The Truck Market Outlook; Production, Trends & Developments

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Power Systems Research profile

*Powerful expertise, innovation for the future*

- Global provider of market research, industry data & forecasting services
- Sole global specialist across all segments of power products & drivetrain industry
- History of innovation; ~40 years experience
- Unique data & forecast tools
- Proprietary market studies
- Market intelligence, modeling, forecasting

Data... Information... Intelligence
Global presence

*Powerful global and local perspective*

Headquarters: St. Paul, MN, USA
Beijing, China
Brussels, Belgium
Detroit, MI, USA
Moscow, Russia
Pune, India
Riyadh, Saudi Arabia
São Paulo, Brazil
Tokyo, Japan

And a network of research specialists in other key markets.
All engine-powered products

Information for multiple industries and markets

- Agricultural
- Construction
- Industrial
- Lawn & Garden
- Light Commercial Vehicles
- Marine Auxiliary
- Marine Propulsion
- Medium & Heavy Vehicles
- Minivans & SUVs
- Passenger Cars

- Power Generation
- Railway
- Recreational Products
Focus: Medium-Heavy Vehicles; (Above 6 Tons)

PRODUCTION
Global M-HCV (6T+) Vehicle Production

The Truck Market is expected to grow slow @ 3% CAGR from 2016 to 2020...

Source: CV Link™ 2015
Region-Wise Medium-Heavy Vehicle Production & Forecast

Source: CVLink™ 2015

G. China: -4%
Europe: 5%
S. Asia: 6%
N. America: 0%
Japan & S. Korea: 0%
S. America: -2%
Focus: Medium-Heavy Vehicles; (Above 6 Tons)

TRENDS & DEVELOPMENTS
It’s about the engine, right?
Trends impacting global truck OEMs

*It’s not only about the engine!*

- Increased Globalization
- Evolution in Emissions & GHG Regulation
- Alternative Powertrains
- Develop Global Platforms
- Fuel Infrastructure & Alternative Fuel Availability - CNG
- Autonomous Vehicles, Telematics
Increased Globalization of Major OEMs

A trend that is likely to continue...

- Smaller OEM’s will continue to be acquired by the larger ones or simply go out of business.

- OEM’s aim to have their global truck platforms share common components which would reduce cost and lead times.

- To produce quality low cost trucks in low cost production countries to capture both domestic and export demand.
Evolutions in Emission and GHG Standards…

*Global Emissions Regulations*

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Evolutions in Emission and GHG Standards

**GHG Emissions Overview…**

- Future regulations are focused on reducing greenhouse gas emissions by improving fuel economy.

- The EPA & the National Highway Transportation Agency anticipate the joint standards will
  - Reduce GHG emissions by nearly 250 million metric tons and
  - Save approximately 500 million barrels of oil over the life of vehicles sold from 2014 to 2018.

- The program applies to trucks with a GVWR > 8,500 lbs. or basically, class 3 – 8 divided into three vehicle segments, each with its own set of standards to meet.
What’s happening with engines?

Engines are becoming increasingly more efficient

- Higher power density
  - Displacement is decreasing for given HP output
  - Smaller, lighter engine package for given HP output
  - Truck buyers increasingly opting for higher HP engines
- More efficient engines consume less fuel
  - Improved MPG, lower operating cost
  - Reduced exhaust emissions volume
  - Lower GHG production
Diesel engines remain the dominant choice globally

LPG & CNG have gained share; displacing gasoline, **not** diesel

Source: CV Link™ 2015

(*Note: LPG excludes non-OEM LPG conversions*)

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Powerful Possibilities™
Engines are gradually getting smaller

**Increasing utilization of lower-displacement engines**

![Bar chart showing engine utilization from 2010 to 2020](chart.png)

Source: CVLink™ 2015
Engines are becoming more powerful

Vehicle production w/301-400 kW engines continues steady growth
Other engine developments/trends

• **Down-speeding**
  - Some fleets operating engines at lower RPM
  - Improved MPG, lower operating cost, extended engine life
  - Requires drivetrain gearing change; higher final-drive ratio

• **Automated transmissions rapidly gaining market preference**
  - Help improve efficiency of less-experienced drivers
  - Raise fleet “freight efficiency”

• **Alternative fuels have gained share**
  - LPG in medium class vehicles; CNG in heavy classes
  - Many LPG vehicles have field-converted gasoline engines
  - Falling diesel prices slowing penetration rate of alternatives
Global Truck Market will continue to innovate through 2020

Global M-H Truck Market to grow at a slow and steady pace of 3%

Further consolidations & collaborations in supply chain to reduce Costs

Diesel Power will dominate; Natural gas & alternative fuels to grow slowly

Engines are becoming smaller, efficient and more powerful
Thank You!