Strategic Outlook of the Global Medium-heavy Commercial Truck Market in 2013
Despite Strong Headwinds Sales Volume Poised to Touch 2.8 Million

Sandeep Kar
Global Director- Commercial Vehicle Research
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Big 5 Predictions

1. The global economy is expected to grow by 3 to 3.5 percent in 2013, resulting in medium and heavy truck demand to increase by 5.6 and 3.6 percent, respectively. Sales in 2013 for medium-heavy trucks will reach 2.8 million units.

2. MCV and HCV sales in Next 11, Russia, and Rest of World markets (outside of TRIAD and BRIC) are poised to increase by 10 to 13 percent. China’s 3.1 percent growth rate, although moderate in comparison to previous years, will provide upside boost to global demand.

3. Nearly 6,000 CNG/LNG-powered natural gas trucks will be sold in North America, while global sales for MD-HD natural gas-powered trucks will reach 16,000 units. Hybrid truck sales will trail NG truck sales.

4. Daimler’s 2013 MD-HD truck sales are expected to reach 350,000 units in 2013; Volvo’s acquisition of Dong Feng could take Volvo Group’s MD-HD truck sales over the 400,000 units mark.

5. Twenty-eight percent of all heavy-duty trucks sold in 2013 will feature platform-based lineage, showing tectonic changes in global truck production. Significant growth in the global low-cost truck market (an 8.6 percent CAGR) will lead to developments and fine-tuning of several BRIC market-based platforms.

Source: Frost & Sullivan analysis.
## 2013 Global GDP and Commercial Truck Market Growth Outlook:
Growth in BRIC and Next 11 economies are expected to offer strength to global truck demand.

### Global CV 2013: World GDP and CV Growth Outlook Overview, Global, 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>GDP Growth Estimates: 2013 (%)</th>
<th>MCV Growth (YoY%)</th>
<th>HCV Growth (YoY%)</th>
<th>Overall CV Growth (YoY%)</th>
<th>Market Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>2–2.5</td>
<td>8</td>
<td>5.9</td>
<td>6.8</td>
<td>Moderate</td>
</tr>
<tr>
<td>South America</td>
<td>4–5</td>
<td>4.6</td>
<td>7.2</td>
<td>6.3</td>
<td>Moderate</td>
</tr>
<tr>
<td>Europe</td>
<td>0.5–1</td>
<td>(3.0)</td>
<td>(7.9)</td>
<td>(6.9)</td>
<td>Low</td>
</tr>
<tr>
<td>China</td>
<td>8–8.5</td>
<td>2.0</td>
<td>3.5</td>
<td>3.1</td>
<td>Moderate</td>
</tr>
<tr>
<td>India</td>
<td>5.5–6.5</td>
<td>1.5</td>
<td>3.5</td>
<td>2.5</td>
<td>Moderate</td>
</tr>
<tr>
<td>Russia</td>
<td>4–6</td>
<td>3.0</td>
<td>13.5</td>
<td>11.1</td>
<td>High</td>
</tr>
<tr>
<td>Next 11</td>
<td>6–7</td>
<td>11.1</td>
<td>10.9</td>
<td>11.0</td>
<td>High</td>
</tr>
<tr>
<td>RoW</td>
<td>4–5</td>
<td>15.5</td>
<td>9.5</td>
<td>12.7</td>
<td>High</td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td><strong>3–3.5</strong></td>
<td><strong>5.6</strong></td>
<td><strong>3.6</strong></td>
<td><strong>4.3</strong></td>
<td><strong>Moderate</strong></td>
</tr>
</tbody>
</table>

Global Medium and Heavy Truck Market Forecast 2013

Despite strong global headwinds, improving Chinese manufacturing indices and strength in BRIC and Next 11 countries will elevate global MCV and HCV sales to 2.8 Million by 2013.


~2.6 million

2013 Regional Shares

<table>
<thead>
<tr>
<th>Region</th>
<th>MCV 2013</th>
<th>HCV 2013</th>
<th>MCV 2012</th>
<th>HCV 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>57%</td>
<td>43%</td>
<td>34%</td>
<td>66%</td>
</tr>
<tr>
<td>South America</td>
<td>67%</td>
<td>33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>73%</td>
<td>27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>53%</td>
<td>47%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>21%</td>
<td>79%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>80%</td>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Next 11</td>
<td>51%</td>
<td>49%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RoW</td>
<td>46%</td>
<td>54%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Next 11 includes the following countries: Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea, Vietnam, and Bangladesh.

MCV: 6T to 16T
HCV: 16T and above

Note: All figures are rounded; the base year is 2012. Source: Frost & Sullivan analysis.
Next 11 Markets:
Indonesia, Turkey, Mexico, and Egypt offer strong growth potential in 2013, as these economies expect rapid economic development, leading to freight movement expansion.

Global CV Outlook 2013: Unit Sales Forecast—Next 11: 2013

As the most populous Arab nation, Egypt offers an attractive opportunity for truck OEMs, as its focus has shifted toward modernizing the economy. Investment in infrastructure is necessary to drive demand for new trucks.

Indonesia is set to double its demand for MCV and HCV by 2018.

The Mexican CV demand is set to triple over the 2011 to 2018 period. Economic growth and rise in construction activity, coupled with the need for replacement of aging fleet vehicles, will drive growth.

Turkey will experience a rising demand for MCVs and HCVs in 2013, which is based on both export-oriented production and local sales.

Note: All figures are rounded; the base year is 2012. Bangladesh data is not present, owing to lack of availability at the time of publication of this study. Source: Frost & Sullivan analysis.
Global MCV and HCV Market—Powertrain Technology Forecast:
Diesel is expected to retain dominant leadership in the powertrain space; natural gas and hybrid/electric technology are expected to experience rising proliferation in 2013.

Global CV Outlook 2013: Powertrain Technology Split by Region—Global: 2013

Next 11 includes the following countries: Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea, Vietnam, and Bangladesh.

Note: All figures are rounded; the base year is 2012. Source: Frost & Sullivan analysis.
Analysis of Key Design Parameter Ranges for HD Engine Market (North America), 2011–2018: Powertrain Downsizing Pushing Weighted Average Engine Displacement to Under 14 L in Class 8 Trucks by 2018


<table>
<thead>
<tr>
<th>Year</th>
<th>Displacement (in L)</th>
<th>Power (in bhp)</th>
<th>Torque (in lb. ft.)</th>
<th>Median range</th>
</tr>
</thead>
</table>

Source: Frost & Sullivan analysis.
A steady increase in adoption is expected through the forecast period, and Class 6-8 natural gas truck shipments are expected to reach 35,429 units in 2017.

### Frost & Sullivan Scenario Breakdown

<table>
<thead>
<tr>
<th>Year</th>
<th>Spark Ignition</th>
<th>Compression Ignition</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>11,028</td>
<td>2,757</td>
<td>13,785</td>
</tr>
<tr>
<td></td>
<td>11,904</td>
<td>9,740</td>
<td>21,644</td>
</tr>
</tbody>
</table>

Note: All figures are rounded; the base year is 2010. Source: Frost & Sullivan analysis.
MD and HD LNG/CNG Trucks Volume Forecast - Europe
The heavy-duty segment set to account for 75% of natural gas truck sales in Europe by 2018.

MD and HD Natural Gas CV Market: Truck Production Forecast by Category, Europe, 2011 and 2018

Note: All figures are rounded. The base year is 2011. Source: Frost & Sullivan
Global Production Volume Forecast by Drivetrain

Combined Hybrid and Electric MCV, HCV, Transit Bus, and Other Bus Production is to Reach 307,000 by 2020; Parallel Hybrids and Pure Electrics Will Be the Largest Contributors to This Growth.

Outside of the big three (North America, Europe, and China), Brazil, Japan, India, and Korea are emerging as countries offering market penetration potential to hybrid and electric powertrain modules, systems, and components suppliers.

Note: All figures are rounded. The base year is 2010. Source: Frost & Sullivan analysis.
Global Hot Spots: Continued economic uncertainty in TRIAD and moderation in growth rates in BRIC will lead to OEMs shifting focus to Next 11 markets; North America and China are expected to remain strong growth bets for OEMs.

**North America**
CV market to improve marginally in 2013 with improving economic indicators. Stronger growth expected in 3rd and 4th quarters.

**Europe**
Economic slowdown to prolong through 2013, thus impacting CV demand. EU OEMs are focusing on Next 11 and RoW for growth.

**Russia**
Russia to be the most attractive among the BRIC countries. Market to grow by 10 percent in 2013.

**China**
Strengthening manufacturing sector and infrastructure development to boost truck demand.

**South America**
With the recovering Brazilian economy and renewed resource demand, trucking will experience global growth in 2013.

**India**
Domestic demand to remain strong in 2013 with improving economic activity. Heavy-duty truck market to grow more quickly than MCV market.

**Next 11**
Several Next 11 markets to post near double-digit growth in new truck sales in 2013. Turkey and Indonesia looking attractive for long-term sustainable growth.

Source: Frost & Sullivan analysis.
**Low-cost Truck Market (Global)** Over 21 key global low-cost MCV-HCV model ranges are expected to be introduced by global OEMs between 2009 and 2016; 2013 is a critical year, as OEMs strive to introduce low-cost truck platforms for both developing and mature markets.


- **2009**
  - HCV: Sinotruk Howo, U-Truck MN 25/40, TATA Prima
  - MCV: Volvo-Eicher VE, GAZ 3309c, DongFeng Duo

- **2013**
  - HCV: Sinotruk HuangHe, DongFeng DFL, AsiaMotorWorks
  - MCV: ISUZU FTR, IVECO’s Chinese Platform Based MD

- **2016**
  - HCV: Hyundai HD, Daimler Brand X HD, Kamaz LCT HD, VolvoDongFeng LCT HD
  - MCV: IVECO LC HCV, GAZ-FAW HD, Fuso FG LCT

Source: Frost & Sullivan analysis
**HD OEM Outlook for 2013:** Participants with global platform portfolios, strong presences in growth markets, and regional branding are expected to sustain profits globally in 2013; Daimler is emerging as a strong benefactor of globalization in 2013.

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**Global CV Outlook 2013: OEM Outlook Comparative Analysis—Global: 2013**

Size of bubble represents expected production volume attributable to platform-based HD truck models by 2013.

- **Global strategy evolving, strong regional products**
- **Clear global strategy, strong product mix**
- **Sought-after zone**
- **Sustained profits globally**
- **Profitable only at regional level**

Source: Frost & Sullivan analysis.
Telematics FMS Opportunities by Country—2013:
There is a growing demand in North America, Europe, Russia, Brazil, and South Africa; Middle East and Asia are likely to gain momentum beyond 2015.

Potential Countries

North America
- Qualcomm, Trimble/PeopleNet, XATA, Teletrac, WebTech Wireless, Telogis, Network Fleet, FleetMatics, Actsoft, SkyBitz, ID Systems, and others

Europe
- Tom Tom, Masternaut, Transics, Qualcomm, Microlise, FleetBoard, Dynafleet, MixTelematics, Trimble, Novacom, Schmitz Cargobull, IDEM-Krone, and others

Russia
- Mobiliz, Arvento, Vektor, Infotech, Solit, Satko, Pergo, and others

Brazil
- Autotrac, Zatix, Onixsat, WirelessCar, and others

South Africa
- MixTelematics, Digicore, Netstar, Tracker, and others

Middle East
- China GPS, Ltd.; FleetBoard; Navman Wireless; Trimble; and others

Asia
- Arya Omnitalk, eLogistics, CMC Limited, Pricol, Mahindra Telematics, Ashok Leyland, Trimble, iTrack, MobiApp, and others

Beyond 2015
- Tom Tom, Masternaut, Transics, Qualcomm, Microlise, FleetBoard, Dynafleet, MixTelematics, Trimble, Novacom, Schmitz Cargobull, IDEM-Krone, and others

Source: Frost & Sullivan analysis.
Vehicle Electronics: Common Multiplexed Architecture Across OEMs

Laying Out a Common Advanced Electrical and Electronics Platform Will Provide Clear Boundaries for Integration of Electronics in Cabins; This Will Emerge as a Key Foundation for Future Cabin Design Strategies

HCV Market: Common Multiplexed Architecture, EU, 2012

Need for Robust, Effective and Efficient Electronics, Communication and Networking Architecture

- Development of architecture in compliance with SAE standards.
- J1939, J1708, CAN, LIN etc - vehicle bus protocol used for communication and diagnostics among vehicle components.
- IEC 60068, ISO 16750

MULTIPLEXED ARCHITECTURE

- Regulation Compliance
- Infotainment
- Telematics Connectivity
- Safety System Integration
- HMI – Driver Comfort & Convenience Controls
- Chassis Control
- HVAC
- Handheld / Personal Device Connectivity
- Powertrain Control
- OBD

Enables seamless communication between vehicle and devices.

Single standardized platform will streamline product development for OEMs and Tier 1 suppliers.

Since, necessary infrastructure is available, new devices addition will not require discrete system integration and customization.

OBD – On-Board Diagnostics; HVAC – Heating Ventilating and Air-Conditioning
Attractive Commercial Truck Segment by Region—2013

The 18 to 25 MT segment is to be the most attractive among heavy trucks globally at a price band of $40,000 to $60,000, while the 25 to 30 MT segment is to be the most attractive in NA and EU.

Global CV 2013: Highest-selling Weight Segment in Each Region—Global: 2013

Size of the bubble: Sales units of top segments in each country in 2013.

Note: All figures are rounded; the base year is 2012. Source: Frost & Sullivan analysis.
### Key Conclusions

1. Global sales of medium-heavy trucks are expected to grow at 4.3 percent to reach 2.8 million units. Both US and China markets are expected to grow more quickly than in 2012, while Europe will experience negative growth of 6.9 percent.

2. Daimler and Volvo will intensify competition in global markets, with both experiencing success through low-cost truck market exposure. Chinese, Indian, and Korean OEMs will benefit from growth in MCV demand in Next 11 and African economies.

3. Volvo’s acquisition of DongFeng stake is expected to not only place it as a global sales leader in 2013, but also to create synergies and opportunities in medium-duty platforms involving Eicher. This is likely to prove important for BRIC, Next 11, and RoW growth strategy empowerment.

4. In 2013, 22,700 natural gas and hybrid/electric medium and heavy trucks will be sold, of which 71 percent will be CNG/LNG-powered vehicles, and 29 percent will be hybrid and electric vehicles.

5. Platform-based MCV and HCV production are set to receive major boosts in 2013, with OEMs’ building and executing capacity aimed at generating nearly 34 percent of total production of MCVs and HCVs from platforms by 2018.

6. In 2013, 19 percent and 16 percent of all MCVs and HCVs in operation in North America and Europe, respectively, will feature in vehicle-installed telematics subscription, offering robust revenue growth opportunities.
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