

NPE 2024 | **MADE
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The Plastics Show

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INDUSTRY ASSOCIATION



Navigating the Surge in Electrification and the Engineering Plastics Landscape

Ramesh Iyer- Director of Polymers

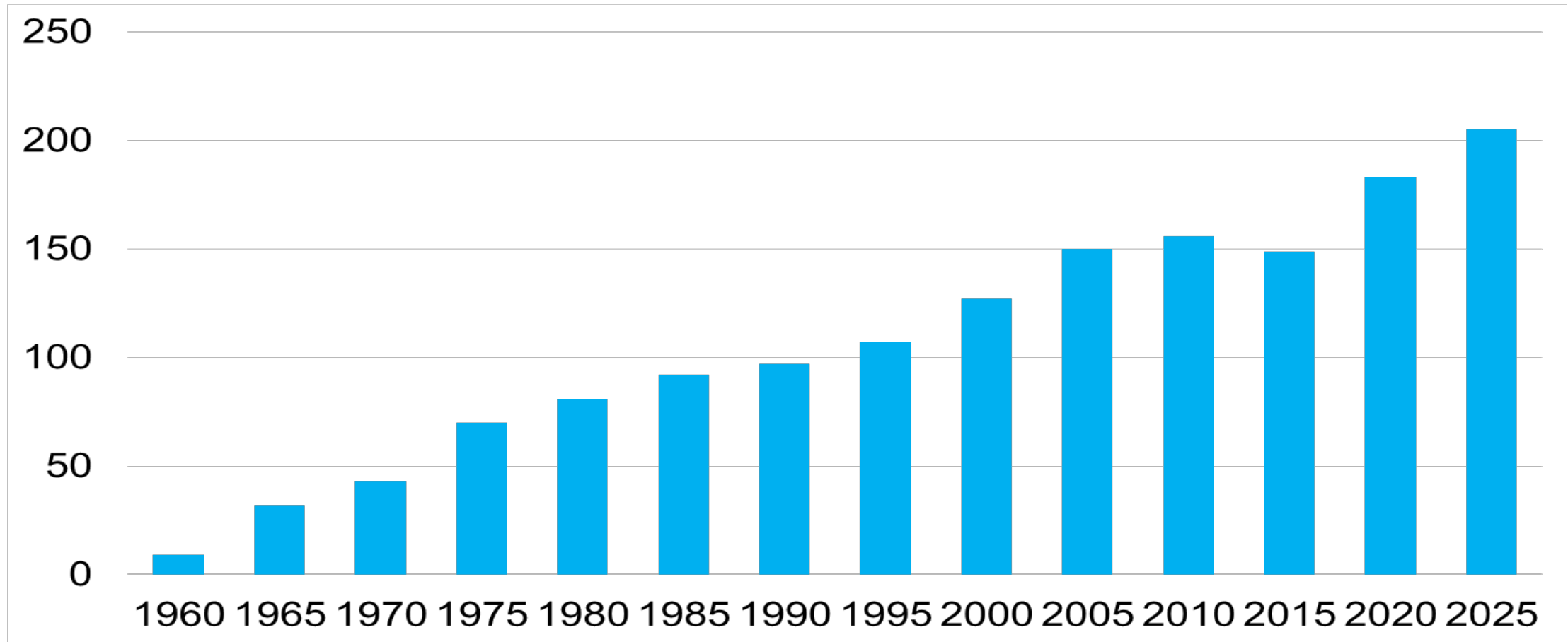
Date•MAY 09,2024

Agenda

- Automotive Plastics use
 - By Region
 - By Application/Resin
 - By Vehicle Type
- EV Penetration
- Winners and Losers with EV penetration
- Q&A

Progression of Plastics in Automotive

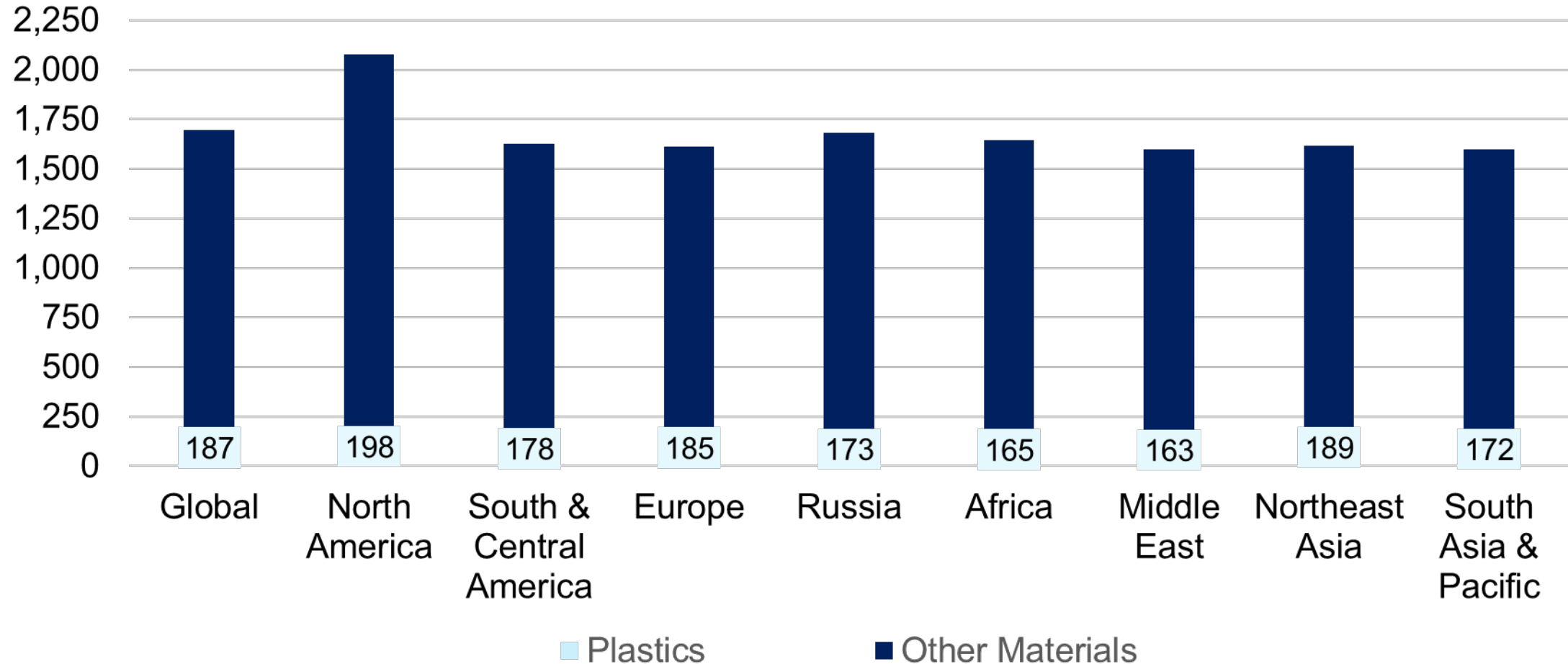
Kilograms per vehicle



Source: American Chemistry Council

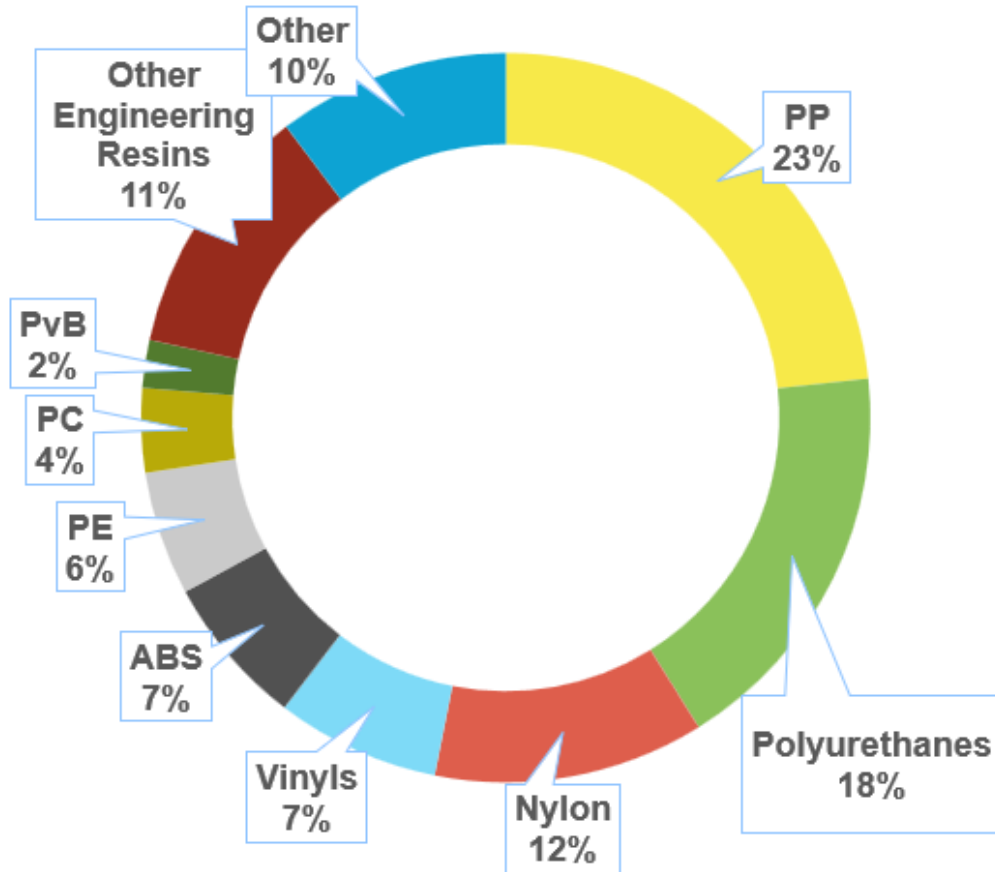
Automotive Plastics use varies by Region

Kilograms per vehicle

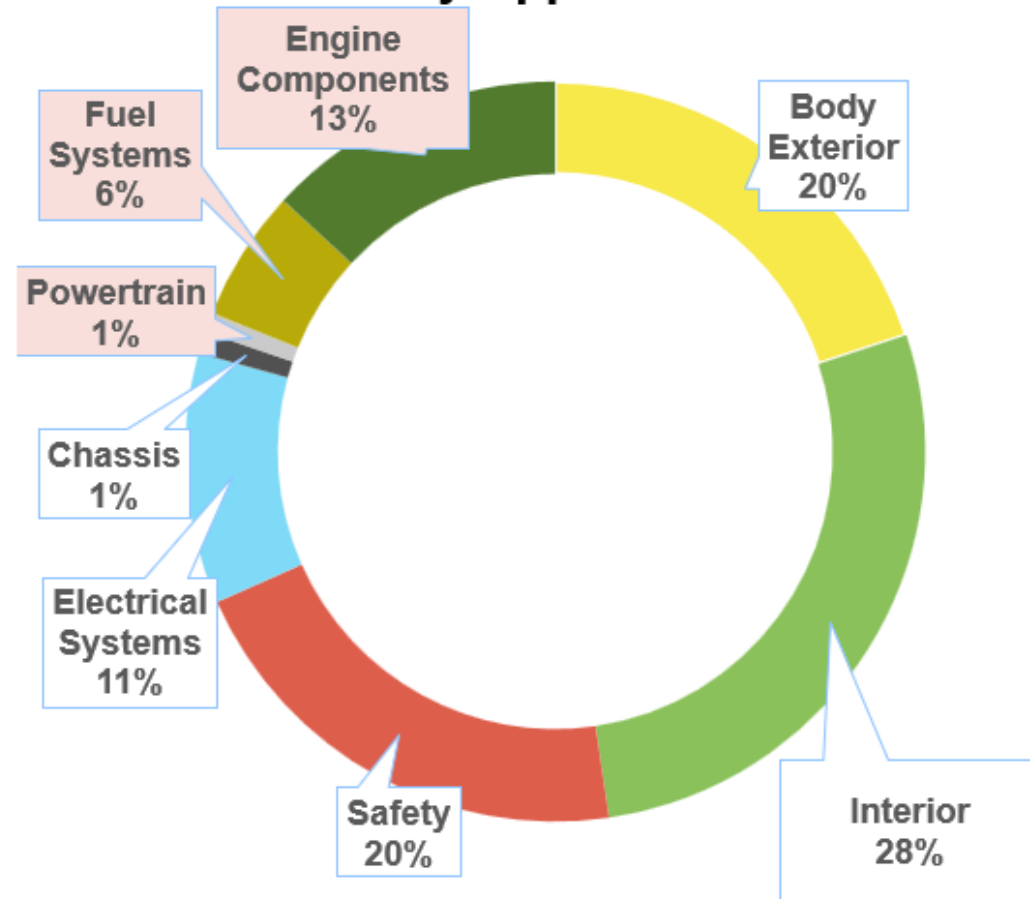


North American Automotive Plastics Use

By Resin



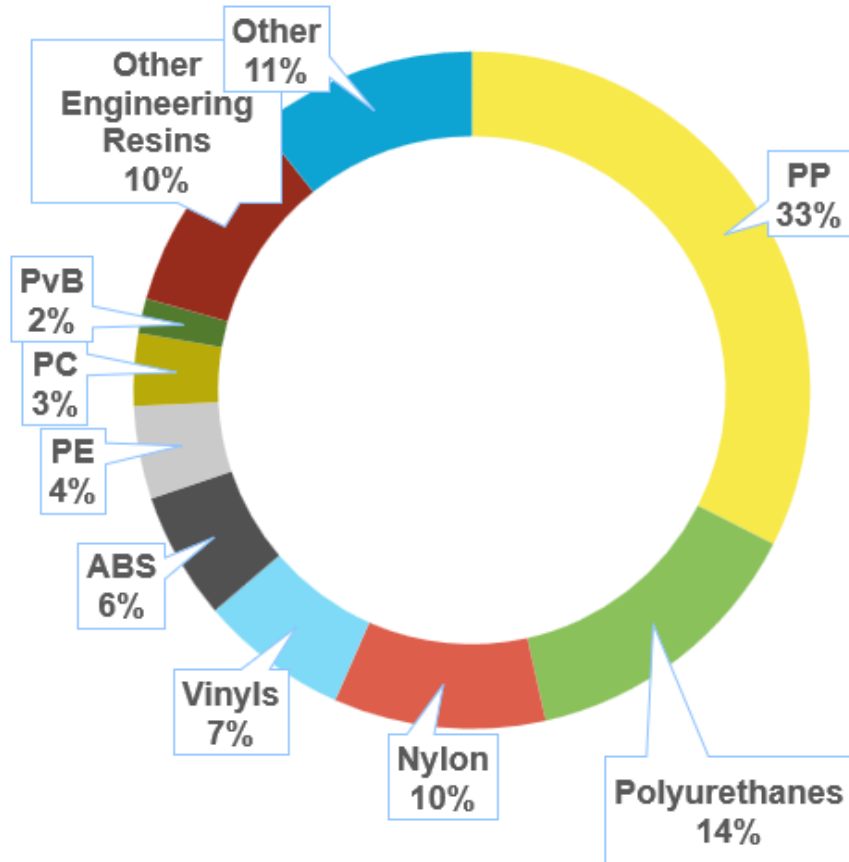
By Application



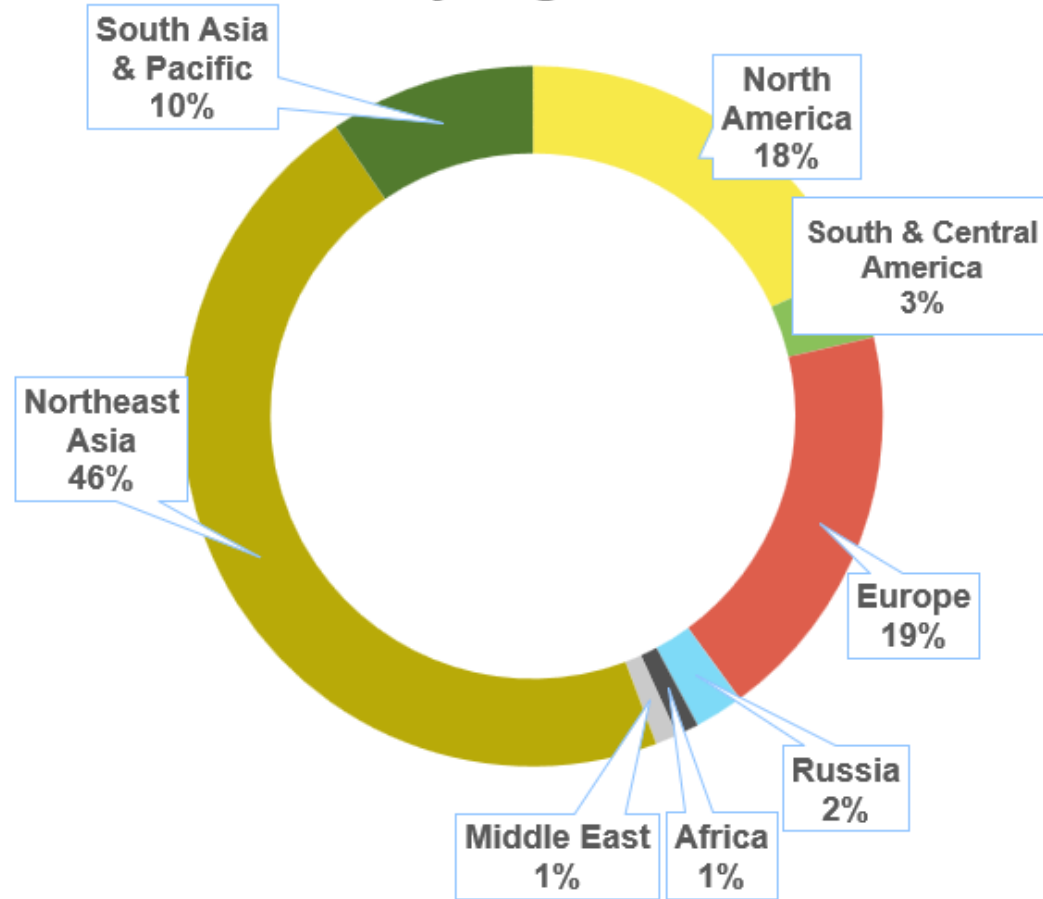
TOTAL : 198 KGS in 2023

Global Automotive Plastics use: 14.1 million tonnes in 2023

By Resin

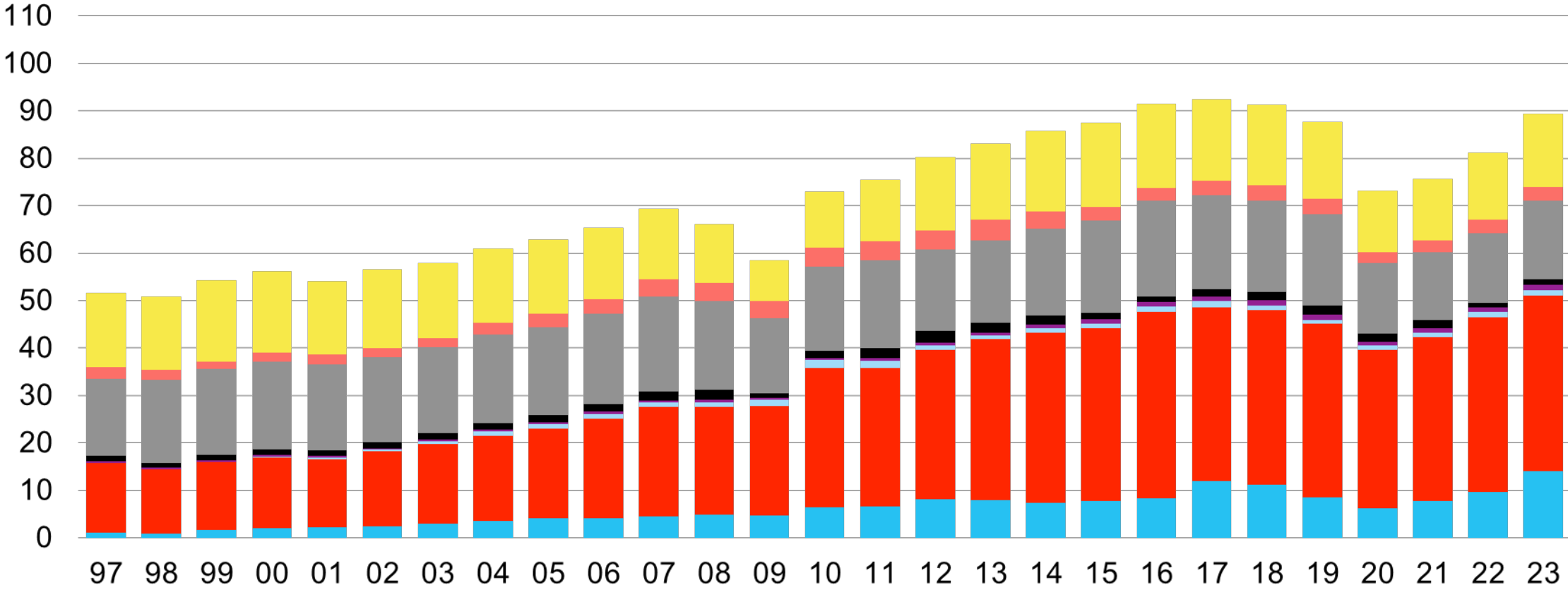


By Region



Global Light Vehicle Production

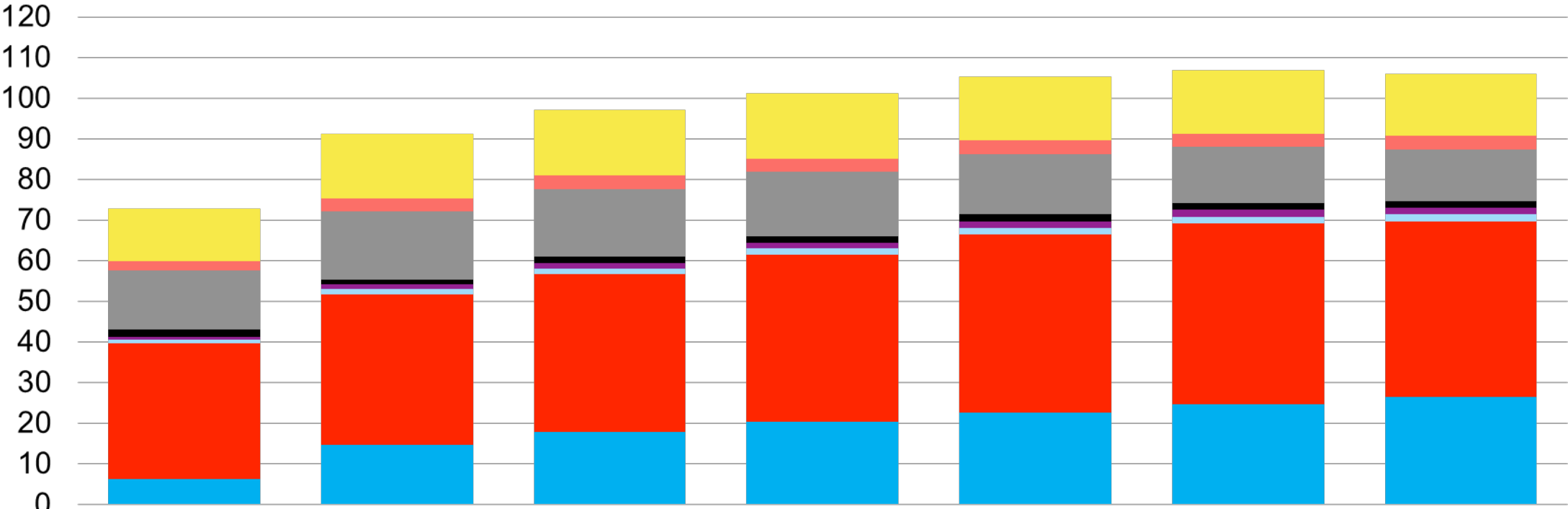
Millions of vehicles



■ South Asia & Pacific
 ■ Northeast Asia
 ■ Middle East
 ■ Africa
 ■ Russia
 ■ Europe
 ■ Central & South America
 ■ North America

Global Light Vehicle Production- Forecast

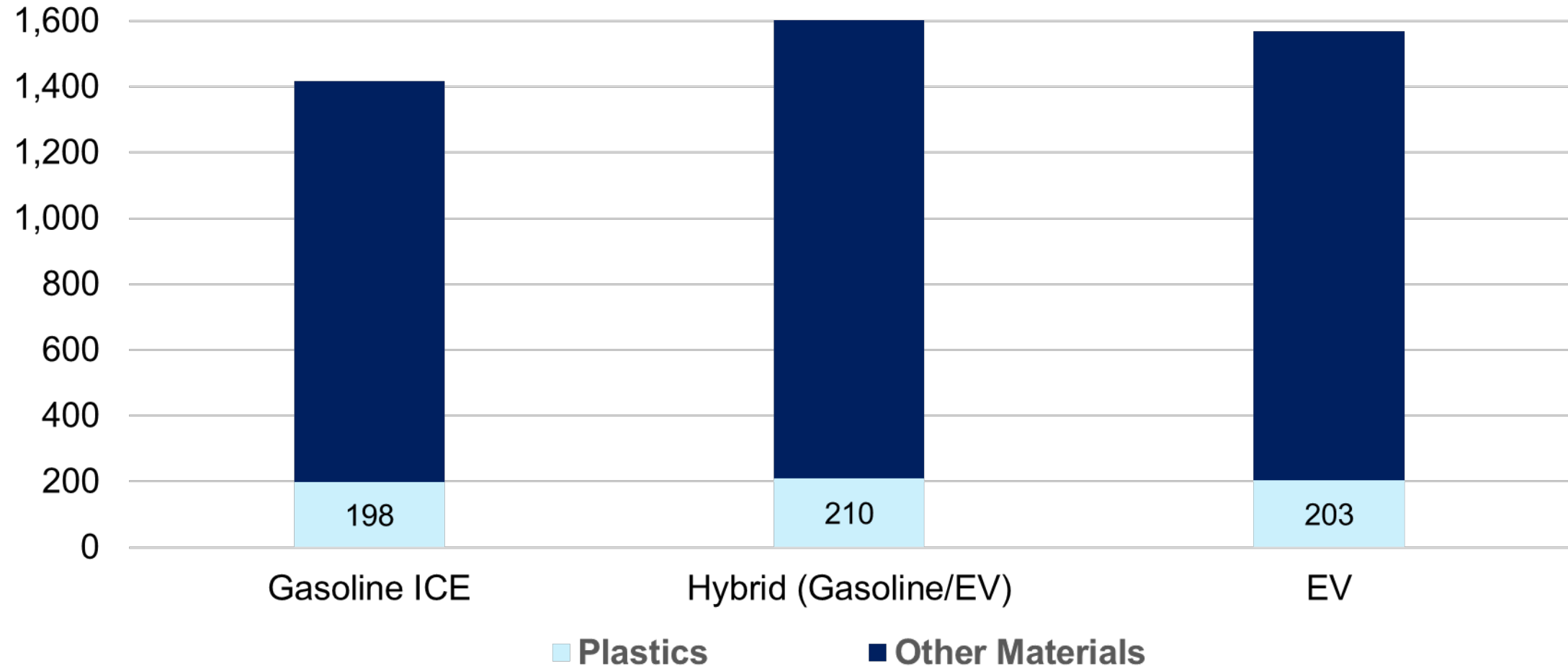
Millions of vehicles



- South Asia & Pacific
- Northeast Asia
- Middle East
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- North America

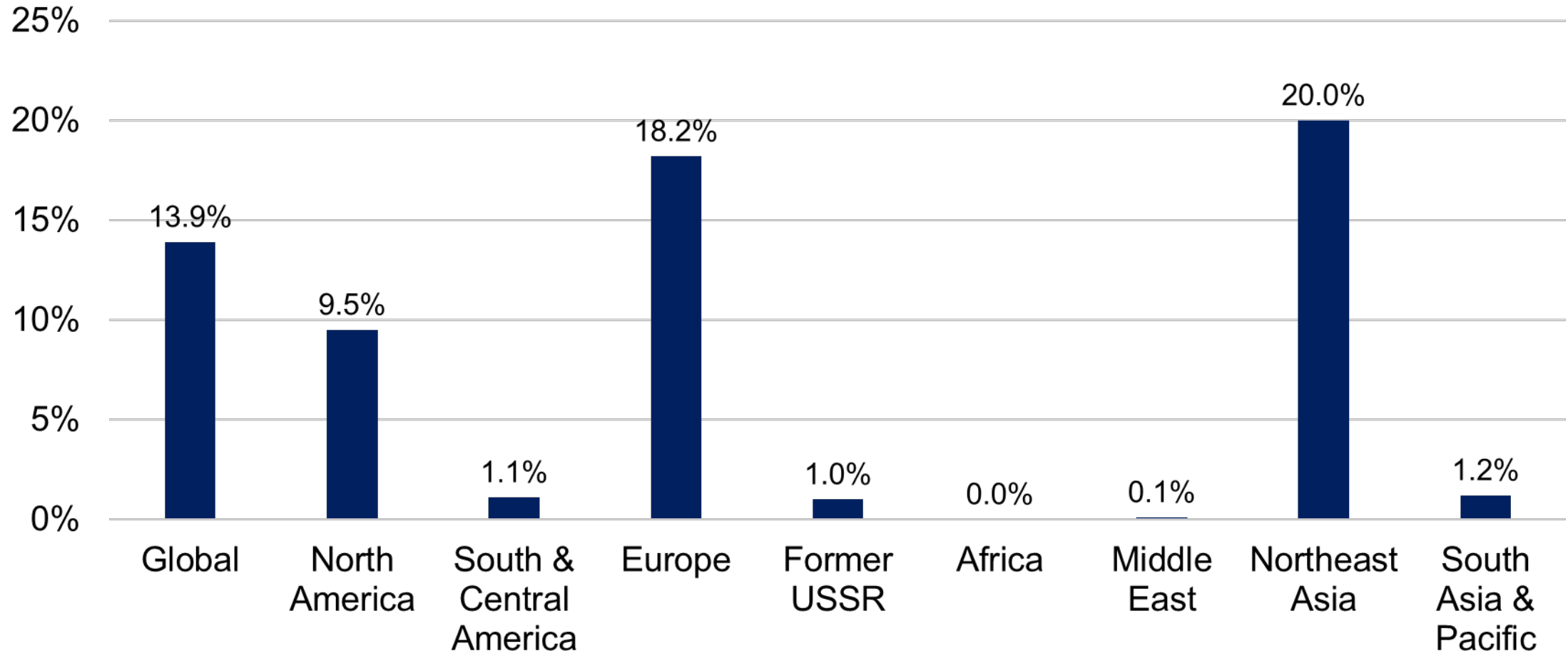
Automotive Plastics use varies by Vehicle Type

Kilograms per vehicle



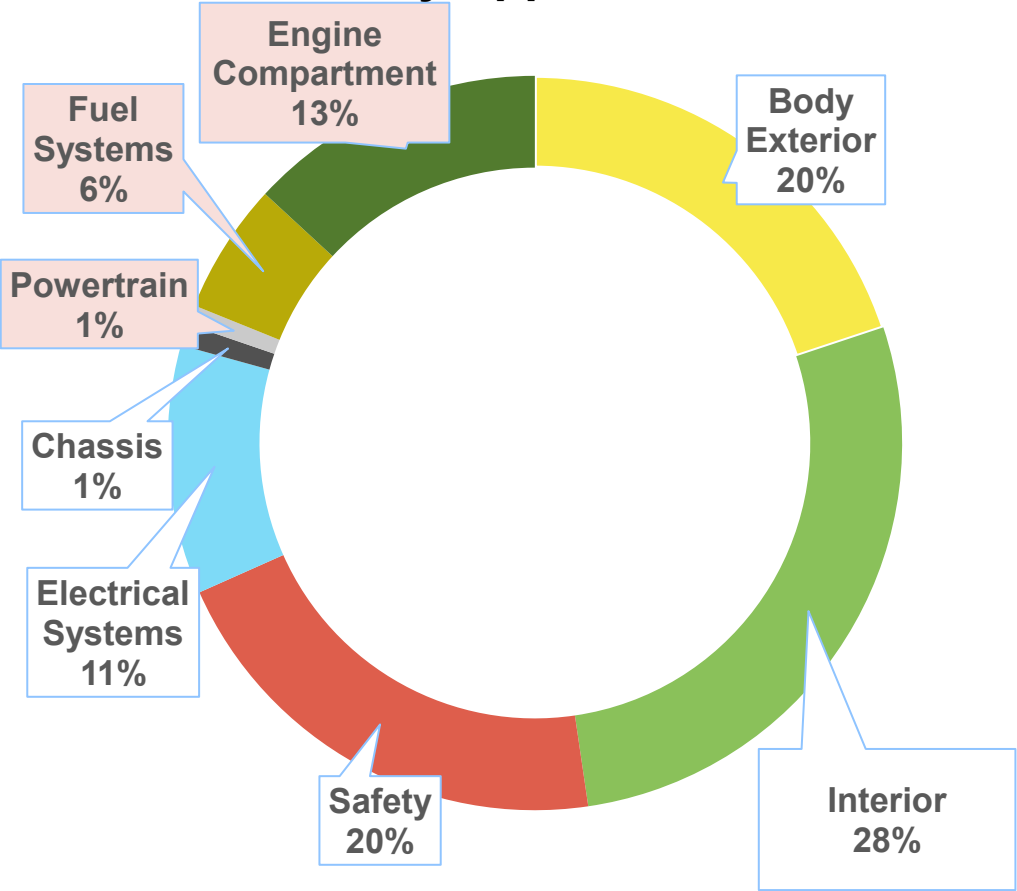
Global EV Penetration Varied by Region in 2023

EVs as % of total light vehicle production



North American Automotive Plastics Use

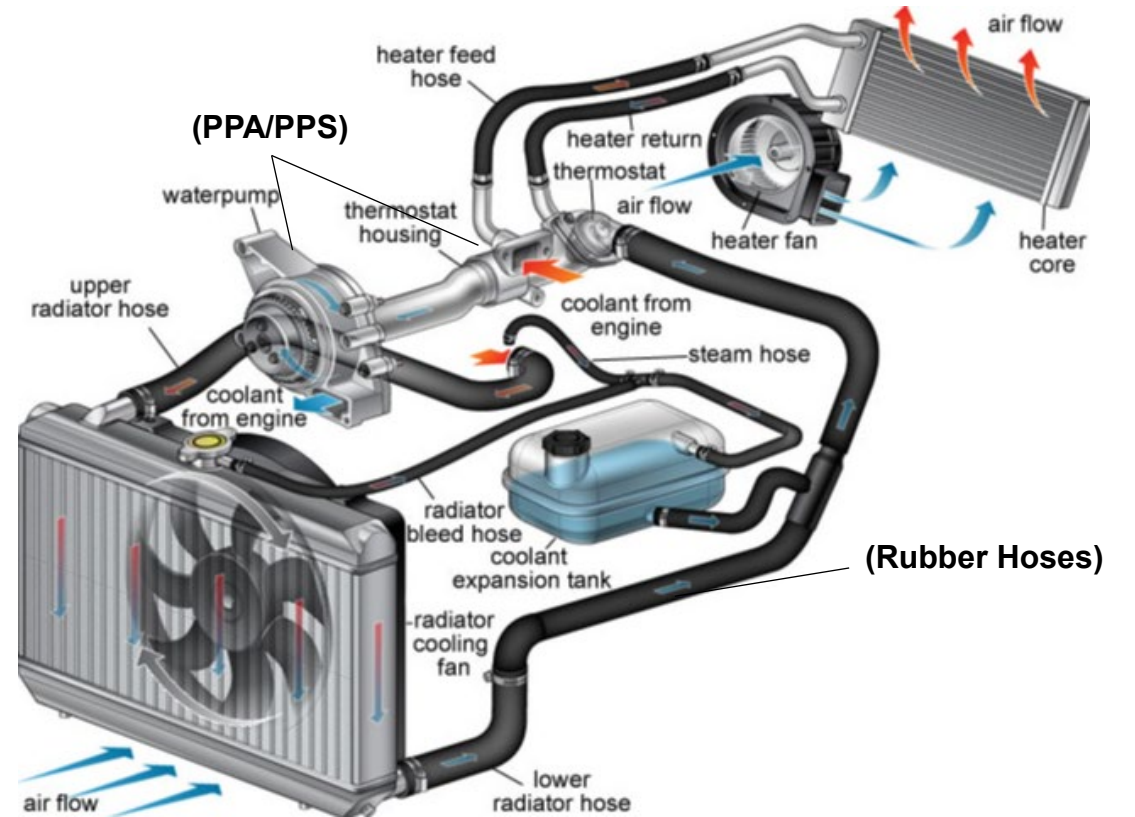
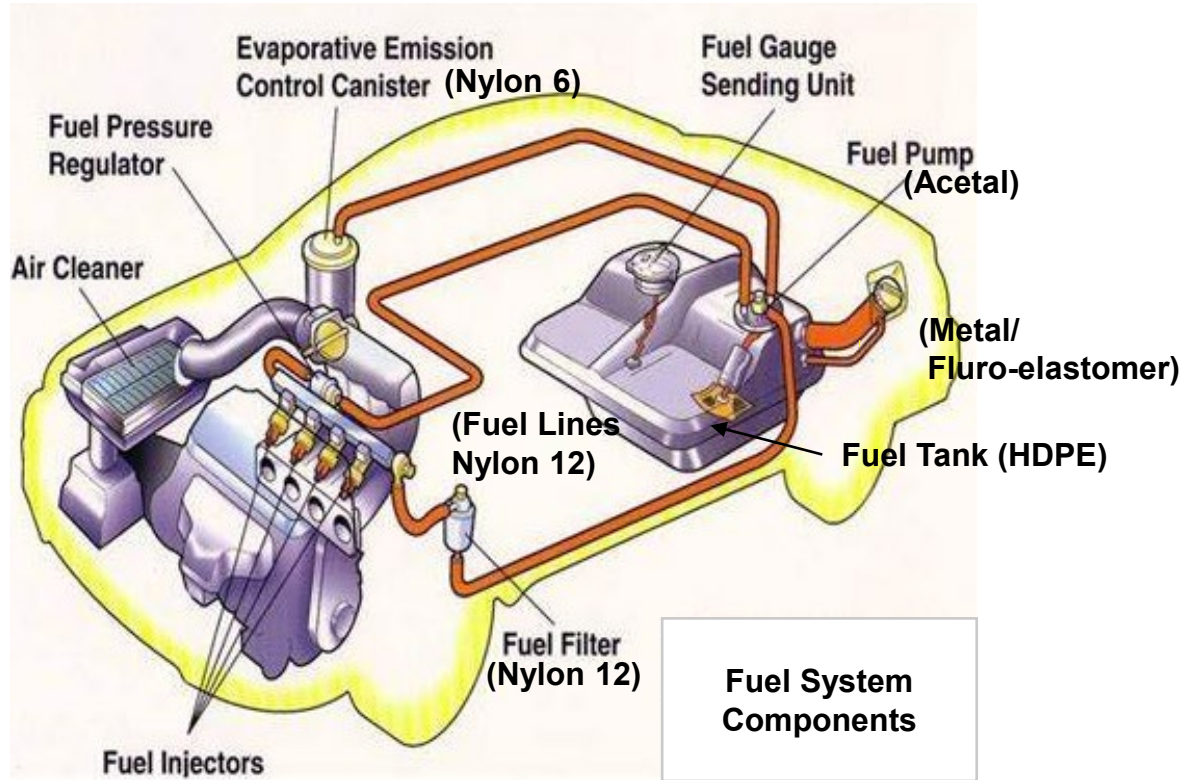
By Application



- Migration from ICE to EV will eliminate the plastics used in fuel systems, engine compartment and powertrain
- Plastics associated with battery components, electrical charging, and delivery systems would be additions in an EV vs ICE

TOTAL : 198 KGS in 2023

Fuel System and Cooling System



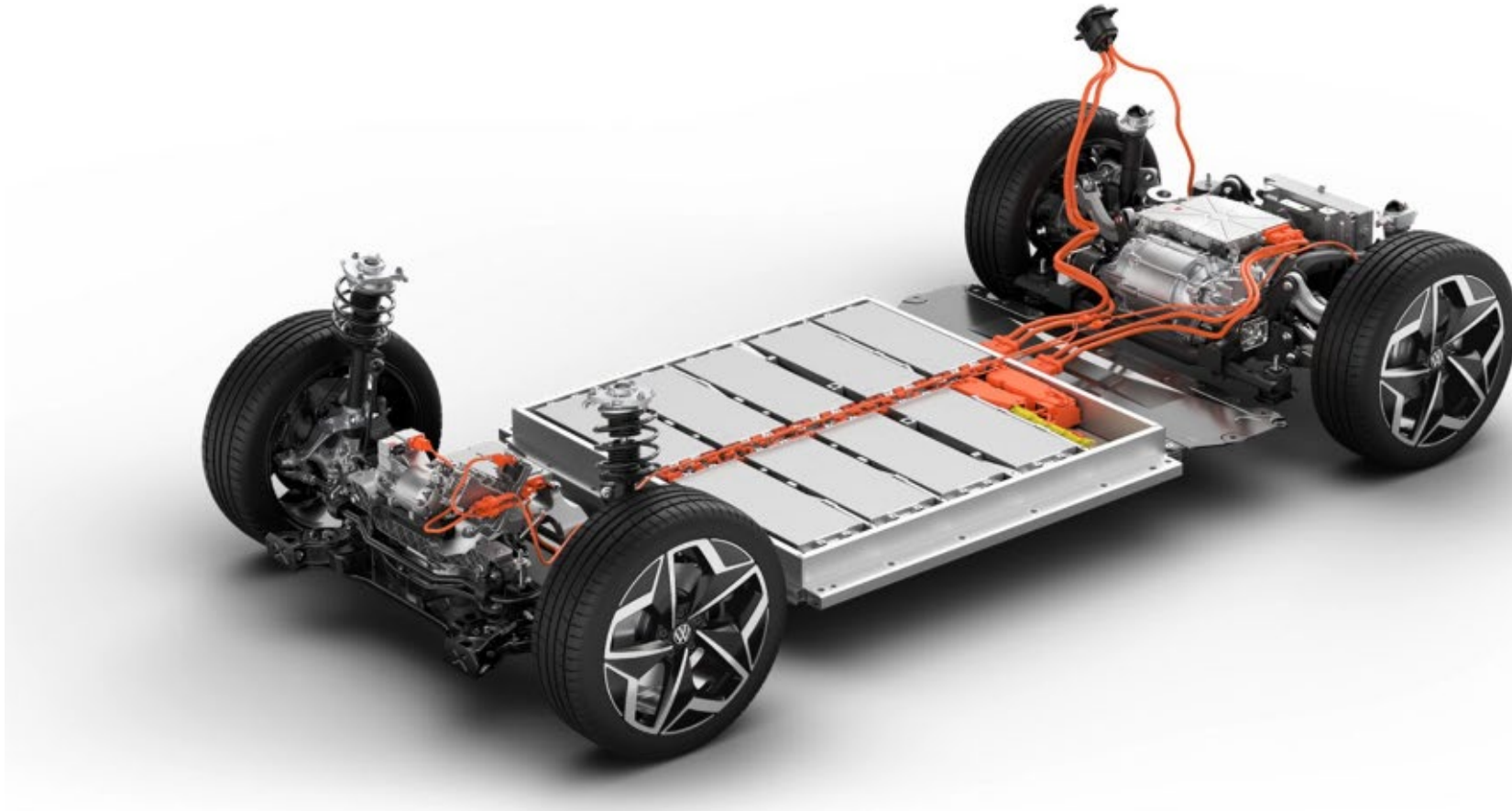
Component	Material
Radiator end tanks	Nylon 6,6
Fans and Shrouds	PP or PA6
Overflow tank	PP
Blower wheel	PP

Proprietary & Confidential

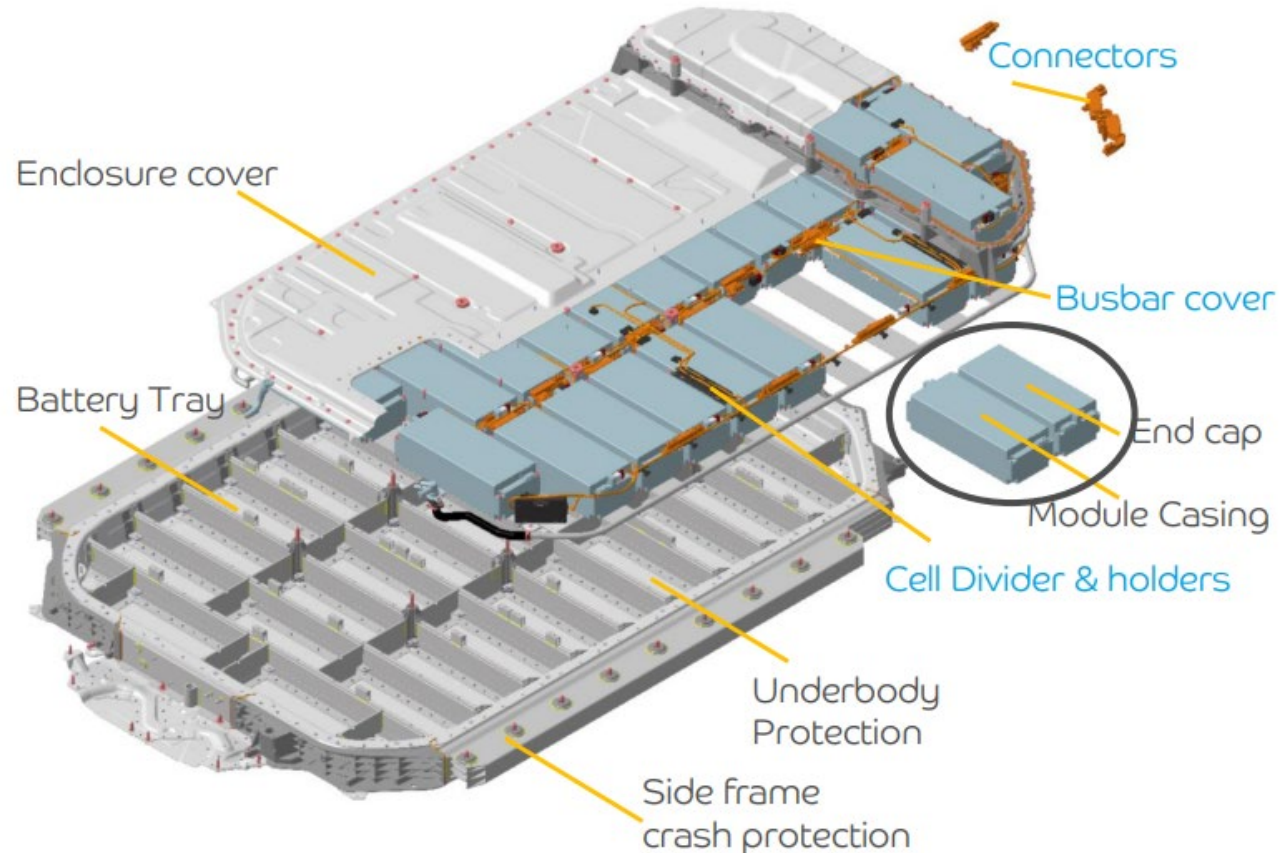
Plastic components in the engine compartment



EV Battery



Battery Components



Profile of Requirements

- Flame retardancy
 - Prevent Thermal Runaway
- Lightweight
- Sealability

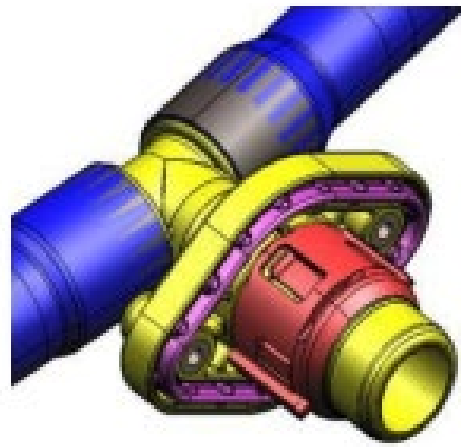
Material Choices

- LGPP-FR
- mPPO or mPPE
- PC+ABS- FR
- FR PBT
- FR PA
- PET Films

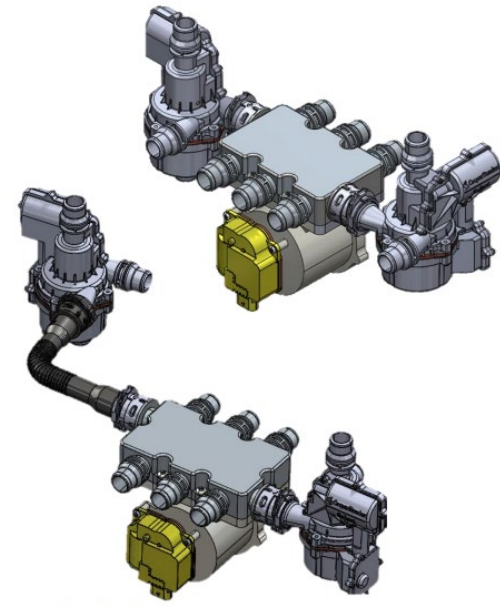
Battery Cooling Components



Hoses & Connectors



Cooling Inlets



CooperStandard

Battery Charging Components



Battery Electrical Cables and Connectors



Cables and Headers



Charge Inlets

No Front Grill in EV's



Exterior



ICE



EV



Winners and Losers with EV Transition

Material	Change	Comment
Polypropylene	Increase	Battery enclosures. FR capability established
Polyurethanes	No change	No change to seating and glass bonding
Nylon	Slight Decrease	Loss of engine component applications
Polycarbonate	Increase	Front End applications as well as battery charging components.
PBT	Increase	Connectors

Winners and Losers with EV Transition

Material	Change	Comment
Polyethylene	Decrease	Fuel Tank
ABS	Decrease	Move away from Chrome Plateable Front Grill
Elastomers (FR)	Increase	Cable Covering
PVC	No Change	No change in interior
Other engineering resins (PPS, PPA, POM..)	Decrease	No need for high chemical and heat resistance.

Questions

Contact Information

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