



Technology innovation as driver for growth for automotive components value chain: Adler Pelzer Group case

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-Adler Pelzer Group Facts

-Innovation at Adler Pelzer: drivers & answers

-eVO: an example of how Adler reacts to market trends/customer inputs

-Q & A

Adler Pelzer Group is a worldwide leader in the design, engineering and manufacturing of acoustic and thermal components and systems

Key stats

€1.41bn

Revenue 2017

€132M

EBITDA 2017 / 9.4%

#2 and #3

In Europe and Worldwide¹

11,000

Employees

22

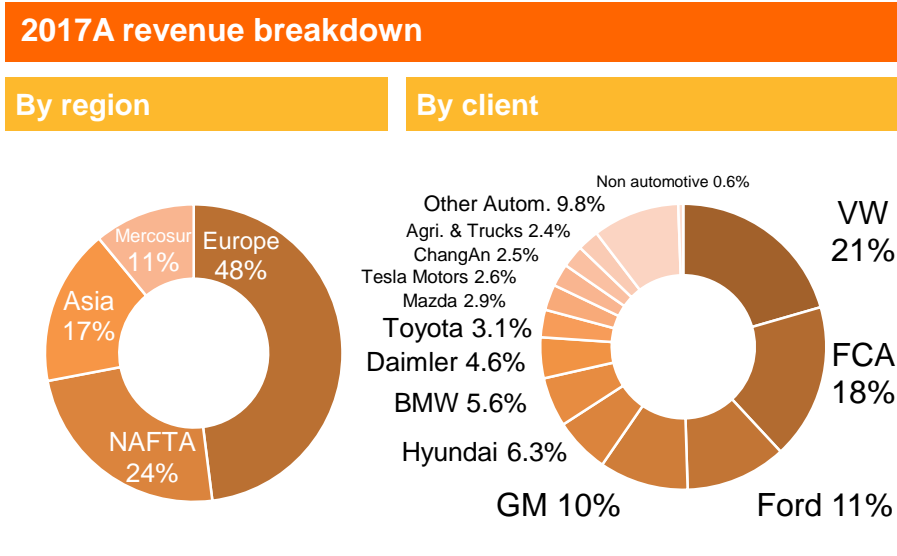
Country presence²

82

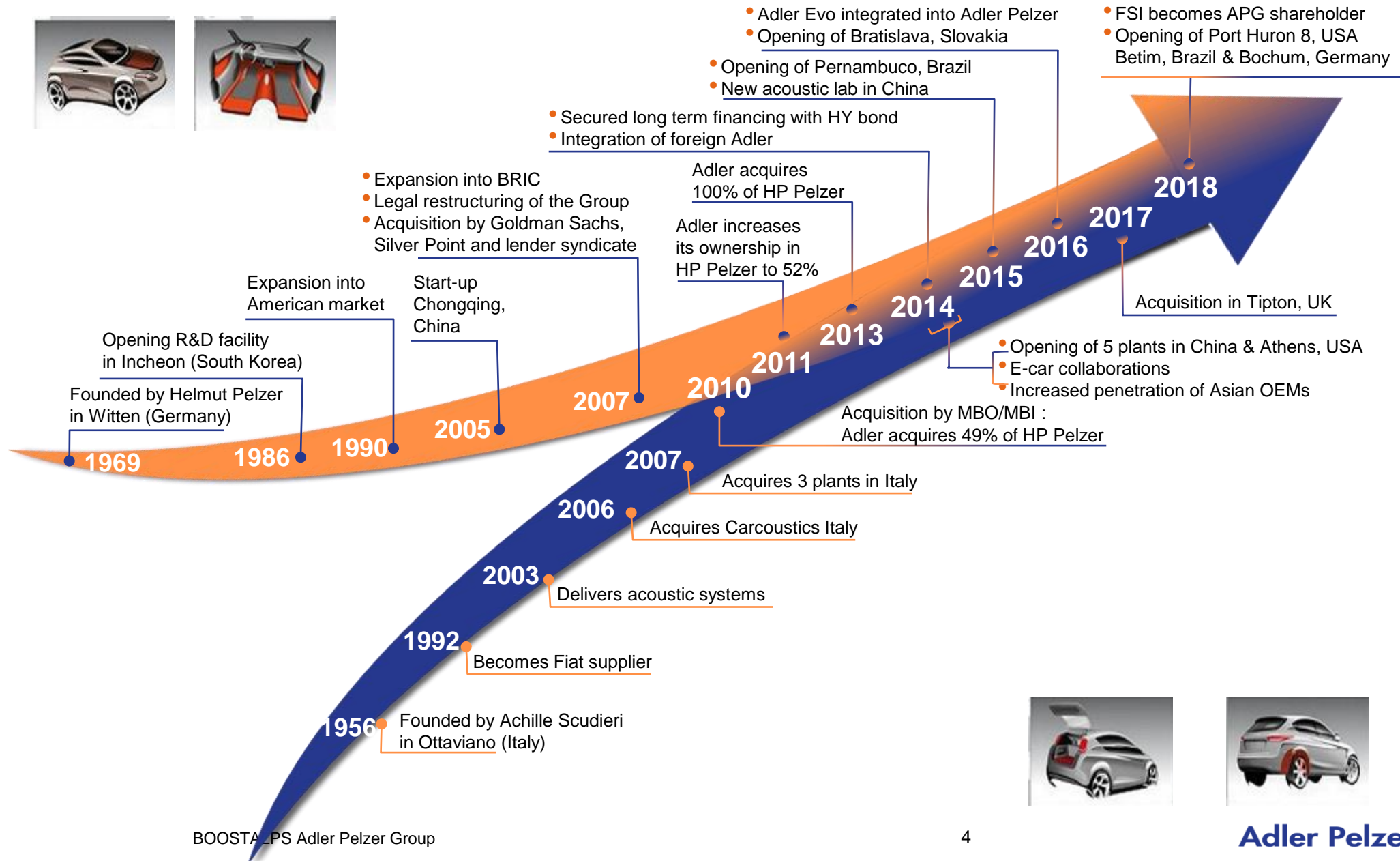
Facilities²

13

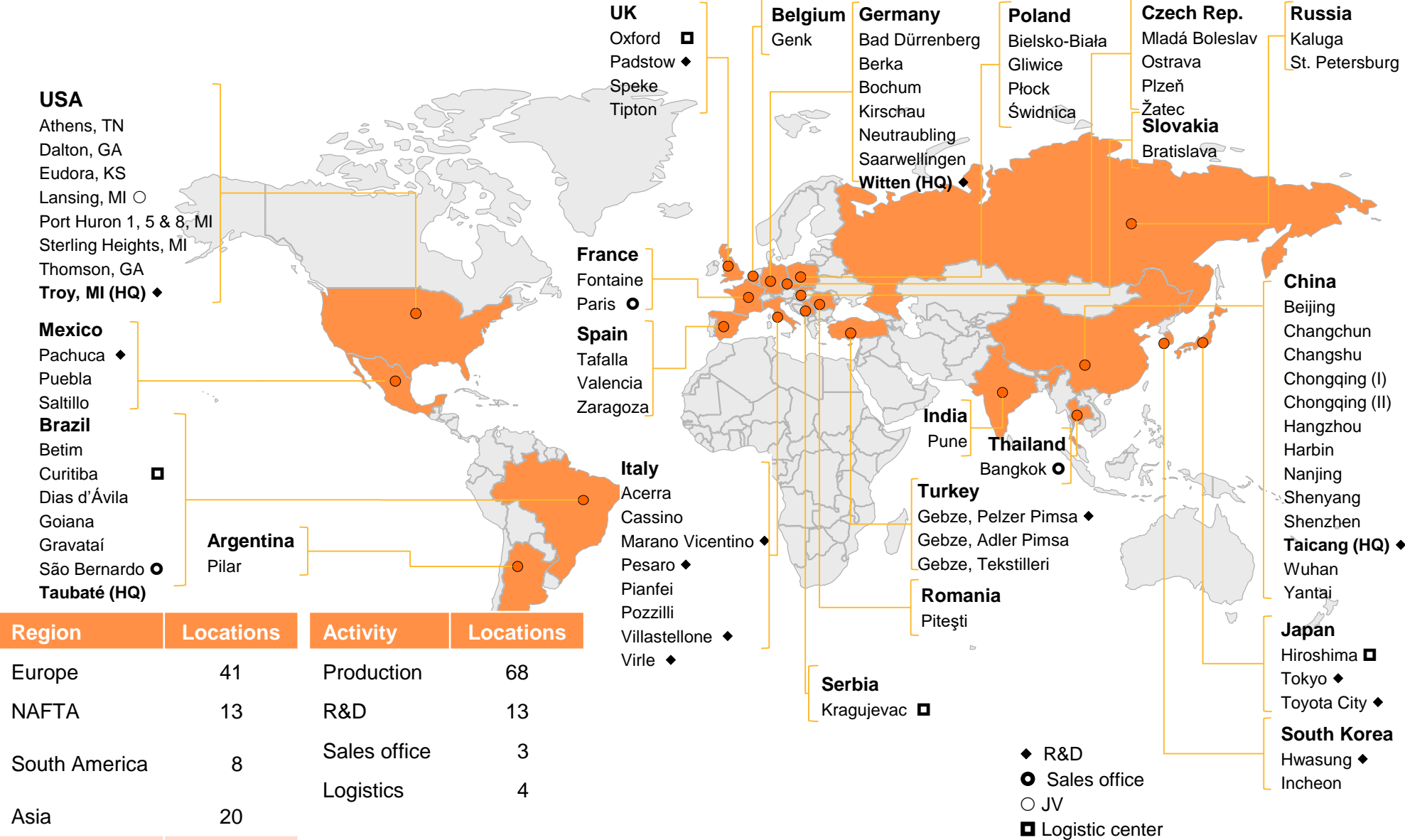
R&D centres



Company history



More than 11,000 employees in sites located near major automotive hubs

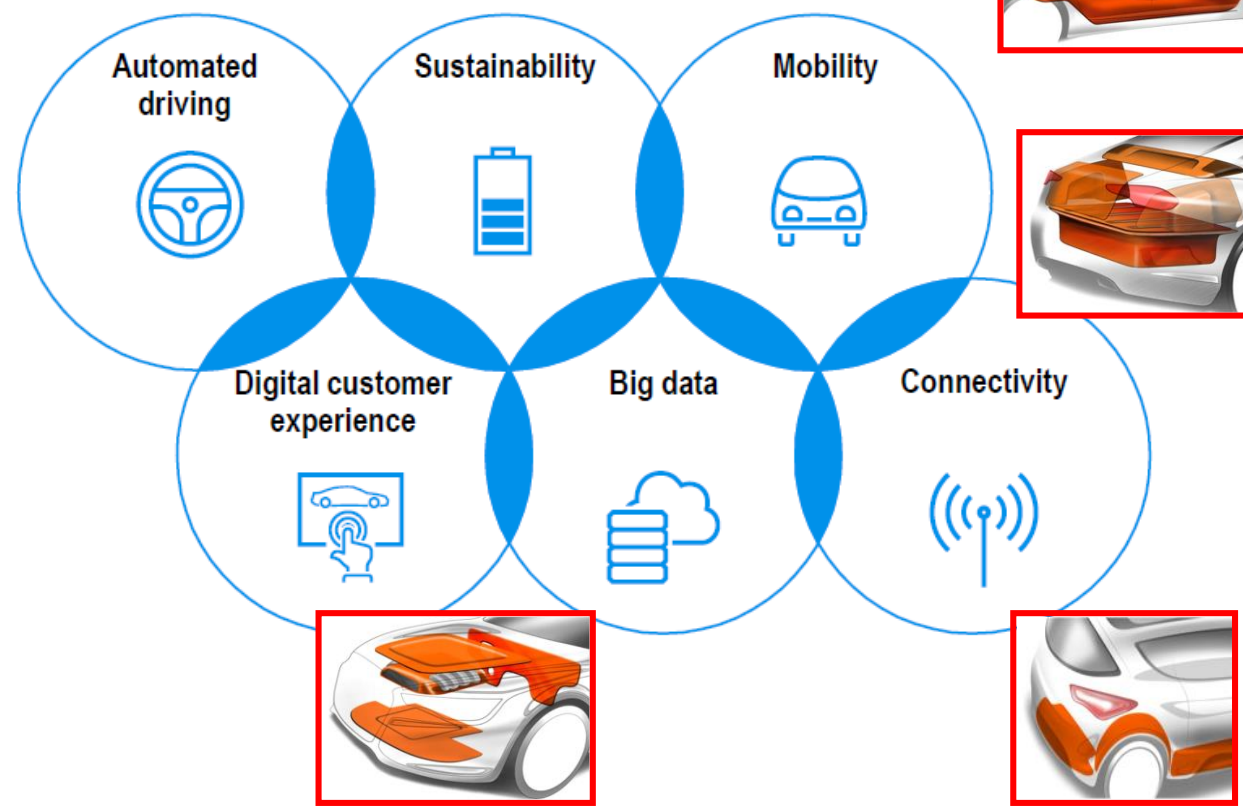


Disruptive trends are converging, significantly reshaping the automotive landscape and traditional value chain dynamics

Key automotive trends and disruptions

Major disruptions

- > Re-prioritizing of **customer expectations** & buying criteria
- > New and open **ecosystem**
- > Innovation in **business models**
- > Change in **value centers**
- > Fast **development cycles**



Trends in the Automotive World

Extended Electric and hybrid vehicle ingress into the market.

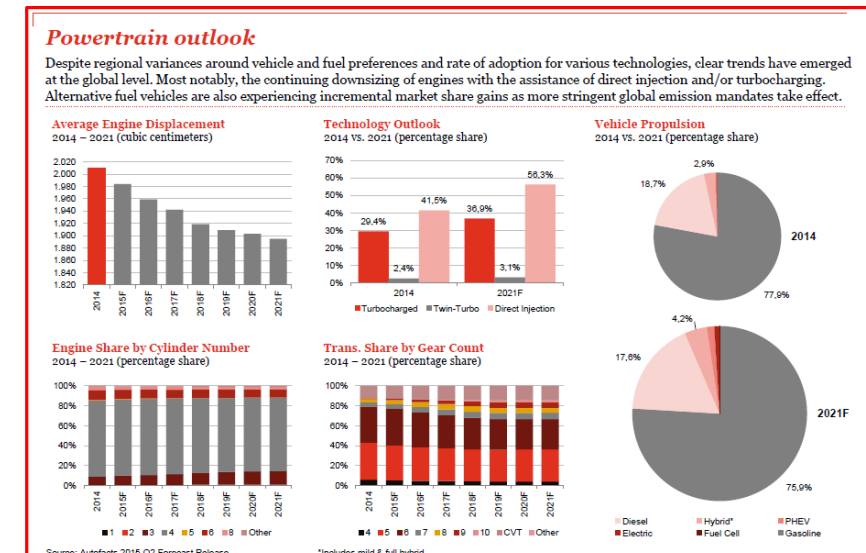
Driverless vehicle development especially by non traditional suppliers (ie Google, Apple,...).

New exterior noise legislation requirements.

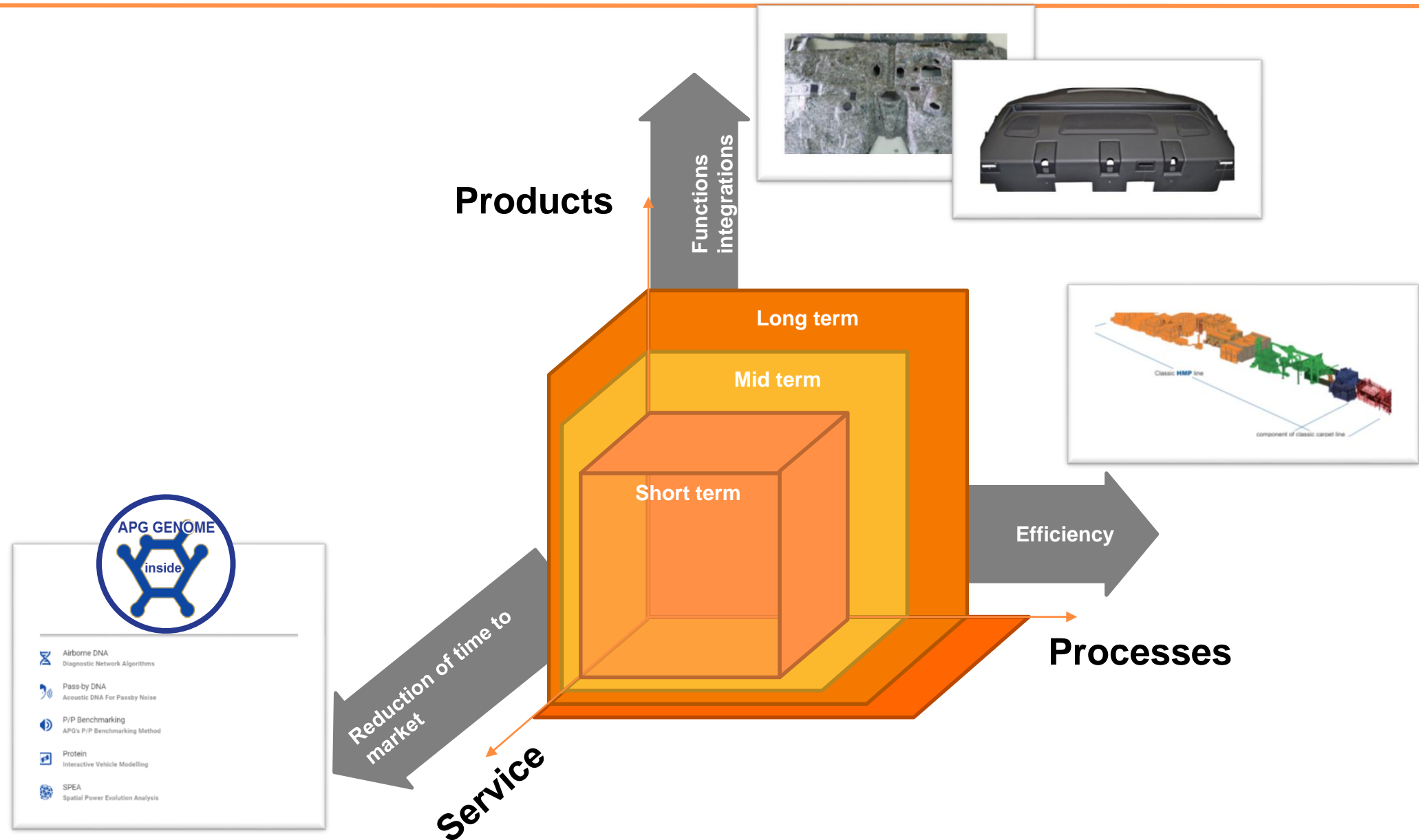
Continued vehicle platform commonality.

Customisation of individual vehicles based on a common platform.

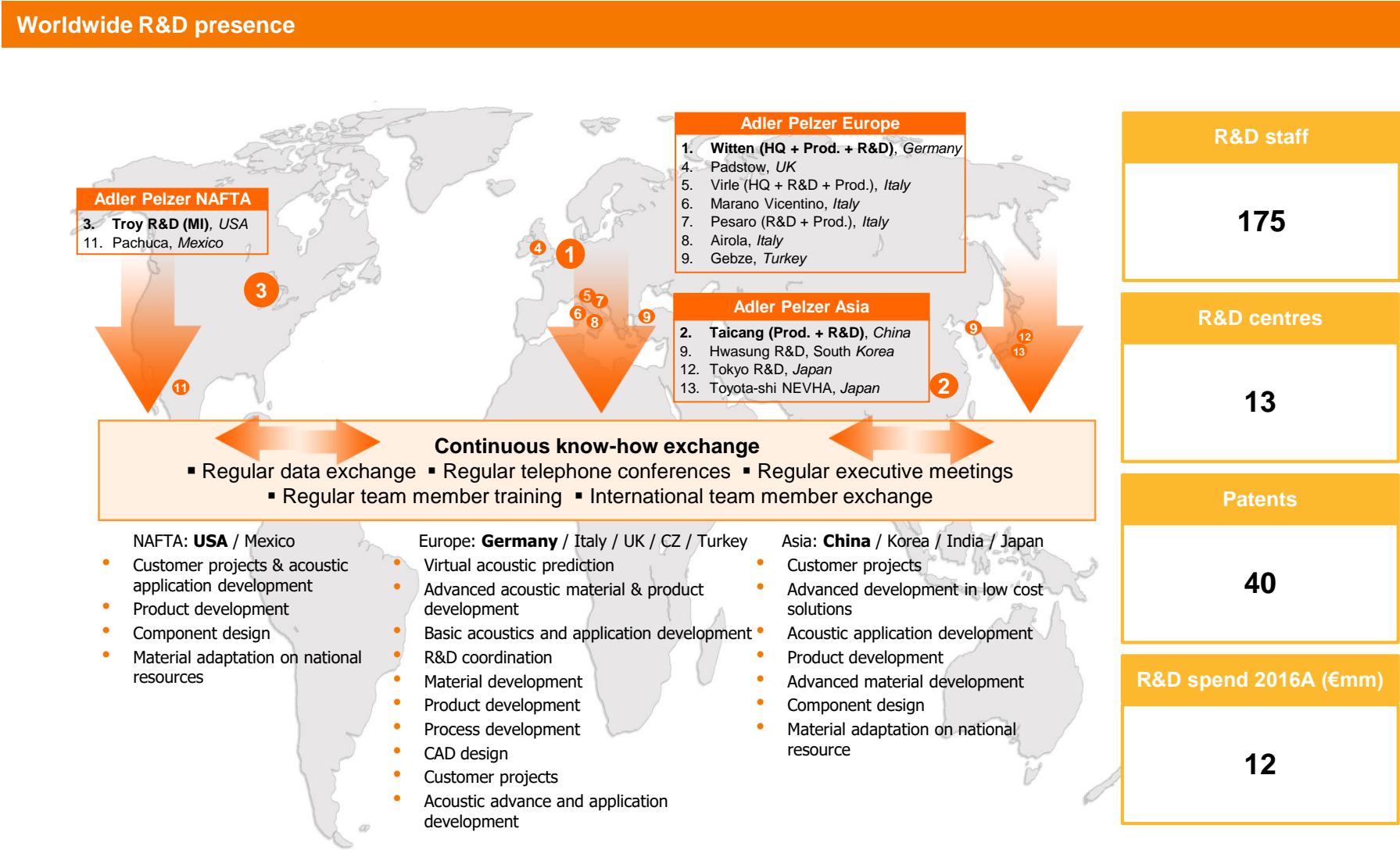
Vehicle sharing, “Robotaxis”... (different ownership/use models).



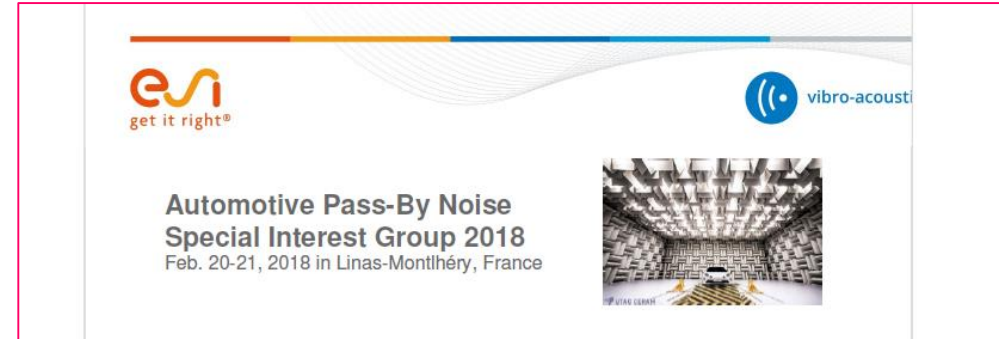
Innovation for APG: driver for growth, in 3 dimensions (product, process, service)



Strong innovation capabilities through a global R&D set-up



APG tech-scientific references & network; projects e partners (some...and very recent)

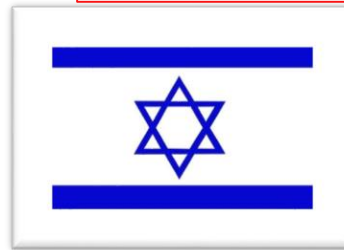


THE USE OF INTERACTIVE WEB BASED PROGRAM APPLICATIONS FOR IN-DEPTH VEHICLE NOISE ANALYSIS

Rod Morris-Kirby, Evan Harry, Adler Pelzer Group
Presented by Dr Weiwei Wu



Adler Pelzer Group



רשות החדשנות
Israel Innovation
Authority



UNIONE EUROPEA
Fondo Sociale Europeo
Fondo Europeo di Sviluppo Regionale



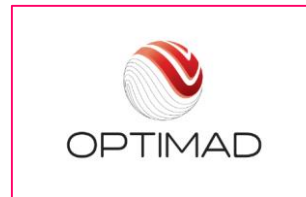
10th International Styrian Noise, Vibration & Harshness Congress The European Automotive Noise Conference



June 20-22, 2018 Graz / Austria www.isnvh.com



The Sound of Silence – NVH trends for conventional and electrified vehicles

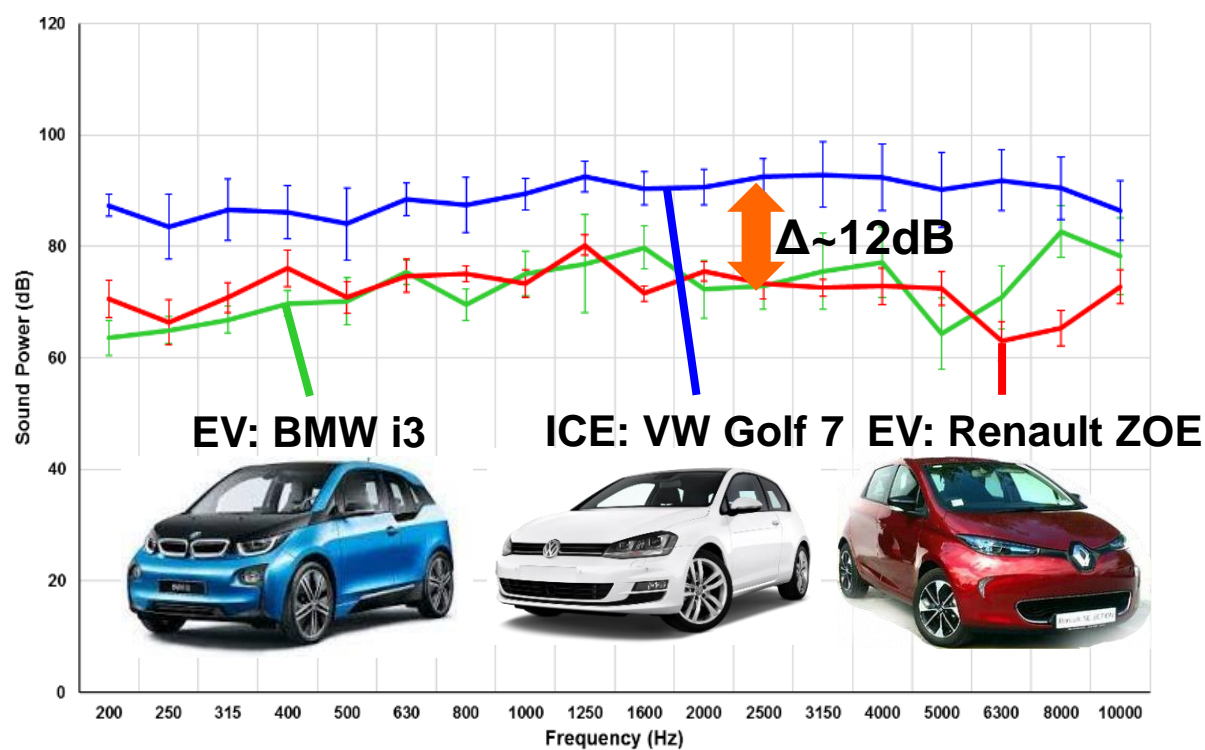


End user expectation of acoustic comfort of an EV¹ is higher than for an ICE² vehicle. Car noise perception highlights dominant tire and wind noise, as well as external noise emitted by accessories, HVAC and BSR³, as well as by surrounding vehicles.

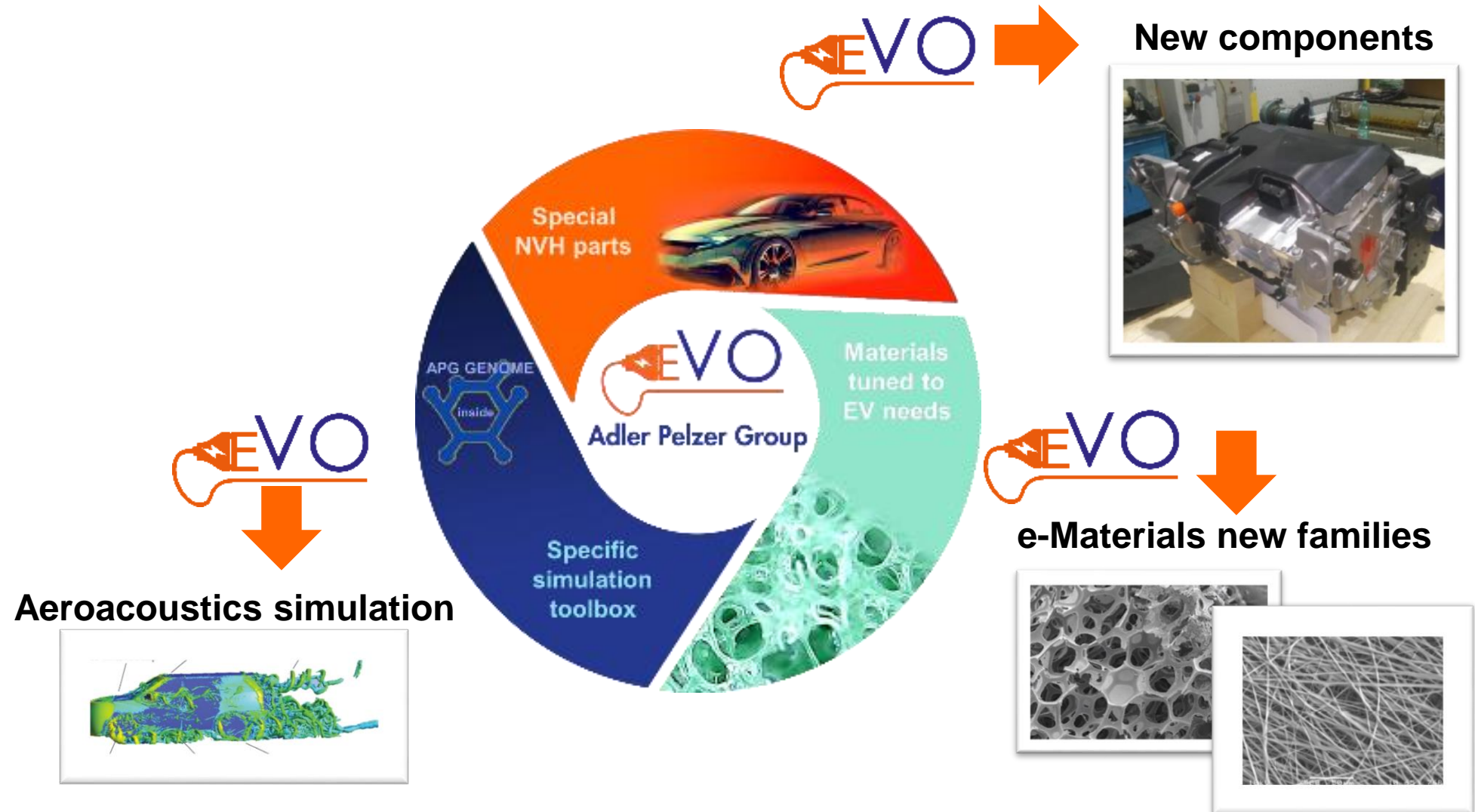
Adler Pelzer Group has developed a specific method of analysis, “DNA⁴”.

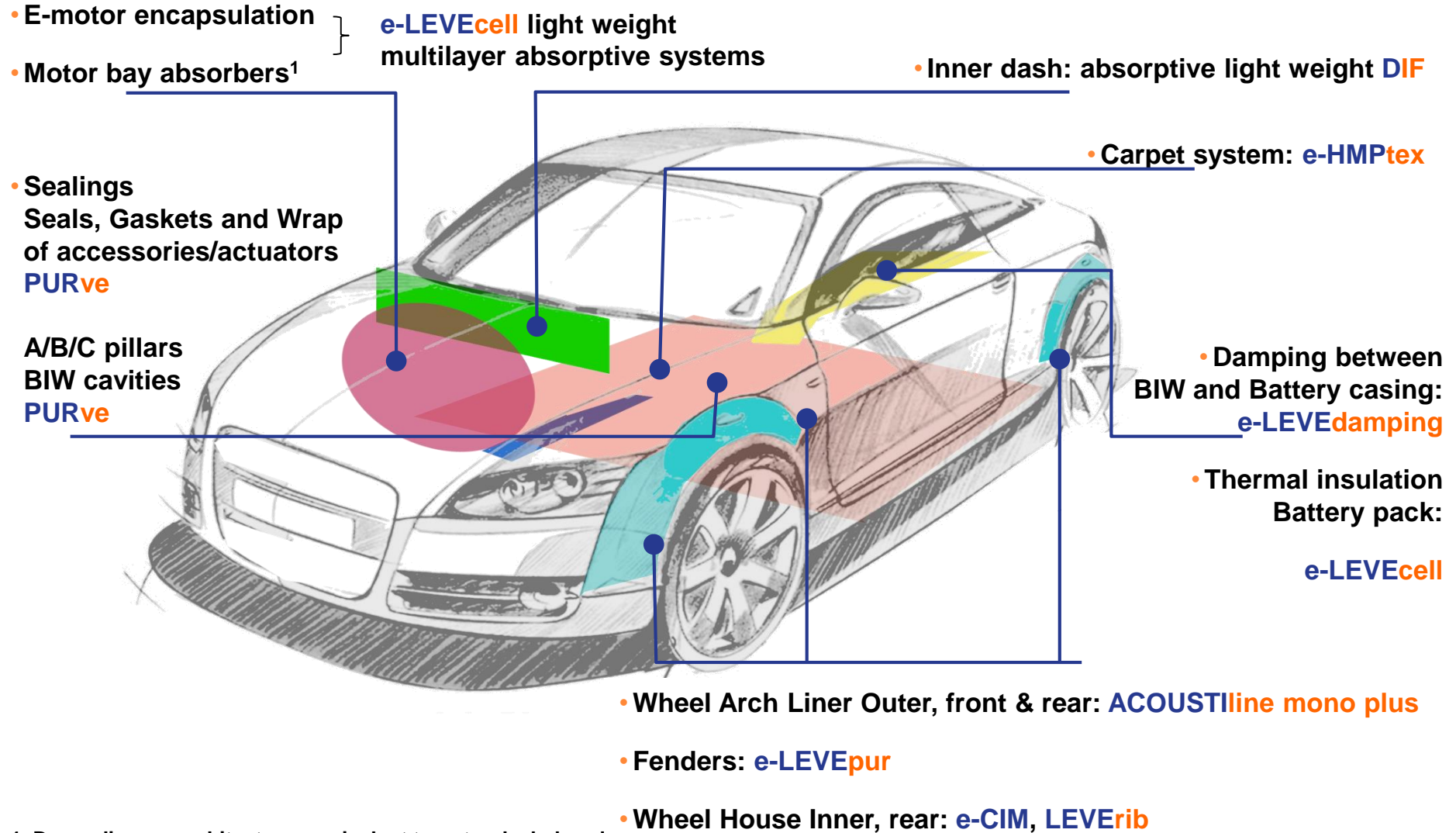
DNA studies confirm the trend to reduce or avoid “mass barriers” against e-motor noise for low and mid segment vehicles.

E-motor sound power is approx. 12dB lower than a diesel engine.



1 Electric Vehicle 2 Internal Combustion Engine 3 Buzz Squeak and Rattle 4 Diagnostic Network Algorithm



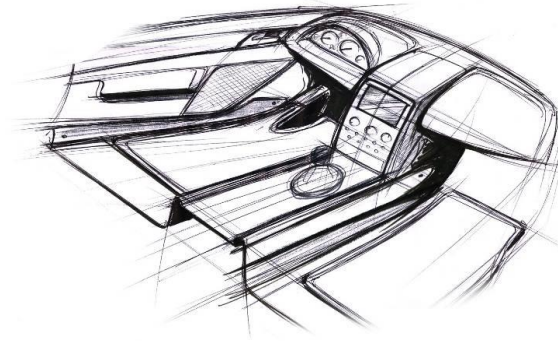


1 Depending on architecture, equivalent to outer dash, hood.....

New megatrends & automotive carpets functional requirements, both for EV and ICE

installation space / package
feasibility
weight
assembly
logistics
performance / functionality
recycling
Shared mobility
„cosyness“

Standard & new drivers



> aesthetic requirements

surface optics, haptics, appearance

> acoustic functions

damping, absorption, insulation

> mechanical functions

penetration force, bending stiffness, abrasion

> best utilization properties

good cleanability, high light resistance

> climate & heat aging resistance

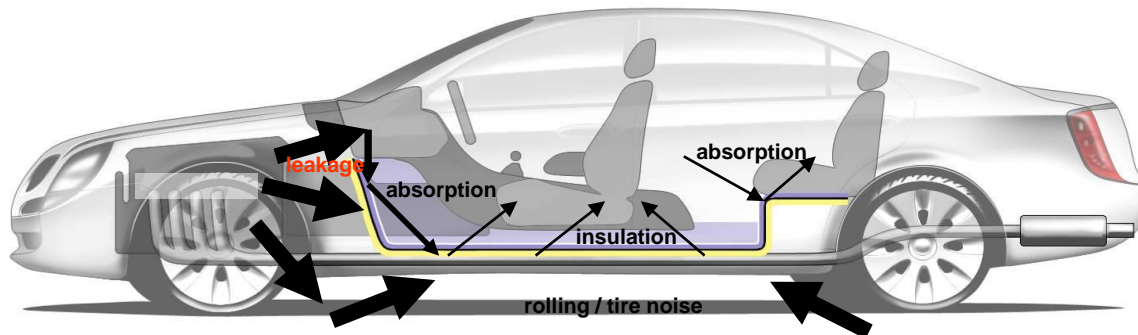
heat resistance, moisture resistance

> emissions

odour, fogging

> burning behaviour

> producibility / feasibility



Footprint at APG, carpet production focus



4 plants producing Tufting carpet

11 plants producing Dilour/Flat Needled carpet

2 Plants producing Fibres for needed carpet

Trends and innovations in automotive carpet surfaces

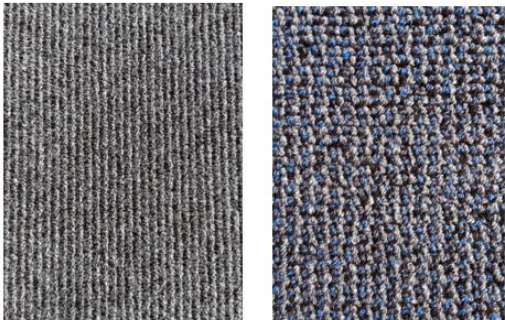
100% PET matrix, both for tufting and needle punch systems



Recycled PA6 matrixes on tufting bases

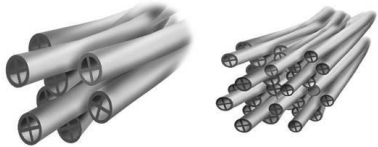


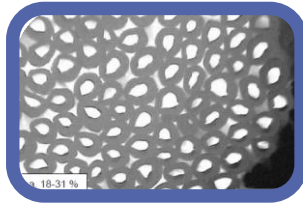
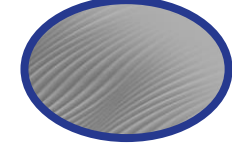
Alternative surfaces, embossed (EV different geometries)



„Domestic“ and different environment trends

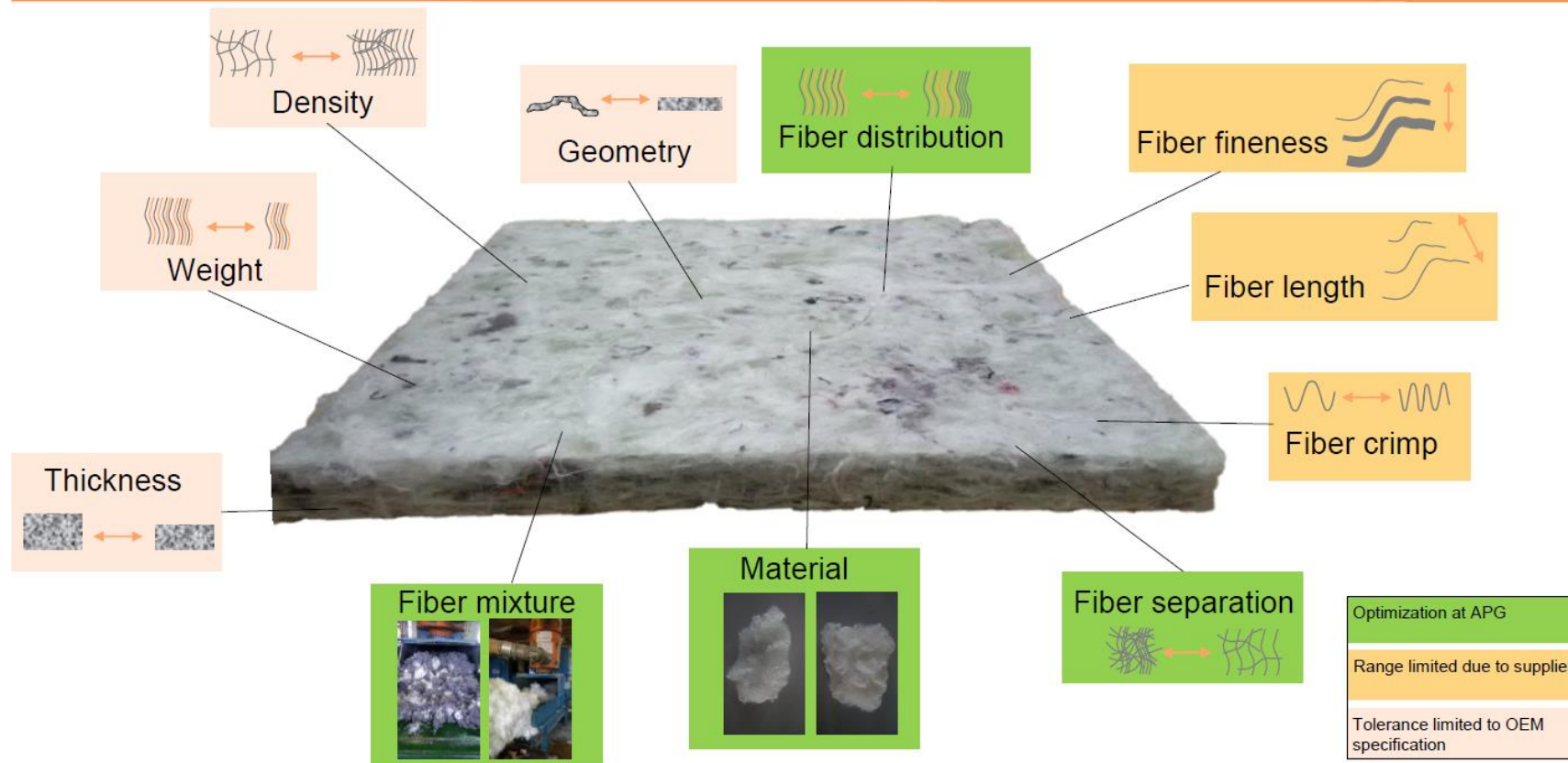
Lightweight (hollow fibers), wear increased resistance

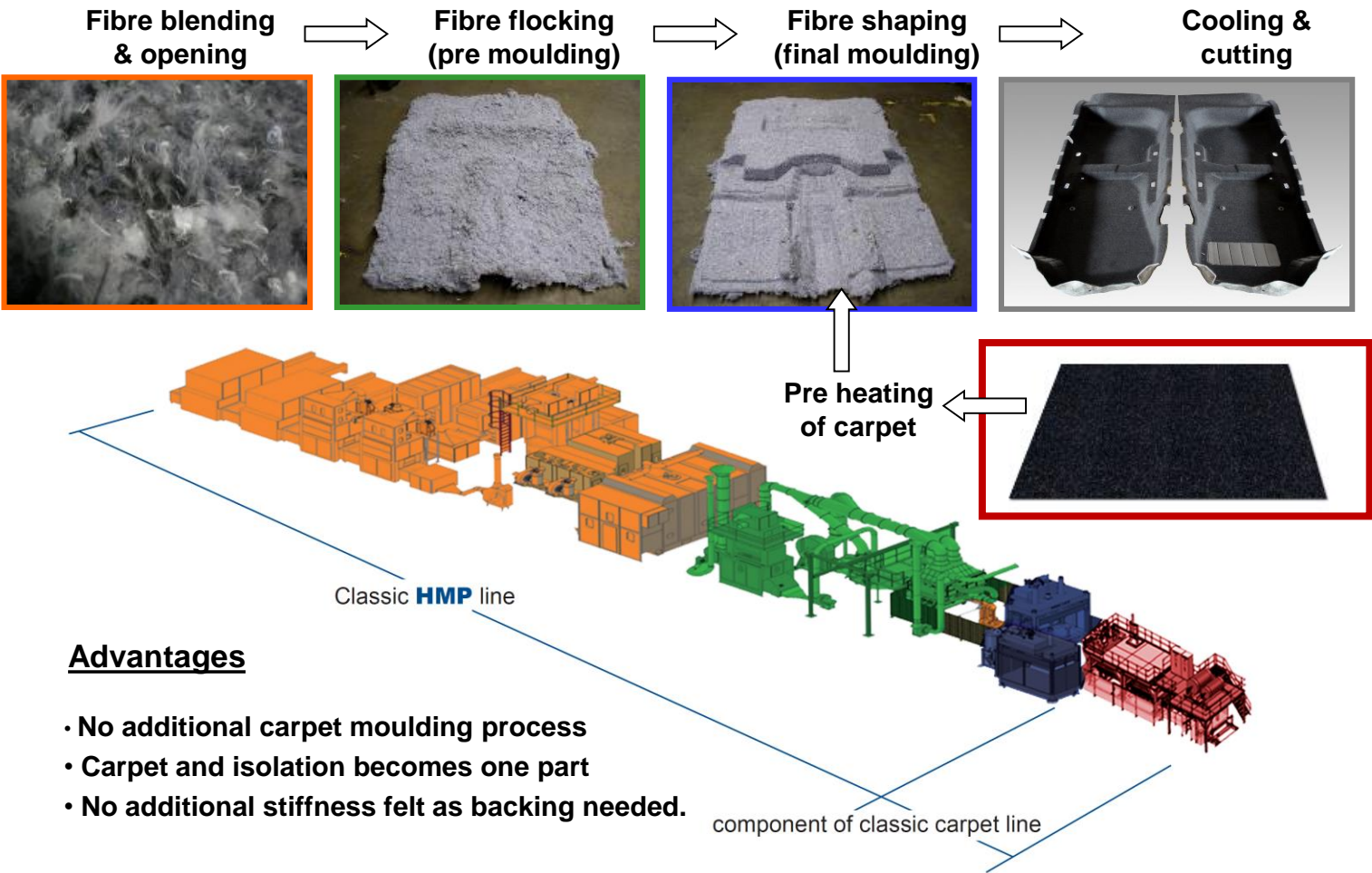




e-HMP: new HMP formula, fully synthetic fibers mixture resulting in low density and outstanding acoustic properties, combined with enhanced mechanical properties

Properties of fibers and fibrous parts contributing to acoustic performance





Vertical integration example: fibers into acou parts (carpet surfaces & insulation) via PET recycling technology

Bottle scrap



PET bottles



PET fibers reprocessing



Car acoustic parts

GRAPHENE SUBSTRATES

Graphene; mono sheet of Carbon atoms (hexagon lattices) in a 2 D structure

Stronger than steel, shapeable in thin structures, fit for several purposes

Can become a thin layer into technical textiles



Applications

- Sport
- Leisure
- Tech textiles
- Apparel

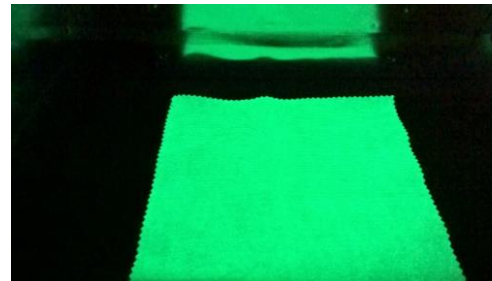
DARK GLOWING TEXTILES

photoluminescent

non permeable

water repellent

Multipurpose textile applications



Envisioning the future



Adler Pelzer Group

www.adlerpelzer.com

Thank you for your attention!