

National Biodiesel Conference, February 4, 2008

Crankcase Oil Dilution Using Alternative Diesel Fuels

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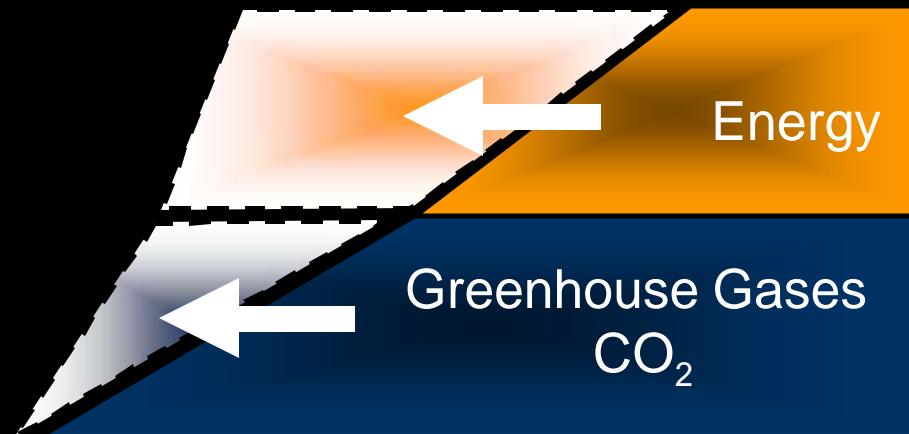


Agenda

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Social Mobility Issues



Exhaust Emissions CO, NO_x, HC, PM



Environmental Goals in Vehicle Development



Production:

- save resources (energy, materials)
- low GHG impact
- build durable products

Vehicle Characteristics:

- clean emissions



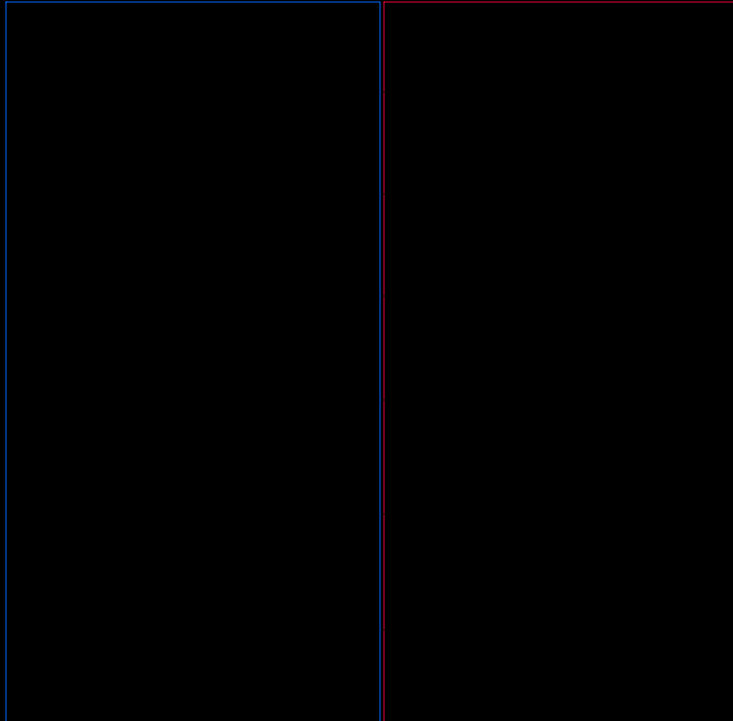
Volkswagen Golf Diesel



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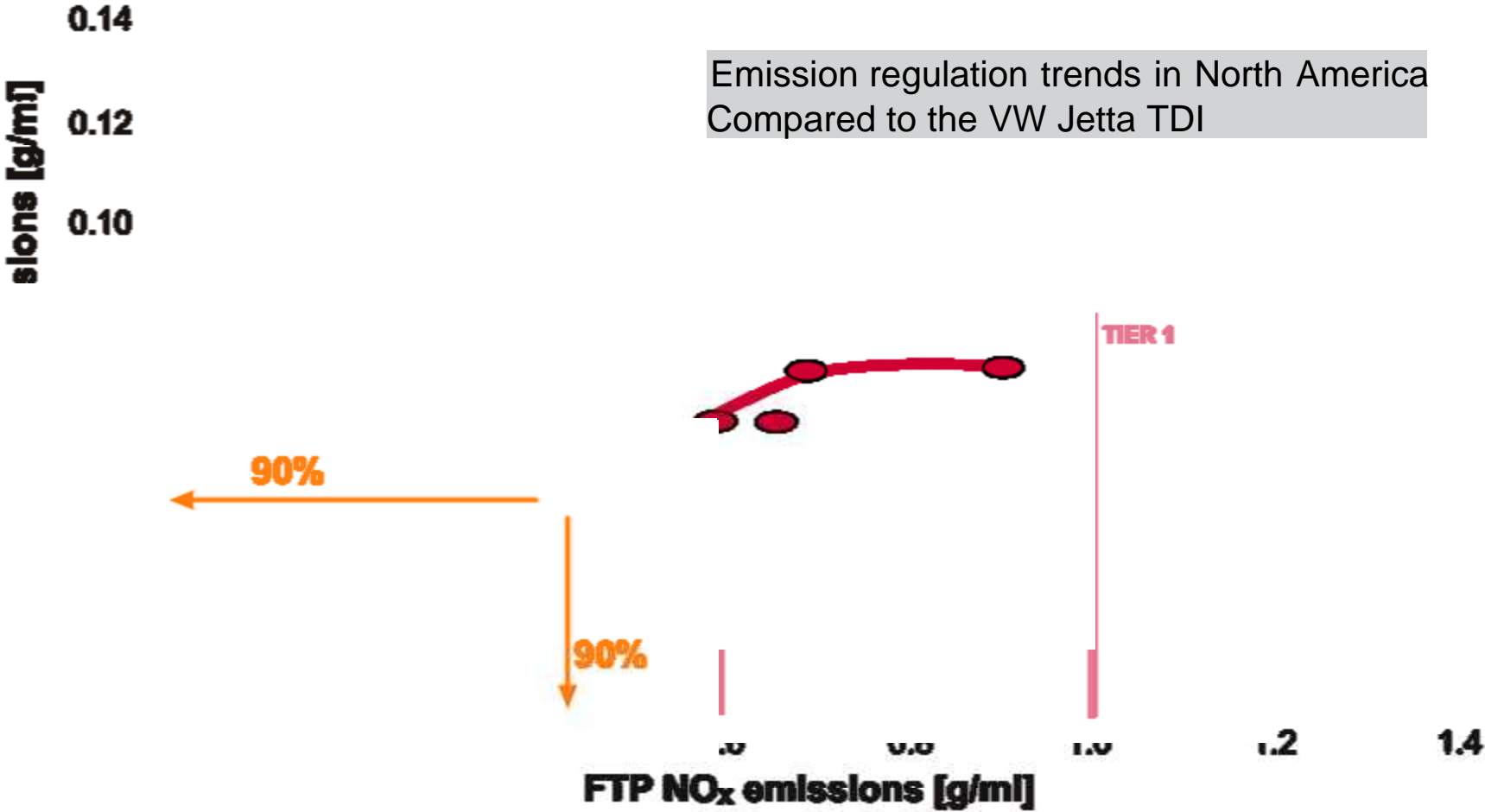
Diesel/Gasoline Comparison



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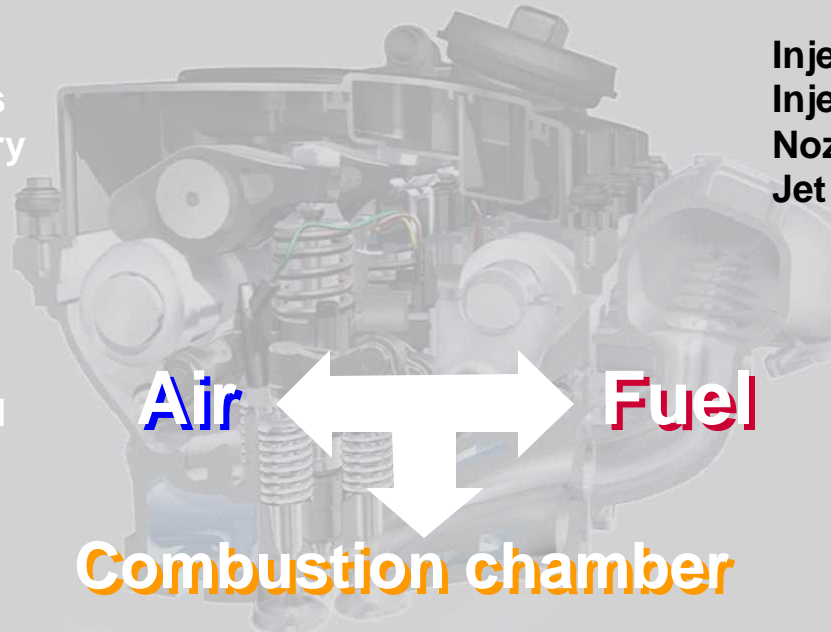


North American Region Emission Results



Optimization of Combustion

Air and flow quality
Number/layout of valves
Timing/degree of delivery
Rest gas and EGR
Inlet/swirl
Compression/inner flow
Tumble
Tightened flow
Turbulence/3D flow field

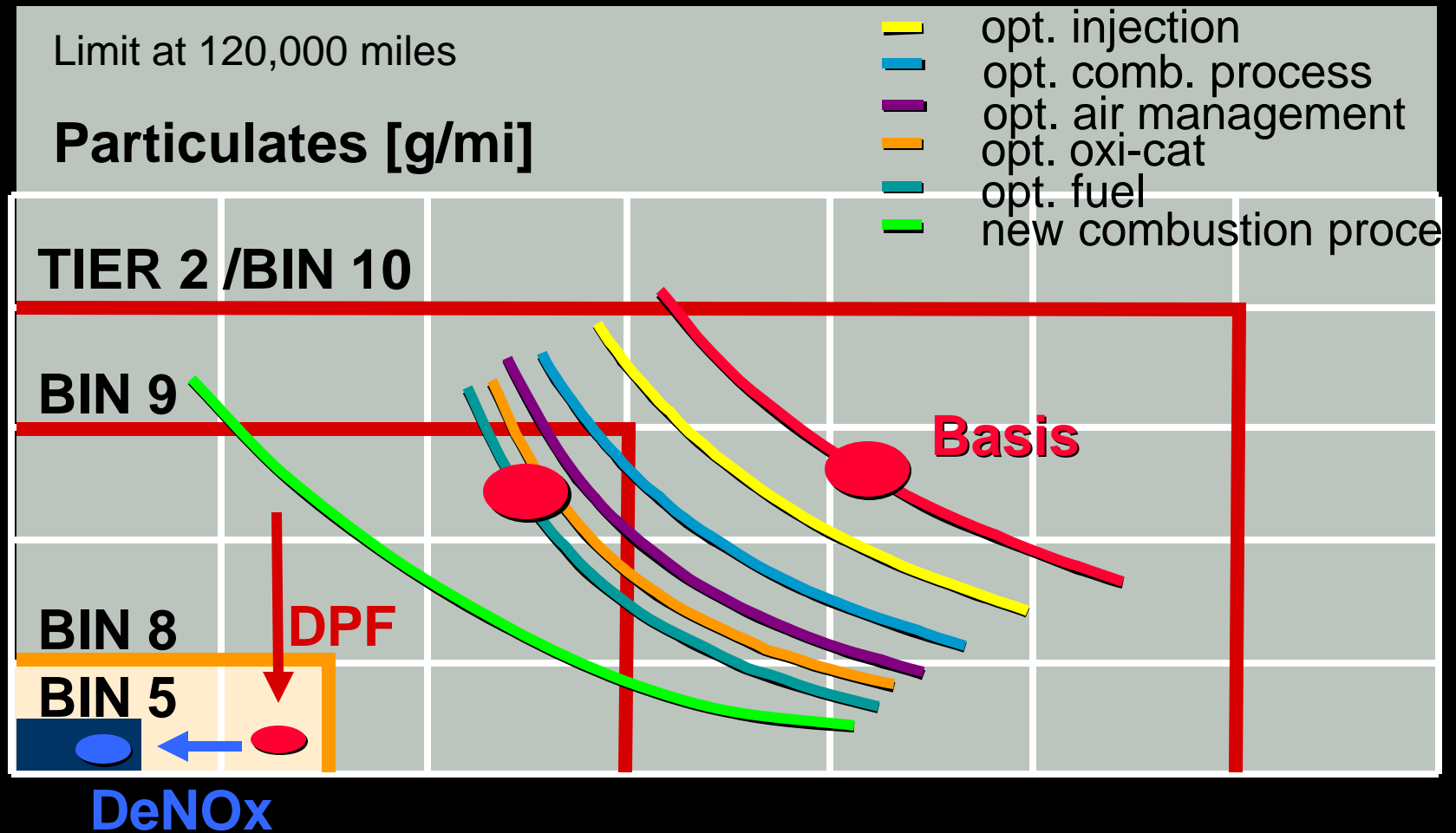


Injection pressure
Injection pattern
Nozzle inner flow
Jet spread
Jet speed
Droplet current density
Droplet diameter
Intrusion depth
Fuel quantity

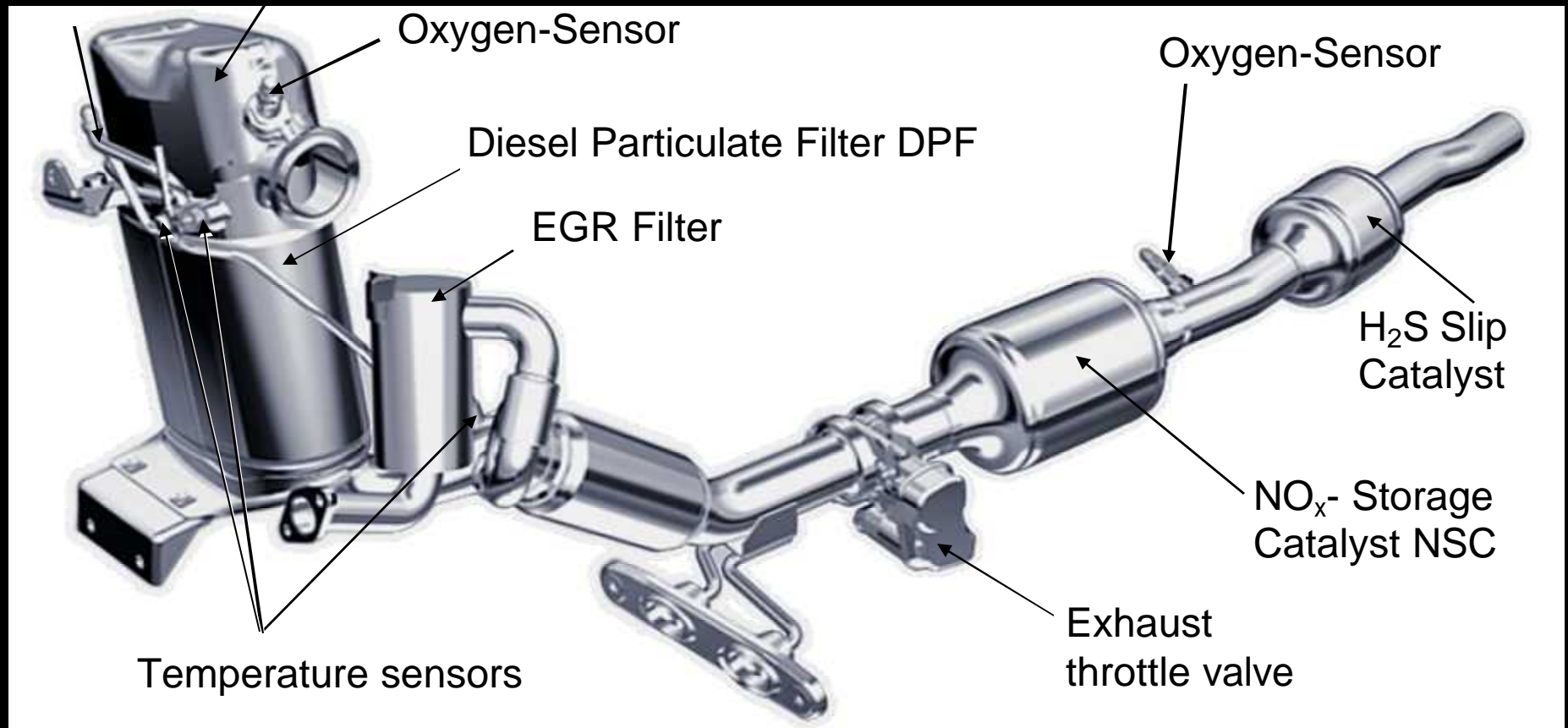
Jet intensity
Wall influence
Evaporation
Ignitable mixture
Advanced reactions
Ignition delay/self ignition
Premixed combustion
Diffusion combustion
Flame spread



Diesel development for passenger cars in U.S.



After-Treatment Components



Fuel Properties and Their Influences

Viscosity
Metals
Additive package

Boiling range,
Cetane number,
energy content

Boiling range,
Cetane number,
biodiesel content

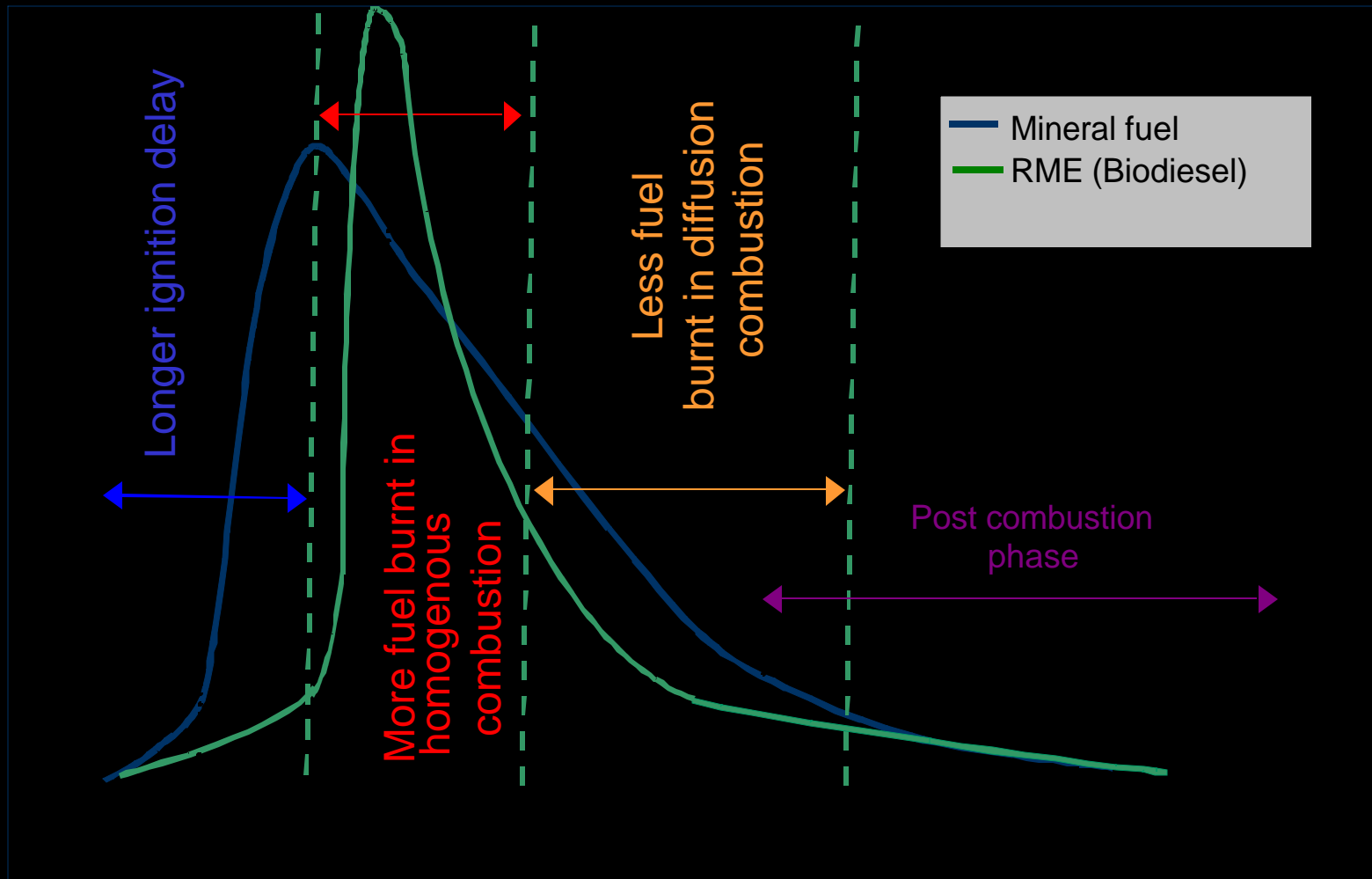
Sulfur content
Phosphorous content
Cetane number

Sulphur content
Biodiesel content
Ash precursors,

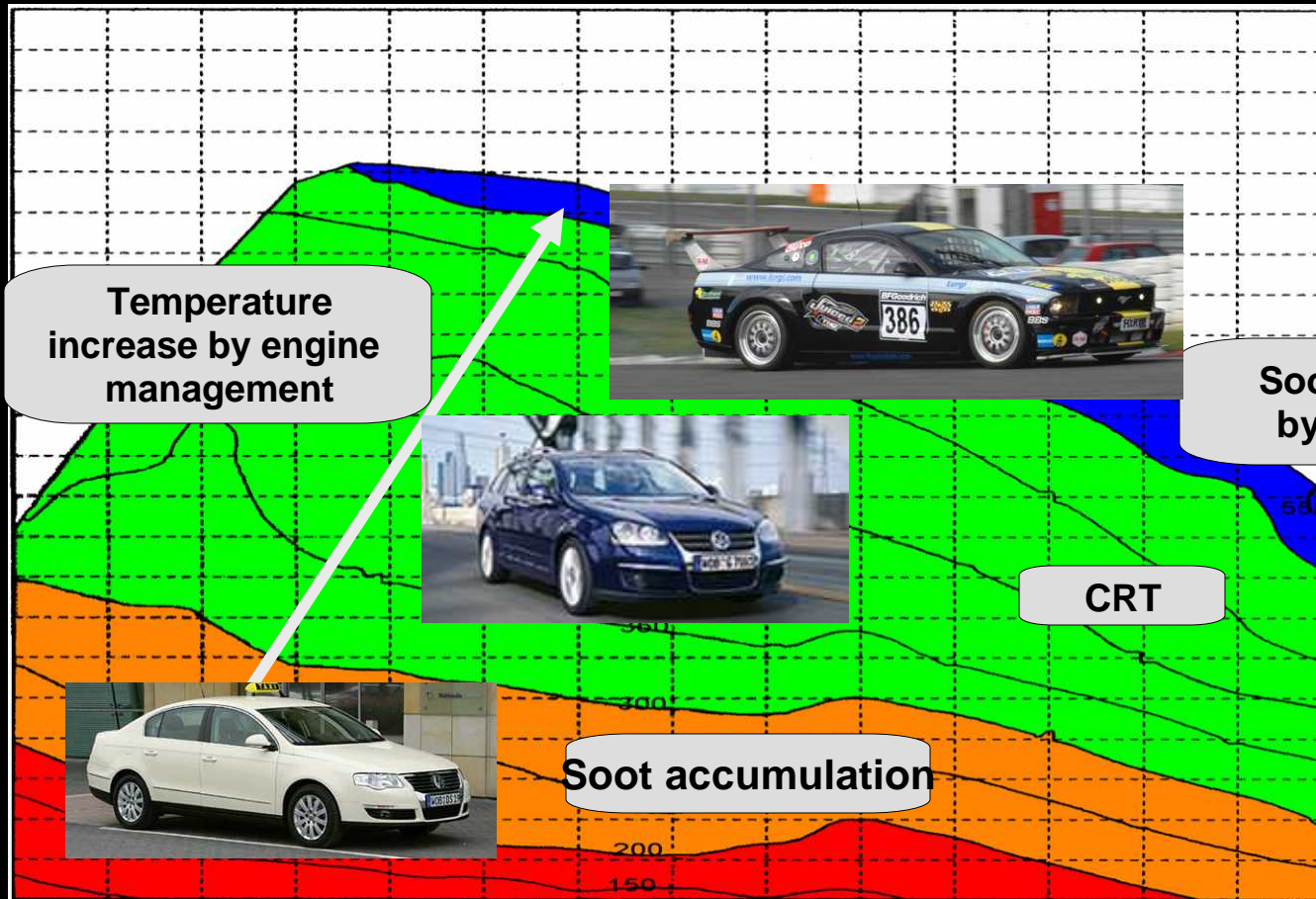
Sulfur content
Phosphorous content



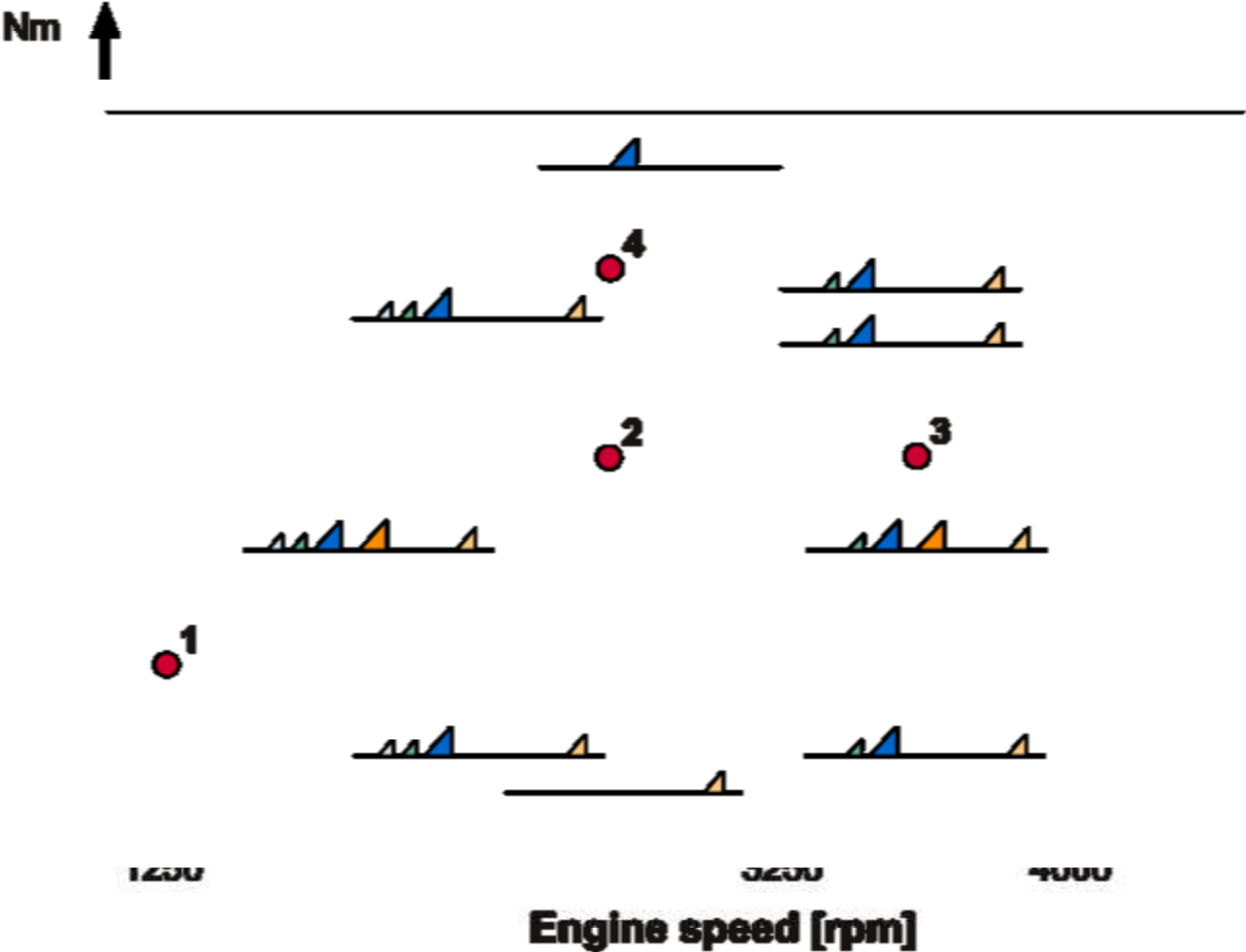
Combustion of Diesel and Biodiesel



Temperatures in Front of the Particulate Trap



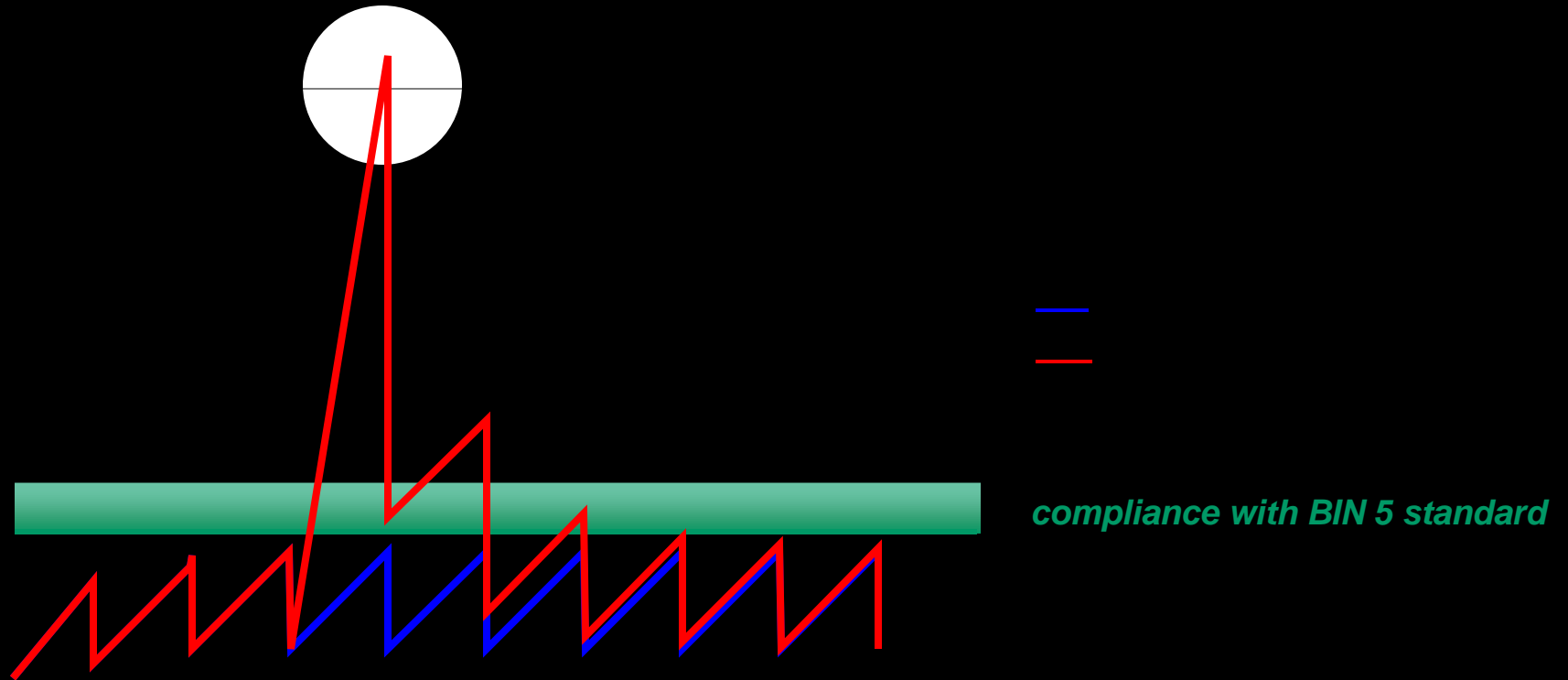
DPF Regeneration Mode



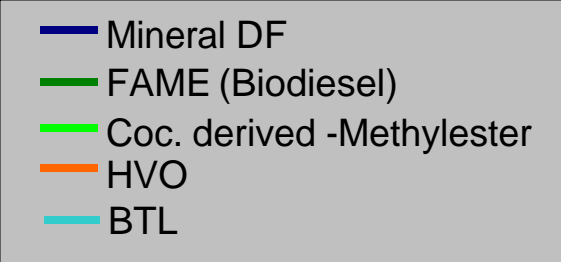
- = PI12
- = PI11
- = MI1
- = Pol2
- = Pol1



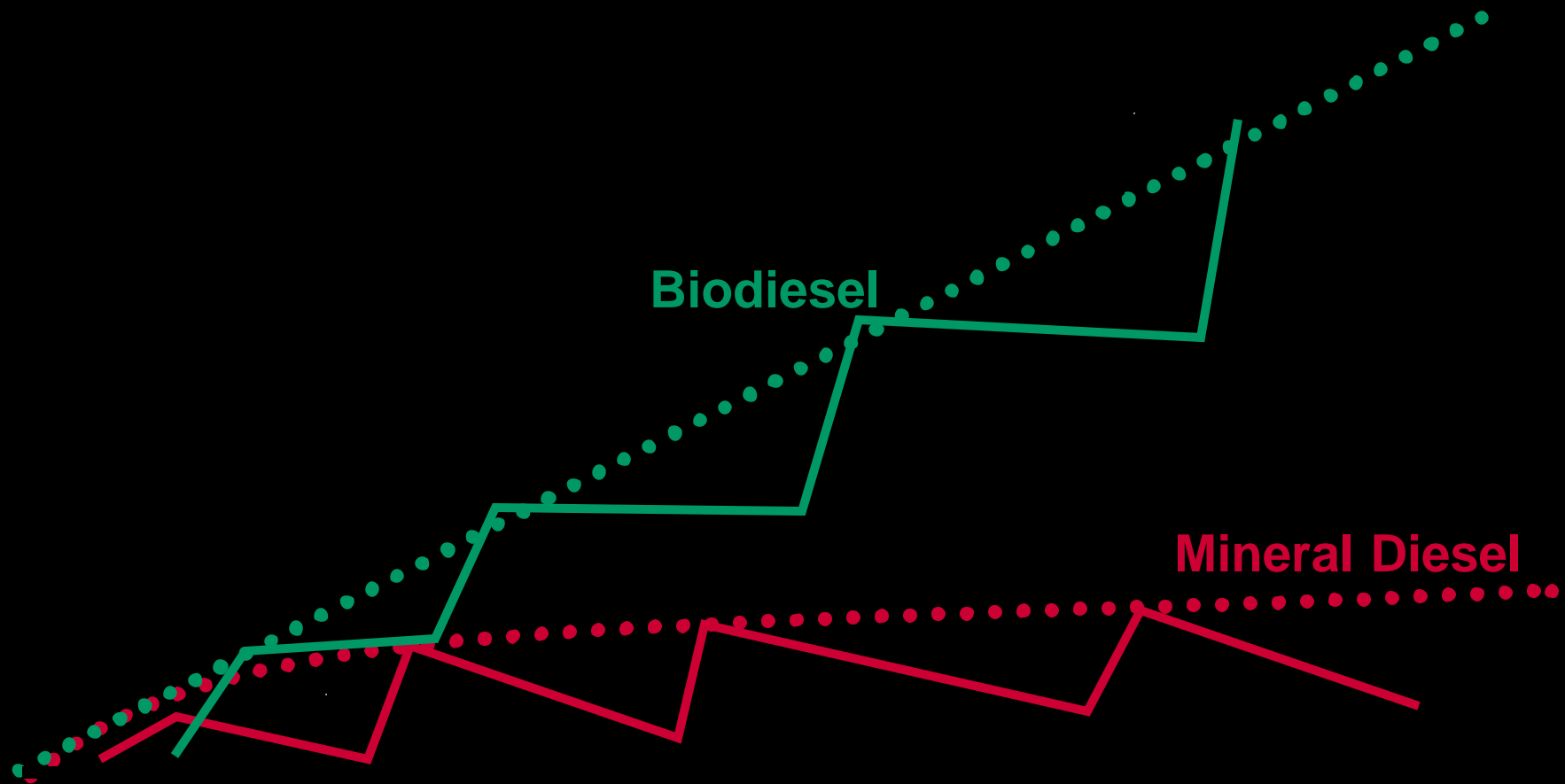
Effect of „Misuse“ with 350 ppm Sulphur Fuel



Boiling Range of Different Diesel Fuels



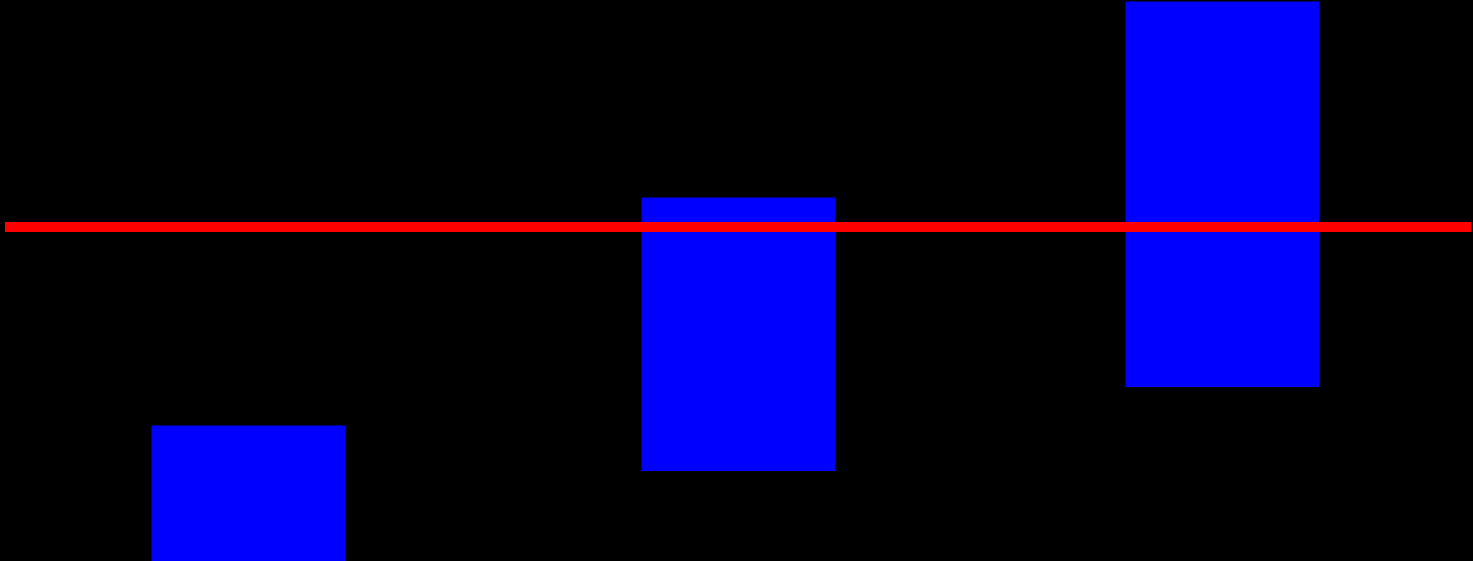
Oil Dilution During Particulate Trap Regeneration



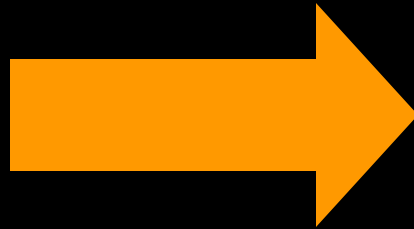
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Crankcase Oil Dilution Versus Fuel Blend Rate



Consequences of Oil Dilution From Biodiesel



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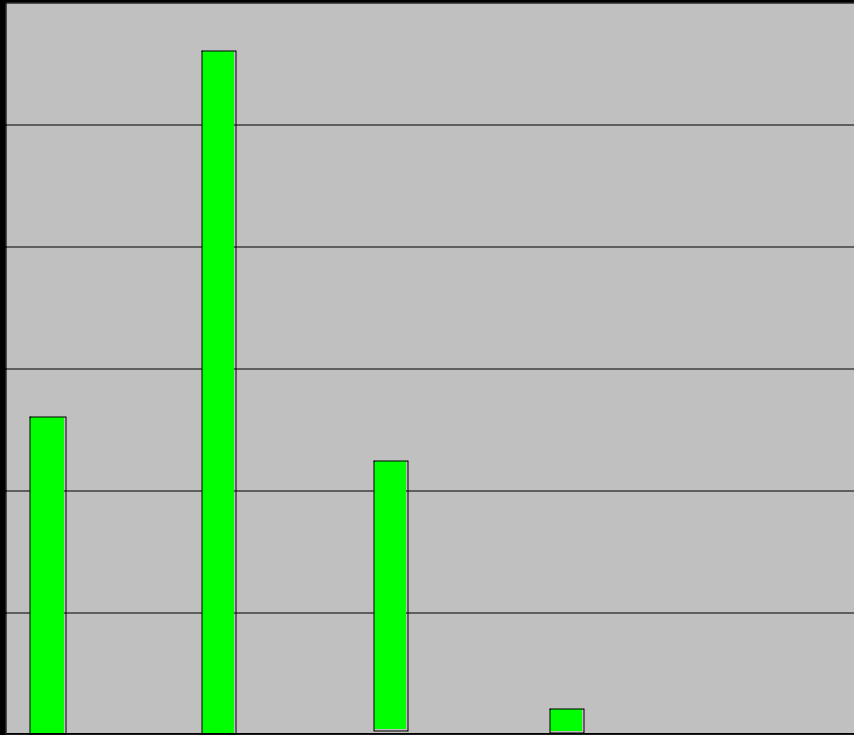
Pre – Results of DGMK – Study 686



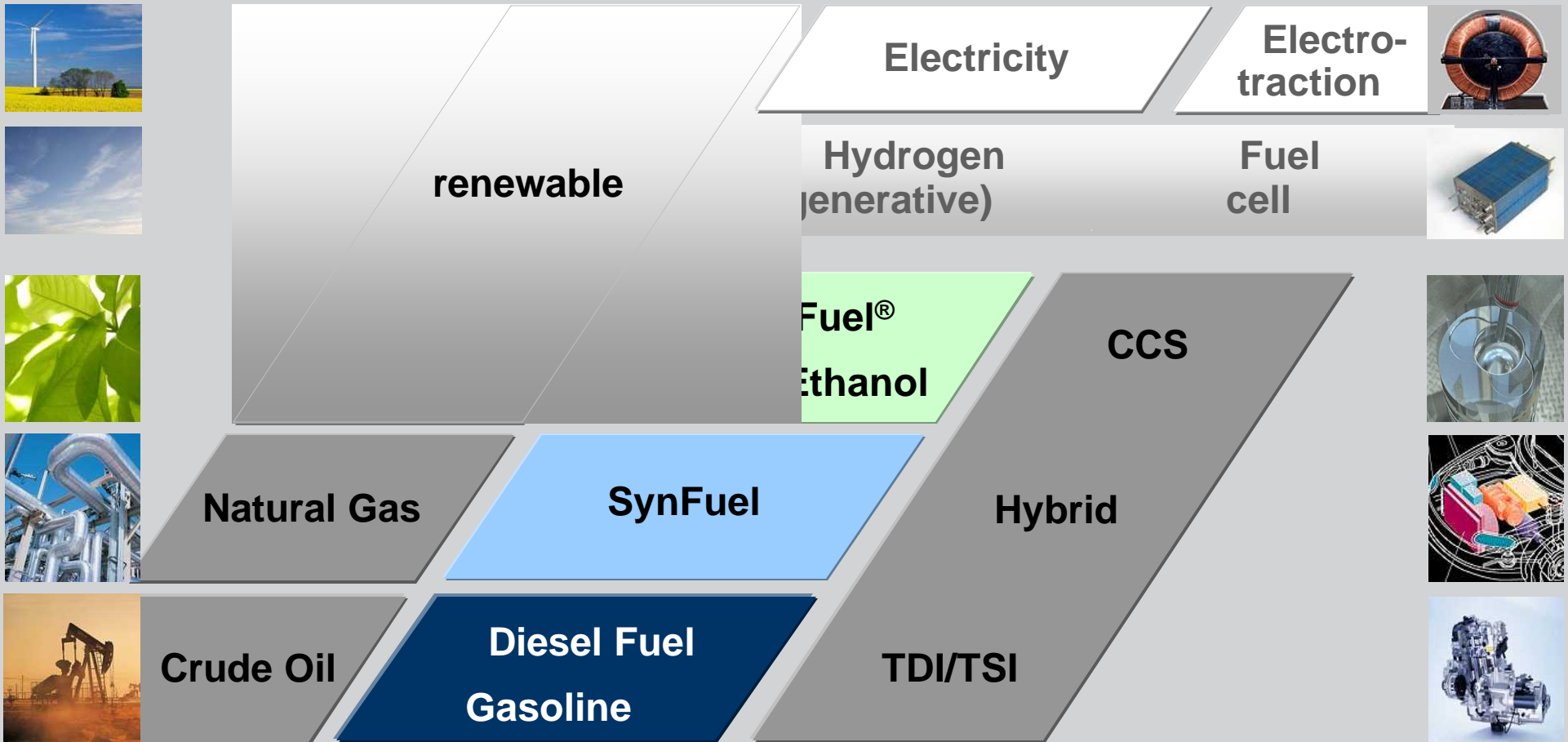
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DGMK 686: Concentrations of the end of the run



Long Term Strategy of Volkswagen



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Thank you



Questions?

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