



is a leading steel information service in Englewood Cliffs, N.J.

WSD's steel experience, steel database and availability of steel statistics are the principles for performing steel forecasts, studies and analysis for international clients. WSD seeks to understand how the "pricing power" of steel companies the world over will be impacted by changes in the steel industry's structure.

The views and opinions expressed in this article are solely those of World Steel Dynamics and not necessarily those of AIST.

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## Auto body sheet warfare: Steel may overcome aluminum's avalanche by 2018

The following are highlights from WSD's report, *Auto Body Warfare: Aluminum Attack*, published in November 2014:

- Ricardo Corp., a firm with expertise in engine design and an understanding of the corporate average fuel economy (CAFE) miles-per-gallon standards by type of vehicle, was hired by WSD to answer some key questions and to provide key data. The firm demonstrated that, because of improved engines, steels that are stronger and less expensive than aluminum should be sufficient to meet the future CAFE standards (Table 1).
- Engines are reduced in size with almost no reduction in effectiveness (Figure 1).
- Weight reduction accounts for only about 12% of the reason for the gain in mileage.
- The body-in-white, where the potential reduction in weight is 20% or more using advanced high-strength steels (AHSS), is 3.5 times the weight of the closures (hang-on parts such as doors and hoods in which aluminum has made strong inroads).

Table 1

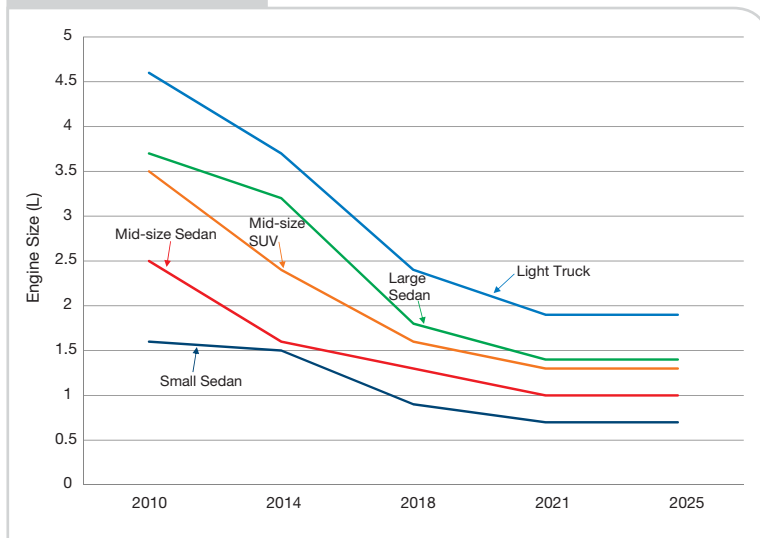
### Miles-per-Gallon (MPG) Gains Due to Engine, Powertrain and Reduced Weight

Mid-size SUV	2018	2021	2025
CAFE MPG	31	34	41
2010 MPG	26.4	26.4	26.4
Gain due to powertrain	3.9	6.4	12.7
Gain due to non-powertrain	0.2	0.3	0.8
Gain due to weight reduction	0.7	1.1	1.5
Total	31.2	34.2	41.4
MPG gain due to weight reduction (%)	14.6	14.1	10.0
<b>Light truck</b>	<b>2018</b>	<b>2021</b>	<b>2025</b>
CAFE MPG	25	27	32
2010 MPG	19.4	19.4	19.4
Gain due to powertrain	4.9	6.6	9.4
Gain due to non-powertrain	0.1	0.3	1.4
Gain due to weight reduction	0.6	0.9	1.6
Total	25	27.2	31.8
MPG gain due to weight reduction (%)	10.7	11.5	12.9

Source: Ricardo Corp. Note: All gains relative to 2010 MPG avg.

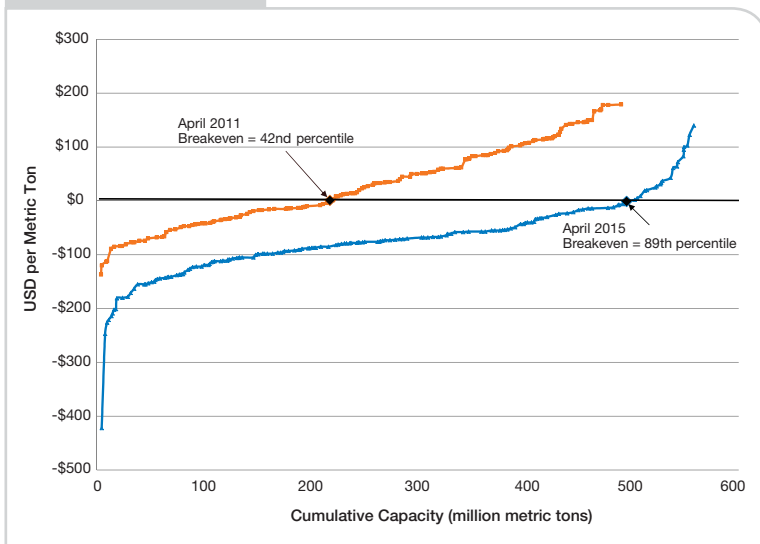
- The additional cost to the automotive company for weight reduction using AHSS may not be substantial because the higher price is offset by the use of stronger and thinner steels.
- The price outlook for primary aluminum ingot should be a worry for the automotive buyer, considering the potential for capacity reductions in China. About 40% of the country's aluminum capacity is based in the northwest, where there are power plants dedicated to serving the often highly polluting aluminum reduction plants. The plants, however, might be repurposed sometime around 2020 to provide power for the region's electrical grid. Aluminum reduction plants elsewhere in China are high in cost because they depend on alumina produced using offshore bauxite. Aluminum reduction plant capacity additions outside of China are minor.
- Aluminum common alloy sheet prices are up 10% to about US\$1.54/lb. since January 2014; hot rolled band is down more than 25% to about US\$0.23/lb.
- While emissions are an issue for both aluminum and steel, savings due to lower vehicle weights are offset by the higher emissions to produce the aluminum ingot, the steel industry says.
- Aluminum auto body sheet shipments may peak by about 2018, having risen to about 3.4 billion lbs. from about 0.6 billion lbs. in 2014.
- AHSS automotive sheet shipments are forecast by WSD to surge to 25.6 billion lbs. in 2025 versus 8.5 billion lbs. in 2014; however, WSD projects an overall 5% decline in steel auto body sheet deliveries of all types by 2025 to 46.1 billion lbs.
- The good news for steel mills is that AHSS appears to offer a higher profit margin. WSD's research indicates the steel mills obtain only a 15–20% EBTIDA margin on automotive sheet

Figure 1



Change in engine size over time. Sources: Ricardo Corp., WSD estimates.

Figure 2



Steel Plant Viability Monitor: hot rolled band export price EBITDA.

products versus 35–40% for aluminum. This is one of the reasons for the explosive rise in the aluminum industry's investment to produce automotive sheet.

## Wide hot strip mill viability monitor: New WSD product

WSD has a new monthly product called the Steel Sheet Mill Viability Monitor (Figure 2). The assessment goes

back to November 2010 for each mill's operating cost to produce slab, hot rolled band (HRB) and cold rolled

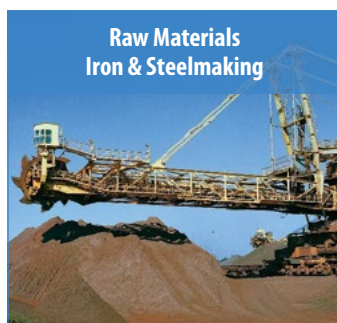
coil; its domestic and export price; the cost to ship hot rolled band to the port of export; and its earnings before interest, taxes, depreciation, and amortization (EBITDA) per metric ton on domestic and export sales. Here's what WSD observes concerning export price:

- In April 2015, only 11% of the steel sheet mills in WSD's monthly World Cost Curve generated a positive EBITDA at the then-in-effect HRB export price (which is lower in most cases in early July 2015).

- In April 2011, 58% were in the black on the same basis.

On a domestic price basis as of April 2015, about 60% of the mills were generating positive EBITDA.

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