

A Decade of Excellence

SE<sup>o</sup>



10

Years

2011-2021

## Strategy Engineers Anniversary Booklet

# Welcome

Ten years ago, we came up with the idea to combine management consulting and technology expertise in one company. The aim was to use our extensive technical know-how on products and technologies to help customers develop successful strategies and better processes, resulting in highly innovative solutions.

The other founders and I honed our skills at large, professional management consultancies, where we learned a lot about the technical challenges facing our target area, the automotive industry. However, to stand out in a crowded sector we decided that we needed to collaborate with a technology partner that had a proven track record of providing analytical, well-founded advice to companies for which technical strategies and decisions are absolutely vital. That partner was AVL List GmbH, which to this day remains a pioneer in the development of new technologies and solutions for the rapidly changing automotive industry.

After meeting with AVL owner and CEO Prof. Helmut List, all parties decided that the Austrian company would become a partner and shareholder in a newly founded consultancy: Strategy Engineers (SE). SE would be an independent company with its own name and an individual market presence, but with close ties to AVL and its technical expertise.

We started in 2011 with just four consultants. Today, with a team that has grown to nearly 50 talented people, we are celebrating our first decade of excellence.

What has shaped us during our first decade is the work we have done together with clients from a wide range of industries. While our initial focus was automotive, we quickly branched out into other sectors.



**Dr. Albert Neumann**  
Managing Director SE

With so many big events having taken place at SE during our first decade, we decided to create this anniversary booklet. Inside, we reflect on the projects that helped define us and outline the challenges that lie ahead for the industries we serve.

I hope you enjoy browsing through this booklet. Perhaps you will even find the contributions inspiring and enriching. In any case, I look forward to your feedback.

A handwritten signature in dark ink, reading 'Albert Neumann'. The signature is fluid and cursive, written on a light-colored background.

Dr. Albert Neumann

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# Foundation & Start of SE



**Dr. Albert Neumann**  
Managing Director



**Thilo Langfeldt**  
Partner



**Dr. Patrick Strunkmann-Meister**  
Principal



**Steffen Schmitz**  
Senior Consultant

A lot has happened during the last 10 years. The world has changed at a rapid pace, pushing many companies to their limits. This has created the perfect environment for Strategy Engineers (SE) to come alive and thrive. Since our humble beginnings in 2011 in Munich, we have expanded into a global operation with offices in Shanghai and Detroit as well as a second German location, in Hamburg.

We started with a simple mission: to understand the root causes of problems and find long-term solutions. We began with a deep focus on the automotive sector, which remains essential to our success. However, we quickly found our methodologies could also help industries ranging from rail to aerospace to energy. The first 10 years have been amazing, and we look forward to another decade of excellence.



This photo shows the door bell for SE's first office in Munich



The main purpose of strategy consultancies is to support organisations in solving problems they are facing, be it identifying new growth opportunities, increasing profitability or changing structures and processes to improve agility, speed and efficiency. The main skillset to do that are specific methodologies and frameworks which help to understand root causes of problems and develop ways to resolve them. The founding team of Strategy Engineers (SE), who have partly worked for international, leading strategy consultancies in the past, had learned many of these tools but was convinced that going to the next level of consulting value add, a more focused approach was needed for two main reasons: (1) Many client organisations have professionalised in a way that generic methodologies have been implemented internally and external support had to be much more specific. (2) Technology in products had become so



From left,  
Dr. Albert Neumann,  
Christian Koehler,  
Dr. Oliver Spreitzer

The early core that is still present

important that technological decision-making was a mandatory part of strategy definition. Thus, the founders of SE wanted to build a clear and unique consulting focus in two dimensions: (1) Sector focus: The founding team had years of experience with companies developing and producing (mostly) mechanically complex products as with automotive companies as well as with machine building, rail, aerospace, wind energy etc. (2) Technological affinity: Bringing cutting edge technological expertise into projects would help to level up the quality and uniqueness in strategic advice.



# SE and AVL

## A Successful Handshake

Written by SE Team



As a strategy consulting firm Strategy Engineers (SE) was looking for an ecosystem which helped to support our positioning as sector experts as well as to provide technological expertise in our projects. With AVL List GmbH (AVL) we found our perfect partner: A highly skilled expert company in automotive and adjacent industries, global footprint, strong culture regarding customer orientation and innovation.

Hence, we were very grateful that the discussions with AVL's CEO Prof. Helmut List resulted in a joint vision how consulting should look like and in AVL being a majority shareholder in SE. Over the last 10 years the partnership has grown in many areas with strong personal relationships between both companies and has created substantial client value add in multiple joint projects.



"The Brain" - A fragile dormant thinking centre at the AVL headquarters in Graz, Austria. It is an energetic control station that allows a view into its interior, onto conductors and neurons, through its protective glass shell.

Ten years ago, the idea of the foundation of an automotive focused management consultancy as part of the AVL was born by Dr. Albert Neumann. The new company was supposed to be largely independent but closely related to the global AVL to serve clients in the automotive industry with both technical expertise and business understanding. The ideas were striking as already back then our clients were more and more seeking not only technical advice but also how their decisions would impact their business. This was a perfect addition to AVL's competences. We quickly agreed that AVL would take shares in the new company to ensure close cooperation and partnership and jointly provide value to customers.

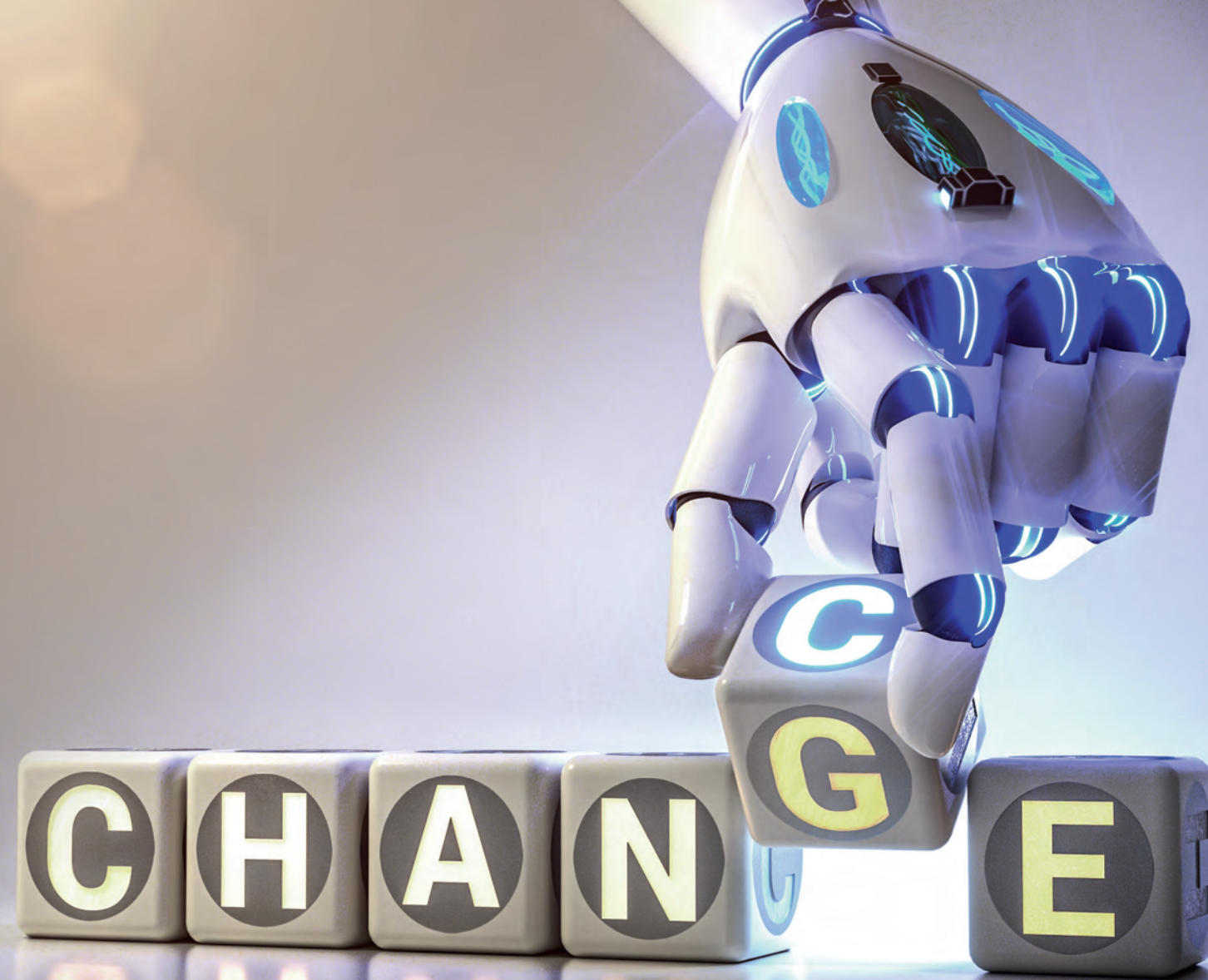
Now, a decade later, we are looking back at a true success story. Our partnership has grown and provided benefits for both companies. SE and AVL have teamed up to serve clients across the major industry topics with new arising technologies, new business ecosystems and competitive value chains, linking our technical expertise with global market and business insights.

Today we are working very closely supporting clients in developing entire new vehicles from early product planning to series production. A service which was unthinkable a few years ago and only possible in the combination from SE and AVL. We are very much looking forward to the upcoming years and further growing of this successful collaboration.



Chapter 2

# A Decade of Excellence

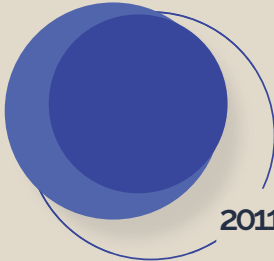


# Company History

Major milestones achieved in the last 10 years

### SE's First Answers to Climate Change

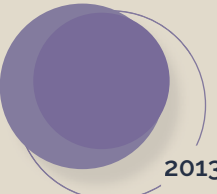
Procurement for one of the largest wind parks in Europe



2011

### Chinese-European Car Development

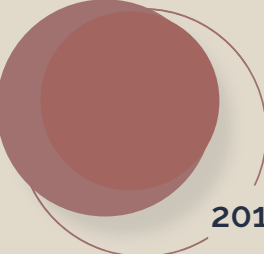
First total vehicle development centre for Chinese OEM in Europe



2013


### Global Expansion Begins

First office outside of Germany is opened in Shanghai in 2015. The move puts SE closer to the Chinese automotive market



2015


### Getting Started



Move into first office in Munich, marking the start of the SE story

### Software: The New Core Competence


Software as driver for business extension



2012

### Product Cost Optimisation

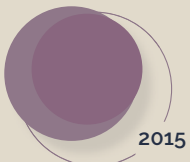
Product cost optimisation of one of the first purpose-built BEV near SOP to reach target costs




2014

### Innovation & Digitalisation

First innovation project for big telecommunication provider

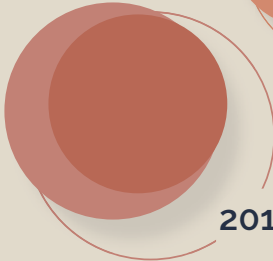


2015



### Combustion Engine Declining

First strategy project for ICE-engaged supplier




2016

### Hamburg Office Opens

Second location in Germany is established in 2016

### Munich Move


SE's headquarters are relocated to a beautiful old building on Seidlstraße in 2018



2018

### Charging Solutions


The first global charging network



2018

### The World Has Changed

Quantum-lead in Battery Development Solid State Battery Strategy



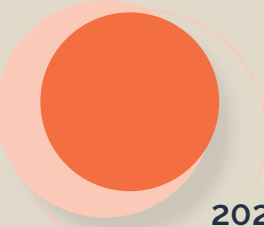
2020

### New Digital Collaboration

Development in Global Network - Managing vehicle development of Multi-Billion Euro BEV Startup: Support from Scratch


### Coming Soon

First UK office scheduled to open in 2021





2021

### Detroit Office Opens



A new big step was taken and the first office in the US was opened in Detroit









# It's All About People

The path so far has not only been marked by many extraordinary projects, but above all by people who were determined to get things done. At Strategy Engineers (SE), we believe that we are only as good as our team. You will find passionate, cooperative, open-minded individuals who have technology at heart and business in mind.

Many of us have an engineering background, but are longing for something more, something exciting – strategic challenges and radical new opportunities in the business world. Our team is comprised of people who came together because of their fascination with technology and their determination to improve things by working together. We grow as a team because we dare to disagree, question and challenge. Together, we think ahead and question the status quo.

Teamwork and mutual respect are particularly important to us. The personal fit counts. Flat hierarchies and interaction among all colleagues create an open and trusting work atmosphere.

Along with our core professionalism, we have a team of caring individuals who look out for each other and who never lose their sense of humour – even when working under stressful conditions.

Defining the future of mobility at the interface of technology and digitalisation is our passion. And we all share the ambition to make a difference together. This is what connects us and why we work as one to create tailored advice and the best solutions for our clients – regardless our office location.

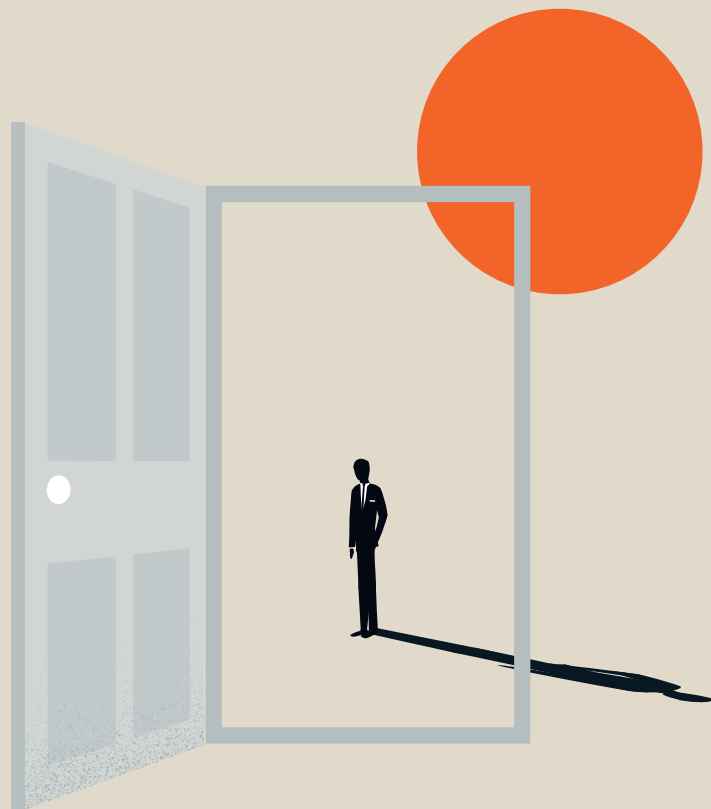
## A snapshot of some of our team members

Today, the company has locations in Munich, Hamburg, Shanghai and Detroit. However, through our project work and our cooperation with AVL, we are active beyond our offices and present worldwide. We are all in close contact and frequently exchange ideas. We learn from each other and gain unique experiences from various cultures and different ways of working.



# Our Alumni

An excerpt from various alumni and where their paths have taken them



Consulting is a people business. In the company's first 10 years many people have been hired and, as is the case with every consultancy, many people have moved on to new jobs. It is always sad when people leave the SE team, but many have remained closely connected with us. As a result, we have a great alumni team!

We like to think back with a smile on the time when we accompanied these people along their career paths and are grateful for the footprint everyone has left with us. We are very proud of the development of each individual and are delighted when our alumni achieve impressive results and enjoy great success.



## Dr. Patrick Strunkmann-Meister •



It's great to see how Strategy Engineers (SE) has developed. SE Managing Director Dr. Albert Neumann and I had already worked together long before SE. One day at a beer garden, he asked me if I could imagine starting a consultancy with him. I was thrilled and told him I would sleep on it - but I already knew the answer was "Yes". Rebuilding things has always driven me, I always wanted to work in an entrepreneurial way. We won our first big projects shortly after SE was founded. We had a strong start. And as you can see to this day, SE has consistently stayed on this path.

At some point, the next idea seized me. It was a real fever, just like back then. Innovative, digital - something that would completely change the way sales processes are organised. And so it came to the foundation of bao solutions in 2017. By now, more than 50 customers are using our Conversation Intelligence Platform, including the medical technology group B. Braun and Barmenia Insurance. And in building up the company, we certainly still benefit from the experience I gained at SE.



## Dr. Stephan Rohr ●

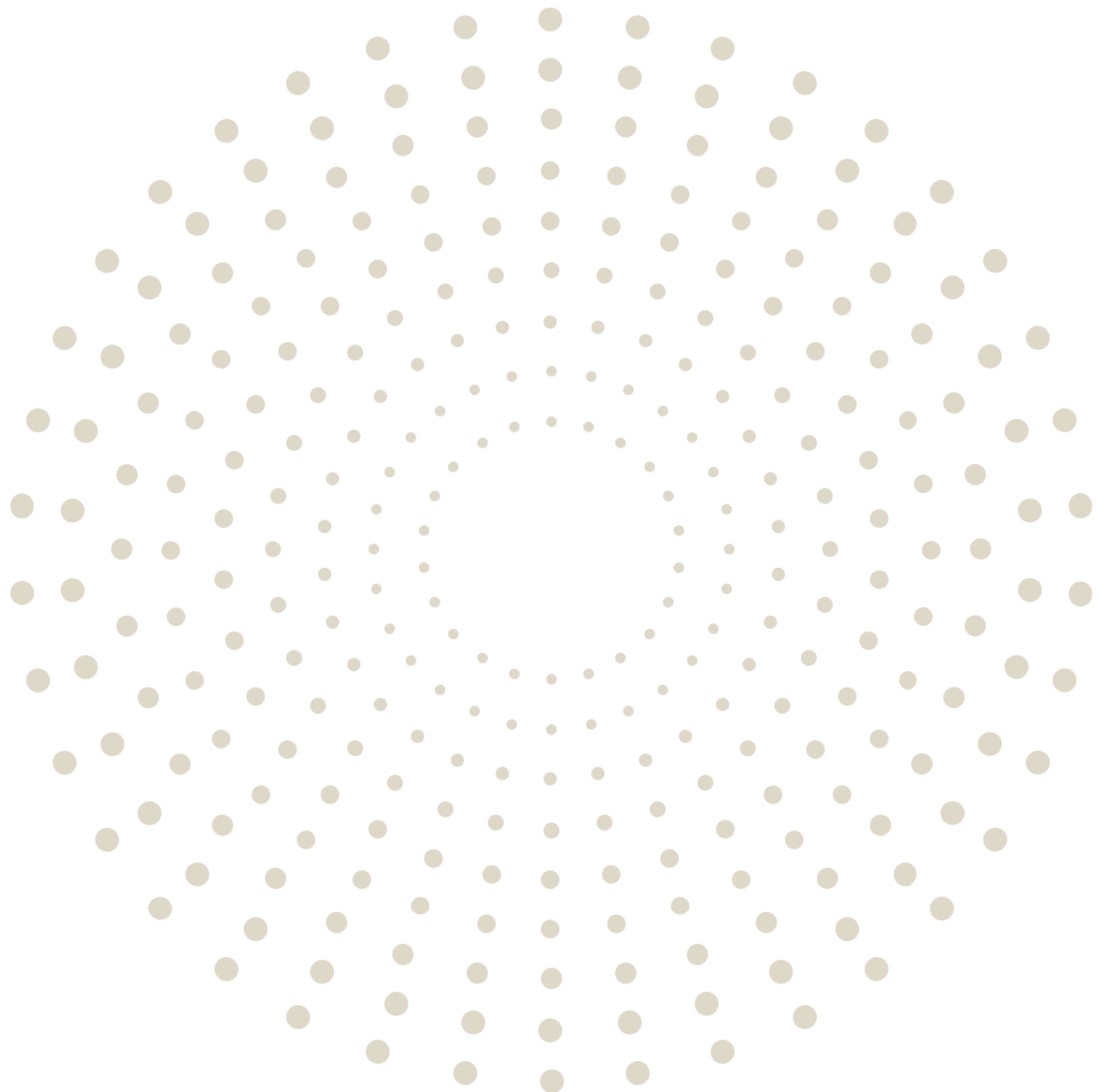
# TWAICE

Three years ago I co-founded TWAICE, which specialises in the creation of battery data, analytics and simulation software for battery systems during development and operation. Last year the company secured consistent financing, and we were recently named the 2021 Global Cleantech 100 European Company of the Year. What I learned during my time at Strategy Engineers (SE) strongly contributes to the success I'm enjoying today.

While at SE I gained invaluable experience working with talented colleagues on a wide range of projects for automakers and suppliers. Those years at SE helped me grow more than I could have imagined.

The experience gave me the determination to further my education – I earned a doctorate in battery analytics from the Technical University of Munich – and gave me the confidence to start my own company, TWAICE, with my colleague and friend Dr. Michael Baumann.

I'm forever grateful to SE for the part it played in shaping me as a person and a professional.



## Jianjie Gong ●



My connection to Strategy Engineers (SE) actually started even before SE was born. SE Managing Director Dr. Albert Neumann, Christian Köhler and I worked together at Ricardo Strategic Consulting prior to the company's formation.

Because of my positive experiences with Albert and Christian, I was delighted when I was asked to lead SE's China team in 2015. This was a great opportunity to re-join the automotive sector after spending a few years working at restructuring specialist AlixPartners. During my almost three years leading the team in Shanghai we grew rapidly as we took on a wide range of projects with Chinese automakers and suppliers.

One of the highlights was working with Geely and China Euro Vehicle Technology (CEVT) in Sweden and China on vehicle development. Our influence is evident today in the vehicles now being produced by the Lynk & Co brand.

My experience at SE thoroughly prepared me for the next step in my career, which was joining NIO in late 2017. Today I'm one of the Chinese EV maker's leading vehicle line engineers. What I learned at SE has come in very handy working at NIO, which also has a proud entrepreneurial spirit.





## Chapter 3

# Customer Project Highlights

## Excellence in Collaborations

The foundation of everything Strategy Engineers (SE) does comes down to establishing and nurturing collaborations with clients. It is absolutely essential at SE to find common ground, develop an in-depth understanding of the customer's needs, build trust and then deliver results. SE has been fortunate to work with fantastic partners that share our commitment to working together. With Zhejiang Geely Holding's China Euro Vehicle Technology (CEVT), SE helped the company define its structure and establish its product development system. MAN Truck & Bus realised it had a great opportunity to extend its product portfolio with a bit of guidance from SE. In addition, SE assisted Swedish utility firm Skellefteå Kraft with the procurement of 39 wind turbines for its Blaiken wind farm. These projects succeeded because of the commitment by all parties to collaborate.





China Euro Vehicle Technology has its headquarters at the Lindholmen Science Park (shown) in Gothenburg, Sweden, where more than 2000 development engineers are employed

# CEVT

## China Euro Vehicle Technology

China's Zhejiang Geely Holding Group has been investing heavily in its European subsidiary, China Euro Vehicle Technology, since 2013. This includes an R&D centre that CEVT established next to its sister company, Volvo Cars, in Gothenburg, Sweden. While CEVT's original mission was to develop shared platform technologies for the Volvo and Geely Auto brands, the company is now creating complete vehicles for Geely Group. CEO Mats Fägerhag, a longtime automotive senior executive, has led CEVT since its inception, spoke about CEVT's unique position within the Geely Group, the growing number of Chinese-Swedish collaborations it is supporting and the company's future prospects.

**Mr. Fägerhag, Chinese investors have not always received a positive welcome in Europe. When the Geely Group bought Volvo Cars in 2010, many people feared there would be a knowledge drain and a loss of jobs in Sweden. What was your experience?**

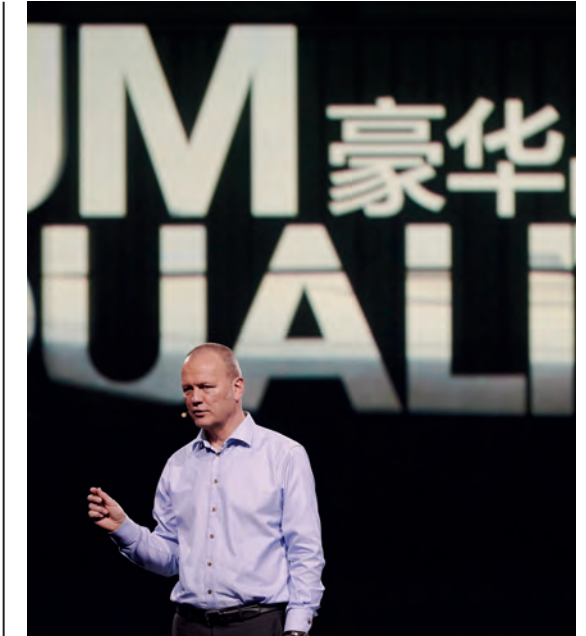
If we look at CEVT, we see exactly the opposite effect. The company was and is funded by investments from Geely, which created more than 1800 new jobs in fewer than four years. Our future outlook is also very promising. We expect further growth, also in highly innovative areas such as connectivity, autonomous driving and alternative propulsion systems. The establishment of CEVT has strengthened Sweden as a location for the development of state-of-the-art automotive technologies.

**What role does CEVT play within the Geely Group?**

CEVT is a wholly owned subsidiary of the Geely Group. CEVT was created to develop a joint car platform for Geely Auto and Volvo. The challenge was to match quality, performance and cost requirements for the two brands. This was managed by developing components and systems with multiple performances. Things have progressed rapidly since the first vehicles based on the new CMA (Compact Modular Architecture) platform were launched in 2017. Today, CEVT is a key innovation centre within the Geely Group.



Never  
stayed



**Management and leadership styles are different in Sweden and China. How does CEVT cope with this?**

Sweden is known for its flat hierarchies and democratic leadership style. In China, on the other hand, you can often find strong leaders and a more centralised organisation. At CEVT, we succeeded in setting up a very fruitful international collaboration. We offer cultural training on a regular basis and support knowledge transfer across locations. Swedish employees work at our locations in China and vice versa. We have employees from a vast number of nationalities at CEVT, therefore the company language is English, which also makes international collaboration easier.

**How would you describe the company culture at CEVT?**

At CEVT, everything is new. When we started there were no defined processes and we could build an organisation from scratch. Many CEVT employees came from Saab, Volvo or other automakers, bringing in an extensive know-how of methods and processes. Based on their experience, we shaped a very flexible, yet lean organisation. I believe this is our biggest advantage over established, traditional automakers. We have been able to shape a fast-reacting organisation free of long-standing inefficient practices you find at many established automakers. This dynamic and flexible working environment is also very attractive to job candidates.



We recruit worldwide and have a very low turnover rate.

**How will CEVT secure its long-term place within the Geely Group and what are the biggest challenges you foresee?**

As an innovation centre, CEVT is responsible for technology development within the Geely Group. Our plan is to further strengthen this position. In particular, through the advanced development of new vehicle platforms that provide a basis for new mobility concepts that exceed Level 2 Plus autonomous driving functionality. CEVT is also working on new cabin and interior concepts as well as looking into service concepts beyond the vehicle. To cope with these new

technologies and challenges, we have re-structured and re-organised CEVT over the last two years. Software and service development capabilities now carry the same importance within our organisation as traditional vehicle development skills.



**About Mats Fägerhag**

Mats Fägerhag has more than 20 years experience in automotive product development, working for companies such as Saab, General Motors and Volvo Cars. He was head of R&D at Saab before moving to Volvo in 2012. A year later he was named CEO at CEVT.

# How SE helped CEVT get rolling

Strategy Engineers (SE) founder and Managing Director Dr. Albert Neumann outlines how SE helped China Euro Vehicle Technology (CEVT), which has expanded its once-small development team an 1800-person powerhouse.

**What role did SE play during the initial setup of CEVT?**

In the early days of CEVT, SE supported CEVT by defining the overall company structure. This included the development of the organisational setup, the establishment of a governance and decision structure as well as the definition of roles, responsibilities and key processes required to kick-start the company's operations. In close collaboration with Volvo, Geely and CEVT, SE developed a global product development system that was rolled out throughout the organisation.

**How did SE collaborate with CEVT's rapidly growing staff?**

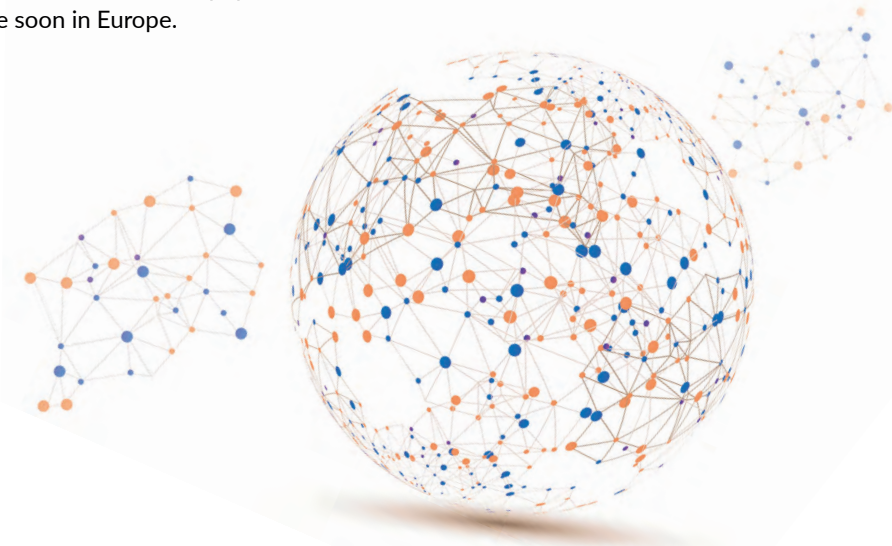
When CEVT grew bigger and the company's work scope extended rapidly, SE supported with an extensive transformation project. CEVT had to move from a single-project organisation to a matrix organisation suitable for the simultaneous development of multiple derivatives. At the same time, CEVT took on the responsibility for the product management of select Geely cars.

Here, SE helped CEVT develop a product planning organisation and facilitated a balanced product portfolio that met customer and market requirements. SE also supported the target cost definition and achievement for the CMA platform through a specific design-to-cost approach that involved teams in Sweden and China from CEVT, Volvo, Geely and suppliers.

The outcome of this was a global platform on which not only Geely Auto cars could be based but also the Volvo XC40, which was the 2018 European Car of the Year. By the way, the very first CMA-based vehicle, the Lynk & Co 01 that is popular in China, will be available soon in Europe.

**Has SE worked with Geely and CEVT in China from the very beginning?**

SE, through its office in Shanghai, was able to work closely with the CEVT team in China from the very beginning. With teams in both Sweden and China, SE contributed to building a strong link between CEVT's two sites. A detailed specification of the work split between the R&D teams in China and Sweden helped to lay the foundation for the positive global collaboration that exists today.







# Mindset Shift

Using software to extend product and service portfolio

In 2010 so-called “external engines” became a core part of MAN Truck & Bus’s growth strategy. As a result, a department for product strategy and product management was founded. This unit would cover a wide spectrum, ranging from on- and off-road segments to marine and power applications.

One key focus was that MAN’s marine arm wanted to supply engines with an open electronic control unit (ECU) that could be connected to the vessel control system. MAN saw the opportunity to revise the product offering in the marine sector through modularisation and widen its portfolio

to become a system provider with extended functionality.

Therefore, MAN teamed up with a dedicated supplier in 2011 to develop a new-generation engine ECU. An analysis of the pleasure boat and commercial vessel markets showed that shipyard operators wanted more system suppliers because the sector included too many small players that offered special vessel functionality, such as automated docking or position holding. These solutions would connect to the boat’s electronic system and take control of the engine and gearbox functionality.



Photo credit: MAN  
<https://www.engines.man.eu/global/de/marine/motoren-fuer-die-berufsschiff-fahrt/produktprogramm/Produktprogramm.html>

6-cylinder MAN  
marine engine

Strategy Engineers (SE) helped MAN determine that it had a great opportunity to extend its product portfolio to cover a larger part of the overall marine electronic value chain. A whole new set of innovative functions was identified. These functions could be linked to the ECU, helping ship designers and shipyard operators offer an integrated system to their clients. This could only be done, however, with partners capable of developing software that would link to the engine ECU and become part of the overall marine electronic system.

Frederic Bar, who was responsible for product strategy at MAN’s external engines unit at the time of the project, recognised the significance of what was accomplished. He said that the project signalled a major change in how MAN’s engine business traditionally operated as it requires a new mindset to respond to customer requirements and embrace the chance to extend the company’s business model.

Today we at SE are reminded by this project that already 10 years ago we recognised that software-based functionality was the key to extending a traditional hardware-based portfolio, and that strategic partnerships continue to be crucial to implementing changes in a company’s strategic direction. Some traditional business sectors still struggle to realise the importance of making this mindset shift.



**Frederic Bar,**  
Today, Executive SVP Global  
Automotive Product at Segula  
Technologies

# Wind Power

How SE transferred its expertise in spinning wheels to spinning rotors

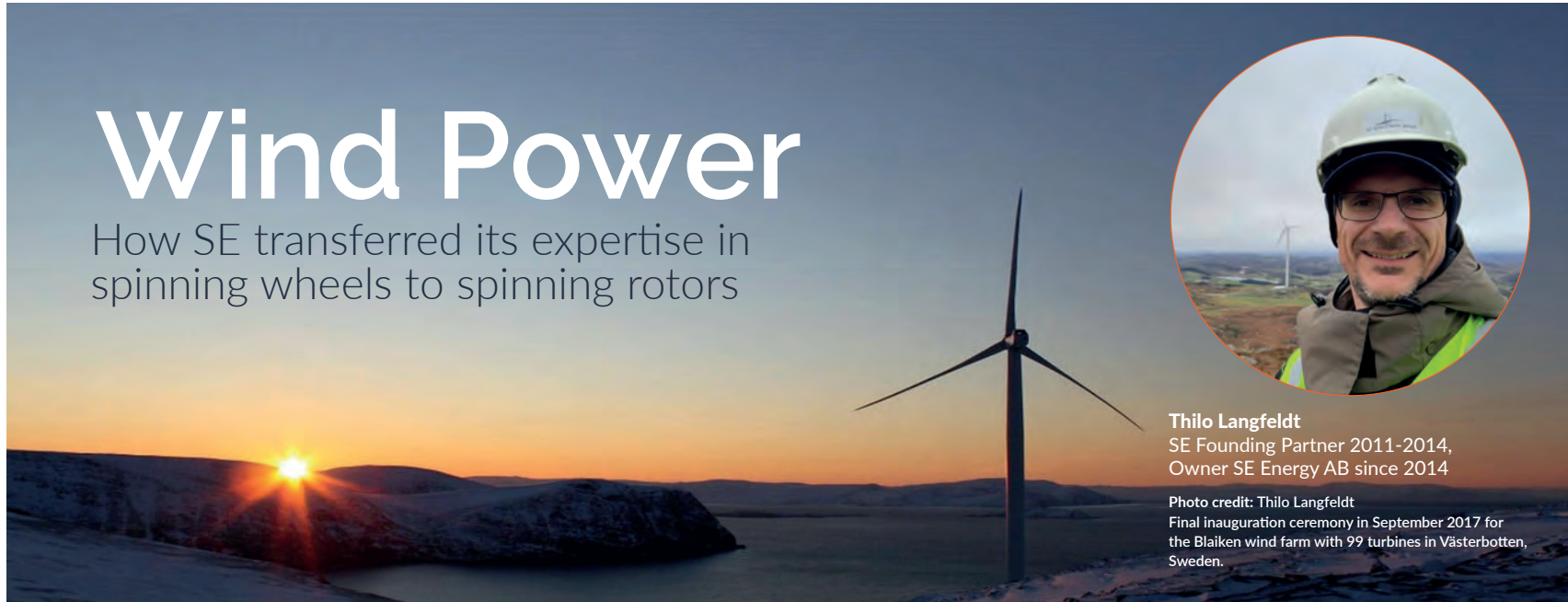


Photo credit: Egon Leonhardsen

Havøygavlen is the northernmost windfarm in the world, located just 45 km south-east of the North Cape in Finnmark, Norway. The picture was taken on January 25, 2012, when the sun rose again above the horizon for the first time since November. In 2019, the author supported the procurement of new turbines to replace the existing ones that had been operating since 2012.

Strategy Engineers (SE) quickly expanded its client portfolio beyond the automotive industry to serve the aerospace and wind power sectors. In fact, SE's first invoice – issued in January 2011 – went to the Swedish regional power utility Jämtkraft for the work we did supporting the procurement of wind turbines. SE's rapid entry into the wind power sector was helped by the successful relationship that the company's co-founders had established with Skellefteå Kraft AB (SKAB) before SE was born. This fruitful relationship with the innovative utility provider continues today. Our long-term engagement with SKAB also validated

our idea of leveraging SE's automotive expertise to improve the procurement process for wind turbines. The most memorable period of this success story for me took place from 2012-2014 when we supported SKAB with the procurement process for phases 3 and 4 of the Blaiken wind farm, which is located in northern Sweden. The €104 million deal included 39 direct-driven, 2.5 megawatt wind turbines from the Dongfang Electric Cooperation (DEC), marking the first time a European power company had purchased such a significant number of turbines for western Europe from a Chinese supplier.

It took about 14 months to complete the contract, which was finally signed in Chengdu, China, on February 20, 2014. SE managed the entire procurement process, starting with identifying nine potential suppliers (five were from Asia), preparing and submitting the request for quotation, collecting and comparing and evaluating the tenders, negotiating with potential suppliers, which sometimes lasted several days and finalising the contract. This process included some unforgettable dinners hosted by our Chinese counterparts.

The project was a game changer not only for SKAB but for the entire industry as it proved the operational competitiveness of Chinese wind turbines, which have been performing admirably since 2015. These crucial years in the wind power sector turned wind turbine procurement into my bread-and-butter business and resulted in the creation of the Swedish spinoff Strategy Engineers Energy AB in 2014.

The importance of wind turbine procurement has grown nearly as fast as the wind power market, which now has a global installed capacity of about 740 gigawatts, up from 198 gW at the end of 2010.

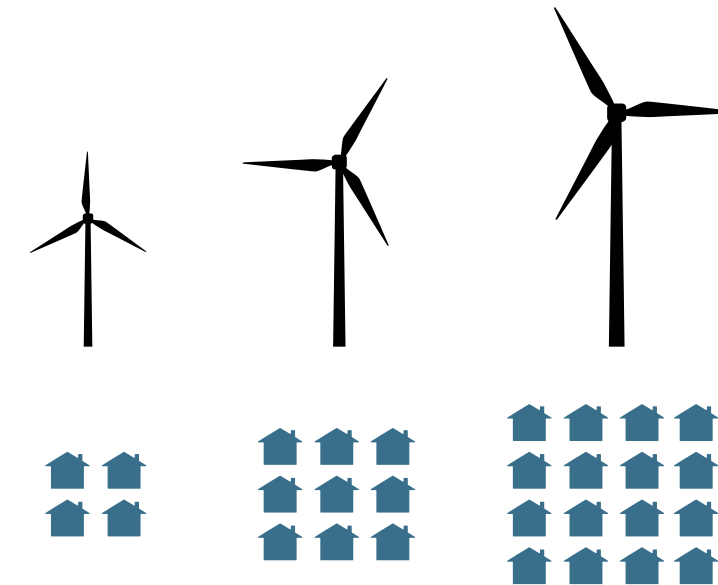
New installations reached an all-time high of nearly 100 gW of added capacity last year (58 gW in China alone) despite constraints caused by the COVID-19 pandemic.

Wind turbine dimensions have increased at a remarkable speed in a short period of time, reaching up to 6.6 mW for one onshore turbine today, up from 3 mW in 2010. Meanwhile, rotor diameters have grown to 170 meters from 112 meters in 2010 and maximum blade tip heights are now up to 250 meters compared with 150 meters a little more than a decade ago.

Although it appears unlikely that the Paris Agreement's goal for limiting global warming can be achieved with the current level of engagement, the nations, regions and cities with an actual or intended net-zero carbon emissions target represent 49% of the world's annual GDP, according to a February 2020 report by the Energy and Climate Intelligence Unit. This gives me hope and provides a huge opportunity for further wind power developments, which are an inevitable building block for a 100% renewable energy system.

A remarkable way since

# 2010



Number of households only illustrativ



# Team Effort

## How SE and AVL helped NEV take a big leap forward

Written by SE Team

Real estate giant China Evergrande Group made headlines in 2019 when it said it would enter the fast-growing electric vehicle sector. Company Chairman Xu Jiayin's vision is for Evergrande New Energy Vehicle to become one of China's leading EV makers by 2025.

The startup is developing up to 14 new vehicles, nine of which were shown as prototypes under its Hengchi brand at the 2021 Shanghai auto show.

Reaching Xu's ambitious goal despite starting the automaker from scratch led to a unique development approach that aims to set a new standard for getting cars to market, with help from four leading European engineering firms and more than 100 strategic suppliers.

To manage this complex partner network, Strategy Engineers (SE) and Austrian technology specialist AVL List GmbH (AVL) established a programme management organisation to achieve component commonality, manufacturing commonality and

a competitive vehicle performance and monitor programme.

The goal was to combine and leverage SE's management and method expertise with AVL's technical know-how.

In a short time, this organisation grew from 14 team members to more than 150. Today, this team manages and steers Evergrande's European partner network.



Evergrande Product Portfolio Hengchi #1-#9 presented at Auto Shanghai 2021



Right from the beginning, SE took steps that made the team an integral and stable part of the quickly evolving Evergrande Auto R&D organisation. Key success factors include:

1. Immediately establishing governance structures for all levels of the business underlined by a transparent issue-management system
2. Harmonising the different development philosophies of each of the engineering partners based on best practices
3. Defining high-quality gateways throughout the vehicle development process based on consistent deliverables and stringent criteria
4. Setting up a vehicle performance management and attribute balancing system based on a transparent and consistent target breakdown from the product profile to the vehicle technical specification.

For SE and AVL, working with Evergrande evolved into one of the partners' largest and most important projects ever. A strong vehicle development management team was formed. In addition, methods, processes and experiences were codified to such a large extent that they can be extended to new and existing players in the electric vehicle market in the future.





# Better Cost for Better Products

SE's assistance includes benchmarking and idea generation

"As engineers, we strive to continuously improve our products. Adding functionality, improving performance and preparing them for the technology shift in our industry," Volvo Construction Equipment Senior VP Technology Thomas Bitter said. "As a result, the best product is the one that combines optimum performance and the best-possible cost."

At Volvo's plant in Belley, France, the company has a long history of developing and manufacturing class-leading compact excavators. To future-proof its next-generation products, the company launched an extensive profitability optimisation programme. It started with a comprehensive benchmark of its products versus their key competitors. Each machine was then torn down to support cross-functional

expert workshop sessions. Strategy Engineers (SE) guided Volvo through the entire process.

"SE's benchmarking methodology and expertise helped us document the teardown, develop and track cost-saving ideas, and establish transparency for our management team at the plant all the way to implementation," Bitter said.

"With SE, we got the full support from one source. From benchmarking to idea generation to tool-based tracking – the team and the method they applied made a strong contribution towards the success of our cost-saving initiatives," Bitter said.

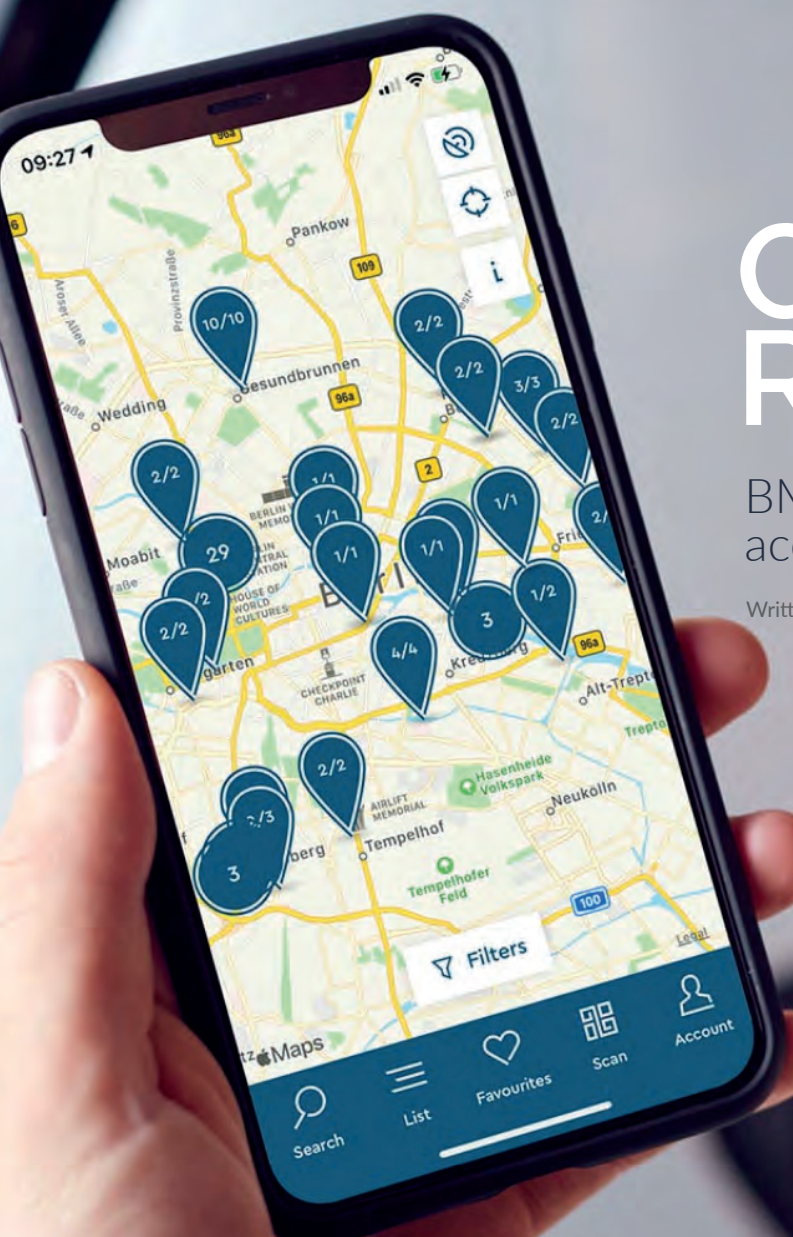


**Thomas Bitter**  
Senior VP Technology,  
Volvo Construction Equipment



Photo credit: Volvo CE  
<https://www.volvocem.com/-/media/volvocem/global/products/excavators/compact-excavators/hero/volvo-show-compact-excavator-ecr25d-t4f-2324x1200.jpg?v=NhY2Pw&download=1>





# Curing EV Range Anxiety

BMW's solution: Give customers access to a vast charge point network

Written by SE Team



BMW became one of the pioneers in the electric vehicle sector when it launched the battery-powered i3 in 2013. The Munich-based automaker wasn't satisfied with just developing and offering a car with a new powertrain. Therefore, BMW re-thought the entire user experience, debuting innovative ideas for the purchase, usage and end of life for EVs.

One of those innovations focused on calming the nerves of i3 customers who feared they would run out of power while traveling long distances because of the limited charging infrastructure and range promised by the car's battery. BMW's solution was to establish a service called ChargeNow, giving i3 customers access to a network of charge points, all of which would be integrated into the car's navigation system. In addition, ChargeNow built Application Programming Interfaces (APIs) into the IT systems at many of the charge point operators around the world, to be able to authenticate and pay with a ChargeNow card and smartphone app in almost all relevant markets.

While the service was well received, BMW realised that limiting it just to its customers would not provide enough scale to turn a profit. The automaker then decided to investigate whether to open up the service to other automakers by making the unit an independent company. That was the point when Strategy Engineers (SE) got involved. SE helped the ChargeNow team sharpen its new business model, create a long-term plan, evaluate the business case and prepare the business to be carved out.

Digital Charging Solutions GmbH was founded in 2017. Today it has access to 95% of European charge points and successfully co-operates with multiple global car manufacturers.

"With their strong insights and great industry network, SE has strongly contributed to the founding of Digital Charging Solutions, helping electric mobility becoming a reality," Digital Charging Solutions Managing Director Markus Bartenschlager said.



Chapter 4

# Challenges for Future Excellence

## Our Management Team's Perspective

Everyone wants to have a clearer understanding of what the future will hold. The information provides a sense of security during extremely volatile times. It takes a special mixture of knowledge and experience combined with a knack for recognising trends to truly excel at providing valuable forward-looking insights. Strategy Engineers (SE) has done just that. The SE team provides predictions for the future of the Chinese market, the automotive sector – including the move towards autonomous driving – and outlines what to expect from next-generation products. In addition,

SE's experts delve into how companies will be able to create market-altering solutions – rather than the evolutionary ones. And the team looks into what the future will hold for society as a whole by asking the provocative question: Are we growing for growth's sake? One thing is certain about the future: flexibility and adaptability will be more essential than ever.







# The Road Ahead for China

Outlook is positive for the world's most important automotive market

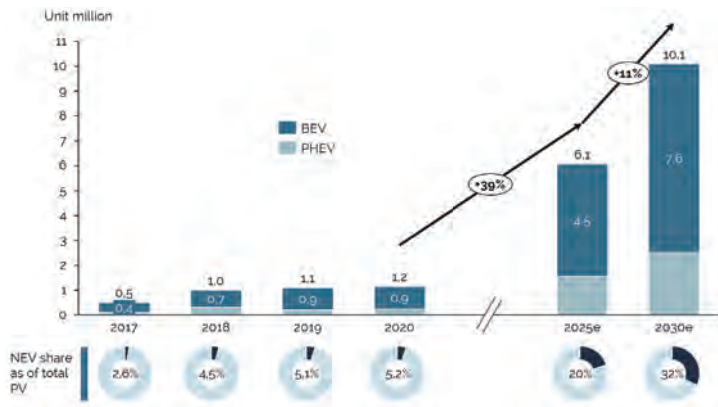


**Andreas Bartels**  
Principal

Specialises in corporate development, restructuring and turnaround, and performance improvement

Since 1985, China has become the world's most important automotive market. Today, 30% of the world's passenger vehicles are produced there, and it is the only major market showing strong growth potential for the next 10 years. It is also a major driver of many automakers' profits and sets the pace globally for electrification.

China's State Council announced last October a new development plan to stimulate the development of the country's new energy vehicle (NEV) sector. NEVs include battery-electric, plug-in hybrid, range extender and hydrogen fuel-cell vehicles. According to the plan, NEVs will account for 20% of total China passenger vehicle sales by 2025. This means a compound annual growth rate (CAGR) of 39% to roughly 6.1 million NEV sales in 2025 compared with the 1.2 million NEVs sold last year.

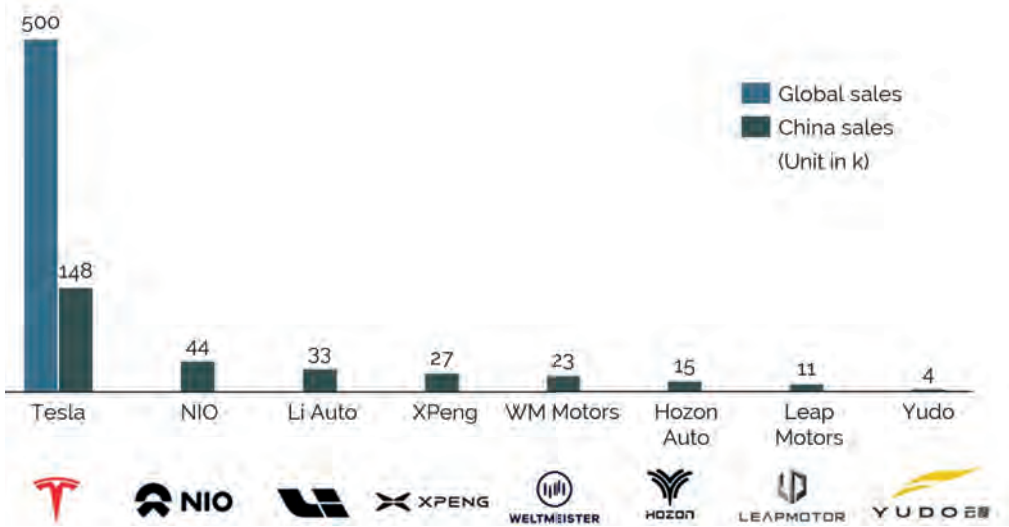


## Clean Opportunities Ahead

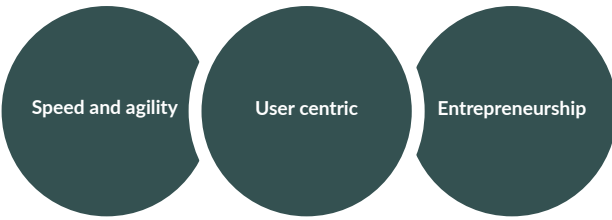
While the 20% share is a challenging target, there are immense opportunities for automakers and suppliers in China, where government policies supporting NEVs exist and will expand, especially in the areas of public transport, taxi services and logistics. Major cities including Beijing, Shanghai, Guangzhou, Shenzhen and provinces such as Shaanxi, Anhui, Yunnan have announced that all new taxi fleets must be comprised of 100% NEVs. Therefore, Strategy Engineers (SE) foresees huge demand for NEVs in public sectors. In the private sector, meanwhile, ride-hailing companies and independent drivers in many Tier 1 cities also favour NEVs because they qualify for "free" green license plates, providing a big financial benefit in a country where registering a car is very expensive.

China also has the world's largest charging infrastructure, with more than 590,000 public stations in 2020. When private stations are included, the size of China's charging network rises to more than 1.46 million. That is just the beginning as infrastructure upgrades and the creation of more charge points across all parts of the country will take place because of further investment that will be subsidised by the Chinese government. It is estimated that China could have 2.42 million charge points by 2025. In Shanghai, where there are 326,000 charge points, city officials plan to add 100,000 to 200,000 more stations over the next three years.

Tesla, which recently started local production in Shanghai, topped China's NEV market with ~148,000 sales in 2020. The Model 3 accounts for more than 11% of total NEV sales. Tesla's China market share is estimated to grow after it starts local production of Model Y in 2021.



New EV startups NIO, Li Auto and XPeng have reported record-breaking full-year China sales, helped by strong demand for the ES6, One and P7, respectively. The three brands have also acquired huge injections of cash from their listings on the New York Stock Exchange and Nasdaq composite. Although unit sales at the startups are not comparable to Tesla yet, they are catching up through ambitious investments in next-generation product plans and advanced driver assistance systems (ADAS). There are some aspects that make the trio different, especially when compared with traditional automakers.





Speed and agility

China’s NEV startups, especially the most successful ones so far – NIO, XPeng and Li Auto – are fast and agile. They are also good at complementing their automotive knowledge and their internet expertise.

They have found a way to balance the classic “front-loading” automotive development principle with the fast-paced iteration of things at the later stages of this process. Here, you could imagine the early planning phase of vehicle product definition, platform strategy, target boundary settings, and even engineering concepts being discussed at the same time that the team decides whether each step can be done in a way that’s more lean, innovative or agile.

The new entrants think boldly. They function without pre-defined compromises in areas such as quality. The same is true when it comes to vehicle software and ADAS development, where new entrants have showcased their creativity and agility.

User centric

NEV startups take a more holistic, user-centric approach when it comes to products and services. NIO customers, for example, have a very different ordering, aftersales and overall experience than they would with a traditional automaker. That is because NIO has no dealers, selling vehicles online only, and puts special emphasis on the virtual experience its cars offer. An example of this is NOMI, which functions as an in-car digital assistant much like Siri does for Apple products. NOMI responds to voice commands and is smart enough to know which window to open or close based on where in the car the request came from. With its round, robot-like design and expressive “face”, NOMI has become one of NIO’s most iconic selling points.

NEV startups have adopted a user-centric approach for product planning, function development, validation and even customer relations management. As a result, specific vehicle functions and top-level user-interaction practices extend to the product level. User experience is continuously monitored and analysed to optimise product design and user acceptance.

Entrepreneurship

A common denominator for NEV startups is their entrepreneurial spirit – both financially and operationally. Almost all NEV startups have equity incentive programmes for either upper- to mid-level managers or the entire staff.

The leadership styles and charisma of Tesla’s Elon Musk and NIO’s William Li evoke deep loyalty from employees, who strongly identify with their bosses' visions. These employees are highly motivated to be innovative and take initiative. Because their companies are relatively small and agile, decisions at these organisations are usually made faster and more efficiently.



How to capitalise

China’s big, ambitious NEV development plan will foster electrification in all areas of the industry. This will benefit both automakers and suppliers, but only if they act fast to keep up with China as the country races towards a future in which mobility is largely – if not completely – electrified. Global automakers such as Volkswagen, General Motors and Toyota have announced they will rapidly increase the number of electrified vehicles they sell in China in the future, but they need to be even more aggressive. Now is the time for automakers to develop concrete action plans and detailed roadmaps for their electrified futures in China that extend to 2025-2030.

China is arguably the world’s most welcoming market for NEVs right now. The government supports them and Chinese customers are open to new products and services. Global automakers and suppliers should focus on establishing competitive advantages in e-powertrains, batteries, software, vehicle integration, manufacturing and customer experience.

# Auto Sector Transformation

Answers to 6 fundamental questions about the industry



**Dr. Oliver Spreitzer**  
Partner

Specialises in innovation and growth strategies, turnaround and M&A

The automotive sector is undergoing significant change, one might call it restructuring. Let's delve into six fundamental questions regarding how the industry might look in the future.

## 1. What are the main drivers of the transformation?

We see three major transformational drivers: electrification, connectivity and mobility as a service (MaaS). The electrification of the powertrain not only introduces a new technology that requires a lot of investment, this transition upends existing value chains including the cooperation model between automakers and suppliers. The need for fast scaling will push suppliers and automakers to form platform partnerships (or even consolidate with new or existing players). Another critical factor is the need for batteries, which will cause this sector to grow by a factor of 20 in the next 10 years.

Vehicle connectivity brings a lot of new use cases and business opportunities (including enabling autonomous driving). At the same time it puts pressure on automotive players to offer sophisticated, secure software inside and outside the vehicle. Automakers are primarily organised to develop hardware products with life cycles of six to 10 years. Now they need to transform into agile software companies that are capable of continuous development.



MaaS is a longer-term driver that will become a market-changing trend beyond 2025. As vehicles become more and more automated we expect private car ownership to drop significantly, declining by as much as two-thirds in major markets starting in 2030. The taxi model of a single-person ride is unsustainable in larger cities because of traffic congestion. Therefore, there will be an increase in ride-hailing and drop-off services such as eight-person full-electric vans that shuttle between fixed points in tandem with other forms of public transport.

Increasing trend of  
mass transport

## 2. How well are automakers and suppliers responding to these challenges?

Some automakers are already finding it difficult to fund the electrification shift and are seeking partnerships (and in some cases consolidation) with other automakers. Suppliers with a heavy reliance on traditional powertrain products are impacted and therefore will try to diversify into new areas and/or divest their powertrain divisions.

Almost all traditional automakers are struggling to transform themselves into software companies, which is why they are pursuing different routes to succeed that include organic acquisition of resources, cooperation with traditional as well as new technology providers and strategic partnerships with leading IT players.

## 3. What might the automotive industry look like in five to 10 years?

The increasing importance of making future vehicles electrified computers on wheels will likely lead to more mergers and acquisitions in the

automotive sector. Chinese players will become more competitive because they have developed a strong basis in electrification technologies as well as local value creation.

The winners could include Tesla, Chinese automakers and electricals/electronic (E/E)-oriented suppliers. Battery cell suppliers will grow substantially. Chinese automakers and suppliers benefit from their focus on speed and time to market, the pace of innovation, their willingness to change platforms, experiment and be flexible. Chinese automakers and suppliers will continuously enhance their presence in the Western world.

In parallel new digital players such as Uber, Didi, Waymo, etc., will grow to substantial size, grabbing a significant share of automotive profit pools whilst traditional players will struggle to keep their financial performances at their pre-COVID-19 levels. Their shares of profits might fall from about 80% today to approximately 50%.

Long-Term

## 4. What is the long-term outlook for private car ownership?

The interest in car ownership and demand for driver licenses has been in decline for a while amongst younger consumers. While a recent wave of shared mobility offerings in major cities has not yet led to a measurable reduction of private car fleets, ongoing investments in these solutions might change this trend beyond 2025. That is when the arrival of autonomous vehicles is expected to cause a substantial shift from private car ownership to professional fleets. This transition will change the way consumers choose their mobility from a mostly emotional decision about a single product based on factors such as status, aesthetics and fun to drive to a rational choice driven by factors such as space, total cost of ownership, robustness and service quality.





## 5. What factors will determine the market success of electrified vehicles?

Emissions regulations are currently driving the market because automakers are forced to reach certain targets to avoid penalties. Government subsidies are also a big driver as incentives in key European markets such as Germany and France boosted EV sales while a move away from subsidies in China had the opposite effect. This so-called “push” scenario will continue in the midterm and will be mostly funded by the automakers.

Starting in 2025, the market could change to a “pull” situation as technologies become more mature and efficient and customers change their buying criteria. Charging infrastructure is clearly a hurdle today but most likely will be solved and people will need to get first-hand experiences to gain trust. There will be several players in the charging infrastructure sector ranging from an automaker’s own network to consortiums that combine multiple automakers, to private and public networks that offer recharging at supermarkets and corporate offices to petroleum giants adding charge points at existing fuel stations.

## 6. How might powertrain technologies evolve?

The automotive industry has chosen hybrid and battery-electric powertrains as their technologies of choice for the forthcoming years. Accordingly, substantial efforts have been and will be taken to achieve industrialisation of cell and battery pack production, resulting in large investments. There are, however, some risks associated with the shift towards hybrid and full-electric vehicles that might require other technologies such as hydrogen-based systems to remain under consideration.

The risks include:

1. Automakers have little to no control over how customers drive their plug-in hybrids and those vehicles will soon be subject to real driving emissions testing. The results of those tests could hurt automakers.
2. The energy mix in many markets is not green enough to make the sustainability case for hybrids and EVs from a well-to-wheel perspective.
3. The production of key components such as large traction batteries is intense from the energy usage and raw material perspectives, which might also harm the sustainability case. Therefore, the continuous search for alternative powertrain concepts is a must for the industry.



# Baby Steps

# Autonomous Driving

## Coming to a car park near you

Autonomous driving (AD) has been one of the hippest topics over the last few years. Expectations grew rapidly after a number of automakers and tech companies predicted that self-driving cars would be on the road by 2020. That didn't happen because the industry soon realised that the cost of making autonomous driving a reality was massive and that the technology wasn't ready.

Many automakers significantly slashed their budgets for full-autonomous driving projects and turned their attention towards advanced driver assistance systems (ADAS) as well as solutions that take over the driving in very specific situations, such as within a car park.

One term being used by Daimler and Robert Bosch for such a system is Automated Valet Parking (AVP), which does exactly as its name states, allowing the driver to exit the car so that the vehicle can park itself.



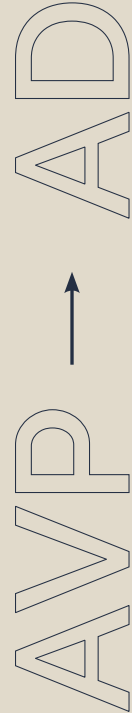
**Christoph Müller**  
Principal

Specialises in strategy development, product development, and R&D efficiency

Daimler and Bosch received approval from the German state of Baden-Württemberg to use their system in the Mercedes-Benz Museum car park in Stuttgart. The partners say their automated valet parking service, which is accessed via a smartphone app and requires no driver, is the first Level 4-capable parking function to be officially approved for everyday use. In the abovementioned case, Level 4 means that the AVP infrastructure together with the car can take over full control of the task of parking. However, this doesn't mean the vehicle is capable of Level 4 under any condition, such as driving in a busy urban area during a snowstorm. Autonomous parking systems will only function in designated AVP-equipped locations, such as the Mercedes-Benz Museum.

It is likely that autonomous parking will be applied at rental car fleet facilities, vehicle production plants as well as other private, controlled spaces where a large number of cars or other vehicles need to be moved around.

How is this supposed to work? First, the vehicle will have to transition from a public road into the private area where Level 4 is allowed by "checking in" to the location. The car connects via the building's wireless communications system with the AVP infrastructure, which regulates the movements of the vehicles, choosing their destinations while also providing surveillance to guarantee safe operation. Another factor that differentiates autonomous parking from full-autonomous driving is that the vehicle does not need specific sensors.



What is the business case for such a solution? There are multiple areas of added value. 1) The end customer will appreciate the convenience of not having to park the car and be willing to invest to have the technology fitted into the car and pay to utilise the service. 2) Car-park operators benefit from being able to utilise more of their floorspace because there will no longer be the need to open any car doors because the driver and passengers will exit before the car parks itself. 3) Another advantage is that a valet service will no longer need drivers to park the vehicles. 4) In addition, fewer drivers will be needed at factories if autonomous vehicles can take over the tasks.

A big advantage of automated parking is that it is expected to launch starting in 2022. Meanwhile, full-autonomous driving in cities and other densely populated urban areas is not expected to debut until around 2030.

The market for automated systems that take over the chore of parking is huge, presenting business opportunities for car, truck and bus manufacturers as well as all kinds of new vehicle types that we expect to see in the future.

SE's vast knowledge and experience within the vehicle and technology sectors puts it in a strong position to support companies looking to tap this high-potential market. SE is already cooperating with tech companies such as AVL as well as Finnish software company UNKIE, which specialises in automated parking.

# The Product of Tomorrow

*"Even in the recent past, the expectations of the product have changed significantly"*



**Arne Petersen**  
Partner

Specialises in engineering processes and efficiency, and product cost optimisation

In the dictionary the definition of "product" is described as "something that is the result of human labour". Although this description has been valid for as long as it has existed, "the product" has changed considerably to this day and will continue to change in the future. In particular, the customer benefit and its perception from the buyer's point of view has shifted in recent years. The increasing demand for individualisation coupled with the desire for short product life cycles and regular product innovations on the model of smartphone production has forced companies in various industries to rethink in recent years and will continue to do so. It will continue to be true in the future: those companies that are prepared to critically question their proven business models and, where necessary, are prepared to break new ground, will be among the winners.

Only with a high degree of standardisation of the product structure and consistent flexibilisation of the production chain the internal complexity can be reduced and at the same time meet the customer's desire for high product variations. Agile product development and a corporate culture that offers room for disruptive innovations play their part in

adapting the entire product development process to these customer requirements. The fusion of hardware and software development is particularly important in this context. What was linked in the past via a few interfaces now requires a complex networking of electronics and software. Only an appropriately efficient development organisation with the right competences is able to cope with this demanding task. The example of the automotive industry shows the degree of complexity to which this development can lead: For example, a modern mid-range vehicle requires 60 or more control units, which must communicate with each other and with the driver in a wide variety of circumstances. The interface to the driver contributes significantly to customer benefit because it offers additional benefits that go far beyond the basic benefit of driving. Numerous digital services, from classic infotainment services to various connectivity offers, complement the range of functions of a vehicle and are becoming increasingly important for customers and their purchasing decisions.

Besides the automotive industry, almost all sectors are affected by the trend topic of digitalisation. It is not only about the digitalisation of analogue products or their addition of digital functions, but also about new forms of digital customer interaction. The actual product core is being pushed more and more into the background and is taken for granted. The differentiation of a product is increasingly based on its additional benefits.



In addition to customer needs that can be satisfied primarily through digital solutions, there are other dimensions that have emerged in recent years. In particular, the sustainability of products has become much more important and already represents an important additional benefit of products in many industries today. The CO<sub>2</sub> emissions of companies or their products are already effectively used as a part of the marketing strategy in many sectors and have a significant influence on the perception of the added value of a product.

**The product of the future must meet many requirements**

Presumably, a "product" will continue to meet the definition printed in the dictionaries. However, the distancing from the classic concept of a product

with a simply definable benefit will continue. Rather, the product of the future is to be understood as a complex solution portfolio that must fulfil extensive customer requirements or tasks. This is done through the individual combination of hardware and software, of analogue and digital products and services. It is no longer just a product that is bought, but a solution.

The trend towards high individualisation and short product life cycles already described will continue. The shift in product benefit also requires critical questioning of one's own core competencies: Which competences need to be newly developed because they are highly relevant for the customer benefit of future products and which competences will become less important in the future. The goal is to build up a decentralised development and production network

that enables the flexible and fast realisation of customer-oriented solutions from the idea to the implementation.



# Crucial Questions

- When will we all have our own personal robot that, because of artificial intelligence, will take over various activities in our everyday lives?
- Will the use of augmented reality have a much greater influence on our private and professional lives in the future?
- Everyone is talking about the digitalisation of industrial production as Industry 4.0, but what will Industry 5.0 and 6.0 look like?



Competition will continue to intensify – in addition to startups, companies that already have successfully revolutionised their business model will gain a foothold in other sectors. Just as the smartphone has long since replaced the mobile navigation device and tech companies are conquering market shares in the automotive industry, new players will also provide surprises in the future.

**The complexity of product costs is increasing - all the more critical for success is consistent planning and control**

With all the increasing demands and product complexity, how can the costs of a product be planned and controlled? The conventional view of a product's costs and their optimisation no longer fully meets future requirements. Since future products are to be understood as a conglomerate of hardware, software and services, this must also

be viewed holistically when considering costs. It must be taken into account that the three elements mentioned are fundamentally different to consider. While the costs for hardware can be broken down into components and/or functions according to proven methodology, this procedure is not fully transferable for software or services. Rather, the focus here is on the consideration of process costs and must be methodically integrated into the overall cost consideration accordingly.

Another new component of product costs is the inclusion of the CO<sub>2</sub> footprint in the overall consideration. In the future, it is to be expected that the cost relevance for the entire supply chain will continue to gain further importance. Thus, not only the optimisation of the CO<sub>2</sub> footprint represents a new challenge, but also the integration of the corresponding costs into the overall consideration.

**The optimisation of product profitability is becoming even more important**

The holistic optimisation of profitable products along the product life cycle is gaining complexity and importance thanks to the numerous new influencing factors described. A high degree of innovation, consistent orientation towards customer benefits, an efficient and preferably standardised product structure as well as speed, flexibility and above all efficiency in implementation – all these are well-known foreign currencies that are more present than ever and are often not only critical to success but also to survival. Experience shows that most companies do not question this, but the consistent and full implementation often represents an insuperable hurdle. However, it is imperative to overcome this hurdle in order to secure or maximise the profitability of products and thus of companies.

# Innovation Driven Transformation

The shift from the product-oriented era to the Internet age and beyond

Germany's world-renown companies were once startups, often founded in garages in places such as Stuttgart. They invented products that changed the world.

As these companies and other organisation of that time grew into multinational corporations their ways of working got more sophisticated and systematic. So, too, did the customer's desire to seek out new products or innovations.

During this era a conceptual framework was introduced to distinguish between innovations that came out of R&D (technology push) and those that were demanded by the masses (market pull).

Some firms installed so-called "houses of ideas" that were fed with suggestions supplied by their employees. Many large organisations created a new central department that was tasked with assessing the ideas and managing them through the corporate chain of command.

In most cases the results of this process were evolutionary new products: incremental improvements achieved without changing the fundamental way of doing business. There were some market-altering products that debuted during this period, often by accident, as was the case with the invention of Post-it notes in a 3M laboratory.

In addition, many firms worked on products that substantially deviated from what existed in their portfolios – such as the Mercedes-Benz Vario Research Car from 1995 or the Daimler-Benz NECAR concept from 1994 – but these ideas were too far ahead of their time.

## Search for new business models: 2000-2020

The internet's move into the mainstream ignited a new round of innovation, leading to a new type of vendor – an online shop. The birth of e-commerce was forecast to signal the demise of bricks-and-mortar retailers. Later, the idea of platform businesses and asset-sharing became popular, supported by ever-cheaper computing hardware that either sat on a desk or fit in the palm of one's hand, providing people with increasingly powerful mobile technology.

Another big change was the emergence of the Blue Ocean Strategy, which promoted the simultaneous pursuit of low cost and differentiation to create new demand by opening up a new market space. U.S. air carrier Southwest Airlines used this approach when it targeted automobile transportation, not other airlines, as its competition.

The last 20 years have also brought us the try often and fail fast technique as well as the greenhouse of ideas approach to determine which offshoots need to be pruned and which ones require further nurturing.

Corporate venturing and the concept of incubators as a breeding ground for innovative ideas were introduced not only in "old-economy" businesses but also high-tech firms such as Intel. Also, data as a new asset class gained prominence, promising better insights into users and their behaviours to help sell more products through better targeted advertising. Whether this is true progress is debatable. Part of the recent shift towards data is the return of artificial intelligence to the forefront after a long hiatus. AI is already being widely used in transaction processing, recommendations, speech recognition and language translation.

If the first two decades of the 21st century taught us anything it is that new business models are here to stay. Booking platforms have made classic businesses such as the travel agency obsolete. The sharing economy is getting pushback but will survive. As for corporate venturing the results are mixed.

## Interesting Nugget

Early forms of what is known today as social media have existed for decades such as the bulletin boards, where users could share information.



## Food for Thought

While we value the convenience of e-commerce, are we taking the full cost of it into account? The shift has created a plethora of low-paying packaging and delivery jobs. Is this the progress we want as a society?



**Joachim Hauser**  
Partner

Specialises in innovation driven transformation, mobility business strategy, and product development



# New horizons

The search for new, better, cheaper products will continue. In the automotive sector this will lead to innovative features and new experiences, especially once the driver is able to hand over the wheel to a computer. With this in mind, there will be further advances in computing power via quantum computing or through better, faster algorithms.

As in the past, major advances will be achieved by combining new technologies or innovations from various fields. The DC-3 is such an example as it revolutionised air travel in the 20th century by fusing an all-metal frame, with more powerful supercharged engines and retractable landing gear. Therefore, we should keep an eye open for combinations of innovations happening in various domains or technologies, such as with bio-hybrid, bio-mimetic technology.

A new dimension is being explored as our terrestrial boundaries expand. Some firms will do business in outer space, ranging from tourism, to mining, to launching inexpensive satellites. But maybe we do not have to look that far as new organisational approaches will continue to be the magic potion that gives rise to innovation and experimentation.

Major global players such as Nucor, Kyocery, Haier or Michelin are using cutting-edge approaches today. These innovative companies are networking hundreds to thousands of teams that either manage

an entire unit front-to-back or function as part of a network in which some nodes take care of client-facing/selling activities while others are suppliers to a node. This helps minimise central overhead and bureaucracy. This organisational setup enables employees not only to “do more” by boosting productivity, but also helps them “be more” by tapping into their abilities rather than locking them into a monotonous, repetitive work environment.

While inventing new products is difficult and a lot of problems need to be solved – the biggest obstacle may not be faulty hardware or a software bug but our own ability to let go of an outdated mindset so that we can imagine a radical new way for thousands of people to work together.



## Masters of Adaption

SE has proved its ability to continually adapt during its first decade, therefore, we are ready to help our clients maximise the potential benefits offered by whatever new business models and game-changing ideas come in the future.

# Society and Progress

Are we growing for growth's sake?

"I want my children to have it better than me!" – my grandparents, my parents and now I too, we know this intergenerational striving for improvement. It has shaped not only society, but also the technological and economic development of the last centuries. The collective consciousness of this begins with mercantilism. Trade was the great hope, and so growth followed the concept of growing at the expense of the very neighbour. In the meantime, this phase rests and has left us enlightened.

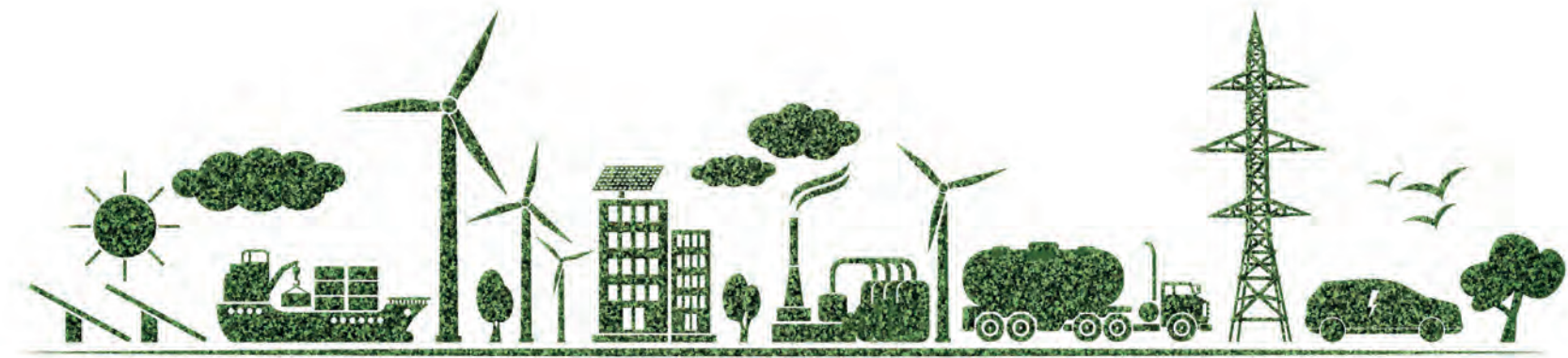
Hans Rosling, the author of the best-selling book “Factfulness: Ten Reasons We’re Wrong About the World – and Why Things Are Better Than You Think”, is a reminder and teacher to me that I – even though enlightened – still live in a bubble. My bubble of perception, which as such is always subjective, a tautology. Interpolation of data is dangerous, whether linear, or as recently “discovered” and fashionable, exponential. With the help of my reminder and teacher and an unbiased view on the facts: “our” children already have it better. That is also part of the truth.



**Dr. Ulrich Guddat**  
Partner

Specialises in  
transformation, leadership,  
and NPI & operations





With this humility before the facts, I now risk a look at the growth of our economy in the light of globalisation, the burden on the environment and the distribution of wealth and ask myself: "At whose expense is our growth in the meantime? Do we by now want growth for growth's sake?"

**How growing at the expense of the neighbour became growing at the expense of all**

The resources on our planet are limited. Our actions cause these resources to be irreversibly lost. Entropy is what physicists call this. Let's take the example of the daily commute to work in private transport. On the one hand, fuel is burned here, or electricity is consumed and converted into - sooner or later - CO<sub>2</sub> and heat. But also the tyres wear out, just like the gearbox and the seats. All this wear and tear leads in the long term to the vehicle being scrapped and a surrogate being bought. But wait! – what about David W. Pierce's circular economy or Herman Daly's steady state economy, is that the answer or a mere utopia? Probably more of a utopia, because no

recycling process can do without additional energy and waste heat, and in very few cases can 100% of a product be recycled into an equivalent product. In times of "Fridays for Future", the environmental consequences of our growth policy are more present than ever.

Since 2000, our CO<sub>2</sub> emissions have increased by 45%, our forest cover has shrunk by 10% and we have experienced 19 of the warmest 20 years since records began (1998 is 10th). On the other hand, particulate matter emissions have declined from 38 kg per Earth citizen in 1970 to 14 kg today and the number of people affected by extreme poverty has more than halved compared to 2002. Ergo: an unromantic rejection of utopia, but a strong plea for the path of resource conservation.

This is the path of resource conservation that humanity must take together on our one and only planet. But is it even possible for 197 states and 7.6 billion individuals to pull together? Obviously, it is, because a central steering of this effort is

now discernible: The 1.5 °C target from the Paris Agreement or CO<sub>2</sub> pricing. In the meantime, only six countries have not ratified the climate agreement. And it can also be seen in global politics that we have understood that this challenge can only be mastered together. However, so far these attempts are sometimes still being pursued half-heartedly and backsliding is to be lamented. What is the reason for this?

**We do not yet sufficiently take into account the true price of our growth**

We are not good enough at dealing with the facts in a balanced way (otherwise my reminder and teacher would not be a best-selling author). Essential factors on growth and resources are not measurable, but are just included in artificial conversions (emission rights, CO<sub>2</sub>...). This is the right approach, but in the balance sheets, P&L and cash flow statements of our companies, this pricing of environmental impacts has so far played only a minor role. Business is mis-sighted on its resource eye.

I think it would be desirable to put a realistic price tag on as many resources of growth as possible in our capitalist system, thus relying on (closed-loop) control rather than regulation.

In this way, the pursuit of growth would become the pursuit of progress and would be much more in line with the aspirations of society for the companies. Because actually we don't want growth at all, but progress. Growth is a macroeconomic quantity and describes the permanent increase in real gross domestic product (GDP) minus inflation. Progress describes the improvement of the current state, mostly through innovations. Even the inventor of GDP, Simon Kuznets, warned the US Congress in 1934 not to understand GDP as a measure of the common good, yet GDP is the maxim of global economic policy.

**We actually want progress and not growth**

What if the following is true: We individuals in our society strive to improve our lives. Economic growth has a historical correlation with living standards, but not causality. What is causal is progress. The invention of the car, for example, increased the mobility of people and goods and thus contributed significantly to economic growth in the 20th century. The upcoming electrification of the car, on the other hand, is a technological advance. This progress will achieve the benefits of a car soon with a lower environmental impact, i.e., at a lower comprehensive cost.

Growth vs. Progress

Technological progress enables an equal or higher quality of life at decreasing comprehensive costs. Costs can be direct production costs, environmental impact, labour input, but also human rights violations, etc. Increasingly, environmental impact is finally coming into focus here.

The means of choice for progress is innovation, i.e., the commercialisation of new ideas and the displacement of more inefficient ideas, also in the form of optimisation, i.e., minimising the use of resources for existing products and processes. For Jim Hageman Snabe, long-time CEO of SAP and current Supervisory Board Member of global companies, "innovation = great idea x scale in market". The second factor of this multiplication is very close to my heart.

**Strategy Engineers (SE) wants to be the scaling expert and thus contribute to progress**

Innovation is the way out. Those who focus too much on optimising existing processes run the risk of losing profound transformation capabilities. The automotive industry is an example of this, because for decades it was able to reduce costs while increasing production numbers, always in the same business model. Porsche, for

example, has improved productivity by over 6% annually since the early 1990s, and is now moving with even more vigour and courage towards electromobility and its new business models. But at large the established automotive industry is struggling. The disruption by Tesla, Uber and Co. is a catalytical challenge for the establishment.

The famous S-curve can only be mastered with great transformation capability, the straight line into the future has always been a myth.

We at SE organise the implementation of innovations so that our clients become more successful in their existing and new markets through us. Sustainability has become the key objective as our clients progress. Side by side, we put ourselves with them into service for a bright future. Together we operate as an integral part of society. And in this way, too, our children will be even better off one day, because this is our contribution to an economy that does not grow at the expense of society.





**Christian Koehler**  
Partner

Specialises in technology innovation strategies, organisational development, and transformation

# Mission Possible

The road to carbon neutrality and beyond

Limiting global warming requires rapid action, breakthrough transformation and widescale behavioural change to put the world on track to zero emissions by 2050. Strategy Engineers (SE) supports the much-needed change in hearts and minds to achieve this goal because global warming is real.

Just look at Germany, where declining groundwater levels endanger the water supply in many rivers. While global surface temperatures have risen 1.2 degrees Celsius in recent years, temperatures in Germany have risen by 2 degrees Celsius, according to a recent study.

## Our addiction with fossil fuels must end

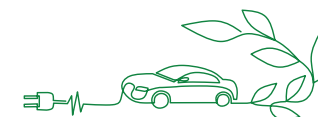
There is little doubt among scientists that burning fossil fuels is the main reason for these climate changes. We are living on credit. The global energy sector emits three-quarters of all greenhouse gas (GHG) emissions today. Road transport accounts for about 12% of those. Our addiction with burning fossil fuels must end.

As part of the Paris Agreement, most of the world committed to slash overall GHG emissions to net zero by 2050. The aim is to limit the global temperature increase in this century to 2 degrees Celsius above pre-industrial levels. This will require a complete overhaul of the way we produce and consume energy, and what fuels we use.

The Paris Agreement requires participants to translate their commitments into binding laws and regulations. More than 60% of global emissions are covered by net-zero goals, but countries must translate national commitments into credible policies. As it stands, the commitments in place would still lead to a 2.1-degree Celsius rise in global temperature by 2050.



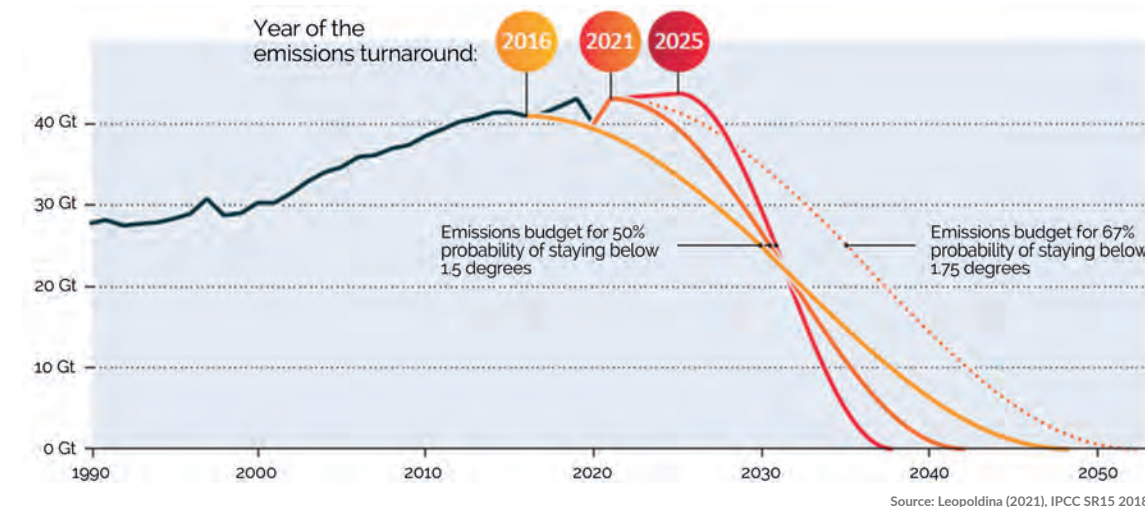
Europe has committed to a so-called Green Deal, which Ursula von der Leyen describes as “Europe’s man on the moon moment”. The EU aims to be climate neutral by 2050. While its current regulations are not sufficient to achieve net zero by 2050, Europe is at least working on a so-called “Fit for 55 programme” towards achieving 55% lower GHG emissions by 2030. The longer we wait to cut emissions, however, the steeper the decline must be. We need transformational breakthroughs, and we need them now.



## ZERO EMISSIONS DAY

### Race to zero: 2021 could be game changer

The emission reductions so far have been easy wins. Switching to renewable power supply and improving process efficiencies are a good start – now comes the hard work. Massive changes are required to achieve structural emission cuts. Companies are taking action. The Volkswagen Group, for example, has committed to become CO<sub>2</sub>-neutral by 2050 with its “Way-to-Zero” initiative. Volvo Cars has made sustainability as important as vehicle safety, pledging to become climate neutral by 2040, reducing CO<sub>2</sub> emissions per car by 40% between now and 2025. These commitments are an important first step, but they are not enough. On the way to COP26 in November 2021 in Glasgow the UN-backed “Race to Zero” calls for breakthrough action from 20% of key



actors in at least 10 industry sectors. For passenger vehicles and vans, the aim is to have 20% of major automakers by revenue commit to 100% zero-emissions vehicles (ZEVs) by 2035 in China, the EU, Japan and the U.S. with 15% ZEV sales as a 2025 target.

The Race to Zero requires sweeping change, but recent history shows us this can be done. Mobile phones, colour TVs and digital photos each reached a global market share of more than 80% within 10 to 15 years. Still, to quote Bill Gates, the move to net zero transition will be “the most amazing thing humanity has ever done.”

What if 2021 becomes the year in which the world decides to target a global temperature increase

below 2 degrees Celsius, or even below 1.5 degrees Celsius? Transformational breakthroughs planned for 2050 are only possible if leaders work together now. The reason is that this kind of change comes with high initial costs and high levels of uncertainty.

After the change moves through the early stages of disruption things accelerate. Little tipping points compound and we enter the steep angle of a rapid S-curve. At the 2021 AVL Vehicle & Environment Forum, VW’s Tobias Lösche-ter Horst compared this type of change to making popcorn because things start off slow and then happen rapidly. It reminded me of the famous Rüdiger Dornbusch quip: “In economics, things take longer to happen than you think they will, and then they happen faster than you thought they could.”

To mitigate the initial risks and costs, companies should form alliances. A good example of this is the fuel cell focused joint venture company Cellcentric that Daimler Truck and Volvo Group have formed. Truck Joint Venture Cellcentric for fuel cell product technology is a great example. Volvo's CTO Lars Stenquist explains it this way: "Cellcentric will provide fuel systems to Volvo and to Daimler. On a vehicle level, when we are installing and optimising the vehicles with these fuel cell systems, then we will remain competitors." The JV hence will merge the companies' capabilities in areas where it is critical for disruptive change and helps them scale the technology in a way they couldn't do on their own. "I think that it is very important that you find new ways of working where you for one piece of the puzzle you can be partners but for the majority of the pieces of the puzzle, there you stay competitors," Stenqvist said.

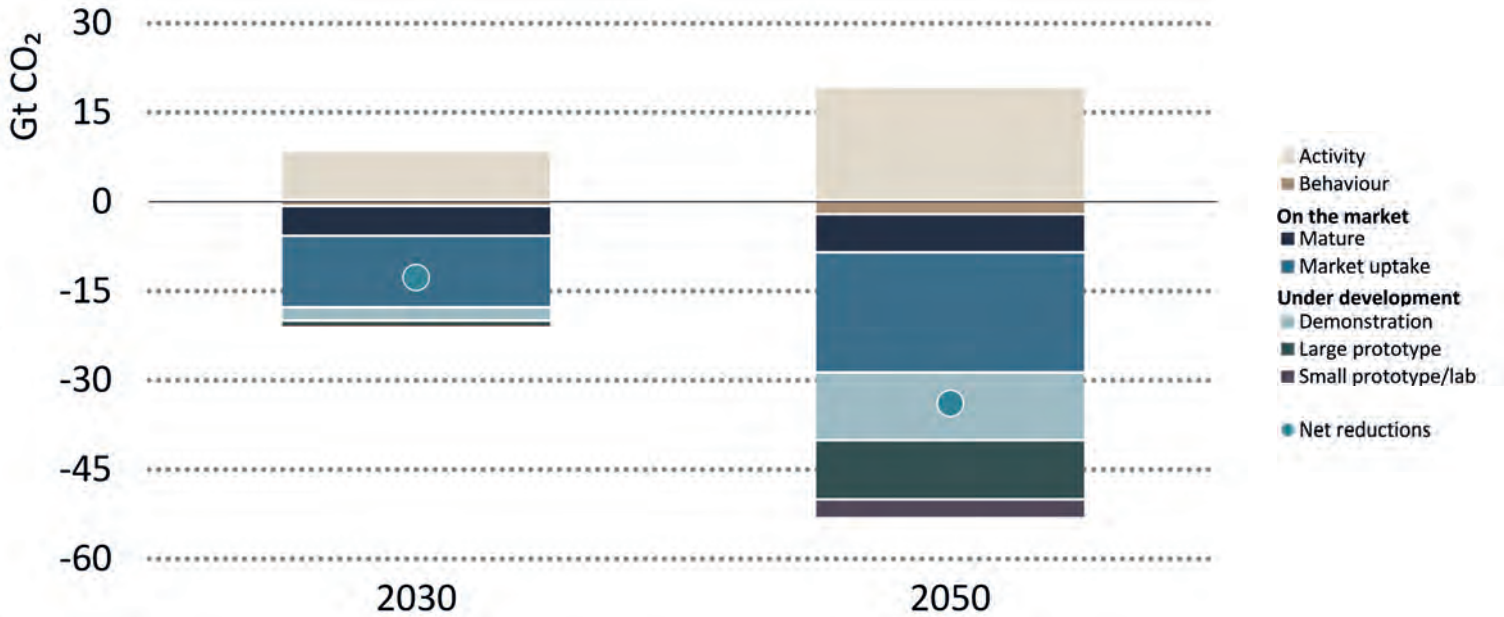
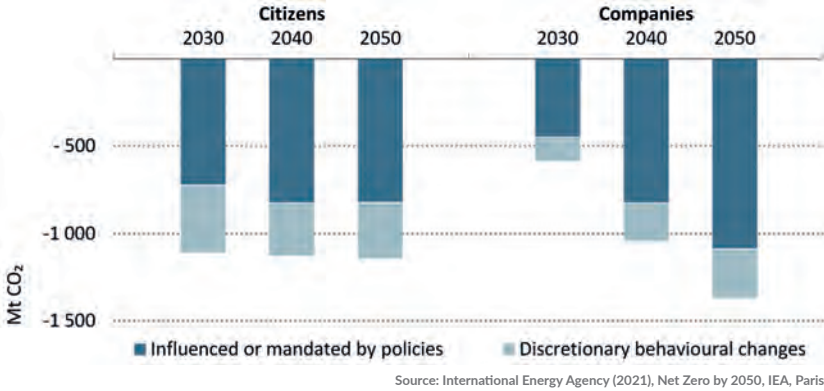
Collaboration should go well beyond sector peers and include investors, policymakers and more. Automakers, for example, need to closely work with their component suppliers if they want to decarbonise upstream value chains and their production technology partners to retool their plants.

The concern is that the International Energy Agency (IEA) believes existing, mature technologies will help us achieve the target for 2030 but not much beyond. New technologies are needed to put the world on track to reach the 2050 goal.

Technology and innovation are important but not sufficient

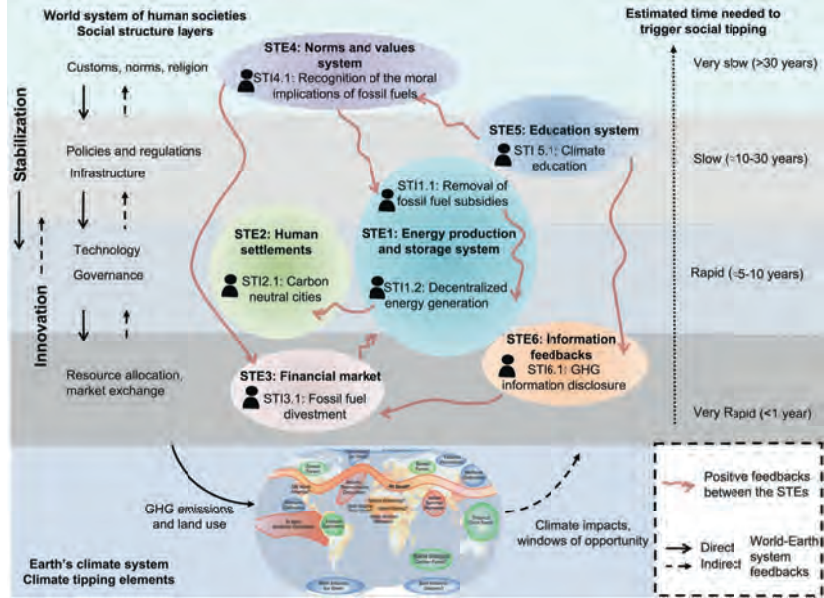
Companies and people need to modify their behaviour if net zero is to become reality. Three-quarters of behavioural changes could be influenced or mandated by policies, according to the IEA. This includes phasing out polluting cars or setting CO<sub>2</sub> prices. Technology is important, but the role of people and companies cannot be understated.

Best-selling author Malcolm Gladwell introduced us to the importance of tipping points in 2000. These little changes can make a big difference. In a fascinating study, Ilona M. Otto and her team apply this concept to environmental change and identify social tipping interventions (STIs) and events (STEs) in six key areas. This includes the removal of fossil fuel subsidies and decentralised energy generation in energy production and storage. It will be tipping points such as these that determine the next big breakthrough.



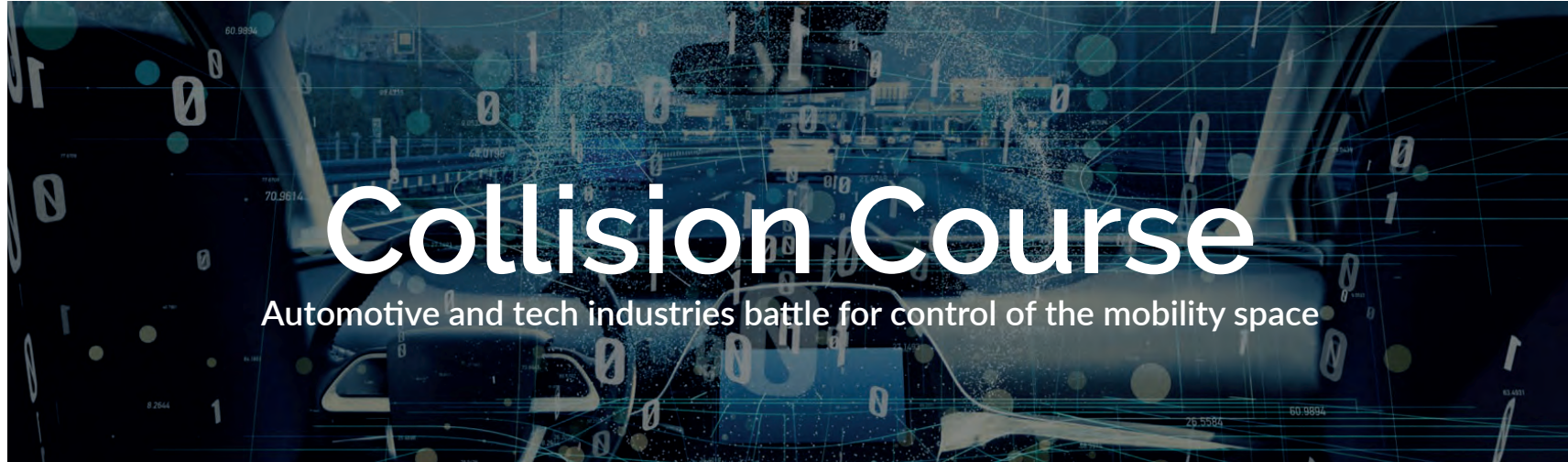
Changing hearts and minds is possible

There are many reasons to be optimistic about the future. In our work at SE over the last 10 years, we have seen people and companies change and transform over and over again. We have seen organisations grow from zero to 2000 staff in 3 years, becoming more efficient by over 25% in 2 years or turning themselves into agile sprint teams in 1 year. There is no reason to assume that the race to zero cannot be accomplished. SE stands ready to help companies make this a "mission possible".



Source: Ilona M. Otto et al. (2020) PNAS, 117 (5) 2354-23





A significant disruption is underway. As mobility becomes more digital, automakers are on a collision course with tech giants and a vast number of startups. These companies are eager to enter the mobility domain with digital products and services, because the movement of people and products is one of the largest and fastest growing sectors in the world.

Companies must innovate aggressively to stay relevant. It is crucial that established and new players have a tight grasp on the latest technology and understand how their offerings compare with their rivals'. Most companies are already actively working on rising technology such as VR/AR, machine learning, AI, cloud computing, blockchain, etc. to identify new possibilities for value creation.

Especially relevant topics and trends in the mobility space are the move towards electrified models, charging infrastructure, advanced driver assistance systems (ADAS), autonomy, vehicle-to-everything (V2X) connectivity, vehicle-sharing schemes as well as fleet management, brand apps, FinTech and InsurTech.

Another huge task is staying on top of massive data management and security needs. Additionally, system integration in the vehicle and production in a smart factory are ongoing challenges. Companies must unlock their full potential and innovate ahead of competitors and customers.



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**Customer-centric innovation elevates the digital mobile life**

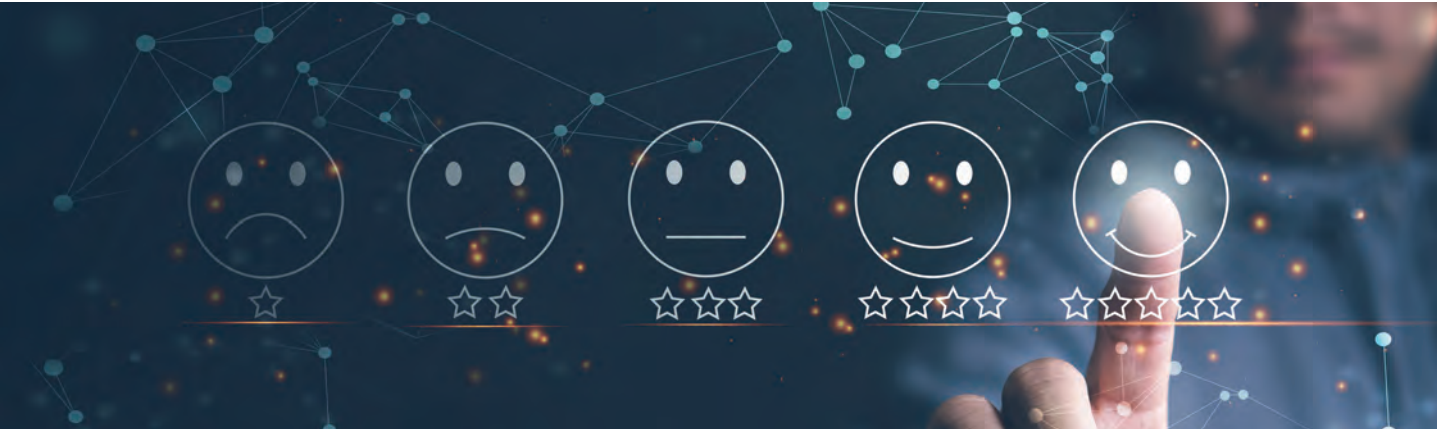
Face-lifts every three years are today's automotive (hardware) reality, but customers' expectations are determined by tech providers, which offer improvements such as new phone hardware every six months and over-the-air software updates continually. Vehicle owners and users now have much higher user experience (UX) demands along the digital customer journey related to vehicle access, settings, maps, voice assistant, phone, messaging, news, cloud technologies as well as e-commerce. Interactions in and around the vehicle must be content-rich and seamless, like they are with a mobile phone, gaming console, smart TV, or streaming service. Transactions must be affordable and easy to access like they are with popular pay-per-use models.

As a result, attractive mobility platforms that provide and coordinate the multitude of solutions will be imperative. It is all about customer first, not technology first, to elevate the digital mobile life.

**Owning the customer interface is crucial**

Digital has always been about reconfiguring the value chain. Hotel booking services do not own the real estate. Mobility providers do not own the cabs. Capex is low, and change is fast. Owning access to the customer is what everyone wants. The established auto industry knows how to scale, but it urgently needs to better master customer interactions.

Extremely customer-oriented and software-centric solutions are the future of the mobility industry. They will create gigantic monetisation potential given the amount of data created by the more than 1.4 billion vehicles in operation globally. The life-cycle value from connected vehicles can only be guesstimated due to the size of the opportunity and business ideas popping up constantly. These endless possibilities are one reason why some automotive players are valued as if they were tech/data companies in terms of market capitalisation, which is an indicator for prospective profits.



### Automotive companies are playing catch up

To seize the opportunity, automotive companies have created digital competence centres and digital product organisations. They have also initiated change out of existing IT groups, enhanced the CIO's sphere of influence, and tried spin-outs as well as spin-ins.

What automotive companies have realised, however, is that technology changes rapidly, yet organisations adapt slowly. There is an indisputable need for faster time-to-market, which can be achieved with e.g. Design Thinking/Sprints, Innovation Cells, and agile frameworks.

There are also many ways to create value through partnerships instead of trying to do it all alone. This explains the success of incubators, accelerators and open innovation platforms. In such an environment, both worlds learn from each other. Tech companies bring a new level of ingenuity and agility while automotive players bring system integration and production capabilities. Likewise, established companies learn from startups and vice versa.

Concerning innovativeness, automotive companies are playing catch up with tech giants that can create radical new technologies at the speed of a startup. Silicon Valley is well-known for its self-propelling startup environment. The speed of cutting-edge innovation grounded on the fail-fast philosophy is contagious and has led automakers and suppliers to establish research centres in this region. Many of them have been in Silicon Valley for decades.

However, increasing digital innovativeness outside of innovation hubs is easier said than done, especially when this mindset is not adopted at global headquarters.

Many companies are still struggling with disruptive innovation and collaboration in innovation networks. For companies that do grasp the potential, there are endless opportunities.

### There is a need for speed

Fruitful innovation is about the well-timed implementation of ideas that result in the introduction of new processes, products, or services in real life. Smart enterprises have stepped up from random experiments in labs to substantial customer-orientation, deliberate strategic planning, and serious execution of new business.

The development of software-centric solutions from idea to integration can be achieved in weeks, compared to traditional vehicle development cycles in years. Continuous delivery is the name of the game. The more software-centric the product is, the more this is possible.

## Food for Thought



- Future-oriented companies re-imagine their place in the mobility space rather than trying to simply adjust something they already do
- Agile companies rethink how to deliver value and constantly evaluate what their portfolio needs to look like
- Determined players initiate perpetual transformation. They scale up innovation, experiment with business models, develop new solutions, implement dynamic operations, and extend their reach

An urgent hardware challenge is the creation of the next generation electrical/electronic (E/E) system architecture, which must be vehicle-centralised to reduce issues due to complexity. It will enable functionalities that have not even been envisioned yet. Also crucial will be having a highly capable and reliable vehicle operating system that runs on the E/E architecture and allows access to a full ecosystem of applications. To feed these systems, vehicles require advanced sensors that collect data, as well as computing power and interconnectivity to process data.

To be at the forefront of these trends, automotive companies need to enhance skills in the areas of embedded systems, big data, simulation, digital twins, and integrated development environments. The focus on software excellence is obligatory.

### People development is the key to success

Successful companies aim to continuously outperform their own standards. This requires the ability to constantly learn, respond quickly to changes and leverage human creativity, ideally in self-organised teams. Teams with digital aptitude and collaborative attitude matter more than ever. They need to energize, empower, and listen to every individual to harness great ideas.

Automotive companies are in direct competition with tech firms for talent that is comfortable and highly capable with software and data skills, for instance data analytics and decision science. Well-skilled, engaged employees are essential, and deliberate people development is the key to success.

But not only do individuals need to develop and learn, the entire company must become a learning organisation. It must unleash the power of cross-functional collaboration and continuously build new capabilities across the entire enterprise.

With this growing knowledge, leaders must think big, set goals, take on complex challenges, and act now. As the saying goes, "You miss 100% of the shots you don't take." It is OK to fail. It is not OK not to learn. This mindset is a fundamental part of how smart enterprises accelerate innovation-based transformation.





Chapter 5

# Moving Forward

Prepared to tackle  
whatever challenges  
come next

As we look back on 10 years, we are fortunate to have had many things develop the way we hoped. However, they did so at a speed few could have anticipated.

When we founded Strategy Engineers (SE), we were convinced the impact of technology on the business world would cause enormous disruption. We knew there would be an ever-growing market for consultancy services precisely at this challenging crossroads. We embraced this opportunity by combining a deep understanding of automotive technology and business processes.

During our first year in business electric cars were considered exotic, the Volkswagen Group diesel scandal was a long way off, and a Tesla share could be purchased for less than \$5. The importance of software and digitalisation was already present outside the automotive industry. Companies such as Google and Apple had shown strong growth for several years.

From the beginning, renewable energies played a prominent role at SE. Despite our focus on the automotive industry, we have been working with wind energy clients since Day One. Alternative energies remain a core theme of our work today.

Our early consulting focus was primarily on efficiency and effectiveness improvements, initial projects to redesign the strategic orientation of business units and an increasingly strong cooperation with China. This remains a cornerstone of our business but due to the fact that the pace of change has increased remarkably, our focus today lies on managing the transformation in the automotive industry.

With the diesel scandal as a trigger, the automotive industry massively accelerated its transition towards new powertrain solutions. Today, car companies appear to be trying to outdo each other with announcements about how quickly they will phase out the combustion engine and become all-electric brands that will also offer increasingly sophisticated vehicle functions as well as an array of new mobility concepts.





# We hope you enjoyed it!

This shift towards electromobility has caused countless new automakers to enter the market largely because developing an EV is less complex than a combustion-driven model. These new-generation vehicles will no longer be defined by their drivetrain. Instead, they will differentiate themselves mostly based on the software functionality and the overall mobility experience they provide. New business models are emerging that focus on alternative concepts for mobility and meeting customer needs instead of focusing on traditional vehicle-use demands.

We are currently witnessing our society's technology-driven transformation, which is particularly reflected in the mobility industry. Innovation and speed of implementation have become crucial factors for success. They will determine which companies succeed and which ones fail. SE's mission is to not only anticipate and understand this change, but to proactively help shape the future.

We are therefore very optimistically looking into the future and the years ahead.

We hope you enjoyed reading this booklet. We tried to highlight the connection from SE's beginnings to the current topics that move us and our customers. It was important to us to not only review the past but to also offer a look ahead at the challenges facing us and our clients. It would make us very happy if you found this booklet helpful and insightful. And, of course, we look forward to staying in touch with all of you in the future.

## Publisher

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Release date: September 2021



