

Great Designs in

# STEEL 2015!!

## **Metallic Material Trends in the North American Light Vehicle**

**Abey Abraham**

May 13<sup>th</sup> 2015 Ducker Worldwide



DUCKER WORLDWIDE

Steel Matters  Demand Nothing Less  
[www.autosteel.org](http://www.autosteel.org)

# Ducker Worldwide Introduction

Ducker Worldwide is a market intelligence, transaction advisory and strategic consulting firm driven to help you achieve your most ambitious growth goals

## What We Do

Market Intelligence and Research

Strategic Consulting

Transaction Advisory and Diligence

## Ducker Facts

- 53** Year history
- 150** Team members worldwide
- 275** End-use markets served
- 32** Languages spoken
- 88** Countries where we have experience

## Access to a Global Footprint



## Industry and Sector Experts

Transportation  
(Automotive and CV)

Building Products  
& Materials

Heavy Equipment &  
Capital Goods

Industrials &  
Raw Materials

Aerospace

Healthcare Device &  
Services

# Steel in the News

The steel industry is innovating at a monumental scale, working close with OEMs

***“Tesla's Gen 3 Sedan To Be Steel-Bodied, Have 'Realistic' Pricing”***

- Motor Authority – July 2014

***“Steel to play a key role in meeting 2025 mpg targets”***

- Automotive World – July 2014

***“Advanced high-strength steels will offer more than sufficient light-weighting opportunities to automotive companies in the next decade, and from 2021-2025”***

- World Steel Dynamics – October 2014

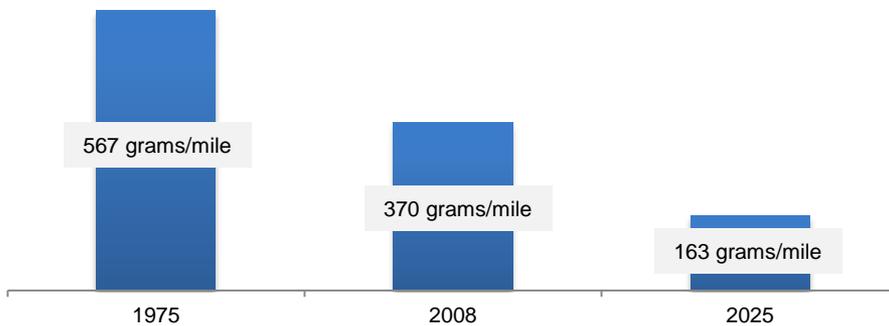
***“The first serially produced vehicles to utilize the new (gen 3) steel will roll off production lines in 2017, ...already undergone formability and weld-ability tests with global carmakers...”***

- Arcelor Mittal – April 2014

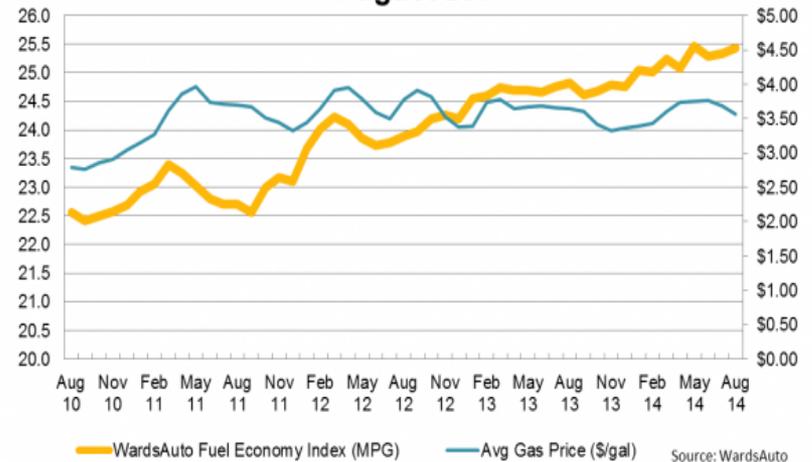
# N.A. Vehicle Market Primer

Automotive light weighting efforts at the OEMs have been accelerated due to the emissions and MPG requirements mandated by the government

Historic and Proposed CO2 Levels



WardsAuto Fuel Economy Index August 2014 25.4 mpg



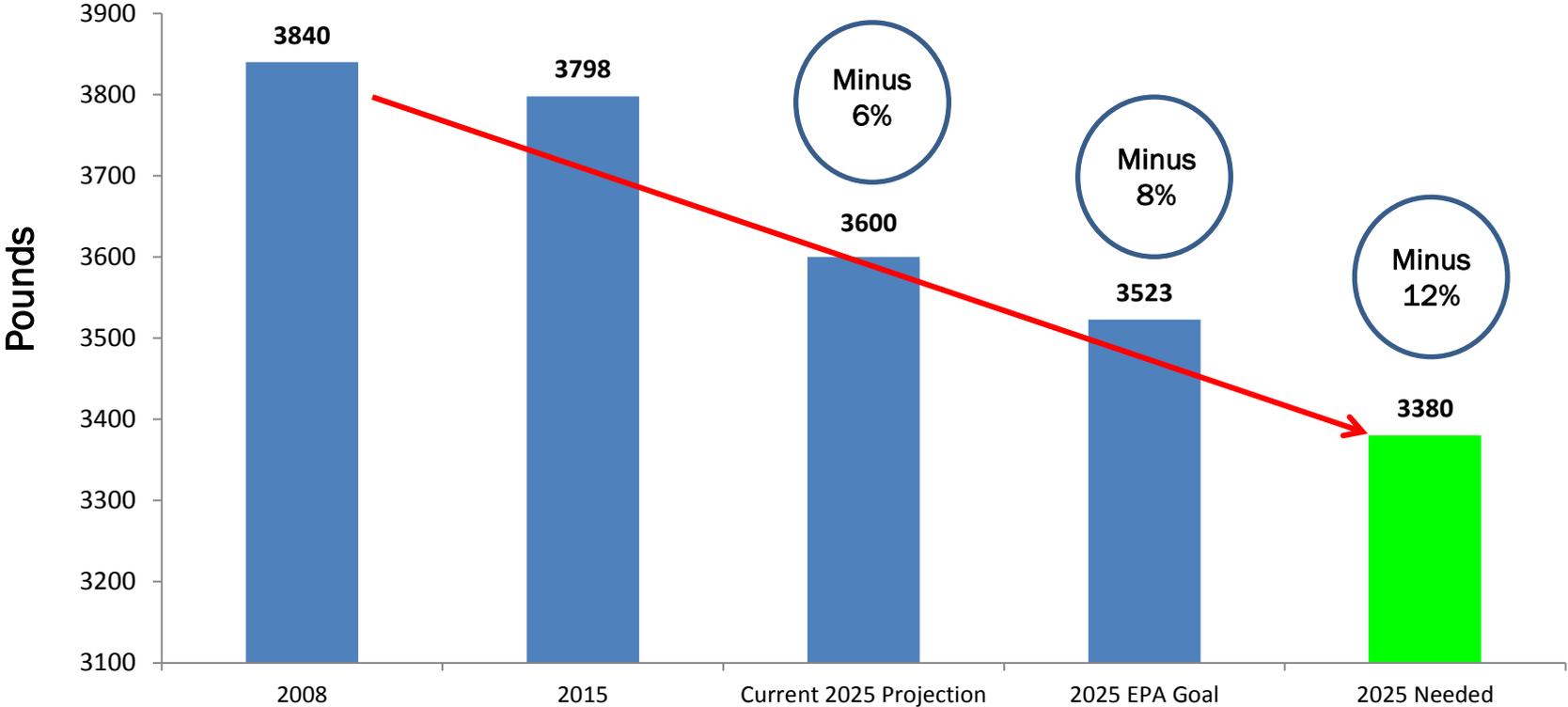
Source: WardsAuto

Source: Ducker Analysis

# A Plan Forward: Weight Reduction

Ducker believes that additional weight reduction will be required to meet the compliance levels

**A Curb Weight reduction of 460 pounds per vehicle is needed to meet the 2025 CO2 compliance levels**

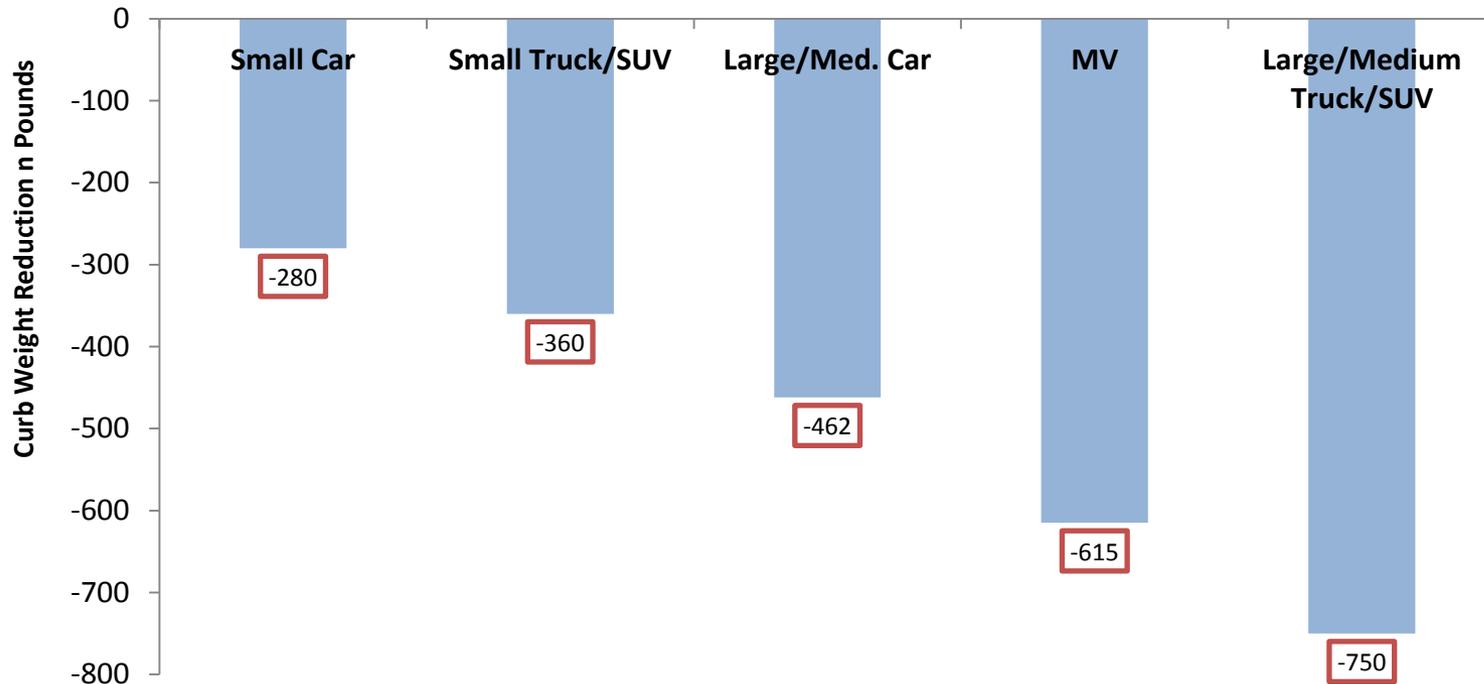


Source: Ducker Analysis

# A Plan Forward: Weight Reduction

To reduce the 2025 curb weight by 12% or 460 pounds compared to 2008, the required weight reduction by vehicle segment is shown below

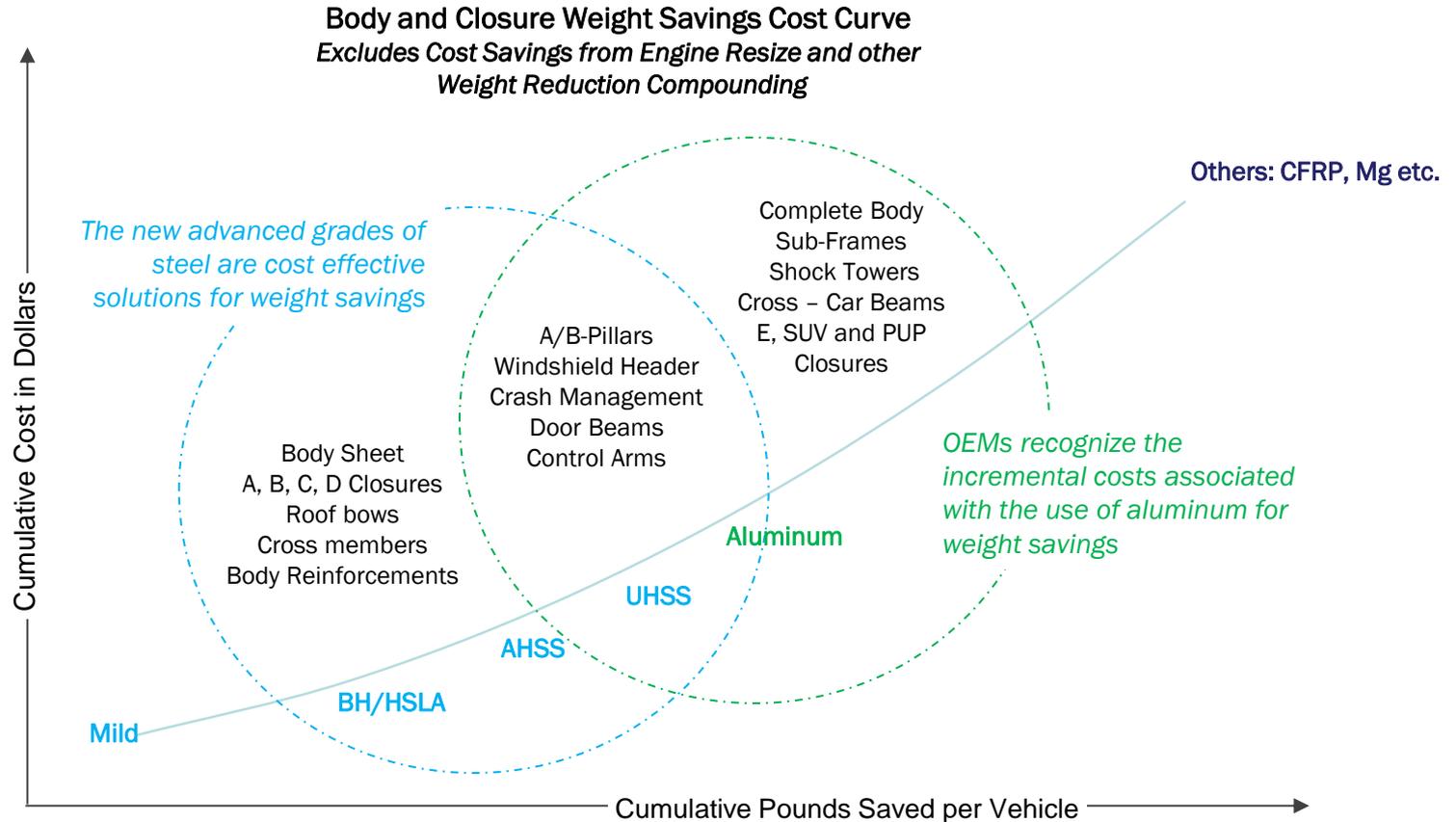
**Curb Weight Savings by Vehicle Segment**



Source: Ducker Analysis

# OEM and Vehicle Segment Driven Material Choice

Given an OEMs mix of vehicles offered for sale in the US, the use of AHSS or Aluminum become strategic in nature: use the best materials for the weight savings required



Source: Ducker Analysis

HSLA = High strength, low-alloy steel | AHSS = Advanced high-strength steel | UHSS = Ultra high-strength steel

# Steel Content

## Objective

- 2013 / 2014 Flat Rolled Steel Content with a core focus on AHSS for the North American Light Vehicle

## Scope

- Steel content to encompass the light vehicle Body-in-White, with additional emphasis to also have specific metrics around bumpers, sub-frames, wheels, and suspensions
- The results are inclusive of over 80% of the vehicles produced in 2013 / 2014
- Similar to the 2011 Study, steel shipment data was utilized for data triangulation

# Steel Content

## Results

- The 2013 North American light vehicle is estimated to have an average of 1,615 pounds of flat rolled steel
  - Although lighter than 2010, the total is slightly greater than what we had expected and may be attributed to the mix difference of production vehicles in 2010 vs. 2013 (greater share of SUV and PUP) as well as by some delays in new vehicle launches
- The 2013 average light vehicle content of flat rolled steel versus the 2010 flat rolled content per vehicle for body structures, closures, door beams, bumper beams, suspensions, sub-frames and wheels in pounds per vehicle has changed as follows:

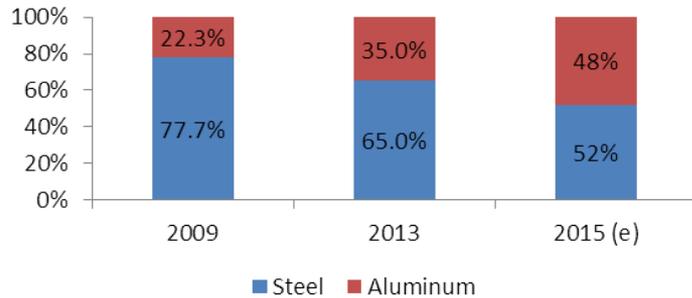
<b>2010 vs. 2013 Average Net Change in Steel Content by Grade in Pounds / Vehicle</b>			
<b>Mild Steel</b>	<b>BH &amp; HSS</b>	<b>AHSS (DP)</b>	<b>UHSS</b>
▼ 110.3	▲ 63.2	▲ 15.7	▲ 16.1

Source: Ducker Analysis

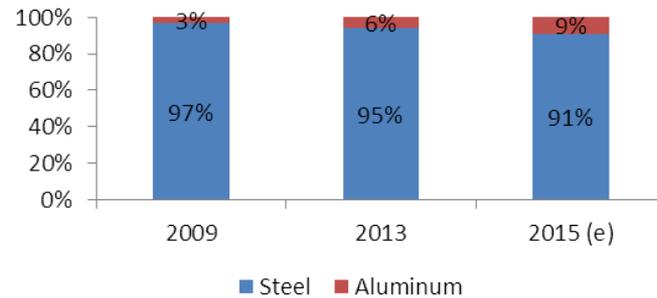
# Steel Content

Steel is the content leader for both hoods and suspension sub-frames & engine cradles. Aluminum is a compelling alternative for some closure parts like hoods

**2009 vs. 2013 vs. 2015(e) Hoods**



**2009 vs. 2013 vs. 2015(e) Sub-Frames / Cradles**

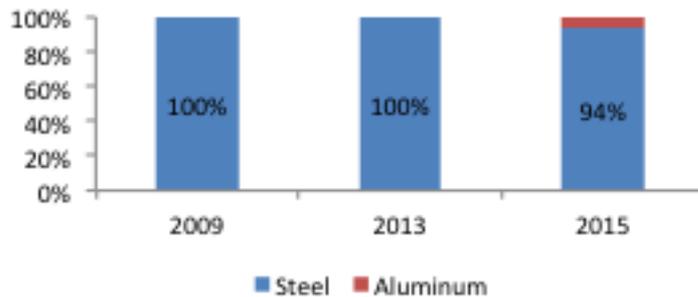


Source: Ducker Analysis

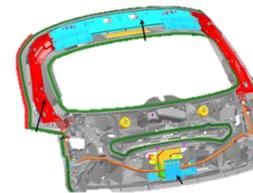
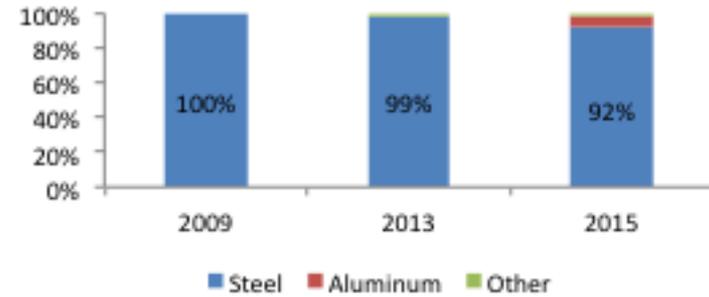
# Steel Content

Steel was the preferred and nearly exclusive material utilized for doors and deck lids until 2013. There are some vehicles that use aluminum, magnesium or thermoplastics, however volumes remain low

2009 vs. 2013 vs. 2015(e) Doors



2009 vs. 2013 vs. 2015(e) Trunks / Boats

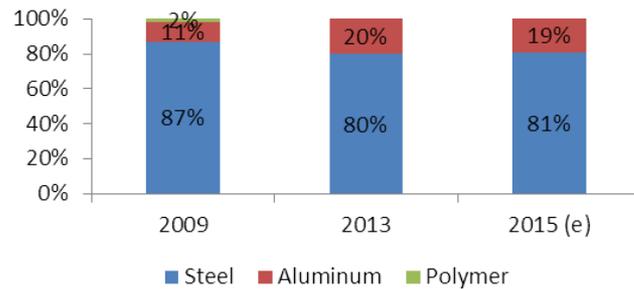


Source: Ducker Analysis

# Steel Content

Crash management systems along with suspension components continue to be dominated by steel; however are considered pendulum parts due to historical material utilization swings

**2009 vs. 2013 vs. 2015(e) Bumper Beams**



**2009 vs. 2013 vs. 2015(e) Suspension Control Arms**

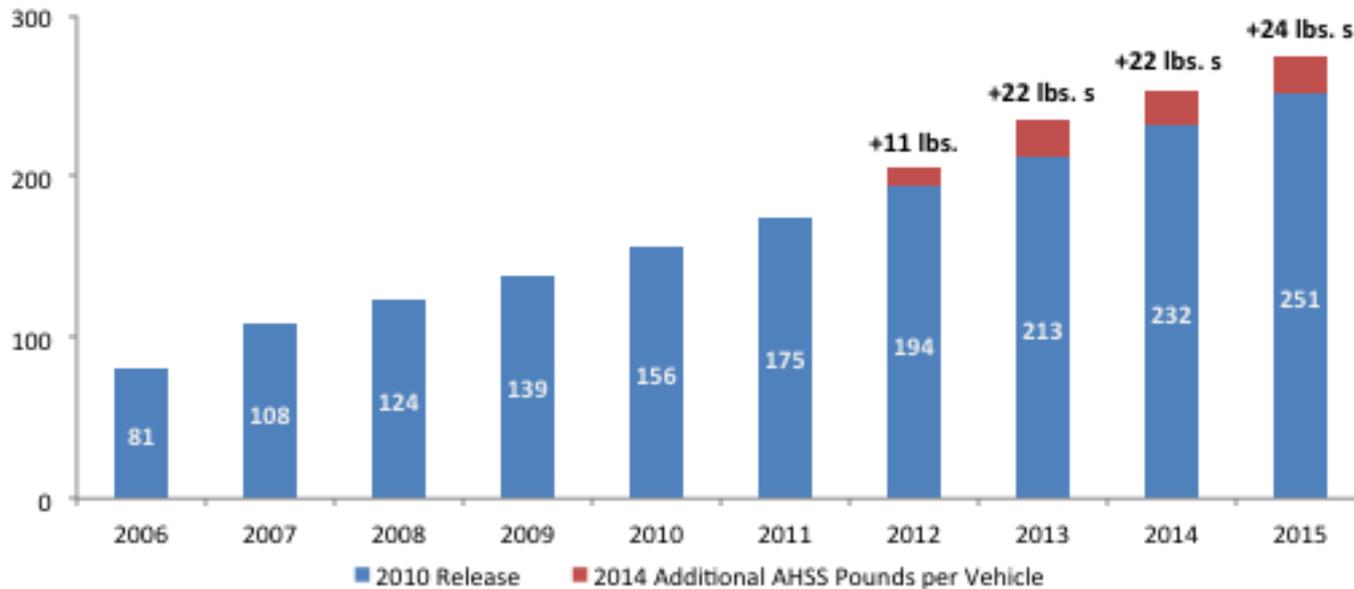


Source: Ducker Analysis

# AHSS Content

AHSS continues its growth trajectory with approximately 254 pounds per vehicle in 2014, surpassing our estimates in 2010 for 2014 by over 20 pounds per vehicle (prior 2014 estimate was 232 Pounds)

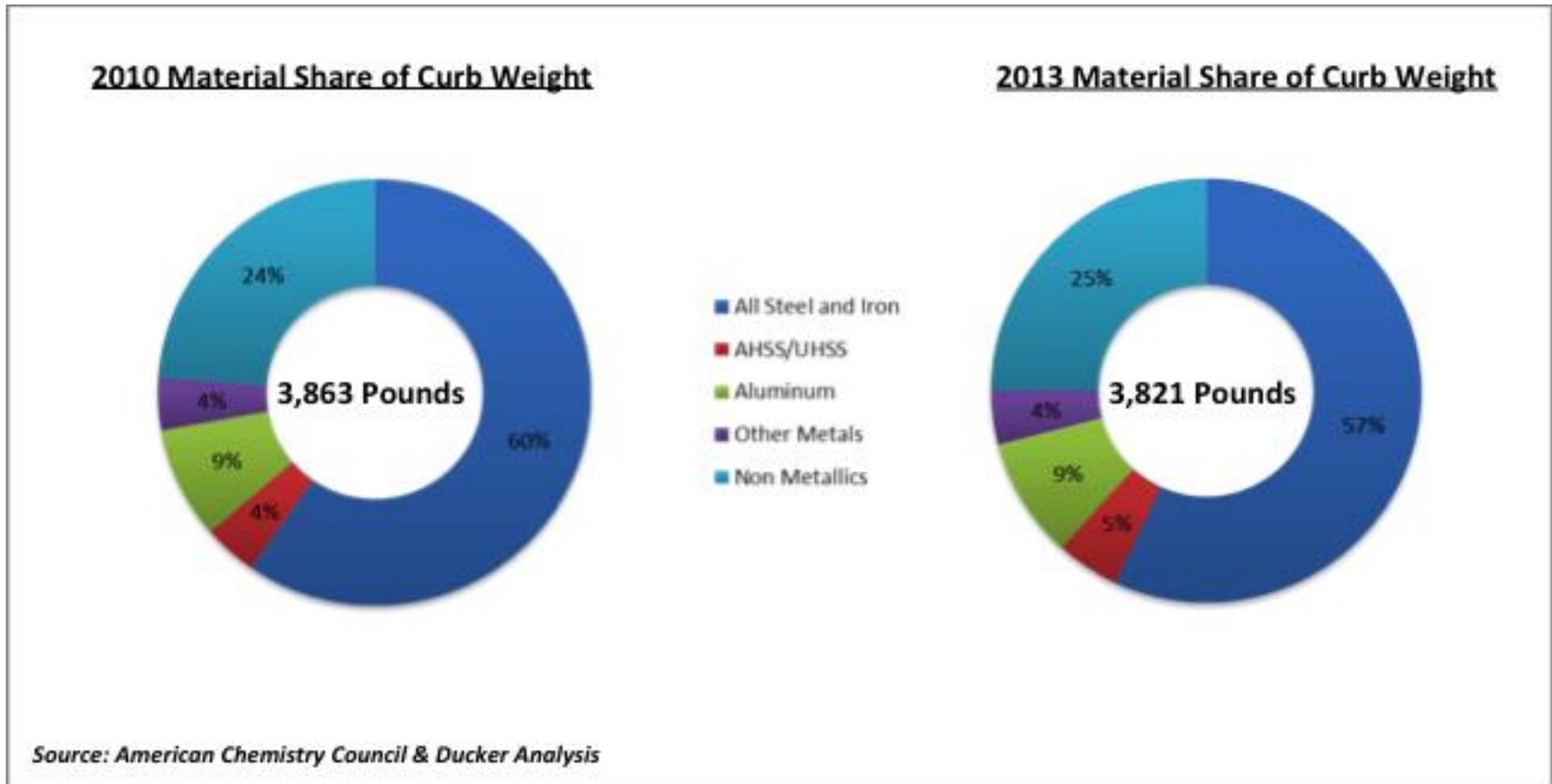
AHSS Pounds per Vehicle 2010 Study vs. 2013/14 Study



Source: Ducker Analysis

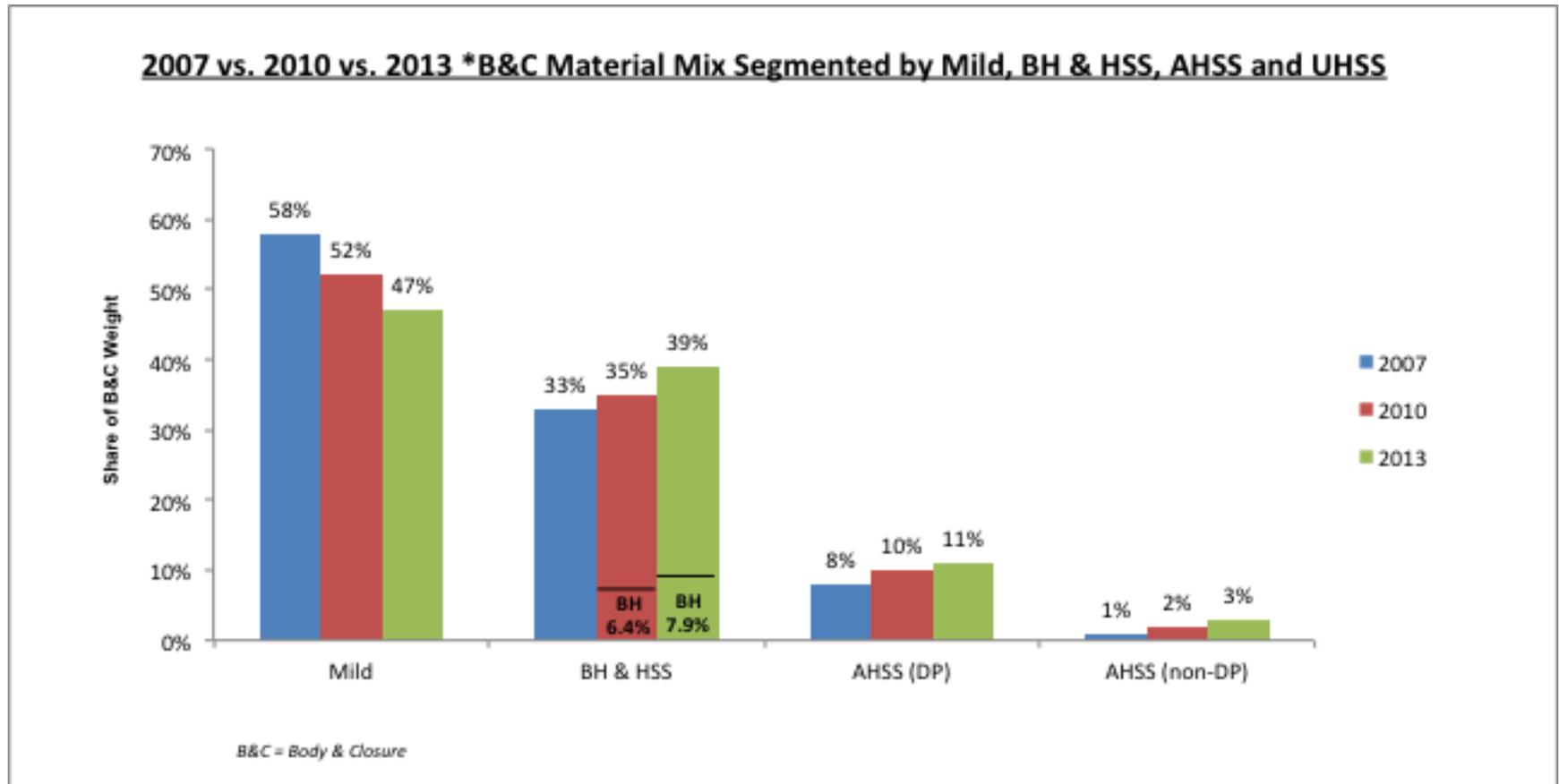
# Material Content as Share of Curb Weight

Ferrous material in its various forms together with aluminum make-up over 70% of the materials mix in the average 2013 light vehicle



# Steel Content – Material Mix

Mild steel share declined as compared to 2010. However, total steel content increased as the share of \*B&C materials for high strength, AHSS and UHSS increased

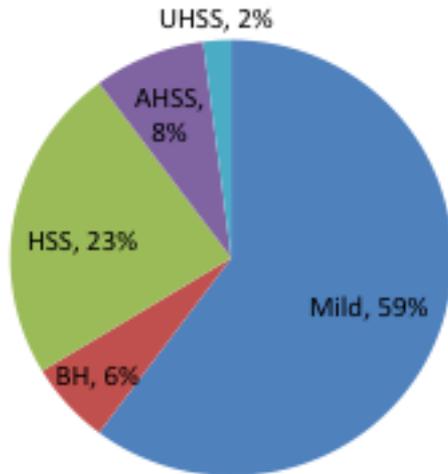


Source: Ducker Analysis

# Flat Rolled Steel Content

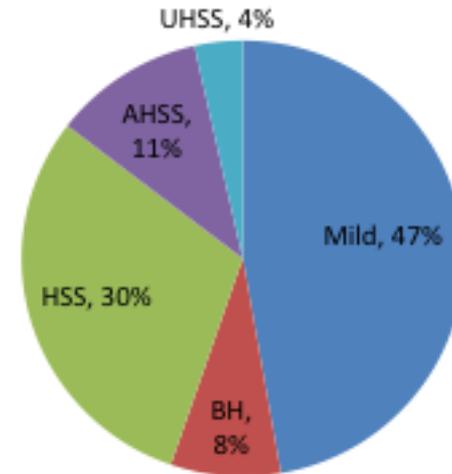
AHSS and UHSS together account for nearly 15 percent of the flat rolled steel content within the average 2013 vehicle. UHSS content doubled in three years

**2010 Flat Rolled Steel Content**



**1628 Net Pounds per Vehicle**

**2013 Flat Rolled Steel Content**



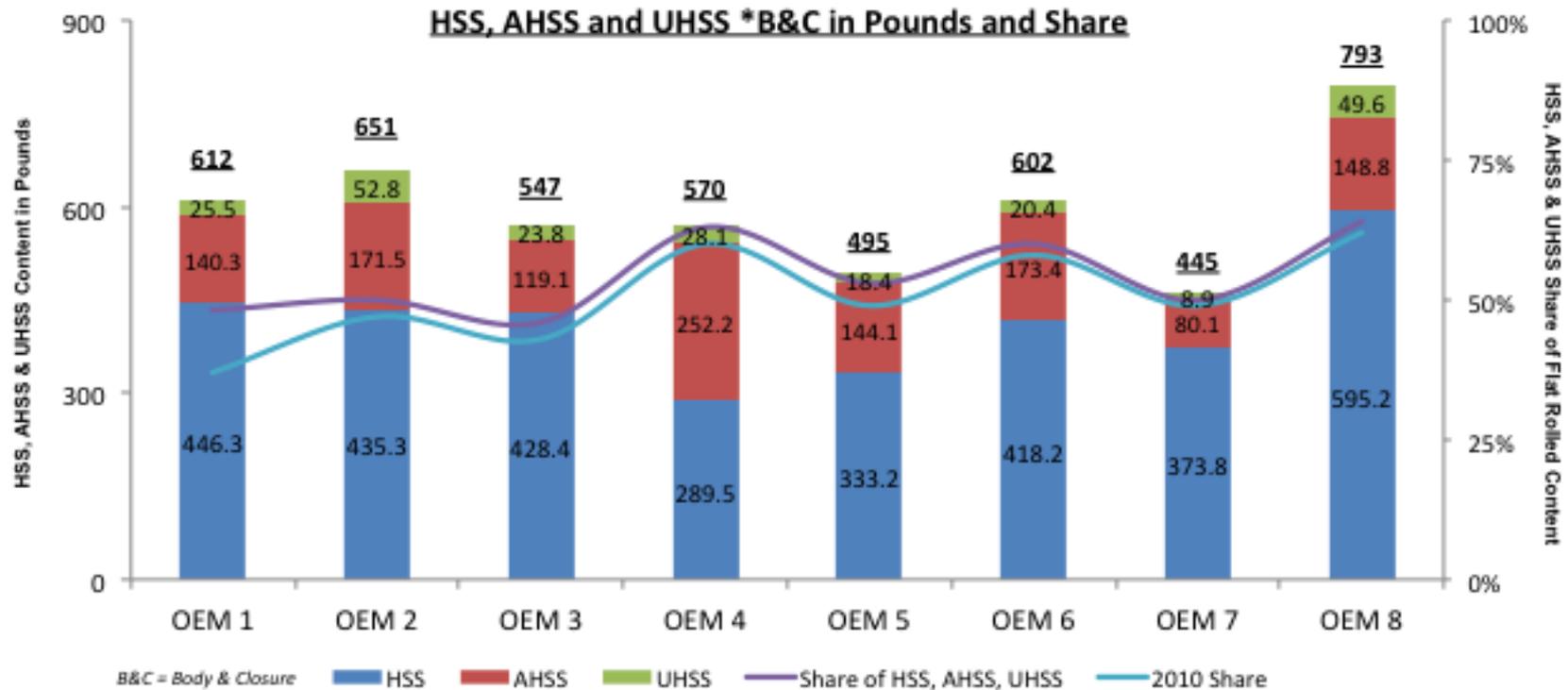
**1615 Net Pounds per Vehicle**

*AHSS & UHSS grow from ~10% of share to 15% of share*

Source: Ducker Analysis

# Steel Content – OEM Analysis

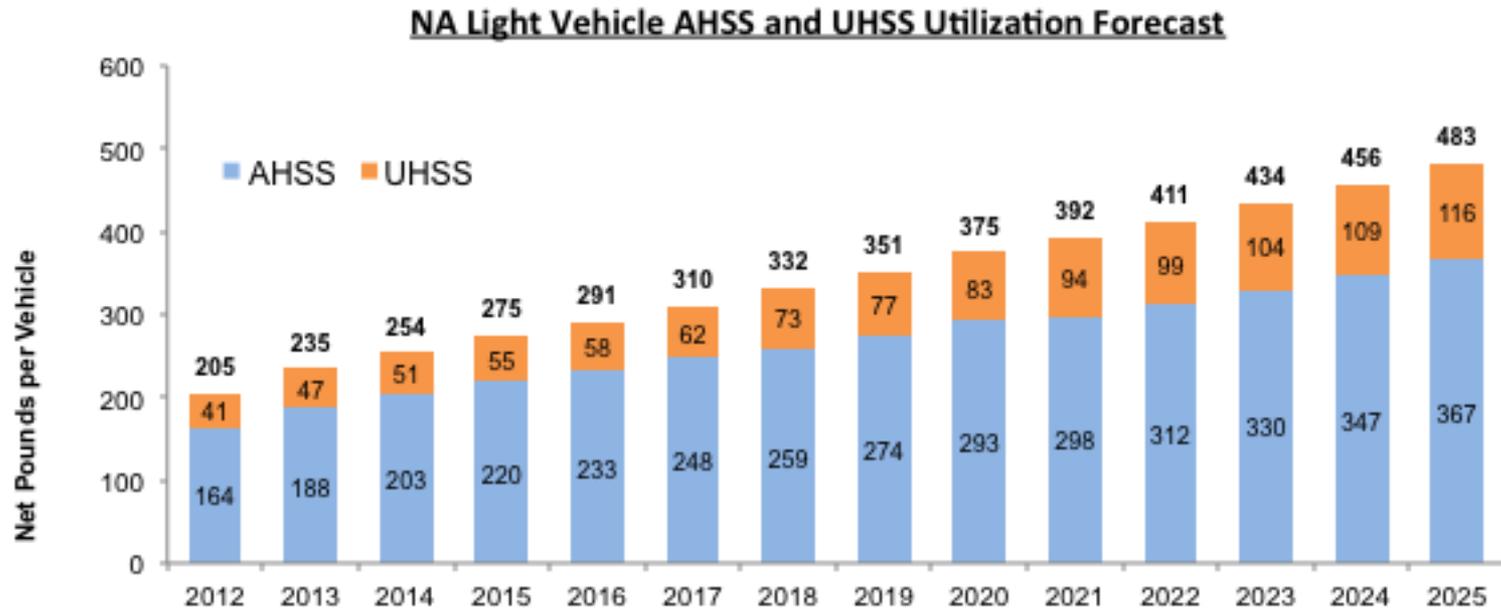
HSS, AHSS and UHSS utilization shares grew from 2010 for all OEMs surveyed for their vehicles produced in North America. The cadence of vehicle launches can impact year to year shares



Source: Ducker Analysis

# AHSS Forecast

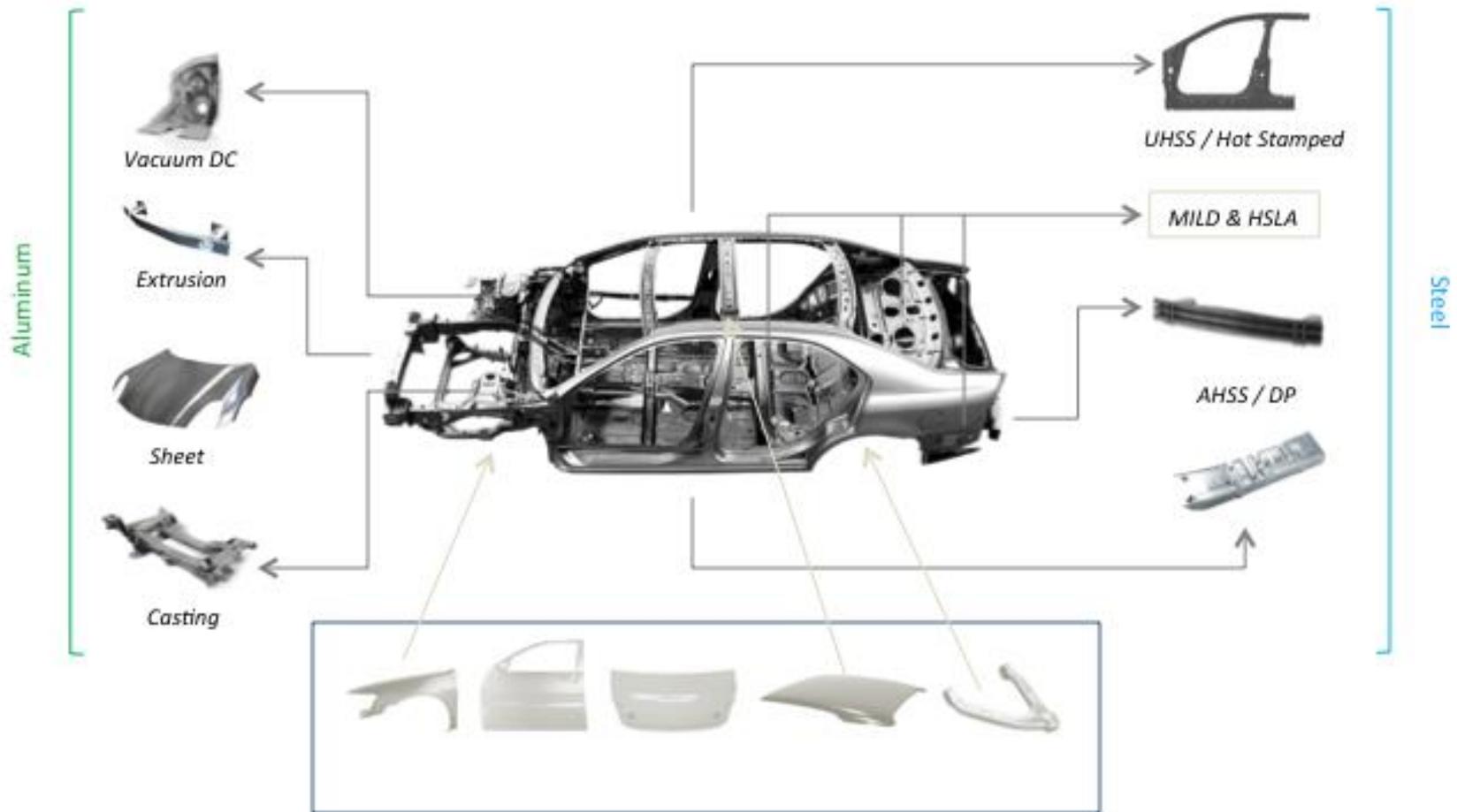
The 2014 average AHSS use in North American produced light vehicles is 254 pounds and expected to nearly double to 483 pounds by 2025



Source: Ducker Analysis

# The Right Materials for the Right Applications

As we continue the march towards the 2025 mandates there are many unknowns as to what the materials mix will look like



Source: Ducker Analysis

## This concludes our report. Thank you.

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