



GOING ABOVE AND BEYOND

Leading the way to sustainable mobility

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ADVANCING THE SUSTAINABILITY AGENDA

Over the past few decades, we have seen sustainability become an increasingly uncomfortable topic for the automotive industry to address.

Rightly or wrongly, the emissions emerging from millions of tailpipes on busy roads represent for many the most visual representation of humanity's carbon dilemma. The result has been a unique sustainability burden carried by the sector, amid wider calls for drastic cuts to global CO₂ emissions (transport in general accounts for 21% of global CO₂ emissions – or 8 billion tons – with vehicles responsible for 74.5% of this overall total¹).

That said, we have also witnessed car makers respond, and demonstrate remarkable progress in comparison to historical precedent. For example, since 1999, the energy used to produce vehicles is down by 19%, water use has fallen by 35%, and 91% less waste enters landfill sites. Equally impressive – new car tailpipe emissions have been reduced by 31% over the past 15 years².

Dramatic progress indeed, which means many original equipment manufacturers (OEMs) may be forgiven for acting frustrated at the news that these collective advances are not proving enough. In fact, they are nowhere near enough to meet society's ever-evolving expectations surrounding sustainable manufacturing and carbon footprints.

In effect, the concept of sustainability has widened to the point that an automotive OEM's entire end-to-end operation – from material sourcing to end-of-life recycling – is now encompassed. An expansion in emphasis caused by a host of transformational forces:



ESG (Environmental, Social, and Governance) ratings – now used by many investors as a key barometer of ethical performance



Supply chain sustainability – focused on sourcing parts that increasingly offer a high sustainability rating – in the most environmentally friendly way possible



Customer expectations – which increasingly favor those products and services able to demonstrate high green credentials



Societal responsibility – with the emphasis on being a responsible enterprise, and championing diversity, equity, and inclusion (internally and across the supplier base)



The circular economy – taking a longer-term view of a vehicle's lifetime environmental impact in terms of material re-use or recycling



The changing role of mobility – which extends from differing types of mobility (car sharing, ride hailing, etc.) to autonomous vehicles

¹ Source: [IEA: Transport Sector CO₂ Emissions by Mode 2000-2030](#)

² Source: [The Society of Motor Manufacturers and Traders](#)



It is little wonder then that the topic of sustainability can be viewed as a burden for OEMs

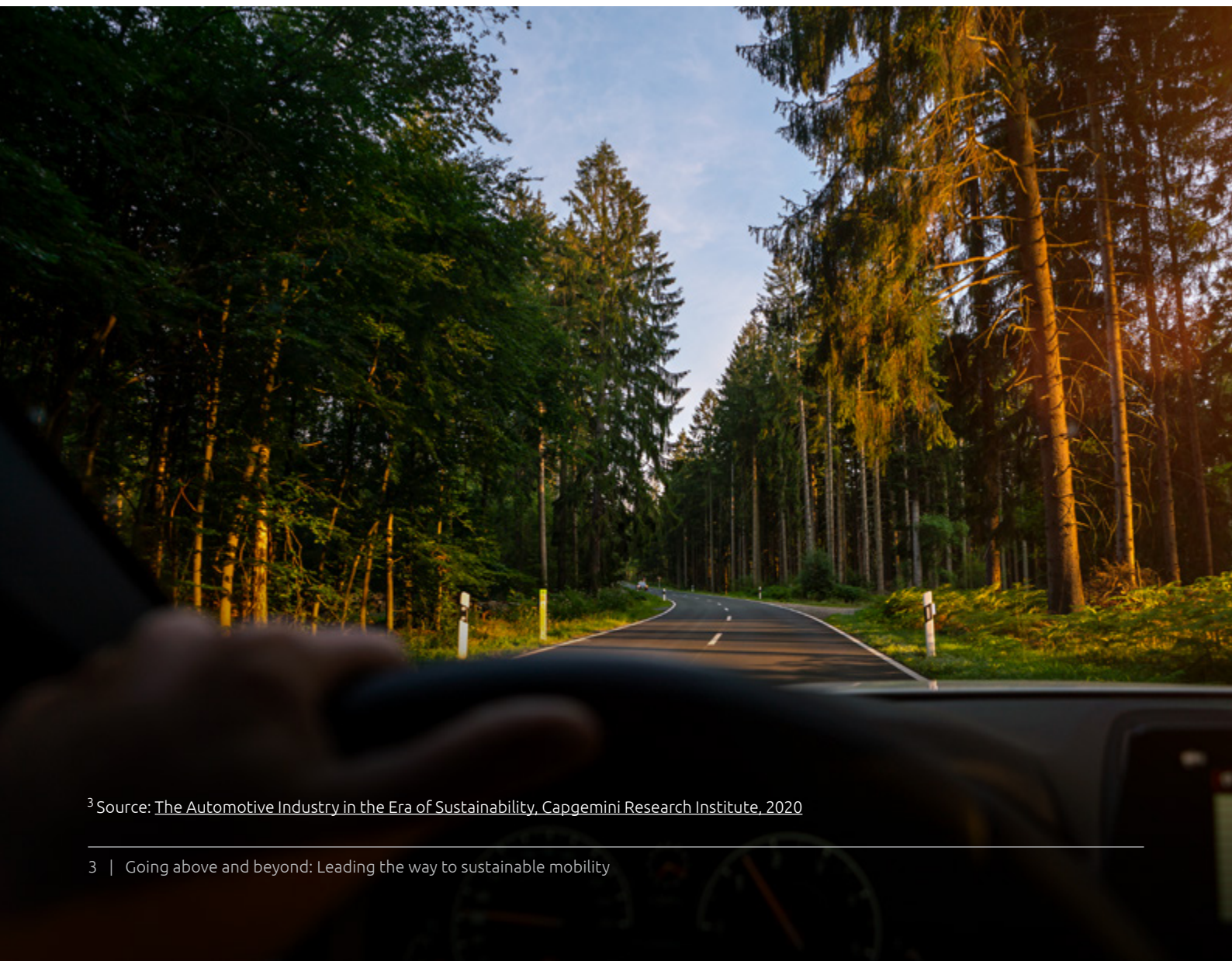
Introducing more sustainable operations is a sizeable and ever-shifting business challenge that is guaranteed to cause ongoing business disruption, and require successive rounds of investment to address (\$50 billion alone over the next five years according to our research³).

That said, what is being recognized in an increasing number of boardrooms is that sustainability also represents a significant opportunity. With it comes the ability to transform an organization, its processes, products, and services. To be future ready and able to meet future customer demands. In this light, sustainability is rapidly becoming an operating principle, a commitment, a philosophy even – that will (or at least should) influence every facet of what they do, how they do it, and why.

In truth, it is all these things and a whole lot more besides. Understandably, the topic of sustainability brings with it

various regulatory targets, but to focus purely on meeting these is to miss the point: dialing up your green credentials is just as much about leadership and tapping into forces already flowing inside and outside of any production facility. It is about thinking beyond extrinsic factors and external pressures forcing OEMs to act. It is about concentrating instead on the intrinsic, internal opportunities that now abound to drive meaningful transformation. And it is about connecting all of these influences together to inspire cultural change, and a spirit of collaborative, continuous innovation able to drive the entire industry forward.

As with any opportunity, there will be those that are quick to embrace it, those that will follow in their footsteps, and those that will adopt a more conservative wait-and-see strategy. In reality, however, the choice faced by automotive OEMs is stark: integrate sustainable design thinking into every facet of your organization or do not and run the risk of increasing irrelevance.



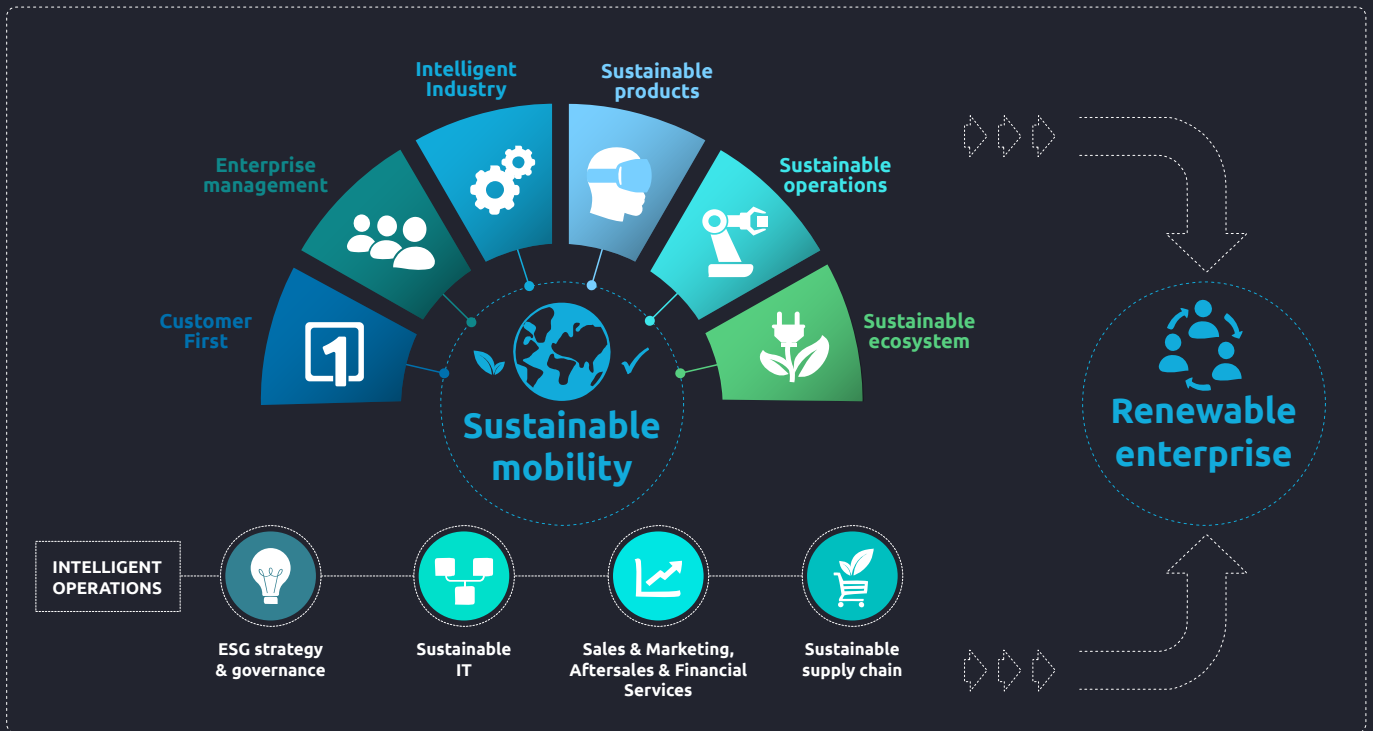
³ Source: [The Automotive Industry in the Era of Sustainability](#), Capgemini Research Institute, 2020



Very little middle ground exists for OEMs to hedge their bets

Delivering carbon neutral production and an ethical and sustainable supply chain strategy – alongside the ideas and innovation needed to deliver on the promise of sustainable mobility – is not an endeavor to be approached with only partial commitment.

Long-term benefits will only come if an OEM’s dedication is total, stretching across all aspects of production, sourcing, procurement, IT, aftersales, and the needs of the circular economy.



Delivering continued advances in each of these areas is of course a task that demands both time and investment. More importantly, however, progress will be closely tied to an organization’s ability to imagine new approaches, energize its workforce to embrace new opportunities, and to define sustainable processes that are sympathetic to a product’s

end-to-end lifecycle. Doing this demands a significant shift in mindset, as it requires OEMs to go beyond just thinking about cars and targets to actively stimulating a culture of constant enhancement – and extending this effort to include partners, experts, and even competitors in a broad union of collective endeavor.

This is a bold vision for the sector

It also speaks of a wider transformation that will force automotive OEMs into unfamiliar territory, as new competencies, capabilities, and partnerships are sought and acquired.

Change that will inevitably cause friction and disruption along the way. Equally, it is also a vision that fundamentally changes the concept of leadership in the field of sustainability. Rather than attempting to appease regulators, true pioneers will be

(and already are) using this transformation opportunity to help move the narrative beyond a fixation on the bottom line – and to recognize the full potential of the so-called green line. It is these individuals and businesses that can see the pivotal legacy such a development will create, as well as the importance of building momentum and stimulating a wider sense of common purpose across the industry.



ADAPTING TO THE SUSTAINABILITY CHALLENGE

Exploring the capabilities needed to succeed

The manufacture of vehicles is understandably an energy-intensive undertaking.

Huge quantities of energy, water, and resources are required, which in turn contribute to a sizeable carbon footprint. In the UK alone, automotive OEMs and component suppliers are estimated to use each year 5.2 billion liters of water and create 1 million tons of CO₂⁴.

What is more, CO₂ hotspots exist throughout the industry's end-to-end value chain:



Fuel supply and tailpipe (73% of total lifecycle emissions)



Logistics (5%)



Material production (20%)



End-of-life materials recovery (5%)



Production and assembly (6%)

That is not to suggest the industry is unaware of its environmental responsibilities – far from it – as great efforts are made to meet (and preferably exceed) carbon footprint reduction targets set by regulators. Actions that are made easier by the growth in consumer demand for electric vehicles (EVs), which had already reached 5 million unit sales in 2018 – and is anticipated to reach 23 million units by 2030, with an overall 130 million EVs on the road by that date⁵.

⁴ Source: [The Automotive Industry in the Era of Sustainability, Capgemini Research Institute, 2020](#)

⁵ Source: [The Automotive Industry in the Era of Sustainability, Capgemini Research Institute, 2020](#)



Long-term change, however, will only come through fresh innovation

Progress is evidently being made. But building on these advances, and aligning business outputs to the broader demands of sustainable mobility, requires more than adapting physical processes alone.

Change needs to be implemented at a far deeper, cultural level to move operations from the static, isolated, hardware-first mindset of old to a more open, dynamic, software-driven future based on ever-growing levels of industry collaboration and knowledge sharing.

By applying new innovations and business models to the challenge, new leaders will quickly elevate their brands in the market. For example, Volvo Car Mobility is a vehicle-sharing initiative based around a more fluid concept of ownership where users can access cars via a subscription service and pay only for the time used and kilometers driven. First imagined as a way to cut the numbers of cars on the streets of Stockholm (it is currently estimated to reduce this number by over 4,500 every year), the model has also proven to reduce CO₂ emissions by 8,200 tons each year – and has freed up over 56,000 square meters of land due to the need for fewer car parking spaces.

Underpinning this type of progress, as well as the advances being made against wider sustainability goals, is a body of data that collectively forms a rapidly expanding automotive information infrastructure. Innovation is of course to a large

extent dependent on data. A lot of data that is collected, ordered, analyzed, and exploited in real time to provide the insight and guidance organizations need to drive change in the right areas at the right time:



Data that offers a transparent, real-time view into every supply chain process



Data that offers a three-dimensional view of evolving customer needs

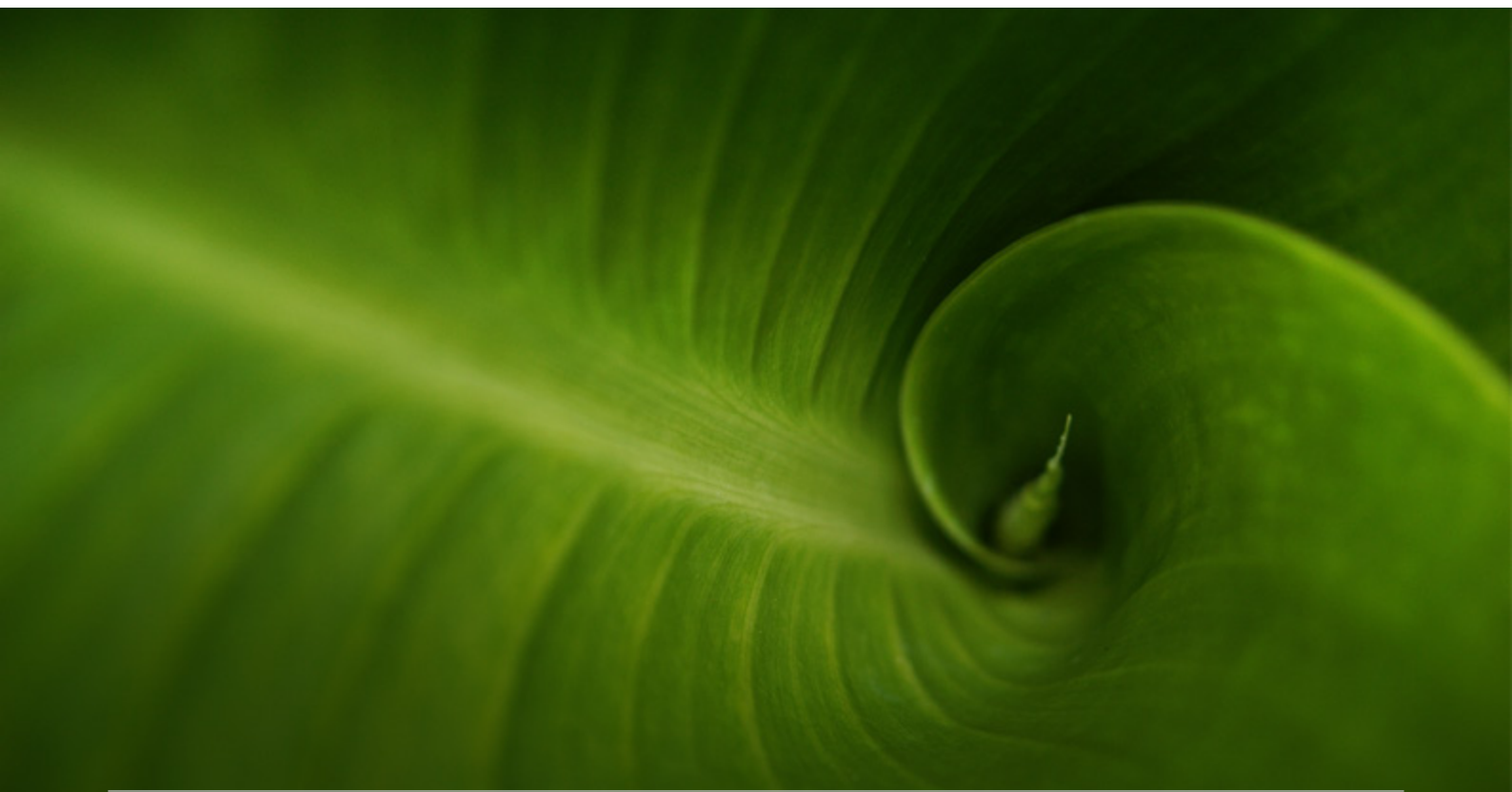


Data that enables the accurate tracking, measuring, and reduction of emissions across the product lifecycle



Data that brings to life the level of energy usage associated with the operation of specific assets and equipment

Plus, there is the data available that points to wider challenges in areas such as charging infrastructures for EVs, the increased complexity of products, raw material availability for batteries, and growing skills gaps, etc.





Data that will not fulfill its potential while sitting inside traditional siloes

Most car makers can access a broad amount of sustainability data, considering their investments in Enterprise Resource Planning and reporting tools.

Many are now demanding more accurate and timely data across their extended value chains to fuel various green metrics, while also being able to call on powerful Artificial Intelligence, Machine Learning, and analysis technologies to help analyze and interpret it.

There is nothing necessarily new here, but what is different is the importance of using this data to build out the big picture; to gain visibility into the environmental impact of not just their operation, but also of the industry in general. No OEM, supplier, or service provider alone can be expected to capture all the necessary information needed to drive the industry toward more sustainable operations. Especially when many continue to be organized –however inadvertently – around data siloes for different processes and locations.

Yet the reality is that one OEM acting independently is not enough to deliver measurable environmental benefits on a global scale. All car makers need to work in a coordinated fashion, putting aside their inclination to see peer brands as purely competitors, and to promote the mutual benefits of collaboration and knowledge sharing. Moving beyond a zero-sum mentality will also place a greater onus on those OEMs prepared to adopt a leadership position, and to prove the business case for becoming more collaborative internally – as well as with shareholders. A goal that is increasingly defining the direction of travel as OEMs seek economies of scale and access to deeper pools of environmental expertise.





This is the pursuit of a comprehensive, end-to-end data value chain

Where OEMs have complete access to all relevant sustainability data inside their business, as well deep insights from across the industry – a concept already being utilized by leading OEMs.

For example, there is the Catena-X Automotive Network where Capgemini and SAP are helping bring together brands like BMW, Volkswagen, Daimler, Siemens, and Bosch. Described as an alliance for secure and standardized data exchange, the network is a great example of proactive and open cooperation between traditional rivals.

Here the emphasis is placed on enabling one secure operating system, and a high-speed knowledge transfer approach across 10 use cases that include:



Quality management



Circular economy



Digital twin



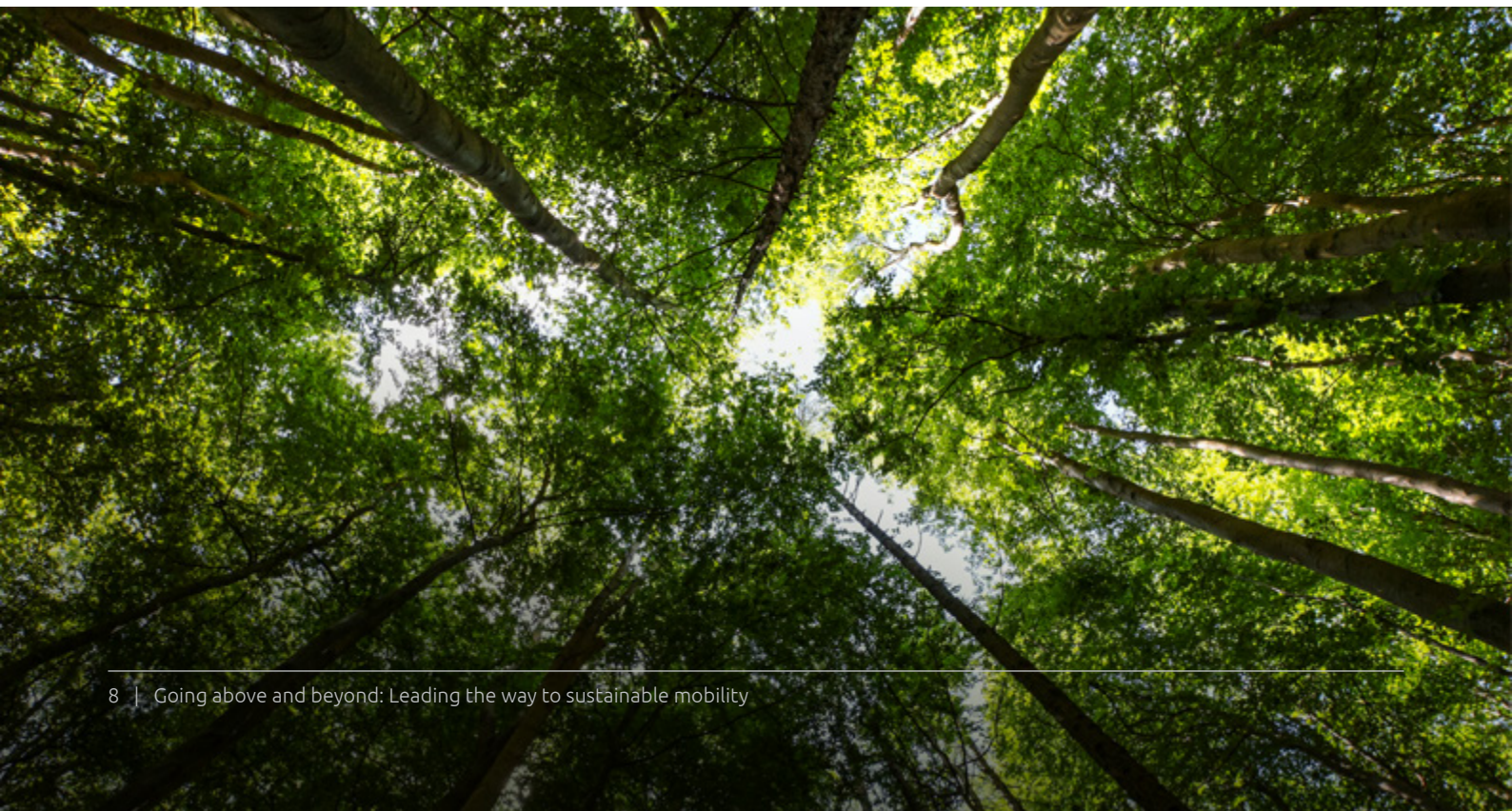
Traceability



CO₂ footprint proof

For all companies involved, Catena-X provides a marketplace for applications, content, and collaboration – as the basis for immediate value generation. It is another example of the power of data in automotive to inspire sustainable supply chain management, detail more efficient production processes, and foster collaboration. All of which, once mastered, points to a mouth-watering potential. However, data on its own is just that: a potential. The task facing OEMs is to optimize its application and utility toward sustainability goals, to map outcomes to strategic goals and priorities.

For example, an OEM seeking leadership in the circular economy could direct a portion of its data capabilities toward supporting a strong recycling proposition. In this instance the car maker has the option to create a centralized hub that connects together customers, spare parts providers, dealers, recycling companies, etc. to facilitate conversations and inspire more sustainable outcomes. Making this happen would require dedicated resources and the sharing of data across this hub, yet the brand and financial benefits would be obvious – while also helping inspire new business models.





Data alone will not fix sustainability, but it does highlight all the options

This is a key point because right now the automotive sector needs confidence in the direction it is taking, as well as raw intelligence to verify course corrections when required – in time to make a difference.

Having the data at hand to support more ethical sourcing is a great start. But so is having the insight needed on battery manufacture (as an example) to make accurate calls on the long-term sustainability of current approaches and methods. Transformation of existing physical processes will need to happen on occasion to introduce greater sustainability, but the vital first step is identifying what change needs to happen – and validating alternatives through trusted, accurate, and timely data.

Get this right, and OEMs have what they need to build innovation into their sustainability agenda. Just as

importantly, it will also give those brands who aspire to the role of market leader the ability to originate differentiating business models around the full length of the sustainability challenge. Just in time too, as the ability to offer carbon-free production, etc., will soon become a commodity offering. Standing out in the marketplace will therefore require a continued mix of cutting-edge technologies and innovation to help OEMs exceed their sustainability commitments, and to advance the concept of best practice that other industries will view with envy.





ACHIEVING A POSITION OF LEADERSHIP

Putting insight to work

Amid this environment of increased data insight, innovation, and collaboration, sustainability evolves from being a target to meet to a mindset to drive the Renewable Enterprise.

To reach this stage, it is critical that OEMs identify those technologies optimized for the use cases they will be asked to perform. Solutions able to optimize, enhance, and extend, while also playing an important role in delivering against three other core strategic priorities:



Intelligent industry – and fostering synergies between the digital and engineering worlds to help OEMs build intelligent and sustainable products, services, and operations



Customer first – and reinventing OEM business models with the customer placed at the very center to enable more personalized and connected experiences



Enterprise transformation – transforming an OEM's core infrastructure to inspire sustainable operations, while also ensuring the business is as profitable as possible

The Renewable Enterprise

This is Capgemini's vision for the future of sustainable business, where we help empower enterprises to constantly grow and adapt to new and changing business environments – while unleashing the power of new digital technologies to transform core processes and operations.

You can find out more by visiting: www.capgemini.com



Equally, any new solutions introduced to tackle the challenge and empower new business models will need to fit within – and contribute toward – an end-to-end view of sustainable performance across an OEM’s full value chain. Again, this is an obvious point to make but what is worth stressing is that integration matters. In fact, it really matters.

Point solutions have their place, dependent on the unique outcomes they alone are able to deliver. But maintaining a trusted view of sustainable performance today demands end-to-end integration. This is a truism that underpins Capgemini and SAP’s solutions for automotive. A key tenet of our long-established partnership that we believe should inform any conversation between OEMs and potential transformation partners.





Empowering automotive sustainability also calls for specific capabilities and attributes

First among these should be a shared undertaking to prioritize environmental concerns.

For a partnership like Capgemini and SAP this can be seen in the very public commitment both organizations have made toward sustainability:

- **Capgemini has set itself the goals of becoming carbon neutral throughout its own operations by 2025, to transition to 100% renewable electricity by the same year, and to help save clients 10 million tons of CO₂eq by 2030.**
- **SAP works on three core sustainability pillars: zero emissions, zero waste, and zero inequality, while also delivering a wide range of customer-facing sustainability solutions.**

The second key requirement for initiating change is a data infrastructure that can be applied to a variety of different use cases. Central to this requirement is the ability to put data to work in inspiring the day-to-day decision-making, performance, and future plans of OEMs. As another example, Daimler is utilizing the Capgemini and SAP partnership to support faster vehicle R&D. This is a transition from waterfall to agile development models, with change incorporated at both the technical and cultural levels – to ensure new sustainability requirements can be identified and introduced into product design in record timeframes.

The third requirement to be highlighted is the need to enable trusted data sharing and collaboration between all relevant parties. The automotive industry can now lay claim to existing in a world of excessive data availability. Data from vehicles, customers, roads, cities, suppliers, partners, regulators, and an array of interested third parties. Such a flow of information will of course demand the strongest layers of security, but it will also need to be facilitated by the will and technology required to encourage close collaboration at every opportunity.

Once these three factors are in play – the ability to identify meaningful sustainability targets, an end-to-end data value chain, and effective data sharing – leading OEMs and suppliers will be in a position to introduce a culture of continuous improvement. What is more, by holistically measuring, managing, and optimizing their sustainability performance, OEMs are far better placed to deliver on their net zero emissions goals. They also gain the ability to reduce and reclaim waste materials, empower a more diverse workforce, and achieve compliance with sustainability regulations. Outcomes enabled by multi-dimensional insights into operational realities, that help ensure environmental concerns are factored into every decision and transformational initiative.

Better still, OEMs can make decisions based on a detailed understanding of cause and effect

For example, the choice to find alternate sources of a key raw material can be made knowing what environmental impact this would have – as well as the consequences for finance, suppliers, and production processes.

Rapid iteration and business model development can then follow in a more agile format, allowing for a spirit of constant refinement to infuse the corporate ethos. Data will sit at the

heart of this undertaking, giving leaders a platform of end-to-end transparency on which to inspire sustainable mobility.

Delivering on this vision is the goal of the Capgemini and SAP partnership, as we implement the solutions and services necessary for helping car makers define an ideal way forward. Working together, we can enable automotive value chains to proactively define the strategies, business models, and transformational paths required to accelerate their journey to net zero and beyond.



Get in touch today to discuss your journey to sustainable mobility

About Capgemini

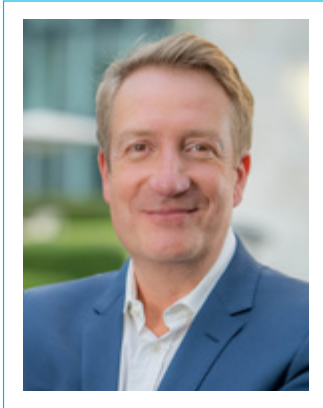
Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided every day by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of over 325,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast-evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported 2021 global revenues of €18 billion.

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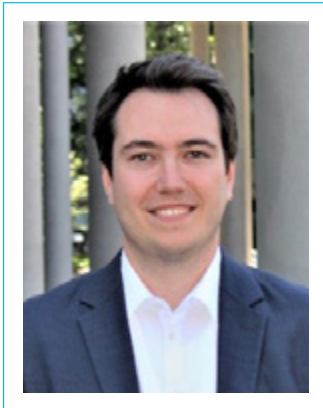
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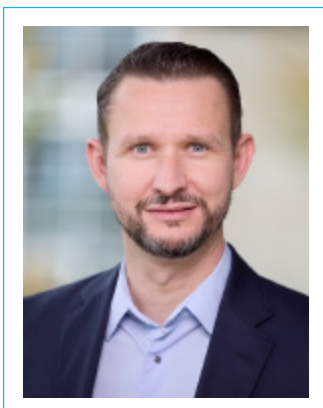
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