FEV CONSULTING

ISSUE 73

FEV CUSTOMER MAGAZINE

SPECTRUM

10 YEARS OF FEV CONSULTING

Engineering skills assessment

Vehicle electrification

Business enhancement strategies

Future energy carriers

Dear readers,

Welcome to this special issue of our FEV SPECTRUM magazine which is dedicated to the 10th anniversary of FEV CONSULTING. The last ten and certainly also the next ten years are characterized by technological, climatic, and social changes. All of these disruptions are taking place at an unprecedented speed, and as a result, many of our customers are facing the greatest challenges in their corporate history. We are proud that our customers trust our technological and strategic expertise to help them master these challenges.

In more than 750 projects, customers from more than 30 countries have placed their trust in us, which has led to the global expansion of FEV Consulting. We have already opened eight offices, with more offices currently being planned.

In this issue, we will showcase the development of FEV Consulting and present selected consulting topics and studies from recent years, e.g., transformation of R&D organizations by analyzing and managing required future R&D competencies, electrification of on- and off-road vehicles, business expansion based on product innovations or M&A strategies, and analysis of future energy carriers for a sustainable mobility and transportation sector.

The contributions in this issue emphasize FEV Consulting's thought leadership in the techno-strategic space. Being part of FEV Group and working closely with more than 6,000 engineering experts worldwide enables in-depth technical analysis and efficient access to industry and product knowledge. FEV Consulting has thus become a valued sparring partner and idea provider for CTOs. Added value is created not only through innovative consulting approaches and methods, but also especially through our own proprietary data and knowledge.

We would like to take this opportunity to thank our customers for the trust they have placed in us and especially thank all our employees. The FEV Consulting success story would not exist without their curiosity, their untiring commitment, and their team spirit.

We hope you enjoy reading this magazine and get to know FEV Consulting even better!

Alexander Nase
Managing Director
FEV Consulting GmbH

Christoph Bollig
Managing Director
FEV Consulting GmbH

Mayank Agochiya
Managing Director
FEV Consulting, Inc.

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10 Years of FEV Consulting

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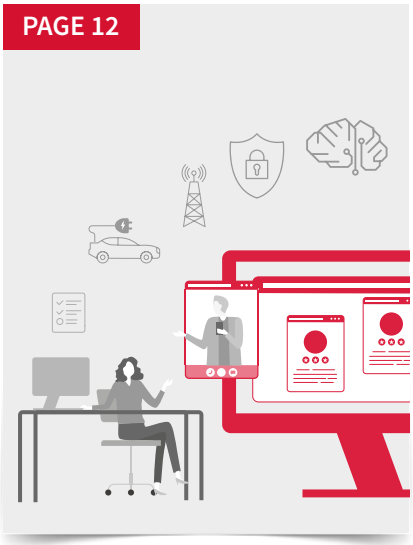

Aligning R&D organizations to future needs

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Future energy carriers in the mobility and transport sector

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OUR INDUSTRY FOCUS

Aerospace, eBikes, Charging Solutions, Clean Energy Solutions, Commercial Vehicles, Digital Services, Marine, Micro Mobility, Off-Highway, Passenger Cars, Power Tools, Rail, Urban Air Mobility

100+
CONSULTANTS
around the globe

OFFICES

Aachen, Beijing, Bilbao, Cologne, Detroit, Dubai, Munich & Tokyo

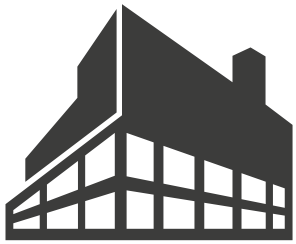
6X BEST CONSULTANTS
in a row
(since 2016)

awarded by
brand eins

FACTS + FIGURES

FOUNDED IN 2011

14 out of the top 15 OEMs are our clients



750+
PROJECTS
in 30 countries

TOP EMPLOYER EVALUATION
4.7/5 stars (Kununu)

INTERVIEW

ALEXANDER NASE

10 YEARS OF FEV CONSULTING

FEV Consulting is celebrating its 10th anniversary this year. A fitting occasion to speak to our three global managing directors, Alexander Nase, Christoph Bollig, and Mayank Agochiya, about the company's key milestones and success factors during this time period.

Christoph Bollig

- Managing Director since 2011
- Located in Aachen

Alexander Nase

- Managing Director since 2011
- Located in Munich

Mayank Agochiya

- Managing Director since 2016
- Located in Detroit

What was the motivation behind the formation of FEV Consulting?

Christoph Bollig: FEV Consulting was set up by FEV Group as an independent subsidiary in 2011. It was prompted by an increased number of project enquiries with a strategic focus. These required a high level of understanding of dedicated drivers, technology, and market trends; as well as an understanding of the resulting influence on the clients' product portfolio and overall strategy. At that time, FEV was already a very successful development services provider in the powertrain and vehicle technology sectors. But FEV had to position itself more broadly for these types of strategic projects. Consequently, FEV Consulting GmbH was founded. To implement this approach successfully, new momentum from the outside was needed, as well as completely different training and skills focus for employees.

That's when you came in Alexander. What persuaded you to join FEV Consulting as managing director?

Alexander Nase: I already had several years experience in management consulting, when in a conversation with Professor Stefan Pischinger, I learned that he wanted to set up FEV Consulting and was looking for an experienced advisor. I quickly realized why FEV is so successful as a family business, and how it got where it is today. I was very impressed by the feeling of solidarity and mutual support. The chemistry was right immediately. In addition, I was enthusiastic about the technological depth of FEV, which combined with FEV Consulting's intended strategic approach to consultancy, would result in a key differentiating factor. In this moment my interest was aroused and still today has yet to diminish.

Mayank, you joined FEV Consulting in 2016, having previously worked for another international strategy consulting firm. What was your initial impression?

Mayank Agochiya: I was impressed by the young and dynamic consultancy team, with its high levels of expertise, and the fact that it already had five successful years behind it. I quickly realized that one could hand over responsibility to the team at an early stage, as the focus was on actively developing the employees and giving them the opportunity to grow in the long term. Furthermore, our USP (Unique Selling Proposition), which Alexander already mentioned, convinced me. Bundling FEV's technical expertise with experienced strategic management consultants has proven to be a very potent combination.

What were important success factors in the first ten years of FEV Consulting?

Alexander Nase: Naturally, there were a few. In addition to the team, I can think of numerous projects. From the very beginning of FEV Consulting there were projects focused on technology roadmapping, modular strategies, process and organization optimization. Topics wich fit very well within our service portfolio. Just as intended, we were able to bundle the in-depth technical knowledge of FEV with our strategic and methodological know-how, and fully exploit our strengths in the interests of our clients.

Christoph Bollig: Besides automotive clients, we have regularly looked after other industries as well. Take for instance, the aviation industry, where in teams of up to 15 consultants, we have advised clients not only on technical content, but also performance and process optimization; as well as shop floor and ramp-up management. As a young company, these stand-alone successes were naturally very important for us.

Although the name "FEV Consulting" could imply it, the business was never supposed to act as an internal consultancy, was it?

Alexander Nase: Correct! FEV Consulting was never to be an internal consultancy for the FEV Group, and we have stayed true to this goal. External customer projects account for an average of 95 percent of our turnover.

How did FEV Consulting develop over the last ten years?

Alexander Nase: Typically, a company grows in phases. I have observed this over the past ten years with FEV Consulting as well. At the start we were like a normal start-up with five employees and we benefitted from being able to act in a flexible, pragmatic and solution-oriented manner. We then quickly moved on to a development phase where we established clear topics and created the team and necessary structures. In the last five years we have leveraged these structures and matured greatly. FEV Consulting has managed to develop its employees so that they can take on appropriate management responsibility and continue to develop the corporate culture and business independently.

Mayank Agochiya: Agreed. This motivates people and is a major reason why we have a very low turnover rate or fluctuation in our team. To safeguard this for the future, we develop opportunities and additional incentives for our consultants so that they can develop in the best manner possible and operate as entrepreneurs within FEV Consulting.

Christoph Bollig: To be able to offer our employees attractive prospects, I have considered it important to maintain our growth rate of about 15-20 percent annually. And this is not as easy as it may seem. As an organization and management team, you must react sensitively to how employees are developing and to how you can unite individual development paths with the goals of the company.

Has FEV Consulting been successful at achieving the goals it set for itself?

Alexander Nase: Yes, our vision was clear, and the underlying goals were realistic. Ultimately it was difficult to foresee how we would grow in strategy consulting as an organization. Looking back however, when you consider our employee numbers, our global footprint, and our turnover, we have well outperformed our plan and achieved our initial goals. The fact that in the space of a few years we opened a total of eight international offices - in Aachen, Munich, Cologne, Bilbao, Detroit, Peking, Dubai and Tokyo - alone is quite remarkable.

Christoph Bollig: Opening the various offices was important; to have the ability to be on-site with the client, and to understand their individual needs. For us, this is a key success factor in our projects. Our next step will be to focus on the growth of these branches. When I consider the goals we had when founding FEV Consulting, I realize that we also managed to initiate a cultural change in the FEV Group more broadly with our approaches and working methods. This might have seemed unconventional from the perspective of a development services provider, but it was necessary against the background of more modern issues - such as electrification, automated driving, or digitalization in general.

How does FEV Consulting plan to differentiate itself in the future in a highly competitive strategy consulting market?

Alexander Nase: I am convinced that both today and in the future we possess a strong differentiating factor with our “best of both worlds” approach; the combination of strategic consulting and in-depth technological expertise. We focus on the client’s actual problem and develop an individual solution for them. We deliver an action plan and sound, sustainable results. Coupled with our demand for maximum speed and flexibility for our customers, in my opinion, there is no beating FEV Consulting.

MILESTONES

KEY MILESTONES IN MAKING FEV CONSULTING AN ESTABLISHED STRATEGY CONSULTANCY

Since its founding in 2011, FEV Consulting has grown rapidly. Working on many projects, not only in Europe but overseas, lead to a successive strengthening of the company's global footprint and the addition of several offices in Europe, the U.S. and Asia. The team has significantly developed and diversified their skills. Since 2016, the team has been regularly awarded "Best Consultants" by the magazine "brand eins." Today, consultants from 12 different nationalities are employed at FEV Consulting.

// 2011
Establishment of FEV Consulting
Opening of the first office in Aachen

// 2013
FEV Consulting expands to Detroit
Opening of the first branch office in the U.S.

// 2013
Office opens in Munich
A second office in Germany is created.

// 2014 100
100 Projects
succesfully closed by FEV Consulting teams

// 2015
Culture Book developed
A growing team needs team spirit and a corporate culture - fundamentals that have been passed on from one consultant generation to the other and were summarized and published for the first time in our "Culture Book".

... and five more "Best Consultant" awards to date

// 2016
Awarded first "Best Consultants" from brand eins

// 2016 200
200 Projects
succesfully closed by FEV Consulting teams

// 2017
First patent application
Method and rescue system for automatic steering of a ship

"... many would follow!"

// 2020

Office openings in Bilbao & Dubai

First lecture, "Energy Team Challenge" at the RWTH Aachen

RWTH AACHEN UNIVERSITY

// 2021

100+ Consultants at FEV Consulting
Since 2021, more than 100 Consultants from 12 nationalities are part of the team. We're looking forward to even more growth and diversification in the future!

// 2019

Office opens in Cologne
In the fall, FEV established an office in the newly built complex "Clouth 104" in Cologne.

// 2017

Cost Engineering joins Consulting
Cost Engineering activities are integrated into FEV Consulting - the team grows!

// 2019

Opened Benchmarking Center in Aachen
We not only show what technologies look like, we also explain why!

BENCHMARKING

// 2017

50+ Consultants
at FEV Consulting

// 2017

100th customer
starts a project with FEV Consulting

// 2018

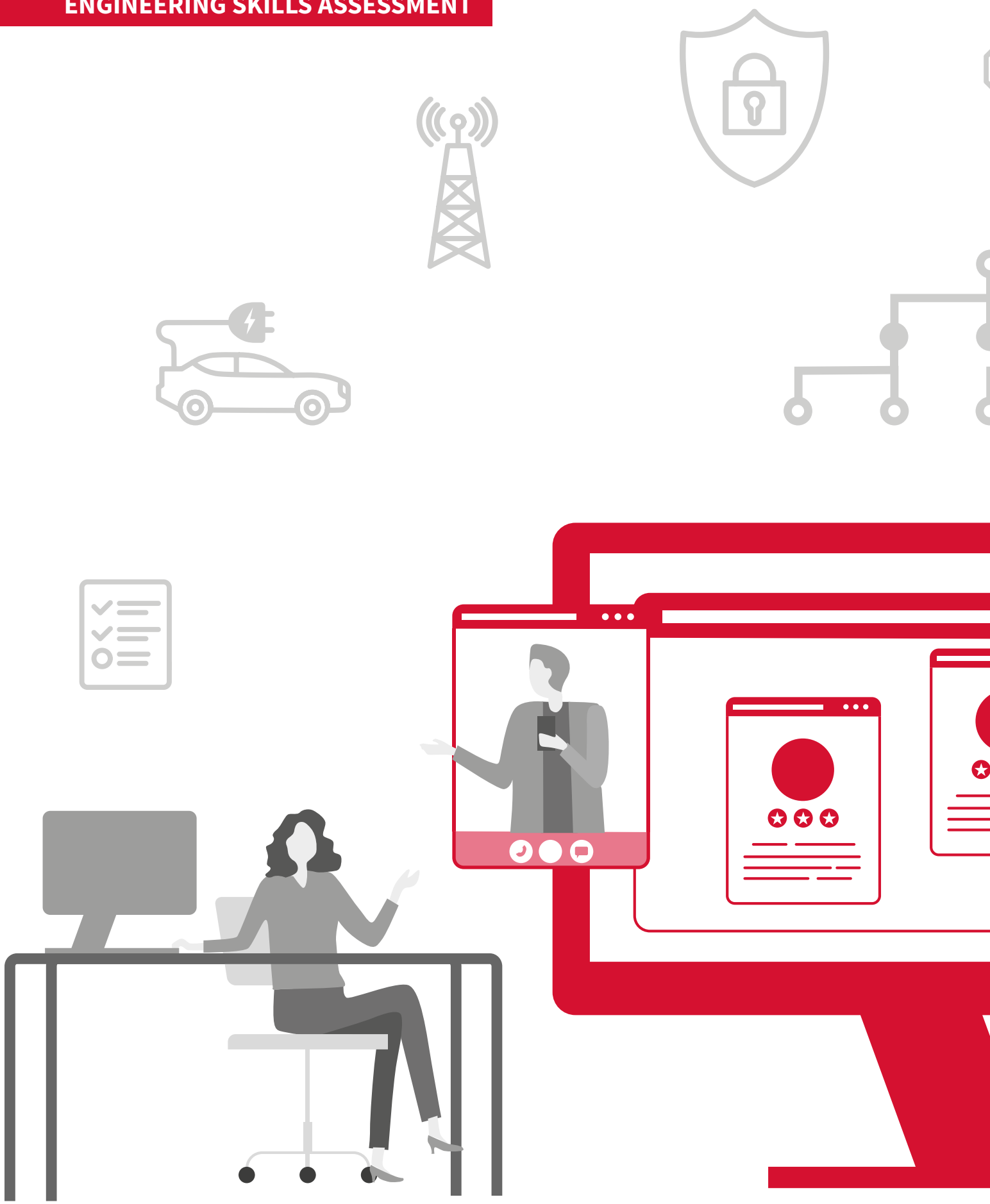
500

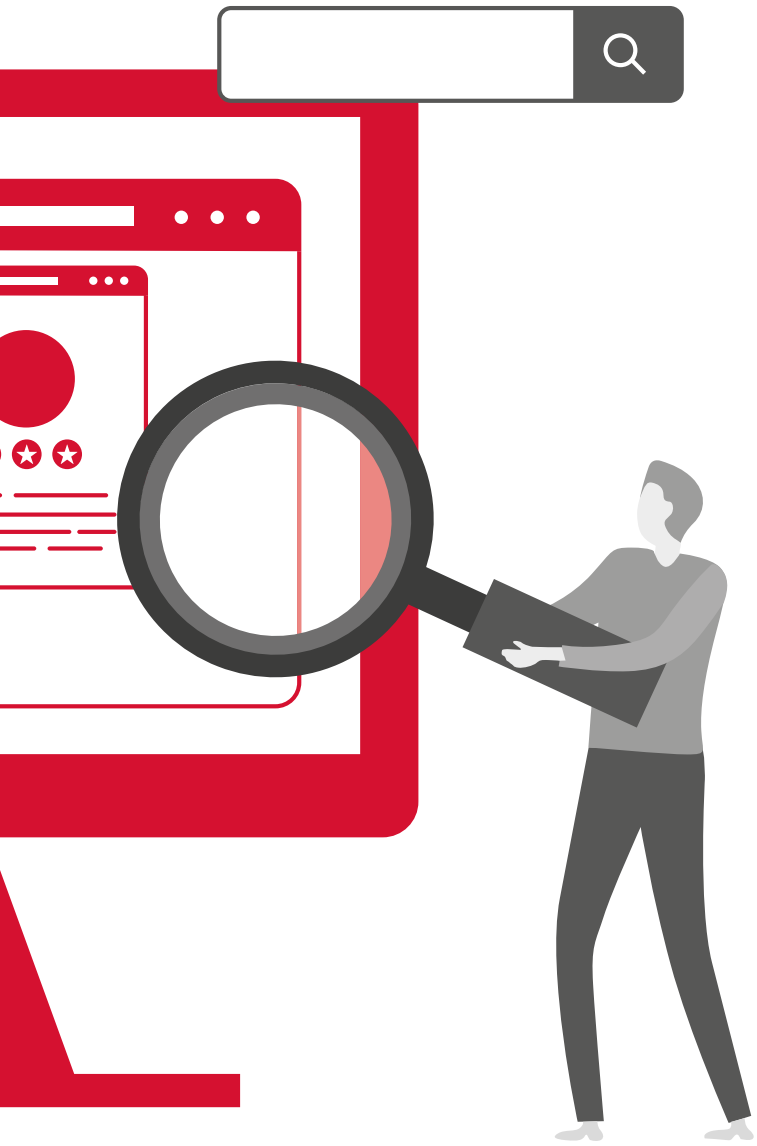
500 Projects
successfully closed by FEV Consulting teams

// 2018

FEV Consulting Team established in Beijing
Opening of the first branch office in Asia

ENGINEERING SKILLS ASSESSMENT





ALIGNING R&D ORGANIZATIONS TO FUTURE NEEDS

The challenge: New technologies, new services, new ways of working

Today's R&D organizations in all transportation and mobility sectors face challenges with the ongoing introduction of new technologies. It's not only the development and integration (e.g., zero-emission powertrains, automated vehicle concepts); the stronger shift to a service- and function-oriented offering puts additional pressure on engineering organizations. While mechanical engineering disciplines are still required, they no longer amount to a marketable differentiation in typical sales channels. New or emerging engineering disciplines are becoming increasingly important.

FEV Consulting identifies and understands these key emerging topics such as electrification, hydrogen technologies, electrics and electronics (E/E), data analytics, AI, connectivity, and telematics or software development. More than that, it is not just having knowledge and insight to these key areas, it is also about the methods being applied within development teams and departments. The aforementioned shift to a function-oriented offering translates from an R&D perspective into much stronger software-based development. The implementation of true, model-based systems engineering (MBSE) with function-oriented development units, organized in small and agile teams, represents both a critical need and a significant challenge.

The solution: Re-skilling and up-skilling of the R&D organization

Today, most R&D organizations are in the midst of a wider shift to an emerging skills-oriented structure. Within this, there are three key questions to consider and discuss during the strategic decision-making process:

1. What will be core, and what will be non-core in our R&D? ("Do we have to cover software development competence internally?")

2. What capacities and which skills do we need? ("How many data scientists do we need, and how skilled must they be?")

3. How do we transform our R&D organization into the target picture? ("To which degree might job rotation within the organization help, and at what level(s) will we need to hire?")

The first question is closely linked to any enterprise's strategic product plan, which includes the definition of targeted development programs, the roll-out plan for the products and the definition of how the company's products should be positioned in the market (e.g., follower, market average, leader). The defined market vision (e.g., "become the leader in fuel cell electric heavy-duty commercial vehicles by 2025") is the foundation to defining the core/non-core strategy, i.e., the in-house coverage of product related development activities.

Both capacity and skill roadmaps, the focus of the second question, are a direct outcome of answers to the first question. R&D programs with well-defined budgets are translated into internal and external capacity needs. The skill roadmap then defines the target picture of internal competences that are in-line with the defined core/non-core strategy.

Finally, to address the third key question, R&D organizations define actions and strategies to drive the engineering skill transformation. Strategies include re-skilling or up-skilling activities, during which the skillset of engineers is either shifted to adjacent technology and competence clusters or improved to higher levels of excellence. The success of identified strategies is strongly linked to each employee's professional and personal background. For example, a designer of conventional powertrain components can transition to e-component design. However, it would be a much larger task to develop that designer to be a data scientist or software developer.

FEV Consulting's approach: A tool-based turnkey program for skill assessment

FEV Consulting has developed a well-established and tool-based method to support its customers throughout the re- and up-skilling process. Key activities are the development of an individual skill matrix, conducting an online survey, a dynamic analysis of skill data, and the data-driven deduction of strategies to close existing competence gaps.

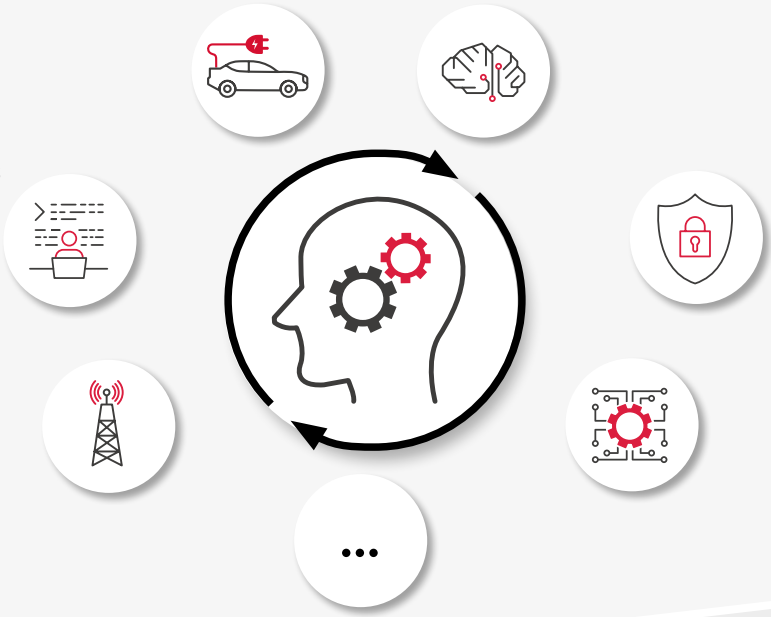
The skill matrix is always linked to the client's industry sector, expected technology evolutions and resulting engineering skill needs. FEV Consulting leverages its own engineering experience and knowledge to develop the engineering skills matrix in joint workshops with clients. The information in the skill matrix is then transformed into a questionnaire, taking the form of an online survey. There are no restrictions on the number of participants or the areas they represent. Here, a flexible survey structure (depending on the survey participant's skill background), does deliver a true value add to our clients.

In larger organizations that involve assessment of >1,000 engineers and 1,300-1,500 engineering skills, the database becomes large and difficult to manage. Therefore, FEV Consulting develops cloud-based and flexible dashboards, accessible for the leadership of R&D organizations. Any helpful view or filtering of skills data can be delivered, allowing for sustainable data management. It's important to note that this type of activity is not a "one-time" exercise, it is the starting point of a longer journey where competences – in-line with the individual development of engineers and their skills – will change. Regular maintenance of the database results in a powerful tool to monitor and steer the company's skill development over time.

But the skills data are only helpful, if the right conclusions are drawn and actions are initiated to close the identified gaps. Together with the clients, FEV Consulting develops strategies and actions to transform the R&D organization. The FEV Consulting team defines and implements skill development programs, develops job rotation models, supports hiring strategies, drives clients into partnerships and collaborations with enterprises and/or universities and research centers, or offers dedicated technology trainings provided by FEV engineers. Our holistic approach helps setting up the right engineering skill targets and supports our clients on their journey to transform their R&D landscape.

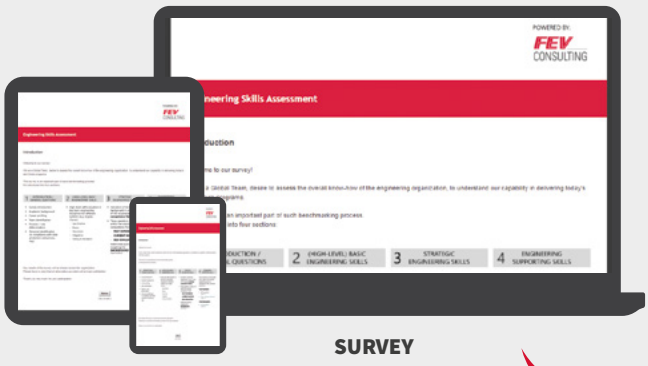
Step 1:
Competence Definition

- Define skills in workshop sessions
- Consider strategic company targets

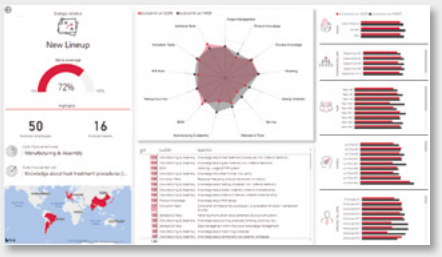


Step 2:
Competence Analysis

- Develop skill database via online survey
- Identify competences & potential gaps



SURVEY



DASHBOARD

Step 3:
Action Plan

- Define skill improvement journey
- Implement actions & measures

By
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VEHICLE ELECTRIFICATION

VEHICLE ELECTRIFICATION: TRANSFORMATION OF THE POWERTRAIN

Passenger Car Market

In 2020, the passenger car market was heavily influenced by the COVID-19 crisis. However, battery electric vehicles gained further market shares, especially in Europe. We expect a fast recovery of the sales volume to pre-COVID-19 scenarios, with an annual growth rate of 1.9%. This growth is dominated by the Chinese and Rest-of-World (RoW) markets, while US and European market are assumed with constant volume.

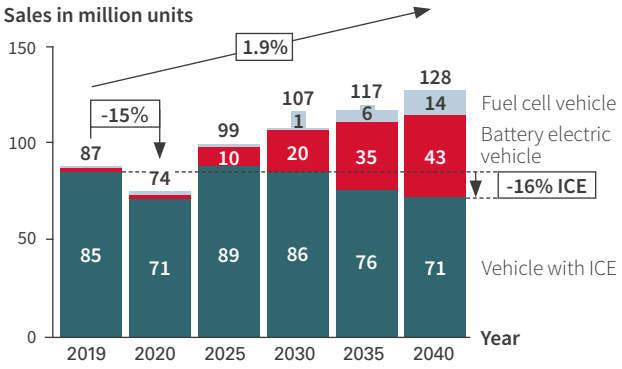
Moreover, the market growth is largely comprised of electric powertrain types, such as battery electric and fuel cell propulsion systems. The sales volume of vehicles with an ICE is expected to decrease by 16% by 2040 compared to 2019. The remaining powertrains with an internal combustion engine (ICE) will become electrified as well. We expect mild and full hybrids to be widespread.

The shift of powertrain types is driven by the CO_2 emission reduction targets in the key market regions. In Europe, ambitions are the highest of all markets. By 2050, the transport sector (all vehicles on the road) should decrease CO_2 emissions by 90% compared to 1990 levels. This means that no new vehicle should have any CO_2 tailpipe emissions by 2040 at the latest, which can only be achieved by battery electric or hydrogen fueled vehicles. In addition, fuels from renewables (e.g., e-fuels) could also be CO_2 neutral, however their role in the regulations is currently under negotiation.

CO_2 targets in USA were relaxed under former-President Trump. The Biden administration has already announced that it will revoke said relaxation and return to more ambitious targets. California and some supporting states are pushing for even more radical regulations, including a proposed ban of combustion engines.

In China the strategy appears more balanced, and the target of becoming CO_2 neutral has been shifted to 2060. The draft of the ostensible Roadmap 2.0 gives a push towards new energy vehicles (NEV) and those with reduced fuel consumption. In essence, the strategy supports the market introduction of battery electric, fuel cell, and hybrid powertrain vehicles.

In the year 2040, we expect that 57 million electric vehicles (battery and fuel cell) will be sold globally. The largest markets will be Europe and China with approximately 15 million units each.



① *Worldwide Light-Duty[1] market vehicle sales forecast*

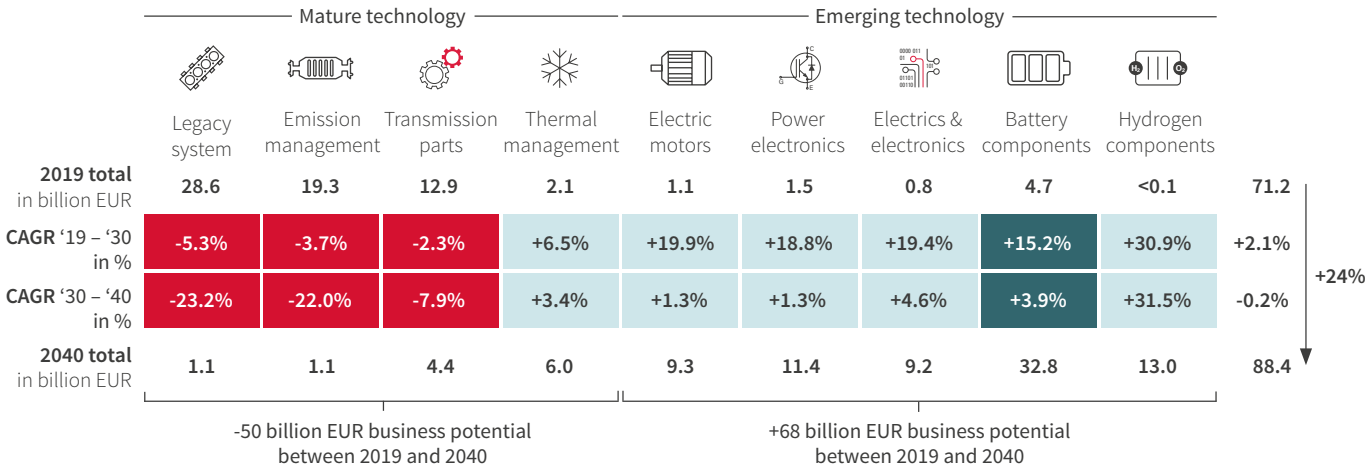
1) Including passenger cars and light commercial vehicles up to 3.5t gross vehicle weight

Business Impact

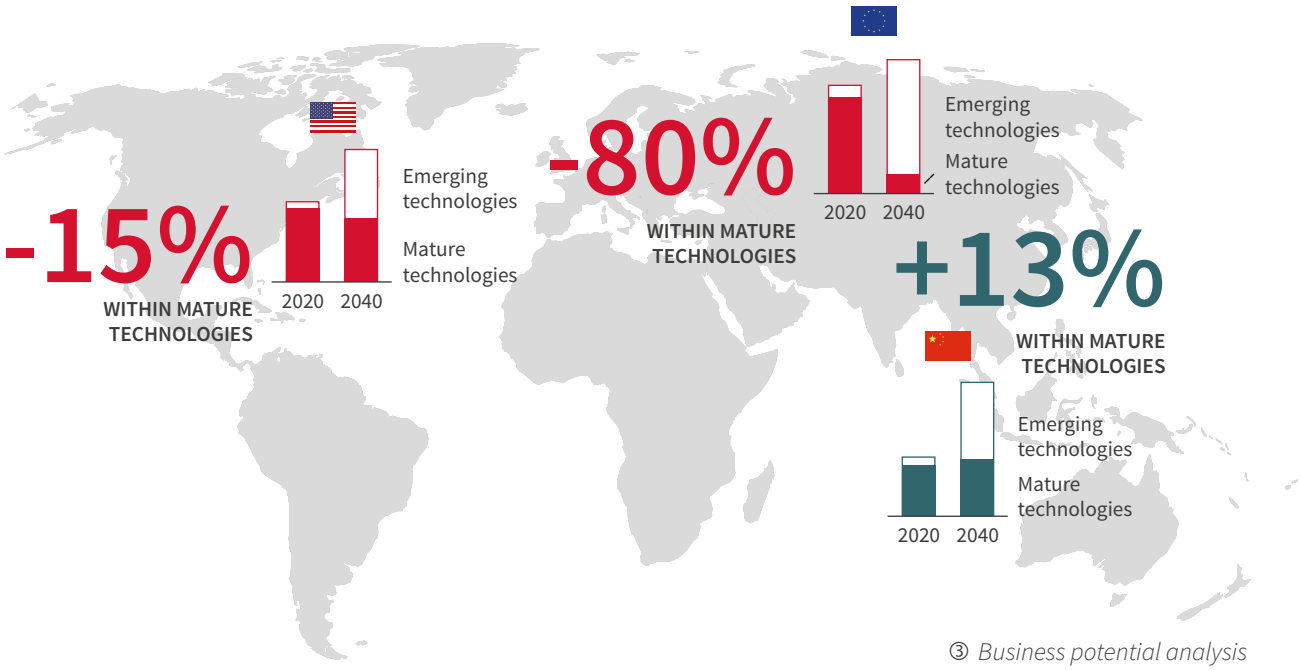
The shift of powertrain types has a dramatic effect on the business potential within the manufacturing value and supply chains. Mature or 'legacy system' technologies, such as base combustion engine components, emissions management systems, and transmissions, will suffer the most from this transformation. Between 2019 and 2040, we calculated a business potential reduction of 50 billion EUR for conventional powertrain systems. Although new technologies will be required to further improve engine efficiency, it will not be able to compensate for the reduction in sales volume. R&D and investment budgets are limited and shifting to electrified powertrain types; hence we expect a strong reduction of combustion engine-based powertrain variants as well. Consequently, we also expect to see extended usage of the existing production equipment. Only thermal management system components are believed to have increased business potential within the mature technology category, as those components are needed for electric vehicles too and are getting more complex in electrified applications.

Not surprisingly, the emerging technologies are related to powertrain electrification. Battery systems, electric motors, and fuel cell components will create a rapid growth of business potential across the industry. Between 2019 and 2040, we anticipate an increase of 68 billion EUR for electrified powertrains. However, the growth does not necessarily translate into manufacturing value creation. The shift from manufacturing intensive components towards higher material intensity will cause the share to be reduced and move upstream in the supply chain (e.g., battery material processing).

Overall, we expect 24% business potential growth between 2019 and 2040. However, this growth happens in the period from today until 2030 only. Thereafter, the reduction of the business potential caused by the shift to electric powertrains cannot be compensated by an increase of combustion engine technology and hybrid powertrains anymore. The transformation towards electric vehicles is accelerated.



② *Business impact*



③ *Business potential analysis*

Key results

The transformation of the automotive industry prompted by the shift towards electric vehicles has had, and will continue to have, a strong impact on the supply chain. For battery systems, electric motors or electronic components, significantly different manufacturing processes are required compared those used for combustion engine components. These processes are also less labor-intensive. As a result, we estimate that 160,000 fewer jobs will be required in Europe by 2040 for the production of automotive powertrain and propulsion systems. The loss of 580,000 jobs within the mature technologies (e.g., combustion engines, transmissions) space cannot be fully offset by the expected 420,000 new jobs within the emerging technologies arena.

However, we expect additional jobs will be created in the upstream supply chain processes. For example, processing materials for battery cells or other raw materials required for production. The build-up and operation of charging and hydrogen infrastructure is expected to contribute as well. Finally, independent of the transformation, new business opportunities will be generated from connected vehicles and digital services.

12 BILLION € INVESTMENT
CONSTANT AVERAGE ANNUAL INVESTMENTS IN EUROPE INTO MACHINES AND PRODUCTION EQUIPMENT REQUIRED

50 € / kWh
LONG-TERM AVERAGE BATTERY PACK COST EXPECTED TO BE REACHED UNTIL 2040

-160,000 JOBS
IN EUROPE; 580,000 JOBS LOST IN CONVENTIONAL TECHNOLOGIES, 420,000 JOBS CREATED IN EMERGING TECHNOLOGIES

INFRASTRUCTURE & SERVICE OFFER FURTHER BUSINESS AND VALUE CREATION POTENTIALS FOR THE AUTOMOTIVE MACHINERY & COMPONENTS SUPPLY INDUSTRY

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NRMM – NON-ROAD MOBILE MACHINERY

ELECTRIFICATION OF NON-ROAD MOBILE MACHINERY: OPPORTUNITIES AND CHALLENGES

In the automotive sector, market shares of electric drives have increased considerably in recent years, and current forecasts predict that the proportion of battery electric vehicles will continue to rise significantly across all vehicle segments. A powerful driver for this growth is CO_2 legislation, which makes the future widespread use of zero-CO_2 solutions inevitable. Similar developments are also expected in the commercial vehicle sector. However, the situation is much more nuanced in the case of non-road mobile machinery or utility vehicles. While some applications, such as forklifts and lifting platforms, already have a high share of electrification; others like agricultural machines have very low rates of electrification. This article explains key differences and shows trends for electrified drives in the area of non-road mobile machinery.

Drivers for electrification

In contrast to road-going vehicles, there is no CO_2 legislation for non-road mobile machinery from a global perspective. Therefore, electrification in this sector must be driven by other factors, such as:

- Operation inside buildings
  (e.g., forklifts, lifting platforms)
- Operation in environmentally critical areas
  (e.g., national parks, conservation areas)
- Operation in noise-sensitive areas
  (e.g., farms, horse stables, or residential areas)
- Desire for improved productivity
  (e.g., electrified implements)

In addition to private companies, more public sector entities are demanding the use of CO_2-free construction machinery. In fact, as part of "C40's Net Zero Carbon Buildings Declaration," 97 cities worldwide are targeting the use of zero-emission construction machinery by 2030.

Fundamental challenges

A detailed analysis of operating costs shows that electrified non-road mobile machinery can also be attractive from a cost perspective in the near future. Under appropriate operational conditions, high energy consumption savings can be realized due to the potential of energy recuperation. In addition, acquisition costs are becoming increasingly competitive due to the rising costs of emissions reductions in conventional powertrains. However, wide disparities in use and demand of construction machines require the consideration of application-specific performance and use profiles.

	CAR	EXCAVATOR	WHEEL LOADER	FORKLIFT	LIFTING PLATFORM	TRACTOR
CO_2 legislation	+	–	–	–	–	–
Operating costs	o	+	+	+	+	+
Indoor operation	–	–	+	+	+	–
Local CO_2 emission	+	+	+	–	–	–
Noise	–	+	+	+	+	o
Productivity	–	o	o	o	o	+[1)]
Energy recovery	+	+	+	+	o	o

+ = relevant driver o = limited relevance – = not relevant

① *Relevance of selected electrification drivers*

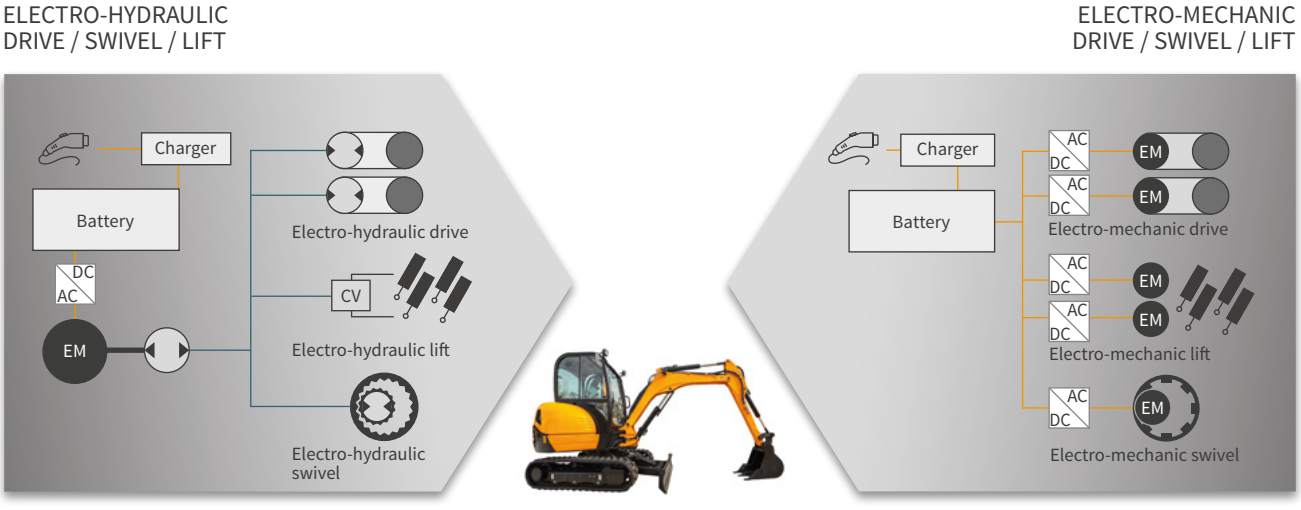
[1)] Increased productivity from electrified implements

Compared to the automotive sector, non-road mobile machinery is characterized by constraints that present additional challenges for electrification, including:

- Comparatively low sales volumes
- High cost pressure (CAPEX and OPEX)
- High number of product variants to cover multiple industries and specific needs therein
- A multitude of smaller, specialized machine manufacturers
- Drive units and vehicles/machines produced from different manufacturers
- Radically varying utilization profiles (e.g., performance requirements, daily operating periods)
- Challenging environmental conditions (e.g., dust, temperatures)
- High mechanical stresses

In addition to all this, many products feature both a traction drive and a power take-off. This raises further questions regarding the overall system concept. For example, in the case of an excavator, it needs to be determined if the traction drive, swivel drive, and working mechanics should be designed to ope-rate hydraulically, electro-hydraulically, or electro-mechanically.

These constraints mean there is a need for intelligent solutions to overcome the challenge of low quantities while meeting the demand for product- or customer-specific solutions at reasonable costs.



② *Exemplary powertrain topologies for NRMM electrification*

Promising solutions

Although a direct transfer of technical solutions from the automotive sector is usually not possible, solutions for non-road mobile machinery must be based on available technologies due to the comparatively low sales volumes and high operating cost pressure. This makes the automotive industry an attractive place to mine for solutions. The choice of battery-cell technology, however, must be based on the specific requirements of a target application. Furthermore, the module and pack design must also be tailored to the application, and thus differ in detail from available solutions in the automotive sector. A similar approach must also be taken with respect to other core components, such as the e-motor or power electronics.

This approach demonstrates that for electrification of non-road mobile machinery the use of specialized components, and therefore the development of corresponding competences, is inevitable. So, the question becomes: Shall manufacturers develop and produce these components themselves or shall the supplier industry be engaged? There is no simple answer to this question. Instead, it depends on a wide range of company-specific factors, including company size, product range, global market orientation and other strategic elements. While a small machine manufacturer is more likely to rely on products from suppliers and possibly create overall system competence, a larger manufacturer should make future plans to internally develop and manufacture core components of the electrified powertrain as well. Expertise can be built internally through close cooperation or through merger and acquisition. Engineering service providers can also provide valuable support.

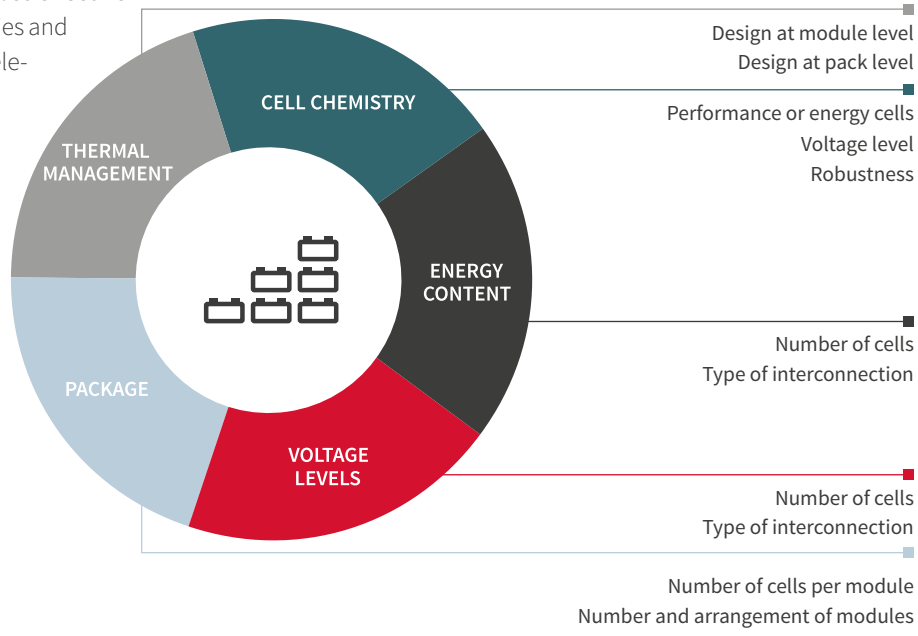
As previously mentioned, there is a need for non-road mobile machinery to provide customized solutions with comparatively small quantities at reasonable costs. Here, modular concepts are a promising approach to offer cost-effective solutions by leveraging existing synergies and standardization whilst considering relevant differences.
At the same time, they enable a flexible reaction to requirements that are specific to the client, market, or application. For example:

- Battery
  + Application-specific cell chemistry for power density, energy density, and robustness
  + Adaptation to various installation spaces
  + Availability of different energy contents and voltage levels
  + Adapted thermal management solutions

- Electric motor
  + Coverage of a wide performance spectrum
  + Coverage of different voltage levels
  + Solutions for different installation spaces with regard to length and diameter

As for an overall electrification strategy, the question becomes which services, in addition to the electrified machine, can be offered in the market in order to achieve the greatest possible value added while increasing customer acceptance. In this context, tailor-made solutions for a charging infrastructure or concepts for a "second life" use of batteries could be considered.

The electrification of non-road mobile machinery will be a major challenge for the companies involved. However, there is a wide variety of opportunities to place competitive products and intelligent solutions in the market and generate a competitive advantage.



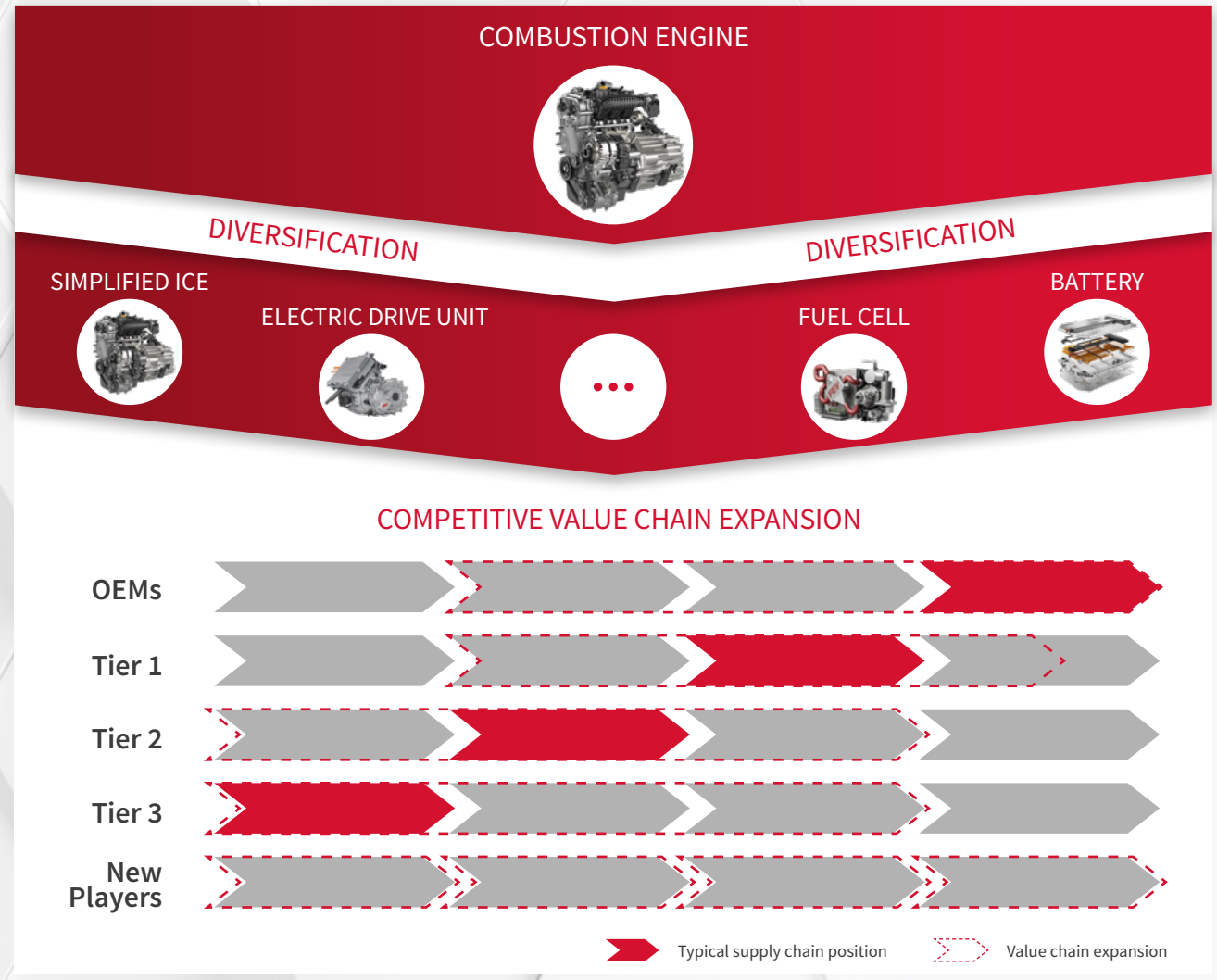
By
Dr. Andreas Wiartalla · wiartalla@fev.com

③ *Design and selection criteria for traction batteries*

SUPPLIER TRANSFORMATION

BUSINESS ENHANCEMENT STRATEGIES TO EXPLOIT MARKET OPPORTUNITIES

It's not only vehicle manufacturers that are under significant pressure from a changing product landscape in the mobility sector, but also large parts of the supply chain. Conventional powertrain technologies and products that have been developed, optimized, manufactured and sold over decades will no longer exist to the same extent in the future. Due to increasingly more stringent emission regulations and growing demand for CO_2-neutral vehicle solutions, conventional powertrain components will, to a great extent, be replaced by electrified alternatives. Large OEMs are shifting R&D activities towards alternative technologies and established suppliers are competing in declining market segments. This results in a consolidation of conventional components business. However, the shift to electrified drivetrain components also creates new market opportunities.But companies need to be quick since competition in new technology fields (e.g., battery, electric motor, fuel cell) is growing. Companies from various sectors (e.g., mechanical manufacturers, electronics manufacturers, chemicals companies) and different value chain positions (e.g., OEMs, Tier suppliers) are fighting for value added shares in the growing market segment.



① *Change of the product landscape and fight for shares in the value chain*

Strategic positioning

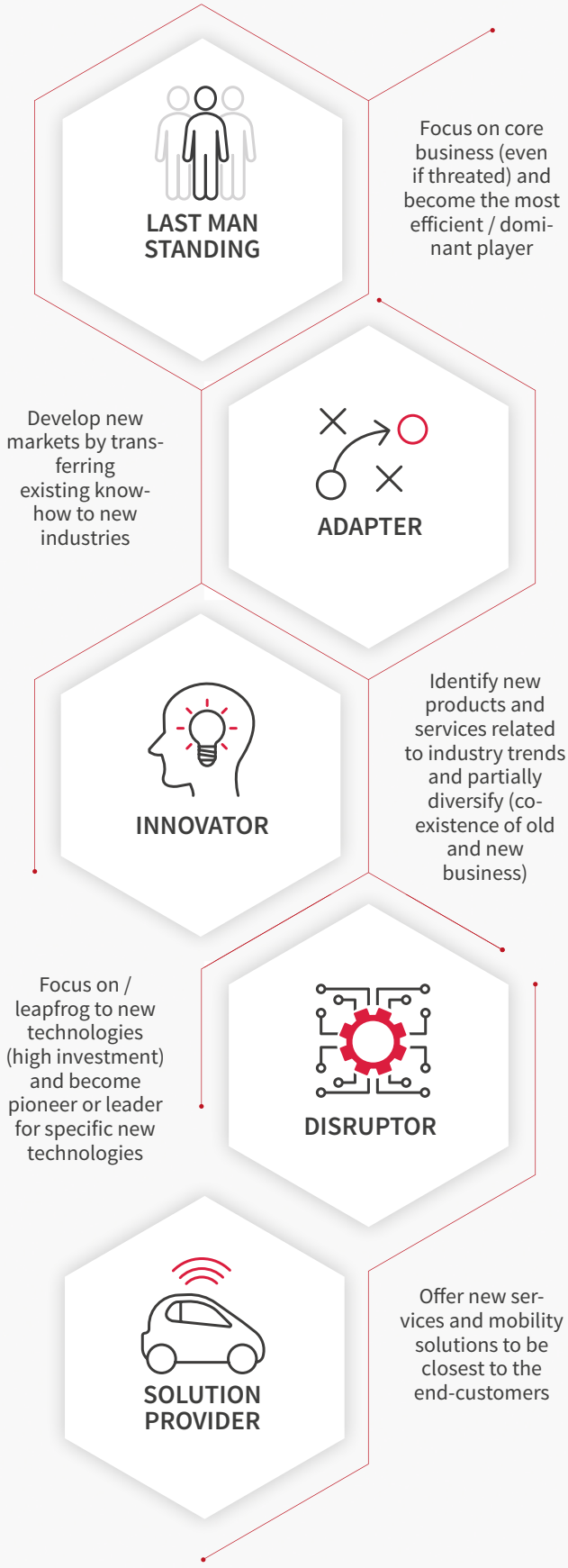
As a result, a strong competition among market players is emerging in conventional sectors, as well as in new sectors of the automotive industry. A company's strategic orientation is increasingly important to ensure long-term profitability and sustainable growth in these very dynamic markets.

There's not only one strategy that might be considered – there are several. Determining which strategy best suits a company must be individually assessed and decided on a case-by-case basis.

The first strategy, "Last Man Standing", primarily focuses on the existing market. At its core, it implies that a company wants to hold its ground in the consolidating market. To be successful in the future, the market share in the shrinking market must be increased by leadership through costs or quality.

Other positioning strategies target new business areas. "Adapters" try to position existing products in new markets, regions, or even new industries. In contrast, "Innovators" and "Disruptors" are relying not only on the existing portfolio but also on the newly emerging market of electrification and digitalization. Their aim is to develop new products that fit the company's core competences and expand the portfolio in a sustainable way. This realignment in the product portfolio may be carried out to varying degrees. The core challenge is that most companies have limited resources, forcing compromises in their allocation. While the existing business is a guarantee for today's sales, new products go hand-in-hand with investments that will often only pay off in the future. "Innovators" are looking for a healthy balance between old and new products while "disruptors" are willing to take a higher risk and focus all resources on the new market.

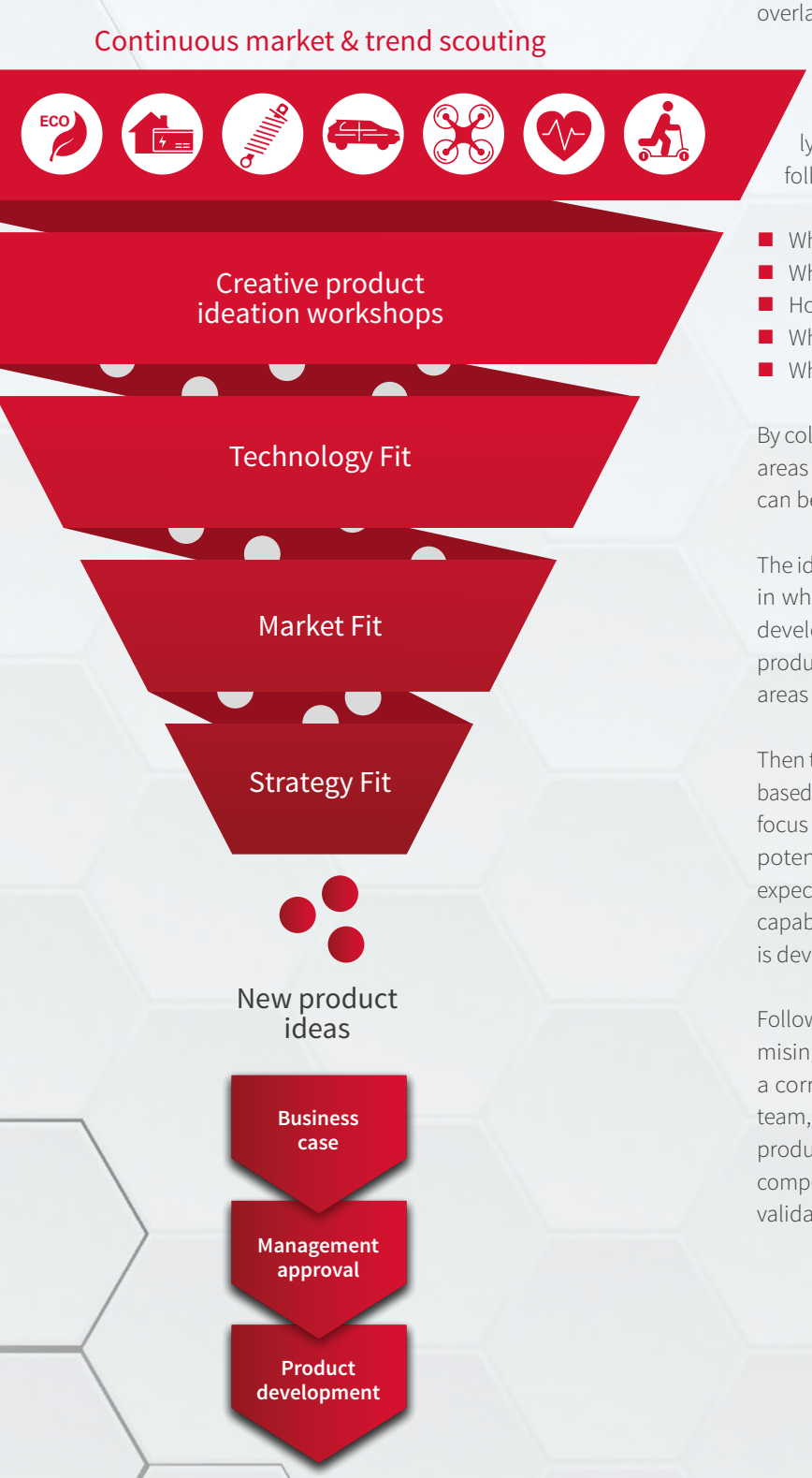
"Solution Providers" target significant expansion of their value added to achieve closer proximity to the end customer.



② *Positioning strategies in a changing market environment*

Identification of new product ideas

At the start of every new alignment, there should be an innovation process where new product ideas are collected, assessed, and prioritized. FEV Consulting has supported many clients in this innovation process. An important part of this is understanding and assessing the new target markets and identifying a potential overlap with the company's capabilities.



③ *FEV Consulting approach to identify new product opportunities*

FEV Consulting follows an approach that can be tailored to each client's needs. Typically, the first step is to analyze market and development trends while discussing the following questions with clients:

- What are the company's capabilities?
- What strategy is the company following?
- How is the company positioned in the value chain?
- What products are being offered?
- What are the company's distinctive competences?

By collaborating with the client early in the process, the search areas can be quickly narrowed down and the ideation process can begin.

The ideation process starts with an innovative workshop series in which client representatives and dedicated FEV product development experts come together. Attractive and suitable product ideas are developed, discussed, and prioritized in new areas of relevant applications.

Then the product ideas are thoroughly analyzed and evaluated based on their technological and commercial potential. The main focus is whether or not the product ideas offer differentiation potential, in addition to, how strong the market demand is expected to be, and the strategic fit to the client. In some cases, capability gaps are identified and a strategy to close those gaps is developed accordingly.

Following a filtering process, only the most attractive and promising product ideas for the client remain. After submitting a corresponding business plan to the client's management team, FEV often can support as a development partner in the product implementation phase if desired. FEV's development competences range from prototype development to testing and validation, up to series development.

Material science as innovation

A specific application example is the strategic positioning of plastics manufacturers. In vehicle manufacturing, where there is a significant effort to reduce weight, increasingly more materials are being replaced by plastics. The continuously improved characteristics of plastics regarding temperature, dimensional stability, and strength ensure increased application opportunities in the vehicle. This means plastics can be used to an even higher degree in the body, interior and exterior, power- and drivetrain, and electronics. By combining the client's competence with the engineering expertise of the FEV Group, valuable and promising product ideas are often generated.

The process for identifying new product ideas is only the beginning. After the strategic decision is made, it needs to be determined how the new products can be incorporated into the existing product portfolio, and what future portfolio and market launch strategies will be required.

In some cases, you also need to consider whether the company can handle the change of the portfolio strategy alone or if a potential takeover of other companies (i.e., M&A) may accelerate the transformation process.

FEV Consulting supports clients by combining its strategic experience in top management consulting with the comprehensive engineering competence of the entire FEV Group. By involving development experts in the ideation phase, not only can the new ideas be checked more effectively for feasibility and usefulness at an early stage, but completely new idea inputs and directions may be discussed.

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④ *FEV Consulting approach to "Integrated Business Enhancement"*

MERGERS & ACQUISITIONS

BUSINESS ENHANCEMENT VIA STRATEGIC INVESTMENTS & DIVESTMENTS

Mergers and acquisitions are essential strategic elements for companies throughout the value chain. There are many causes and motivations for this: Many companies in the automotive sector and related industries are operating in an area of conflict between considerable pressure to reduce costs, required investments in new technologies (e.g., electrification, autonomous driving, connectivity) and shifts within the value chain. The established corporate strategy and the associated product portfolio are often not in-line with this transformation. As a result, technologically well-positioned companies may consider the acquisition of individual business sectors or entire companies to strengthen their own market position, raise synergy potentials, or strategically expand the business into new markets or products. Divesting companies are often driven by persistent financial difficulties, a lack of size for steadily increasing project order volumes, or in the case of smaller businesses, a potential lack of management succession.

FEV Consulting holistically supports clients along the acquisition or sales process: from the screening of potential acquisition candidates via comprehensive due diligences, to the integration of acquired companies and definition of the product portfolio strategy.

	Pre transaction phase		Post transaction phase	
	Screening	Acquisition	Integration / Growth	Selling
OUR CONSULTANCY SERVICES	+ Company and industry profiling + Industry and sector trend analysis + Screening of target companies	+ “Red flag” reporting + Commercial and technical due diligence + Support in evaluation and negotiation	+ Post-Merger integration and transformation concept + Management of integration and transformation + Interim management	+ Planning of disposal and divestments + Preparation of business plan and sales strategy + Potential buyer screening + Vendor due diligence
CUSTOMER BENEFITS	+ In-depth industry understanding and large network + Deep technical know how and engineering expertise + Significant depth of project experience	+ In-depth understanding of trends and markets + Sound technical knowledge and engineering expertise + Experience in M&A buy processes	+ Sound experience in integration and transformation + Strong turnaround management experience + Strong background in C-level and senior management advisory	+ Extensive experience in the preparation of business plans + Professional market and technology description + Buyer-friendly marketing

① *Consultancy services for Merger & Acquisition activities*

The screening phase

Proper target screening requires in-depth knowledge of the industry, technical expertise, and a wide expert network that is aware of the different interdependencies in the industry. This is where FEV Consulting begins its search process, tailored to the client's requirements, to identify potential purchase candidates. After an initial filtering of results, the prioritized companies are examined in detail and evaluated based on the product portfolio, technical expertise, and business; as well as strategic positioning. Following successful contact establishment and the securing of non-disclosure agreements, onsite visits to evaluate development centers and production facilities help to prioritize and form recommendations for most attractive acquisition candidates.

The acquisition phase

For the due diligence process, various aspects including legal, tax, financial, as well as commercial and technical analysis, are essential. FEV Consulting is very well positioned, particularly in the last two aspects, because we combine the necessary disciplines, technology and markets, in our business model.

For a commercial due diligence, FEV Consulting investigates in detail market conditions, including existing and potential new competitors, supply chains, customers, and growth drivers. In the process, the sales potential of products and companies, as well as corresponding growth drivers or risks, are carefully examined. At the same time, FEV Consulting considers various scenarios, leveraging its extensive market and industry knowledge to understand relevant market dynamics.

For a technical due diligence, there are two significant perspectives: First, the product portfolio is examined to determine its current and future competitiveness and ability to withstand identified technology trends and competitor innovations. Second, FEV Consulting thoroughly assesses the organization and its key processes for strategy, research & development, manufacturing, purchasing, logistics and sales. Ideally this is complemented with an onsite visit of the local development and production sites to obtain first-hand accurate insights. Depending on the client (purchaser or seller), these analyses are accompanied by the development or evaluation of business models for various scenarios. Based on these examinations, the business model can be presented and challenged in detail against the turnover expectations of the company.

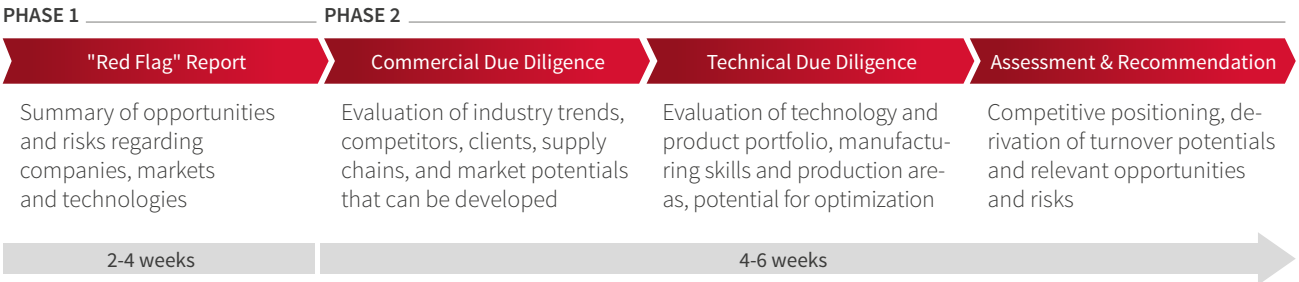
Acquired! Now it's time to grow

After the successful completion of the acquisition, the post-merger integration is typically a major pitfall for many companies, especially if experience with acquisitions is limited. Specific "roadmaps" are required for the first 100 days and the first year, where the most significant company areas (development, manufacturing, logistics, sales, etc.) are strategically and operationally defined together with the entities that are now merged. To avoid the acquired organization being perceived as a foreign body and not adequately integrated into the existing business, it is important to continue identifying key synergy fields, beyond those found during the due diligence, and promptly exploit them. FEV Consulting's vast experience in turnaround management, strategic development, and change management, enables the company to expertly serve clients in these disciplines.

The selling process

The success factors are similar for the process in which the seller (e.g., parent company, group of investors) is the driving force to sell - whether it be shares, a division of the company, or the entire enterprise. In this case, the process is typically reversed, and an appropriate divestment strategy is initially developed. From there, a detailed description and evaluation of the company is developed before the search for potential buyers begins.

In general, FEV Consulting recommends long-term planning of an acquisition or sales process. Investing in or divesting of a business should be considered as part of the overall strategic



② *Commercial and technical due diligence - Our approach*

process. In many cases, it is effective to plan and prepare the due diligence and the potential data room over a long time period in advance, as this makes it easier to identify and mitigate potential weaknesses. Typical challenges for companies could be critical cost structures within their company or the supply chain, as well as a decrease in investment and innovation. Periodic market and product analyses support innovation and usually lead to clear sales opportunities that can be realized in the short- to medium-term. These analyses also include the identification of potential synergies with interested purchasers, which can be evaluated to form a solid basis for purchase price evaluation and post-merger activities.

CASE STUDY: DUE DILIGENCE OF A BUS MANUFACTURER

SITUATION AND APPROACH

- An international strategic investor was looking for an investment into a bus manufacturing company and to increase its production capacities
- FEV Consulting was tasked with performing a commercial and technical due diligence to provide the client with an understanding of the investment's opportunities and risks, as well as a reasonable price
- Within the commercial part of the due diligence, the overall business model of the target was analyzed, management forecasts were reviewed, and an enterprise valuation was performed based on their assumptions
- Within the technical part of the due diligence, operational capabilities, including R&D, production and supply chain management were analyzed, and existing assets evaluated
- The upside and downside potentials of the transaction have been analyzed

RESULTS AND BENEFITS

- The client obtained detailed insights into the essentials of bus manufacturing and the competitive positioning of the target company
- Findings were summarized in a clear recommendation along with an enterprise valuation
- Post acquisition activities were planned to realize upside potentials and avoid risks

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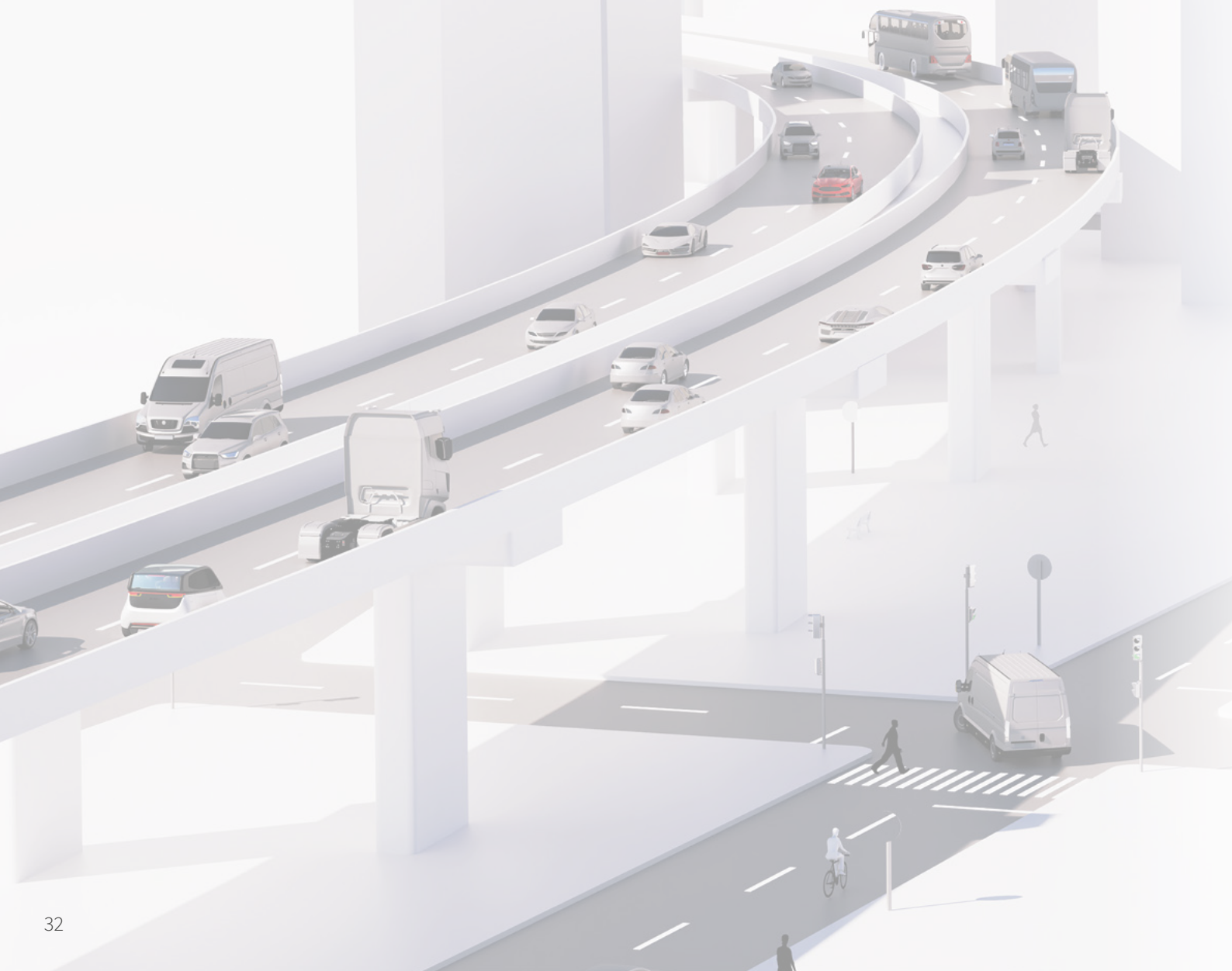
FUTURE ENERGY CARRIERS

FUTURE ENERGY CARRIERS IN THE MOBILITY AND TRANSPORT SECTOR

With the "Green Deal", Europe has set the goal to reduce net greenhouse gas emissions to zero by 2050. For the mobility and transport sector, the 2050 target is a 90 percent reduction in greenhouse gas emissions compared to 1990. A key step in achieving this goal is the tightening of the previous overall emission reduction target for 2030. In April 2021 it was agreed to reduce emissions by 55 percent compared to 1990. It is not yet clear how much the individual sectors will contribute to this target by 2030. Furthermore, it is uncertain which energy carriers must be supplied for this purpose and to what extent.



Key challenges for the transport sector

Despite all efforts, emissions from European road traffic have not decreased since 1990. In fact, they have increased by more than 25 percent, creating an urgent need to switch to more climate-friendly technology solutions. A variety of policies and regulations are available to support this, including the taxation of CO_2, fleet emission targets for new sales, and the frequently discussed registration ban of vehicles with internal combustion engines. One of the factors impeding the achievement of the targets is the continuous rise in mobility demand.

Several uncertainties go along with the regulations. Which powertrains are required to achieve the targets? Is it sufficient to rely on battery- and fuel cell electric vehicles? Or are liquid fuels from renewable energy required? How, where and in what form will the required energy be made available to the end customer? It is certain that a very diverse mix of decarbonization technologies must be utilized in the transport sector to meet the ambitious targets.

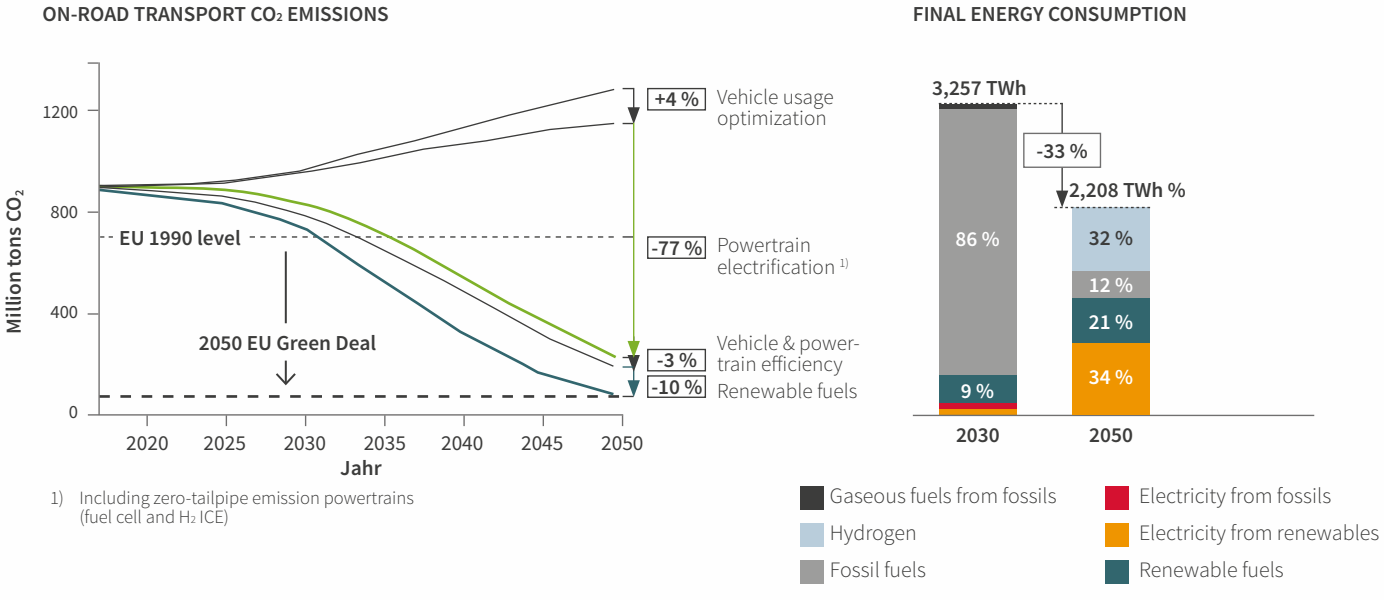
To ensure the adequate supply of the transport sector with energy carriers in the future, it is crucial to estimate their demand already today. Unfortunately, this demand is affected by many uncertain boundary conditions, such as legislation, consumer behavior and technological development.

Future demand of energy carriers

Using the "Energy Demand Model" and assuming vehicle emissions must decrease by 90 percent by 2050 compared to 1990, the illustrated demand for energy carriers results (see Figure 1). This result is based on the currently more likely scenario, which assumes accelerated electrification of the vehicle fleet and corresponding decline in new vehicles with combustion engines.

However, looking to the year 2030, it's obvious that emissions will not fall below 1990 levels through electrification alone. Despite increasing sales of purely electric vehicles, a large proportion of the vehicle fleet is still powered by combustion engines at that point in time. If the transport sector is to contribute to the reduction of CO_2 emissions already in 2030 compared to 1990, the utilization of renewable fuels is unavoidable and its share must be increased even more.

In 2050, the transformation of the vehicle fleet to electrified vehicles will be largely completed. Also due to the higher efficiency, the final energy demand of the transport sector will decrease to 2,208 Terawatt hours (TWh) by 2050. Electricity and hydrogen will be the primary fuels, while liquid fuels will play a minor role with 730 TWh compared to 2030. However, demand for liquid fuels from renewable sources further increases.



1) Including zero-tailpipe emission powertrains (fuel cell and H_2 ICE)

① *On-road transport CO_2-emissions and final energy consumption*

FEV Energy Demand Model

For the analysis and prognosis of emissions in the transport sector, FEV has developed the "Energy Demand Model" to determine future energy demand and the associated emissions for passenger and commercial vehicles, as well as shipping and air transportation. The model combines market predictions, technological developments, regulatory conditions, the effects of the future demand for mobility, and transport efficiency improvements. The modeled energy demand is then broken down into individual energy carriers. From there, requirements for future production capacities and manufacturing paths can be derived within the context of the climate objectives.

Hydrogen - the energy source of the future

In addition to its use in today's CO_2-intensive industries, such as steel and cement, the increased use of hydrogen as an energy carrier is also necessary in the transport sector. Apart from the reduction of CO_2 emissions through battery electric vehicles, electrification will need to be consistently implemented through fuel cells in commercial vehicles by 2025 and in passenger cars by 2030. For commercial vehicles and off-road applications, hydrogen can also be converted in a hydrogen combustion engine. All of this results in an increased European demand for hydrogen used in mobility applications to approximately 700 TWh per year by 2050.

However, for economic use and sufficient supply to occur, an appropriate infrastructure must be created. Apart from local and potentially decentralized production of hydrogen, additional international supply chains must be developed. The cost of electricity for electrolysis is crucial in the overall production costs of hydrogen. This means the construction of hydrogen production plants is most efficient in areas where renewable energy is cheap due to high full-load hours (e.g., for solar energy in Spain or North Africa). The lower production costs are expected to at least partially offset additional costs for transportation and distribution.

Hydrogen produced at these plants can also be used to generate liquid fuels. This would enable even more favorable distribution, especially for long distances between primary energy conversion and the end consumer, which can use existing supply chains and infrastructure.

Liquid fuels from renewable energies

Liquid fuels from renewable sources are also required to achieve the emission targets, especially for long-distance and heavy goods transport, which include shipping and air transport. In 2030, 290 TWh of liquid fuels are expected to be used in European road traffic. In 2050, the share will increase to approximately 460 TWh.

In addition to the biofuels already in the market, fuels produced from synthesis gas based on biomass (BtL fuels) or electricity and CO_2 (PtL fuels) are primarily under discussion. Key representatives are Fischer-Tropsch fuels, and fuels produced via the methanol route. Particularly in shipping, research is also being conducted to use ammonia, produced from hydrogen.

In terms of the availability of resources, the PtL approach is promising, as the feedstocks required in this process are theoretically available without limitations; whereas the use of biomass involves the risk of supply restrictions. However, production costs for PtL (Power-to-Liquid) fuels will be 2-3 times higher than for conventional fuels for the foreseeable future, depending on the production path. For BtL (Biomass-to-Liquid) fuels, cost parity or only a slight cost difference is regarded as possible.

To achieve the emission targets with the support of liquid fuels from renewable sources, various issues must be clarified in the short term. Is there sufficient biomass available to meet future demand with biofuels alone? If PtL fuels are also required, can production capacities be built up quickly enough and under which conditions does this result in an attractive business case for operators and investors?

Apart from these aspects, there are still ambiguities and a lack of incentives on the legislative side. Reasons why the actors in the energy sector are still reluctant to make the necessary investments, even despite the agreed fuel quotas.

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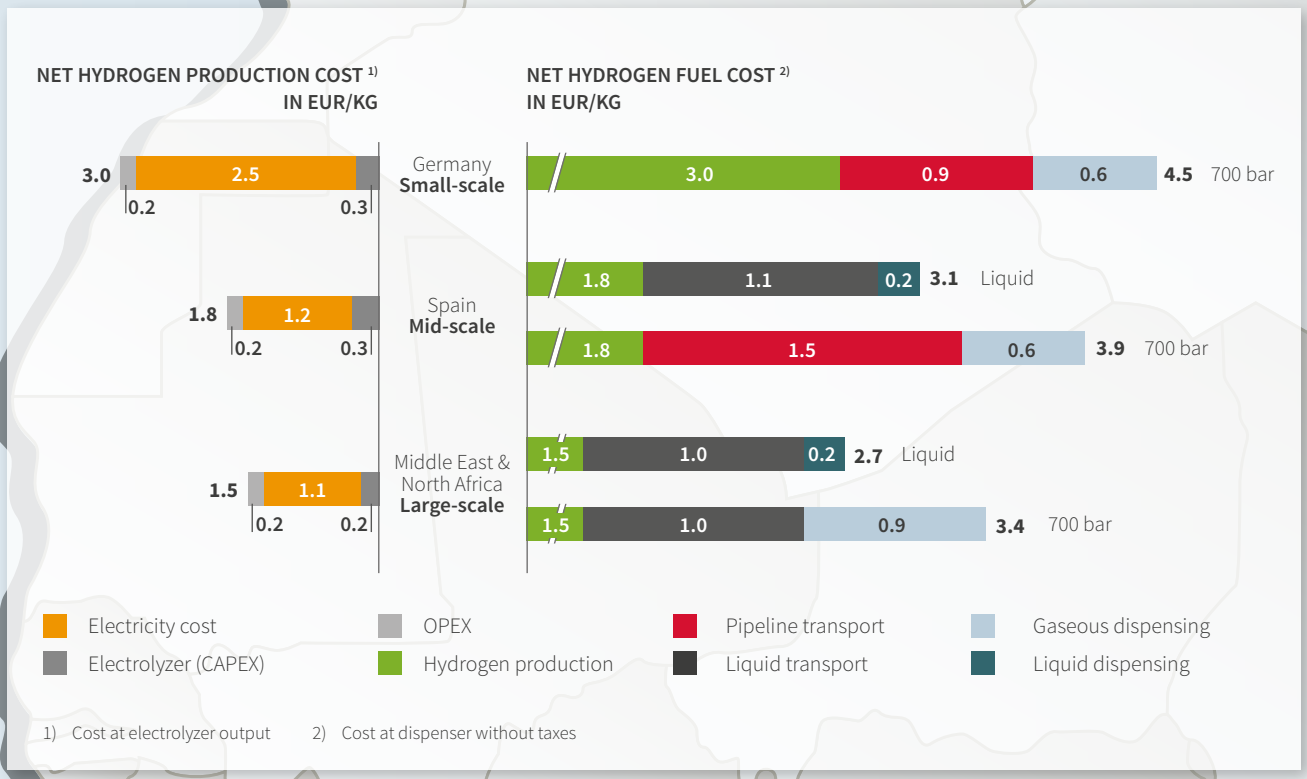


② *Hydrogen costs for the mobility and transport sector*

CUSTOMER TESTIMONIALS

FEV CONSULTING: WHAT OUR CUSTOMERS SAY ABOUT US

FEV Consulting's mission is to deliver the maximum benefit to boost our clients' performance and operational efficiency in a most sustainable way. We truly care about a positive customer experience and aim to be the trusted advisor at every stage of the customer journey. Each project is individual and tailored to the specific needs of our clients. Here's what our clients say about our work:

IVECO

"A balanced mix of strategic vision, technical knowledge on new technology / industry and high level of agility make FEV Consulting a strong partner for us."

Marco Liccardo
Chief Technology & Digital Officer

PETRONAS

"FEV Consulting has delivered very tailored support at high quality and professional representation at our customer front. Appreciate their listening to our demands and turning their work into value for our business."

Dr. Peter Kraneburg
Head of Automotive
Fluid Technology - Global R&T

stoba e-Systems

"FEV was very responsive to our wishes and expectations. This was also noticeable by the fact that they advised us quickly and competently even with new requirements or questions. Also, very positive was the great professional competence in the field of NRMM."

Miljan Sljuka
Head of Supply Chain Management
stoba e-Systems GmbH

"The pan-disciplinary experiences and deep insights that FEV Consulting own, have strongly contributed to our strategic planning and technical evaluations.

We have no doubt that they will take a large role in creating a sustainable future society."

Yoshiyuki Watanabe
General Manager,
Business Creation &
Digital Strategy Unit,
Industrial Materials Group

Mitsubishi Corporation

NGK SPARK PLUGS | NTK TECHNICAL CERAMICS
NGK SPARK PLUG EUROPE GmbH

"We have been working for several years now with FEV. I value very much the state-of-the-art technical and strategic insights that help in proving our business direction, and the "can do" professional approach."

Philip Irving
Vice President OE Division EMEA

"Working together with FEV has further accelerated our exploration journey of new applications for the Datwyler core technologies. FEV has engaged their whole organization based on the focus on high-quality, value-adding services and thanks to the superb professionalism of their team."

Andreas Minatti
Head of Business Development

DATWYLER

VDMA

"FEV has been our highly competent partner for the VDMA-FVA scenario studies "Drive in Change" for several years. The key reasons for choosing this partner were superior powertrain technology competence, as well as their global network in the automotive industry and science community.

Congratulations on 10 years of Drive4Business and thank you for the successful cooperation."

Hartmut Rauen
Deputy General Manager

"The results of the market analysis as well as the insights from customer surveys and expert interviews were very well assessed and extremely helpful for us. I am still quite impressed with their reports and their work in general. I really did not expect so much detailed information."

Volker Rosenburg
Head of Competence Center Transmission and Driveline

XCMG
欧研中心 European Research Center

OUTLOOK TOWARD THE YEAR 2031

THE TRANSFORMATION OF FEV CONSULTING

The downside of business plans: they formulate and quantify assumptions about the future, even though - as everyone knows - the future cannot be known, only be predicted. Nevertheless, planning is a suitable way to reach a goal, at least if the planning process is understood as considering consequences of certain actions and examining whether they can bring you closer to the desired goal. From this perspective, we sketched three target scenarios for 2031, which, if they occur, will (in addition to other factors) have a serious impact on the business of top management consultancies.

Let's imagine it's the year 2031. How is it different from 2021?

First: Globalization has further progressed, but there has been a shift in value chain activities away from steadily increasing exports of goods towards decentralized production. We know these locations and therefore we are on site with our customers.

Second: Regional focus has become even more important for the global strategy of our customers, especially when it comes to R&D activities and qualified employee recruitment aiding the critical role of technical innovations. This means regardless of location, we are a local sparring partner and idea provider to OEMs, in particular regarding industrial digitalization.

Third: As the complexity of transformation and future technologies has further increased, we are a guide and enabler after joining forces with expert companies to form business ecosystems. After all, competition in complex technologies increasingly takes place between ecosystems/networks and less between individual companies.

How did these three scenarios influence FEV Consulting's structure and way of working?

First: We have learned to think and work in a truly interdisciplinary way - between and across fields of work, cultures, expertise, sectors, and locations - each integrated under one business focus, such as customer/market/brand, strategy/business model/plausibility, technology/ecosystem/roadmapping, R&D/applied science/innovation.

Second: We harmonized and, where possible, standardized, and thus accelerated our work processes. Related keywords were: Combination of natural and artificial intelligence (experts and AI-based systems) and "Next-generation strategy consulting."

Third: For our mandates, we developed and work according to a competitive innovation model. A model, which is based on our core competences as "360° technology and business model experts.“ However, self perception moved away from "leveraging" toward "expanding."

According to BCG's "Six Innovation Models," the required key characteristics are:

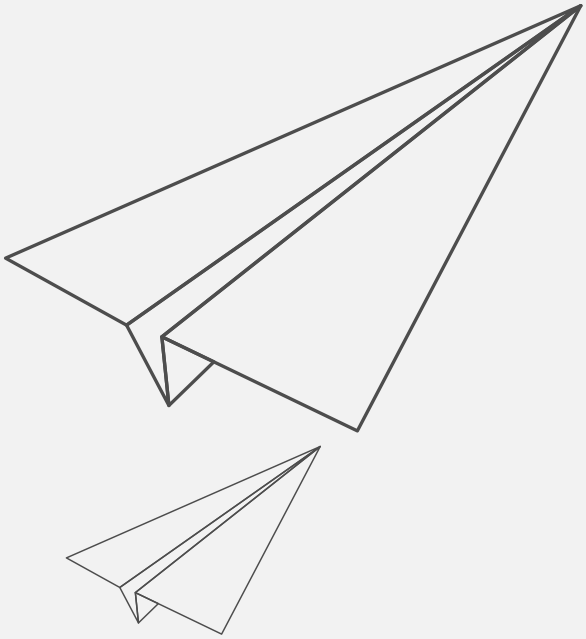
- A mandate for growth
- A focus on one or two competitive advantages
- Consistent in-market experimentation
- An open, empowering innovative culture

Put in more pragmatic terms our motto in 2031 is:
"We're seeking share to gain more!"

This holistic expansion strategy is based on a perception that became increasingly prevalent over the past ten years and has changed our strategic thinking and work accordingly: "Science shows that our systems for food, energy, industry, transport and cities are inefficient and largely unsustainable. The social and the environmental costs run into trillions of dollars. Therefore, we must change our local and global economic system fundamentally."[1]

[1] Source: SYSTEMIQ Ltd.

By
Dr. Volker Düsberg, ü,ö. Strategie und Design,
Expert for Corporate Identity and Corporate Communications



BECOME PART OF OUR TEAM.
SHAPE THE MOBILITY OF TOMORROW.

JOIN THE FEV CONSULTING TEAM
www.fev-consulting.com/career

You are solution-driven and want to work in a young and professional team? Are you interested in sustainability, digitalization and innovation in the mobility sector?

Become part of our team, bring in your expertise and together with our international customers, we shape the **mobility of tomorrow**. Combine your knowledge and your affinity to technology to discuss the complex issues of today.

As a strategy and technology consultancy, FEV Consulting supports its customers in all mobility related questions. Many years of experience in top management consulting combined with the technical expertise of the FEV Group enable us to develop innovative ideas and solutions to address the challenges of our customers.

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IMPRINT

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