

# Is Natural Gas Finally Accelerating as a Transportation Fuel?

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# Driving a Shift to Natural Gas as a Transportation Fuel

- » Energy transitions are enormously difficult
- » Natural gas is emerging as the first significant new transportation fuel in a century



## ENERGY

- Gas exploration & production
- Distribution & utilities
- Fuel station owners/operators
- Renewable fuels

**Westport™**

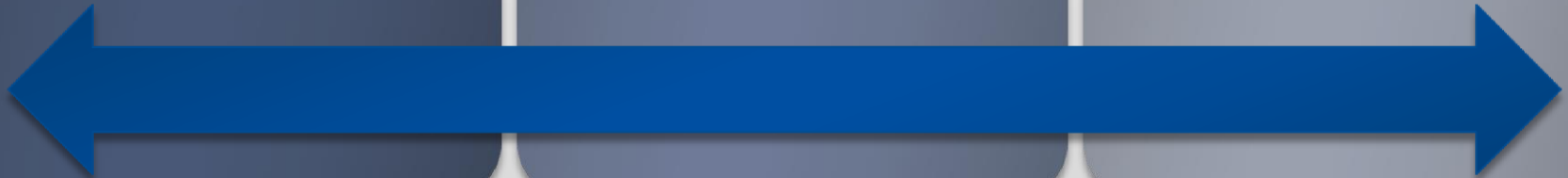
## TECHNOLOGY

- Market-spanning experience
- Expansive IP portfolio
- Capital light business models



## TRANSPORTATION

- Engine & vehicle OEMs
- Fleet operators
- Shippers, transportation users
- Consumers



# Westport Technology & Applications



Heavy-Duty & High Horsepower Applications



Medium-Duty Applications

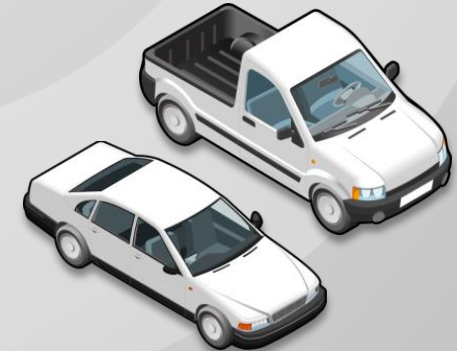
## Advanced Dual Fuel Vehicles



## Bi-Fuel Vehicles

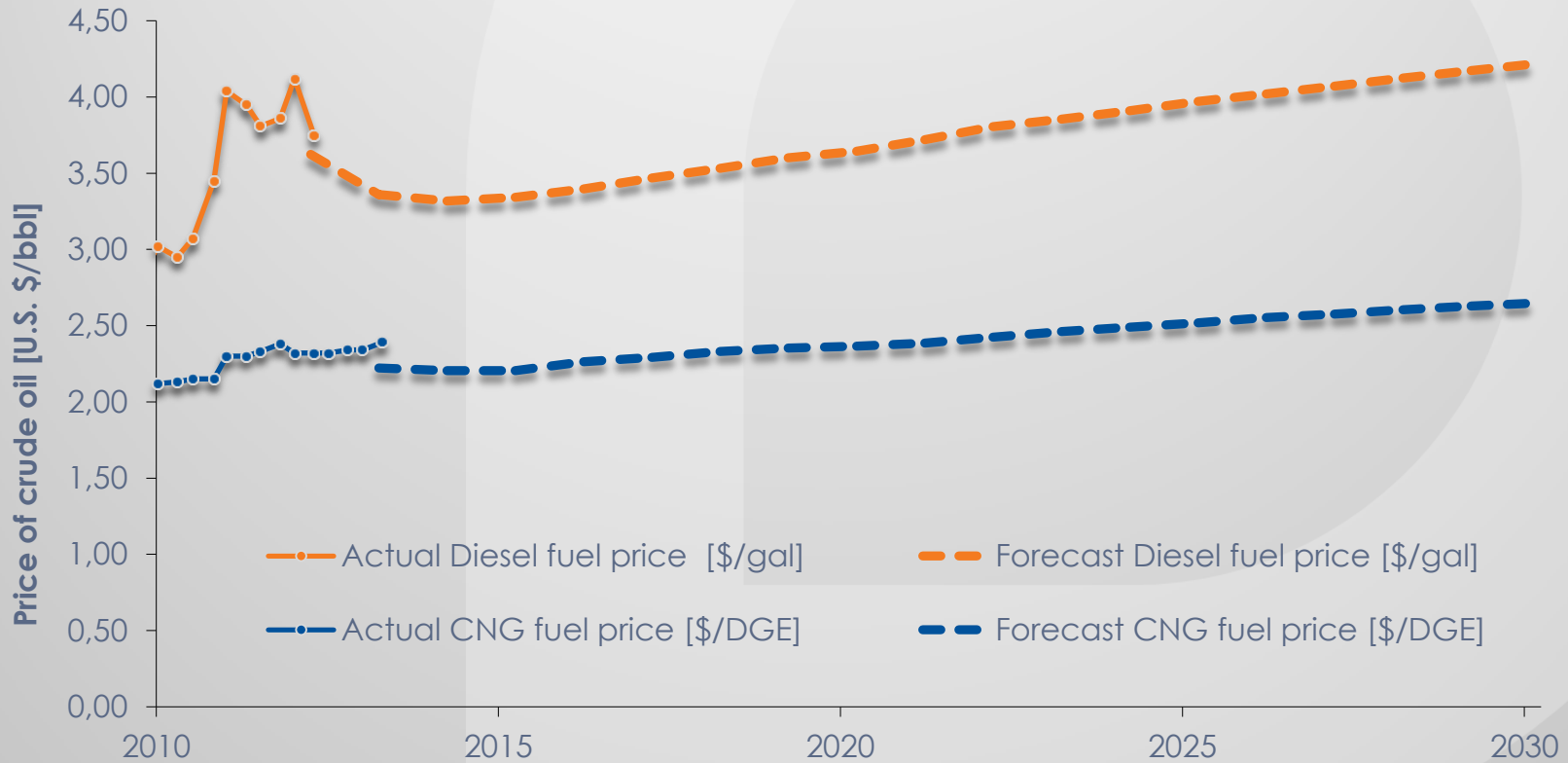


## Spark Ignited Direct Injection

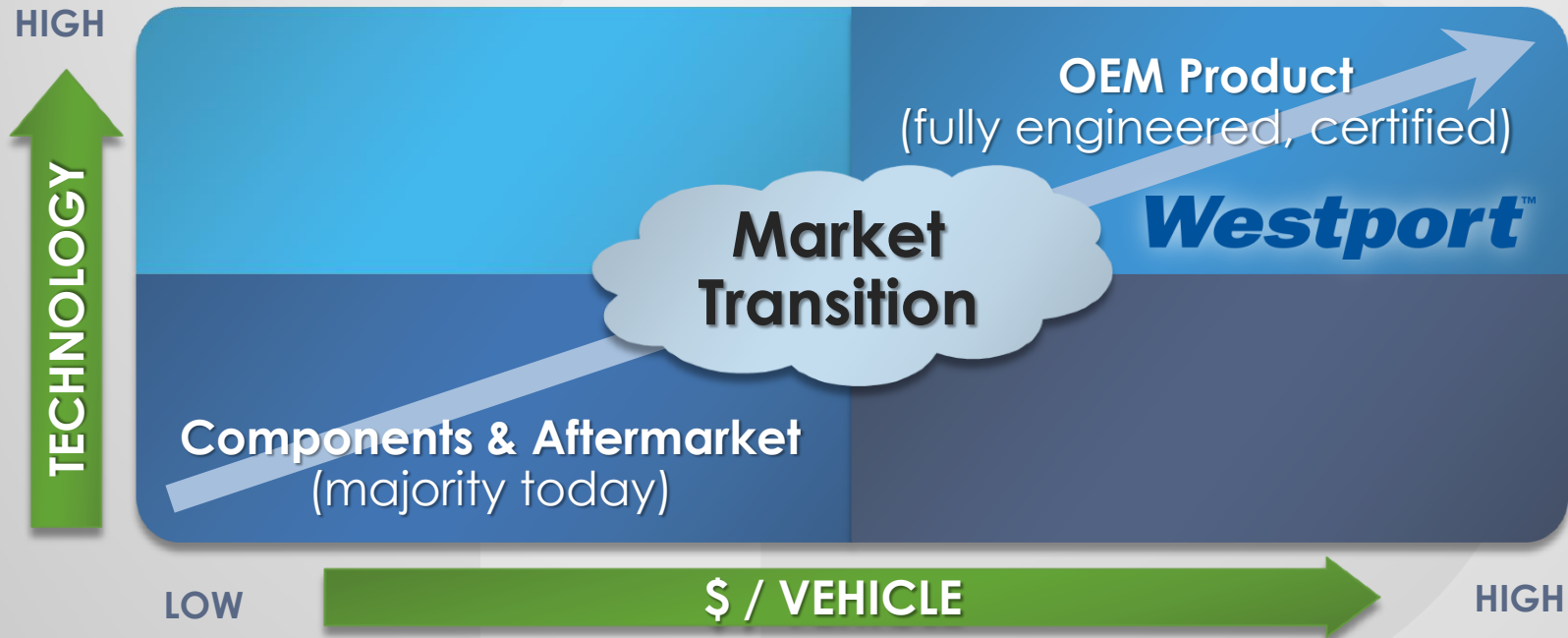


# Stability of Fuel Price Differential is Driving Confidence at Fleets

Price History of Diesel Fuel & CNG for Vehicles,  
with EIA Projections



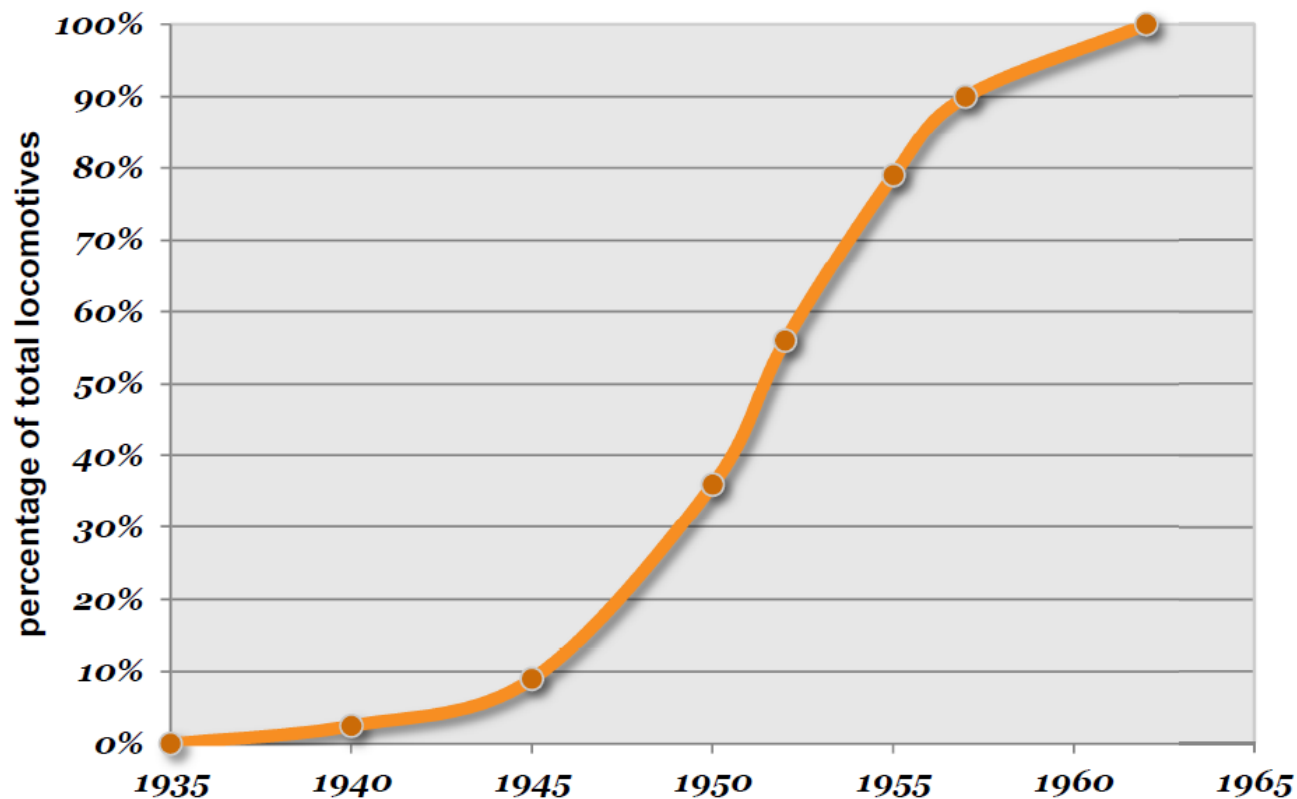
# The Natural Gas Vehicle Market is Evolving Quickly



- » Majority of natural gas vehicles (NGVs) to date have been “aftermarket” conversions delivered by third parties
- » Next generation NGV OEM vehicles will be superior performance and customer value; Westport positioned to be the dominant specialist in commercial vehicle sector

# Historic Transition: Steam Locomotives Totally Replaced by Diesel

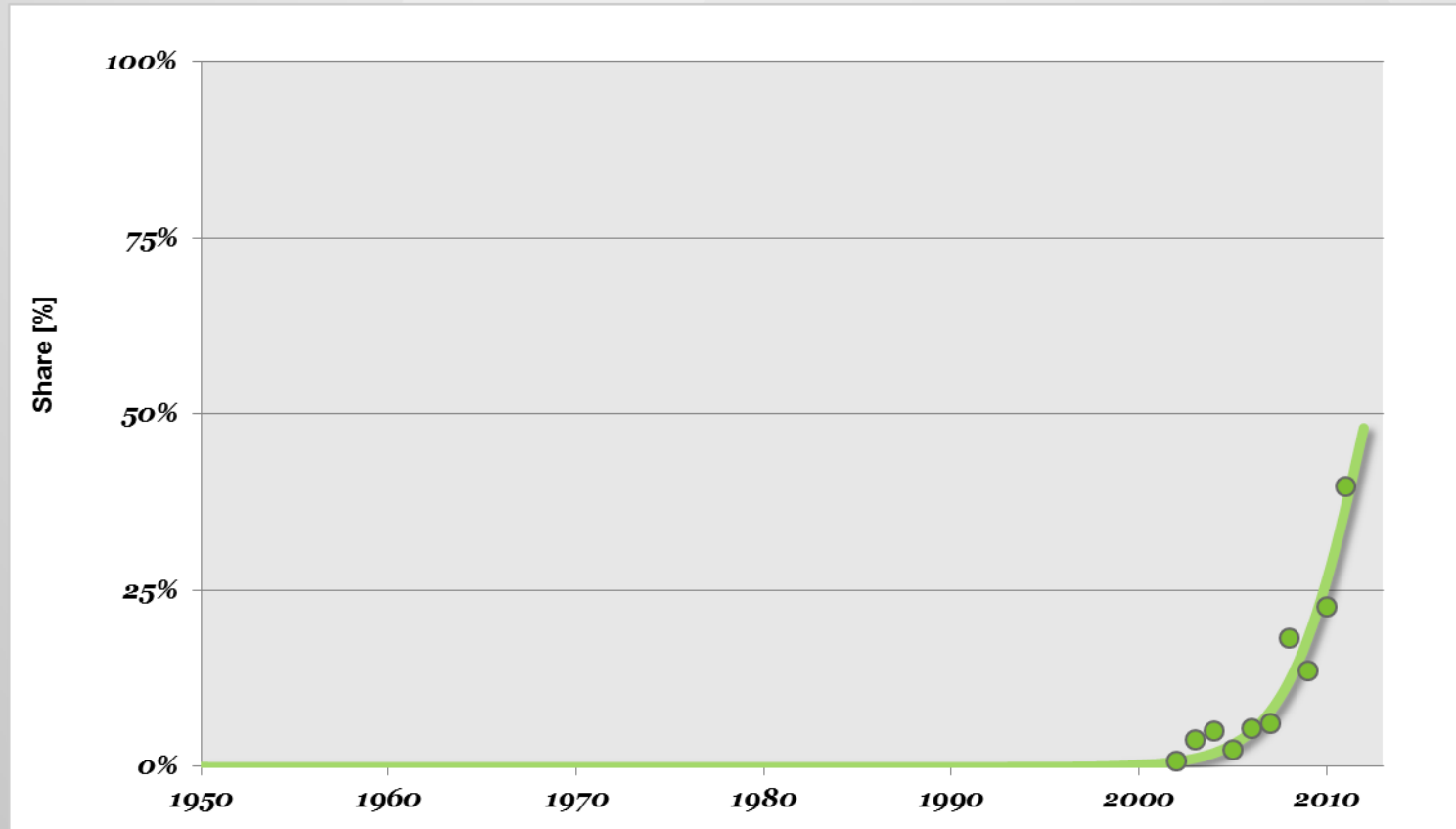
## Diesel Powered Locomotives, North America



Source: Robert U. Ayres, Leslie W. Ayres, Benjamin Warr, "Exergy, power and work in the U.S. economy, 1900-1998," October 25, 2001.

# Rapid Adoption of Natural Gas Refuse Trucks

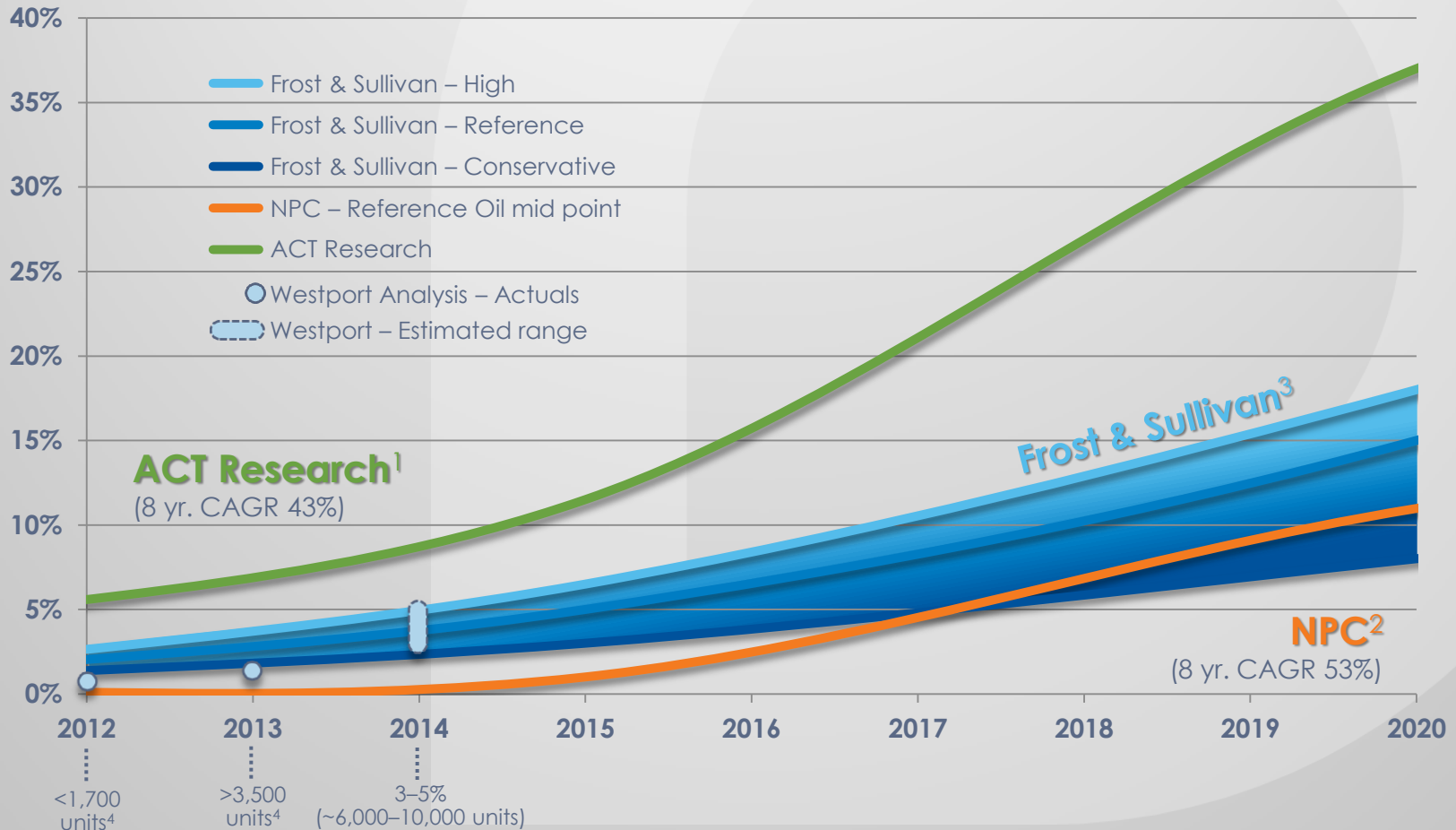
## Market Share of New Natural Gas Refuse Truck Sales in the US



Source: Blomerus, 2013

# Projections for Heavy-Duty On-Road Trucking

Market Share of New Class 7 & 8 Natural Gas Trucks  
 (NPC with approximate correction from VMT to vehicle units)



**ACT Research<sup>1</sup>**  
 (8 yr. CAGR 43%)

**Frost & Sullivan<sup>3</sup>**

**NPC<sup>2</sup>**  
 (8 yr. CAGR 53%)

2012  
 <1,700 units<sup>4</sup>

2013  
 >3,500 units<sup>4</sup>

2014  
 3-5%  
 (~6,000-10,000 units)

2015

2016

2017

2018

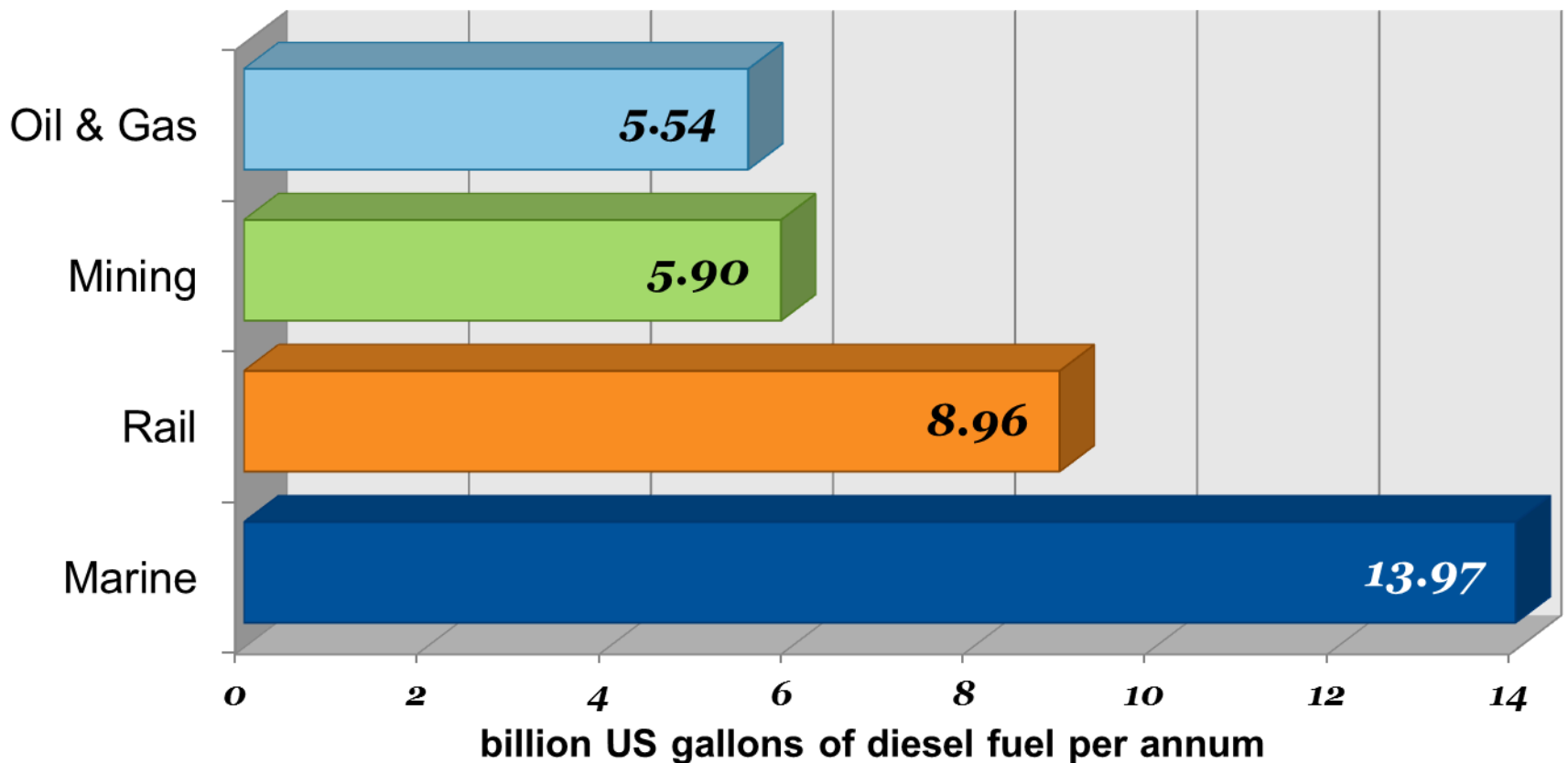
2019

2020



# Significant High Horsepower Opportunities

Global Diesel Consumption  
in Demanding High Horsepower Applications



Source: UN Energy Statistics Database, Westport analysis

THANK YOU

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