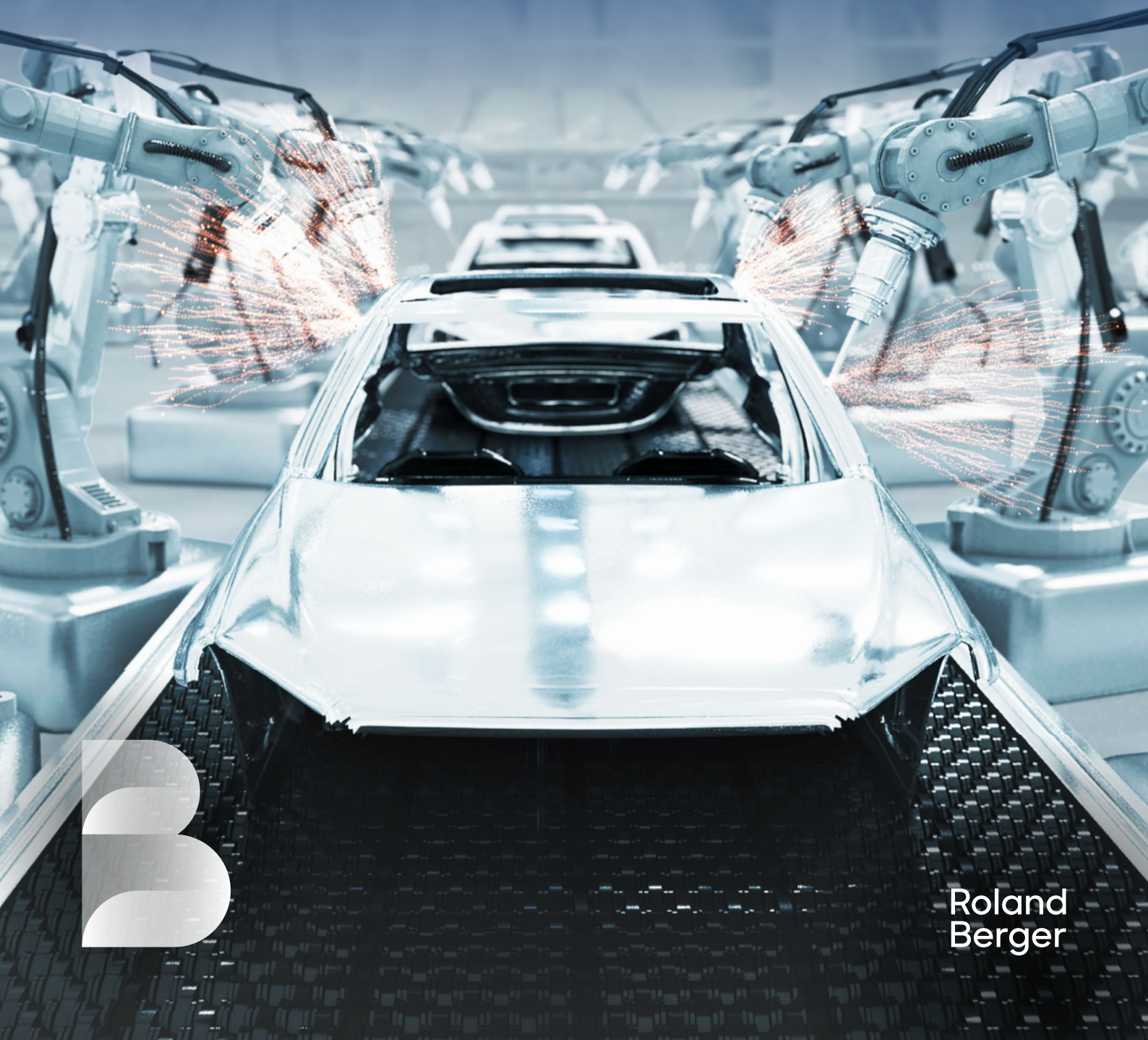


# Cost-efficient automotive production

Rising to the challenge



# Management summary

**E**ven if the public is not fully convinced and investment budgets are tight, political demands and stricter CO<sub>2</sub> regulations continue to push the automotive industry in the direction of electric vehicles (EVs). Yet while Chinese OEMs demonstrate exemplary efficiency and deliver increasingly impressive products, many Western OEMs – including those that are genuinely cost-sensitive – are finding it hard to compete.

Reaping the benefits of far lower cost structures, Chinese EV manufacturers are going from strength to strength. Their passenger car exports now exceed those of Japan, Germany, Mexico and South Korea, with total exports up by 62% in 2023. Meanwhile, traditional Western OEMs continue to lose ground and are flirting with irrelevance on the global market. They do what they can and invest heavily in new production structures and automation. But even then, they still find themselves unable to raise productivity to competitive levels. Roland Berger proposes to resolutely address these challenges with an optimization strategy comprising two modules. The first module emphasizes rapid cost savings through efficiency measures, laying the groundwork for more radical, long-term improvements. The second module focuses on essential structural measures designed to achieve cost improvements, with the goal of staying ahead of industry trends in the medium to long term.

This approach gives incumbent OEMs and Western players a pathway to strategically enhance their cost-efficiency, strengthen their market position, keep pace with evolving market demands and rise to the formidable challenge posed by Chinese players. Doing so, however, will demand more than tinkering and fine-tuning: a radical rethinking of vehicle production needs to take place across the entire company: every business needs to understand how it can positively influence factory costs.

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## Fast Facts

# 27%

of all passenger car exports in 2020-2023 came from China

# 80%

of the world's top 15 BEV models in 2023 were made in China

# 1

of them came from Europe

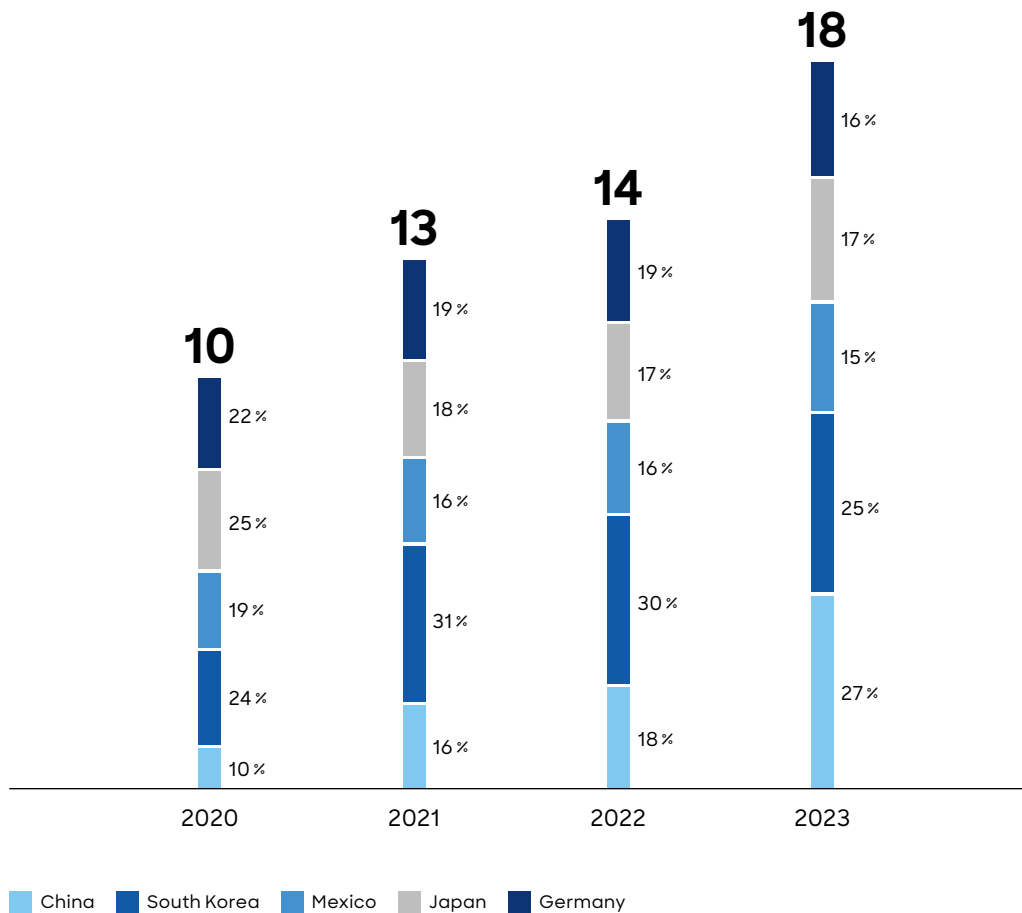
# 1

## Western OEMs on the defensive?

Chinese players are rolling up the global market – Western players must make radical changes if they want to compete

Traditional original equipment manufacturers (OEMs) in the automotive space are facing numerous challenges in effectively transitioning to electric vehicle (EV) production and reducing factory costs. To date, market demand for EVs has fallen short of policy expectations as economic troubles and energy risks prompt consumers to either choose combustion-engine models or postpone purchases altogether. At the same time, Chinese OEMs' innovative processes and automation capabilities are enabling them to drive down manufacturing costs and scale up their operations. This fact, coupled with advances in logistics and high production capacity, has let Chinese players expand their presence on global markets, to which they now export more cars than countries such as Japan, Germany, Mexico and South Korea. ▶ [A](#)

### **A Chinese carmakers are outpacing even their fiercest Western rivals** Passenger car export volumes (2020–2023, millions of units)



Source: S&P Global Mobility, CAM, desk research

To make matters worse, many Western automotive suppliers are – understandably – exploring collaboration opportunities with Chinese OEMs, seeking to quickly incorporate their innovations in the latest vehicles and so nurture new business prospects. As things stand, the outlook for traditional Western players is grim.

This report tackles these challenges head-on. It spells out the reasons for the competitive weakness of traditional OEMs – a weakness exposed by downbeat economic developments and a confluence of other factors. But it also argues that Western OEMs could stop the negative trend if they act swiftly and resolutely. Step by step, it shows how traditional OEMs can overcome existing limitations, adapt to changing market conditions and embrace technological advances in order to regain competitiveness and stand up to the seemingly unstoppable advance of Chinese automakers.

## **WHY DOES IT WORK FOR THE CHINESE? (OR: WHAT IS CHINA DOING THAT THE WEST IS NOT?)**

Faced with largely the same worldwide economic conditions, Chinese players have significantly expanded their presence in the global automotive ecosystem, as was clearly visible at the IAA Auto Show in 2023 and as proven by the sale figures for BEVs in the same year: in 2023, Chinese vehicles accounted for no fewer than 12 of the top 15 global EV models. ▶ [B](#)

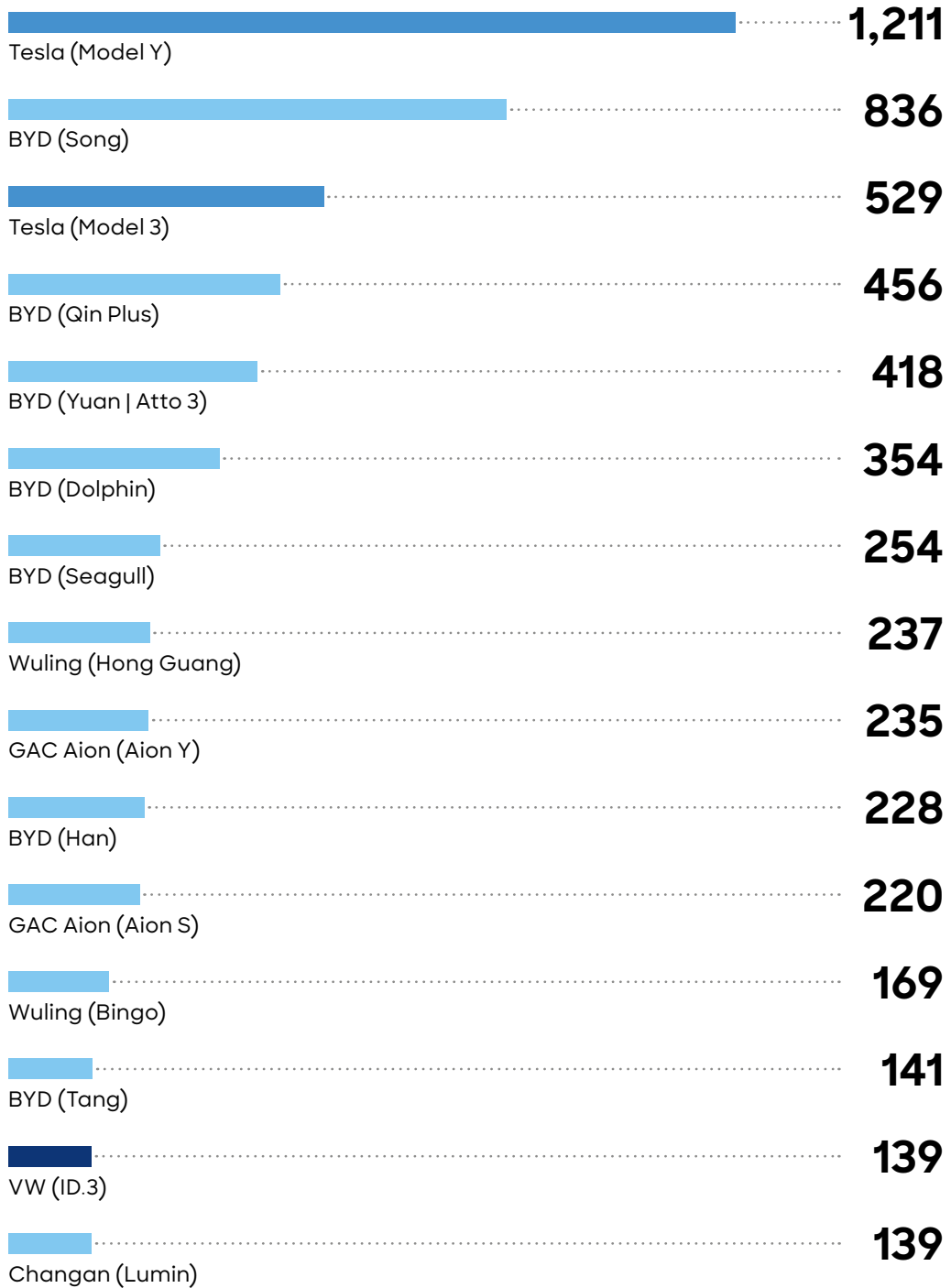
Boosting production of electric vehicles and the associated batteries is a central tenet of China's industrial policy. The country's government has thus thrown its weight behind this endeavor on a massive scale, securing raw materials for battery production and building port terminals and ships for EV distribution. This policy is now bearing fruit in the shape of technologically advanced products and highly competitive battery prices. Chinese EV brands are also pioneering advanced software development approaches, employing a single software platform for all systems and fostering close supplier collaboration, all of which facilitate faster and more cost-efficient vehicle development.

Now that the USA has drastically increased import taxes on Chinese electric cars, the already significant pressure on the European automotive market will rise even further. Chinese transport ships loaded with thousands of vehicles are being routed to Europe, flooding the market there and posing a substantial risk to indigenous car manufacturers and their employees – especially those in Germany.

## **POOR JUDGMENT AND LOOSE COST STRATEGIES ARE HURTING WESTERN OEMS**

Many traditional automakers have underestimated the importance of in-house battery production and software competence – two factors that are proving crucial to China's current market successes. As a result, doubts are now emerging about whether European manufacturers are even capable of producing battery packs on a par with those of Asian players. Yet this is not the only instance of poor judgment: traditional OEMs have also largely neglected the need for cost-efficient vehicle production. If they are to remain competitive, German automakers in particular therefore need to swiftly and radically rethink their attitudes and actions: Essentially, they must embrace far more ambitious vehicle concepts,

**B Vast majority of the world's top EV models in 2023 came from China**  
BEV production in 2023, in thousands of units



China USA Germany

Source: S&P Global Mobility

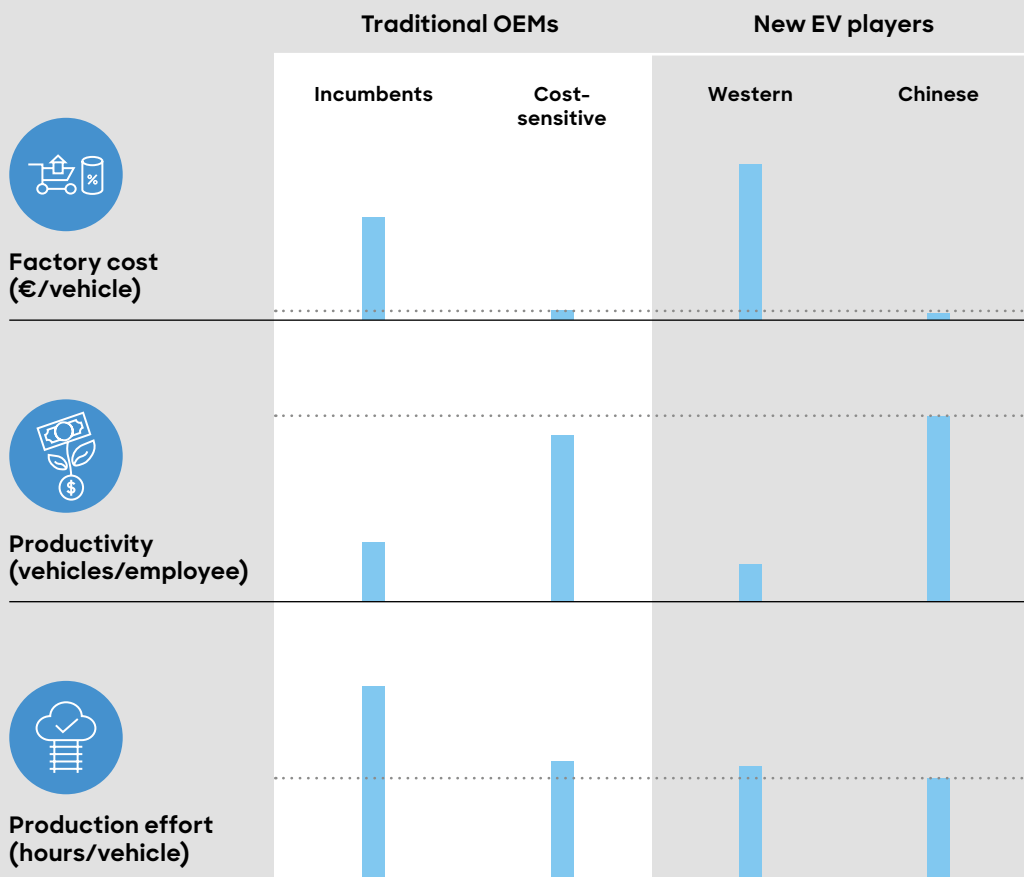
more advanced vehicle design, and the operational transformation of their manufacturing practices and supply chain. The rise of Chinese EV players, who are currently succeeding where their Western counterparts are not, underlines the need for this transformation.

## HOPEFUL SIGNS AS SOME OEMS WAKE UP TO THESE CHALLENGES

The criticisms leveled above do not apply to all Western players. Some have indeed paid much closer attention to costs and have already responded to shifting market dynamics – and are reaping the benefits, showing that this can be done in traditional automotive markets as well as in Asia. The competitive landscape within Europe's automotive industry, for example, reveals sharp differences in operational performance among the various OEMs. ▶ C

### C China sets benchmarks, incumbent OEMs lag behind, but some Western players are turning the tide

Competitiveness of Western and Chinese OEMs based on three key metrics



..... Benchmark

Source: Roland Berger

The above chart highlights how incumbent OEMs, once leaders in their industry, today lag far behind Chinese OEMs in key areas. That said, cost-sensitive Western OEMs demonstrate that vehicles can be produced at significantly lower cost not only in China. Their performance indeed gives the lie to the argument that higher labor costs in Europe and generous government subsidies in China are solely to blame.

Especially German OEMs often point to what they see as superior product design and quality standards to justify higher manufacturing costs. However, new entrants and Chinese EV players are today routinely satisfying high standards of product design, safety and quality. Approval tests that once ended disastrously for some Chinese OEMs are no longer an obstacle. On the contrary: recent tests show that Chinese vehicles achieve impressive quality scores in NCAP safety tests, for example.

What, then, is the root of the problem? Yes, higher employee compensation and welfare benefits are an issue that must be addressed. But another pivotal issue is clearly employee productivity. Defined as vehicles produced per employee, productivity is around a third of that of cost-sensitive OEMs from the West and, in some cases, a quarter of that of Chinese competitors. Similarly, effective annual working time is as much as a third lower than at cost-sensitive OEMs or in China. A further factor is that the production cost differential is closely linked to production-oriented design concepts and the constraints imposed by development, procurement and sales practices.

The key performance indicators (KPIs) reported by cost-sensitive and Chinese OEMs demonstrate their admirable expertise in production efficiency and performance. These OEMs consistently implement efficient and effective company-wide processes, prioritize integrated product development, evaluate procurement sources on a holistic basis and limit features to ensure production feasibility.

Chinese OEMs also focus heavily on robust processes and the use of digital systems to attain operational excellence. They have accumulated considerable industrialization expertise in recent years and are increasingly expanding their influence within the ever-changing automotive landscape. Some new Western EV players are approaching the business with similar aspirations but tend to fail due to a lack of operational understanding and expertise across their entire value chain.

## 2

### **Six levers to optimize automotive production costs**

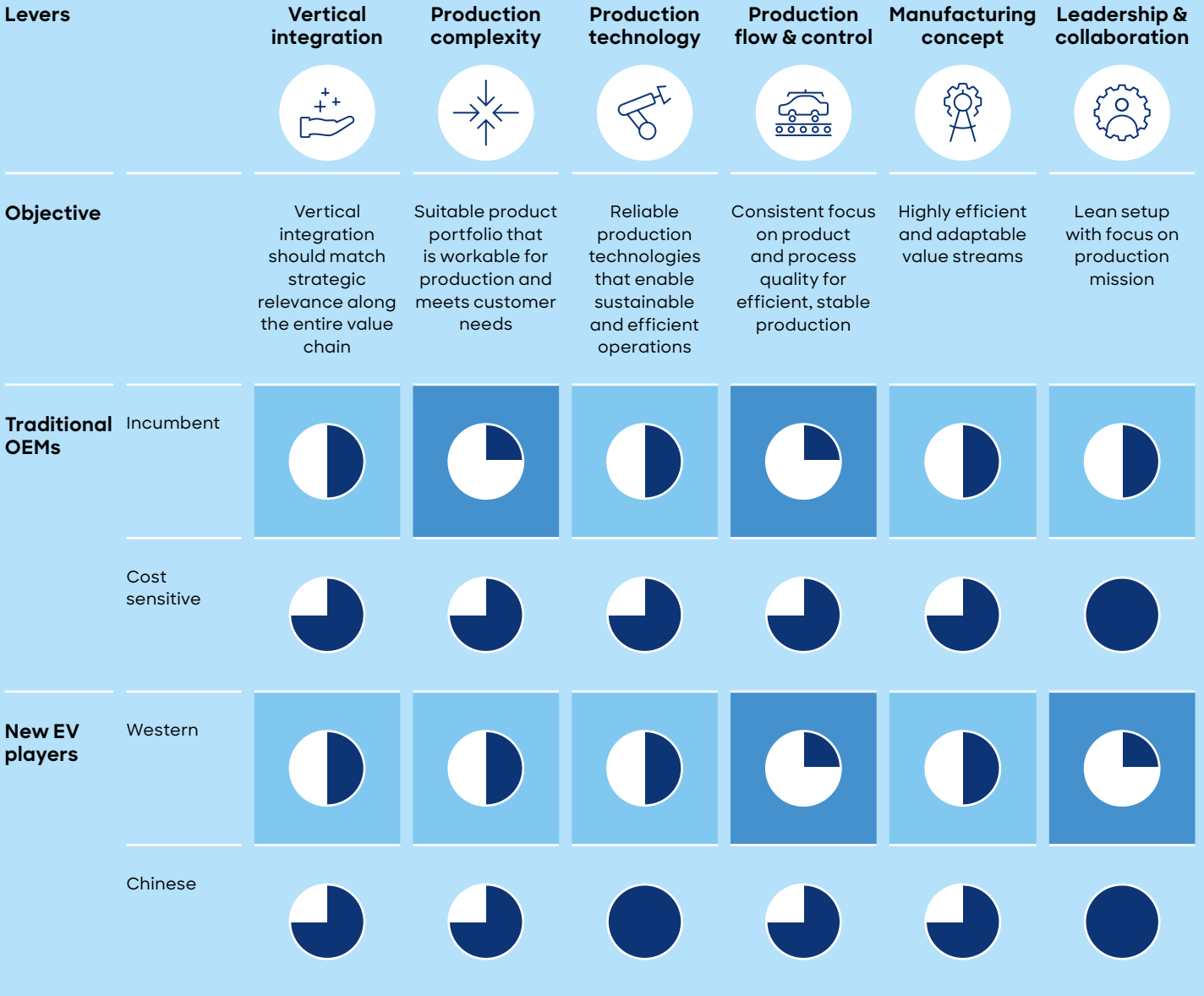
#### **A nuts-and-bolts strategy to get traditional OEMs back in the game**

Drawing on its wealth of project experience and in-depth discussions with industry leaders, Roland Berger sees the six key levers shown in the figure below as the central factors with which automotive OEMs can optimize every aspect of their cost structures. Only then can they stay – or once again become – competitive even in today's challenging environment. ▶ [D](#)



# D Western OEMs must slash factory costs and radically rethink their approach to vehicle production

Strategic options for OEMs to transform production



Lever not utilized
  Lever fully utilized
  White spots
  Major white spots

Source: Roland Berger

**// Cultivating a sense of urgency and getting 'all hands on deck' fosters an inclusive environment where every individual is empowered to contribute."**

The first three levers address structural optimization and essentially target enduring impacts over the medium to long term. In contrast, the latter three focus more on efficiency gains that typically deliver faster results. Mastering both aspects, however, is absolutely vital.



### **LEVER #1: VERTICAL INTEGRATION**

The degree to which a company takes ownership of upstream and/or downstream links in its overall production process must be closely aligned with its strategic priorities. Vertical integration has, for example, helped many Chinese OEMs gain control over key components in the supply chain. They not only manufacture electric vehicles, but also produce their own batteries, as well as making bumpers and other key parts in-house. Other Chinese OEMs contract external suppliers to put together modules or sub-assemblies on their own production lines. These approaches can improve efficiency by cutting costs and boost supply chain resilience by reducing reliance on external suppliers, all while the OEM's quality standards remain the same.



### **LEVER #2: PRODUCTION COMPLEXITY**

Complexity is a cost driver. One challenge facing today's OEMs is therefore to strike a healthy balance between satisfying customers' needs and guaranteeing both feasibility and economic efficiency. Cost-sensitive OEMs focus heavily on managing complexity in line with the capabilities of each plant. One way to do this is by maximizing the volume of carry-over parts and streamlining production processes across multiple vehicle models. Many new EV players in particular also tend to offer a limited choice of color options and other variant features to keep both complexity and costs down.



### **LEVER #3: PRODUCTION TECHNOLOGY**

Cost-efficient approaches limit the selection of new technologies and materials to what is necessary rather than what is possible. In other words, practicality and economic viability take precedence over technological sophistication for its own sake. German OEMs, for example, possess extensive technological and process expertise, which they often translate into proprietary specifications for new machines, systems and services. This imposes very clear requirements on suppliers, but these requirements are generally rigid and expensive, leaving suppliers and service providers little room for further optimization – especially when specifications deviate from industry norms. On the other hand, cost-sensitive OEMs opt for specifications that leverage the expertise of suppliers who also serve a varied customer base outside the automotive industry. Utilizing external innovations and expertise in this way gives OEMs the benefit of input from other markets. One well-known American EV manufacturer, for instance, has collaborated with a supplier to integrate its high-pressure die-casting technology into the production process, minimizing the expense of a value-added technological advancement.



### **LEVER #4: PRODUCTION FLOW AND CONTROL**

Stable production processes are efficient production processes. Any instability adds complexity, cost and the likelihood of quality issues. Best-practice OEMs therefore cultivate an unwavering commitment to process stability and high pearl-chain quality as a key priority. While traditional OEMs operate their plants on a build-to-order basis with complex production management and control, cost-sensitive players limit production complexity and prefer a build-to-stock philosophy to better ensure plant capacity utilization. Small buffers between different shops and fixed production cycle times thus promote stable operations. Having perfected this approach, many Asian OEMs no longer need to intervene in the production flow: instead, they simply automate processes, deploy ubiquitous digitalization and "switch off the lights" in what are termed "black-light factories".



### **LEVER #5: MANUFACTURING CONCEPT**

Incumbent OEMs often argue that their worse KPIs are due to their traditional or "brownfield" structures, claiming that these do not allow for more efficient value streams or more modern process designs. We see this differently and call for more stringent cost analysis and stricter cost management for every new plant construction project. Cost-sensitive OEMs design factories to ensure full capacity utilization and leverage economies of scale based on a 15-shift-per-week system. Unlike many German OEMs, they do not keep capacity in reserve

to cover potential demand peaks or non-released model variants. Instead, weekend shifts can be added for this purpose as and when required. Again, these OEMs focus on what is necessary rather than what is possible.



## LEVER #6: LEADERSHIP AND COLLABORATION

The importance of consistent leadership and effective collaboration cannot be overstated, as it underpins all the other five levers and ultimately determines how successfully they will be applied. The issue here is to foster a culture in which all parties at the company – managers and employees alike, but also external stakeholders such as politicians and trade unions – are committed to optimizing working models and aligning them across all facets of the organization. This kind of collaboration demands a dedicated mindset and the genuine ambition to drive continuous improvement processes (CIPs) on every level. Radically revitalizing employee-driven CIP in this way across the entire plant is essential to restore competitive capabilities and boost productivity. Every party must therefore be sharply focused on the production mission of the plants, and roles must be split unambiguously between the plants themselves and corporate functions. The bottom line is consistency: There can be no exceptions, no excuses and no redundancies.

# 3

## "All systems go!" Systematically activating all levers

Developing programs to fully exploit both "quick wins" and lasting structural optimization

As touched on at the start of the previous chapter, the first three levers – vertical integration, production complexity and production technology – focus on structural optimization criteria that will take time to implement, but that, ideally, will have a profound and enduring impact on OEMs' ability to compete. Conversely, the other three levers – production flow and control, the manufacturing concept, and leadership and collaboration – primarily target efficiency gains that will deliver much-needed results in the shorter term. ►E

**/// Cost sensitivity is the order of the day. No traditional OEM is going to compete with the Chinese if they can't get their factory costs down and keep them down."**

## E Tasks and timelines

Efficiency criteria can be realized quickly –  
Structural topics take time but yield more profound impacts

### Vertical integration

- 1 Focus on strategically differentiating products
- 2 Safeguarding critical production processes
- 3 Partnership-based cooperation with suppliers

### Production complexity

- 4 Economic utilization of the production sites
- 5 Ensuring a high proportion of COP
- 6 Ensuring a manageable number of variants

### Production technology

- 7 Sustainable use of production facilities/assets
- 8 Intensive involvement of system manufacturers
- 9 Use of digitalization / automation suppliers

### Production flow & control

- 10 Synchronization of the production areas
- 11 Implement. of a straight-line production flow
- 12 Contin. safeguarding of stable prod. processes

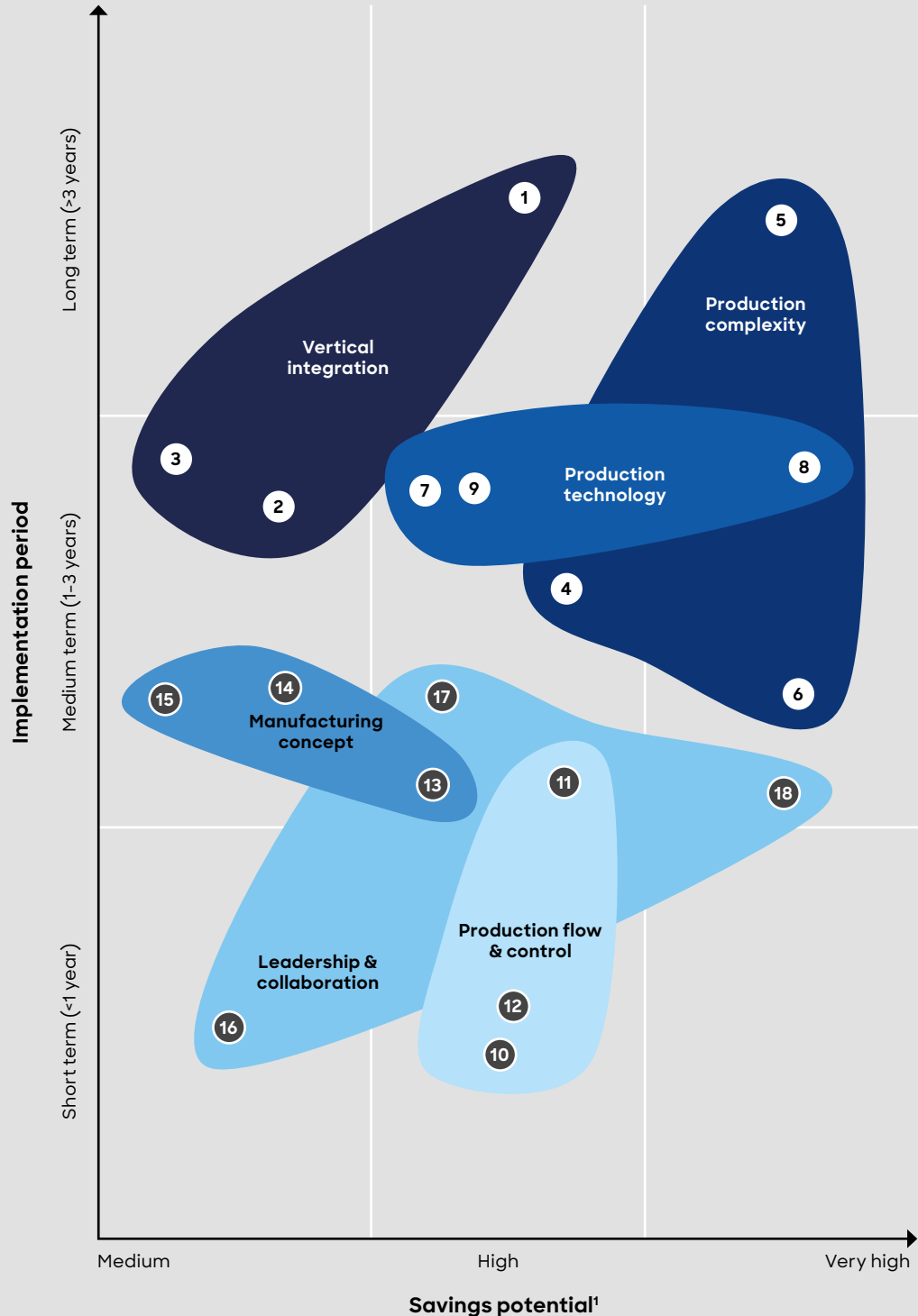
### Plant concept

- 13 Ensuring an adaptable factory
- 14 Implementation of a straight-line material flow
- 15 Efficient use of space

### Leadership & Collaboration

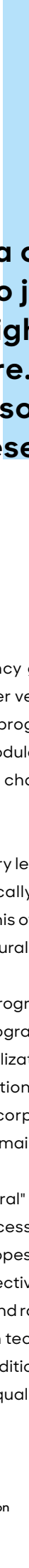
- 16 Pursuit of a focused production mission
- 17 Implementation of a lean collaboration model
- 18 Ensuring dynamic adj. of personnel capacities

- Structure
- Efficiency



1) Factory cost (€/vehicle)

Source: Roland Berger Project References



**// Saying a car was 'made in Germany' to justify why the costs are so high used to work, but not anymore. You should see the quality of some of the new Chinese EVs!"**

The short-term approach to rapid efficiency gains has the potential to yield savings of between 10% and 20% of the factory cost per vehicle. An additional benefit is that, as quick wins are realized, acceptance of the overall program increases and people buy more readily into the optimization drive. The structural module focuses on keeping production operations competitive through medium- to long-term changes and can potentially shave 15% to 30% off the factory cost per vehicle.

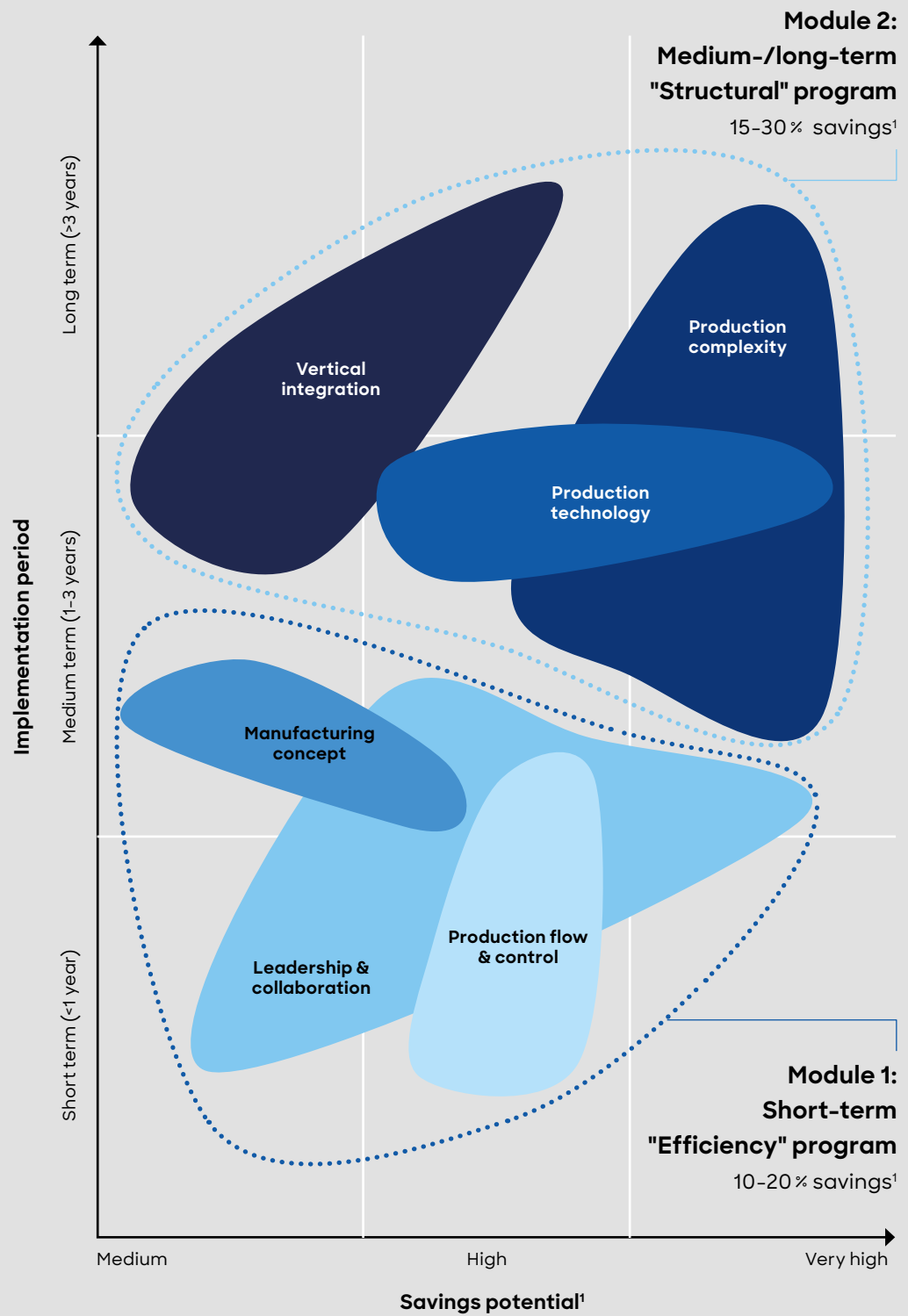
Any OEM looking to optimize its costs on every level and sharpen its competitive edge for the long haul will obviously have to systematically address both aspects. In the interests of clarity, Roland Berger's framework divides this overall program into a short-term "Efficiency" module and a medium- to long-term "Structural" module. ▶ **F**

The success of the short-term "Efficiency" program (module 1) is largely contingent on three key factors: first, more stable production programs must be established to cultivate reliable routines in each plant. Second, capacity utilization must ideally reach an equilibrium state where excess reserves are avoided, utilization levels remain sustainable and production thus remains competitive. Third, effective corporate structures must be put in place that stay focused on the production mission and maintain a lean organizational setup.

Similarly, the medium- to long-term "Structural" program (module 2) will deliver the targeted improvements only if three further key success factors apply: first, production operations must clearly prioritize critical production scopes that will stay relevant in the future. Second, the product portfolio must be managed effectively at each plant. Product diversity must be aligned with what customers actually demand rather than what is technically feasible. Third, it is important to carefully select production technology that optimizes a systemic balance between product, process and working conditions. This is crucial to drive productivity gains while enhancing both process and product quality.

**F The long and the short of it**

Both quick wins and radical structural alterations are essential to optimize factory costs



1) Factory cost (€/vehicle)

Source: Roland Berger Project References

# 4

## Conclusion - Getting OEMs back in the fast lane

### A call to swift, strategic and systematic action for traditional automotive players

All the actions outlined above - the short-term ones as well as the longer-term ones - must be tightly interwoven within a strategy that combines a clear vision with resolute action. Within this framework, eight basic rules will lay a firm foundation for lasting transformation: first and foremost, a sense of urgency must be cultivated - a collective acknowledgment and acceptance of the challenges and risks that lie ahead. This sense of urgency will act as the catalyst for change, igniting the flames of motivation and mobilizing the entire organization toward a common goal.

However, no entity can undertake the journey toward transformation alone. There will also be the need to form powerful coalitions - a diverse ensemble of stakeholders ranging from C-level executives to advisory boards and works councils. Through collaboration and consensus, coalitions forge a shared commitment to change and lay the groundwork for progress.

Once unity has been established, the focus shifts toward defining clear, specific and measurable savings targets, together with a precise roadmap of initiatives to achieve them. This targeted approach provides direction and purpose, guiding the organization toward tangible results.

True transformation must, of course, extend beyond the boardroom and permeate every echelon of the workforce. Applying the principle of "all hands on deck" thus fosters an inclusive environment where every individual is familiar with their role in the transformation process and empowered to contribute. This collective effort not only ensures widespread acceptance of change, but also cultivates a culture of support and resilience. Importantly, leaders must nevertheless be visible and lead the process. Like the captain of a vessel, they have to give their crew guidance on rough seas.

**// The time for trimming costs a bit here and making minor organizational adjustments there is over."**



## **Eight rules of sustainable transformation**

- 1** Sense of urgency
- 2** Powerful coalition
- 3** Target & initiatives
- 4** All hands on deck
- 5** Remove barriers
- 6** Target quick wins
- 7** Accelerate effort
- 8** Embed change

Encountering obstacles on the path to progress is inevitable. To overcome these challenges, barriers must be identified, torn down and kept down, enabling responsible teams to complete initiatives unhindered. Removing barriers paves the way for seamless implementation and execution of optimization measures.

Especially at the beginning of the journey, the focus must be on quick wins – small but visible achievements that yield immediate improvements and bolster morale. These quick wins serve as stepping stones, propelling the organization forward and strengthening its financial standing in the short term.

However, transformation is not a sprint, but a marathon that requires passionate commitment. Over time, the progress of implementation must be regularly reviewed. Corrections must be made where necessary, while also ensuring that an appropriate level of ambition is pursued. "Thinking big" becomes the mantra as the organization embarks on impactful initiatives aimed at restructuring and redefining its future trajectory.

Ultimately, perhaps the most crucial aspect of transformation lies in its sustainability: Change must be embedded in every fiber of the organization – a cultural shift that lets it adapt to new environments and pursue long-term success. Properly executed, this process will ensure that the organization not only survives but thrives, emerging stronger and more resilient than ever before.

# Why Roland Berger?

## Three key reasons why Roland Berger is your partner of choice for cost optimization in automotive production

- 1.** We are experts in the automotive sector, possessing an in-depth understanding of the intricate dynamics that shape OEM and supplier production. Our team stays ahead of the curve by continuously monitoring and analyzing the latest trends and technological advances impacting the industry. These insights allow us to provide cutting-edge solutions that are tailored to the specific needs and challenges faced by automotive manufacturers and their supply chains.
- 2.** We have accumulated profound expertise in production in automotive engineering as well as in many other industries. Our extensive experience in various production environments equips us with a deep knowledge of best practices and innovative strategies. This allows us to address production challenges effectively, ensuring that our clients benefit from the most efficient and effective solutions available, regardless of the industry.
- 3.** We pride ourselves on our strong track record of successfully executing production cost optimization projects. Roland Berger has consistently delivered tangible results, helping clients achieve significant cost reductions and operational improvements. Our proven methodologies and commitment to excellence ensure that each project we undertake is completed to the highest standards, with specific outcomes that drive measurable value for our clients.

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