



For a Better Environment

DOR GROUP

OCTOBER 2019

DOR GROUP

60 years
of excellence

ENERGY

INDUSTRY

ECOLOGY

SOLUTIONS FOR A BETTER ENVIRONMENT



METHANOL
Fuel Alternative



CARMEL BLUE
NOx reduction for
transportation



MTBE
Fuel additive
as lead substitute

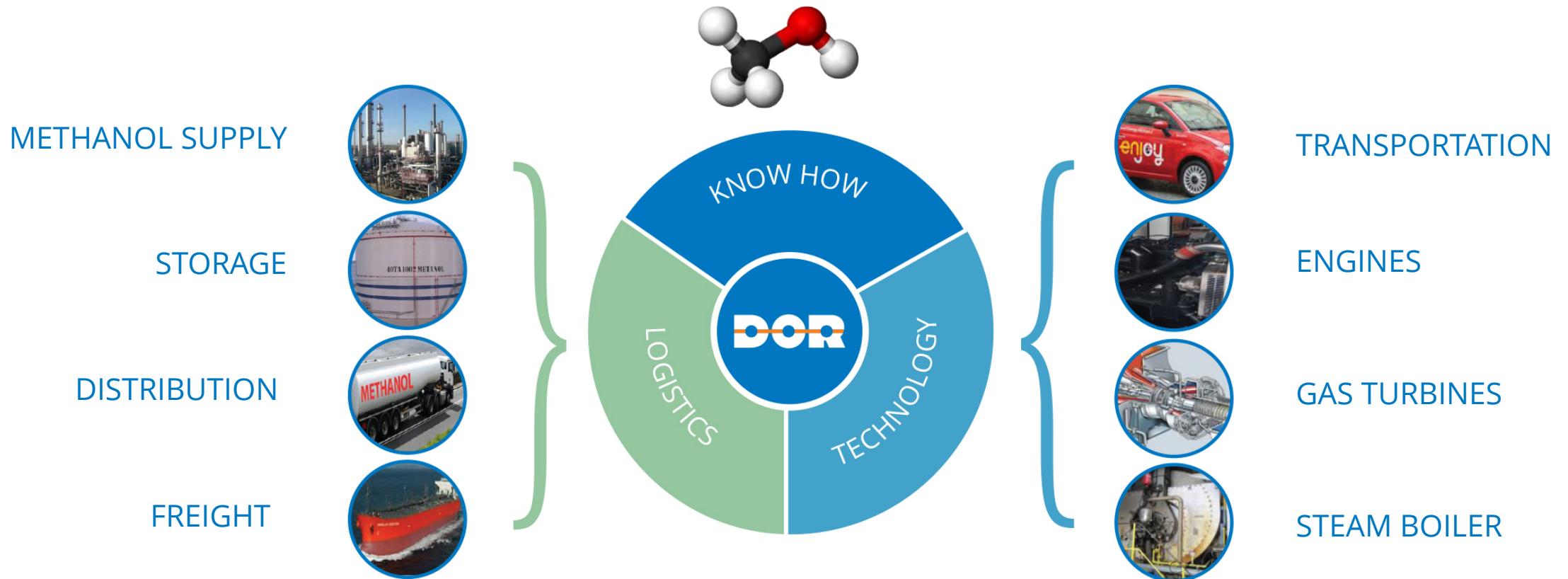


HYDROGEN
Cell fuel
to power vehicles and
electric devices

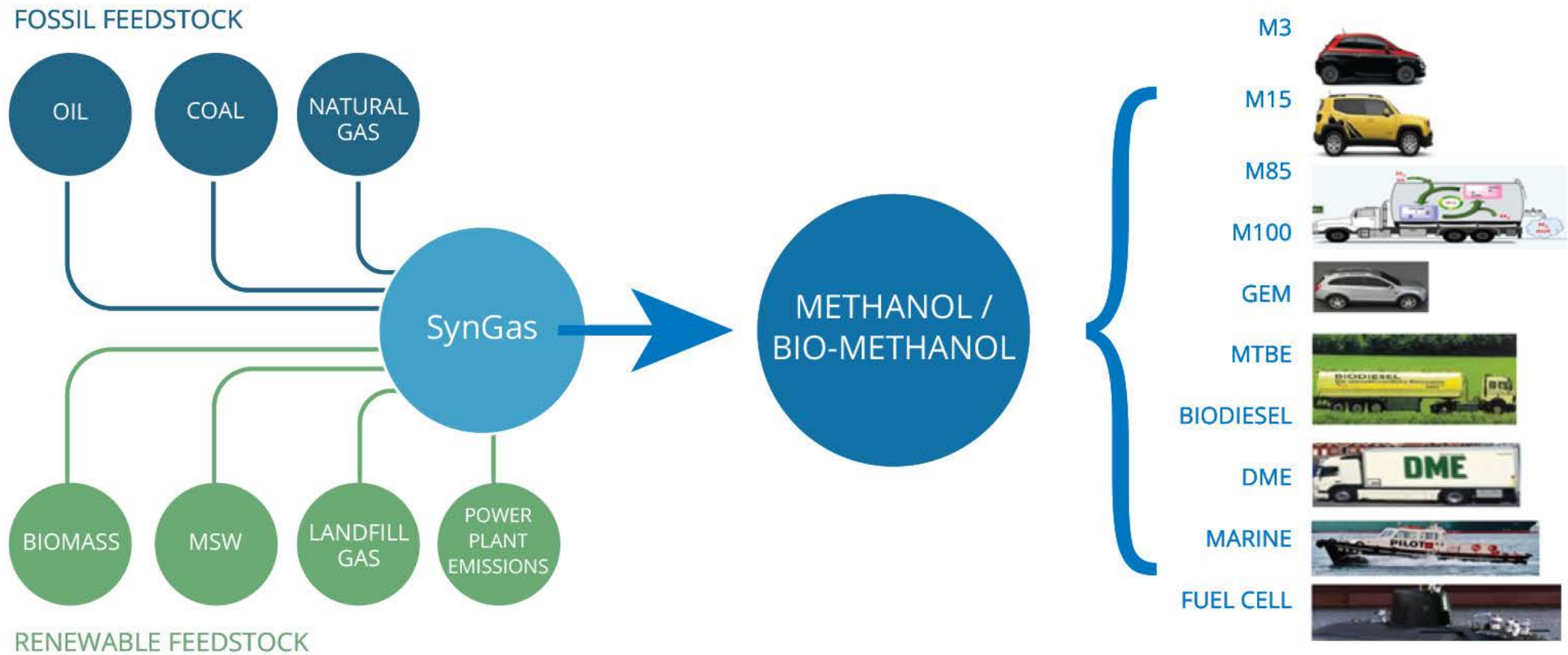


SOLVENTS
Recycling
and retrieval

DOR'S SOLUTIONS



METHANOL FOR TRANSPORT

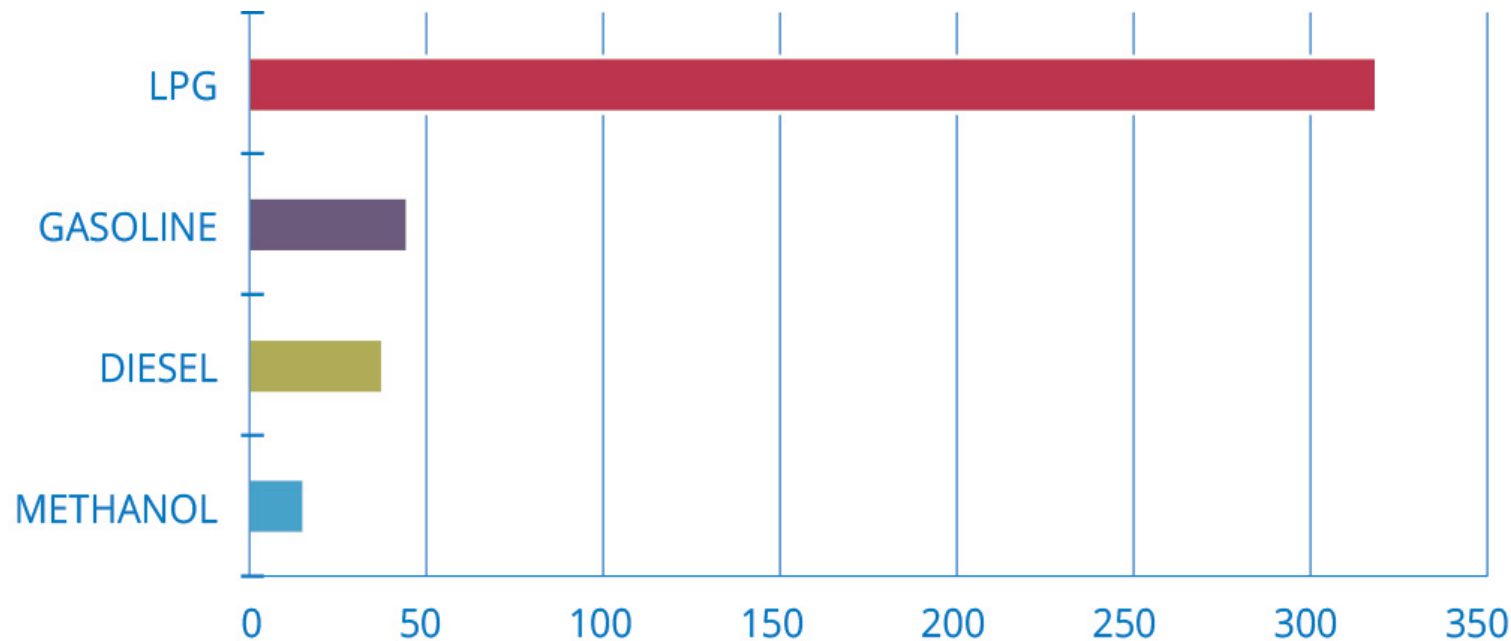


SAFETY - Methanol vs Diesel vs Gasoline vs LPG

Methanol, Diesel, Gasoline -leakage from a tank creating a pool fire in an area of 100 sq. meters.

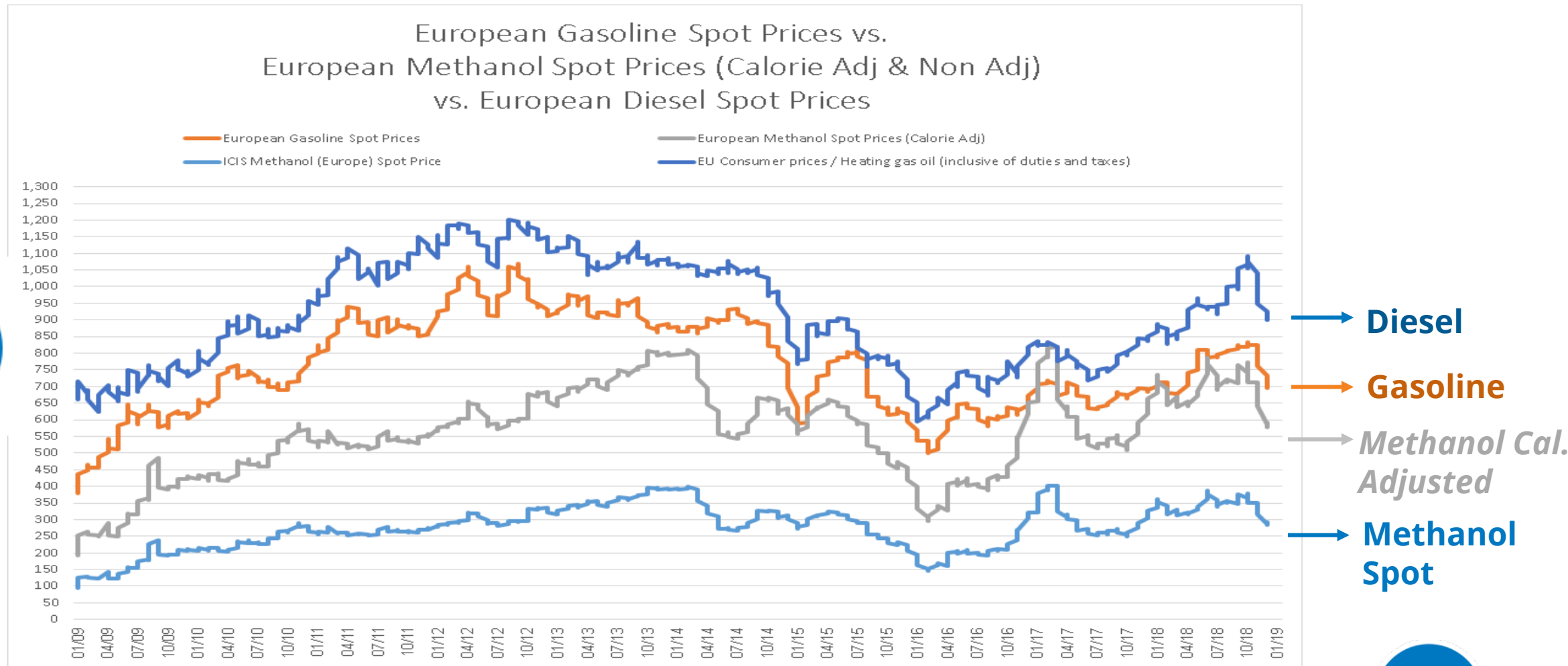
LPG – leakage develops to tank explosion (BLEVE).

Comparison of risk ranges (Meters) - Methanol vs Diesel vs Gasoline vs LPG



Methanol Vs. Gasoline Prices (Euro/MT)

Euro / Ton



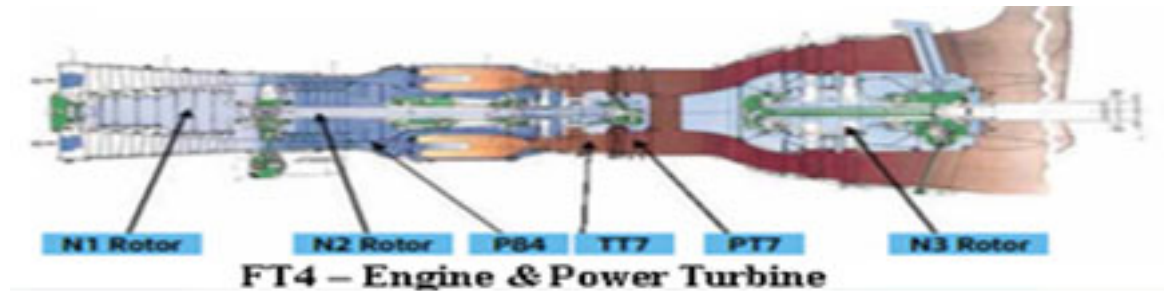
GAS TURBINE CONVERTED TO METHANOL



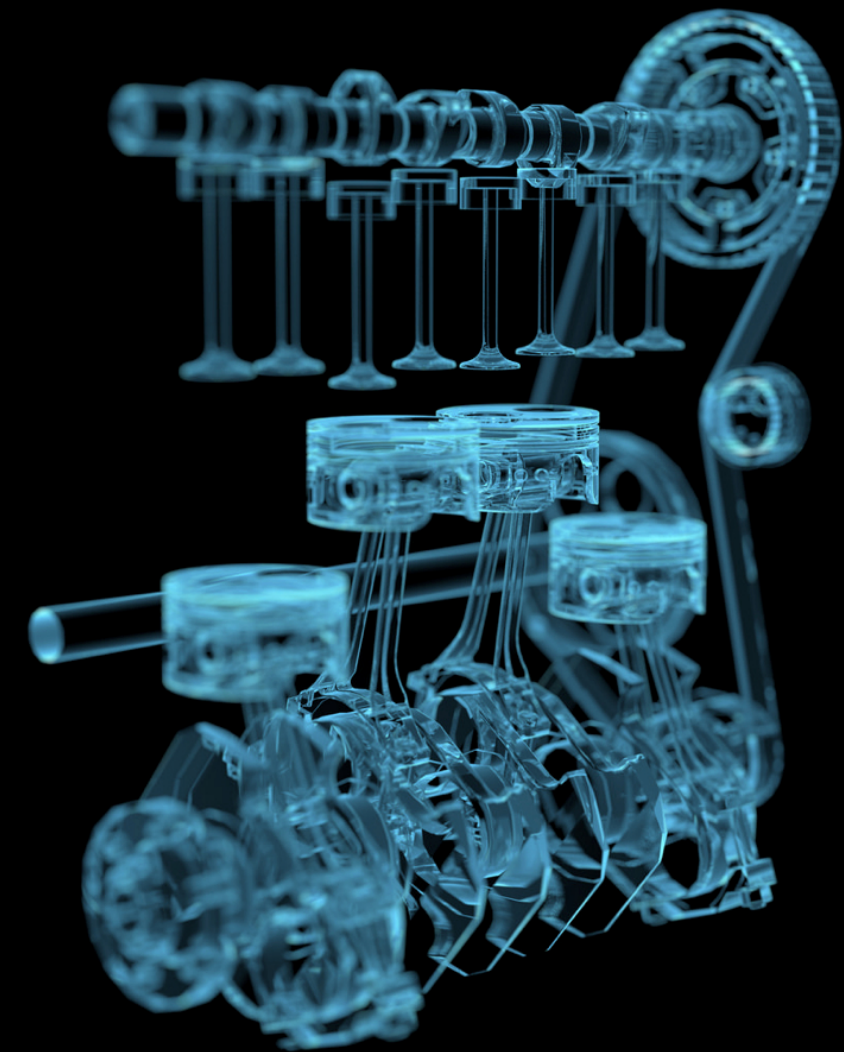
DOR and Israel Electric Company (IEC) developed Methanol application for Power plants

Converted a Pratt & Whitney 50 MW Gas Turbine Unit in Eilat, Israel from Diesel to 100% Methanol firing

The turbine has been active for six years



INTERNAL COMBUSTION ENGINES



M15 -A Newly approved Fuel Standard

Joint cooperation with
Fiat Chrysler on M15



Fiat 500 Enjoy
Natural Energy
Methanol

- Over 3 Million KM accumulated



ENVIROMENTAL BENEFITS

FCA Emission Test Results

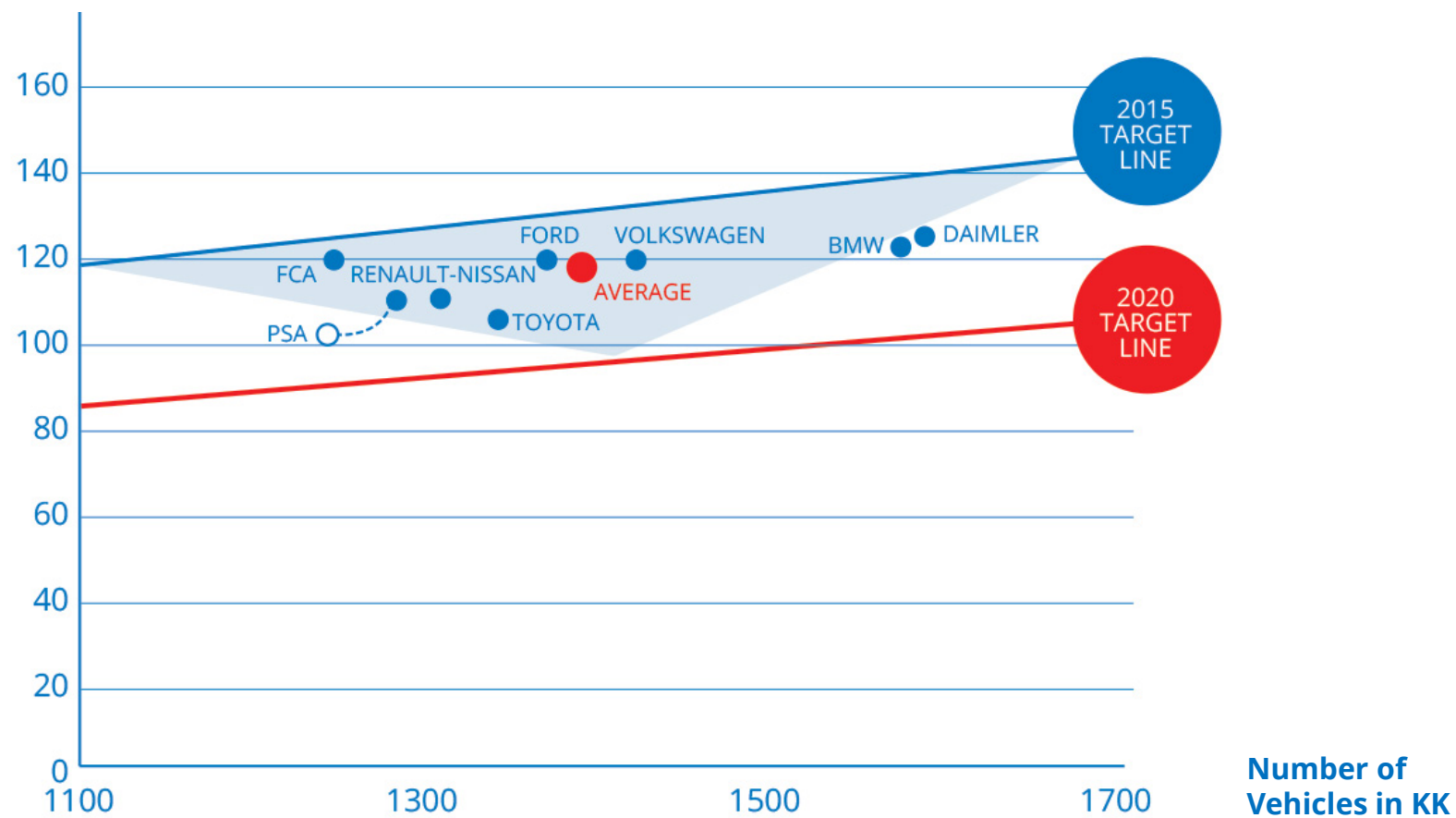
Type	Units	95 RON	M15	Improvement %
HC	mg/km	37	24.5	33.78
CO	mg/km	241.5	228.5	5.38
CO2	g/km	134	132	1.49
NOx	mg/km	19	18.5	2.63
NMHC	mg/km	10	6	40.00
PM	mg/km	1.36	1.1	19.12

A20 : A New Italian Standard Based On M15

COMBUSTIBILI PER AUTOTRAZIONE	PROGETTO C U N A (NC 627-02)
Combustibile alternativo ad elevato numero di ottano a base di alcool (A20)	
Requisiti e metodi di prova	GIUGNO 2018
	Alternative Alcohol-Based High Octane Fuel (A20) - Requirements and test methods
SOMMARIO	Lo scopo del documento è di definire le proprietà chimiche e gli standard di un combustibile alternativo a basso contenuto di carbonio e alto numero di ottano per nuovi motori dedicati ad accensione comandata e per tutte gli autoveicoli compatibili con E10.
	A20 = M15 + E5

EMISSION REDUCTION TARGETS

Average CO2
emission g/km



CO₂ Emission Standards For Heavy-duty Vehicles

Two binding reduction targets for fleets of each manufacturer:

- **15% in 2025**
- **30% in 2030**

As compared to the 2019 baseline (= average of all manufacturers).

- Unit: g CO₂/t km

Compliance assessment

Penalties for exceedances of targets:

- ✓ **EUR 4,250** per gCO₂/t km in **2025**
- ✓ **EUR 6,800** per gCO₂/t km in **2030**

* Regulation (EU) 2019/1242

M100 - 100% methanol solution



FPT engine
inside



A generator
working on
100%
Methanol



M100 – DOR MIX

The Future for Commercial Transportation
100% DOR mix
to replace diesel fueled trucks



CONCLUSIONS

Engine Manufacturers and Methanol Industry Should Collaborate in the development of internal combustion engines in order:

- ✓ Lower emissions
- ✓ Improve energy efficiency
- ✓ Reduce total cost of ownership
- ✓ Establish DOR mix distribution



THANK YOU

