



Sustainability - Implications on the supplier industry

Study summary

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Sustainable mobility is a major trend impacted by multiple drivers

A.T. Kearney Sustainable Mobility Strategy Framework

Customer perspective

OEM perspective

Technology perspective

Regulation perspective

TCO

The more progressive the scenario, the more competitive alternative powertrains become in terms of TCO (1/2)

Functionality

Full Hybrids outperform other powertrains in terms of functionality

Powertrain	2017	2020	2025	2030
Gasoline	High	Medium	Low	Very Low
Hybrid	Medium	High	Medium	Low
EV	Low	Medium	High	Very High

Image

Increasing importance of a "green image" for customers will be beneficial for alternative powertrains

Mid-term planning

Mid-term planning of OEMs today results a slow penetration of alternative powertrains

Development status

While Electric Vehicles are nearing market launch, Fuel Cells are still in the early development phase

Powertrain	Development Status
Gasoline	Commercial
Hybrid	Commercial
EV	Commercial
Fuel Cell	Development

Penetration speed

Toyota's Hybrid strategy can be used as a benchmark to predict future penetration speed of alternative powertrains

Technology maturity

Lithium Batteries outperform Fuel Cells in terms of technical maturity

Technology	Maturity
Lithium Batteries	High
Fuel Cells	Low

Infrastructure build-up

The development of the LPG/NG infrastructure exemplifies the speed of future infrastructure developments

Infrastructure cost

The establishment of a H₂ infrastructure for Europe would require investments of \$2.6-4.9B

Infrastructure	Cost
H ₂ Infrastructure	\$2.6-4.9B

Emission limits

Global CO₂ regulations will gain in stringency until 2020; Europe sets the global agenda

Subsidies

Alex is leading in terms of subsidies for EV/PHEV; in Europe, France has just launched an aggressive program

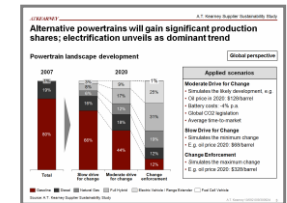
Country	Subsidy Program
France	Aggressive program

Initiatives

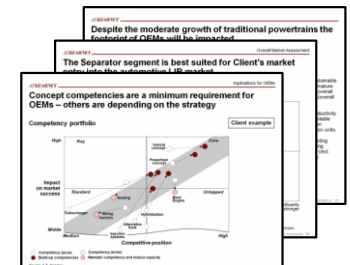
Production share of Gasoline and Diesel benefit from limited availability of other powertrain technologies

Powertrain	Production Share
Gasoline	High
Diesel	High
EV	Low

Sustainable mobility landscape 2020



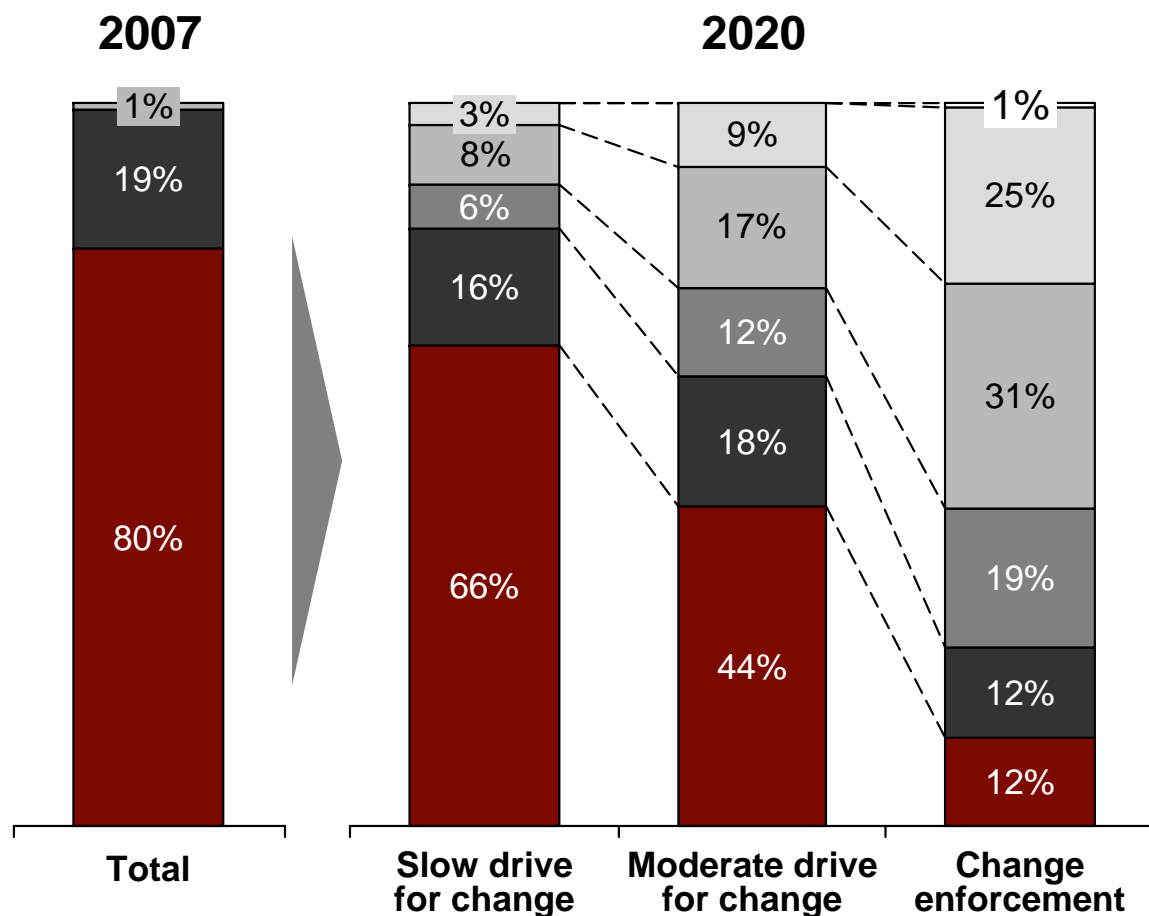
Supplier strategies



Alternative powertrains will gain significant production shares; electrification unveils as dominant trend

Powertrain landscape development

Global perspective



Applied scenarios

Moderate Drive for Change

- Simulates the likely development, e.g.
- Oil price in 2020: \$128/barrel
- Battery costs: -4% p.a.
- Global CO2 legislation
- Average time-to-market

Slow Drive for Change

- Simulates the minimum change
- E.g. oil price 2020: \$68/barrel

Change Enforcement

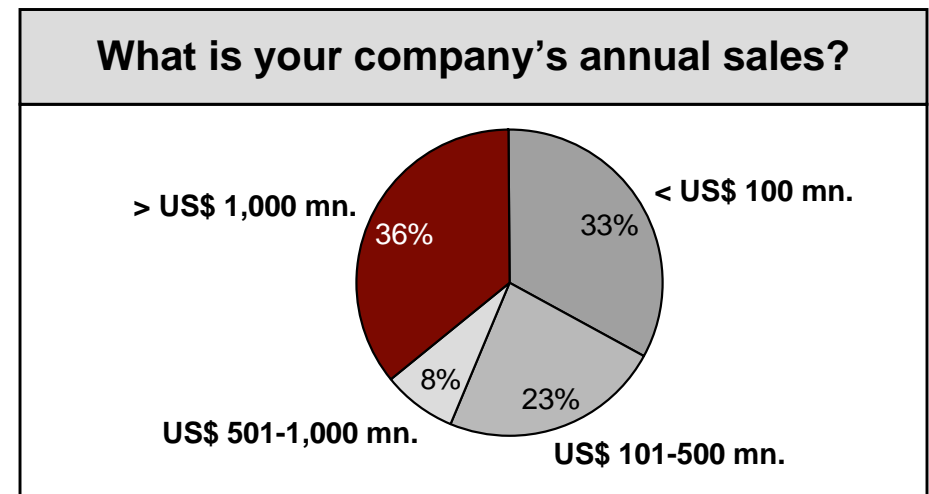
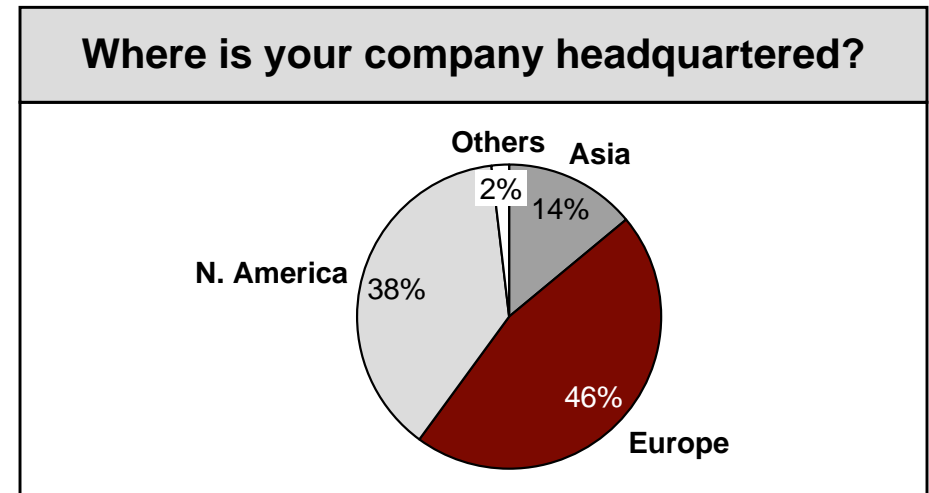
- Simulates the maximum change
- E.g. oil price 2020: \$328/barrel

Gasoline Diesel Natural Gas Full Hybrid Electric Vehicle / Range Extender Fuel Cell Vehicle

A.T. Kearney conducted a global study on the impact of the sustainability trend on automotive suppliers

Study setup

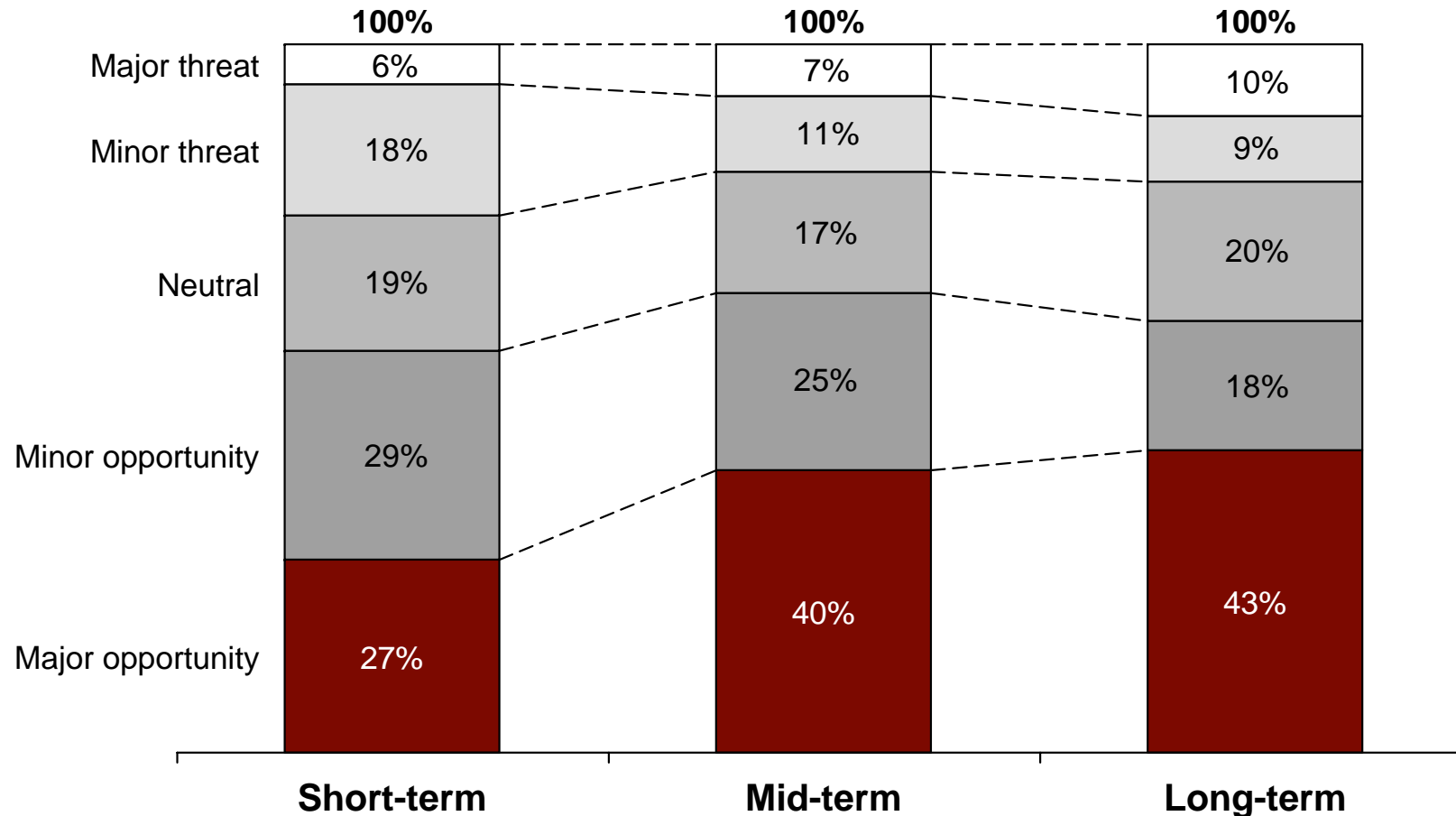
Study approach
<ul style="list-style-type: none"> • Global study conducted in 2009 • Objective of the study is to understand the impact of the sustainability trend on automotive suppliers and to develop related strategies • Based on a Delphi-Study with ~260 participants of more than 100 automotive suppliers in Europe, USA and Asia • Complemented by <ul style="list-style-type: none"> • global market assessments of more than 20 market segments • impact assessment of 40 European automotive suppliers



Two-thirds of all participants see sustainability as an opportunity for the supplier industry; one-fifth as a threat

Question: “In your business area, is sustainability generally seen as an opportunity or a threat for suppliers?”

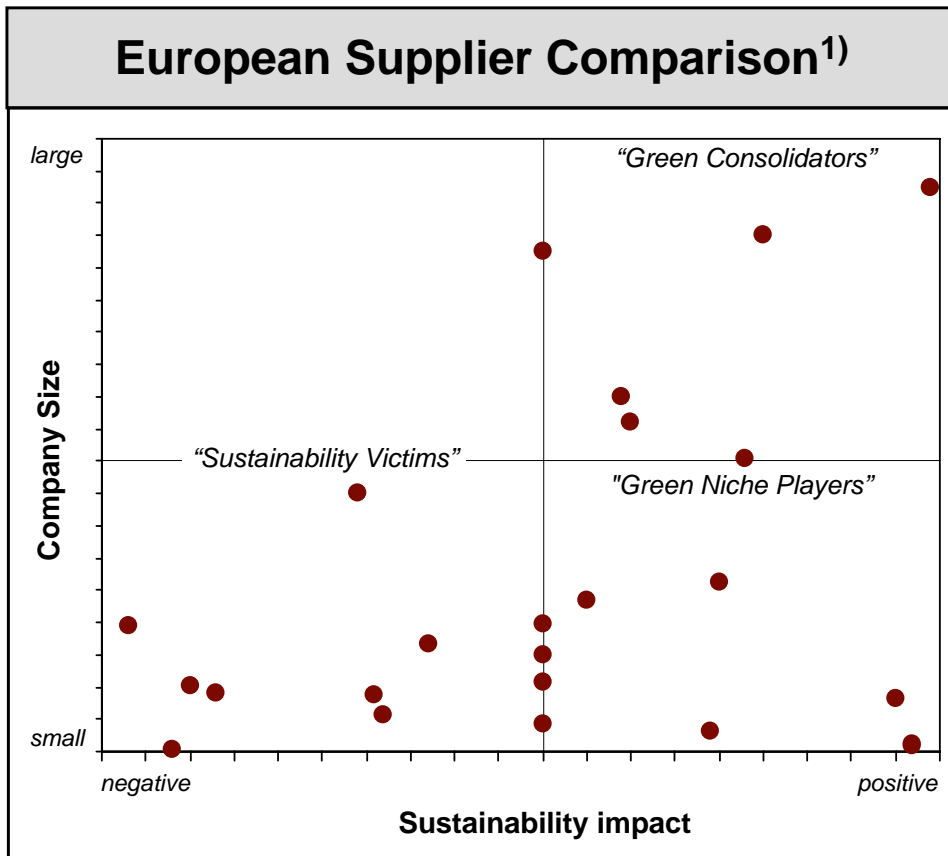
Global



The impact of sustainability mainly depends on the suppliers' product portfolio

Impact of Sustainability on Automotive Suppliers

Excerpt Europe



- ### Key findings
- “Green consolidators” are positively impacted and in a position to actively drive the industry (e.g. large electronic players)
 - “Green Niche Players” are also positively impacted but more specialized in their portfolio (e.g. battery player)
 - “Sustainability victims” are negatively impacted by future powertrain trends (e.g. suppliers of commodity combustion engine components)
 - A group of mainly smaller companies is not yet impacted by the trend, but should consider selective portfolio enlargement with “green” products

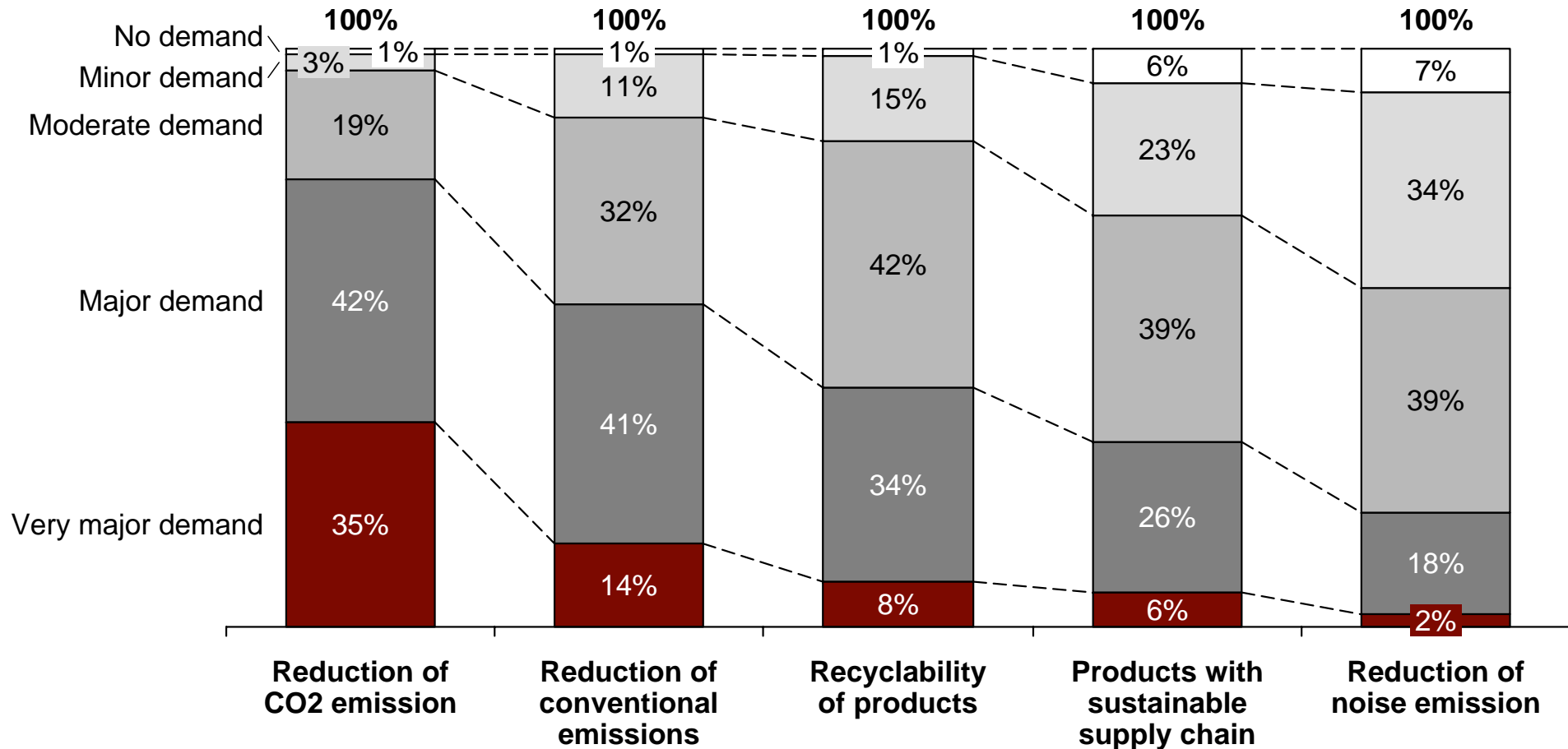
● Assessed European suppliers (one point may cover multiple suppliers)

1) Based on 2020 “Moderate drive for change” scenario
Source: A.T. Kearney Supplier Sustainability Study

Reduction of CO₂ and conventional emissions is in the focus of the market demand for sustainable products

Question: “What is the focus of the market demand for sustainability products?”

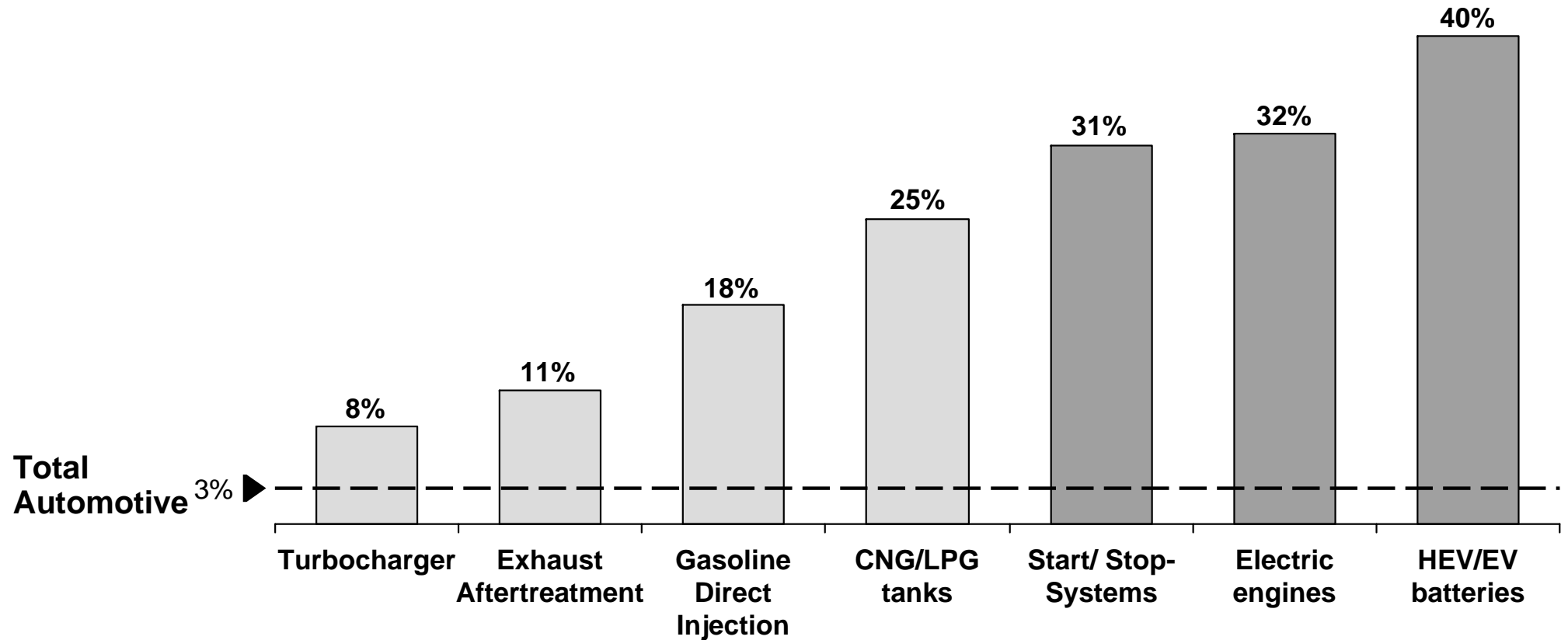
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Thus, the related market segments will grow significantly stronger than the average automotive industry

Growth of "sustainable" product markets
(CAGR global 2007-2020 in %)

Example Powertrain



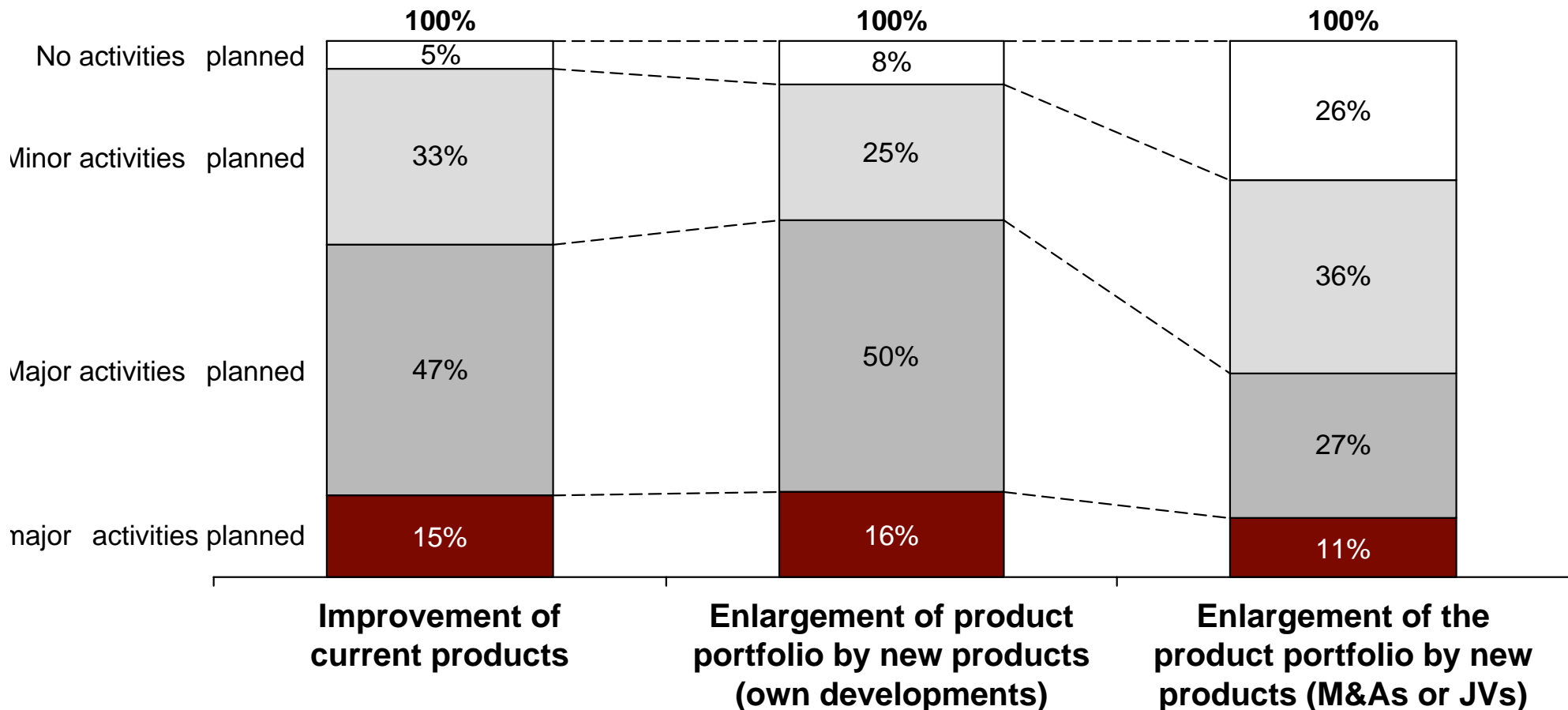
Optimization of conventional engines
 Electrification

Comment: CAGR= Annual Growth Rate, HEV=Hybrid Vehicle, EV= Electric Vehicle
Source: A.T. Kearney Supplier Sustainability Study

To participate in the growing sustainable markets, suppliers focus on organic growth; one-third plans M&As

Question: “How does your company plan to participate in the growth opportunities of sustainability-related market segments?”

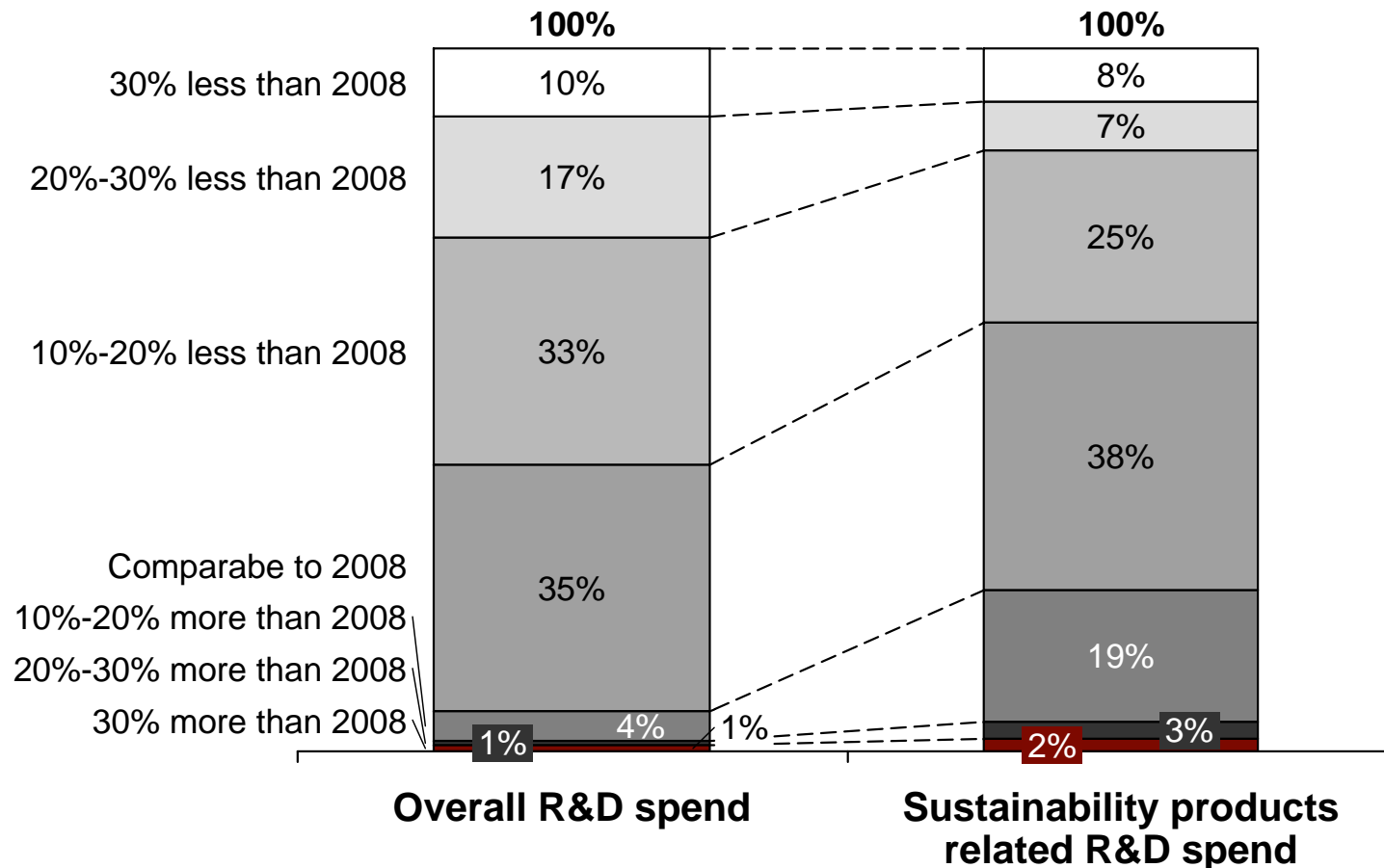
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Consequently, suppliers spend money for R&D of sustainable products even during the current crisis

Question: “How will the financial crisis impact the R&D spend of your company in 2009?”

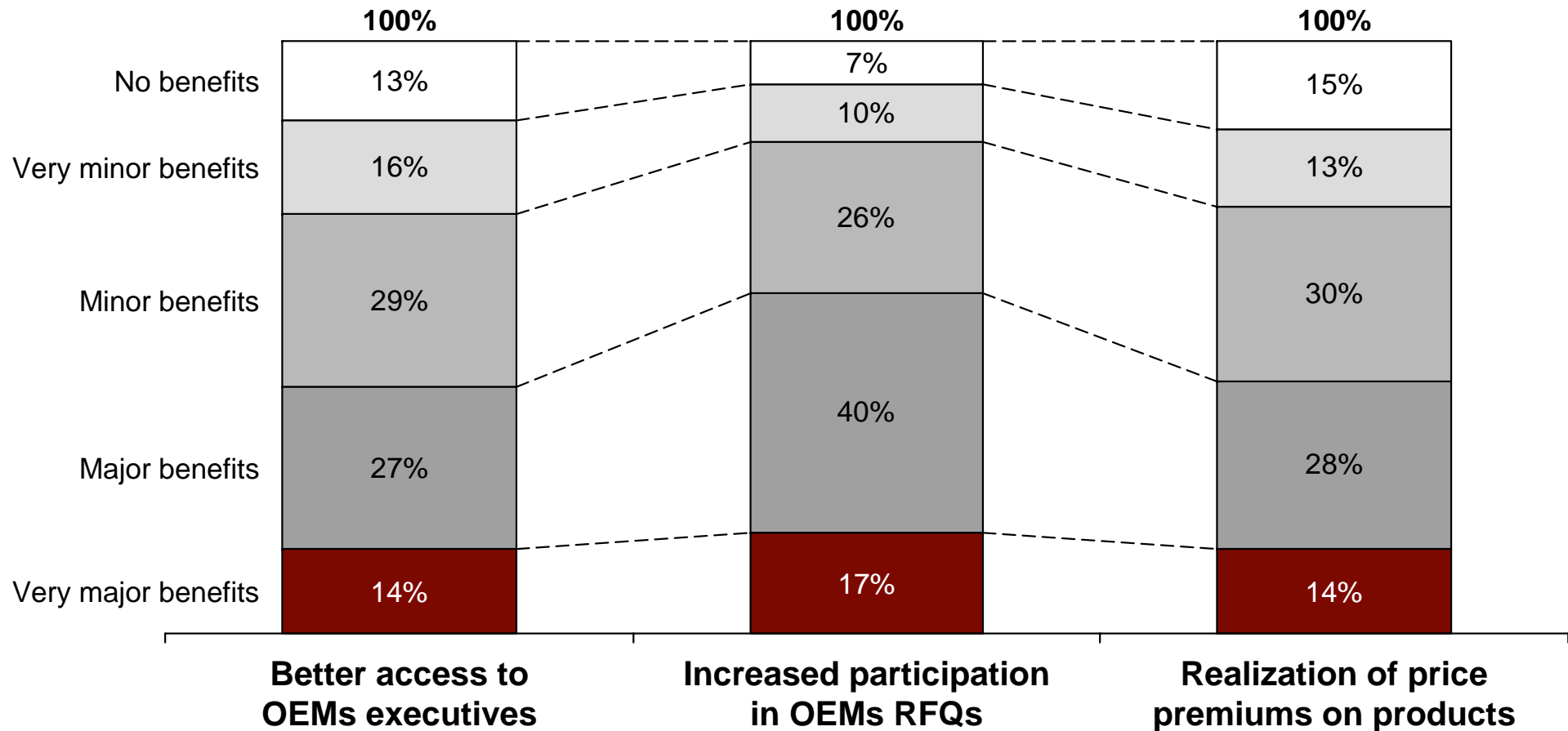
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When offering sustainable products, suppliers experience significant benefits in their sales process

Question: “In your experience, what benefits do you have if you can offer products that improve sustainability of OEM’s vehicles?”

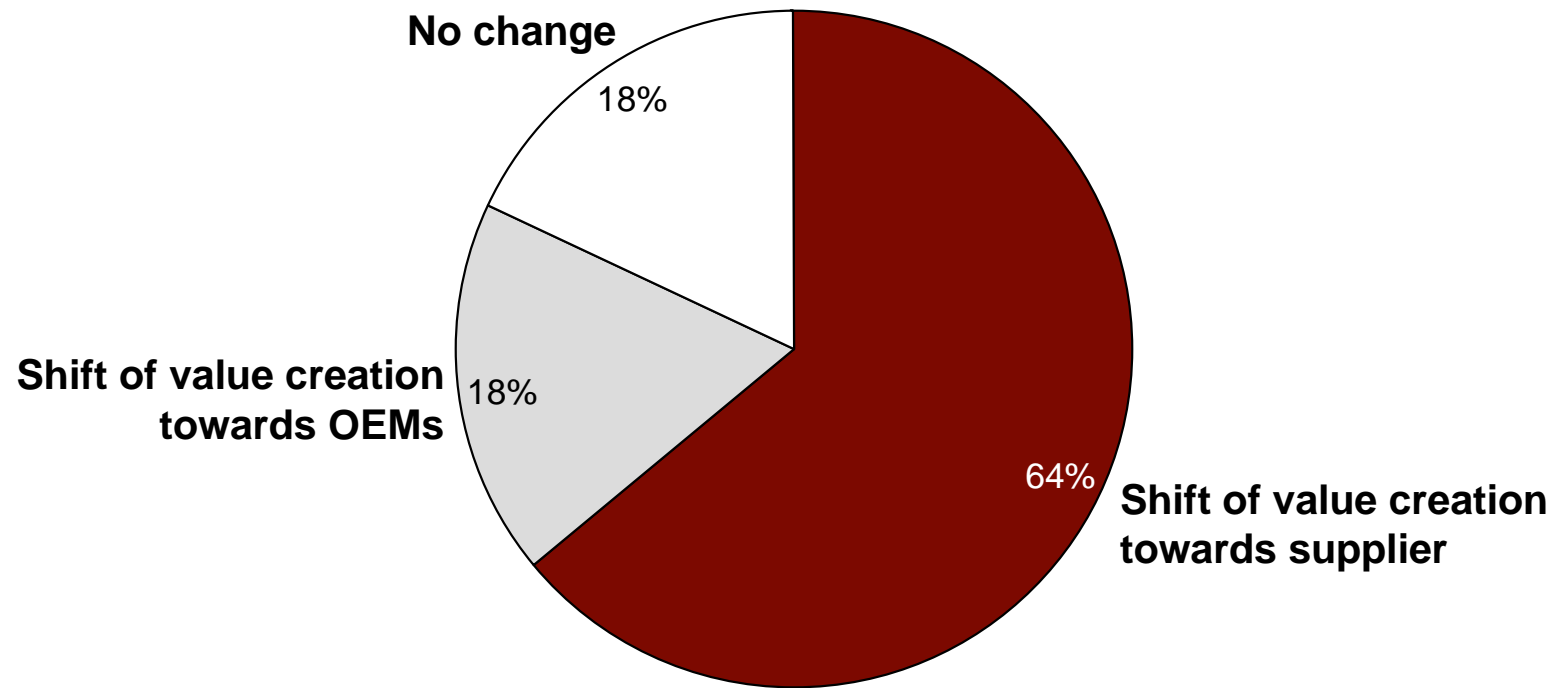
Global



The sustainability is expected to shift value creation from OEMs to suppliers

Question: “How will the Automotive value chain be impacted by sustainability?”

Global





Thank you!