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Grant No 723119

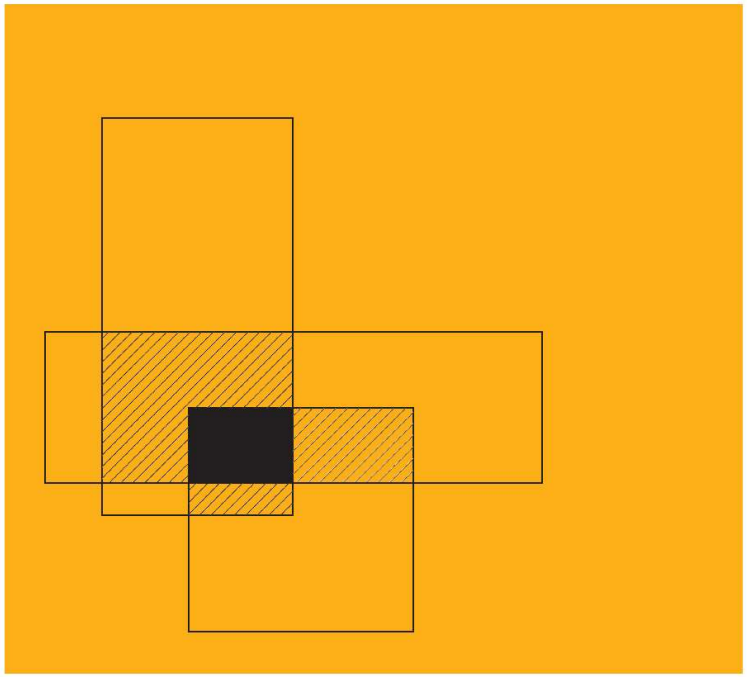
DEMOBASE

JOINT NETWORK EVENT

DEMOBASE

JEAN LAMONTANARA, MA
PIETRO PERLO, I-FEVS

SEPTEMBER 16TH 2020, JOINT NETWORK EVENT
(GRAZ, REMOTELY)



This project has received funding from the European Union's Horizon 2020 research and innovation programme

Main Focus: Modularity and Reduction of Investment

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The major concern of the OEMs is on the necessary investment to produce new safe, efficient and robust cars assuring a rapid return of the investment.

MA and I-FEVS focused on those aspects impacting most on the necessary upfront investments before manufacturing:

- Modular Body Frame: Safety First,
- Doors: Integration of a skeleton body to reduce the efforts on conventional stamping,
- Corner Wheel (hub and suspension arms): No moulds, no casting,
- Battery Pack Integration: Direct Cell to Pack («Lasagna»), Multifunctional composite floor,
- PWT assembly (4WD).

The development focused to a passenger vehicle is ready also for an urban delivery VAN.

Several patents have been applied.

Modular Body Frame

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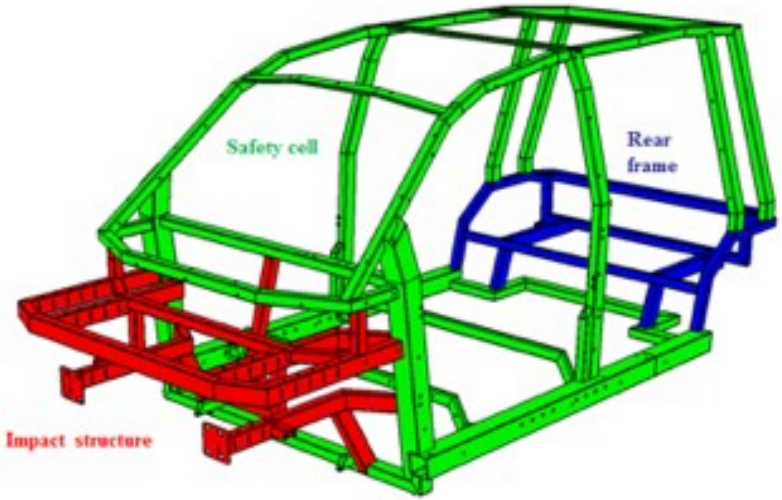

Comparison of a chassis made by conventional metal sheet stamping and a chassis made using high strength 3D laser modeled tubes. Left, conventional chassis: Design, Construction of Moulds, Stamping, Robotized line assembly (>100M€ investment, > 1 year development time). Right, Automatic driven design and construction of tubular chassis: - no moulds - no stamping - no robotized assembly - ultra simplified templates for a **quasi-self-assembled chassis**, meeting full frontal, off-axis and lateral crash test requirements (few M€ investment, two weeks including design and development time). Straightforward modifications of the dimensions.

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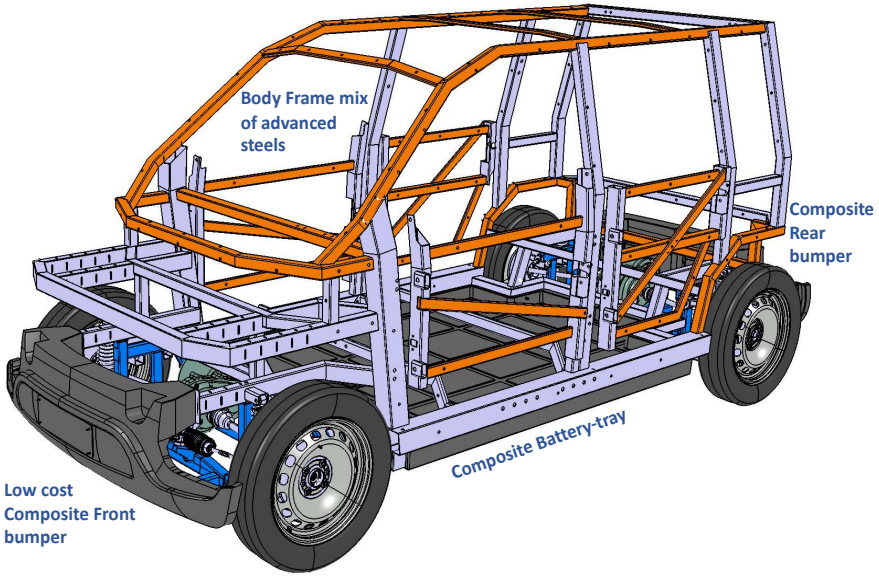
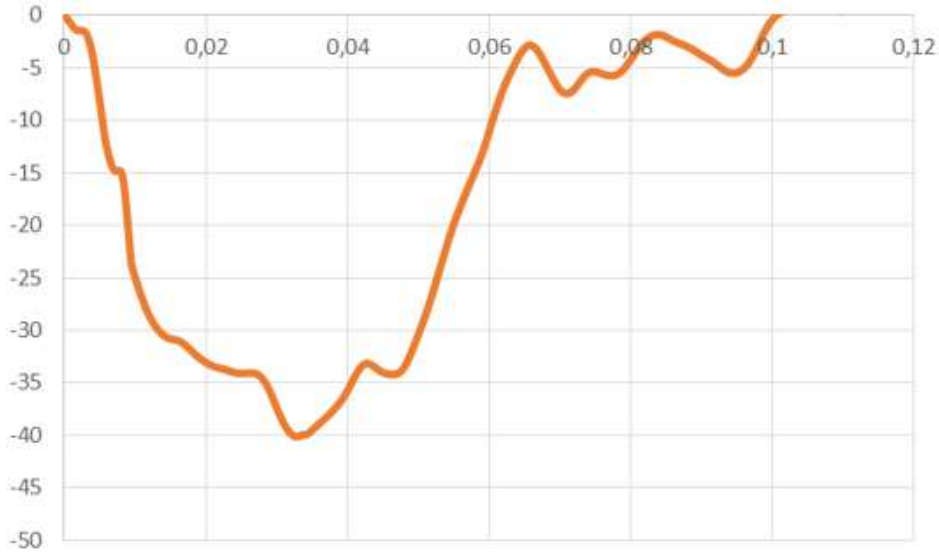
Body frame: Safety First





Full frontal crash simulation of the body frame: a peak acceleration of 40g position the vehicle at the best in class per its category. Similarly, we have demonstrated best in class performance for side and off-axis impacts.

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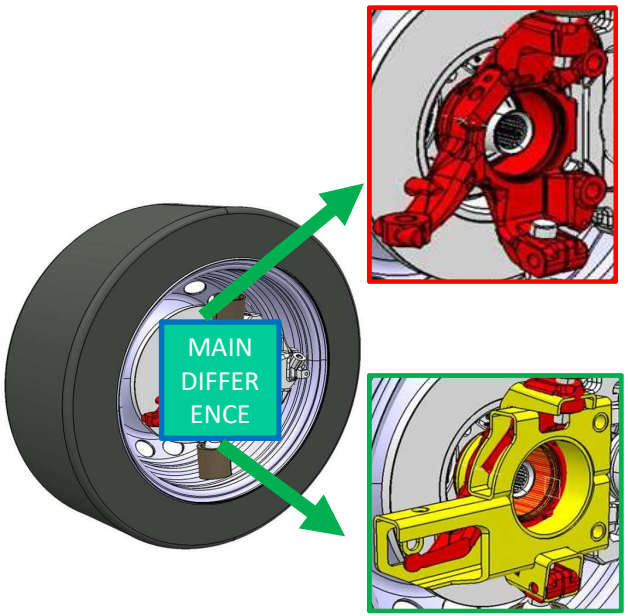
HUB and corner systems– New concepts

- New Hub concept was developed within the Demobase project. Today this component is designed as a monolithic structure obtained through a fusion process. The new hub holder concept, on the other hand, is thought of as a simpler component made by means of a series of tubes welded together.
- Currently the structural capabilities of the new component are being verified. These verifications are compared with the component made in the traditional way.
- These evaluations include both virtual calculations and experimental tests.
- Similar activity performed for suspension arms.

Traditional concept



New concept: no moulds, easy to change and to make.

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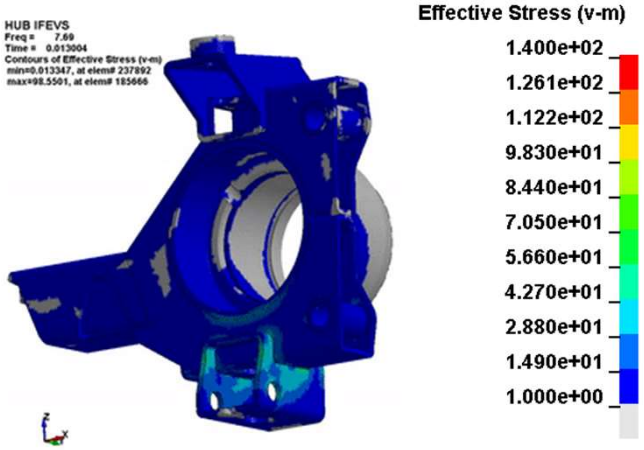
HUB and corner systems– New concepts

- Virtual verifications extend from quasi-static non-linear analysis to dynamic (fatigue) analysis..



Experimental tests are performed at ToProveLab using appropriate instrumentation for structural testing of wheel systems.

Battery Pack: direct cell to pack solution «Lasagna» patented approach

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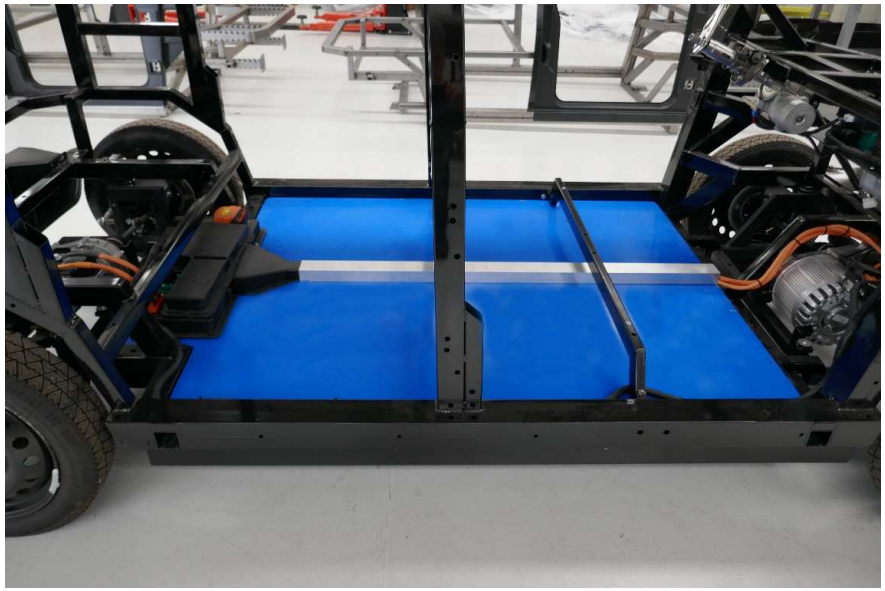
Ultra lightweight thermally insulated battery tray also acting as vehicle floor.



21kWh Lasagna pack in a total thickness of 100mm

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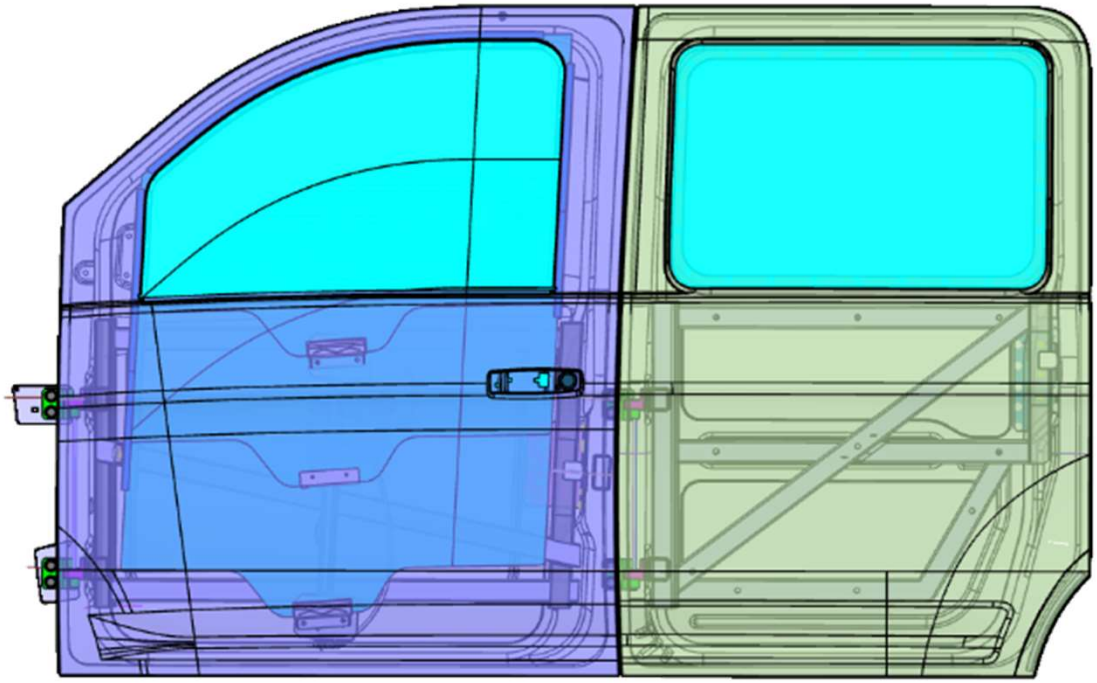
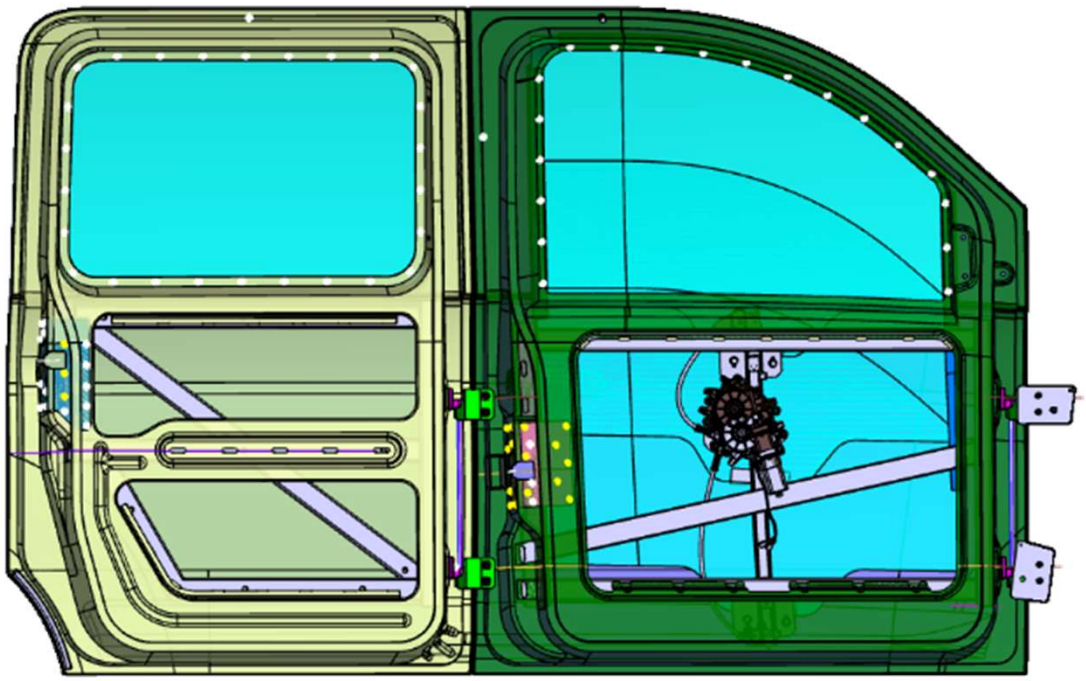
Final Doors



Outside view



Inside view

2 dies for outer and inner panels instead of the usual 10 to 12 dies

Assembly line concept under development (started thanks to DEMOBASE)

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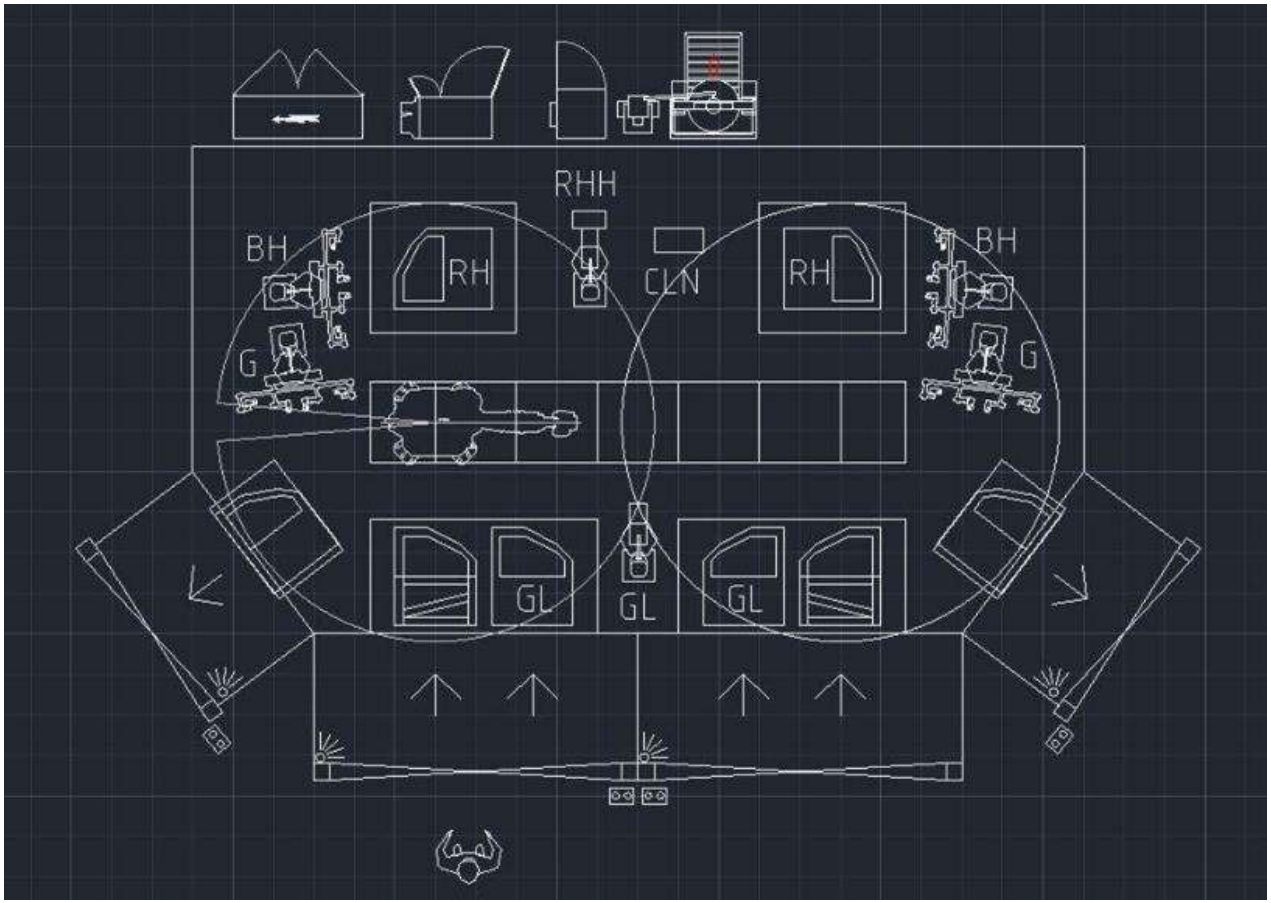

Low investment microfactory

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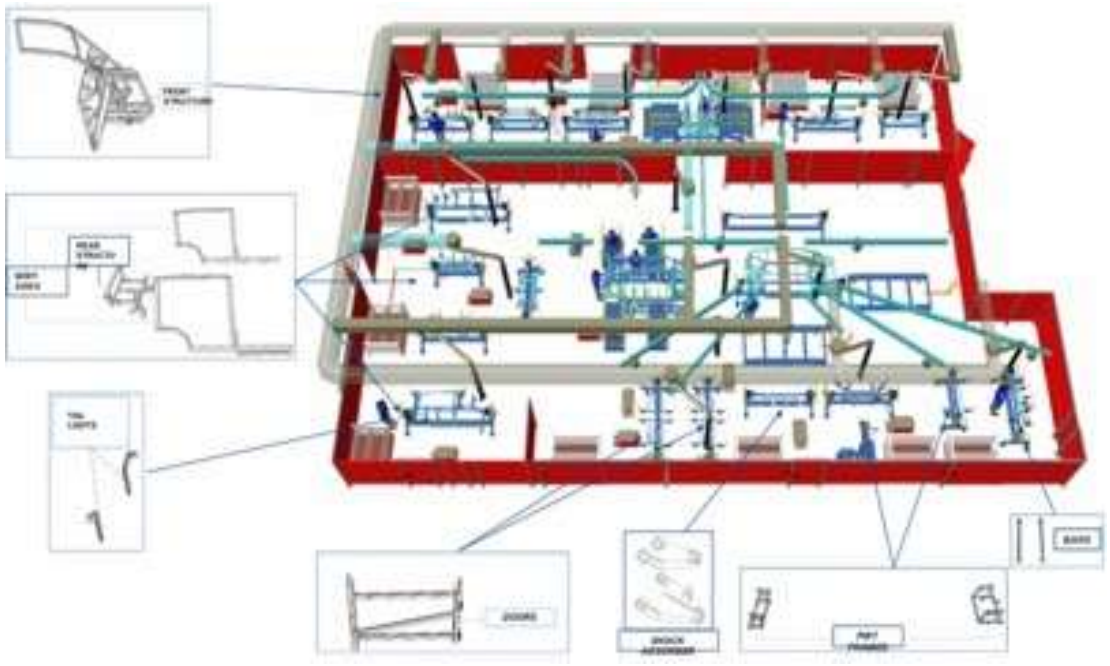

Top view of the 1500m^2 area where body frames, doors frames, axle frames, wheel hub and suspension arms are produced. No expensive moulds and no advanced robotics are needed. The complete microfactory requires 4500m^2.

Conclusions: Outcome of the Modular Platform

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Demobase Passenger M1

Multipurpose Van N1 (Option L7e CP)

- Low Investments, Flexible, Agile and Lean Manufacturing,
- Best in class: **Safety, Affordability, Ergonomics, En. Consumption, Security.**

A big thank you to the partners and to the EC for the support

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- **SAFT SAS**
- ACCUREC-RECYCLING GMBH
- FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
- INSTITUT NATIONAL DE L'ENVIRONNEMENT ET DES RISQUES INERIS
- INFINEON TECHNOLOGIES AG
- MODELON AB
- IFP Energies nouvelles
- FORSCHUNGSZENTRUM JULICH GMBH
- INTERACTIVE FULLY ELECTRICAL VEHICLES SRL
- K&S GMBH PROJEKTMANAGEMENT
- MA SPA

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