McKinsey&Company

The Future of the North American Automotive Supplier Industry:

Evolution of Component Costs, Penetration, and Value Creation Potential Through 2020

March 2012

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The past decade has been especially challenging for North America's automotive-component suppliers. Input costs rose steeply, but market dynamics, including competition due to globalization, left little room to increase prices, resulting in declining profitability for most industry participants.[1] And new platforms—specifically, hybrids—did not necessarily favor U.S. or Canadian suppliers.

The steep drop in North American vehicle production caused by the recent global recession, coupled with a tightening of credit, only exacerbated the challenges: production plummeted by more than 40%, from 15.1 million units in 2007 to 8.6 million units in 2009.[2]

Most of the suppliers that survived these challenges evolved to become much stronger. Of course, rebounding vehicle sales are helping (North American passenger-vehicle and light-commercial-vehicle production was close to 13 million units in 2011, an increase of 50% from 2009). But suppliers have also positioned themselves for success. Most have significantly cut costs across their businesses, and some have undergone deep financial restructuring. Consequently, although the stocks of publicly traded automotive suppliers underperformed the S&P 500 and one-year AA bonds over the past three decades, since the downturn this pattern has been reversed. Some suppliers are also reporting record profitability after several years of margin declines.

Despite these improvements in performance, suppliers recognize that fresh challenges are looming. These suppliers are exploring their future strategic priorities and determining how to position themselves for the next decade. With those needs in mind, McKinsey & Company recently completed a research effort to develop quantitative perspectives that will not only guide automotive-supplier executives' assessment of strategic options and subsequent implementation plans, but also help them position their organizations for profitable growth over the next decade. McKinsey's research is based on a proprietary model to gauge how the feature content and costs of approximately 620 vehicle components (the vehicle "bill of materials") could evolve through 2020. The research also examines the basis on which vehicle components will capture value—that is, how they will earn returns equal to or greater than their cost of capital.

The work provides three critical insights.

First, **the North American automotive-supplier industry will face an almost unprecedented challenge as new costs due to tightened fuel-economy standards confront long-established end-customer expectations' for increased vehicle content at constant prices (in real dollars).** That is, absent a discontinuity regarding cost-reduction and consumer-willingness-to-pay trends, we estimate that the cost of components in standard midsize North American passenger vehicles—more or less flat at U.S.$13,400 (in real dollars indexed to 2010) for at least a decade[3] —will rise to $15,900 by 2020 (an incremental $2,500), even accounting for projected industry productivity gains of about 2.4% per year.

---

1 Taking a synthetic index of 16 major suppliers, between 2001 and 2009 profitability fell from one year to the next six times and rose in subsequent years only twice.

2 Source: IHS Automotive, North American passenger-vehicle and light-commercial-vehicle production.

3 Specific cost figures appear as real dollars, adjusted for inflation and indexed to 2010 values.

This anticipated 20% increase largely stems from components and systems required to meet more-stringent government fuel-economy standards. From the regulators' perspective, these standards aim to improve U.S. energy security, ameliorate climate change by reducing carbon emissions, and at least partially address trade imbalances. From the consumer's vantage point, new components that improve fuel economy mean less money spent at the pump. Indeed, the U.S. Environmental Protection Agency estimates that the average consumer will save more than $3,000 over the life of a model-year 2016 vehicle compared to a vehicle not meeting the new EPA GHG standards.[4]

However, the structure of the North American car industry today—particularly the intense cost competition due to the relative balance of power between suppliers and automotive original equipment manufacturers (OEMs), and the abilities of manufacturers from low-cost countries to offer many components at lower costs than North American suppliers—all point to the difficulty that North American suppliers will have if they wish to increase component costs much beyond today's levels. Instead, suppliers will likely be under considerable pressure to address the potential 20% cost increase. This hypothesis is supported by McKinsey's recent survey of 100 North American supplier executives, the majority of whom said they believe their industry will bear much of the responsibility for containing costs by increasing productivity and making changes in design or content.[5] Fewer than 10% of surveyed executives thought that higher costs could be either passed on to consumers as higher sticker prices or avoided through changes in regulatory standards. To put this "productivity imperative" in context, an annual improvement of 5% would be necessary to maintain component costs for an average midsize passenger vehicle at historical levels of $13,400 (real 2010 dollars).

The second key insight from our research is that **suppliers today have a relatively clear picture of which components will generate significant growth through 2020.** By way of contrast, suppliers said that a decade ago they had much less confidence in the set of components and features that would appeal consistently to carmakers and consumers. But today, it is evident that components that improve fuel economy—mainly those found in the powertrain—will capture a disproportionate amount of the new investments that OEMs and suppliers will make. We project that the dollar content related to new fuel-economy components will climb 16-fold over the course of the next decade compared with the past 10 years,[6] making it essential for suppliers to have clear answers to the strategic question of *where to compete*. Of course, not all suppliers will or should invest in fuel-economy-related components. *Where and how* a company joins the fuel-economy game will depend on its starting point, and other attractive component segments promise growth as well.

Third, **there will likely be a sharp drop in the fraction of components that create value, as well as a shift in the mechanisms by which components manage to create value.** We predict that the share of components (as a percentage of vehicle cost) that will have a sustainable basis for creating value will fall from about 55% today to just over 40% in 2020. The upshot: it is becoming more critical to select the product portfolios that can create long-term value. Indeed, many suppliers will face tough decisions regarding whether and how to divest components where value comes under pressure, and how to position themselves to pursue the most attractive opportunities. Any portfolio assessment and rebalancing efforts will be incremental to operational excellence, which we regard as "table stakes." That is particularly true for companies that engaged in initiatives designed to survive the recent downturn rather than to create sustainable value.

4 "EPA and NHTSA Finalize Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks," Regulatory Announcement, EPA-420-F-10-014, April 2010.

5 Executives were polled during the Original Equipment Suppliers Association (OESA) Industry Vision 2020 forum in late July 2011.

6 Approximately $200 in total for an average passenger vehicle from 2001 through 2010 vs. $3,200 from 2010 through 2020 (both in 2010 real dollars).

On a more positive note, despite the many threats that North America's automotive suppliers should guard against, the industry also stands to benefit from exciting opportunities. For most participants, the return to profitability presents a chance to put in place the skills, equipment, and other assets needed to increase productivity and to make changes in design or content that will allow them to thrive despite intense cost pressures. Current high levels of profitability also give suppliers breathing room for bold strategic thinking and repositioning, including exploring entry into or strengthening current participation in adjacent non-automotive sectors, which was deemphasized in recent years because of more pressing operational and financial requirements. Our research can serve as a useful template for automotive-supplier executives to assess the current and future performance of their organizations, weigh their strategic options, and be confident they are doing everything necessary to achieve and sustain profitable growth.

While the output of our research is most relevant to the North American auto market (because the data for component costs and penetration, the regulatory landscape, and industry participant input all focus on this region), the main insights and strategic implications are similar for suppliers based in or doing business in Japan and Western Europe, countries that have or plan similarly strict fuel-economy and/or emission standards.

This report is divided into the following major sections. The first provides background information, outlines the key questions addressed by the research, and describes the methodology used to develop an answer. The second provides historical context for our findings by looking in detail at how suppliers fared over the past decade. The third outlines our cost projections for components through 2020. The fourth examines the basis on which these components are likely to capture value in 2020. The fifth reviews the plausible strategic options available to suppliers. We conclude with a summary and suggestions for next steps that suppliers could take.

THE FUTURE OF THE NORTH AMERICAN AUTOMOTIVE SUPPLIER INDUSTRY

TACKLING THE HARD QUESTIONS ABOUT COMPONENT COSTS

THE QUESTIONS

Each fall, car dealers nationwide start to build up their new-vehicle inventories and try to attract buyers. In the battle to win market share, the real winner is usually the customer. Indeed, McKinsey research has shown that the average North American consumer decides what vehicle to buy largely based on "good value for money," forcing original equipment manufacturers (OEMs) to compete on price and increased content.[7] As an example, over the past decade, the Toyota Camry has added at least $1,400 in new content, while the manufacturer's suggested retail price (MSRP) for the base model has actually stepped down by about 1% a year (in real dollars). The new content—components and subsystems not available on the base-model car in 2001—ranges from traction control to trunk lights, from stability control to speed-sensitive sound-system volume control.

The story behind this development is that suppliers played a significant role in reducing the costs of existing components in order to accommodate the new content. Suppliers' productivity gains made it possible to bring the new content to market at a price consumers would pay. Remarkably, this occurred even as suppliers had to absorb significantly higher input costs, which increased 50% between 2001 and 2010 to approximately $3,500 per U.S. light vehicle.[8] In addition, many incumbent suppliers were forced to compete with new entrants that enjoyed manufacturing footprints in low-cost countries (LCCs). And the relentless cost pressure on suppliers was only compounded by the recent recession.

Automotive-component suppliers that survived the downturn now are benefiting from stronger consumer demand and, as a consequence of restructuring efforts, operating with much leaner cost structures. But they face many uncertainties, not least of which are macroeconomic concerns about the trajectory of the economic recovery in various regions, long-term fossil-fuel prices, and a host of market-specific issues, such as the extent to which car buyers worldwide will embrace vehicles with electrified powertrains.

To provide useful insights for the industry's leaders, McKinsey launched a comprehensive, quantitative research effort that spans the vehicle bill of materials (aggregated to roughly 620 components and systems) and their potential growth, given market and economic trends and scenarios. Our objective was to answer several key questions:

- How has the North American supplier industry **evolved over the past decade** and what is its **current position**?
- What are the **critical trends** that will shape the industry through 2020?
- How will these trends influence the feature content, cost, and penetration of different components and systems under a variety of plausible **scenarios over the next decade**?
- How will different trends, combined with shifting industry structures, influence the **ability of components and systems to create value** over the next decade?

---

7 See, for example, "Roads Toward a Low-Carbon Future: Reducing CO2 Emissions from Passenger Vehicles in the Global Road Transportation System," McKinsey & Company, 2009.

8 "Who Makes the Car – 2010," Bank of America Merrill Lynch, 2011.

- **What strategic options are available** to suppliers to actively shape their value creation plans early on and thus gain more degrees of freedom in the future?

THE RESEARCH APPROACH

To understand the possible evolution of the North American supplier industry, we built a detailed cost model for approximately 620 components (see the sidebar "Inside the Cost Model"). The model translates the five trends listed below (see Exhibit 1) into quantitative inputs that shape component costs. The five trends are those most likely to impact this industry over the next decade, as identified through extensive interviews with 25 senior industry executives, including former top OEM engineering executives, and more than 20 McKinsey experts:[9]

- The **influence of macroeconomic forces**, specifically the increases in input costs and cost volatility
- The **impact of regulations**, focusing on the deployment of alternative powertrain technologies
- The **nature of the vehicle content**, with an emphasis on the adoption rates of safety, driver information, customization, entertainment, and other features
- The **impact of renewed and continuing cost pressure**, set in the context of OEM pricing power and LCC suppliers' efforts to gain market share
- The impact of **market growth in Brazil, Russia, India, and China (BRIC)**, which includes the need to tailor portfolios to local needs, a topic we don't address in this paper[10]

EXHIBIT 1

Major trends that industry participants say are likely to shape the future

SOURCE: McKinsey interviews

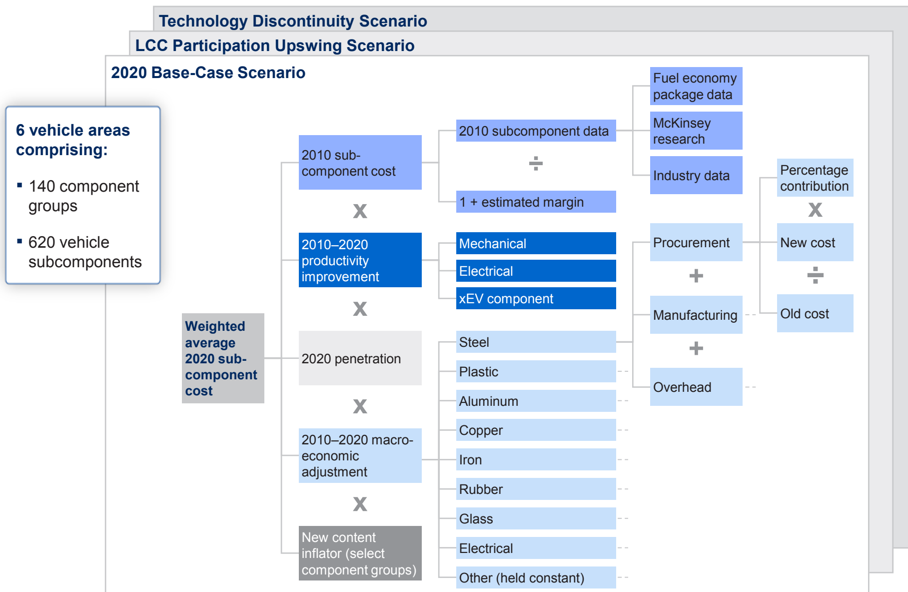
9 The five trends were prioritized from a set of approximately 150 trends that are broadly relevant to the automotive industry. The trends are part of the Future Trends Database administered by McKinsey's Strategy Practice. The Strategy Practice works with industry, academia, government, and nongovernmental organizations to identify and describe technological, macroeconomic, regulatory, and demand-side trends that may have a material impact on individuals, companies, and countries in the future.

10 Trends that suppliers considered less important or less certain included the following: the entrance of new competitors that today focus primarily on consumer electronics, difficulty accessing capital or funding going forward, and renewed or continuing cost pressure that will increase supplier investments in LCCs.

We used the model to project the evolution of feature content, cost, and penetration of different components and systems under a variety of plausible scenarios over the next decade. (see Exhibit 2)

EXHIBIT 2

High-level overview of the cost model used in this study



SOURCE: McKinsey

In all of our analyses and projections, we considered the costs, not the prices, of the various components. This useful simplification allows us to separate and sequentially address issues that have an impact on costs (such as productivity, macroeconomics, and regulation-driven component penetration) before we turn to issues shaping price (such as industry structure and conduct).

Separately, to estimate the potential of different components to capture value—that is, to earn returns equal to or greater than their cost of capital—today and in the future, we conducted extensive interviews with supplier executives, industry observers, McKinsey automotive experts, and recently retired executives from leading automotive manufacturers. This last group reviewed individual components and systems and provided examples of specific characteristics that could help protect profit margins, as well as factors or circumstances that could change the value-creation potential of components or systems.

To derive actionable insights from the research, we stepped back to ask about the overarching strategies that suppliers can deploy to achieve profitable growth, given the potential evolution of component adoption, penetration, and costs and the ways in which components' abilities to capture value may change in the coming decade.

Inside the Cost Model

We built a detailed quantitative model to explore how the cost of automotive components may change through 2020. We began by determining the individual cost structure of approximately 620 components that encompass the roughly 120 groups that OEMs use to organize their purchasing decisions. Next, we used interviews with industry experts to estimate the annual cost givebacks that OEMs are likely to win for each component, based on the product technology and manufacturing maturity of the components, the productivity improvements that suppliers are likely to be able to achieve with each, and the leverage that OEMs have been able to apply in order to reduce prices in recent years.

To model the impact of changes in macroeconomic factors, we built a fact base for each component, accounting for the relative contributions of different inputs including steel, cast iron, molded and fabricated plastic, copper, aluminum, glass, rubber, printed circuit boards, other electronics, composites, ceramics, magnets, other metals, chemicals, cloth, and labor. We derived 2020 base-case estimates for different macroeconomic values (and thus critical inputs to predict future costs for components and systems) from sources including McKinsey's Basic Materials Institute and other McKinsey research, the U.S. government's Energy Information Administration and Bureau of Labor Statistics, industry analysts, and interviews with industry leaders. The proprietary model explicitly accounts for the evolution of components' compositions in the future, such as the substitution of plastic for steel in some components.

In addition, we factored in the change in penetration of different components, driven by regulation, consumer preference, and the shifting competitive landscape. We validated the adoption rates of fuel-economy components in our model by confirming their consistency with the new U.S. Corporate Average Fuel Economy (CAFE) standards.

Finally, we used historical data to estimate the potential change in component costs in the future due to improvement of their quality, functionality, and so on.

A REVIEW OF THE PAST DECADE: CONSUMERS CAPTURED VALUE CREATED BY THE INDUSTRY

Although our research aims to provide a future perspective, it's important first to understand the realities of the past decade. Specifically, we reviewed changes in cost and the industry's response to cost shifts between 2001 and 2010 to validate our research approach and to provide potential lessons for tackling future challenges.

2001 TO 2010 AT A GLANCE

The weighted average cost of components for a standard midsize passenger car remained unchanged between 2001 and 2010. (see Exhibit 3) At the start of the decade, the typical share of the overall cost of the car that was borne by suppliers—that is, the aggregate cost of the components—was $13,400 (real dollars indexed to 2010).[11] Over the decade, the supplier industry achieved productivity gains equivalent to $2,900 per car, or about 2.4% per year.[12] Put another way, if suppliers had continued to manufacture the same components for a standard midsize passenger car over the entire decade, and if macroeconomic forces had remained unchanged, the cost of vehicle components in 2010 would have fallen to $10,500.

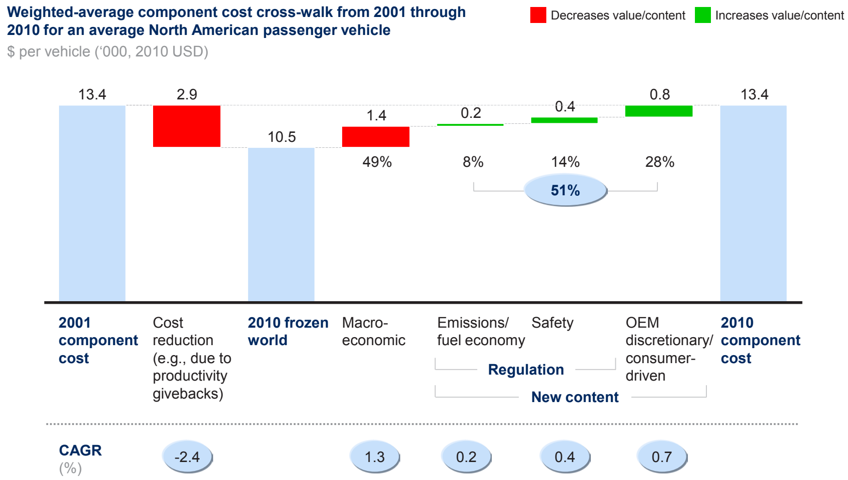
11 "Who Makes the Car – 2010," Bank of America Merrill Lynch, 2011.

12 IRN.

EXHIBIT 3

Over the past decade, about 50% of productivity givebacks has been recaptured by suppliers via new content

U.S. EXAMPLE



NOTE: Numbers and calculations may reflect rounding.
SOURCE: Industry interviews; McKinsey analysis; IRN; U.S. Government

Of course, much did change. Macroeconomic costs for supplier-manufactured components increased by more than $1,400 per vehicle, predominantly owing to changes in steel, rubber, petroleum, and plastic prices. Government regulations required OEMs to spend approximately $600 per vehicle on new components, comprising about $200 for emission and fuel-economy regulations and about $400 for safety regulations. Most OEMs chose to reinvest the remaining approximately $800 per vehicle recovered from productivity gains; those dollars went into content intended to differentiate their products from those of competitors or to persuade buyers to at least consider their vehicles. Indeed, interviews with former top OEM executives confirmed that some automakers' choice to not reinvest in discretionary or differentiating content eventually hurt vehicle sales. Collectively, the macroeconomic, regulatory, and discretionary spending offset productivity gains, meaning that component costs per vehicle ended the decade where they began, at $13,400 per vehicle.

A MORE GRANULAR LOOK AT HISTORICAL TRENDS

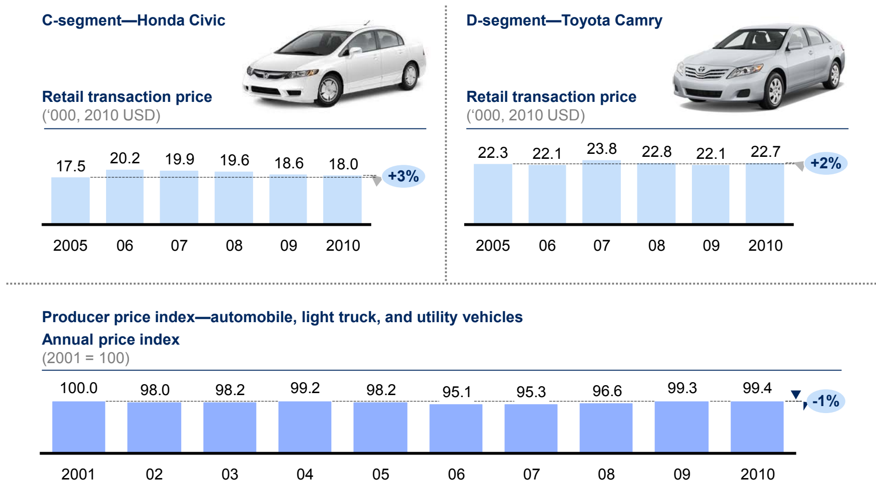
Four trends accounted for the stagnation in the overall cost of components per vehicle from 2001 through 2010:

Unyielding cost pressure due to consumers' purchasing power. Evidence for the cost pressure experienced by the automotive industry is shown indirectly in Exhibit 4, which looks at price evolution at the vehicle level in North America. Segment leaders by volume, including the Honda Civic and Toyota Camry, have seen only slight increases in retail transaction prices (3% and 2%, respectively) from 2005 through 2010, while overall the annual price index for automobiles, light trucks, and utility vehicles has fallen by 1% in aggregate from 2001 through 2010.[13] Consumers thus impose cost pressures directly on the industry initially through OEMs and, in turn, on suppliers.

13 J.D. Power and Associates; U.S. Census Bureau.

EXHIBIT 4

Historically, competitive dynamics have limited OEMs' ability to raise prices



SOURCE: J.D. Power & Associates; U.S. Government PPI Index

OEMs won significant cost givebacks. A major contributing factor to flat component costs was the ability of OEMs to extract annual productivity gains from suppliers. The level of competition among suppliers in North America has been such that OEMs have been able to demand average annual cost reductions on the order of 2.4% in the 2001–2010 timeframe—which steadily eroded profit margins for many suppliers. Over the course of the decade, such productivity has amounted to just over a 20% reduction in component costs (real dollars). Although the giveback average is our benchmark, the rate varies among OEMs; whereas one managed annual productivity of 2.3%, another achieved 3.2%—equivalent to cost reductions of 20% and 28%, respectively, over the past decade.[14] Cost pressure on a particular supplier was highly dependent on which products it made, the competitive alternatives for an OEM, and which OEMs and models were included in the supplier's portfolio.

Input costs rose sharply. The change in supplier-specific input costs from 2001 through 2010 was substantial. (see Exhibit 5) Increases in the prices of steel and petroleum—30% and 250%, respectively—made up the lion's share of the rise in input costs. Most relevant to suppliers that source from LCCs: the cost of labor in China tripled during the decade. Overall, total raw material costs of a typical U.S. light vehicle doubled from 2001 through 2008 to roughly $3,500. After a sharp drop in 2009, input costs were still up by more than 50% in 2010 relative to 2001.

14 Pricing Survey Report, IRN, 2009.

EXHIBIT 5

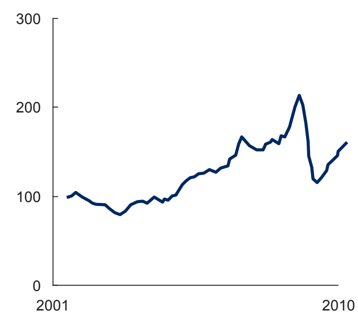
Input costs, especially for petroleum and metals, rose significantly over the past decade

Comparison of input costs in 2001 vs. 2010
2010 USD

	2001	2010	Δ (%)
Steel $/ton	480	690	44
Aluminum $/ton	1,800	2,170	21
Copper $/ton	2,050	7,500	266
Petroleum $/bbl	31	78	152
Labor (U.S.) $/hour	22	21	-5
Labor (China) $/hour	0.7	2.2	214

Input costs increased 50% over the past decade

Total raw material costs in a typical U.S. light vehicle
Index: 2001 = 100



Cost increases added about $1,400 to component costs over the past decade

SOURCE: Platts; EIA; BLS; LME; Merrill Lynch; McKinsey analysis

More content, same price. The stagnation of transaction prices from 2001 through 2010 is surprising when one considers that, over the same period, the amount of vehicle content increased dramatically. For example, the Toyota Camry, whose MSRP fell by 1% per year from 2001 through 2010 in real dollars, now has approximately $1,400 more in new content relative to its makeup a decade ago.[15] (see Exhibit 6) Some of the new content is safety related and mandated by regulators, and some is discretionary on the OEM's part to further differentiate the vehicle from competitors. Critically, the cost of the new content matches the cost savings extracted by OEMs from suppliers of existing products.

EXHIBIT 6

Toyota Camry example shows $1,400 in new content added over the past decade

	2001 Toyota Camry—base model	2010 Toyota Camry—base model
		
Manufacturer's suggested retail price 2010 USD	$21,900	$19,400
	-1% per year	
Content	▪ Child seat anchors ▪ Ventilated front disc/rear drum brakes ▪ Rear door child safety locks ▪ Rear center 3-point belt ▪ Front seatbelt pretensioners ▪ Electronic brakeforce distribution ▪ Emergency interior trunk release ▪ Front height adjustable headrests ▪ Rear height adjustable headrests ▪ Remote trunk release ▪ Speed-proportional power steering ▪ 12V front power outlet ▪ Tilt-adjustable steering wheel ▪ Element antenna ▪ AM/FM in-dash single CD player stereo	▪ Child seat anchors ▪ Ventilated front disc/solid rear disc brakes ▪ Rear door child safety locks ▪ Rear center 3-point belt ▪ Front and rear seatbelt pretensioners ▪ Electronic brakeforce distribution ▪ Emergency interior trunk release ▪ Front height adjustable headrests ▪ Rear height adjustable headrests ▪ Remote trunk release ▪ Speed-proportional power steering ▪ 12V front power outlet ▪ Tilt/telescopic steering wheel ▪ Element antenna ▪ AM/FM in-dash single CD player with MP3
Curb weight Lbs	3,042	3,263
	+ 1% per year	
Fuel economy (cty/hwy) mpg	20/29	22/33
	+1% per year	

Added Camry content	Type/cost (2010 USD)
▪ Front and rear head airbags ▪ Dual front side-mounted airbags ▪ 4-wheel ABS ▪ Emergency braking assist ▪ Stability control ▪ Traction control ▪ Daytime running lights ▪ Tire pressure monitoring	**Regulatory Content: ~$600**
▪ Audio and cruise controls on steering ▪ Trunk light ▪ External temperature display ▪ Speed sensitive volume control ▪ Auxiliary MP3 input ▪ Additional speakers ▪ Power door locks ▪ Interior air filtration ▪ A/C ▪ Power mirrors ▪ Cruise control ▪ 4 one-touch power windows ▪ Radio data system	**OEM Discretionary Content: ~$800**

SOURCE: Edmunds; McKinsey analysis

15 To be clear, *transaction* prices increased modestly from 2005 through 2010, while *MSRP* decreased modestly from 2001 through 2010. In the light of new vehicle content introduced over the 2001–2010 period, these observations reinforce the purchasing power of consumers.

In summary, over the past decade OEMs were unable to raise prices for mass-market cars. In turn, OEMs used their purchasing power to limit suppliers' abilities to increase prices, even in the face of higher input costs. In addition, regulators requested new content, split roughly into two-thirds for safety and one-third for improved fuel-economy and emissions. And OEMs sought to differentiate their products by means of new content and features. Collectively, these factors led to productivity givebacks of 2.4% per year on average, and erosion of suppliers' profitability.

LOOKING AHEAD TO 2020: TOUGHER THAN THE PAST DECADE?

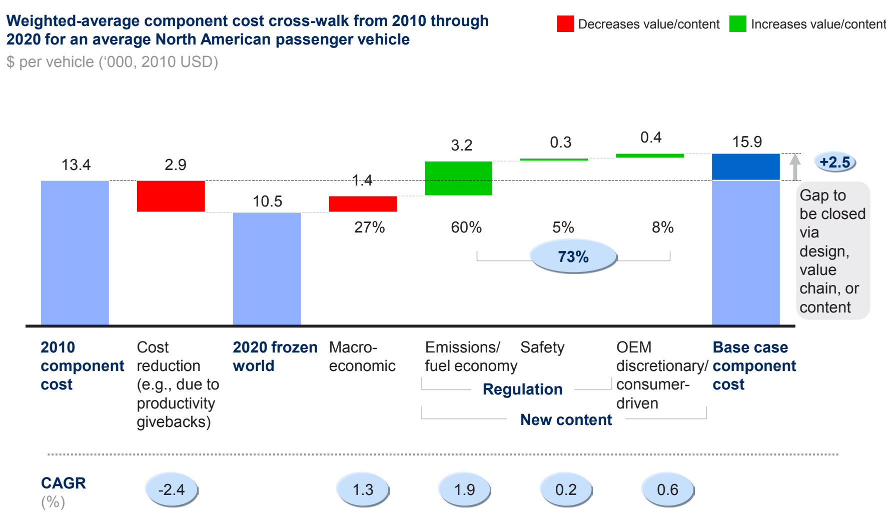
Available evidence points to an outlook for the coming decade that marks a radical departure from the past.

2010 TO 2020 AT A GLANCE

Our research predicts that in a business-as-usual case, the weighted-average cost of components for a midsize passenger car will evolve between 2010 and 2020 with several similarities to the past decade. (see Exhibit 7) Starting from component costs of roughly $13,400 per average U.S. vehicle in 2010, detailed interviews project cost reductions through 2020 to equal $2,900 per vehicle, largely the same as over the past ten years. Changes in macroeconomic factors, such as more expensive labor, steel, and petroleum, could add $1,450 per vehicle to the cost of components, again similar to the trend observed over the past decade.[16]

EXHIBIT 7

In 2020, macroeconomic factors and content required to meet fuel-economy standards will capture most of the available value pool



NOTE: Numbers and calculations may reflect rounding.
SOURCE: Industry interviews; McKinsey analysis; U.S. Government

However, other trends promise to markedly distinguish the 2010–2020 decade from the prior decade. Regulations related to fuel economy could add $3,200 (on a weighted-average basis across different powertrains) to new-component costs—almost 16 times more than over the prior decade. Meanwhile, safety regulations could add $250 to new-

16 The similarity between productivity-giveback figures and macroeconomic figures from 2001 through 2010 and through 2020 is coincidental: productivity-giveback estimates were derived through supplier and OEM interviews on a component-by-component basis and thus reflect the impact of the introduction of new components and shifting penetration of existing components. Likewise, in our base case, macroeconomic factors that fell from 2001 through 2010 (such as labor) are projected to rise slightly through 2020. The inverse is also true (such as for copper).

component costs by 2020, a decline from that seen over the 2001–2010 period. In our base case, we project that future investments in discretionary components—parts that OEMs choose to add—may fall by half, to just $430 per vehicle, compared with the 2001–2010 time frame, although ultimately the amount of discretionary feature additions depends on the brand strength of the OEM, the value of these features to the consumer, and the price sensitivity of the targeted consumer segments. Discretionary spending of $430 per vehicle, if it materializes, would mark the lowest dollar amount of new content that OEMs have added since the late 1990s.

Overall, assuming the productivity levels estimated from our interviews, the component cost of the car could climb to approximately $15,900 in 2020—up $2,500 from both 2001 and 2010. But few suppliers believe that incremental component costs will lead to higher vehicle-transaction prices, based on the lessons from the previous decade and the heightened global competition in all regional markets. Instead, supplier executives believe they will need to increase productivity to minimize the value-chain cost of new components, and they will need to make design changes or explore content reduction to further reduce costs.

As in the first decade of the 21st century, the second decade is shaping up to be quite challenging for suppliers.

2020 PROJECTIONS IN DETAIL

What follows is a trend-by-trend explanation of the forces that will impact component costs over the next decade. In the sidebar "Alternative Scenarios," we speculate on some other possible developments.

Productivity improvements will continue. We estimated the minimum cost givebacks that are likely to occur from 2010 through 2020 as follows. First, we divided the 620 components and systems in our model into different cost-reduction categories based on their physical characteristics, production processes, and design maturity. Example categories include mechanical components, electronic components, novel components for electrified vehicles, and components whose penetration is increasing significantly to improve internal-combustion-engine fuel efficiency. Next, we used interviews with suppliers and recently retired automotive OEM executives to arrive at a consensus view on annual productivity givebacks for each category. On a weighted-average basis, we predict a minimum giveback of 2.4% per year, or roughly $2,900 over the next decade—but this sum may indeed go higher because of other trends.

Materials costs will keep rising. To understand plausible component costs in 2020, we consulted individuals and institutions that study factors influencing macroeconomic trends, with a focus on the balance between supply and demand. Once the physical composition of the components in our model is factored in, consensus estimates of changes in raw-material costs lead to a projection of an additional cost of $1,450 per average vehicle through 2020, mainly because of increases in the costs of petroleum, labor, and metals such as steel and aluminum.

Component costs will climb steeply, assuming historical rates of productivity. The biggest projected change from the past decade will be the $3,200 in incremental costs brought about by new fuel-efficiency-related product content. This represents the weighted-average cost of components found in the vehicle types predicted to be sold in North America in 2020—namely, a combination of more-fuel-efficient internal-combustion-engine vehicles, hybrids, plug-in hybrids, and battery electric vehicles. Our choice of components for internal-combustion-engine vehicles—such as variable valve control, electric power steering, and regenerative braking—was constrained by the requirement that they collectively are sufficient to improve fuel economy to meet pending government targets. That said, consumer choice could increase the cost of fuel-efficiency-related content. One critical uncertainty is the extent to which the costs of leading fuel-efficiency technologies fall as adoption increases.

Further cost increases, projected in our base case to be about $260 per vehicle, will likely be incurred as federal regulations mandate more safety features, including advanced driver-assistance systems and vehicle-to-vehicle and vehicle-to-infrastructure communications. However, the adoption of safety products is tempered in our base case by the incremental cost of meeting fuel-economy standards. In addition, regulations for safety features are still in development and may change the current assumptions. Consumer priorities may increase adoption and penetration rates if consumers see incremental value in such safety features. Adoption and penetration will, of course, vary significantly by OEM and brand for reasons of product positioning, product differentiation, and brand positioning.

Finally, we modeled the content that will be added either by OEM choice or because of consumer demand between now and 2020. Our value of roughly $430 per vehicle is derived from the minimum annual investment to accommodate OEM choice and from observations of consumer demand over the past 15 years. This conservative estimate is held in check by the required investments in other components. Note that this value represents an aggregate view, rather than providing guidance on which features or components OEMs and consumers will select by 2020.

Reflections on our findings. The potential $2,500 increase in component content from $13,400 per vehicle would be a major departure from historical norms. Much of this increase would stem from regulations, effectively defining "where to play" in order to generate new revenue streams. The most commonly articulated view from our interviews and surveys is that consumers are unlikely to be willing to pay more for mass-market vehicles. This belief is supported by the volume gains achieved by South Korean OEMs that consistently undercut the prices of comparable models from leading players by at least 10–15%. There is also broad agreement that suppliers will need to sharpen their focus on productivity. By way of illustration, to hold component costs flat in real dollars, suppliers would need to more than double their productivity gains, to an average of 5% a year through 2020 (though this will vary by component).

Our research underscored the high probability of increased input costs. Even when we ran a sensitivity analysis for some larger cost drivers, such as steel and labor, it was clear that costs are likely to climb. For example, in the base case, the cost difference between 2010 and 2020 starts at $2,500. If we specify that steel costs remain unchanged from 2010, the model still shows an increase of $2,240; if we hold labor costs flat instead, the increase falls, but only to $1,710.

Alternative Scenarios

The flexibility of the cost model allowed us to explore several alternative scenarios. Although such speculation is not the focus of this report, we call attention to the potential outcome of two possibilities:

LCC Participation Upswing. In this scenario, we studied the impact of even greater competition in the North American market, resulting, for example, from the importation of more components or vehicles from LCCs. Primary changes versus our base case to reflect a possible response by North American suppliers included extending the decline in North American wages (in real dollars) observed from 2001 to 2010 through the next decade and assuming a modest increase in annual productivity above and beyond what has been achieved historically. We also assumed that average passenger cars sold in the North American market would need to further enhance their safety content to keep pace with content we inferred LCC participants might use to try to differentiate their vehicles. Under this scenario, the projected increase in the cost of components sold by suppliers participating in the North American market would increase relative to historical norms, but by less than half of what we calculate in our base case (by about $1,150 versus $2,500 [2010 dollars]). Interestingly, increasing average productivity gains across all components to an annual rate of 3.4% would be sufficient to maintain flat input costs. Such a task would be similar to that achieved by suppliers satisfying the requests of the most demanding OEMs over the past decade—to be clear, no easy task.

Technology Discontinuity. In this scenario, we asked what impact a step-change reduction in the cost of energy storage might have on the type and cost of components sold into the North American market. Explicitly, if storage costs of $200/kWh can be attained, and if the efficiencies of electrified vehicles (i.e., Wh/mile) can be improved relative to what is observed today, we find the total cost of ownership for battery electric vehicles (BEVs) would compare favorably to that of internal-combustion-engine vehicles (and would be more attractive than hybrid electric vehicles [HEVs] or plug-in hybrid electric vehicles [PHEVs])—even if petroleum costs remain at roughly $3.5–$4 per gallon. Such a situation would then set up critical debates over customer willingness to make tradeoffs between up-front and total cost of ownership (TCO) prices and the fraction of customers' needs that BEVs would serve. It is worth noting that a willingness to purchase vehicles on a TCO basis (i.e., given low energy-storage costs) could expand the opportunity to add content to vehicles such as new safety features or consumer/OEM-driven content. That is, purchase decisions made on a TCO basis could result in decisions to trade off content and features against petroleum expenses, increasing revenue to automotive suppliers and OEMs.

THE PROJECTED IMPACT ON TOP AND BOTTOM LINES

Thus far, we have focused on the cost of components in our base case for 2020. To link this case to the implications for a supplier, we translated the findings into the potential impact on revenues and profitability, with the latter defined as margins sufficient to meet or exceed a company's cost of capital.

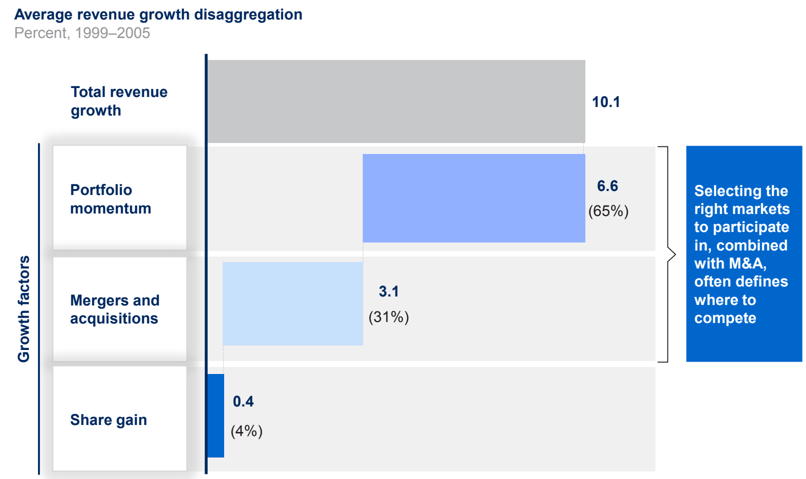
THE PROSPECTS FOR REVENUE GROWTH

In principle, there are many avenues to revenue growth. Independent McKinsey research[17] has suggested that historically, about 65% of any business's revenue growth comes from participating in the right markets, while a further 30% is captured through mergers and acquisitions. Strikingly, on average, only 5% of revenue growth can be attributed to taking market share from a competitor. (see Exhibit 8)

17 For example, see *The Granularity of Growth,* John Wiley & Sons, 2008.

EXHIBIT 8

Portfolio momentum is critical to company growth

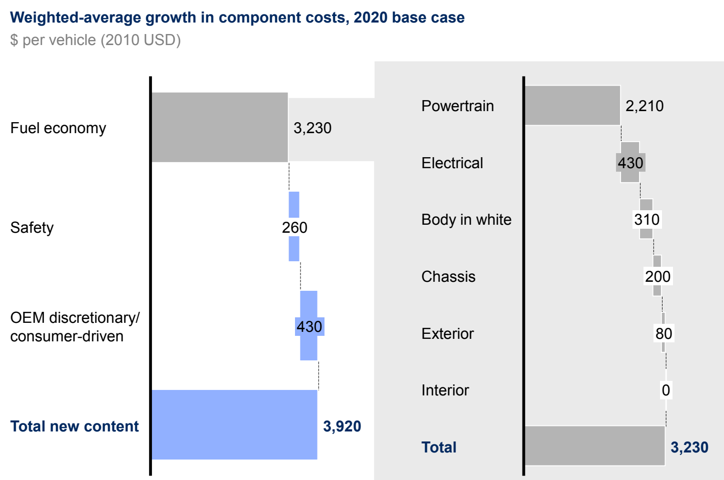


SOURCE: McKinsey Granularity of Growth database

These findings have two important implications for North American components suppliers. First, revenue growth will most likely come from the design, development, and manufacture of products and product features that improve fuel economy—principally, through participation in the powertrain segment. (see Exhibit 9) This clarifies which products a supplier might want to target over the next decade—a departure from the situation a decade earlier, when regulators played a smaller role in guiding vehicle content and, rather, OEMs and consumers exerted a stronger say in defining content additions and tradeoffs. For instance, features as diverse as power mirrors and auxiliary MP3 music inputs, steadily added to many cars over the past decade, have been incorporated more at the discretion of the OEM.

EXHIBIT 9

Portfolio momentum over the next decade will be mostly focused on fuel-economy measures



SOURCE: McKinsey Analysis

Powertrain solutions are not the only opportunities for companies to improve fuel economy. Suppliers can, for example, continue to design components that reduce vehicle weight—a potential fuel-economy saving of 5–10% for a typical car[18]— or produce components that make more efficient use of on-board power, such as electric power steering, which yields a fuel-economy gain of up to 5% relative to hydraulic power steering. Other suppliers will gain revenue from selling lower-rolling-resistance tires, for an additional fuel-economy savings.

The second major implication is that suppliers need to rigorously prioritize their investments in the North American components market vs. other potential opportunities. Upon reflection, some suppliers may choose not to target fuel-economy-related components in the North American market but rather to pursue geographic expansion into fast-growing regions (e.g., the BRIC region), given a need to focus limited management resources, for example, or for financial, technical, or other considerations.

Although the BRIC market opportunity is outside the scope of this report, we believe it is important to call attention to several critical questions that should be considered in evaluating geographic expansion into BRIC markets:

- What is the actual addressable market? For instance, which vehicle programs will be open to North American suppliers, even with local content?
- What are realistic targets for per-vehicle revenue? Even in 2020, these may be considerably lower than what will be found in North America.
- To what extent will macroeconomic forces be similar or different in the BRIC countries compared with North America? Suppliers should focus in particular on inflation in labor costs, electricity prices, and petroleum prices (the last item will have an impact on resins, plastics, and transport).
- How will the balance of supply and demand evolve in BRIC countries, and what implications will this have on pricing power and revenue targets?

18 "Roads Toward a Low-Carbon Future: Reducing CO_2 Emissions from Passenger Vehicles in the Global Road Transportation System," McKinsey & Company, 2009.

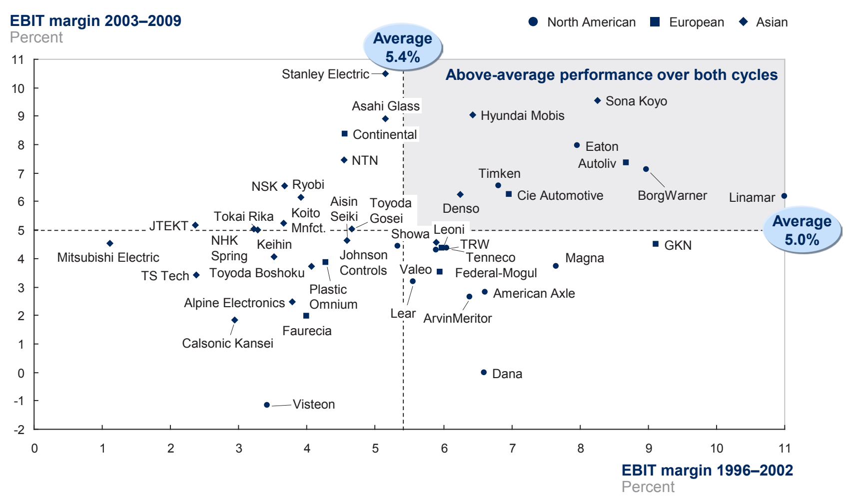
Clearly, even if suppliers turn to BRIC countries for growth, they should not lose focus on the need to monitor how well their North American portfolios can create value, and they should ensure that they put in place the measures needed to maintain profitability.

HISTORICAL VALUE-CREATION STRATEGIES

Just as there are several drivers of revenue growth, suppliers have, in principle, many routes to value creation. To understand which strategies have been most successful, we plotted the earnings before interest and taxes (EBIT) margins for suppliers across two economic cycles: 1996–2002 and 2003–2009. (see Exhibit 10)

EXHIBIT 10

A historical analysis reveals that some suppliers have managed to outperform their peers over two economic cycles



SOURCE: Computstat; McKinsey analysis

Of the 43 companies analyzed, 9 outperformed the group's profit average over both cycles. We analyzed these company's product portfolios and operating patterns, and conducted interviews with automotive OEM and supplier executives to understand how the companies created value. Three themes stand out among the high performers:

Superior product innovation. Innovative and differentiated products demanded by consumers or regulators kept some of the top nine performers ahead of the pack across these two economic cycles. These leaders made relatively large investments in research and development (R&D), chose components where design control rests with suppliers rather than OEMs, or focused on components that successfully integrate mechanics and electronics.

Formidable barriers to entry. Some suppliers managed to identify markets where knowledge, capital investment, or market structure favored a more balanced relationship with OEM customers. For example, companies that manufacture seats—a product that must satisfy strict regulations—have accumulated sufficient critical knowledge of how to respond to crash-test performance data that market entry becomes difficult for other companies. Likewise, for components where the top three players control approximately 80% of the global market, suppliers have a stronger hand relative to OEMs, leading to higher operating margins for the suppliers. Yet these barriers to entry don't last unless they can be continually refreshed through new knowledge, optimized for the supply base structure, and capital investments.

Innovating and arbitraging to improve costs. The more profitable suppliers were among the first to look to LCCs for production of a significant portion of their portfolios. They sourced low-cost labor, materials, or both, while considering risk-adjusted landed cost and sensitivities around currency fluctuations and tariffs. Other suppliers that excelled in cost improvement did so by developing innovative, hard-to-copy manufacturing processes.

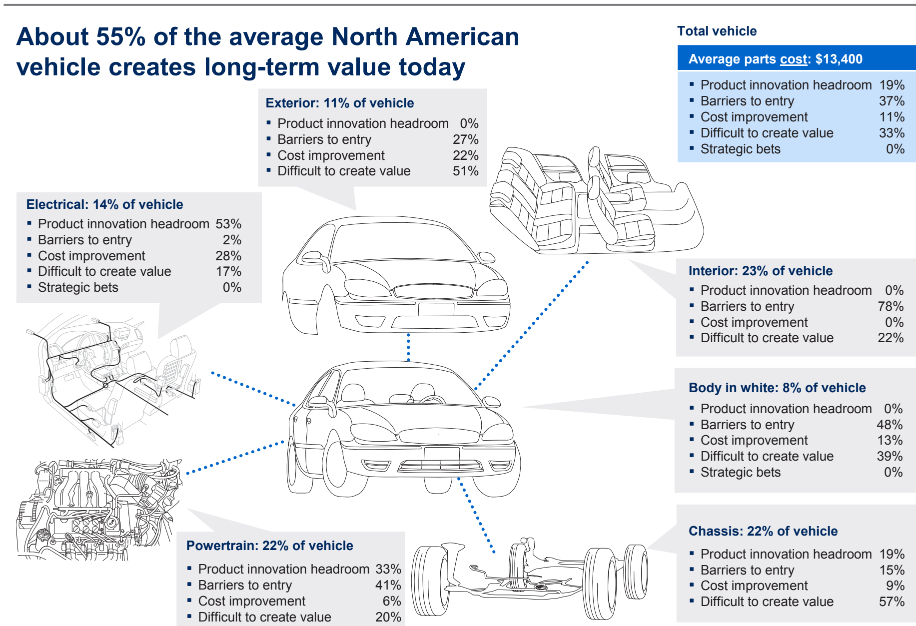
Importantly, suppliers that outperformed the market over two economic cycles didn't have to employ all three of these value-creating methods. Many focused on one. What defines the most profitable suppliers of the past 15 years is that the bulk of their portfolios (from 70% to 100%) was anchored in their preferred value-creating strategy.

THE OUTLOOK FOR VALUE CREATION

We used the series of interviews with supplier and OEM executives to systematically assign the potential for each component found in an average midsize passenger car to create value, both now and in future. In addition to the three value-creation categories outlined above, we placed some new or planned components in a fourth category that we call "strategic bets," even though margins may be poor today. For some of these components, greater scale and/or advances in product or process expertise may improve cost positions, leading to differentiation that will create value in the future. We assigned components not belonging to these four categories—"product innovation," "barriers to entry," "cost improvement," and "strategic bets"—to the "difficult to create value" category.

Applying this classification to today's components (see Exhibit 11), we find that about two-thirds of components, measured by cost, create value. This varies by vehicle area, with 80% of components in the powertrain and electrical areas creating value, in contrast to the chassis or exterior, where fewer than 50% of components do so.

EXHIBIT 11

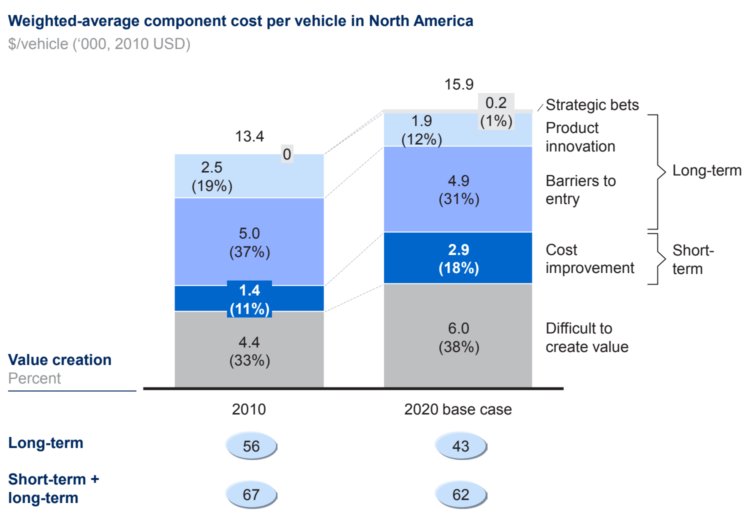


NOTE: Long-term value creation is defined as participation in the product innovation and barriers to entry categories.
SOURCE: McKinsey Analysis

Our research suggests that the share of components creating value in 2020 will probably decline as components found in the "product innovation," "barriers to entry," or "cost improvement" categories are forced down into the "difficult to create value" category, owing to competition and increasing OEM insights that erode the OEM/supplier balance of power. As an example, whereas in 2010 roughly 55% of components created long-term value (which we define as being in the "product innovation" or "barriers to entry" categories), this share will fall to just over 40% by 2020 (see Exhibit 12).

EXHIBIT 12

The long-term value-creation potential of automotive components is expected to fall to about 40% over the next decade



SOURCE: McKinsey Analysis

Historically, components with increasing penetration have often met the criteria required to be in the "product innovation" category, but this should occur less frequently in the future. This is for two reasons: the set of companies focusing on such components will inevitably increase as regulations provide clarity around their nature (i.e., improving fuel economy), and the set of products required to improve fuel economy will often represent refinements of existing products rather than game-changing, completely new products. To quantify this projection: approximately 70% of content associated with fuel economy today falls into the "product innovation" category. By 2020, we project, this value will have dropped by half to approximately 35%. Moreover, even game-changing, completely new products may not fall into the "product innovation" category. For example, a large number of companies are now competing to develop large-scale automotive lithium-ion battery cells. Our research suggests that the market structure and company conduct in this emerging industry will cause such components to fall into either the "cost improvement" or "difficult to create value" category by 2020.

Conversely, the "barriers to entry" category for components contributing to fuel economy should expand from 11% today to 36% in 2020. On a weighted-average basis (i.e., component cost multiplied by penetration[19]), components that show significant growth in per-vehicle cost include optimized transmissions (contributing less than $10 today but reaching $555 in 2020), stop/start systems and regenerative braking (from $10 today to $440 in 2020), and variable valve control (from under $10 today to $205 in 2020). Our interviews suggest that while advanced drivetrain components require technical knowledge that will likely prevent their rapid commoditization, the high prices of these parts will undoubtedly spur efforts to reduce their cost, potentially resulting in these components moving to the "cost improvement" category.

19 Note: a $1,000 component with 10% penetration has a weighted-average per-vehicle cost of $100.

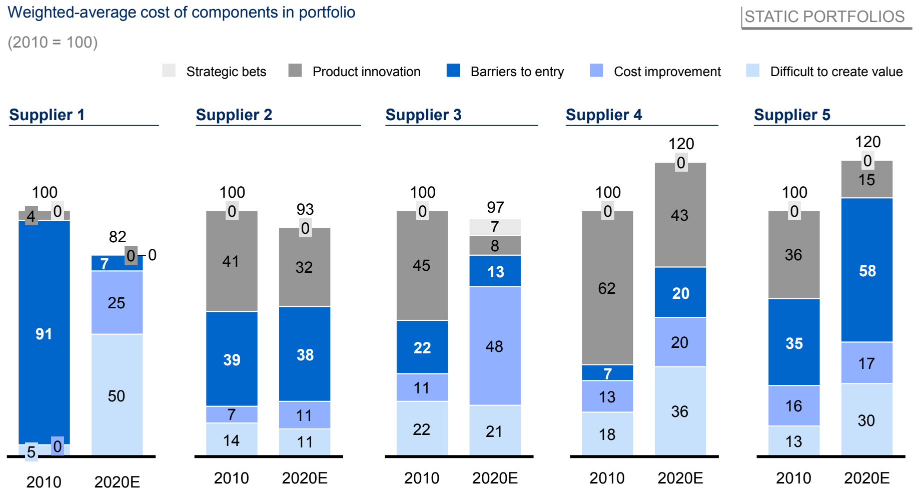
While our initial analyses focused on the North American industry as a whole, we also wanted to understand how individual suppliers might fare over the next decade. Using publicly available information about the portfolios of companies as an input to our cost model, we calculated the current and future average cost of components provided by suppliers, and the value-creation potential. As a necessary simplification (due to our use of outside-in data), we held the composition of suppliers' portfolios constant and assumed that each component contributes equally to sales over the next decade. Exhibit 13 shows how the portfolios of five leading North American suppliers are positioned through 2020.

EXHIBIT 13

Our research suggests many leading suppliers will experience significant reduction in long-term value-creation potential, assuming static portfolios

Weighted-average cost of components in portfolio

(2010 = 100)



NOTE: Numbers and calculations may reflect rounding.
SOURCE: McKinsey Analysis

At one extreme, we find suppliers with relatively limited exposure to regulated content and whose portfolios should face greater difficulty in creating value owing to stronger competition. At the other extreme, a few suppliers have portfolios that are well positioned to help automotive OEMs meet future fuel-economy standards. But even those more fortunate suppliers will see a decrease in the proportion of their portfolios that can create long-term value (as assessed by components in the "product innovation" and "barriers to entry" categories); instead, competition forces components into the "cost improvement" and "difficult to create value" categories. These insights further support the importance of undertaking a timely, fundamental review of the competitive, regulatory, and technological forces affecting a supplier; that review should then inform the development and assessment of strategic options for securing future profitable growth. As part of this process, suppliers should prioritize their OEM customers with regards to future growth opportunities, with an eye to profitability and not just revenues. Assessing the growth trajectory of global and regional OEMs, and their attractiveness from a profit-pool perspective, is critical to ensuring that scarce management time and resources are invested in the most fruitful areas.

STRATEGIC OPTIONS AVAILABLE TO SUPPLIERS

Given the many forces that will shape the industry through 2020, what strategic options should suppliers consider?

Most of the 620 components in a vehicle's bill of materials will persist through 2020 (albeit with likely changes in material composition or penetration). For these components, the evidence points to those falling into the "product innovation" and "barriers to entry" categories as being the best bets to create long-term value. Identifying and implementing a new, differentiated, and hard-to-copy manufacturing process that leads to a step-change in product cost (i.e., the "cost improvement" category) may also provide at least several years of advantage—but will be challenging to sustain. Companies with products that do not fall into these three categories[20] must carefully evaluate whether continuing to manufacture "difficult to create value" components makes sense; if not, divestiture is a viable option. Separately, suppliers must consider moving to adjacent markets in non-automotive industries, given appropriate capabilities and assets. Operational excellence, to be sure, will continue to be "table stakes" for suppliers over the next decade. Let's consider each of these options in greater detail (see also Exhibit 14).

EXHIBIT 14

Five strategic options are available to suppliers

	Description	Examples
Product innovation	• Explicit decision to **manage portfolio** to achieve full benefit of innovation – New strategies to bring innovations to consumers, overcoming reluctance to reward innovation	 Low rolling resist.
Smart consolidation in select segments with high barriers to entry	• Opportunistic investment to **rationalize capacity**, particularly for components with low "transportability" – Important to avoid overpriced assets and hidden post-merger costs	
Cost improvement	• Unsentimental assessment of **ability to lead on cost** in near-to-medium term – Highly transportable goods with misperception of quality or regulatory barrier to sourcing/manufacturing in LCCs	
Divestment of "hard to create value" products	• If product not capable of sustaining mid- to long-term value, consider divesting to owner willing to accept **lower rate of return**, or with **significant synergies**, or willing to **operate for cash/shut down**	
Exploration of adjacent areas	• Systematic scan for **capability or product-based adjacent** opportunities – One-third of respondents to a recent supplier survey derive more than 10% of their revenue from outside the automotive sector, and almost all consider this critical for future growth	Cleantech, hydraulics, sintering, filtration
	Operational excellence is "table stakes" going forward	

SOURCE: McKinsey

RETHINKING INNOVATION

How to innovate effectively over the next decade remains an open question, and the first issue that suppliers must resolve is where to invest their resources. While regulations point to the need to improve fuel economy, the relevant opportunities extend well beyond powertrain improvements. As noted earlier, options such as reducing weight in other vehicle areas may prove just as useful. OEMs will also differ in the degree to which they need to adopt fuel-economy measures, so a supplier must understand different OEM strategies around fuel economy and emission standards, and then decide which technologies will support the various OEM strategies and ultimately create value for the supplier.

---

20 Suppliers may also choose to place one or more "strategic bets" as part of their broader portfolio strategy. We don't consider this to be a core strategic option given the uncertainty that such "bets" will pay off and the relatively small set of components that fall into this value-creation category.

A related issue is *how* to invest R&D resources. Some suppliers may retrench to focus narrowly on R&D that relates to specific OEMs and vehicle programs. Others may look for more general solutions that can be adopted widely across OEMs and platforms. In any case, we believe that investments in targeted advanced engineering will be essential to develop and market winning product innovations, by helping to build a knowledge advantage relative to competitors and OEMs. These choices will obviously be shaped by the nature of the component being sold. In addition to organic R&D investments, some suppliers may want to augment their knowledge of specific areas through acquisitions, especially given that the scope of knowledge advances now extends beyond the automotive industry itself.

Suppliers will also be forced to take a close look at how efficient and effective they are at R&D. Many will need to develop return-on-investment metrics for R&D itself and institutionalize the metrics in their strategic and R&D planning and resource allocation processes. Shifting market demands, the availability of new talent pools, and economic factors have already altered the R&D landscape, moving sources of innovation outside of traditional geographic areas. This trend will likely accelerate in the future.

BUILDING HIGHER BARRIERS TO ENTRY

In the past, access to capital created opportunities for suppliers to capture value. Over the next decade, the ability to access capital may diminish in significance as state-provided capital in emerging nations or private capital continues to support new entrants that will undoubtedly seek to sell products into the North American market. Instead, we contend that suppliers will need to enhance the development of hard-to-replicate knowledge. Further “smart” consolidation—resulting in access to proprietary knowledge, to customers, and/or to additional scale or an optimized footprint—can also build barriers to entry, putting a sharper edge on the value generated through consolidation.

One caveat, however: OEMs will likely evaluate this category of components to assess whether to manufacture these parts in-house (e.g., electric motors) and whether to integrate these parts with sophisticated data-logging devices (e.g., to monitor electric vehicle energy storage). Both actions would allow OEMs to gain insights from real-world production and product use and would reduce the bargaining power of suppliers. For suppliers to succeed at the knowledge-building route, they may need to combine rich product knowledge with an advantaged manufacturing cost structure to capture value.

In any case, barriers-to-entry strategies should also be evaluated from a customer lens, because customers determine which choices among supplier options OEMs will make and whether to increase the number of alternative supplier choices, as has happened in the past.

CONTINUING TO DRIVE DOWN COSTS

There are at least two strategies that suppliers should evaluate for achieving more than short-term cost improvement. First, there may be instances where market constraints make it difficult for high-cost producers to exit or to lower their costs. In such instances, suppliers with a low-cost advantage that can capture a modest share of the existing market, while maintaining pricing discipline, could create value. Second, there may be opportunities to invest in new or enhanced manufacturing processes for innovative components, such as high-strength metals or advanced composites, and thereby develop low-cost production techniques that cannot be easily duplicated and that thus confer a sustainable cost advantage.

In addition to capturing value through hard-to-copy cost-improvement strategies, suppliers must respond to OEM-mandated cost givebacks through adjustments in several areas of operations: along the value chain (through better procurement and design and execution of logistics chains), in manufacturing (through higher productivity and/or lower labor costs and lower capital expenditures), and in design (through integration of components or design-to-value, where the producer delivers a less expensive product based on the features that customers actually use or are willing to pay for).

In our experience, leading suppliers in this value-creation category apply the methods mentioned here in a simultaneous and integrated way, so that the methods accrete to extend or maintain a cost advantage.

CONSIDERING DIVESTITURES

The decision to divest part of a portfolio is rarely straightforward. Immediate questions arise along several fronts: capturing fair value, making a clean separation (particularly if components with different value-creation potential are manufactured in the same facility or if selling, general, and administrative (SG&A) resources are shared or must be reassigned), restructuring costs, and determining how to reinvest net proceeds from divestiture.

Yet maintaining a portfolio with "difficult to create value" components can erode value. It detracts from reinvesting into profitable areas, on occasion provides OEMs with leverage to achieve price reductions in higher-value components, and soaks up management attention. Senior management teams thus should seriously evaluate whether and under what circumstances to continue in certain market segments. Ultimately, such analyses and decisions should be guided by components' mid- to long-term value-creation potential and should be weighed against the best alternative investment options. In light of the industry dynamics projected for the next decade, we strongly believe that divestiture needs to be considered and applied more frequently than in the past.

EXPLORING ADJACENT AREAS

Some suppliers may find they can use accumulated expertise or adapted products to enter adjacent markets, in order to offset cyclical demand and tap new revenue streams. To be sure, this is not an opportunity available to all suppliers, and companies entering a new market today often exit it tomorrow, citing the need to "focus on core strengths." Nevertheless, examples of successful forays into non-automotive businesses include efforts by Federal-Mogul, Eaton, and Autocam Automotive.

When evaluating opportunities for thoughtful diversification, suppliers should take care to spend more time on the overarching themes of market attractiveness, including growth, profitability, and total addressable market than on the themes that define automotive, such as high volume, just-in-time delivery, and business-to-business channels. Fortunately, the tough competitive environment in automotive and the cutting-edge expertise many suppliers have developed in technology topics, operations, global footprint management, and customer interactions should position suppliers well for exploring adjacent market moves.

THE SURPRISES THAT SHOULD INFORM TOMORROW'S MOVES

We began this work with the hypothesis that the current high profitability levels of North American suppliers, since their rebound in 2010, provides a short window of opportunity during which these suppliers can improve their position for future success in the face of stiffening competition. During the course of the research, we encountered a number of surprising findings that only reinforce this perspective.

First, the cost of components sold in North America was flat, in real dollars, over the past decade. This observation surprised even long-term industry participants, who are more familiar with the nominal 20% increase in costs from 2001 to 2010 (i.e., when costs are not adjusted for inflation). This flat cost level is all the more sobering given that raw-material-input costs increased more than 50% during the decade. Nor did we anticipate just how steep cost givebacks to OEMs were during this era—totaling $2,900 per vehicle—and the ability of consumers to capture nearly all of the givebacks from OEMs through increased vehicle content, quality, and performance.

Second, a doubling of productivity and renewed focus on design imperatives through 2020 will be required to satisfy new macroeconomic, regulatory, OEM, and consumer demands while maintaining historical norms for component costs. To put the imperatives in proper context, maintaining component costs at $13,400 per vehicle through 2020 using productivity alone would require cost improvements equaling approximately 5% per year. Of course, there are at least two alternative outcomes. It is possible that OEMs will raise prices to consumers. Yet when we polled 100 executives earlier this year, very few saw price increases as a realistic option given the current intensely competitive environment. Or, OEMs may attempt to trade more expensive inputs for less expensive (but feature-rich) content, such as advanced electronics. Such a strategy will need to be carefully weighed against the risk of ceding content (and margins) to companies with formidable product and brand capabilities.

Third, we didn't anticipate the extent to which the new fuel-economy regulations provide clarity to suppliers about what content will be adopted in the years ahead. In our 2020 base case, we had to include almost a dozen fuel-economy-related components in internal-combustion-engine vehicles, and we had to increase the penetration of hybrid vehicles to about 20% of new-vehicle sales, in order to meet projected CAFE standards. With today's technology, and absent a change in regulations or radical uptick in the sales of electric vehicles, OEMs are likely to deploy by 2020 most of the available cost-effective technologies that improve mileage.

Finally, on a weighted-average basis, the share of components that are capable of capturing value is likely to fall by 2020. Strikingly, this is true despite the introduction of regulated components, in no small part owing to the entry of well-funded competitors into these market segments.

Thus, the coming decade will likely be tougher than the past one, forcing supplier executives to carefully weigh which components to keep in their portfolios, which to add, which to divest, and which strategies will raise the odds of generating long-term value. Executives should assess the value-creation potential of their product portfolios with a future-oriented lens and start defining and evaluating strategic options and priorities now. An active posture and approach are critical to generating profitable growth in the future.

The authors wish to acknowledge the contributions of Nicholas Laverty and Erica Lo to the development of this document.

The authors would further like to acknowledge the continued collaboration and co-leadership from the Original Equipment Suppliers Association (OESA), and in particular Neil De Koker, Margaret Baxter, Dave Andrea and the CEOs and members who participated in the Industry Vision 2020 joint research effort.

GLOSSARY

Average North American midsize passenger vehicle
A midsize car in the C or D segment with an average purchase price of USD$18,000–$23,000. Examples are the Honda Civic and Toyota Camry

Base case
The set of assumptions concerning commodity prices, labor costs, component penetrations, etc., that define our "most plausible" future state of the North American automotive-supplier industry

Base model
A passenger car model that offers standard products and/or features (not optional upgrades)

Battery electric vehicle (BEV)
A vehicle that uses electric motors for propulsion, where the required electricity is stored in an onboard battery pack

BRIC countries
Brazil, Russia, India, and China

Business-to-business channel (B2B)
Refers to a business that sells its products directly to other businesses (i.e., as opposed to consumers)

Components
Vehicle parts required to manufacture passenger cars. Our work divided automotive components into six major categories: body in white, chassis, electrical, exterior, interior, and powertrain

Corporate Average Fuel Economy (CAFE) standards
U.S. legislation that establishes the fuel economy that automotive OEMs must meet across the set of vehicles sold into the U.S. market. Currently, OEMs are required to meet a fleet-wide average of 54.5 mpg by model-year 2025 from 35.5 mpg for model-year 2016. Standards for 2016–2025 are based on the footprint of each vehicle. Smaller cars (less than 40 square ft) are required to improve fuel economy by 5% annually to comply with 61.0 mpg in 2025, while larger vehicles (greater than 55 square feet) are required to improve 3.5% annually to 46 mpg. Manufacturers that do not meet the standards pay a penalty

Cost givebacks
The annual amount by which OEMs expect suppliers to reduce the prices of existing components, generally through changes in design, content, or value chain

Design to value
Design to value involves designing or redesigning components to meet required critical performance or functional needs. Often, this process eliminates performance or functional attributes that customers do not "value," resulting in a lower cost

Discretionary components
Components that automotive OEMs add to base models to compete more effectively for customer business and/or to realize improved prices

Drivetrain
The system of components that connect a vehicle's transmission with the drive axles; the drivetrain includes a universal joint and drive shaft

Electric power steering
Electronic actuators that control the vehicle-steering mechanism to reduce the physical effort needed to turn the wheel; this typically improves fuel economy (vs. hydraulic systems) via weight reduction and more efficient use of electric energy (i.e., the system draws current only when power assist is required)

Electric vehicle energy storage
On-board battery packs that store energy for propulsion; lithium-ion cells are increasingly used to store energy

Hybrid
A vehicle with a powertrain combining an internal combustion engine with one or more electric motors used for propulsion, coupled to a battery to store electric energy. Hybrids typically recapture energy via regenerative braking that would otherwise be lost

Hydraulic power steering
Power for steering is provided by hydraulic pumps attached to the car's engine through a belt and pulley

Input costs
Reflects the cost paid by suppliers (and OEMs) for raw materials and labor needed to manufacture passenger vehicle components

Just-in-time delivery
Delivery of materials and/or components to a manufacturing facility immediately prior to the need for the materials and/or components. This significantly reduces inventory but can lead to disruptions if suppliers cannot maintain a normal cadence of deliveries (as happened following the March 2011 Japanese earthquake and tsunami and after the October 2011 flooding in Thailand)

Nominal dollars
Dollar amount expressed in terms of value at a specific point in time and not adjusted for inflation

North American auto market
The combined U.S. and Canadian markets for passenger car and light truck vehicles (approximately 12.8 million units in 2011)

Original equipment manufacturers (OEMs)
Major automotive companies engaged in the final design, development, assembly and sale of vehicles

Passenger and light commercial vehicles
Passenger vehicles/cars consist of small and midsize cars, sports utility vehicles (SUVs), and pickups. Light commercial vehicles (LCVs) are defined as larger SUVs, pickups, vans, and crossovers used to transport goods or perform work-related functions

Plug-in hybrid
A plug-in hybrid electric vehicle (PHEV) (sometimes also called a range extended electric vehicle [REEV]) is a hybrid vehicle with an electric motor and an internal combustion engine (ICE). Series hybrids use an ICE to power a generator. The generator supplies current to an electric motor (and on-board storage), which then rotates the vehicle's drive wheels. Parallel hybrids can transmit power to their drive wheels both from an internal combustion engine and from an electric motor

Powertrain
The vehicle component system used for propulsion including an engine and transmission, and sometimes an electric motor and battery

Productivity givebacks
See "Cost givebacks"

Real dollars
Dollar amount adjusted for inflation; used to compare values across time

Risk-adjusted landed cost
The average per-unit cost a buyer will pay over time, accounting for additional charges due, for example, to supply-chain disruptions

Vehicle bill of materials
The set of components and materials provided to OEMs by automotive suppliers: the cost of these components and materials for an average North American passenger car was $13,400 in 2010, roughly constant in real dollars over more than a decade

Weighted-average basis
The cost of a component multiplied by its penetration (i.e., percent of vehicles into which the component was/is sold)

Vehicle-to-vehicle and vehicle-to-infrastructure communications
Vehicle-to-vehicle (V2V) communication is enabled by onboard electronics that permit location information to be transmitted between vehicles. Vehicle-to-infrastructure (V2I) communication occurs between vehicles and infrastructure (e.g., to increase the efficiency of traffic flow)

Study authors and key contacts

Russell Hensley, Expert Principal, Detroit Office, Automotive and Assembly Practice and Advanced Industries Practice

Russell_Hensley@mckinsey.com, +1 (313) 202-5389

Srikant Inampudi, Principal, Detroit Office, Automotive and Assembly Practice and Advanced Industries Practice

Srikant_Inampudi@mckinsey.com, +1 (313) 202-5236

Hans-Werner Kaas, Director and Automotive and Assembly Leader for the Americas and Advanced Industries Co-Leader for the Americas, Detroit Office, Automotive and Assembly Practice and Advanced Industries Practice

Hans-Werner_Kaas@mckinsey.com, +1 (313) 202-5207

John R.S. Newman, Expert Associate Principal, San Francisco Office, Advanced Industries Practice

John_Newman@mckinsey.com, +1 (415) 318-4942

The Advance Industries Automotive & Assembly Practice

McKinsey's global Automotive & Assembly Practice serves clients around the world on issues relevant to the top management of companies in the automotive and assembly industries. Our staff consists of individuals who combine professional experience in these industries with functional expertise in a broad range of related disciplines and comprehensive training in business, economics, engineering or the natural sciences.

Industry areas served include automobiles, trucks and buses, other vehicles (such as construction, agricultural and rail), automotive distribution and retail, automotive suppliers, machinery and equipment, mechanical and electrical components, plant construction, engineering and other related businesses.

The practice provides clients with comprehensive functional expertise in every aspect of the value chain, ranging from product development, manufacturing, purchasing and supply to branding, distribution and retailing. Furthermore, we have developed perspectives on how new technologies and other external discontinuities may influence these industries. The practice maintains a significant presence in industry and public discussions through McKinsey-authored books, brochures, articles and participation in conferences.

As in its work in other industries, McKinsey's goal is to help automotive and assembly clients make positive, lasting and substantial improvements in their performance.

The Automotive & Assembly Extranet

Our Automotive & Assembly Extranet website is the gateway to some of the best information and people in the industry. We offer selected McKinsey-generated information that is not available on the general McKinsey website. Direct communication channels ensure that your questions and requests will be addressed swiftly. The site is updated weekly with new articles on current issues in the A&A industries.

In this way, we support the formation of a professional community where decision makers can exchange ideas. We provide you with readily applicable insights to support you as an executive and business leader in the field.

Through McKinsey's A&A Extranet, you can:

Get exclusive information – free of charge – and take advantage of an Internet portal specifically designed for the automotive and assembly industries.

Access cutting-edge business know-how, interact with other experts to get new perspectives and contact leading industry professionals.

Stay ahead with industry news tailored to your needs and interests.

Leverage our advanced research capabilities for business literature and enjoy access to a selection of A&A-specific publications.

Register @ http://autoassembly.mckinsey.com

McKinsey & Company is a global management consulting firm dedicated to helping the world's leading organizations address major challenges. With consultants deployed in 50 countries around the globe, McKinsey advises on issues of strategy, operations, marketing & sales, organization, restructuring, and technology.

This report was printed and bound by Villanti, a FSC® certified printer. www.villanti.com. This report is printed on Imagination (FSC® certified), made with 100% recycled fiber and 100% post-consumer waste, processed chlorine free. It is designated Ancient Forest Friendly™ and manufactured with electricity that is offset with Green-e® certified renewable energy certificates. Villanti is also a Green-e® certified Marketplace printer. This publication was manufactured using 100 percent certified renewable energy, no-VOC inks, and no film-processing chemicals.

NEW LEAF PAPER manufactured with wind power

ANCIENT FOREST FRIENDLY™

RECYCLED Paper made from recycled material FSC® C013435 FSC www.fsc.org

Green-e

Paper Manufactured and Printed Using 100% Certified Renewable Electricity TN #: 12-5005-1019

McKinsey Advanced Industries
March 2012