

ArcelorMittal Multi Part Integration™ for Scalable Vehicle Architectures for Multiple Powertrains

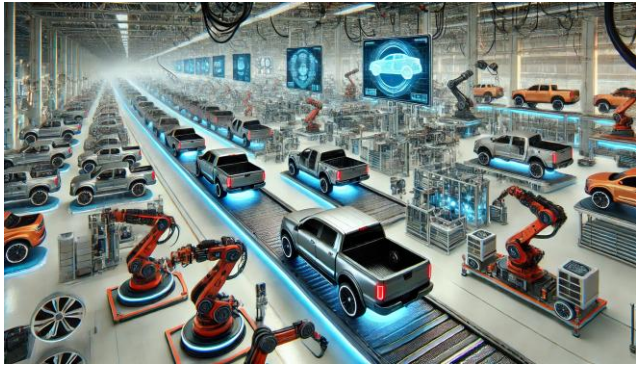
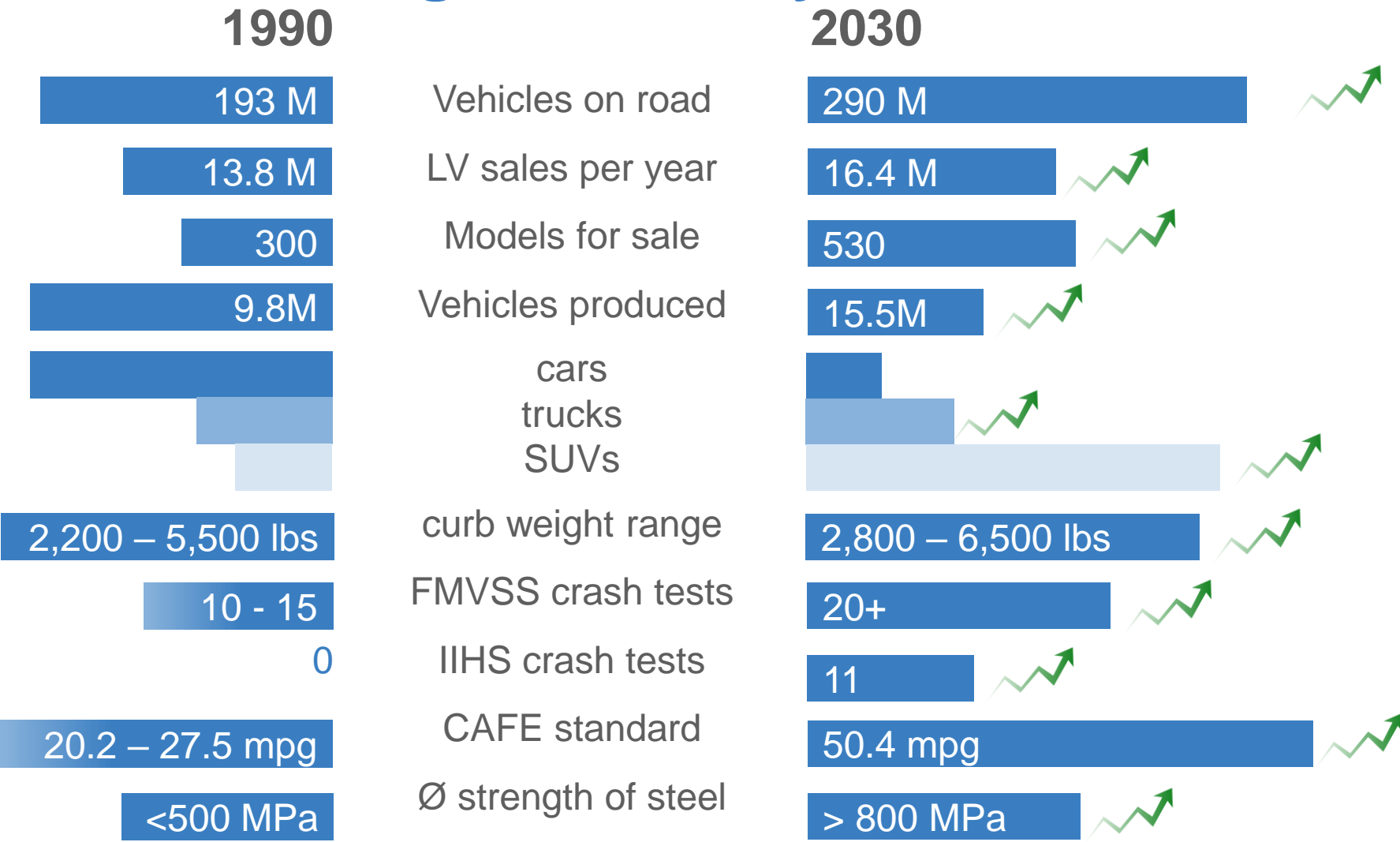
Nachiket Gokhale

Product Development Manager

ArcelorMittal Tailored Blanks

GREAT DESIGNS IN
STEEL™

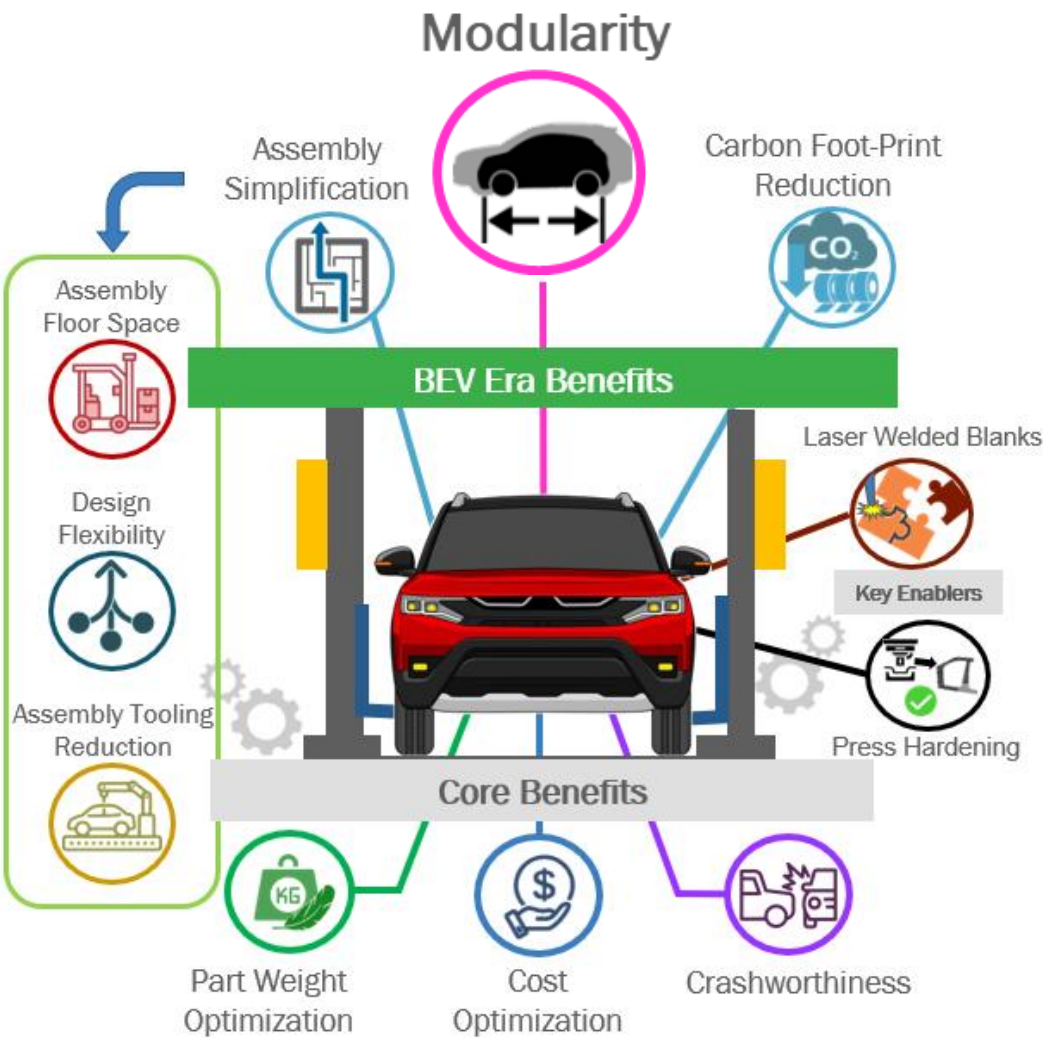
OEM Challenge Yesterday & Tomorrow



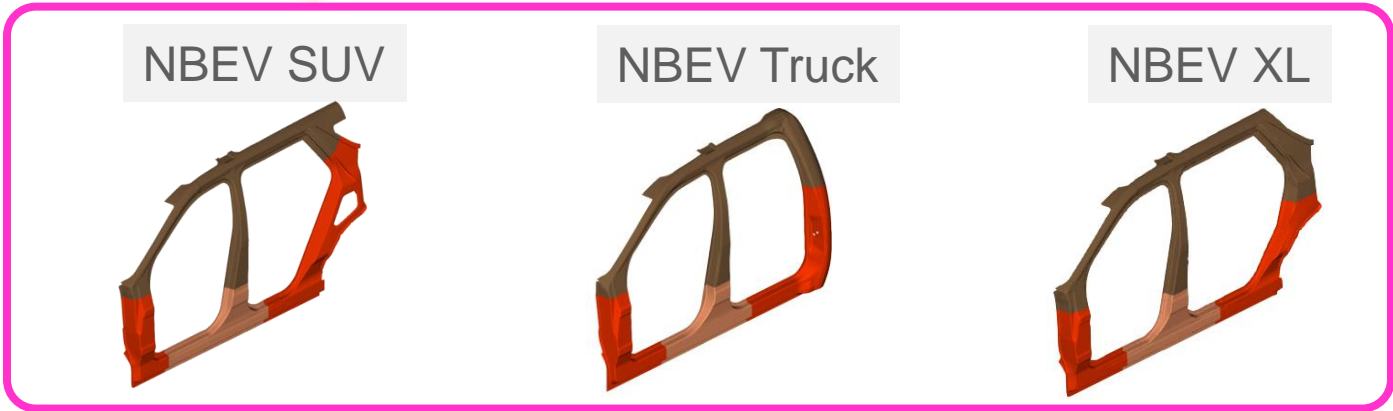
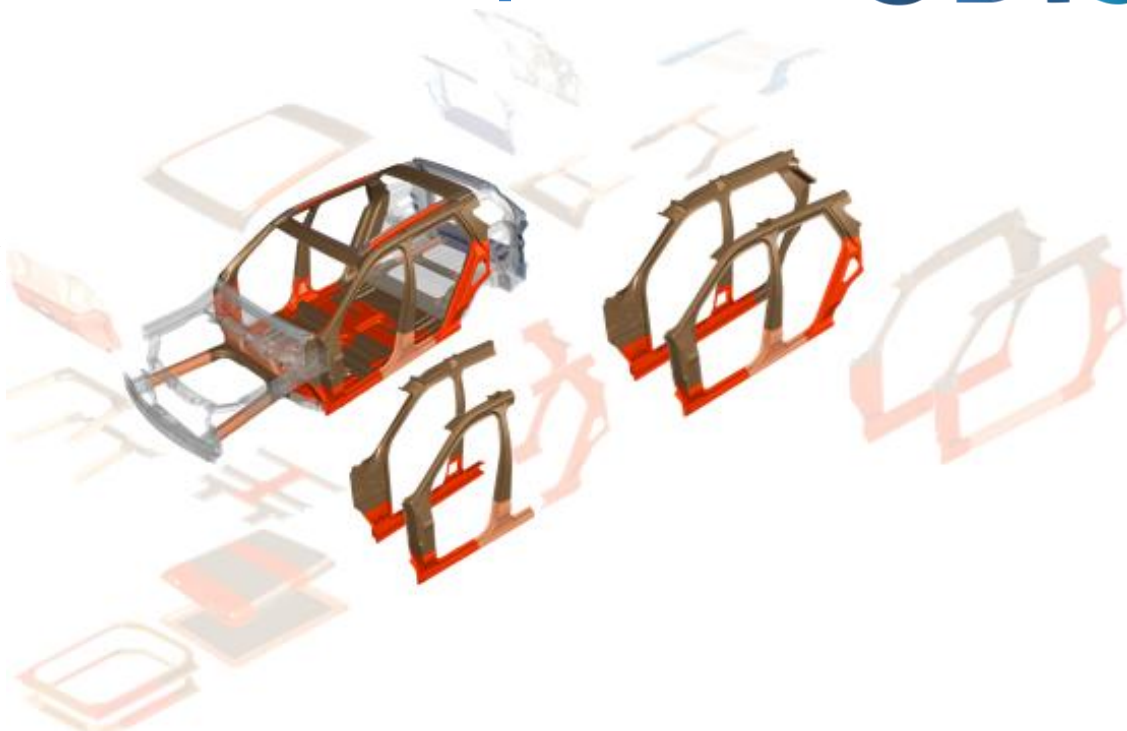
Data For NA Market

Steel has played a pivotable role in offering crash safety, lightweighting and cost-effective solutions

ArcelorMittal Multi Part Integration™ Concepts



- PHS 2000
- PHS 1500
- PHS 1000
- AHSS
- HSS
- Mild steel

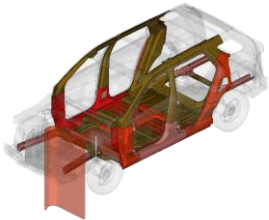


MPI concepts show promise to meet the key challenge of part consolidation & crash safety

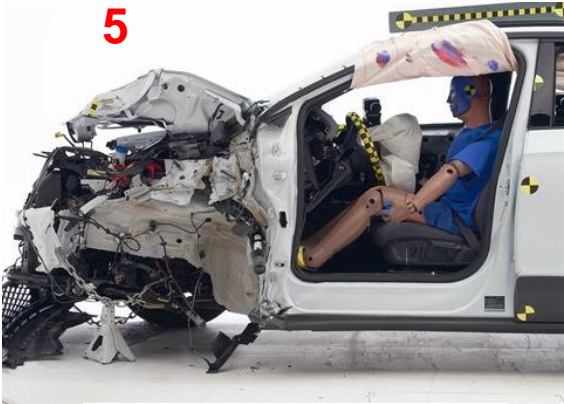
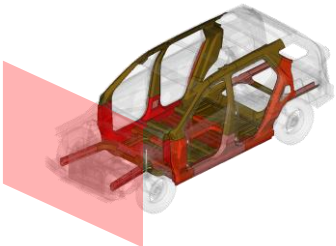
DDR MPI Concept Validation – Crash Load Cases



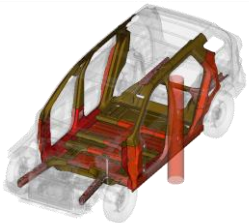
IIHS SORB



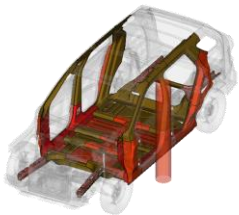
FMVSS 208 Full Frontal



FMVSS 214 50th Pole



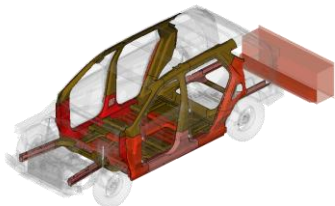
FMVSS 214 5th Pole



IIHS Side Impact



FMVSS 301 Rear Impact



- PHS 2000
- PHS 1500
- PHS 1000



Crashworthiness

Source: [IIHS Vehicle ratings](#)

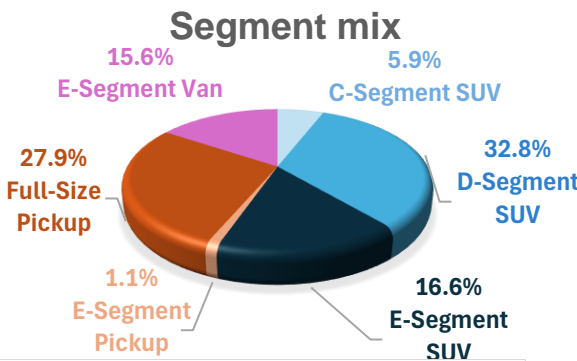
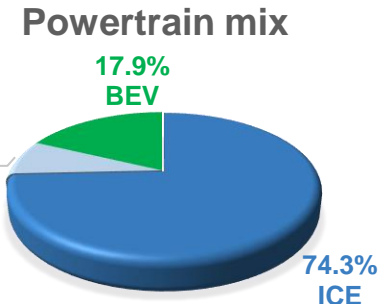
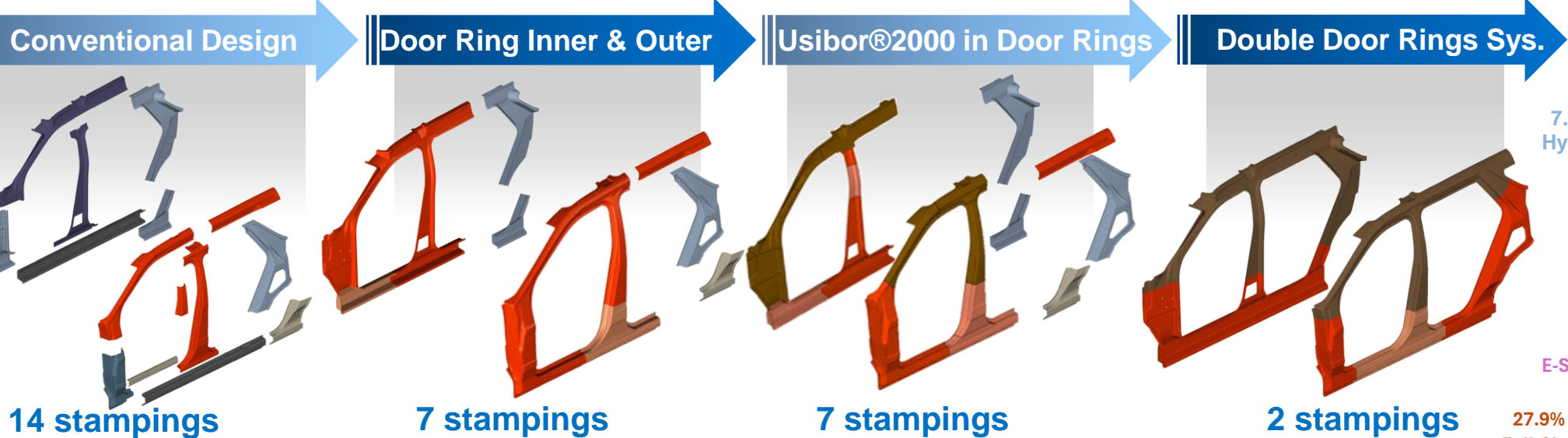
1-2: 2024 Jeep Grand Cherokee (ICE)

3-4: Volvo XC90 (PHEV)

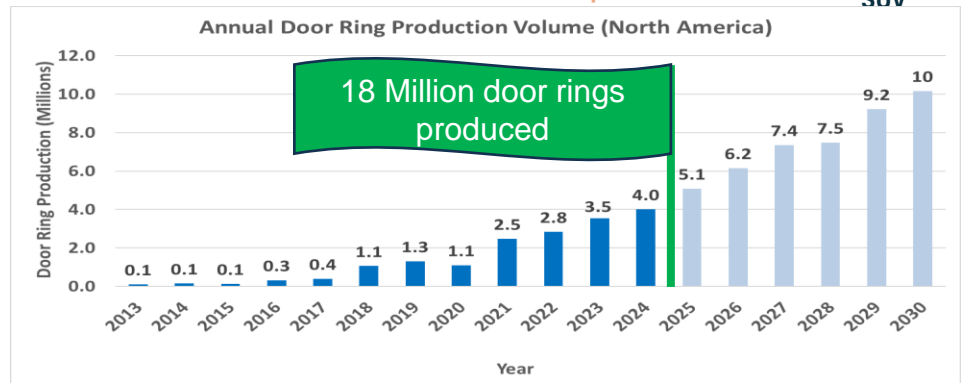
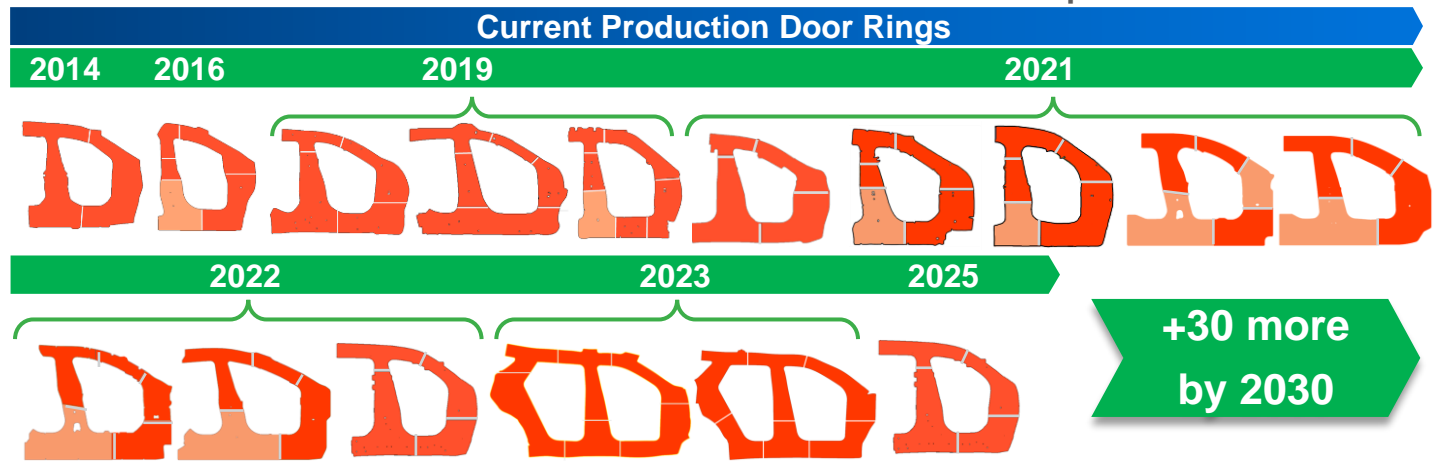
5-6: Volkswagen ID.4 (BEV)

DDR MPIs play a critical role in vehicle safety with the updating needs of modern vehicles & standards

Door Ring Evolution + Current Door Rings in Production GDIS

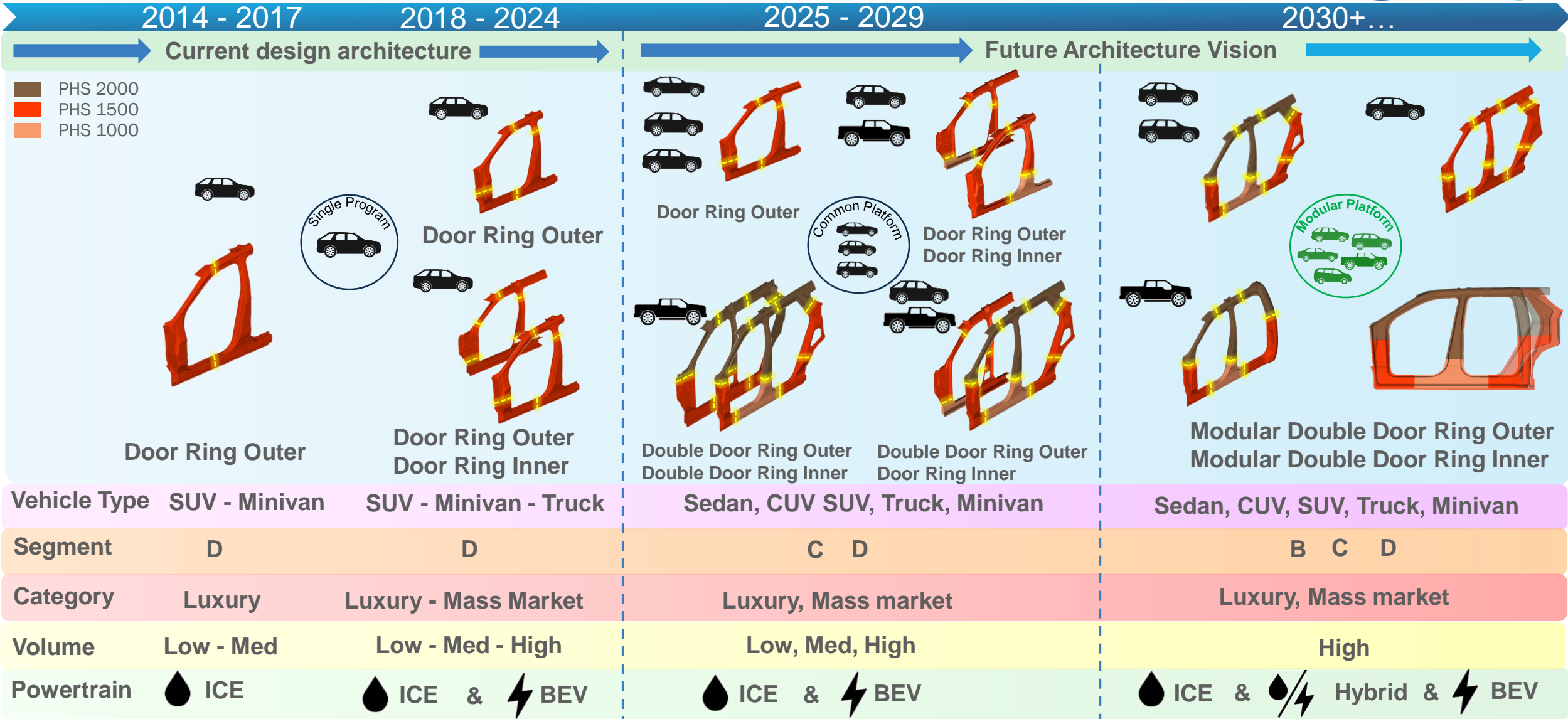


Door ring Execution



OEMs have implemented multiple Door Rings across multi-powertrains & vehicle sizes

AMTB Vision: Door Ring Modularity Evolution



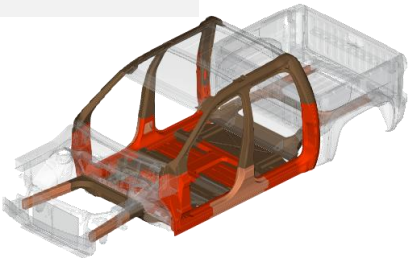
AMTB visualizes future double door ring as a common modular part design across powertrains

Side Structure Part Modularity

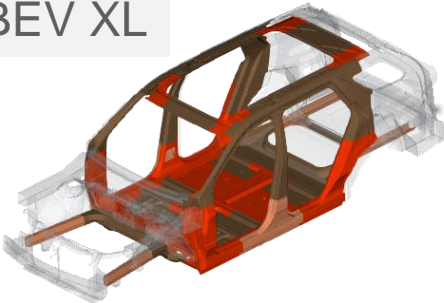
NBEV SUV



NBEV Truck

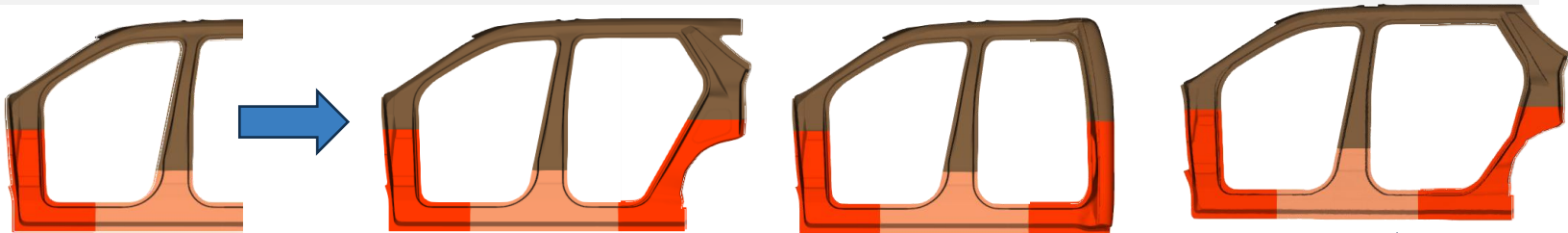


NBEV XL



- PHS 2000
- PHS 1500
- PHS 1000

Door Ring Outer + 3 C-Pillar Variations = 3 Double Door Ring (DDR) MPIs

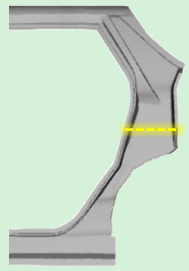
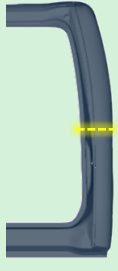
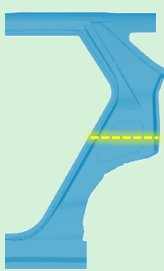
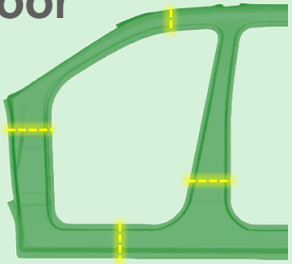


NBEV SUV

NBEV Truck

NBEV XL

Common Door Ring



2 unique sub blanks for each vehicle



Mass Optimization



Assembly Tooling Reduction



Design Flexibility



Modularity

DDR MPI design allows application across segments with high modularity

Modularity Benefits – DDR Weld Tool Commonization

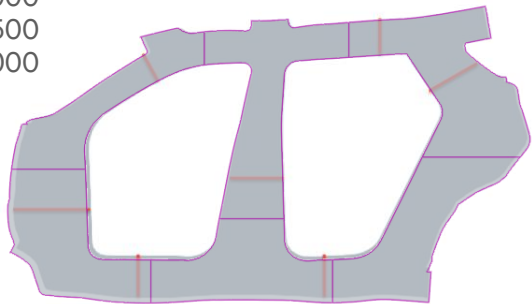


NBEV SUV



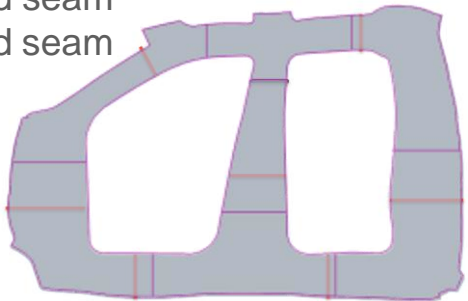
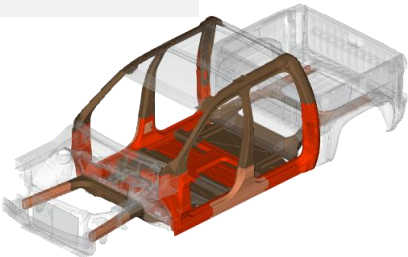
- PHS 2000
- PHS 1500
- PHS 1000

Unoptimized seam
Optimized seam



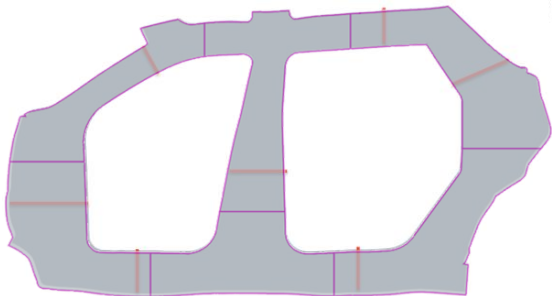
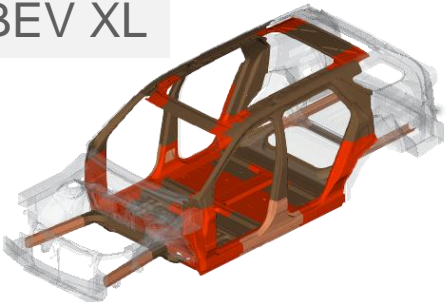
67.3%

NBEV Truck

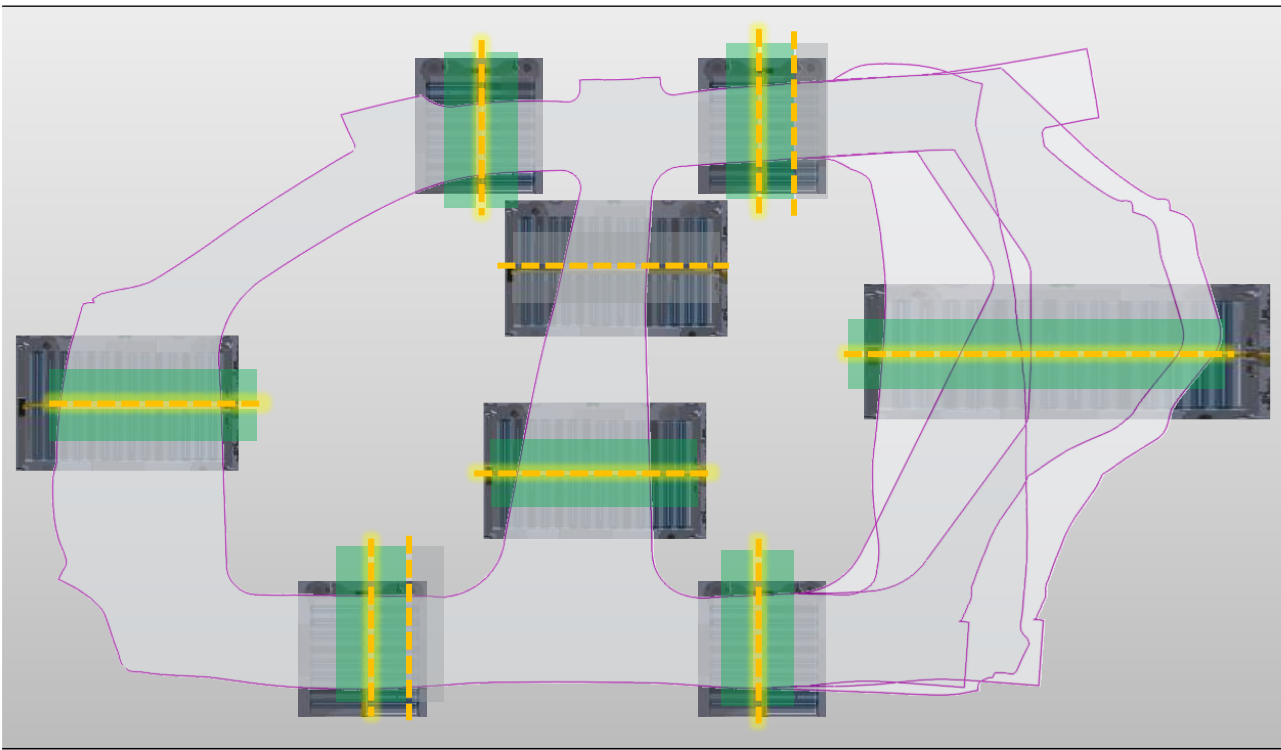


70.2%

NBEV XL



67.5%



Representative Weld Tool



Mass Optimization



Investment Reduction



Design Flexibility



Modularity

We need flexible weld tooling to achieve Door Ring Modularity

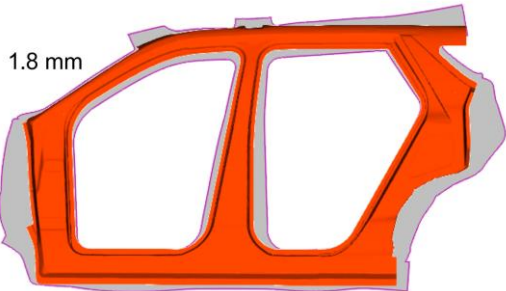
Modularity benefits – Gauge-Grade Flexibility



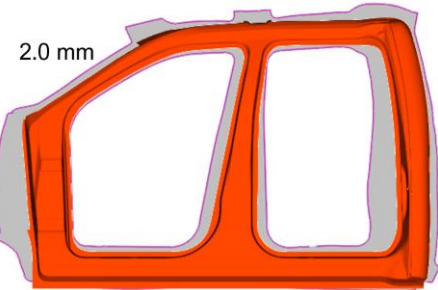
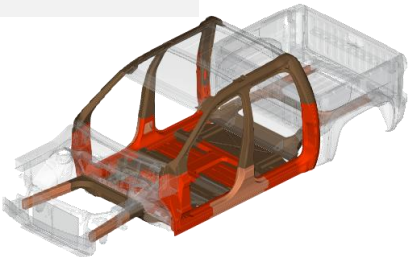
NBEV SUV



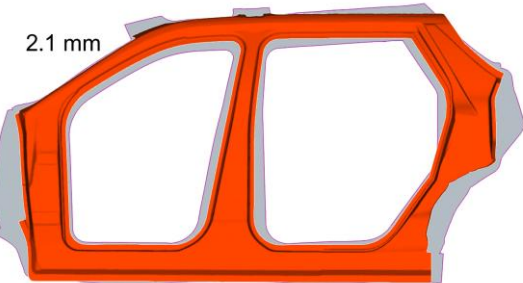
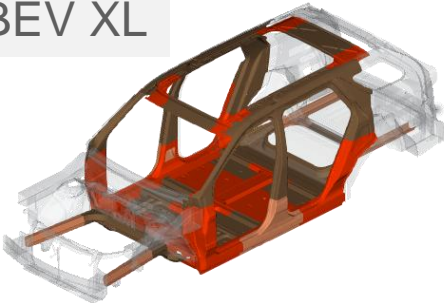
- PHS 2000
- PHS 1500
- PHS 1000



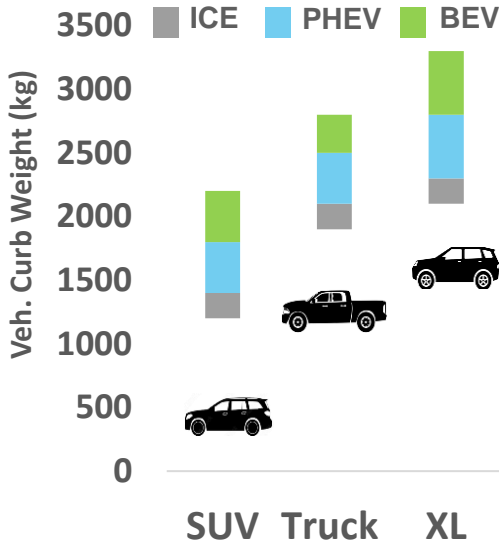
NBEV Truck



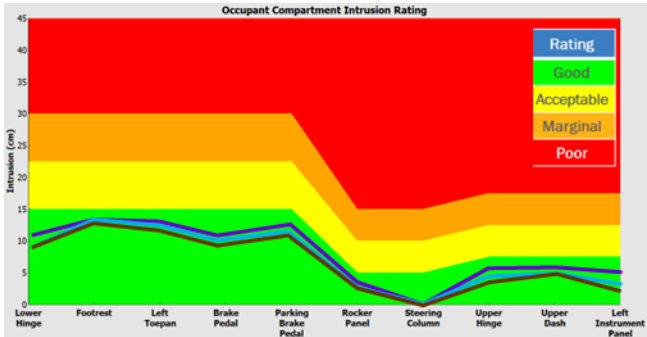
NBEV XL



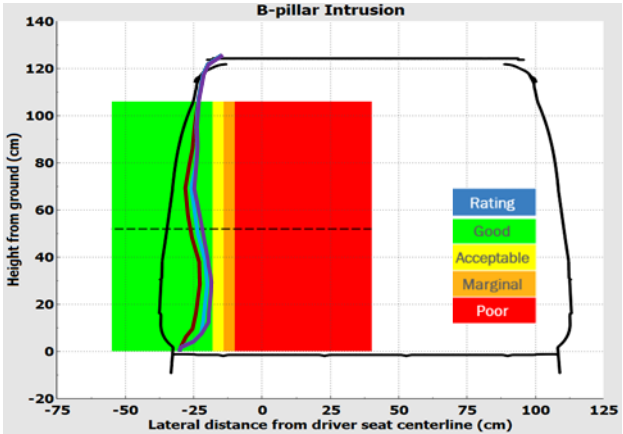
Powertrain variants



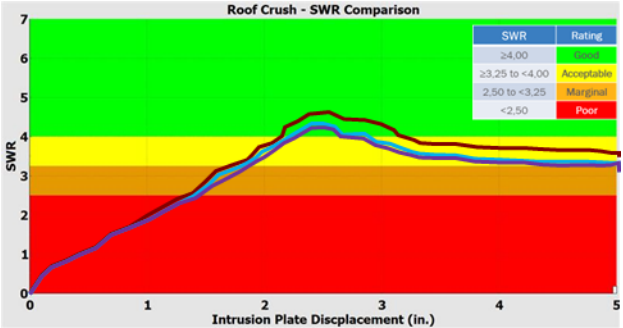
IIHS SORB Intrusions



IIHS Side Impact Intrusions



Roof Crush SWR

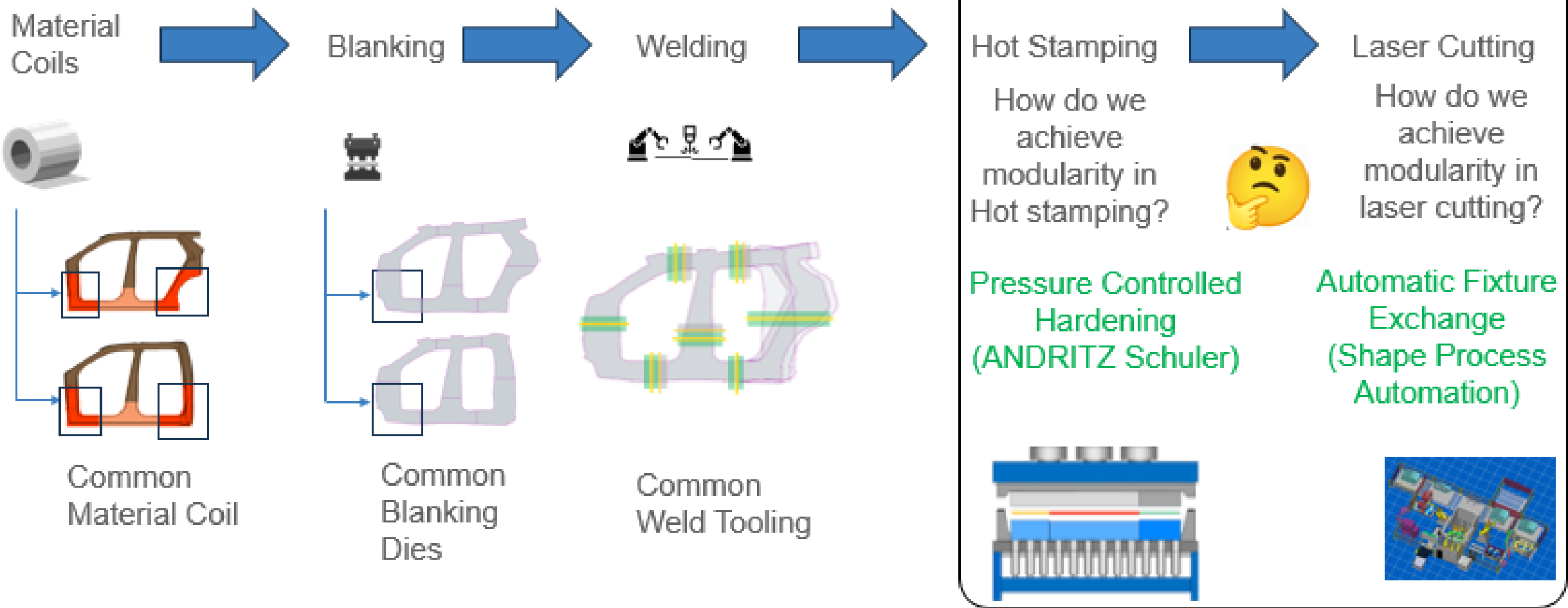


Local patches might be needed to meet crash while keeping the door ring common

Modular Laser Welded Blanks with unique gauge and grade tuning will help meet crash requirements

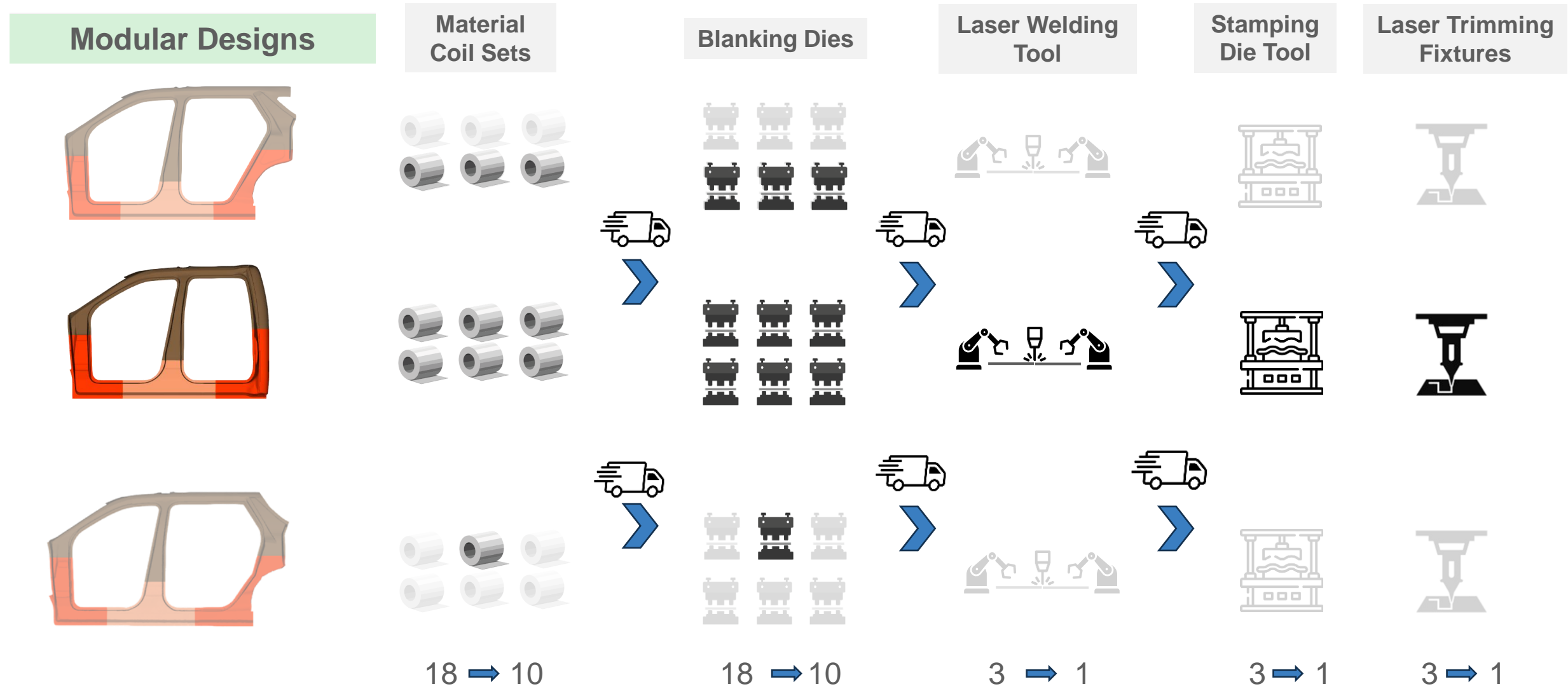
Modularity Through DDR Supply Chain

Vision for the Future!



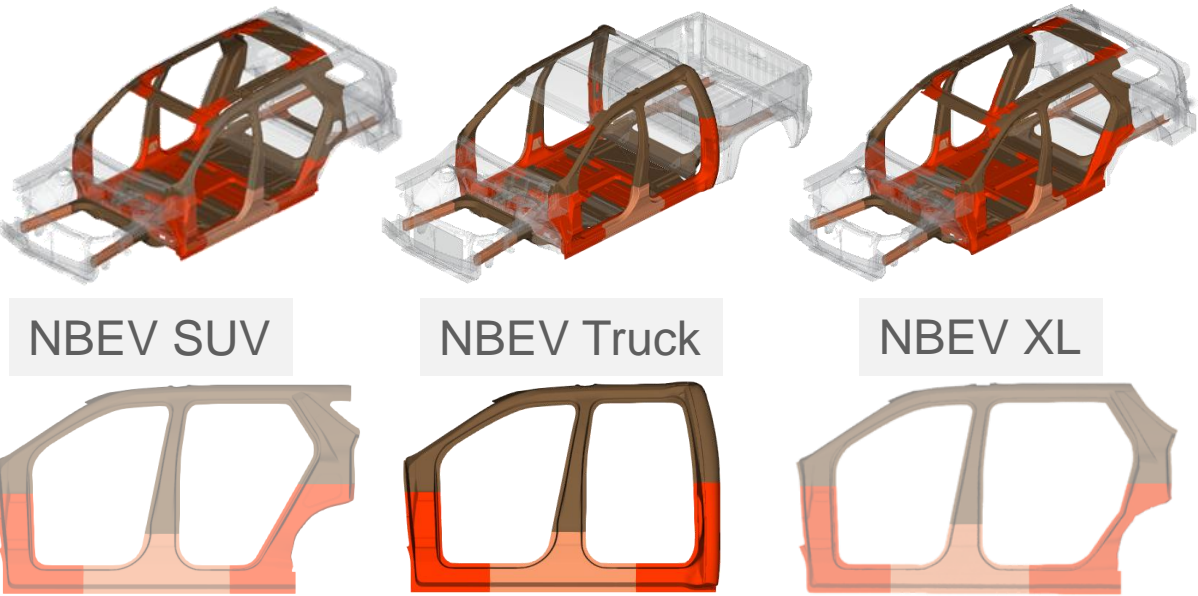
Modularity across the supply chain will enable OEMs integrate door rings across their platforms

Modularity benefits – Streamlined Supply Chain



Modular designs can significantly simplify the supply chain reducing upfront OEM investment for tooling

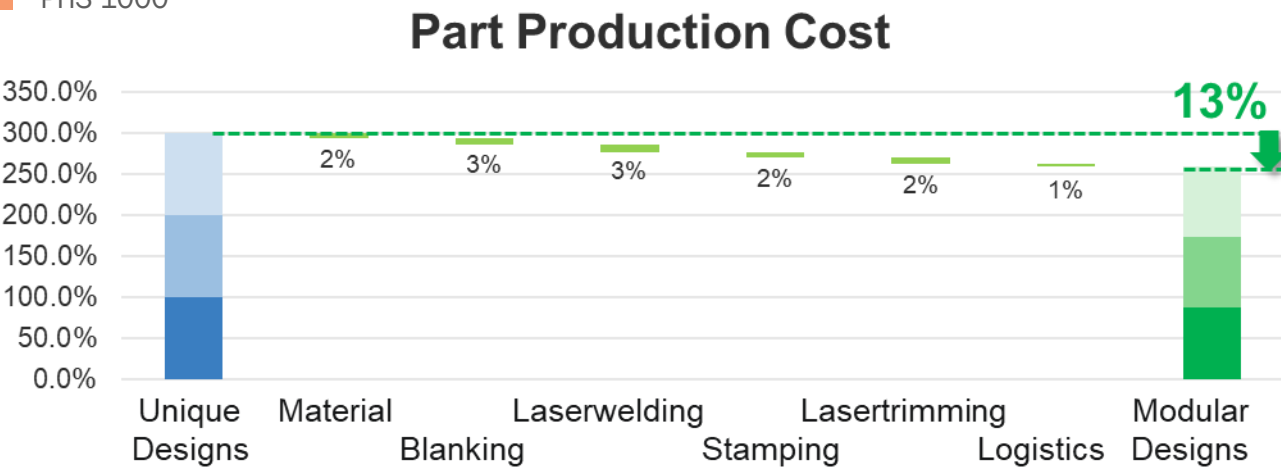
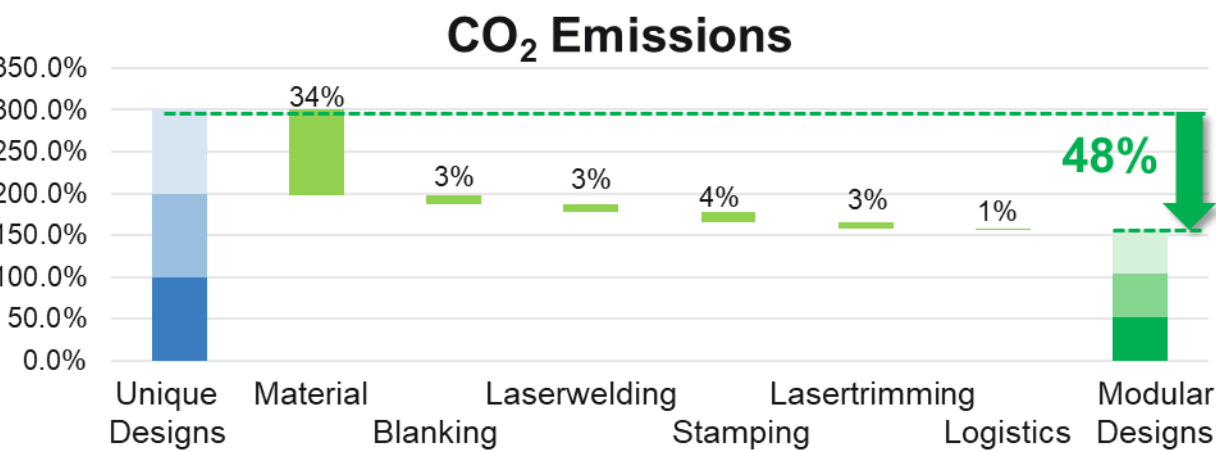
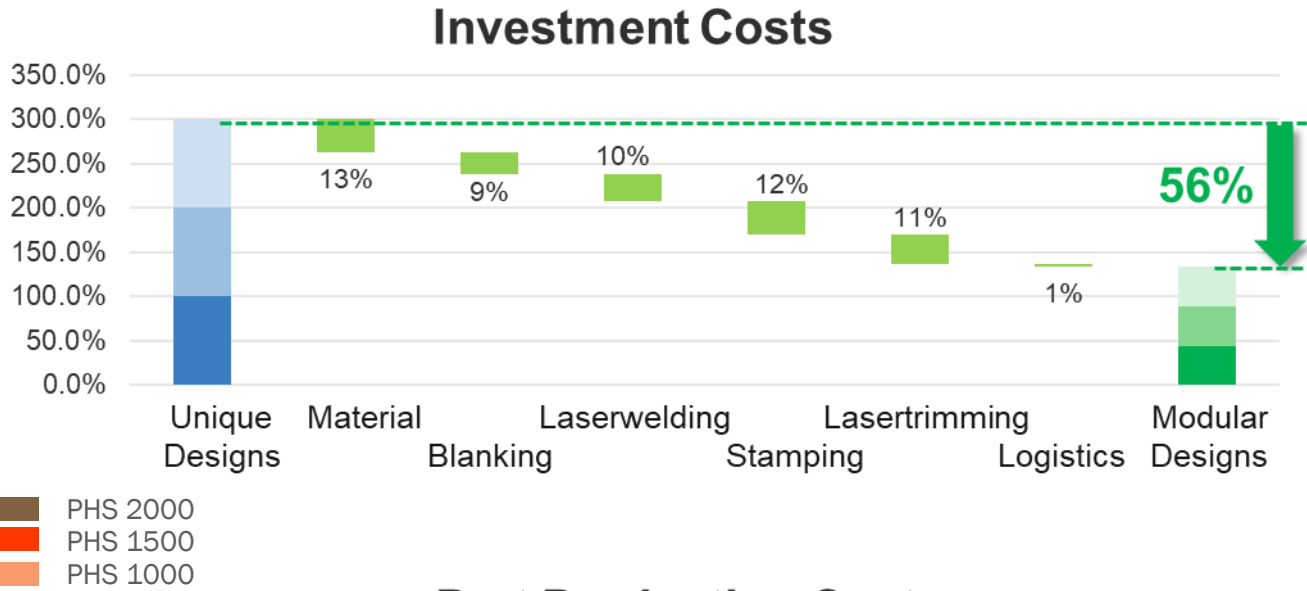
Modularity benefits – Costs & Sustainability



NBEV SUV

NBEV Truck

NBEV XL



Engineering estimates only

Modularity in Double Door ring designs supplements the benefits of LWBs

Achieving economies of scale without limiting consumer choice



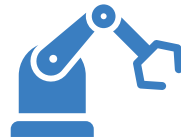
Reimagine Assembly

Multiple vehicles and power-trains on one assembly line



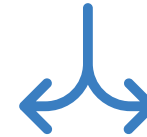
Collaboration

Co-Engineering the Future



Common Underbody

To achieve scalability, modularity and efficiency



Spread Investment

Lowers cost without limiting choice



Modular DDRO & DDRI

Provide crashworthiness and can enable commonization

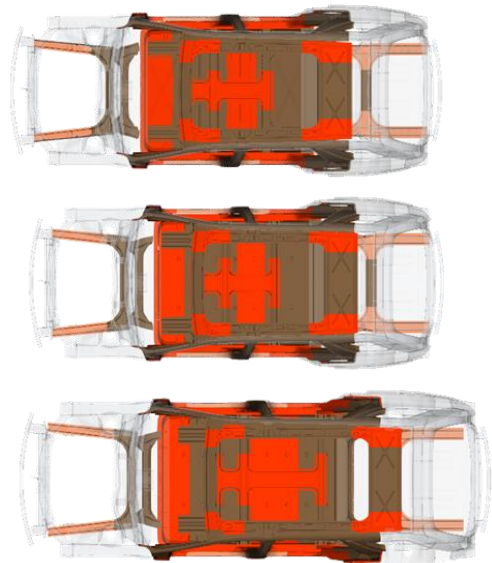


Commonality

Modularize all possible manufacturing steps

Unlearn the past to envision the future

Future Role of MPIs in Modular Architecture

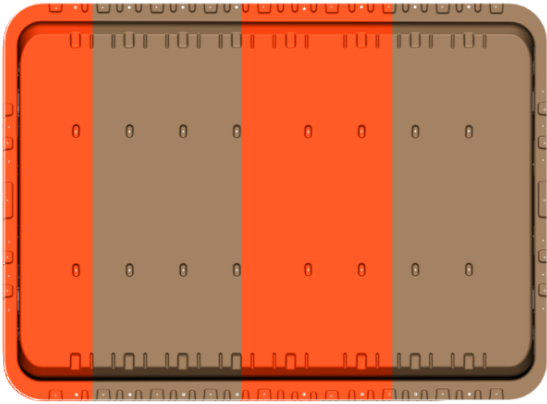


NBEV SUV

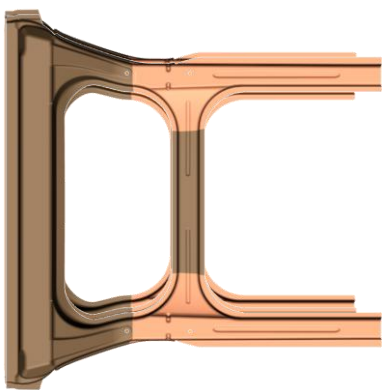
NBEV Wide

NBEV XL

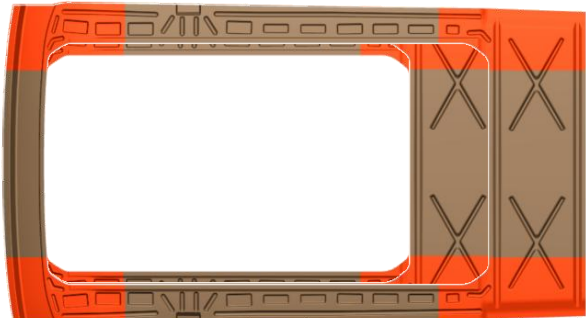
Battery Enclosure



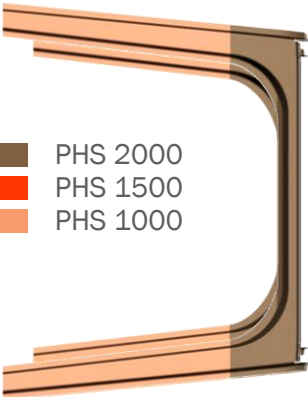
Rear O-frame



Roof Ring



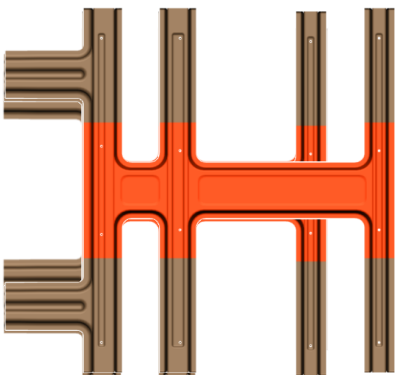
Front U-frame Upper



Front U-frame Lower



Floor Reinforcement



- PHS 2000
- PHS 1500
- PHS 1000



Design Flexibility



Assembly Tooling Reduction



Modularity



Part Weight Optimization



Crashworthiness

Modularity at part level re-imagined thanks to MPI – Power of Less!!!

Conclusions & Summary

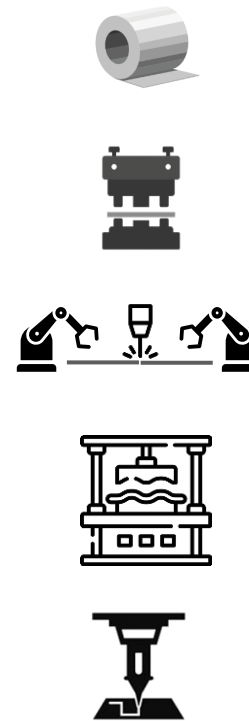
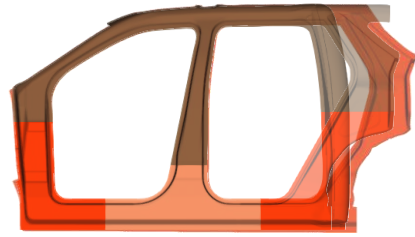
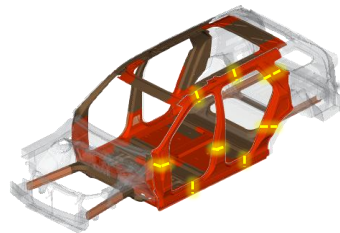
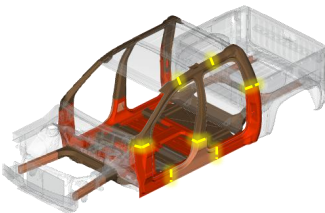
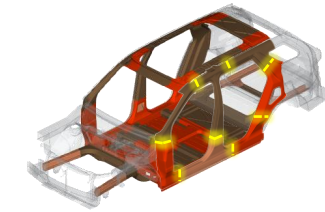


OEM
Challenge

Common
assembly

Multiple
vehicle sizes

Multiple
Powertrains



Co-engineering is key!

- Shorter design cycles
- Investment share across programs
- Lower overall investment
- Flexibility to manage market demand
- Excellent crash performance

Modular laser welded door ring designs give OEMs the flexibility to manage changing market demands

Home of the most advanced Laser Welded Door Rings

GDIS

ArcelorMittal Tailored Blanks

Driving a **Safer** and **Greener** Tomorrow

4 locations in North America

- ✓ Concord, ON
- ✓ Woodstock, ON
- ✓ Detroit, MI
- ✓ Silao, MX

16 locations in Europe and Asia

ArcelorMittal



Stop by our booth for more information!


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AMTB's 15,000,000TH
DOOR RING

AMTB is a leading global supplier of tailored (laser welded) blanks – safer, stronger, lighter and greener solution