

Truck 2020: Transcending Turbulence



Interviews included the entire trucking value chain, multi-modal operators, industry regulators and associations

Truck OEMs



Chongqing Heavy Vehicle Group

Truck Suppliers



Value Chain



Fleets



Bus OEMs



Regulators



Associations

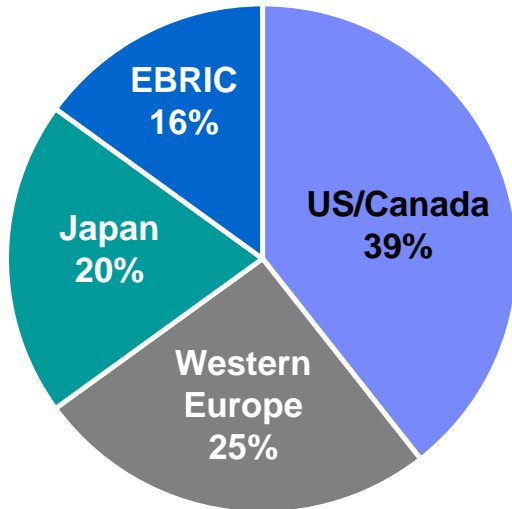


Others

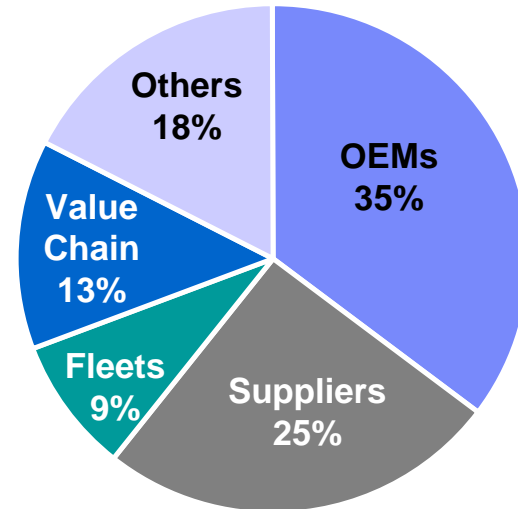


Our interviews were global and comprehensive

Interviews by Region



Interviews by Industry Segment

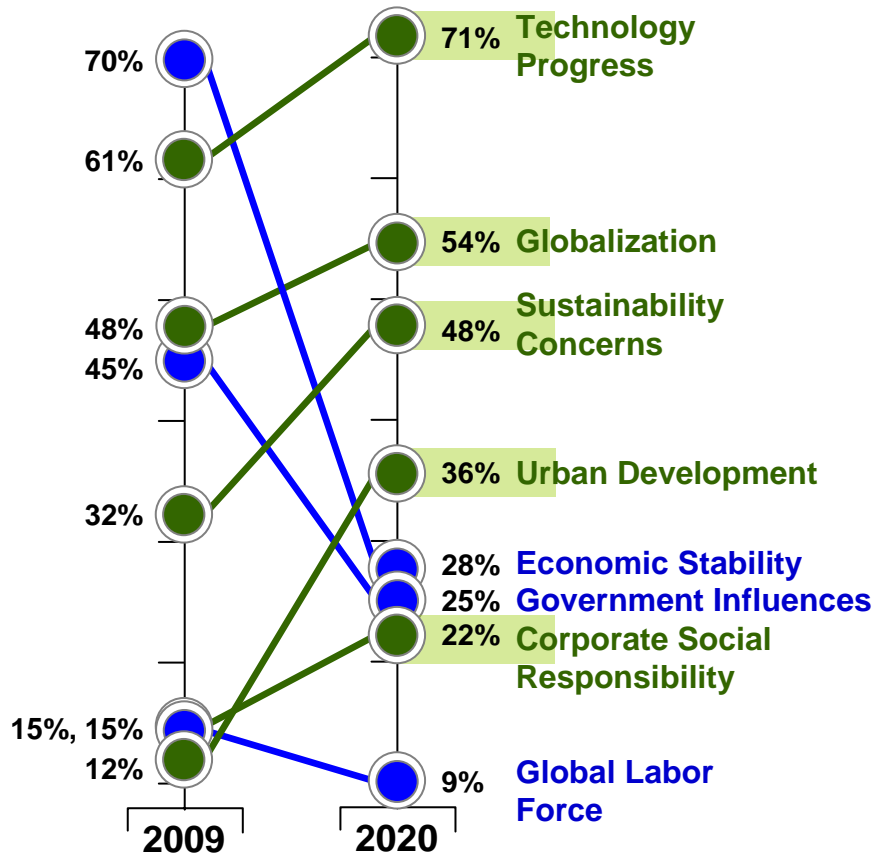


- 91 executive interviews completed
- 13 countries
- Emerging countries accounted for 16%: Eastern Europe, Brazil, Russia, India and China

- 60% - OEMs and suppliers
- 8 of the top 10 OEMs, that includes over 85% of total volume
- Other interviews include; regulators, dealers/bodybuilders and multi-modal operators

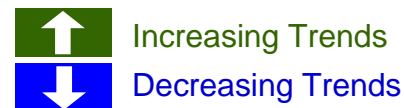
By 2020, there will be radical changes in the pressures facing truck executives compared to the issues they are addressing today

What are the most important external forces impacting the industry Today and in 2020?



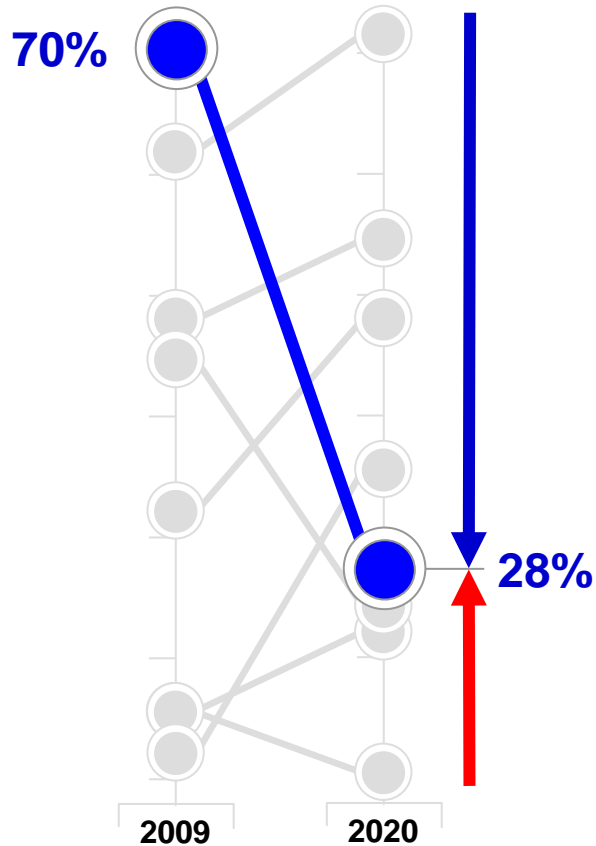
“Our business will change drastically as the basics of our economics and ecology is radically altered”

–European Truck OEM



The impact of the current economic crisis will subside, but could have longer implications for those who have failed to invest

Economic Stability



Truck production volume has seen the largest decreases on record over the last 8 months

Executives largely agree that these events will abate over time and the industry will focus on growth for the future...

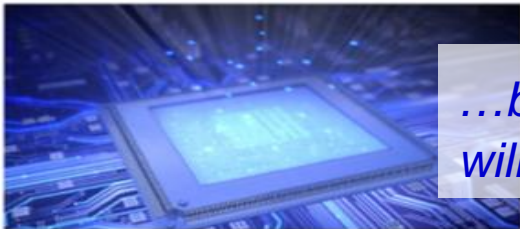
... but, there may be residual effect from the economy. Companies deferring investment leave themselves at risk when growth resumes

The monumental changes facing the industry require truck producers to navigate the road ahead carefully



Globalization efforts will be a force through the decade...

...as the vehicle's **Brand** is increasingly commoditized...



...but embracing **technology** will be a clear path forward...

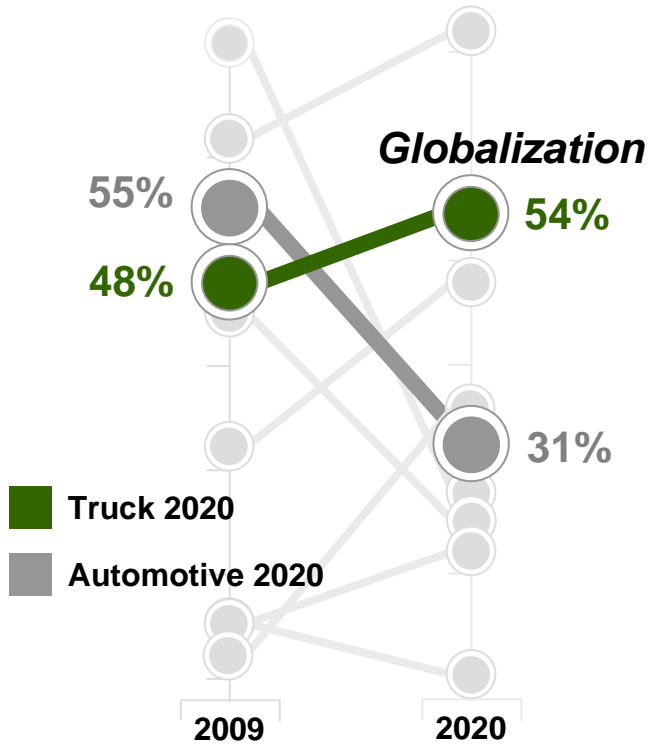
...while new **markets, partnerships** and focus to **service** offers growth



This transition requires a new enterprise and different **workforce**

While the surge toward globalization is building, the path and speed of that transformation is less certain

What are the most important external forces impacting the industry Today and in 2020?



“Suppliers and Auto OEMs are successful because they embraced globalization. Truck OEMs need to do this urgently”

–Japanese Truck OEM

“There are too many differences regionally for globalization to work for this industry”

–US Supplier

Purchasing decisions will be based on regulatory and value issues, rather than brand loyalty

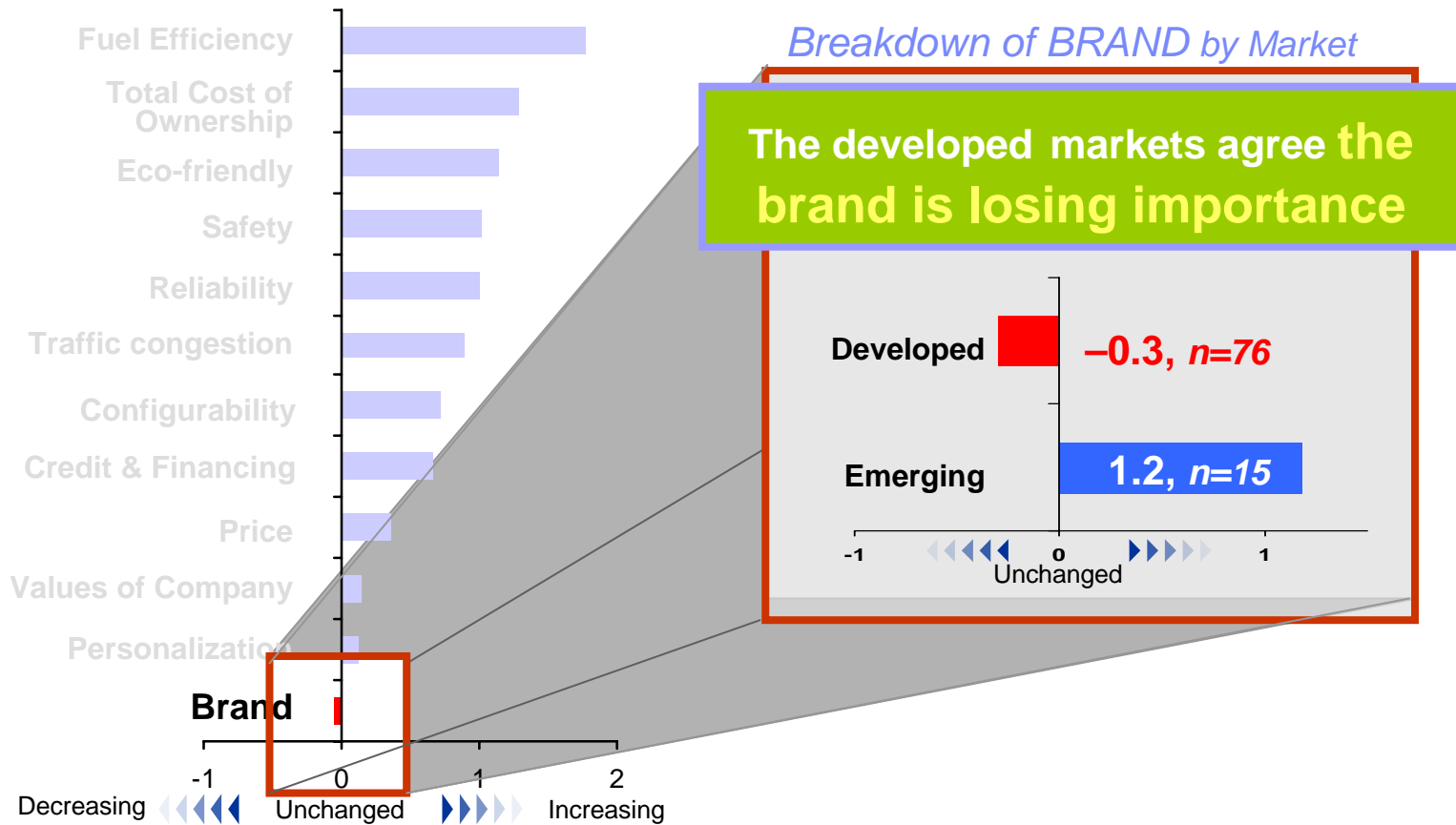
Rate the Change in Vehicle Buying Criteria
2008 → 2020



Fuel Efficiency, Total Cost of Ownership, and Eco-friendly criteria are **increasing** in importance

Brand of the vehicle is becoming much **less important**

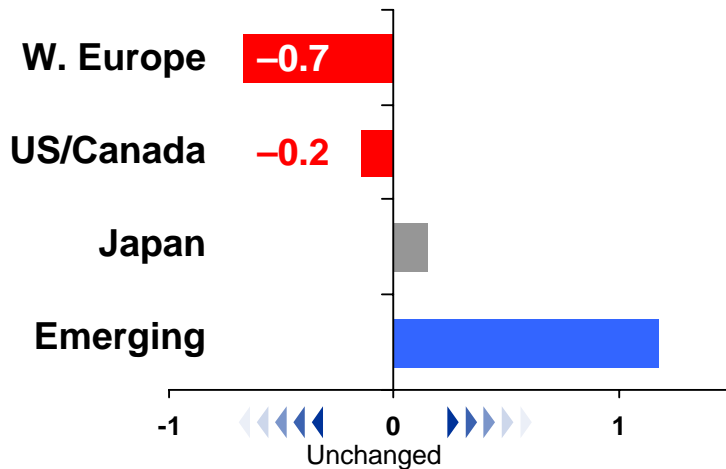
The developed markets, with established brands, recognize the vehicle is being commoditized



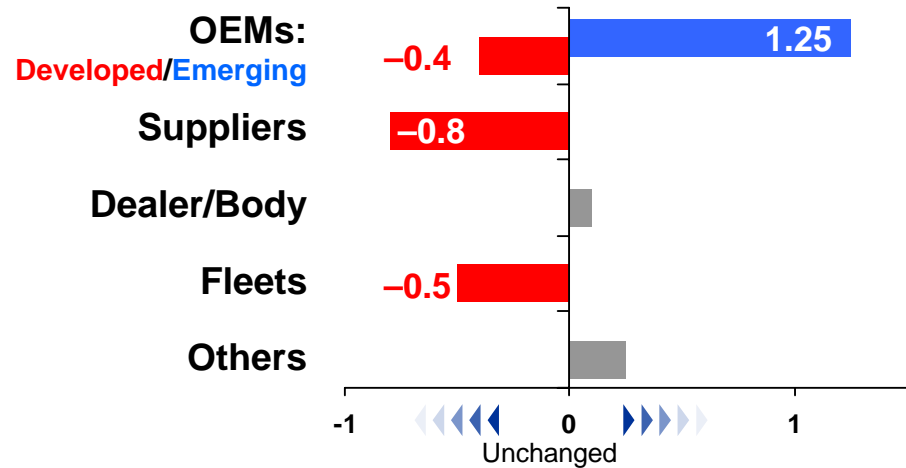
There is broad agreement across markets and industry segments that the vehicle's brand is diminishing in importance

Brand diminishment was validated in Europe, US, OEMs in developed countries, suppliers and fleets

Breakdown by Market



Breakdown by Segment



“Brand reduces in importance as more similar products enter the market”

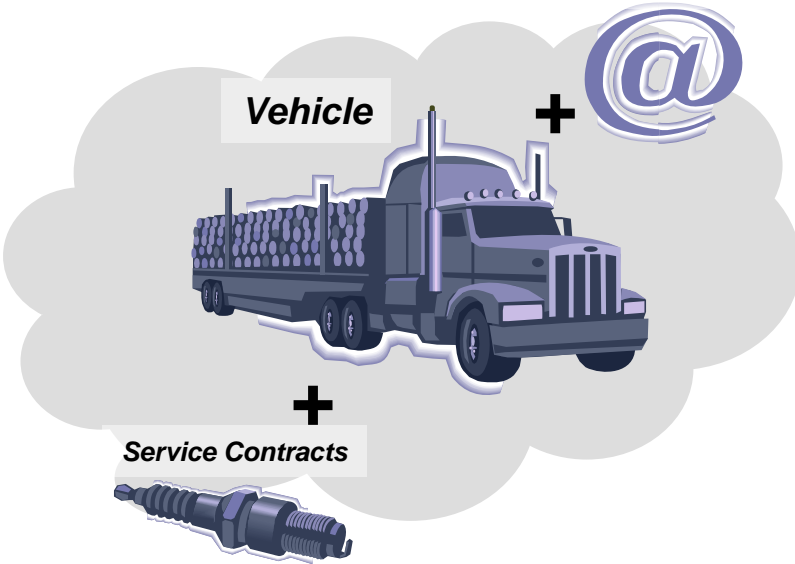
–Indian Truck OEM

Truck manufacturers must transition from a brand image centered on the vehicle to one that addresses the larger transportation solution

Today vehicles are sold with **non-integrated** add-ons

By 2020, the value will be in **integrated solutions**

Navigation / Routing

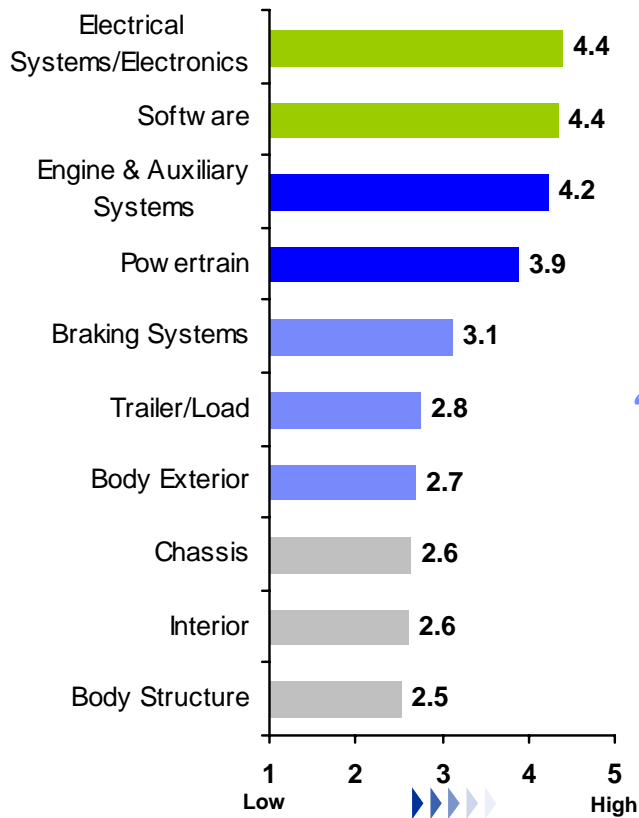


“The differentiation won’t be on products, but on services”

—European Truck OEM

Innovation in the vehicle will remain important as investments center on connectivity, emissions and fuel economy

Rate the Level of Innovation in various aspects of the vehicle by 2020



“The development of software is much more important than hardware”

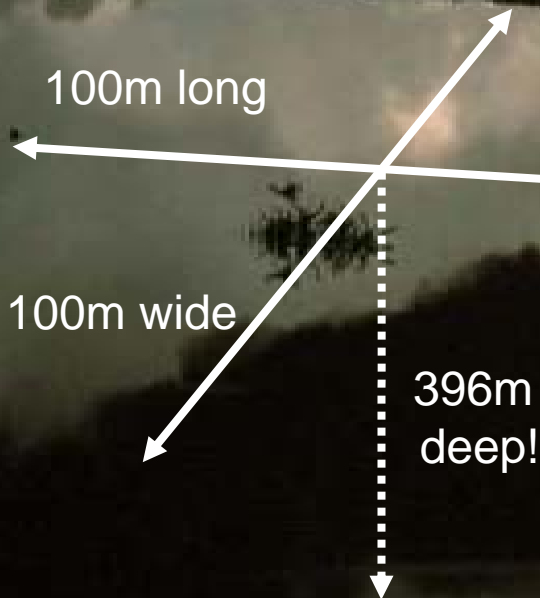
–Japanese Truck OEM

Telematics will impact everything about the vehicle and its usage

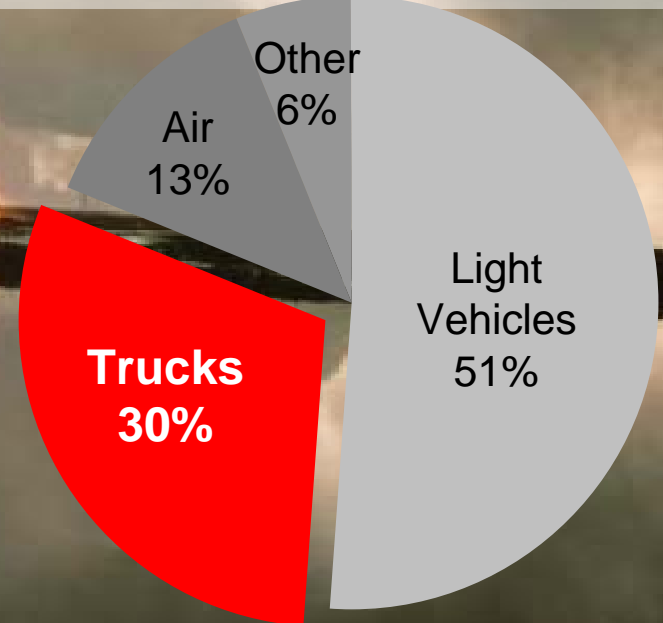


Technology is also critical in addressing the issues of oil...

Daily US Oil consumption represented as a lake...



Energy and Transportation Consumption in the US



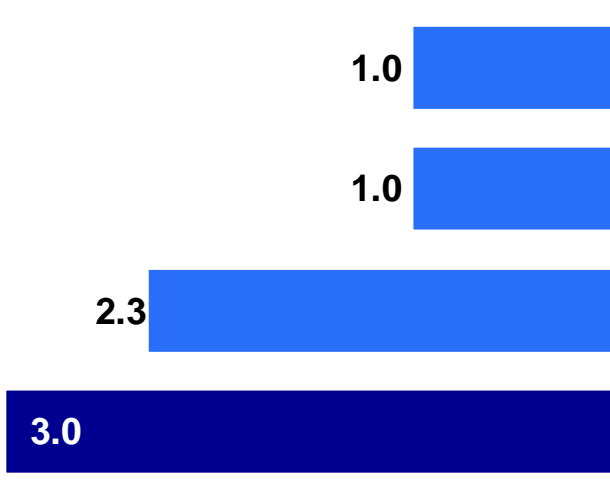
...81% of US oil imports could be eliminated if all cars and trucks were fully electric

Hybrid vehicles offer the best overall opportunity for more efficient energy usage

Efficiency of each source based on **cumulative** effects associated with **producing, transporting, and using fuel...**

Energy Efficiency Ratio Comparison

Light Vehicles Relative to Gasoline



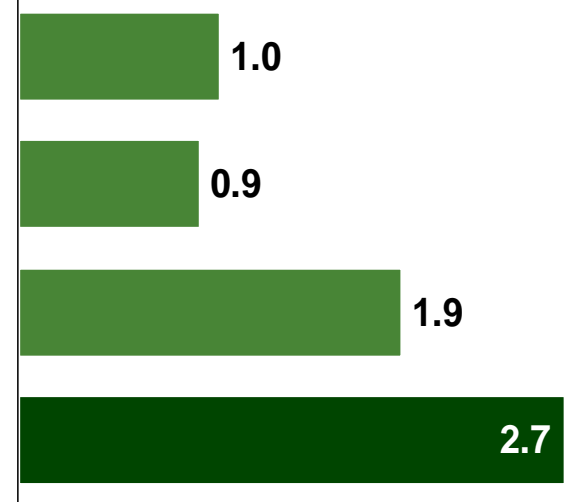
Gasoline/diesel plus ethanol and biomass blends

Compressed and liquefied **natural gas**

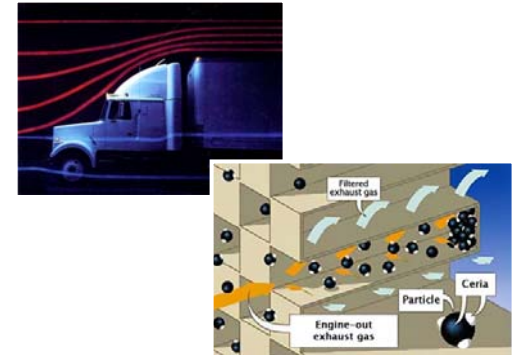
Hydrogen in a fuel cell

Electricity in a battery or plug in hybrid electric

Heavy Vehicles Relative to Diesel



Solutions will come from many places, but hybridization will make the biggest difference by 2020



Hybridization will be applied far and wide...

- Plug-in hybrid
- Hydraulic hybrid
- Some applications can be electric

Alternative fuel technologies develop as infrastructure is built out

- CNG
- LNG
- Methane

Retrofitting existing fleets should be encouraged

- With as much incentives as new production...

The US is in an outstanding position to lead this transformation

We have the entrepreneurship



- More small emerging suppliers
- Venture capital investment

We have the innovation



- Outstanding innovation culture
- Many hybrid solutions are being tested here

We have the incentive



- US is enabling stimulus explicitly for hybrid trucks
- State-based stimulus helps further

The combination of technology, solutions and partnerships will lead to differentiating business models



The combination of technology, solutions and partnerships will lead to differentiating business models



- Fully electric
- 60,000lb Load
- Recharge in 30 min

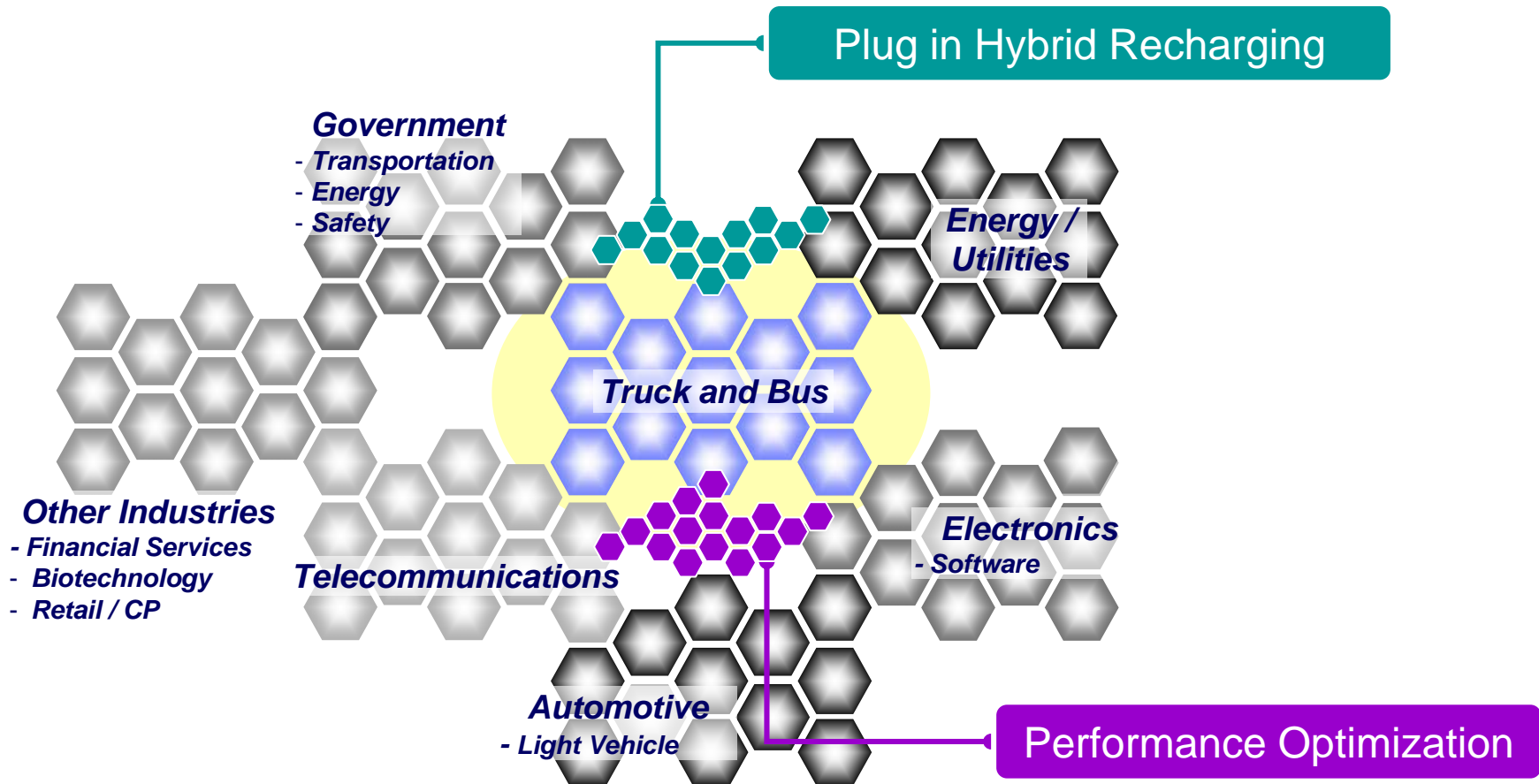


- Price as conventional vehicle
- Deferred fuel annuity
- Battery swap warranty



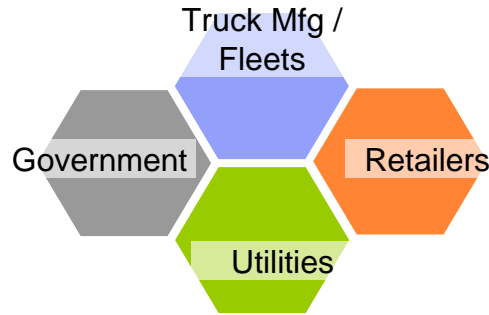
- Partner based on applications
- Establish preferred transport green routes

Industry ecosystems must align to address environmental, regulatory and customer concerns

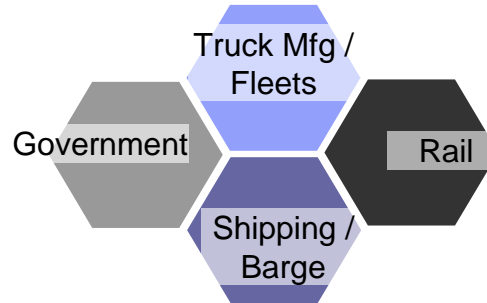


Cross industry partnerships will be instrumental to some of the biggest issues facing the industry

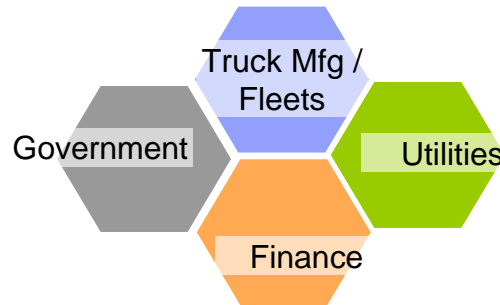
Urban Traffic Management:



Intermodal Optimization:



Transition to Plug-in Hybrid Fleets:

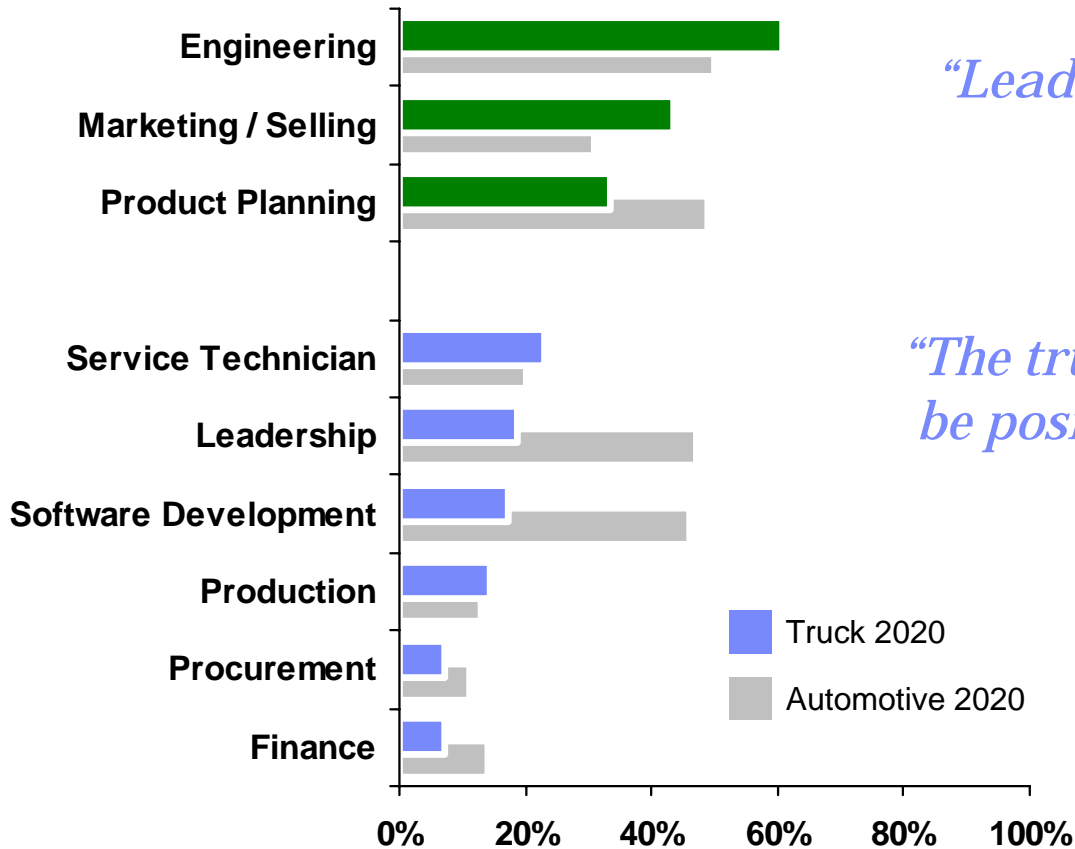


“The industry doesn't realize yet how much it needs to change”

–US Industry Organization

This transformations requires a new enterprise and a fundamentally different workforce

Rate the most critical skills for the industry in 2020



“Leadership is especially critical in a distributed workforce”

–North American Integrator

“The truck enterprise of the future has to be positioned differently in the market”

–European Truck OEM

The future will be exciting for the truck industry and the industry must seize the moment

- To **globally** integrate or **regionally** specialize? This is the dilemma for truck manufacturers
- **Brand** of the vehicle is being **commoditized**, truck manufacturers will have to evolve their definition of brand and develop solutions
- **Telematics** is your most important **investment** for the future
- **Hybrid** truck development is **critical** for the future, particularly given increased urbanization globally
- The **US is leading** this innovation and must continue to invest to maintain this lead
- Truck manufacturers must aggressively **expand** their thinking about **partnerships** beyond traditional industry boundaries
- The winners by 2020 will have significantly **transformed their workforce**