

BMW 1.0

A Brand Product
Concept

Yagya Raj Adhikari	yagya.adhikari@aalto.fi
Sara Aito	sara.aito@aalto.fi
Ali Amaan	ali.amaan@aalto.fi
Eva Mega Astria	eva.astria@aalto.fi
Erno M. V. Hänninen	erno.hanninen@aalto.fi
Yufei Chen	yufei.chen@aalto.fi

Vintage Retrofit Electric

TEAM 1

2023



**Corporate
Entrepreneurship
and Design**
MUO-E9009

Introduction

This report has been prepared as a fulfillment of the requirements of the Corporate Entrepreneurship and Design course, supervised by Peter McGrory, in the International Design Business and Management degree program at Aalto University. This report focuses on BMW group, and our proposition for it's futuristic new concept.

The goal of this study is to understand how futuristic innovations, insights, and opportunities can arise from and to be linked in BMW's strategy.



BMW STRATEGY

Overall Strategy

The BMW Group strategy regarding their electric vehicle segment can be summarized in five points:

First class individual mobility

Sustainable mobility development

Customer-Centric approach

Innovating with style

Pioneering technology

While keeping all of these aspects in mind, the two main focus areas that are the most relevant for both BMW as a vehicle manufacturer with a long past, and their future goals and visions, are first class individual mobility and sustainable mobility development.



(BMW Group - English, n.d.)

First class individual mobility

Premium, Personalized, Passenger–Car relationship

First class individual mobility refers to the offering of high-quality and luxurious products and services. The target customer group values premium quality and is willing to spend more money to have a more enjoyable experience. Customizability and having options regarding ones vehicle are big factors in creating a first class individualized feeling to the products and services at BMW. The personalization of ones vehicle simultaneously further advances the relationship between the passenger or owner and the car.



(BMW M3 Wallpaper 4K, n.d.)

Sustainable mobility development

Developing sustainable mobility is an important step towards a more environmentally conscious and responsible company. BMW is developing their sustainable mobility by investing into innovation of electric and hydrogen vehicles. In the case of electric vehicles sustainability can be achieved by reducing the consumption of resources through the development of the car batteries and finding solutions for the recycling of lithium and cobalt. Recycling and reusing old materials for other parts besides the battery is another point of focus for BMW towards sustainable mobility.

Although the car industry is truly not sustainable at its core, BMW is aiming to make more environmentally responsible choices regarding their manufacturing processes as well as the charging and refuelling solutions. The goal of the company is to be fully climate neutral throughout their entire value chain by 2050.

(Urban Mobility., n.d.)

*“Developing
needs-appropriate
solutions while
achieving
sustainability
goals”*

(Urban Mobility., n.d.)

To develop a solution that fits the BMW company strategy the needs of the customers as well as the sustainability goals should be considered. In addition, customer-centric approach, pioneering strategy, and innovating with style should be kept in mind.

The proposed solution fits all these five areas of the company strategy. Individualization of the vehicle and maintaining a bond between the car and the customer is an aspect that is very much present in the suggested solution.

Sustainability is connected in multiple ways, from the circular economy perspective as well as the electrification of personal vehicles point of view.

BMW &
MARKET



The Global Automotive Industry Market Size



2021

2028

3.3 Trillion
USD

3.01%
CAGR

Manufacturers by
revenue (2021)

1. Volkswagen group	254 <small>billion USD</small>
2. Toyota Motor	249 <small>billion USD</small>
3. Daimler	176 <small>billion USD</small>
4. Ford Motor	127 <small>billion USD</small>
5. General Motors	123 <small>billion USD</small>
6. Honda Motor	122 <small>billion USD</small>
7. BMW Group	113 <small>billion USD</small>

STRENGTH

- 1. Strong Brand Image
- 2. Product Diversity
- 3. Global Presence

S

WEAKNESS

- 1. High Cost Structure
- 2. Dependence on Auto Market
- 3. Environmental Concerns

W

- 1. Electric Vehicle Market Growth
- 2. Emerging Markets
- 3. Partnerships and Alliance

O

OPPORTUNITIES

- 1. Intense Competition
- 2. Regulatory Changes
- 3. Changing Consumer Preferences

T

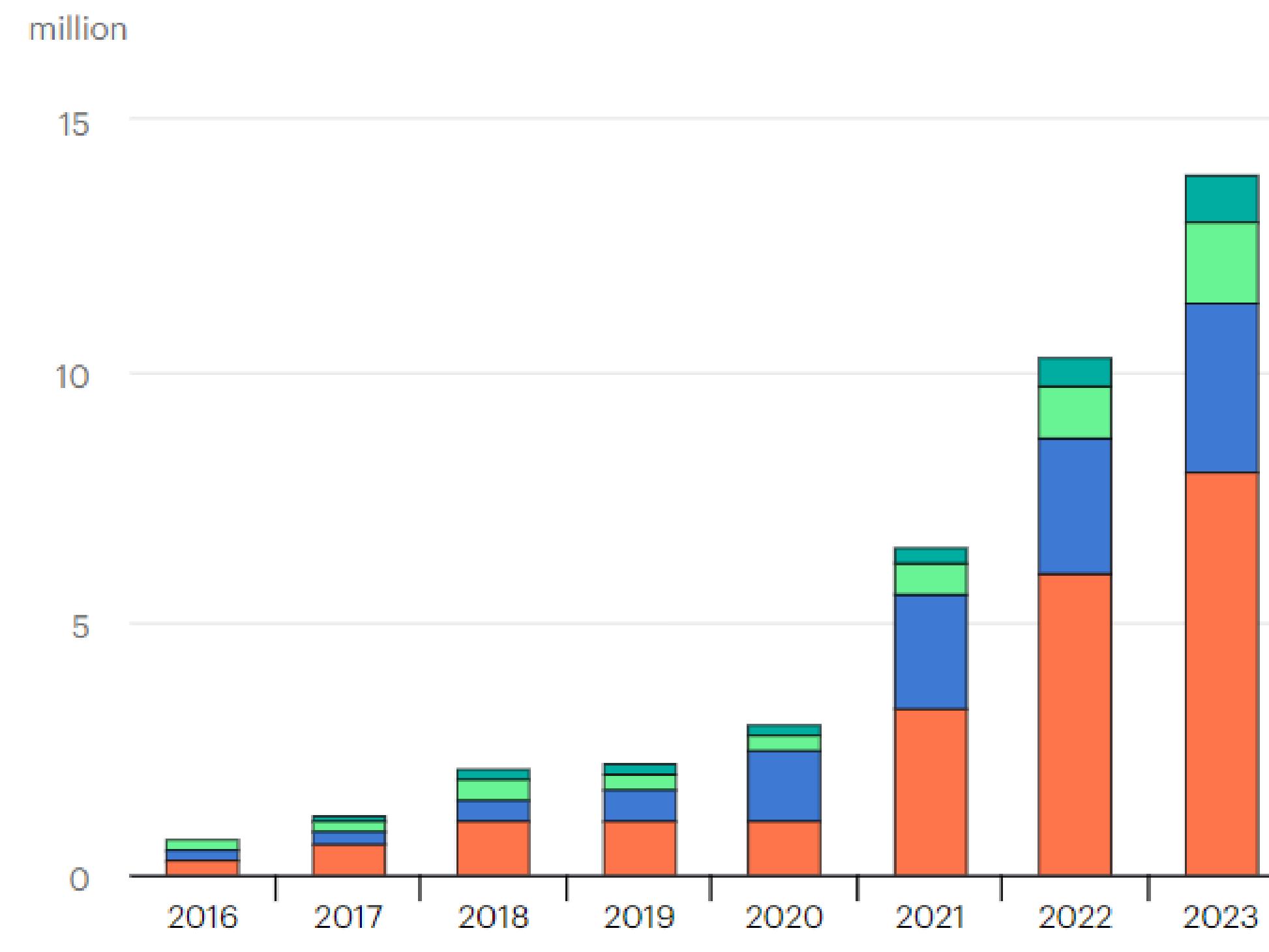
THREAT

Global electric vehicle market

Growing global demand

The electric vehicle market is going through a rapid growth globally.

- 2020 ~3 million sold electric vehicles
- 2023 ~14 million sold electric vehicles*
- 2040 ~70 million sold electric vehicles*

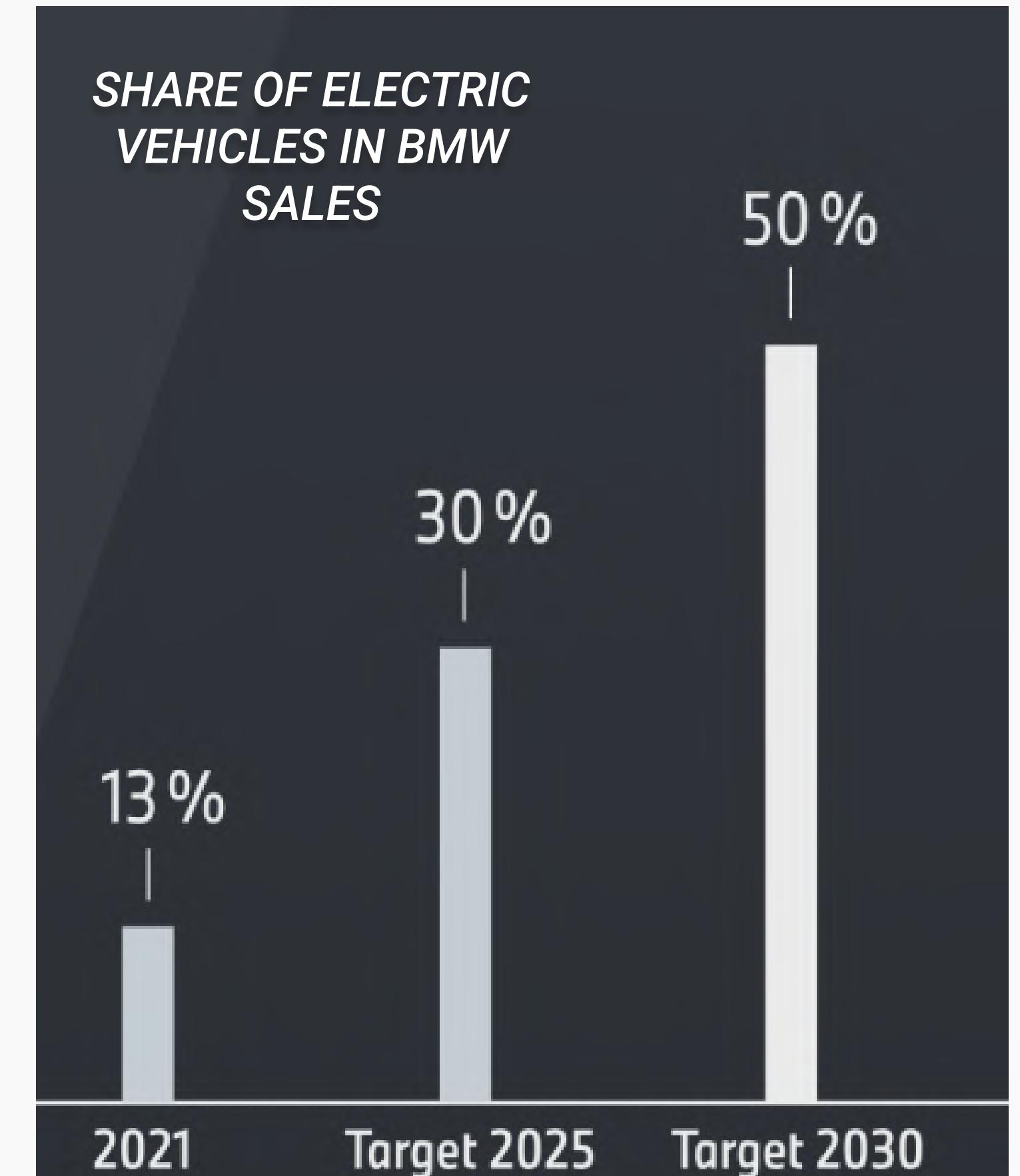


*projected

● China ● Europe ● United States ● Other

(ELECTRIC VEHICLES - IEA, N.D.)

[IEA. Licence: CC BY 4.0](#)



BMW Group

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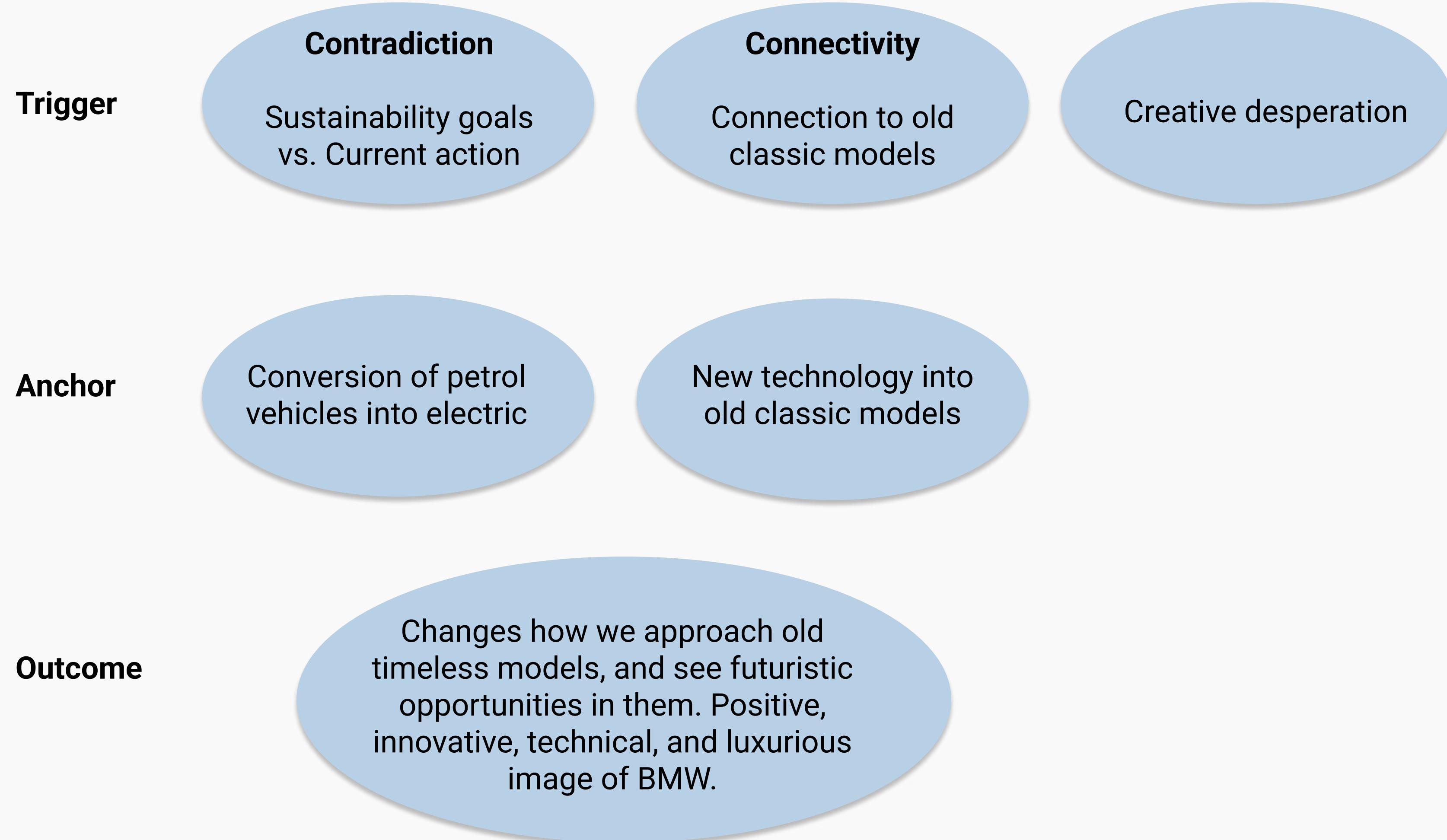
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https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/ir/downloads/en/2023/bericht/BMW-Group-Report-2022-en.pdf

INNOVATION

Sources of innovation



Trigger for innovation,

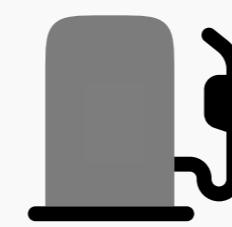
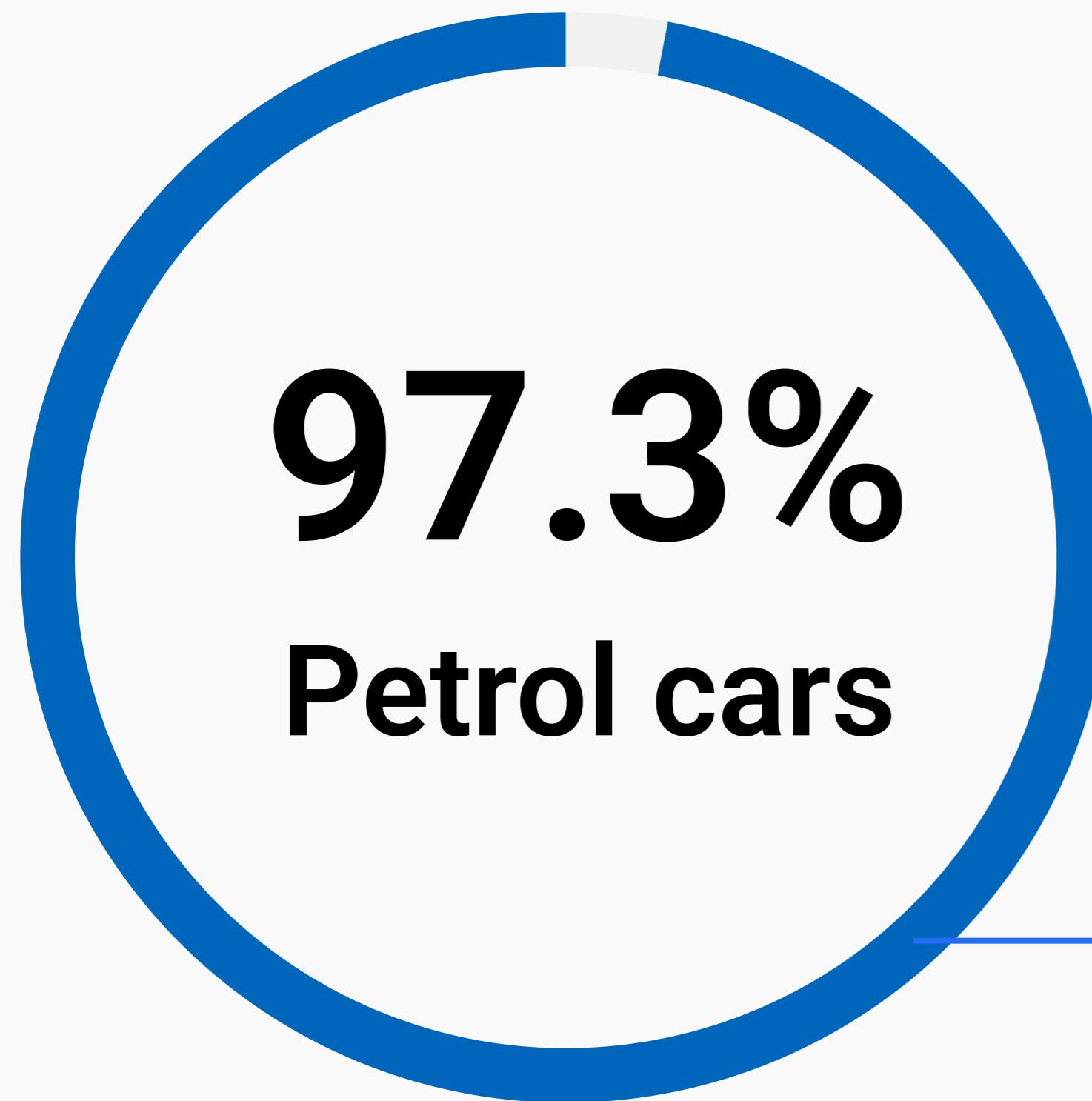
Contradiction & Connectivity



*Most of the vehicles in
the world would **still**
use petrol.*

*Is manufacturing of new
vehicles sustainable?*

CIRCULAR ECONOMY

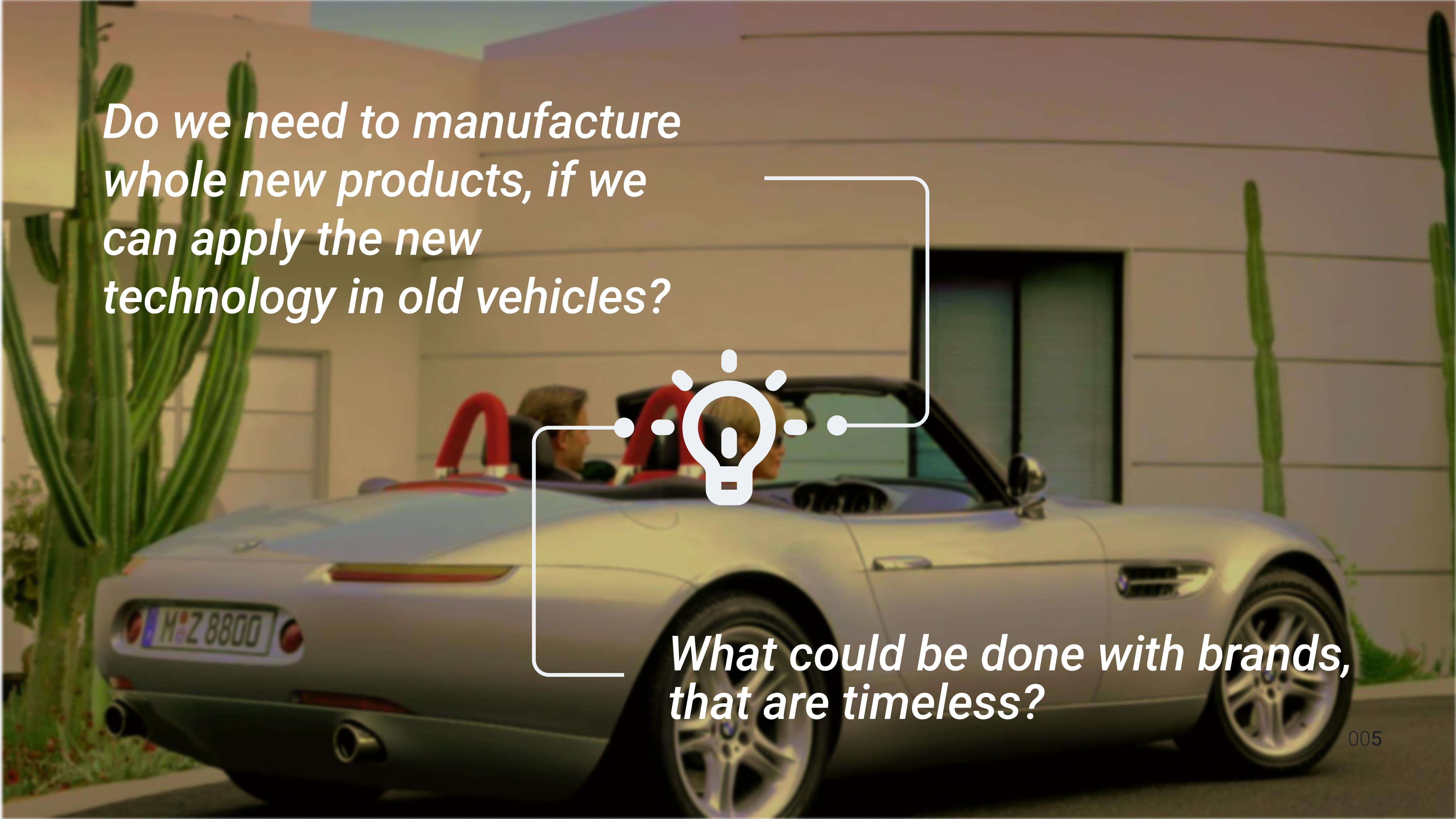


What happens to the old
petrol vehicles?

In 2023

(How Many Cars Are There in the World in 2023? – Hedges & Company., n.d.)

<https://www.virta.global/en/global-electric-vehicle-market>



*Do we need to manufacture
whole new products, if we
can apply the new
technology in old vehicles?*



*What could be done with brands,
that are timeless?*

“Forget about Teslas: Converting vintage muscle cars into electric vehicles is now a thing”

Fortune, 2022



Benefits

Customers

Although the field is new and unexplored widely, studies in Germany highlight a surprisingly positive response to electric vehicle conversions.

Also, a movement of classic luxury vehicle conversion can be seen done by smaller companies providing these services.

BMW

The concept would focus on promoting the brand of BMW as innovative, sustainable, technologically superb, and customer engaging. It would highlight the legacy of BMW and the high quality individual mobility they have offered to their consumers for years.

(Hoeft, 2021)

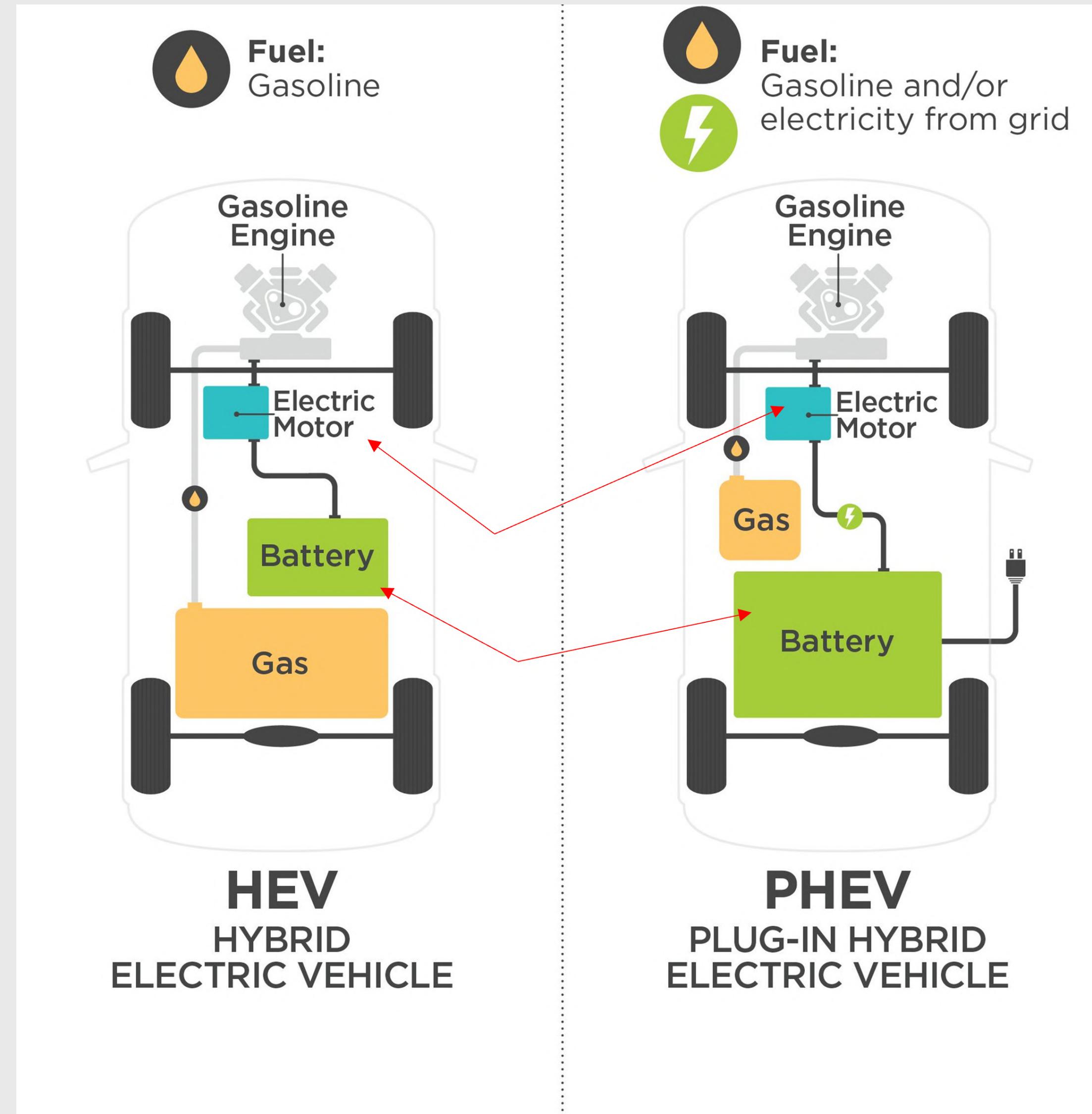
TECHNICAL
FEASIBILITY

Technical feasibility

We conducted technical feasibility research by reviewing various published white papers to investigate the conversion of internal combustion engines (ICE) to hybrid electric vehicles (HEV). Our findings indicate that this conversion is primarily carried out by hobbyists and environmental sustainability enthusiasts. Our research demonstrates that retrofitting is indeed feasible and has been successfully accomplished.

We also explored emerging technologies, such as in-wheel motor technology, that could facilitate the retrofitting process. However, the primary goal of this paper is to illustrate a potential pathway for overcoming the technical challenges associated with this conversion. Our aim is to demonstrate that, with sufficient research and commitment from large companies, it may be possible to scale up and implement this transformation.

Major Upgrades



Electric motors Batteries

The system consists of three main parts: an electric drive, a battery, and a generator. An optional external battery charger can be added for plug-in operation. The electric drive includes a converter and an induction machine for high-performance applications. The battery acts as a buffer to smooth out energy demand, while the generator runs at its most efficient level, typically between 20-30%. With the battery and electric drive operating at about 70% efficiency, the system averages 14-21% efficiency, making it more efficient for start-stop driving compared to traditional internal combustion engine vehicles.

Is there enough space?

The BMW Z8 comprises a multitude of components, and their compact arrangement presents a challenge when it comes to accommodating new additions. Adding new motors and batteries for the conversion into a hybrid electric vehicle (HEV) necessitates the utilization of innovative technology. While there is some available space under the rim, in the trunk, and within the platform where the exhaust pipe is located, it's nearly impossible to introduce additional components elsewhere. To address this issue effectively, the integration of novel technology is imperative.



(BMW Z8: History, Review and Specs of an Icon | Evo, 2018)

Hub motors

by Protean electronics

Protean's clever design places the fixed permanent magnet in the middle of the device, while the rotating part is on the outside. This design allows for easy attachment to the wheel. Additionally, the inverter and power electronics are positioned between these components, rather than in a separate unit, which makes the whole system simpler and lighter. Each motor consists of four to eight parallel submotors. This means that if one submotor fails, the unit can still function until it's time for maintenance.

(Gastelu, 2016b)



Stoklosa, A. (2020, November 23)



Protean Electronic

Tyre sizes

18 Inch – 24 Inch

BMW Z8

Tyre sizes

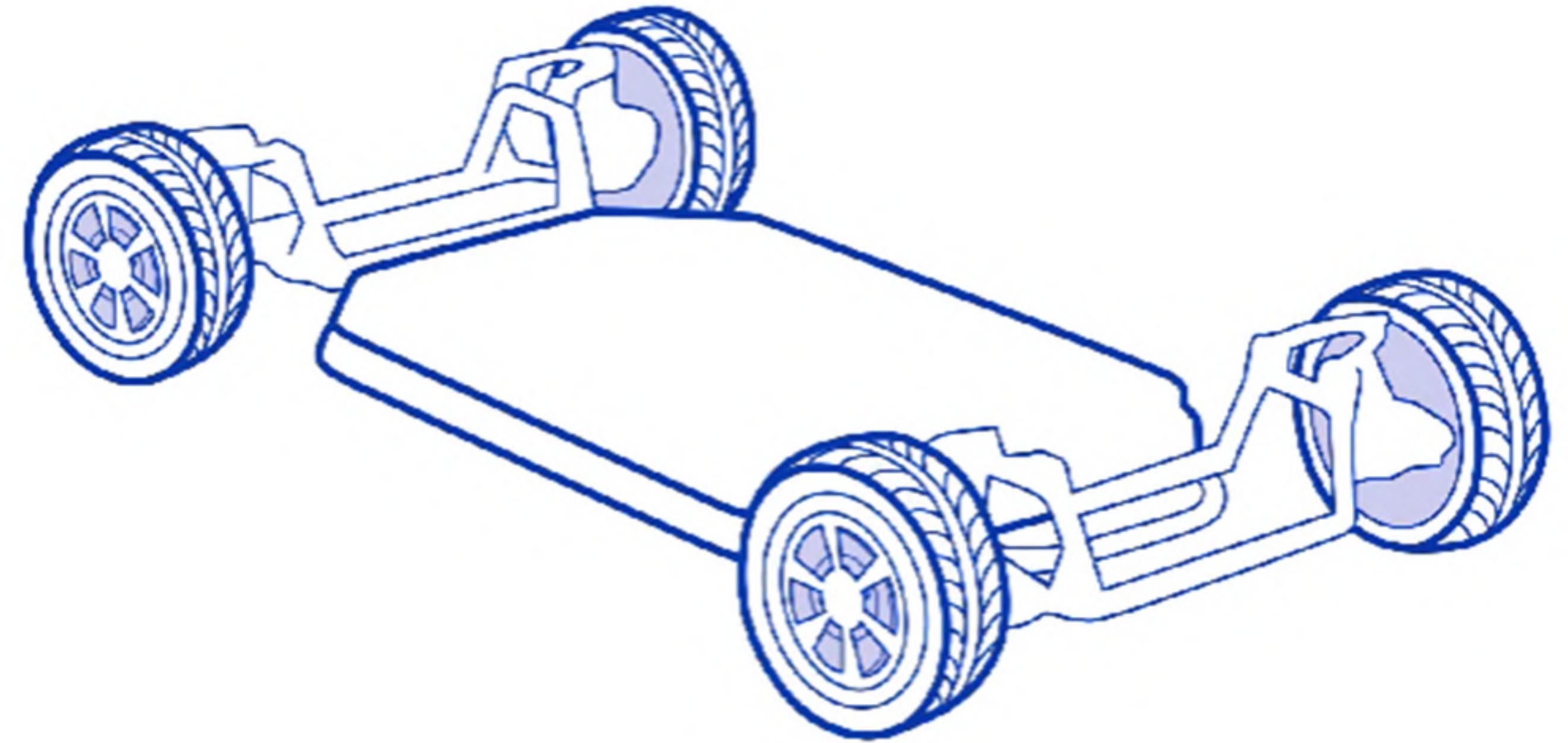
18 Inch – 20 Inch

Why In-Wheel motors?

Flexible vehicle design

Flexible manufacturing process

Simpler development of hybrids



(Homepage - Protean, 2022b)

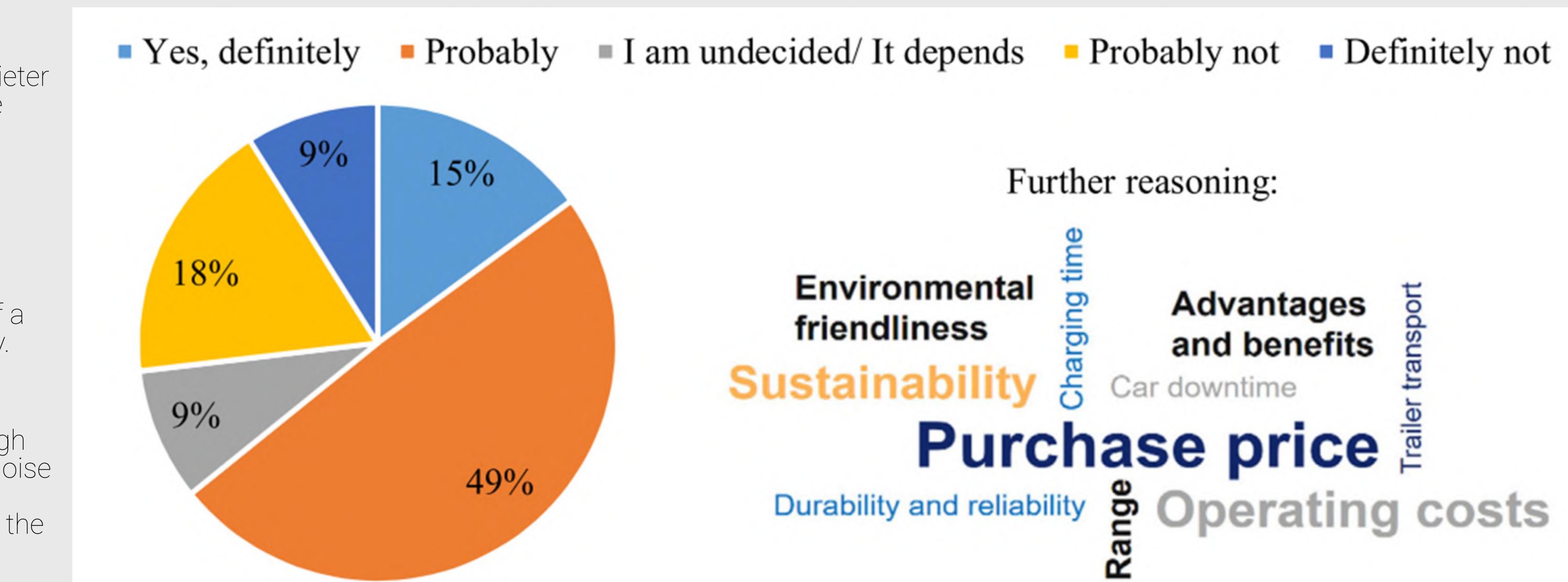
Retrofit electrification offer acceptance

Motivations for using electric vehicles (EVs) include potential environmental benefits, quieter operation, improved acceleration, lower operating and maintenance costs, extending the vehicle's lifespan, and enthusiasm for EV technology. In a quantitative study, 52% of respondents expressed that they see car electrification as a way to contribute to sustainability.

Other factors that can encourage EV purchases are the desire to drive an EV as a status symbol, portraying a positive image for companies, avoiding restrictions on internal combustion engine (ICE) vehicles in certain major cities in Germany, and the prospect of a wider variety of electric vehicle choices compared to the limited selection available today.

However, some potential customers have concerns and questions about retrofitting ICE vehicles to EVs. These concerns include worries about limited driving range, the initial high cost of conversion, unfamiliarity with the technology, and emotional attachment to the noise of ICE vehicles. Additionally, they may have questions about certification, insurance, environmental benefits, durability, safety, residual value, changes in driving behavior, and the availability of retrofitting companies in their region.

Regarding expectations, some potential customers anticipate no significant changes in their daily vehicle use apart from recharging the battery, with no visible modifications to the vehicle or differences in how they use it. Others expect slight changes, such as access to EV parking spaces and charging points, new in-vehicle display features, alterations in the driving experience, and a more environmentally conscious and forward-looking feeling while using the vehicle.



Source: Transportation Research Interdisciplinary Perspectives 9 (2021) 100330

SERVICE
& DESIGN
CONCEPT



First BMW i-Series



Latest BMW i-Series



First BMW i-Series

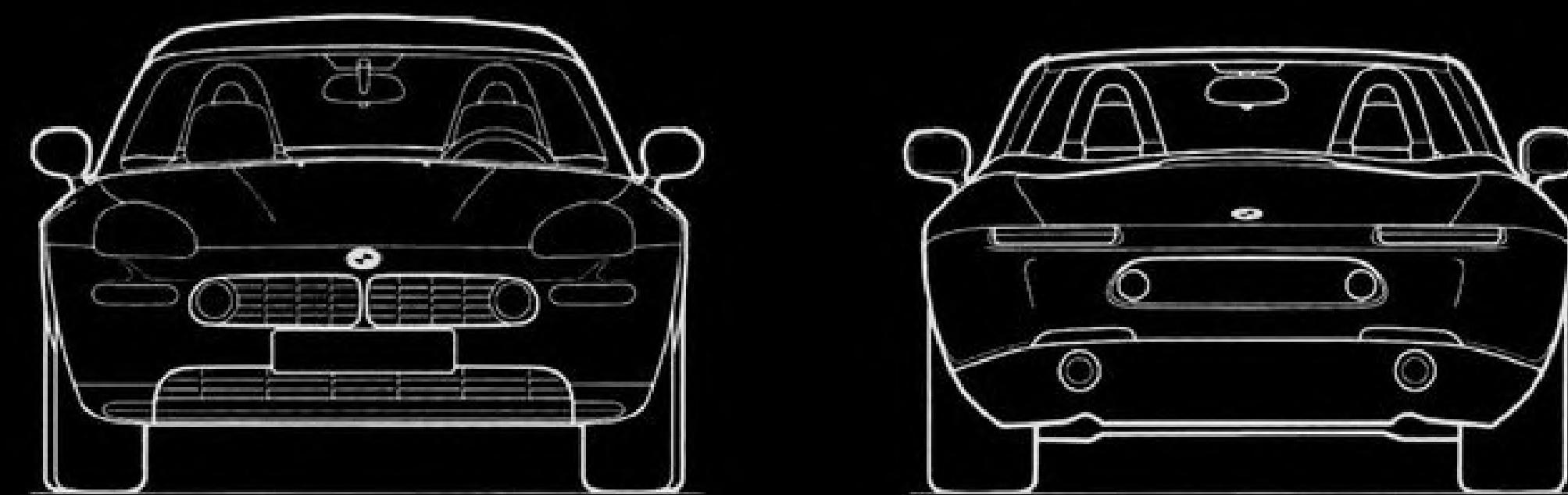
As the pioneering BMW's "i" sub-brand, its vision was to showcase BMW's innovation in sustainable mobility. As a result, BMW may have wanted to establish a distinctive identity from its traditional models. The i3 was designed to appeal to urban and environmentally conscious consumers, and its design reflected to what one would expect in a typical sustainable car.

Latest BMW i-Series

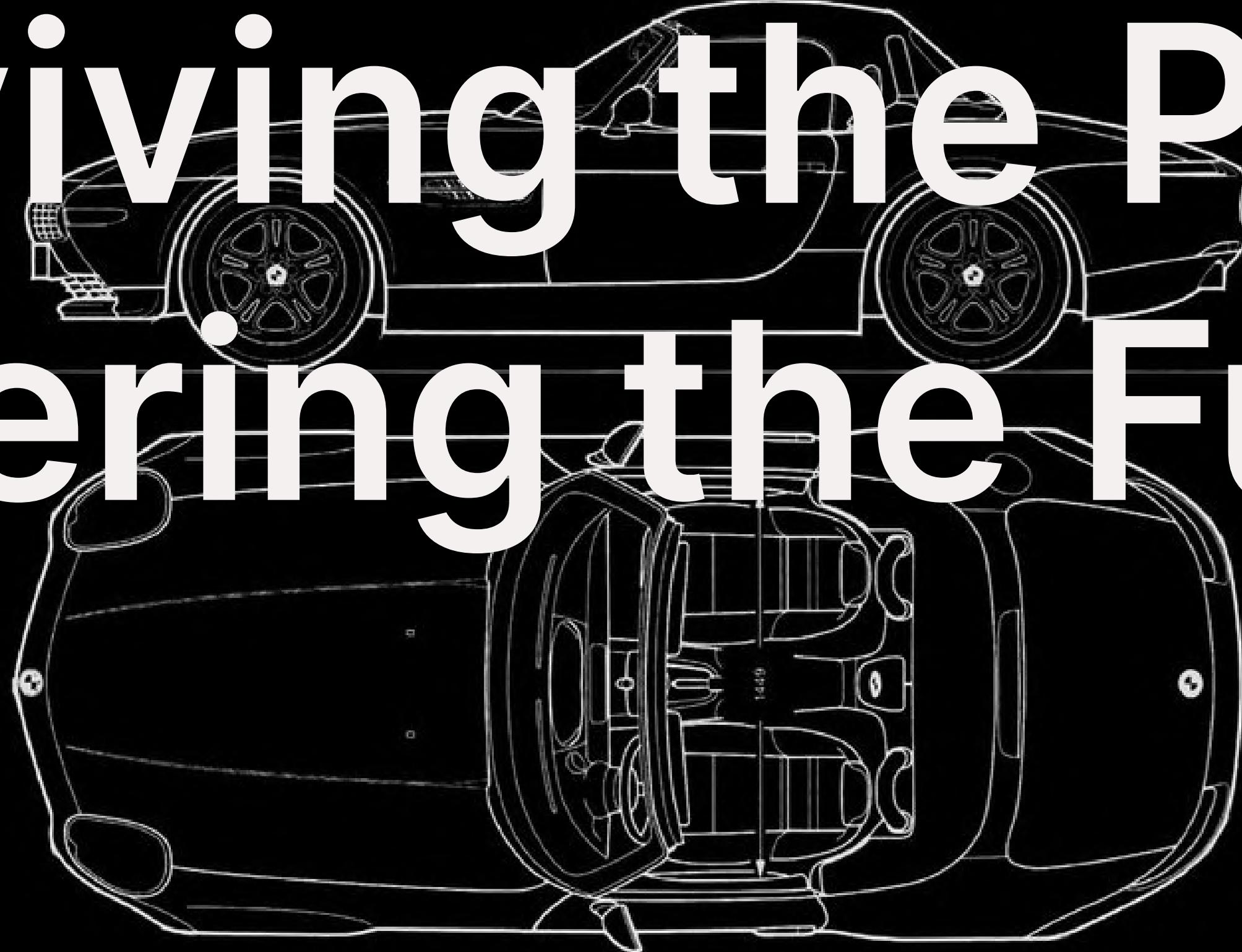
In contrast, later BMW electric models, like the iX3, i4, iX5, and iX7, may have incorporated more elements from the design language of BMW's existing lineup, making them look more in line with the overall BMW brand identity.

Now that they gain more experience to refine their electric car, there are bigger possibilities for the design to become more integrated into their overall vehicle lineup.

(The BMW I Models at a Glance | BMW.com.au, n.d.)



Reviving the Past,
Powering the Future





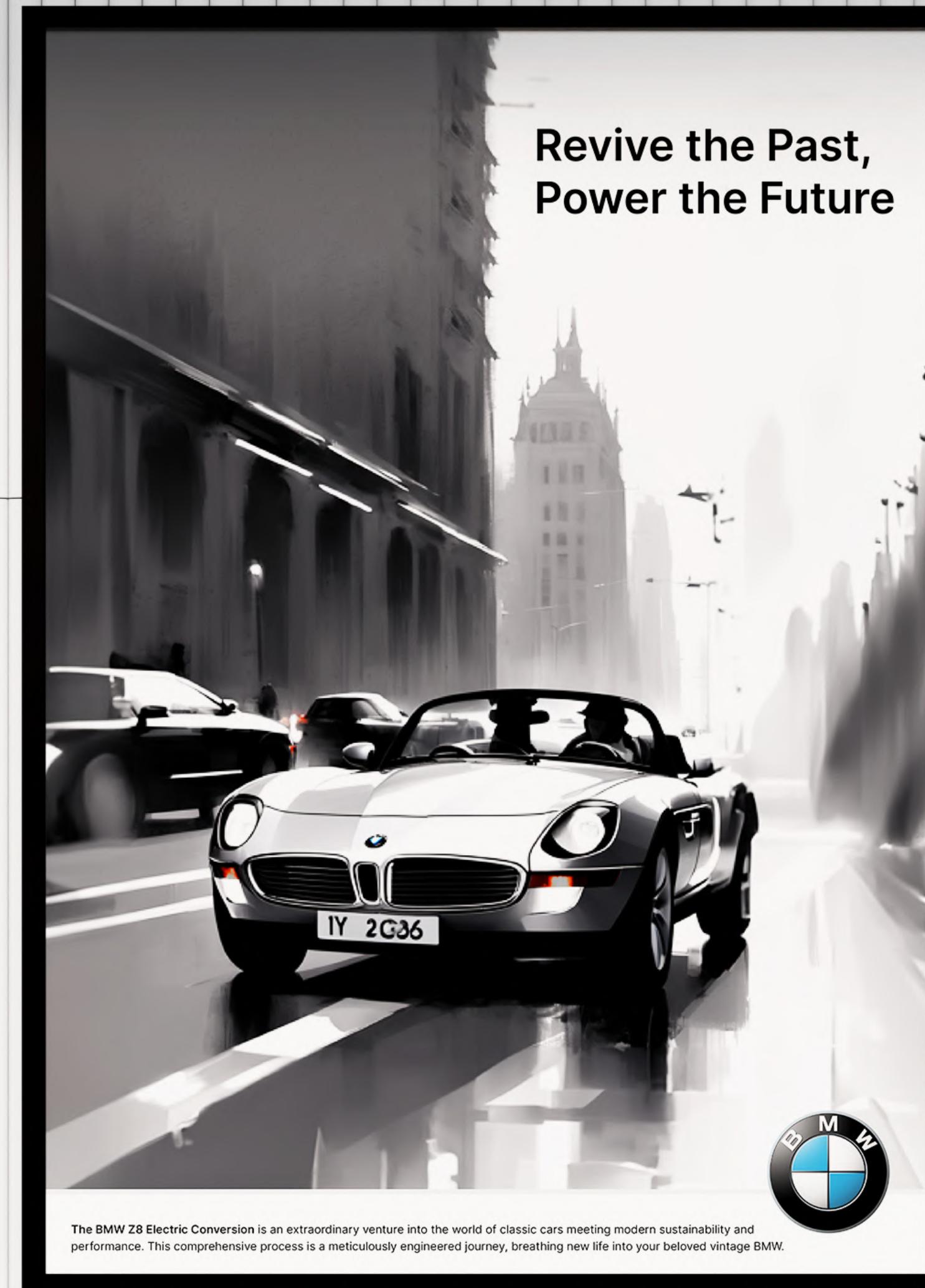
The BMW Z8 electric conversion offers a remarkable opportunity to breathe new life into a classic BMW, seamlessly blending **vintage aesthetics with cutting-edge electric technology.**



BMW Z8 Electric Conversion

With the BMW Z8 electric conversion, you can embrace the future of automotive innovation while preserving the legacy of your cherished classic, making it a true embodiment of automotive history and modern sustainability.

The BMW Z8 Electric Conversion is an extraordinary venture into the world of classic cars meeting modern sustainability and performance. This comprehensive process is a meticulously engineered journey, breathing new life into your beloved vintage BMW.



Revive the Past, Power the Future

The BMW Z8 Electric Conversion is an extraordinary venture into the world of classic cars meeting modern sustainability and performance. This comprehensive process is a meticulously engineered journey, breathing new life into your beloved vintage BMW.



Classic Elegance, Electric Excellence

Our customer-centric approach ensures that every step of this transformation is a collaborative experience, where your preferences and vision are honored. With electric performance classics, you not only own a piece of automotive history but also become a pioneer in shaping the sustainable driving experience of tomorrow.

The BMW Z8 Electric Conversion is an extraordinary venture into the world of classic cars meeting modern sustainability and performance. This comprehensive process is a meticulously engineered journey, breathing new life into your beloved vintage BMW.



Sustainability Meets Authenticity

We want to understand the BMW loyal customer's passion for classic cars and the desire for modern, eco-friendly performance. We provide a seamless transition from the roaring engines to the quiet power of electric motors, all while maintaining the authentic charm of the BMW classic.

Collaborative Transformation

Our customer-centric approach also ensures that every step of this transformation is a collaborative experience, where customer's preferences and vision are honored. With electric performance classics, you not only own a piece of automotive history but also become a pioneer in shaping the sustainable driving experience of tomorrow.



Richard

Investment Banker

Classic

Enthusiast

Traditionalist

Savvy

Eco-Conscious

“

My BMW Z8 is a timeless masterpiece, but it's time for it to evolve sustainably.

”

Demographics

Ages: 55

Owning car model

BMW Z8

Traits

Budget Conscious



Authenticity Preservation



Environmental Impact



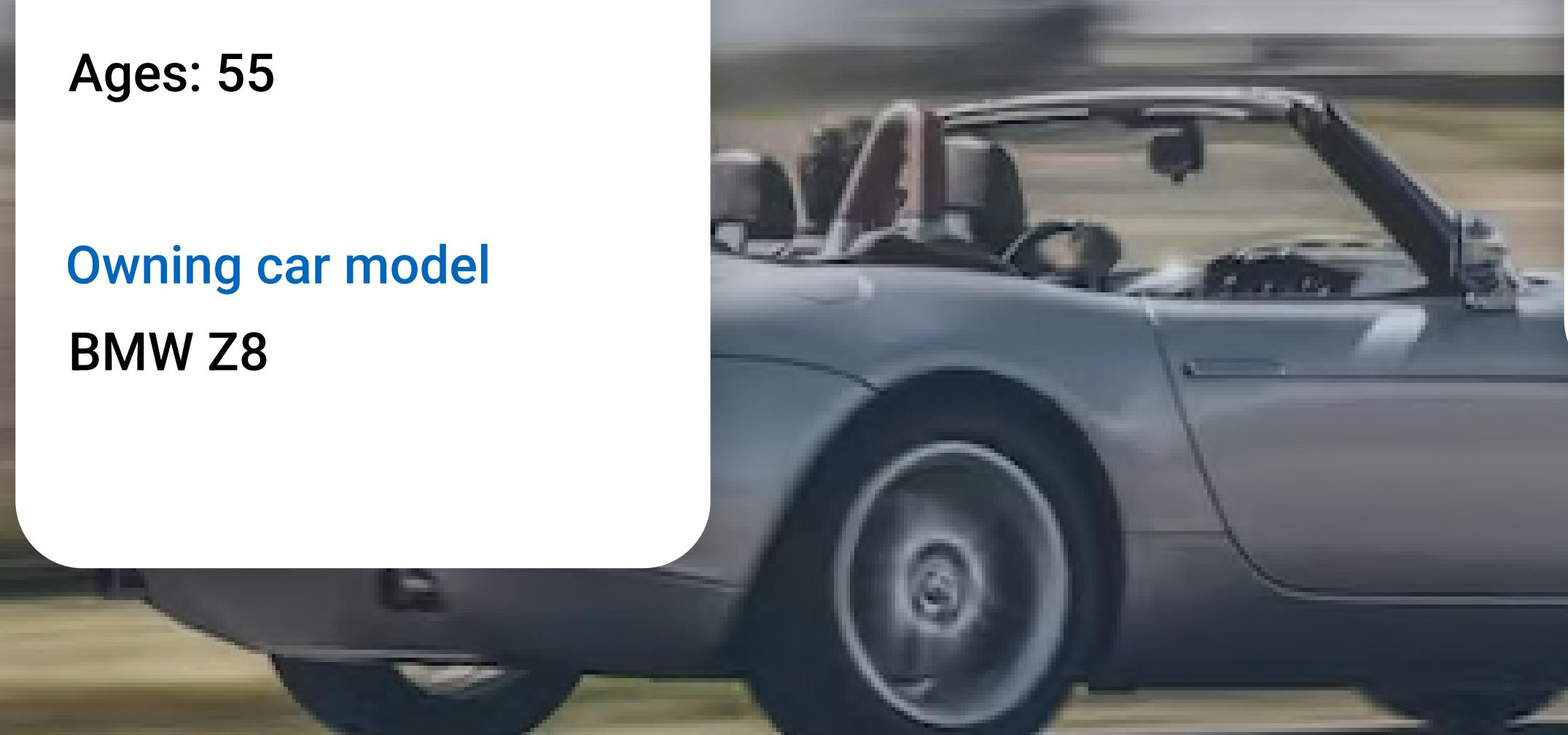
Needs

Expertise and Craftsmanship

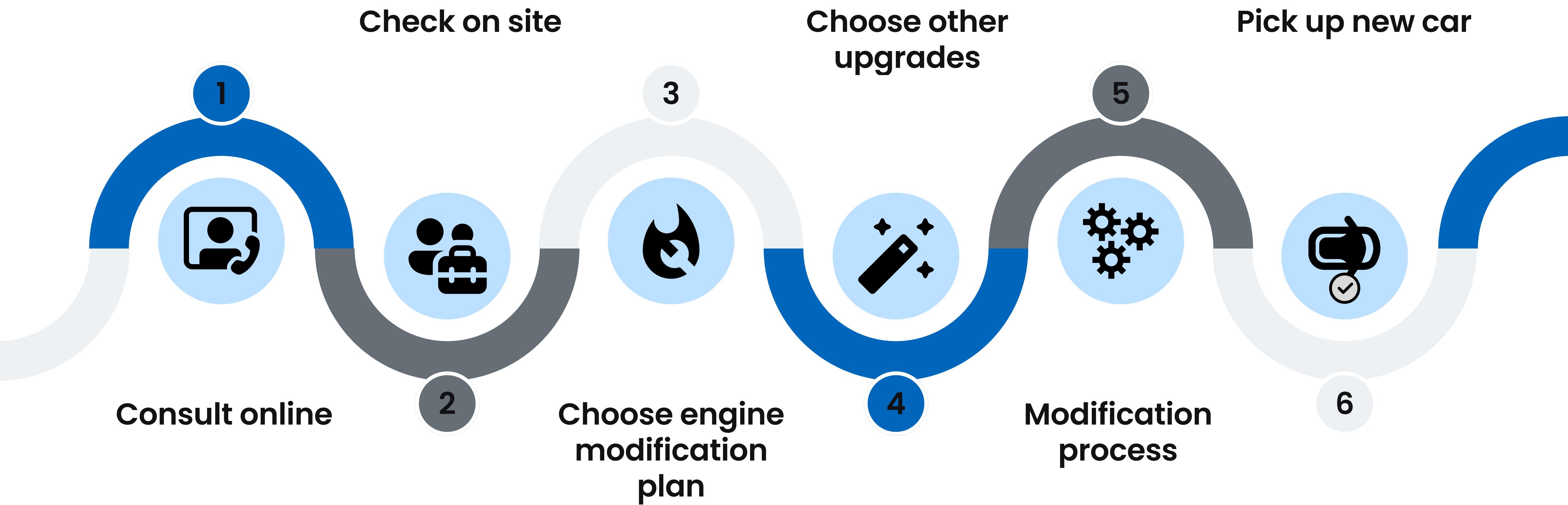
Customization Options

Sustainability Certification

Maintenance Support



Service Blueprint





Engaging Customers in modification process

Unlike traditional high-end services, we involve our customers in the car transformation process. Recognizing the deep emotional value our clients attach to their beloved vehicles, we offer tailored customization experiences.

Whether through remote video updates or onsite participation with DIY options, customers build a one-on-one relationship with their conversion specialist, ensuring their cherished cars receive the finest care.





B
M
W

Beautiful
Masterpiece on
Wheels

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