

# Electronic Fuses

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## EXPERTS FOR AUTOMOTIVE ICs

**We have a broad expertise** in analog mixed-signal integrated circuit design.

**We deeply understand our customers** application needs to create real system innovation.

**We are a global player** for automotive ASSPs and ASICs. We offer worldwide sales and application support.



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# CORPORATE KEY FACTS



## 6 Elmos ICs

on average in every new car

## 6 product segments

Motor Control, Lighting, Safety/Power/Custom ICs, Ranging, Optical, Sensor ICs

## 16 locations worldwide

incl. 7 R&D centers, HQ located in Dortmund, Germany

## 35+ years of experience

in analog mixed signal IC solutions

## ~1,150 employees

thereof 350+ product developers & engineers

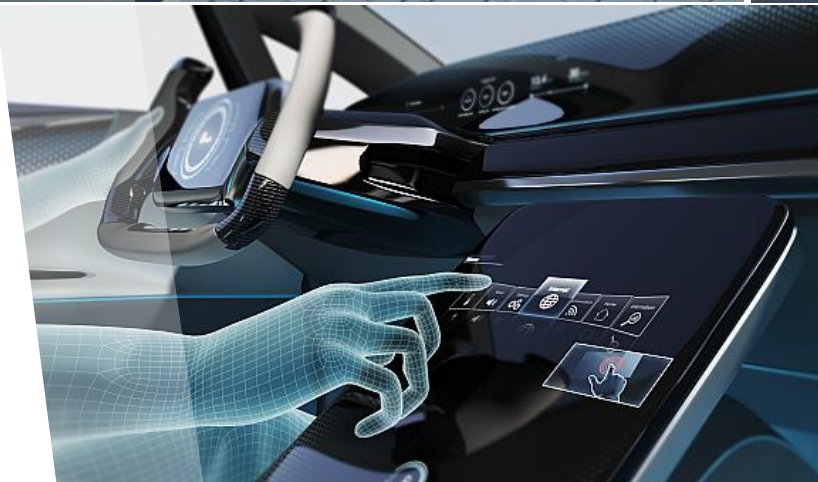
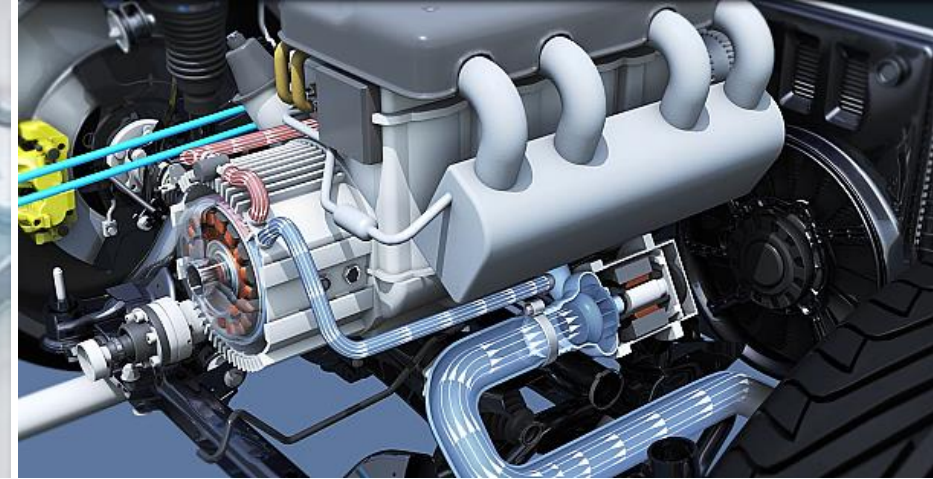


WE ARE LOCATED ALL OVER THE WORLD



# PRODUCT SEGMENTS

- RANGING
- OPTICAL
- SENSOR ICs
- MOTOR CONTROL
- LIGHTING
- SAFETY, POWER & CUSTOM ICs





# ELECTRONIC FUSE CONTROLLER

## Technical benefits of electronic fuses

- Reduce wire harness weight
- More trustable sensor integration due to less voltage drop and less sub-net interference in vehicle power network
- Power monitoring and diagnostics all over the vehicle smart power network (e.g., direct diagnostics or plausibility check possible)
- Smart power distribution with advanced function on vehicle application level (e.g., predictive maintenance function)

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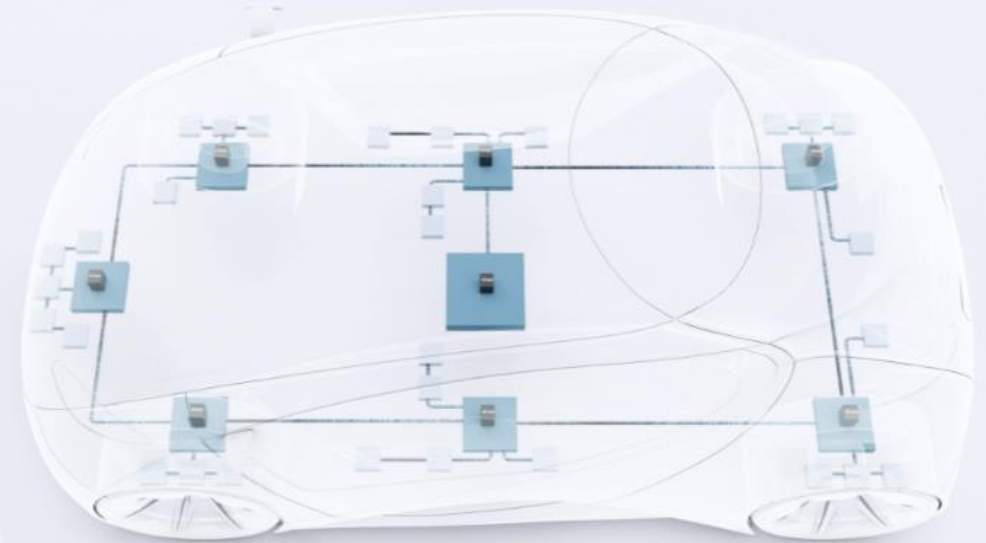
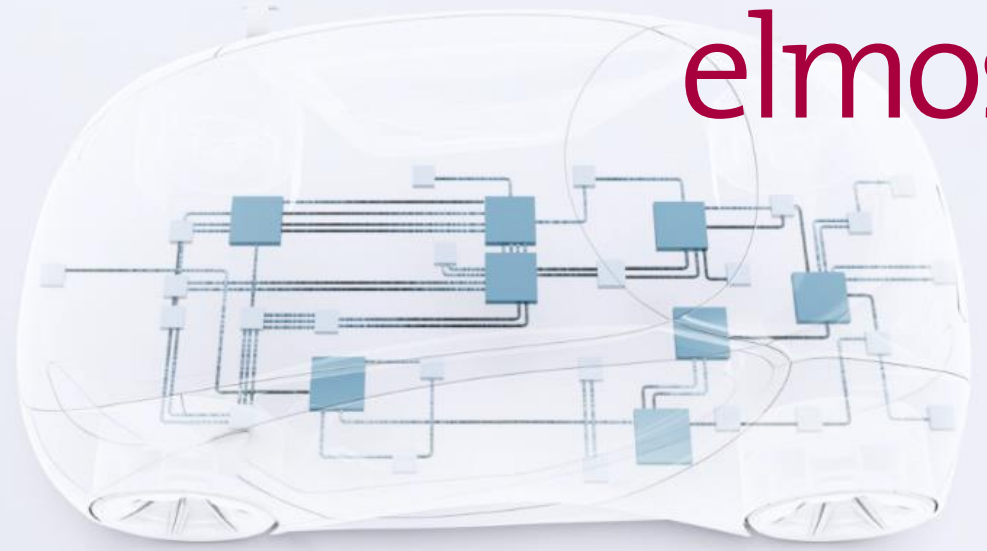
# VEHICLE WEIGHT REDUCTION

Accurate current / power measurement allows reduced wire harness

The Elmos solution emulates the dynamic “melting fuse” characteristic but adaptive, faster and more precise

- Less wire diameter and wire harness weight
- Cost savings
- Configurable fast protection for improved wire protection
- Lower tolerances due to calibrated measuring unit and software temperature compensation

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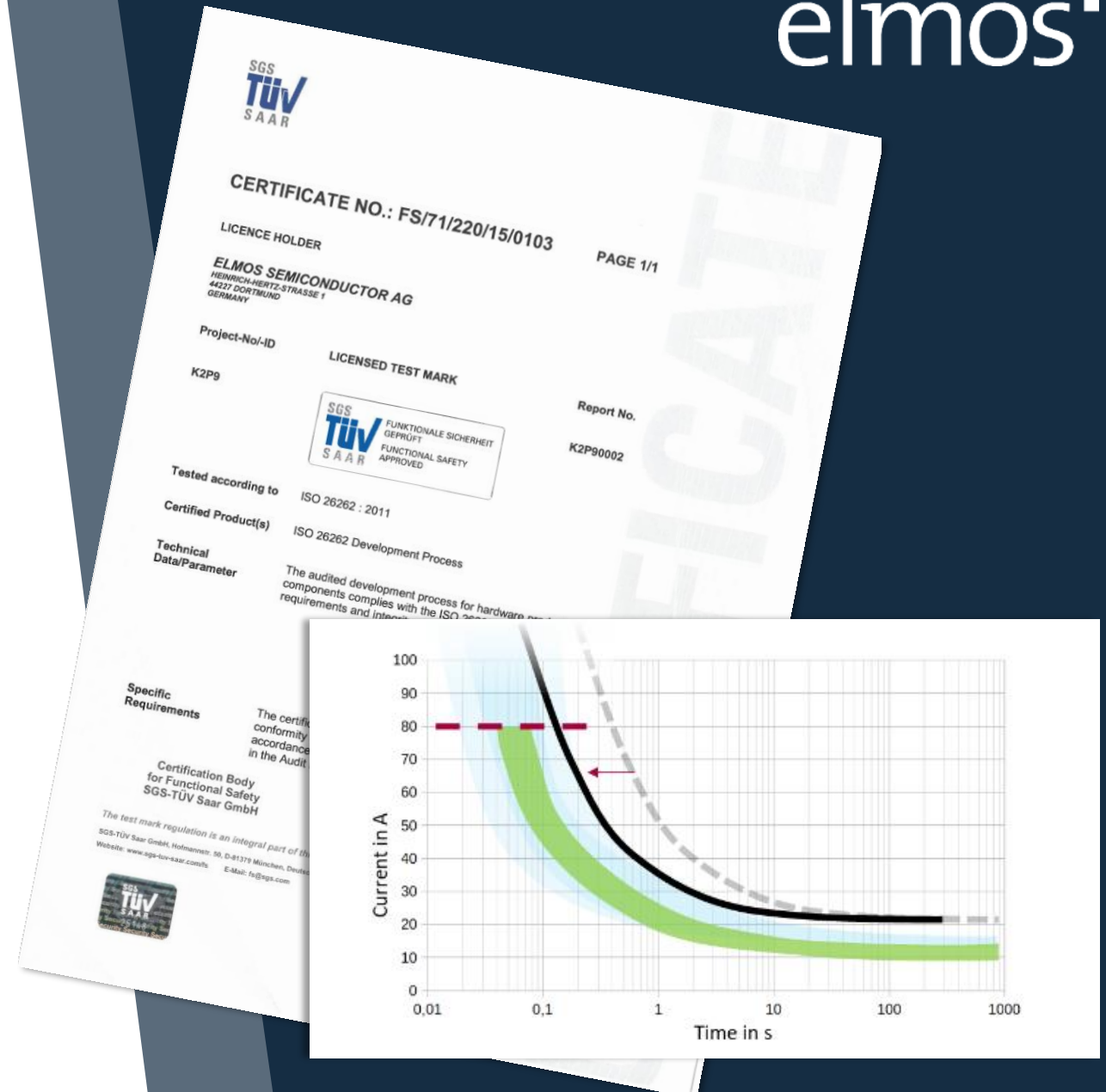


# FUNCTIONAL SAFETY

ISO 26262 certified processes at Elmos

## Global safety benefits compared to a melting fuse

- Individual remote channel switching
- Automatic recovery with limited number of retries
- Predicted maintenance
- Diagnosis feedback
- IC fulfils technical safety requirements with ASIL B





# ARCHITECTURE FLEXIBILITY

Electronic Fuses to enable flexible power E/E architecture

## Advantages

- Reduced junction box construction
- Freedom of mounting position
- Optional decentral fuses
- Bus controlled flexibility
- In-vehicle network interface
- Zone controlled power subnets
- Reduced central power lines
- One chip solution with bus interface eases the customer release process



# ACTIVE POWER MANAGEMENT

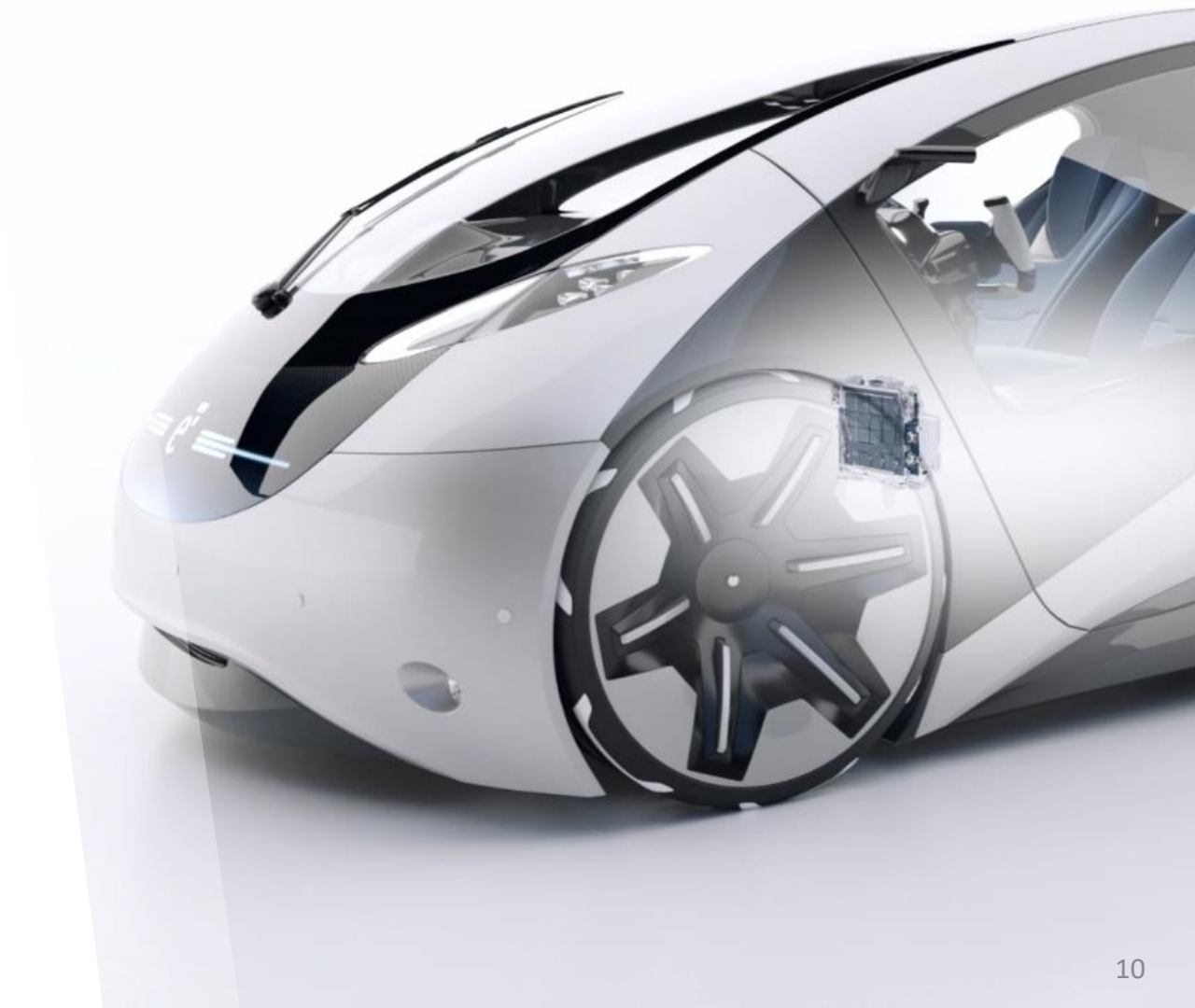
Benefit from several operating modes for many use cases

## Elmos solution allows individual remote channel switching

- Adaptive wire harness protection → In-rush current management by adaptive shutdown threshold
- Reduces sleep current in high voltage domains
- Efficient parking modes (sleep current)

## Zone controller can be remotely configured for:

- Different platforms
- Different vehicle configurations
- Vehicle operating modes (drive, park, .....)
- Remote re-cover / re-activation
- Management of rush-in current during power-up



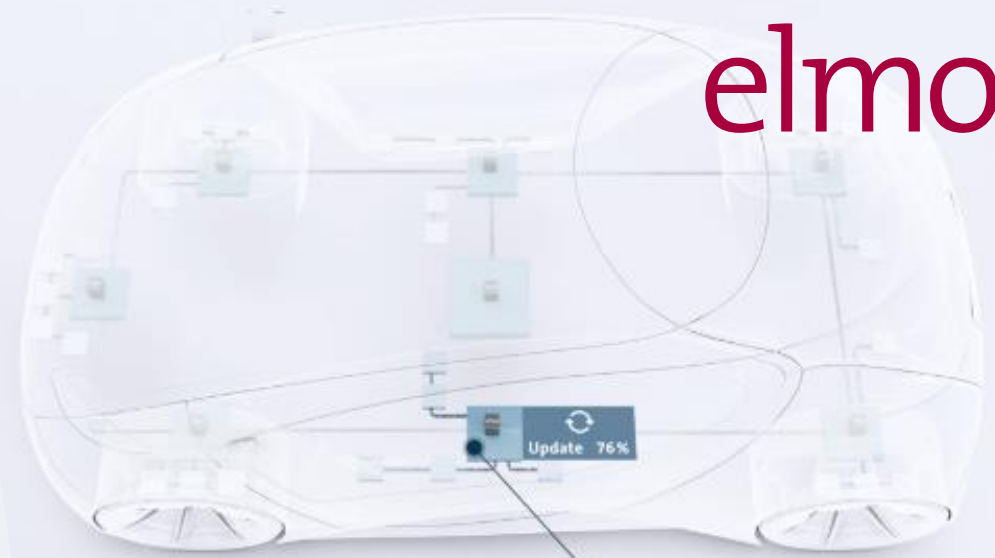
# BETTER SYSTEM RELIABILITY

Limit voltage drop on supply network

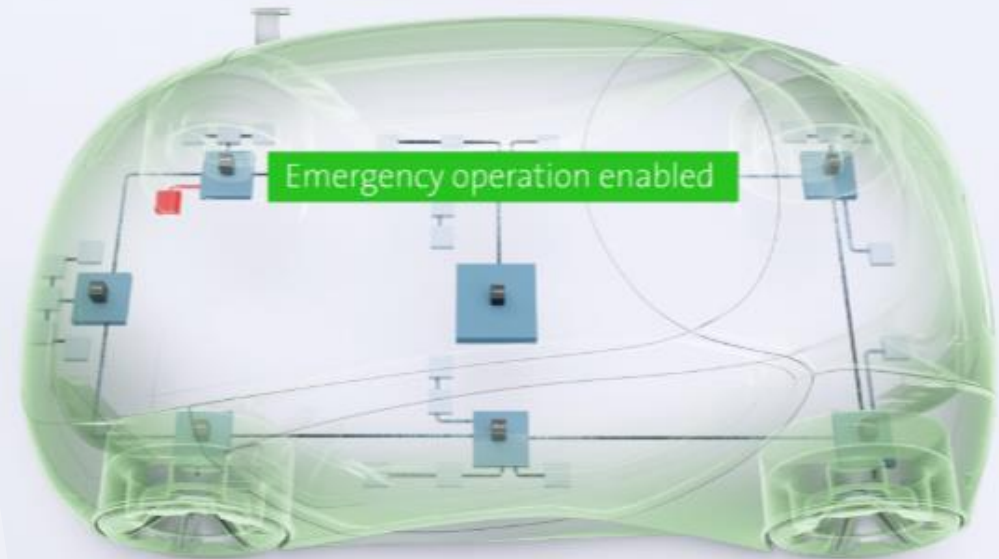
Avoid instable bus communication, unreliable sensor data and unwanted resets by using eFuses

- Reduced failure cross coupling to other power segments by fast over current shutdown → Fast reaction time
- Predicted maintenance by accurate power measurement → Local software controlled algorithms
- Smart system recovery by individual segment control → Adaptive over current threshold
- Independent channel switching
- Software update, flexible & sustainable

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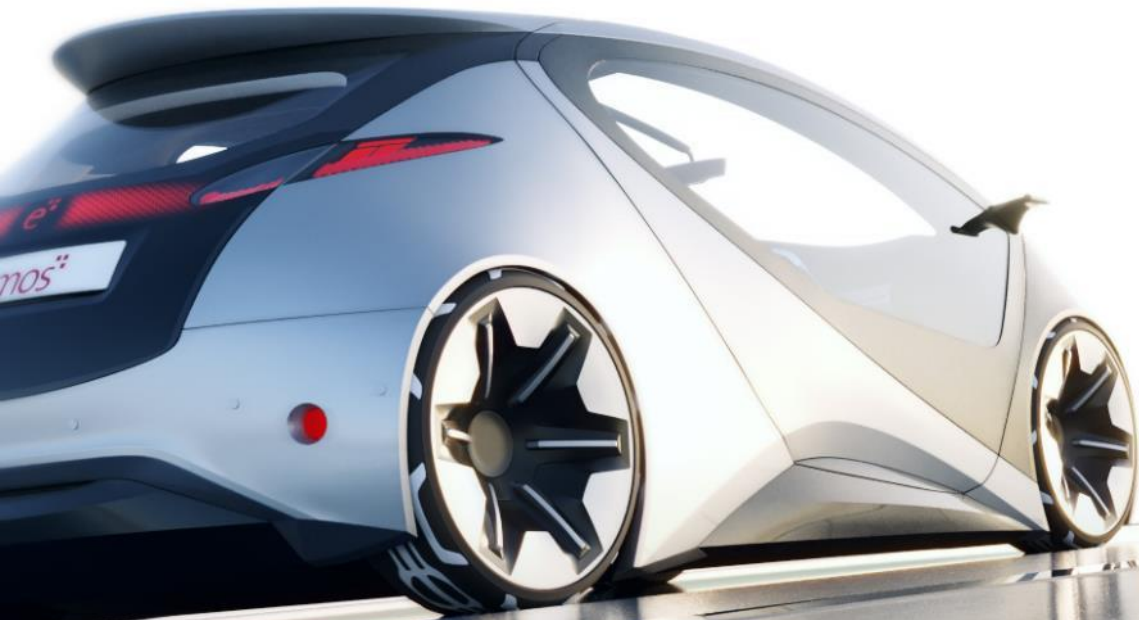


Modules update separately





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# Innovation Matters

# DISCLAIMER

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