

ArcelorMittal Multi Part Integration® Production CO₂ Footprint



IABC - Turin 2023



Contents

- **Introduction to ArcelorMittal Multi Part Integration™**
- Industrial gains induced by ArcelorMittal Multi Part Integration™
- Synthesis about production CO₂ footprint
- Conclusion

What is ArcelorMittal Multi Part Integration™ ?

ArcelorMittal needed to provide an answer to new automotive market trends such as:

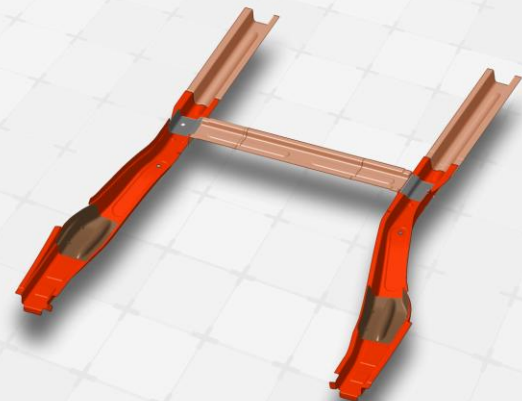
- Simplification
- Modularity
- Electrification
- Sustainability

ArcelorMittal Multi Part Integration™ made of steel:

- Produces high-tech LWBs
- Uses latest PHS steel products to form complex designs
 - **Usibor® 2000 and Ductibor® 1000**
- Uses hot stamping of one single LWB
- Creates large parts which integrate many components

New **mindset** brings added value to OEMs – in addition to mass savings, cost efficiency and sustainability.

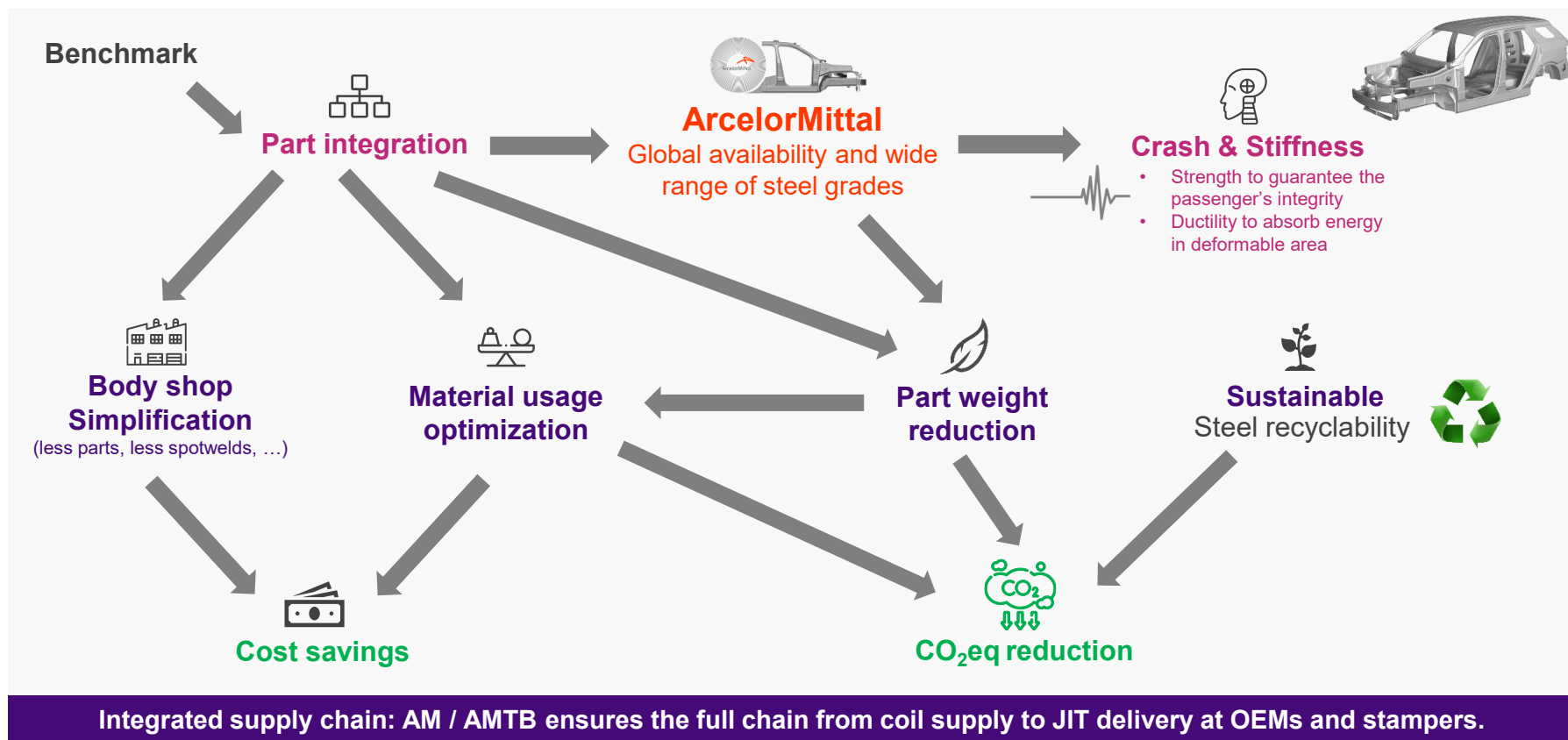
ArcelorMittal Multi Part Integration™
Sustainable steel solutions to simplify car manufacturing



ArcelorMittal Multi Part Integration™ helps to reduce the number of parts.

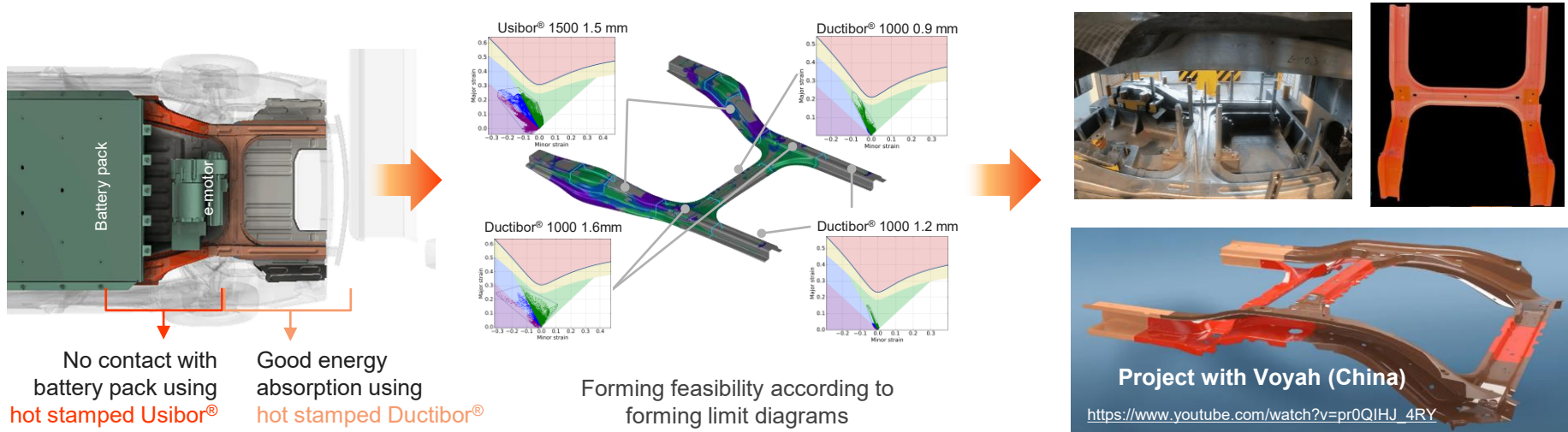
Here from 11 parts to only 1 part.

ArcelorMittal **Multi Part Integration™** to help carmakers to reach their challenges



ArcelorMittal Multi Part Integration™

From design engineering to Prototyping and Implementation



Design Engineering

Feasibility Assessment

Prototyping

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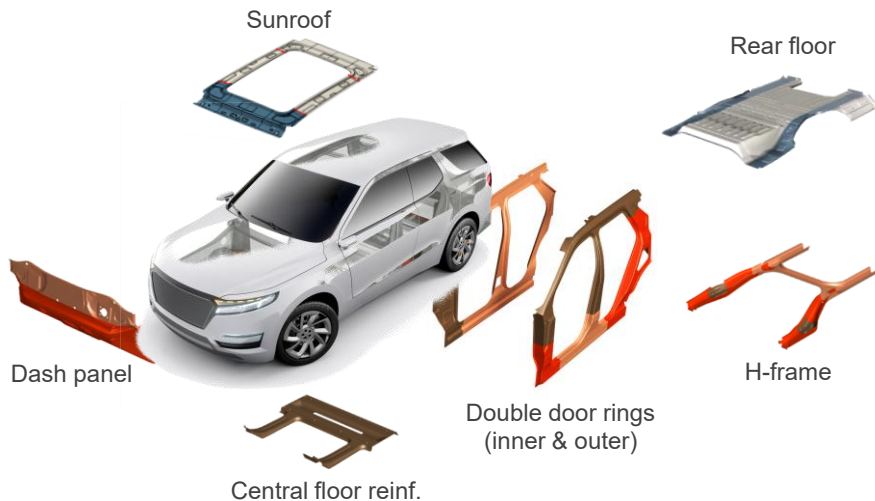
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ArcelorMittal Multi Part Integration™

Potential body-in-white applications for BEV



Several MPI solutions have already been developed based on ArcelorMittal's generic S-in motion® SUV BEV



Upcoming MPI solutions are currently in development

Reference



-18 parts/vehicle

-10 parts/vehicle

-3 parts/vehicle

-8 parts/vehicle

-7 parts/vehicle

-3 parts/vehicle

MPI

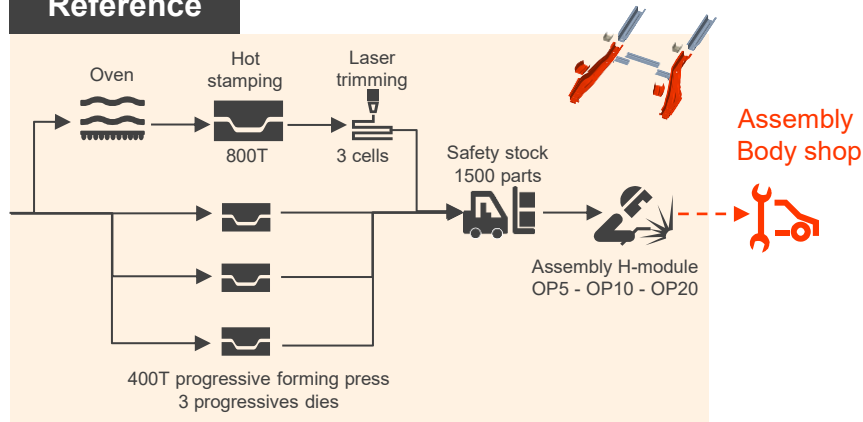


From 62 parts to 14 parts (-48 parts) / vehicle

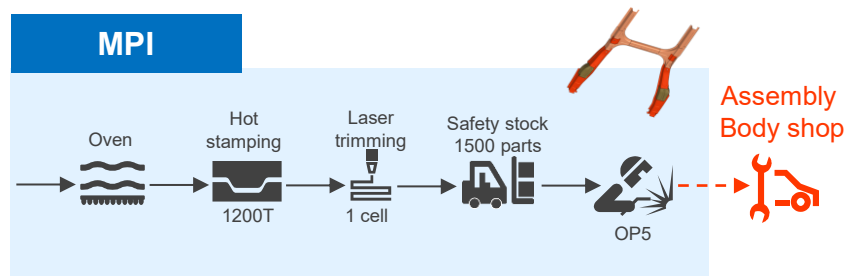
Up to -567 spot-welds / vehicle

Process simplification thanks to ArcelorMittal **Multi Part Integration™**

Reference

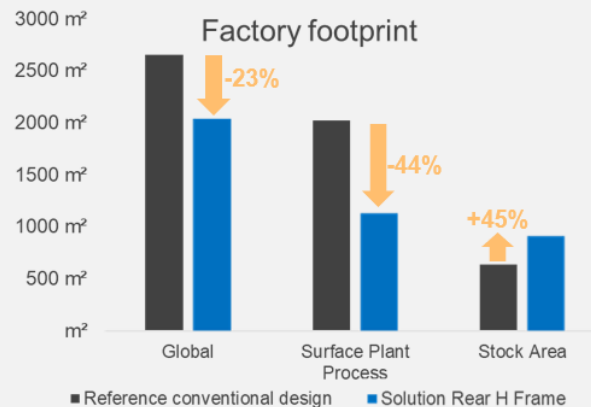


MPI



- Detailed analysis done by **bertrandt** on the area required for both configurations (press shop, module assembly, stock area).
- Key hypothesis
 - Plant production: 45 vehicles/hour → ~150,000 vehicles/year (life time 5 years)
 - Safety stock = 1500 stamping out parts

bertrandt



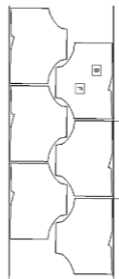
A reduction up to 23% of the global area thanks to the MPI H-frame.

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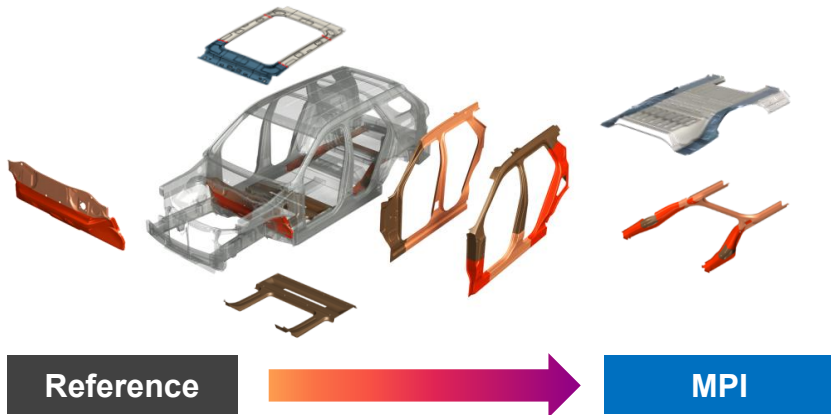
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ArcelorMittal Multi Part Integration™ brings additional CO₂eq savings thanks to nesting optimization

- Manufacturing context: EU-28
 - Metal production: Steel sourcing - Europe
 - CO₂eq savings due to **Material utilization reduction**
 - *Suppression of overlap areas*
 - *Higher flexibility in the nesting*
- MPI solutions minimize scrap and gross weight*

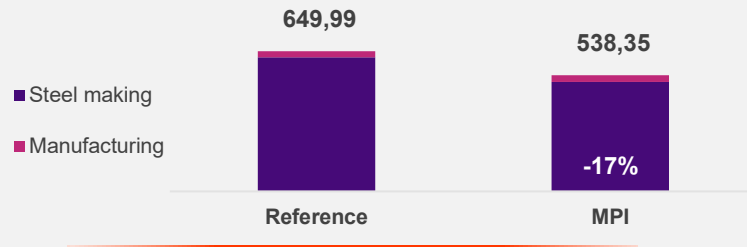


Considering those 7 MPI solutions

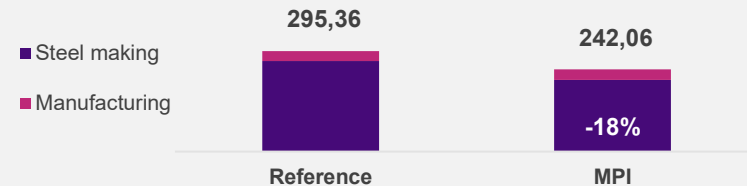


Raw material savings
-46.9 kg/vehicle (-18%)

Without recycling credit (kg CO₂eq)



With recycling credit (kg CO₂eq)



Driving phase not included



Additional CO₂eq reduction achievable thanks to
Part net weight savings: -15.1 kg/vehicle (-9%) with MPIs

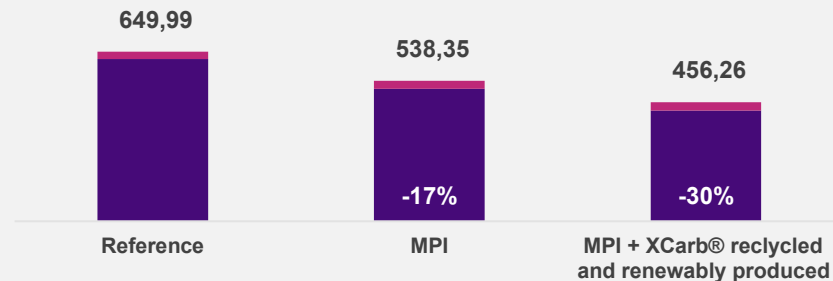
XCarb® products combined with ArcelorMittal Multi Part Integration™ to go further in terms of sustainability

Usibor® 1500 AS coated represents only **20%** of MPI gross weight



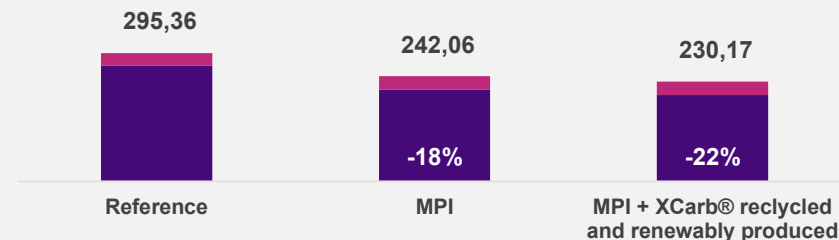
■ Steel making
■ Manufacturing

Without recycling credit (kg CO₂eq)



■ Steel making
■ Manufacturing

With recycling credit (kg CO₂eq)



Driving phase not included

Targets & ambition



ArcelorMittal
net zero 2050

2030

Group - 25%
EU+NA - 35%

Decarbonisation
projects in EU
started

XCarb®
Green steel certificate

- 2020: Launch of XCarb® green steel certificates
 - For steel made in blast furnace route
 - CO₂ savings from reducing fossil coal via specific & audited decarbonisation investments
 - Available in all products and grades

XCarb®
Recycled and renewably produced

- 2022: Launch of XCarb® recycled and renewably produced
 - Low CO₂ footprint steel made in electric arc furnace
 - Using renewable electricity
 - High recycled content
 - Available products:
 - HRP&O: FB & HSLA
 - Usibor®1500
 - More to come

XCarb®
Brand to be developed

- From 2025: New XCarb® products to be launched
 - Physical decarbonised steel
 - Based on direct reduced iron (DRI) technology
 - Available in all products and grades

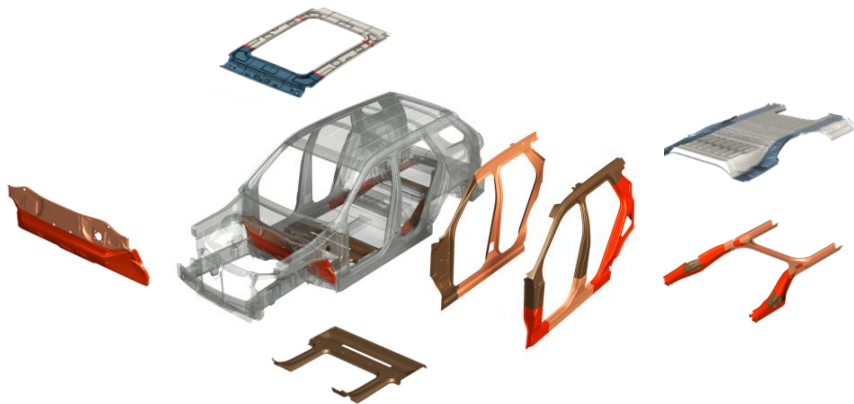
More low-carbon emissions XCarb® solutions will be launched as new decarbonisation technologies are deployed

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ArcelorMittal Multi Part Integration™

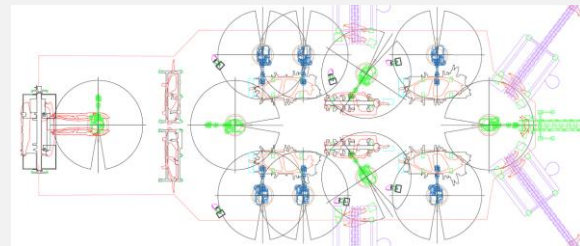
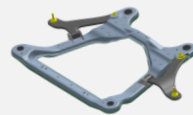
Tailored blanks giga stamping applications to simplify car manufacturing and make it greener



- From 62 parts to 14 parts (-48 parts) per vehicle
- 567 spot-welds per vehicle
- 26 stamping tools
- Gross weight savings: -46.9kg (-18%) per vehicle
- Up to 18% of CO₂eq reduction (excluding use phase & XCarb®)

Upcoming MPI results

1. New MPI solutions in development for:
 - Body-in-white
 - Chassis
 - HV-battery housing
2. Complete analysis regarding weight, cost and CO₂ footprint
 - At the rear unit level
 - At the BiW level
3. Steel MPI versus Aluminum high pressure die casting
4. Detailed body shop process (including equipment, operators, and plant area)



Multi Part Integration

Discover the power of less with MPI

In a rapidly evolving automotive industry, flexibility wins. Multi Part Integration maximises automotive manufacturers' ability to adapt through the power of less: less parts, less time less process, less floor space, less material, less CO₂ and less assembly cost.

Harness the strength of steel and the power of less.

For more, head to
mpi.arcelormittal.com

