

# Group III base stocks and future HDDOs for Heavy Trucks in Brazil

AEA - V Symposium of Lubricants, Additives and Fluids

Sao Paulo 24<sup>th</sup> Oct 2012

Neste Oil Corporation – Base Oil's Market Development / Kari Kulmala

**NESTE OIL**



# Aim of the presentation

- How Neste Oil as European Group III base stock producer sees the future Heavy Duty Diesel Engine Oil quality (HDDO) in Brazil

- The presentation concentrates especially on Heavy Duty Trucks (gross weight >15t)



# Contents

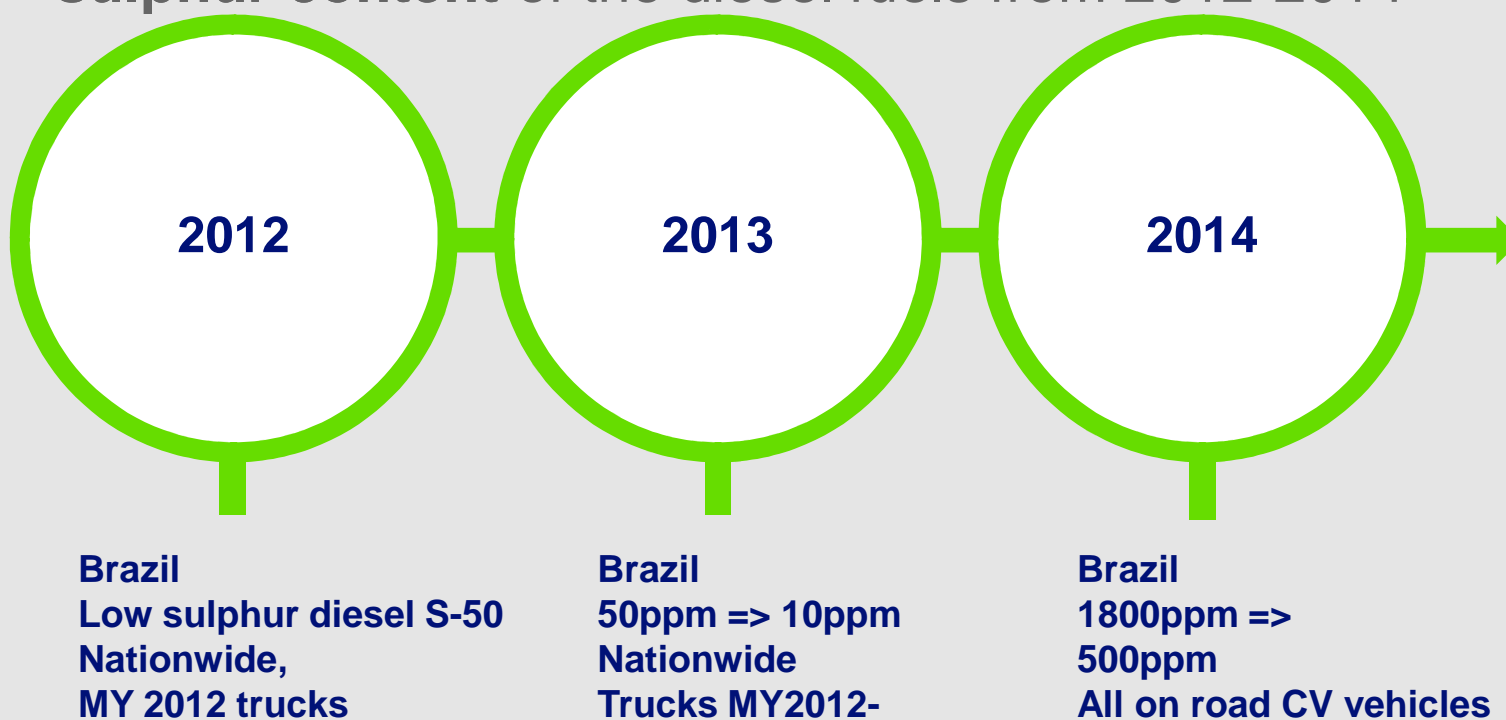
1. Main drivers affecting HDDO quality in Brazil
2. Key Heavy Duty Truck OEMs and market outlook for registrations of new commercial vehicles
3. Possible changes in heavy duty diesel engine oil quality
4. How Neste Oil's Nexbase Group III base stocks could fit into possible future HDDO quality levels
5. Summary and conclusions



# Main drivers

## 1. Diesel Fuel quality

Confirmed several key steps in Brazil to reduce the **sulphur content** of the diesel fuels from 2012-2014



Source: Source: Hart Energy's International Fuel Quality Centre Jan 2012 &  
ANP – National Agency of Petroleum, Natural Gas and Biofuels

# Main drivers

## 2. Emission standards

- The numerical emission limits and certification test cycles are based on [European Union](#) regulations.
- PROCONVE P7 (Euro V equivalent) for heavy trucks and buses in force 2012

Overview of European and Brazil emission standard for Heavy trucks and Buses:

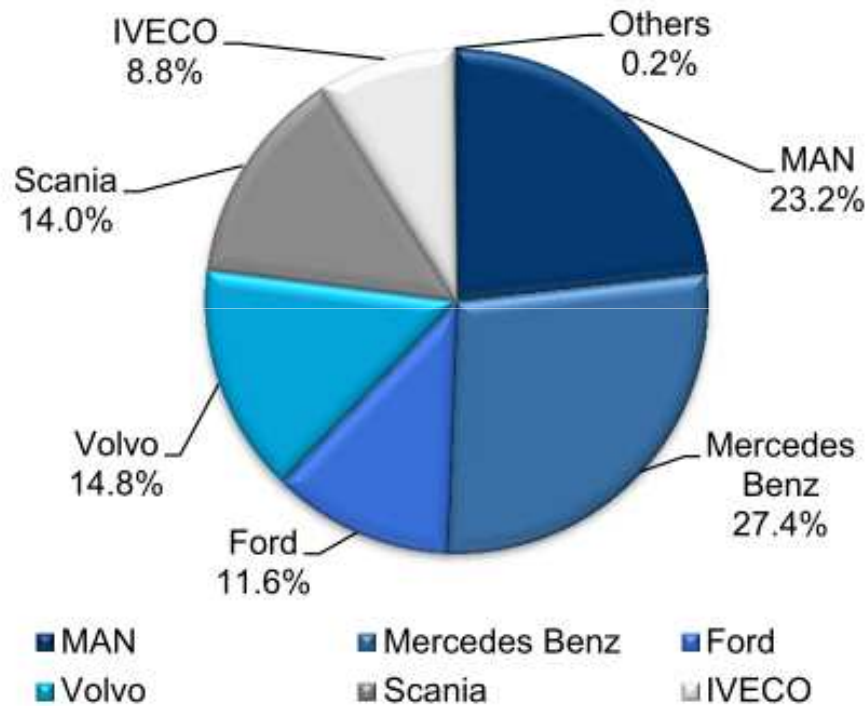
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EU27	Euro IV		Euro V					Euro VI				
Brazil	PROCONVE P5 (Euro III)					PROCONVE P7* (Euro V)					Euro VI equivalent**	

\* = PROCONVE P6 (Euro IV) should have started 2009, but it was never implemented    \*\* = Estimated

Sources: IBAMA, Diesel Net, IFQC, MAN Factbook 2012

# Heavy truck market in Brazil

**Commercial Truck Market: Heavy Duty Truck Market Share Breakdown by OEMs (Brazil), 2010**

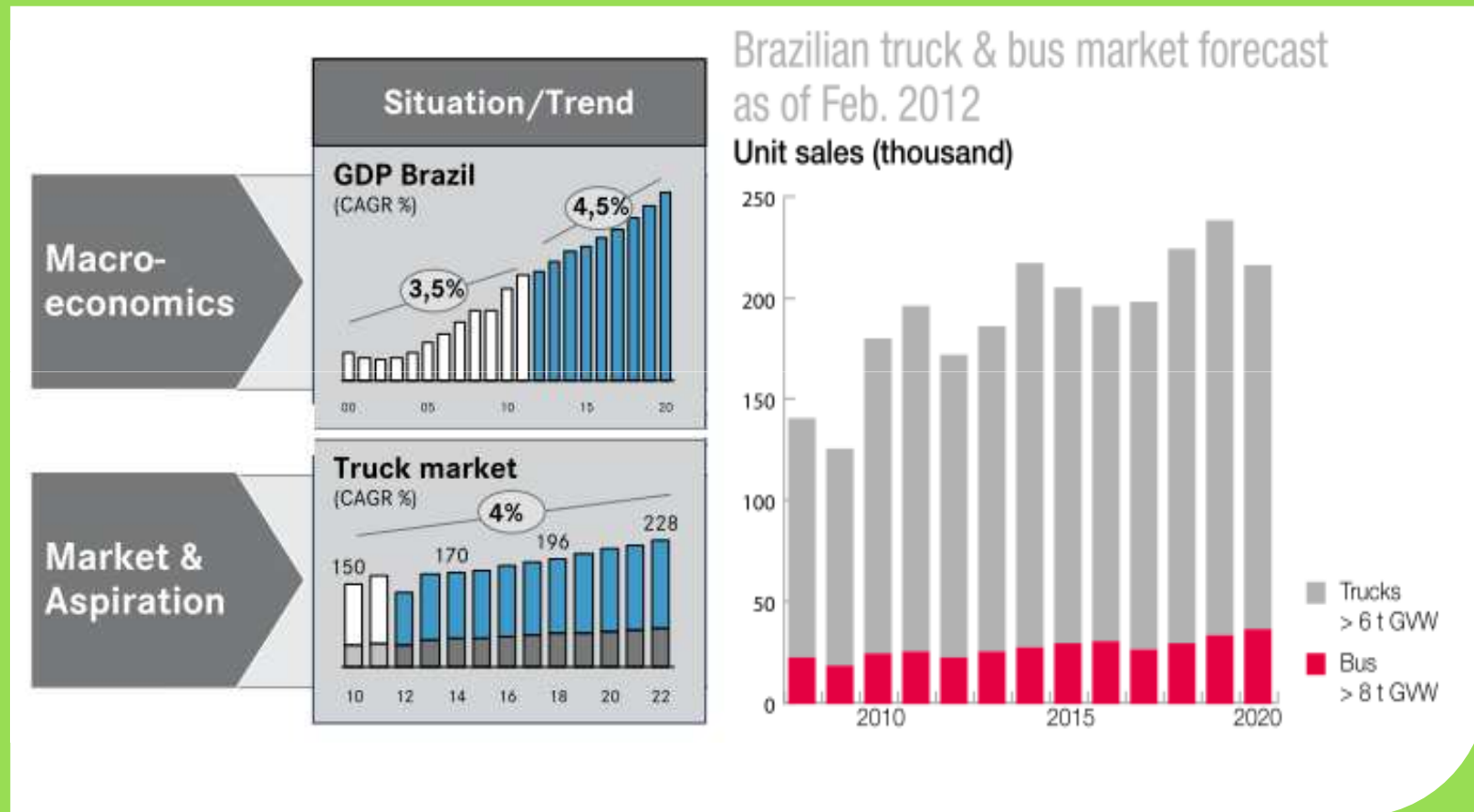


Note: Others include Agrale, Sinotruk.

- CV market in Brazil absorbs >90% of local production
- Importance of European OEMs
- Mercedes Benz and MAN are the leading heavy duty truck OEMs having >50% market share in 2010
- Scandinavian OEMs Volvo and Scania have also strong presence in Brazil
- Heavy trucks are trucks which gross weight is over 15t


Source: Frost & Sullivan Strategic Analysis of Brazilian Commercial Truck Market (Nov 2011)

# Growth in Brazilian Truck market foreseen by major OEMs



Source: Daimler Trucks Division Day presentation 2012

Source: MAN Factbook 2012

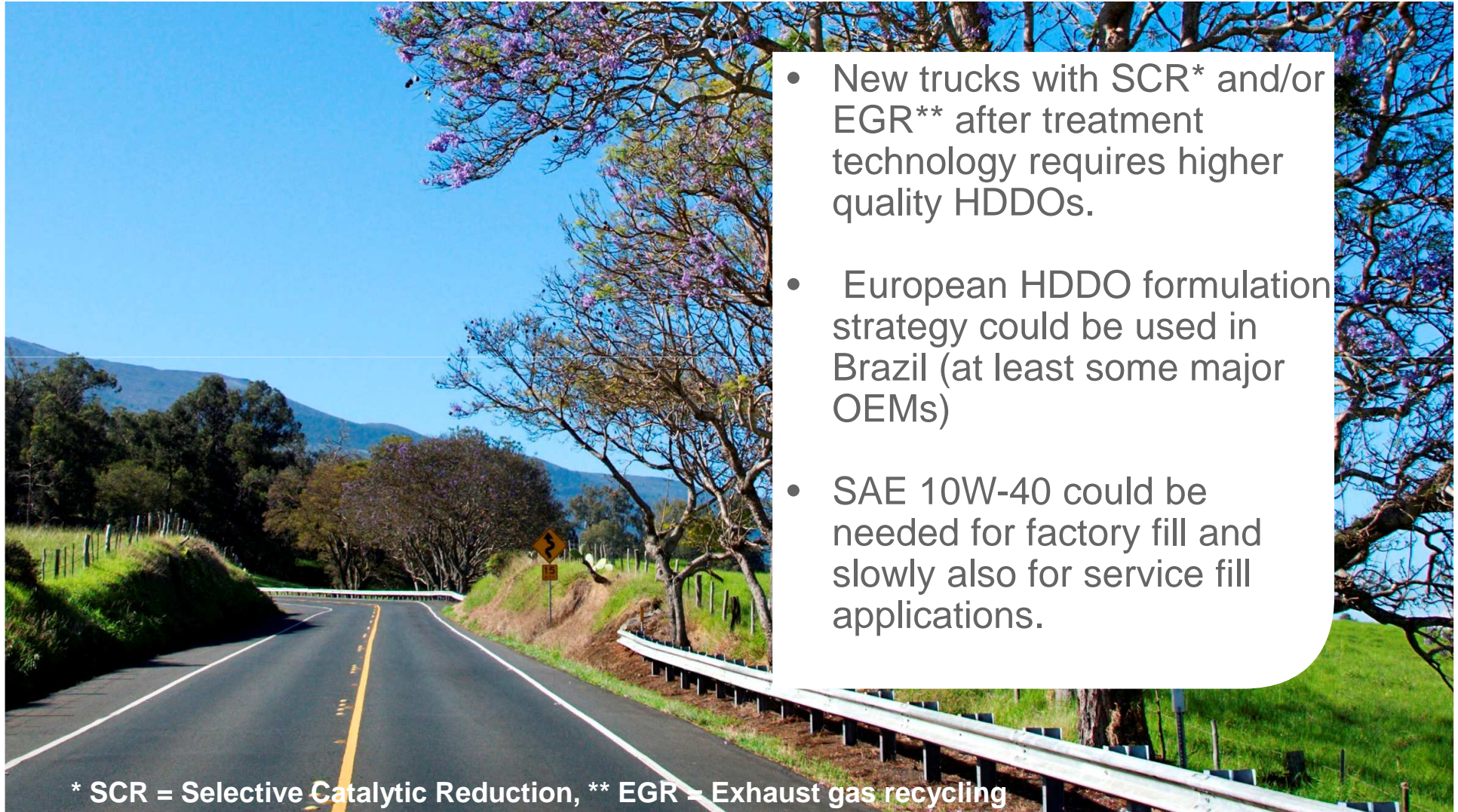


**What does all this  
means for heavy duty  
diesel engine oils?**

**NESTE OIL**



# Main HDDO assumptions

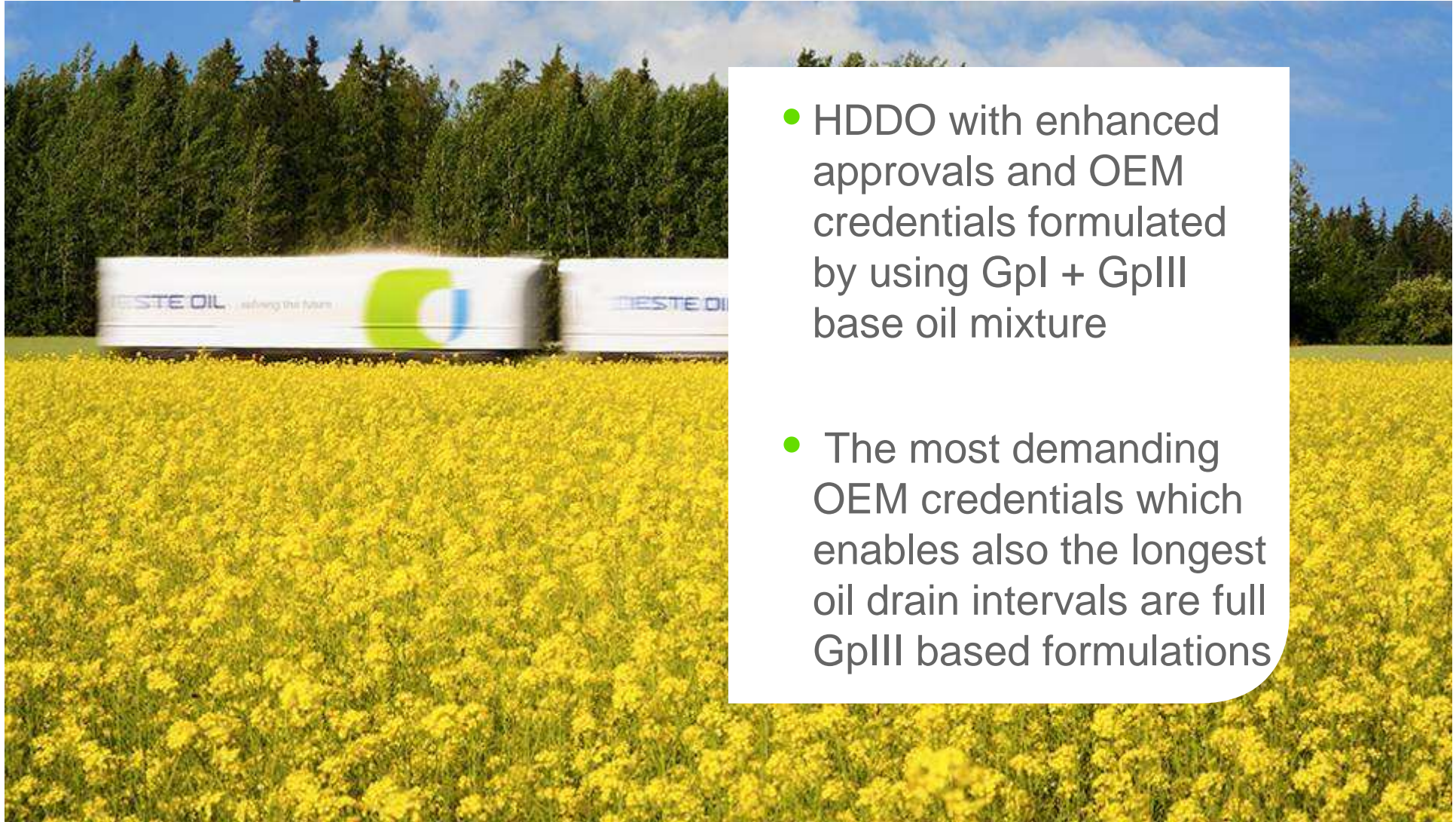


- New trucks with SCR\* and/or EGR\*\* after treatment technology requires higher quality HDDOs.
- European HDDO formulation strategy could be used in Brazil (at least some major OEMs)
- SAE 10W-40 could be needed for factory fill and slowly also for service fill applications.

\* SCR = Selective Catalytic Reduction, \*\* EGR = Exhaust gas recycling



# Neste Oils experience from European HDDO market



- HDDO with enhanced approvals and OEM credentials formulated by using Gpl + GpIII base oil mixture
- The most demanding OEM credentials which enables also the longest oil drain intervals are full GpIII based formulations

# Case Scania – Example of OEM approvals



- Scania is well known North European OEM which has strong presence in Brazil and in Latin America
- Heavy Duty Engine Oils with **Scania LA** (low ash) and **Scania LDF** (Long Drain Fluid) approvals must pass extensive and very demanding field test with several trucks running severe or medium operation conditions.
- Oil drain interval in the field test for LDF approvals is 90tkm or 120tkm and for LA approval 60tkm or 90tkm or 120tkm.

# Scania approvals for long oil change intervals & NEXBASE GpIII formulations

OEM Credential	SCANIA LDF-2	SCANIA LDF-3	SCANIA Low Ash (LA)
Engine emissions	- Euro IV & most Euro V without DPF	- Euro VI	- Euro V with DPF
ACEA / API	E4, E6, E7, E9 or CJ-4		
SAE Viscosity Grade	10W-40	10W-40	10W-40
Additives	Top tier	Top tier	Top tier
Base stocks	Gpl + NEXBASE GpIII	Full NEXBASE GpIII	Full NEXBASE GpIII

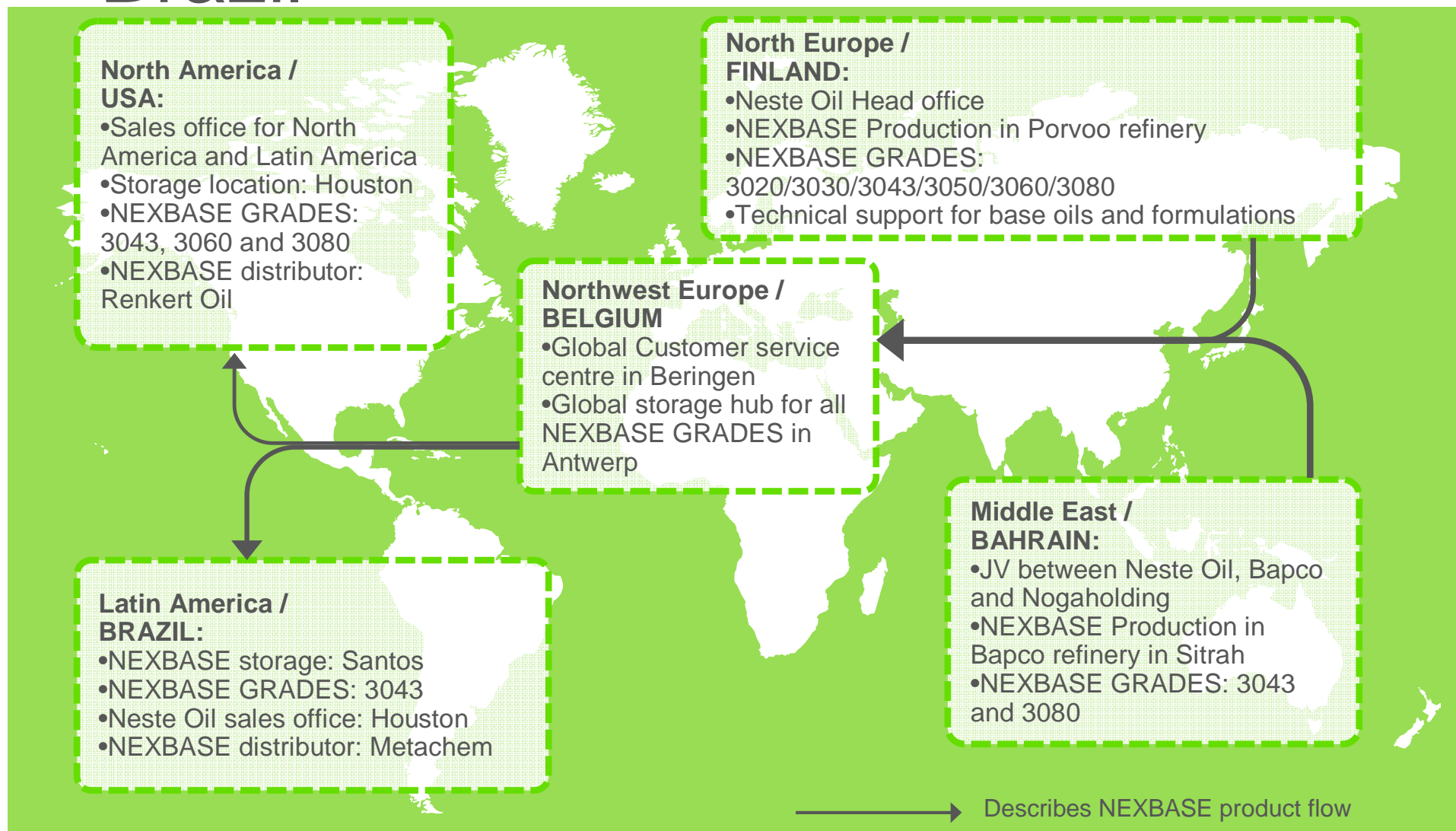
# Future HDDO market in Brazil looks attractive for NEXBASE Group III

- Government confirmed requirements on diesel fuel quality improvements (2012-2014)
- Heavy duty diesel engines must meet even stringent Euro V equivalent (PROCONVE P7) emissions limits
- The influence of European OEMs in Brazil is remarkable

- Demand for European type HDDO formulations where GpIII base stock are vital part of solution looks possible



# NEXBASE – Key operations for Brazil



# Conclusions

- The HDDO quality upgrade in Brazil will be in full strength after implementation of S-10 diesel fuel in 2013.
- The role of GpIII base stocks depends on required OEM performance levels, fleet owner's oil drain interval targets and future viscosity grades.

