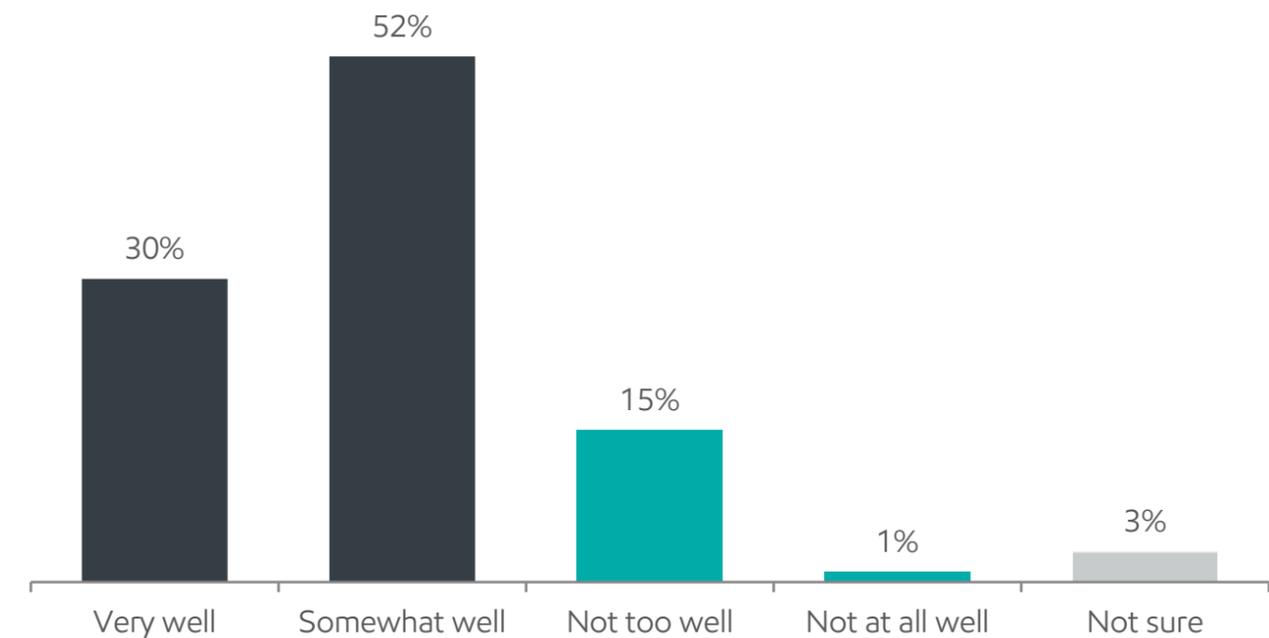
Four in ten companies (39%) use bright stock or wax. APAC (50%) is more likely to use bright stock or wax than both the Americas (37%) and EMEA (31%).

82% believe that their companies have adapted well to Group I's decline in usage, considering that bright stock is manufactured from Group I base oils.

**Use of Bright Stock or Wax**  
(n=306)



**Ability to Adapt to Group I Decline for Bright Stock Users  
(Using Bright Stock or Wax Only)**  
(n=120)





# Decline of Group I base oils *(continued)*

Most companies that use bright stock or wax have been impacted by Group I plant closures.

41% have been able to switch suppliers to ensure supply, but 43% are struggling to find a supplier.



## Adjustments to Meet Wax and Bright Stock Needs (Using Bright Stock or Wax Only) (n=120)

41%



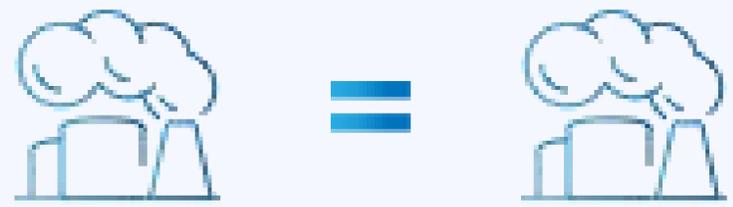
We have recently switched suppliers to ensure reliable wax and bright stock supply

43%



We are struggling to find a supplier to meet our wax and bright stock needs

17%



Our wax and bright stock supply hasn't been impacted by the Group I plant closures

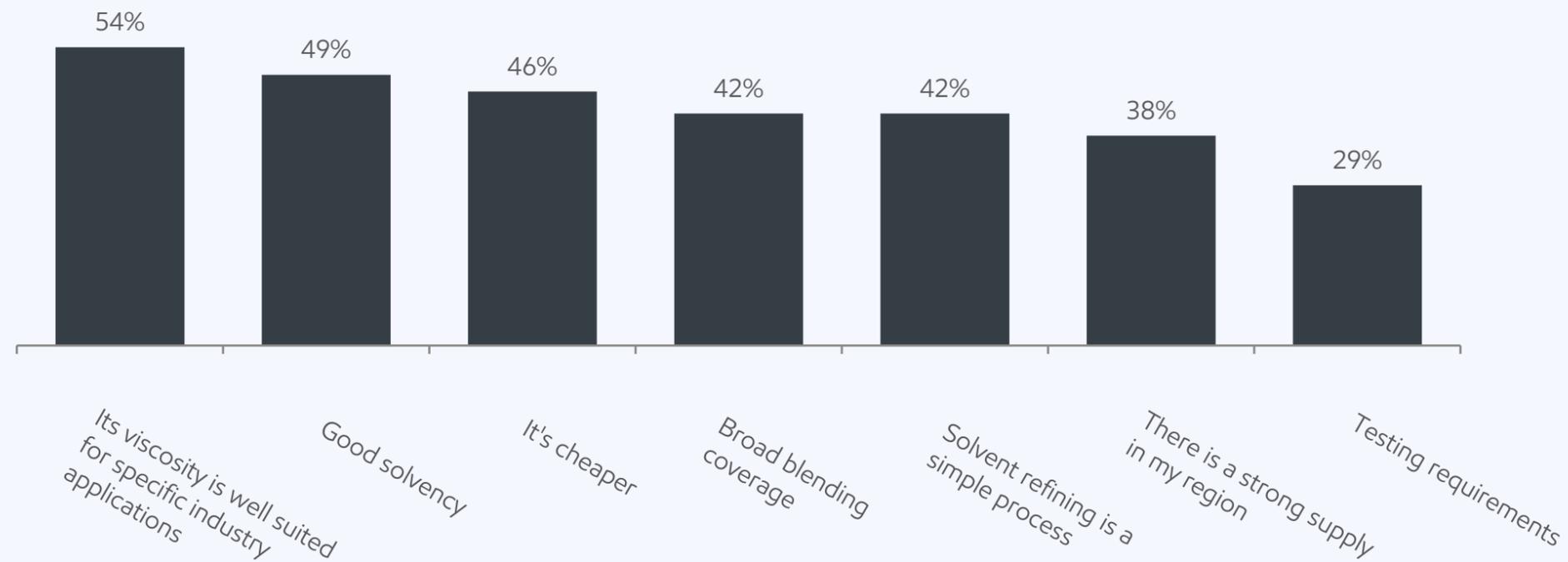


## Decline of Group I base oils *(continued)*

The primary benefits of Group I base oils are viscosity (54%), solvency (49%), and affordability (46%).

In choosing a base oil manufacturer, respondents value an affordable price (37%) second only to expertise in the industry (38%). This potentially indicates Group I base oils still have a place in the industry because of cost.

**Benefits of Group I Base Oils Ranked  
Combined Ranks 1, 2, 3  
(n=306)**



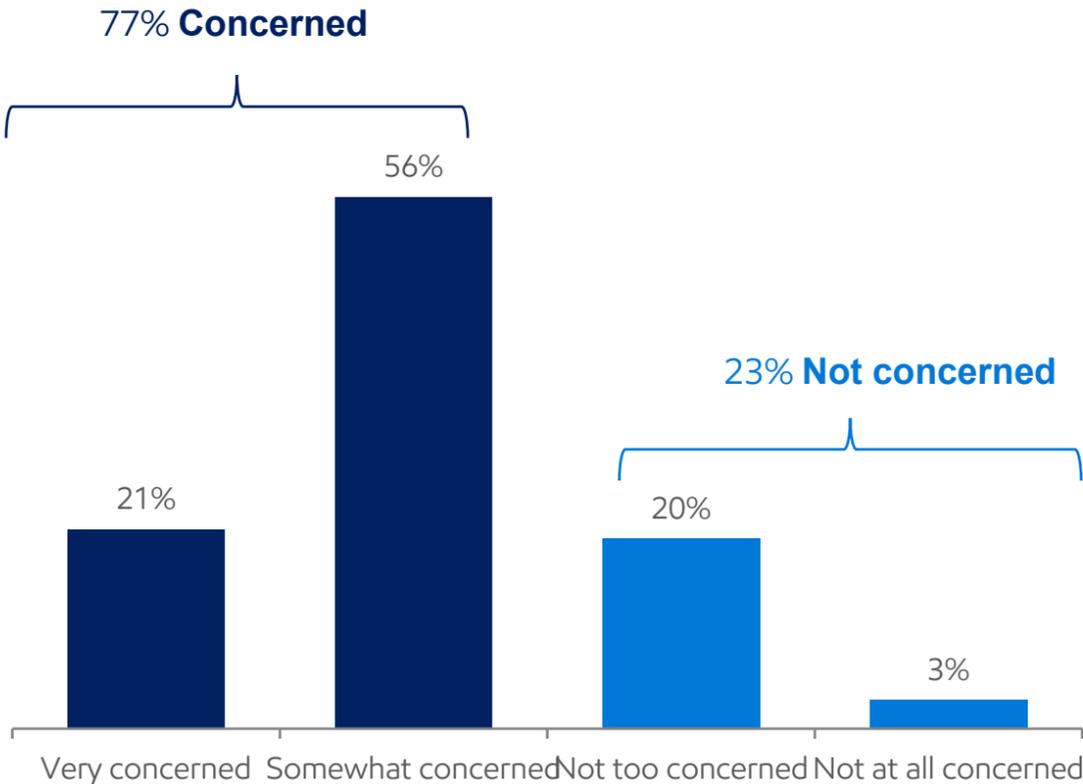


# Automotive industry

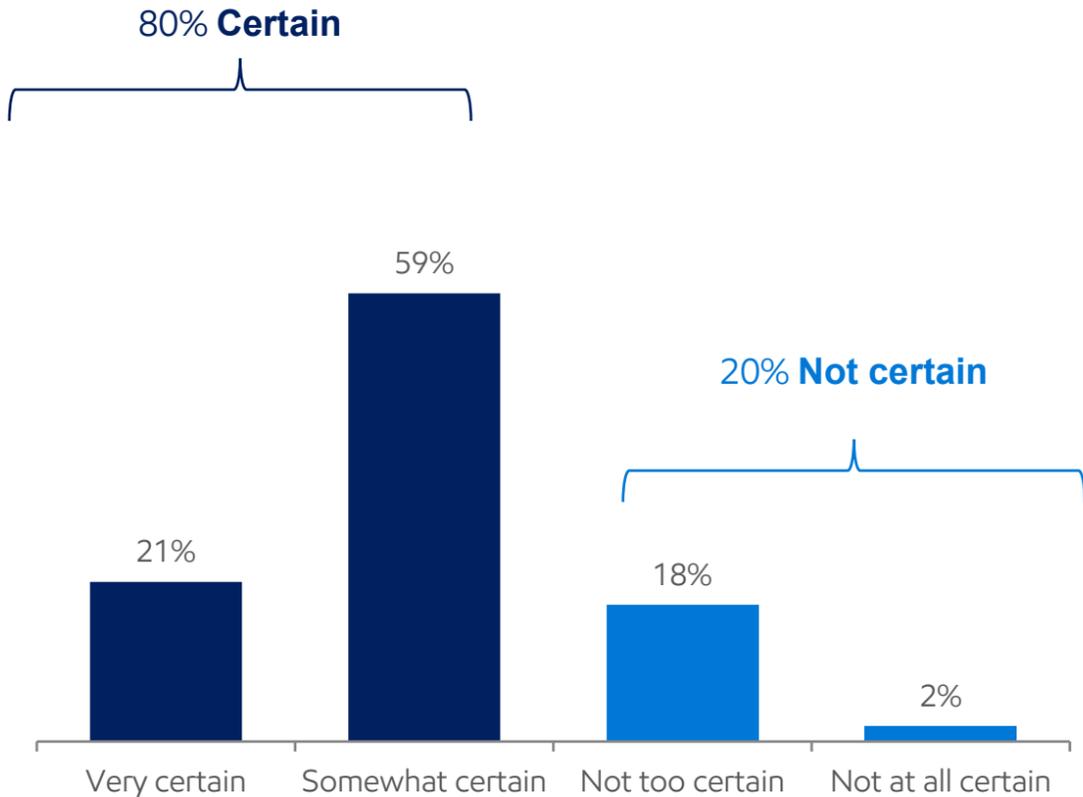
More than 3 in 4 (77%) are concerned about the increased implementation of fuel economy and emissions regulations.

However, 80% are certain that the base oil industry will be able to keep up with these regulations.

**Level of Concern about Increased Regulations**  
(n=306)



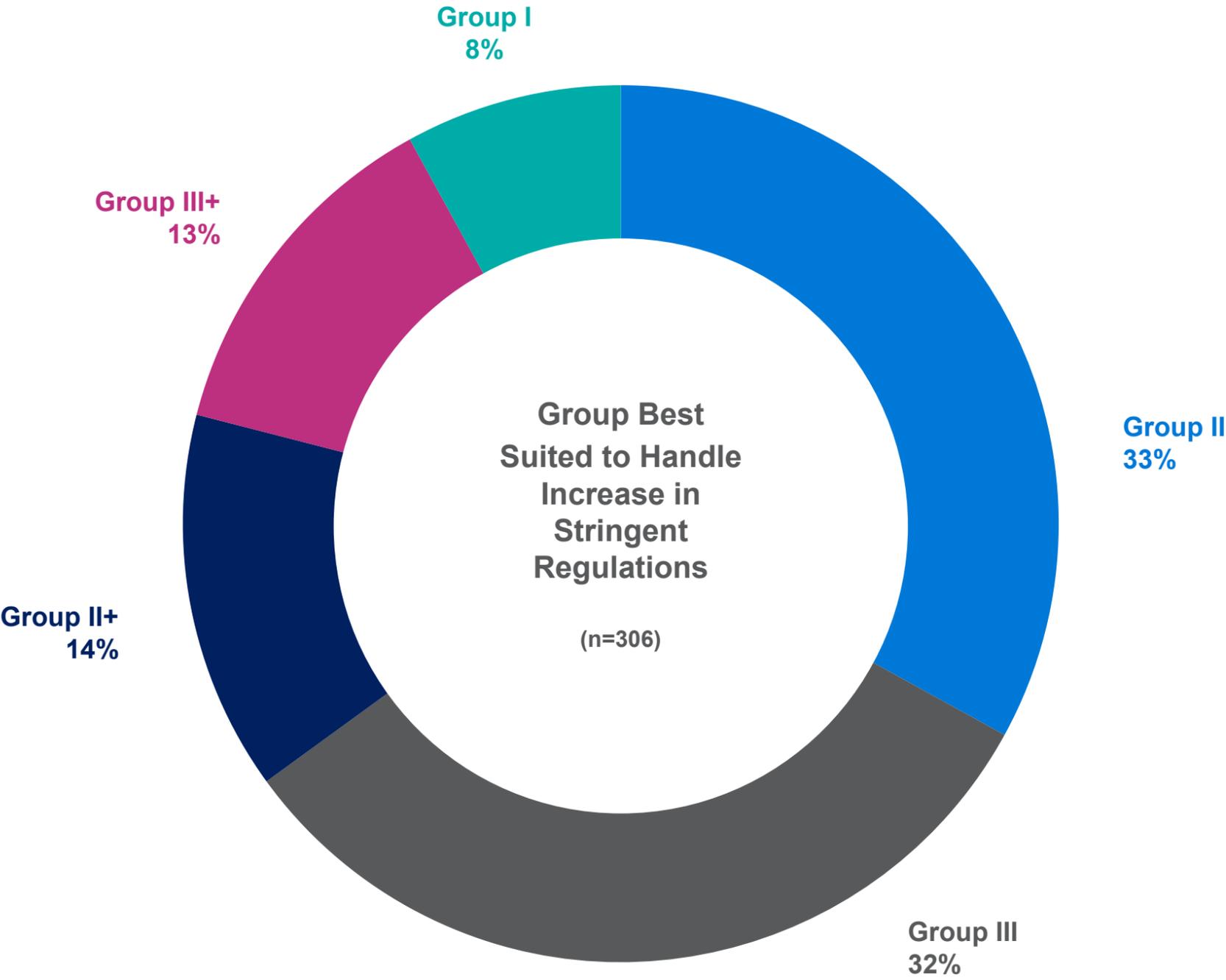
**Certainty in Base Oil Industry's Ability to Keep Up**  
(n=306)





# Automotive industry *(continued)*

Two thirds believe that Group II or Group III base oils are the best to handle an increase in more stringent fuel economy and emissions regulations.



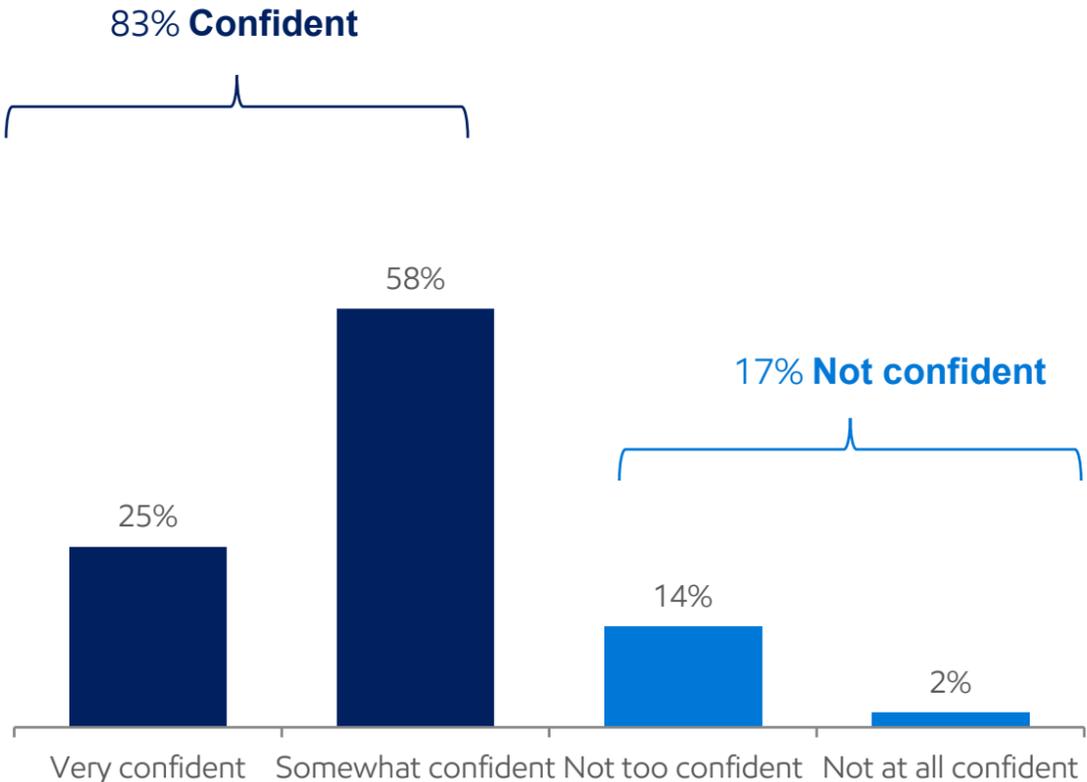


# Automotive industry *(continued)*

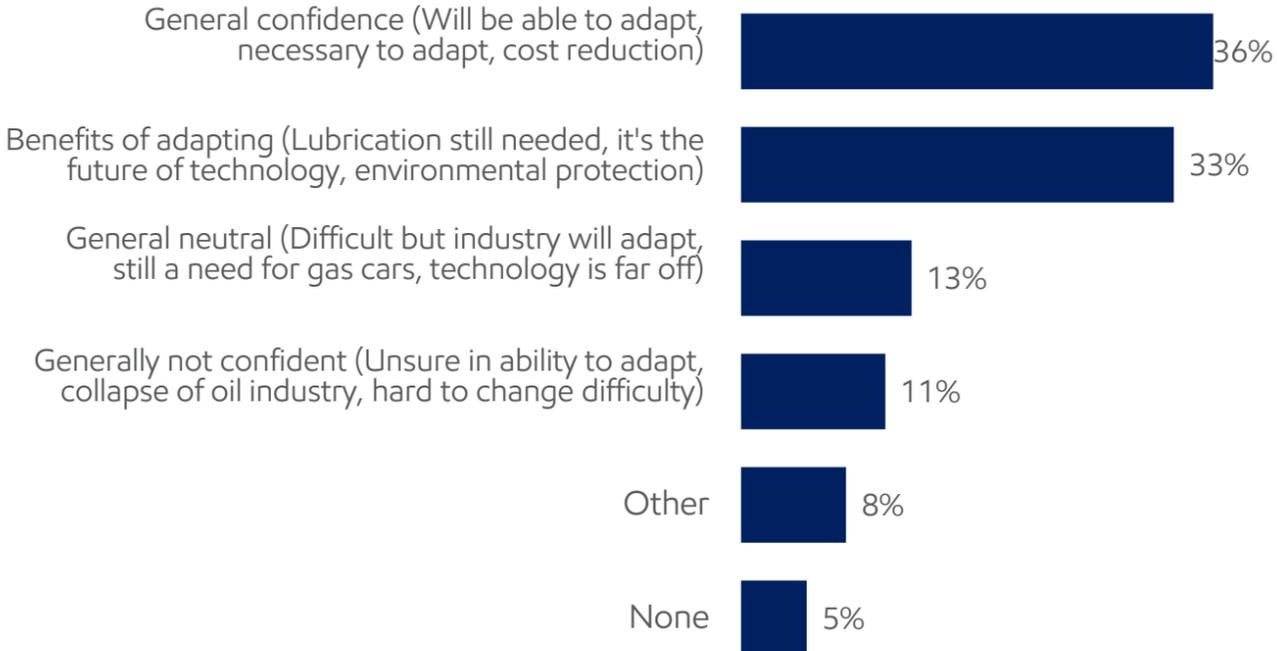
Respondents are equally confident in the base oil industry's ability to adapt to the rise of electric or autonomous cars (83%) as they are certain the industry can adapt to the increase in regulations (80%).

Two thirds believe that Group II or Group III base oils are the best to handle an increase in more stringent fuel economy and emissions regulations.

### Confidence in Base Oil Industry's Ability to Adapt to Electric Cars (n=306)



### Ability to Adapt to Electric Cars (n=306)





# Automotive industry *(continued)*

Despite their confidence in the industry's ability to adapt to electric and autonomous cars, respondents do have concerns.

Primarily, they anticipate declining use across all base oil groups (30%), job loss across the industry (28%), and machinery becoming outdated (27%).

## Concerns Due to Increased Production of Electric/Autonomous Cars (n=306)

**30%**

Declining use across all base oil groups



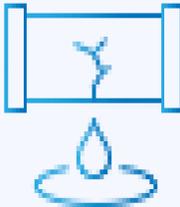
**28%**

Job loss across the industry



**27%**

Outdated machinery



**25%**

Increased costs at your business



**22%**

Plant closures



## About the ExxonMobil Basestocks 2018 Industry Pulse Report

The ExxonMobil Basestocks 2018 Industry Pulse Report surveyed 306 base oil decision makers from the following industries: additive manufacturers, lubricant manufacturers, industry associations, and equipment manufacturers. The survey required an even split of at least 100 respondents from APAC, the Americas, and EMEA to ensure results encompassed a global perspective. The survey was also translated from English to Spanish, French, German, and Standard Mandarin as needed. The information contained in the ExxonMobil Basestocks 2018 Industry Pulse Report is comprised solely based on information gathered from the 306 base oil decision makers, and does not include ExxonMobil internal data or information.

The ExxonMobil logo is displayed in red, featuring the word "Exxon" in a stylized font with a red 'X' and "Mobil" in a standard sans-serif font.

## About KRC Research

KRC Research is a global full-service nonpartisan opinion research and strategy firm. A unit of the Interpublic Group of Companies (NYSE: IPG), KRC Research offers the quality and custom service of a small firm with the reach of a global organization. For over 30 years, KRC Research has worked on behalf of corporations, governments, not-for-profits and the communications firms that represent them. Staffed with multidisciplinary research professionals, KRC combines sophisticated research tools with real-world communications experience. For more information, visit: [www.krcresearch.com](http://www.krcresearch.com)

The KRC Research logo consists of a blue square icon with white geometric shapes on the left, followed by the text "KRC RESEARCH" in a bold, blue, sans-serif font.