



Trinidad Forum

Gil Dankner, CEO & Chairman
DOR GROUP

JANUARY 2019



60 years of excellence



ECOLOGY



METHANOL



ENERGY

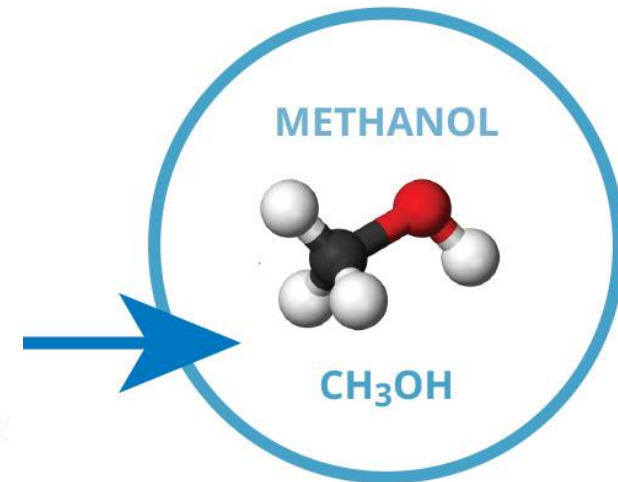
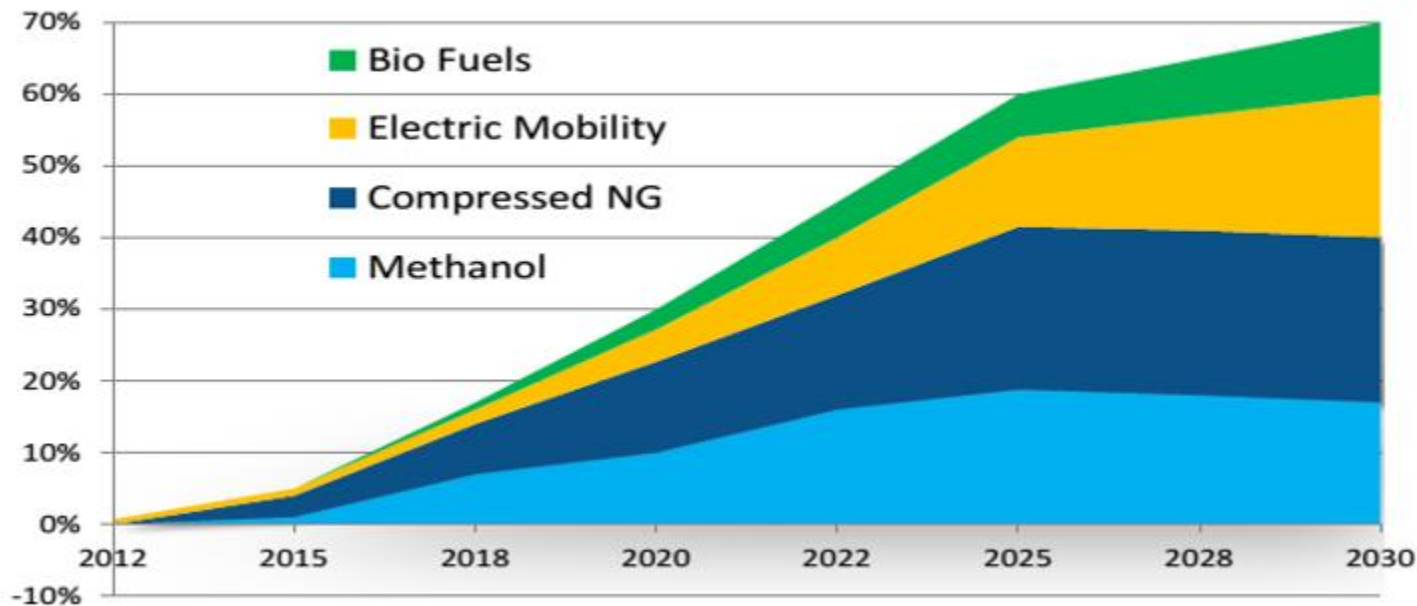
FUEL CHOICE INITIATIVE - PMO

October
2013



ISRAELI GOVERNMENTAL DIRECTIVE

Reduce the share of crude oil in Israel's transportation sector by 30% by 2020 and by 60% by 2025



METHANOL AS FUEL ALTERNATIVE

METHANOL



M3



M15



M85



M100

GEM



MTBE



BIODIESEL

DME



MARINE

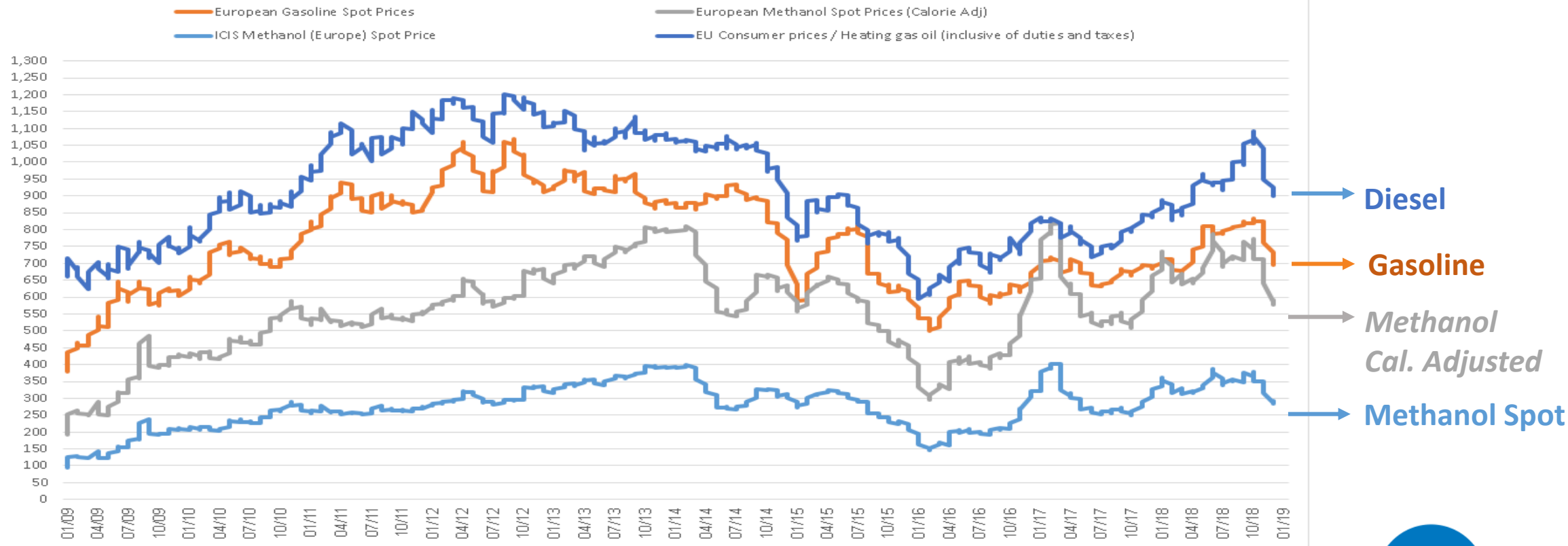


FUEL CELL



PRICE

European Gasoline Spot Prices vs.
European Methanol Spot Prices (Calorie Adj & Non Adj)
vs. European Diesel Spot Prices

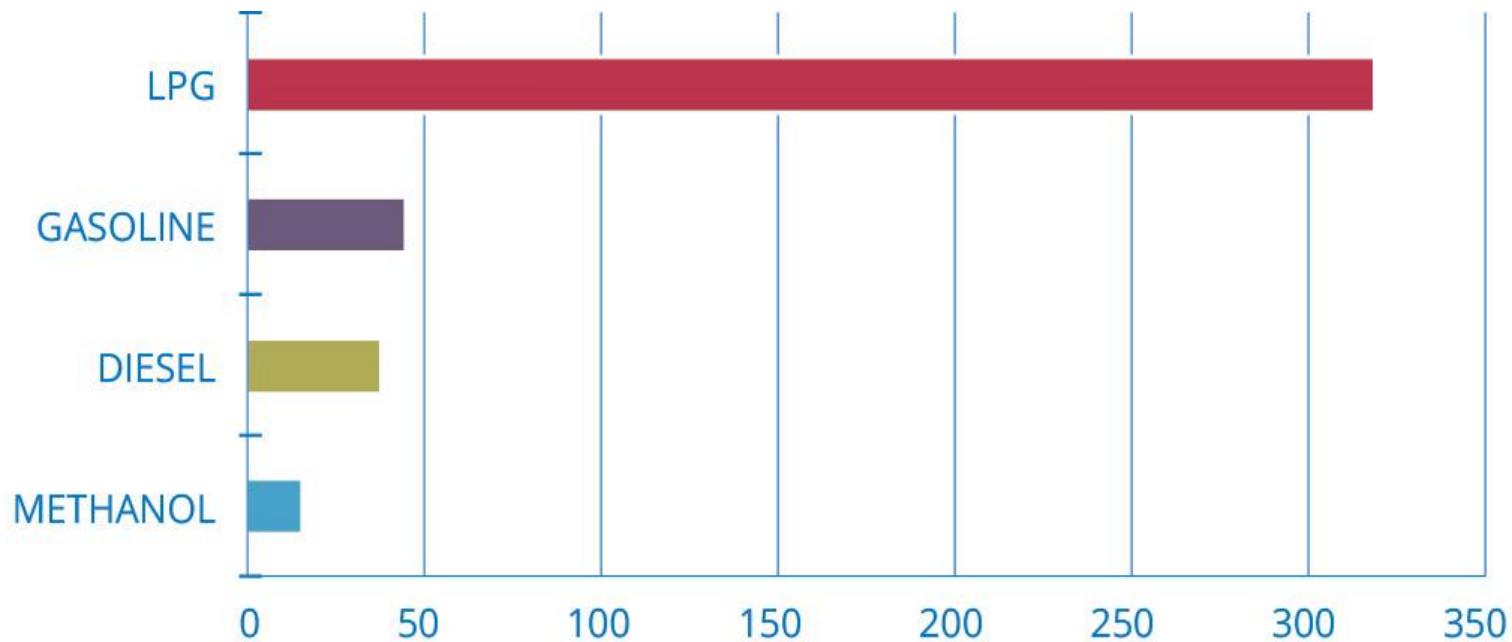


SAFETY - Methanol vs Diesel vs Gasoline vs LPG

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



M15

Joint cooperation with Fiat Chrysler on M15



Fiat 500 Enjoy
Natural Energy
Methanol

- Over 3 Million KM accumulated



ENVIROMENTAL BENEFITS

FCA Emission Test Results

Average Emissions - FIAT			
Type	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

M15 STANDARD RELEASED IN ISRAEL

M15 Promoted by Dor

A Newly approved
Fuel Standard in
Israel

Foreword

This Israeli Standard, SI 90 part 4, is based on the Israeli Standard SI 90 part 2 Automotive gasoline- Unleaded gasoline (which adopts the European Standard EN 228 Automotive fuels- Unleaded petrol - Requirements and test methods, with national modifications and additions).

This Standard is part of a Standard series dealing with automotive gasoline. The Standards in this series are the following:

SI 90 part 2 — Automotive gasoline: Unleaded gasoline

SI 90 part 4 — Automotive gasoline: Methanol-gasoline (petrol) fuel blend composed of 85% unleaded gasoline (petrol) and 15% methanol (M15)

A20 : A NEW ITALIAN STANDARD BASED ON M15

The New York Times

Fiat Chrysler and Eni Cooperating on Emissions Reductions

By THE ASSOCIATED PRESS NOV. 21, 2017, 1:39 P.M. E.S.T.
MILAN — The CEOs of Italian-American carmaker Fiat Chrysler Automobiles SpA and Italian energy giant ENI have agreed to jointly develop technologies to reduce carbon emissions from vehicles.

The companies signed the agreement Tuesday in Rome with Premier Paolo Gentiloni that broadly focus on technologies related to compressed natural gas and liquefied natural gas - alternative fuels in which Italy has long been a market leader.

The deal also includes the use of a new alternative fuel - **15 percent methanol** and **5 percent bioethanol** - that will be tested by five Fiat 500 vehicles in ENI's car sharing service. The companies said **the fuel can reduce carbon emissions by 4 percent.**

FCA CEO Sergio Marchionne said the cooperation aims to achieve **"an incisive and permanent reduction in emissions."**



The president of the Italian Council Paolo Gentiloni, the CEO of eni, Claudio Descalzi, and the managing director of fca, Sergio Marchionne

A20 ITALIAN STANDARD

COMBUSTIBILI PER AUTOTRAZIONE

Combustibile alternativo ad elevato numero di ottano a base di alcool (A20)

Requisiti e metodi di prova

**PROGETTO
C U N A
(NC 627-02)**

GIUGNO 2018

Alternative Alcohol-Based High Octane Fuel (A20) -
Requirements and test methods

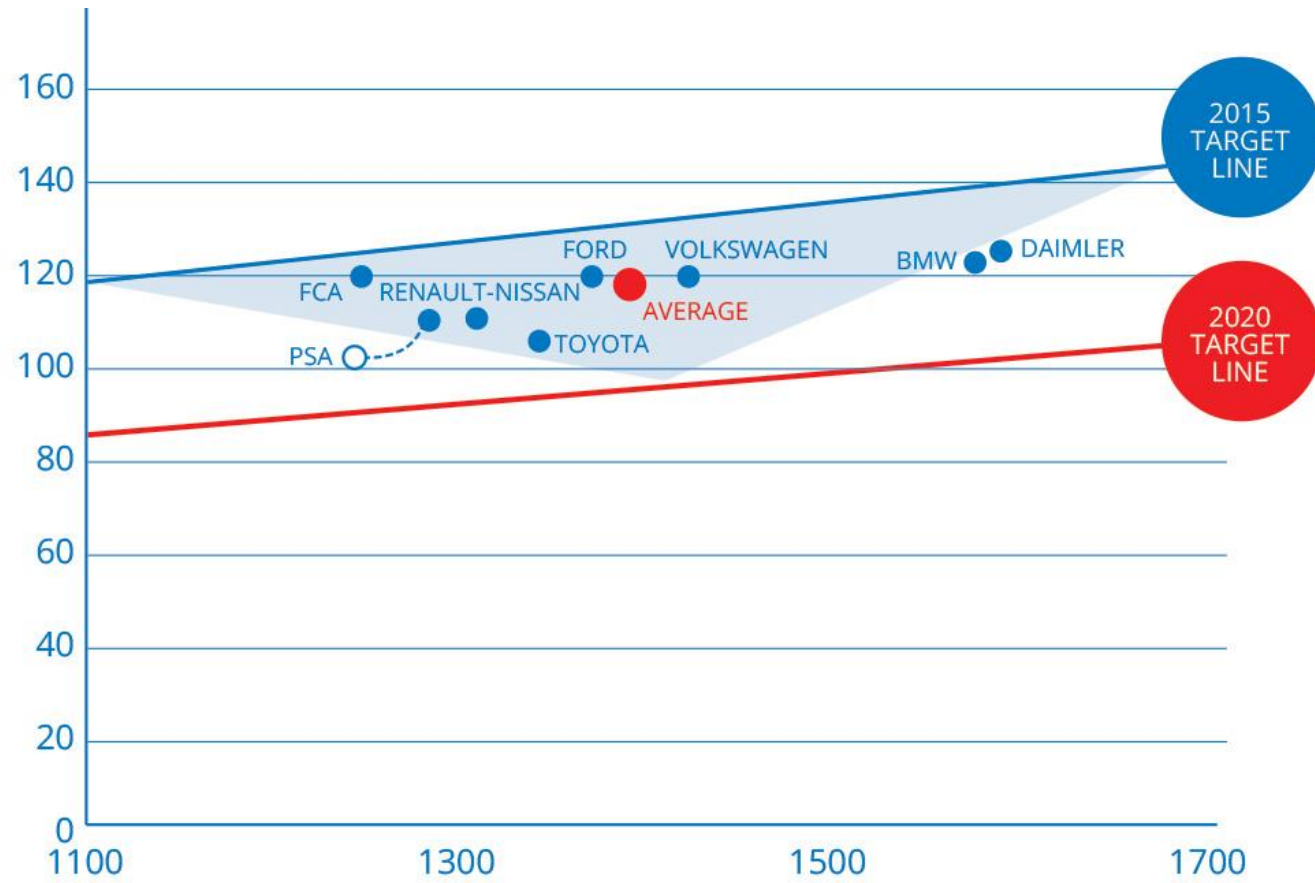
SOMMARIO

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



Number of
Vehicles in KK

M51 - M85

GEM :

Gasoline, Ethanol & Methanol mixtures

- FFV Vehicles can use up to 85% Ethanol / Methanol
- FFVs are marketed worldwide
- M70 blends tested in Flexible Fuel Vehicle (FFV)
- There are at least **25 Million** FFV in the US



M51-M85 AMERICAN STANDARTS

2007



Designation: D 5797 – 07

**Standard Specification for
Fuel Methanol (M70-M85) for Automotive Spark-Ignition
Engines¹**

UPDATED
2016



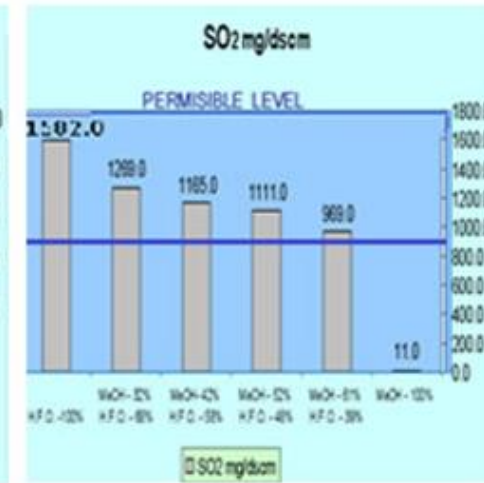
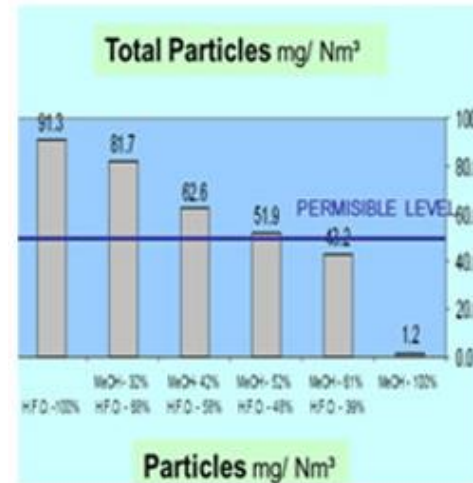
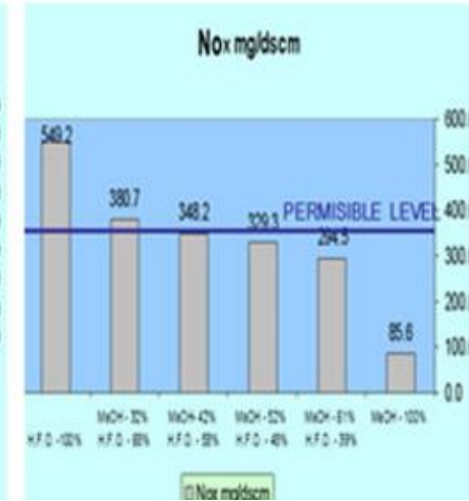
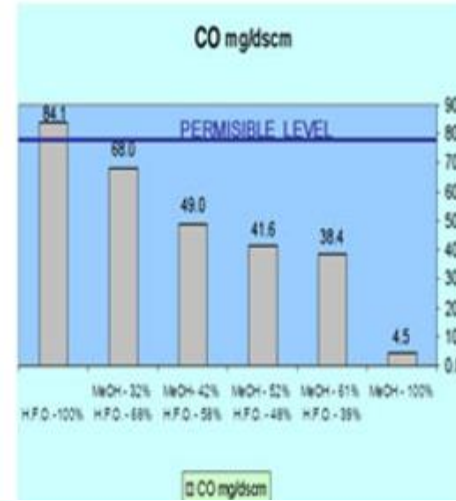
Designation: D5797 – 16

**Standard Specification for
Methanol Fuel Blends (M51–M85) for Methanol-Capable
Automotive Spark-Ignition Engines¹**

AVAILABLE STANDARDS

COUNTRY	STANDARD
ISRAEL	M15
INDIA	M15, M100
ITALY	A20
USA	M51-M85

STEAM BOILERS CONVERTED TO METHANOL

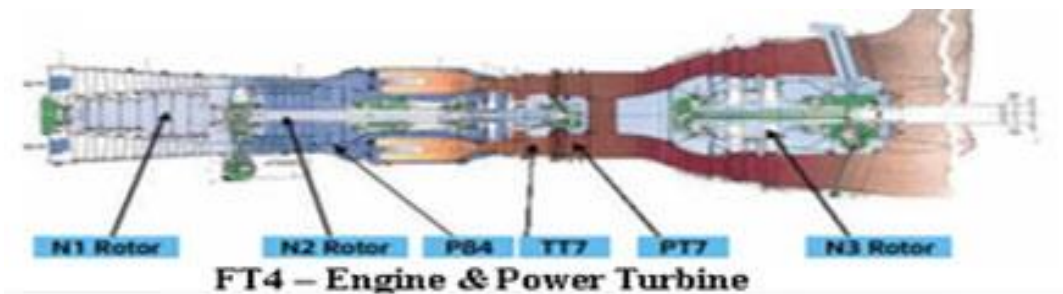


METHANOL FOR POWER GENERATION



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

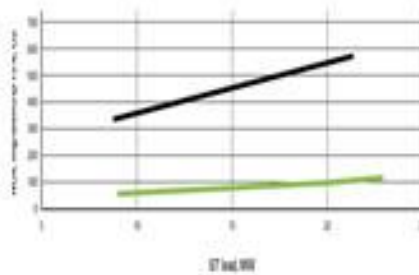
Converted a Pratt & Whitney 50 MW Gas Turbine Unit in Eilat, Israel from Diesel to 100% Methanol firing



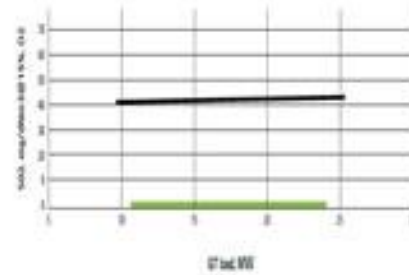
GAS TURBINES CONVERTED TO METHANOL



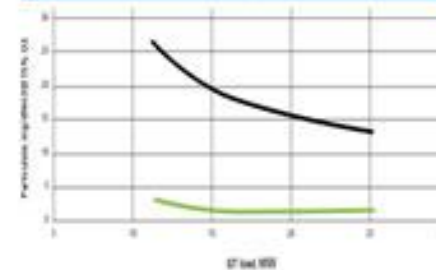
NOx emission as function of GT load
P&W GT, Eilat



SO2 emission as function of GT load
P&W GT, Eilat



Particulate emission as function of GT load
P&W GT, Eilat



Methanol
Oil#2

FILTER COMPARISON

DIESEL

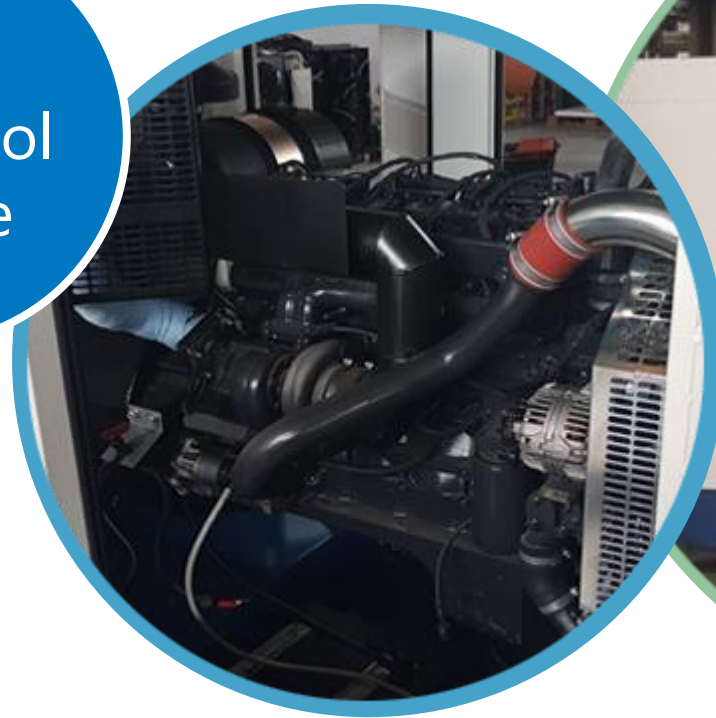


METHANOL



M100

100%
Methanol
Engine



M100

The Future for Diesel Trucks*

100% methanol solution
to replace diesel fueled trucks

* Under development



DOR GROUP & GOVERNMENT OF INDIA


DOR Group will transfer know-how on Methanol Blending to the **Government of India**

December 7-8 2017 - Meeting with:
Mr. Nitin Gadkari
Minister of Roads and Transportation
Dr. VK Saraswat
NITI Aayog member and Chairman of the
Combustion Institute



IMPLEMENTATION OF METHANOL POLICY - INDIA

THE ECONOMIC TIMES PTI | Dec 09, 2017, 06:46 PM IST



MUMBAI: Union Roads Minister Nitin Gadkari today said the government will be soon announcing a policy which calls for 15 per cent blending of methanol in petrol to make it cheaper and also reduce pollution.

"In the upcoming Parliament session, I am announcing a policy of blending 15 per cent methanol in petrol," Gadkari said at an event organised by Moneycontrol and Free Press Journal here.

"The costs will go down, pollution will go down," the Union minister said.

He said methanol gets made from coal and costs only Rs 22 per litre as against the prevailing price of about Rs 80 per litre for petrol and added that China is making the coal byproduct for Rs 17 per litre itself.

"The costs will go down, pollution will go down," the Union minister said.

He said factories in and around Mumbai, including Deepak Fertilisers and Rashtriya Chemicals and Fertilisers (RCF), can generate methanol.

Gadkari said Swedish auto major Volvo has got a special engine to the financial capital which runs on methanol and using the locally available methanol, he will be attempting to run 25 buses entirely on the fuel.

Niti Aayog evaluating ₹5,000 crore Methanol Economy Fund
Updated: December 19, 2017
19:56 IST | Our Bureau



Dr. VK Saraswat , NITI Aayog member and Chairman of the Combustion Institute (Indian Section)

- **1 crore = ₹ 10 Million Rupees**
- **5000 Crore = \$780 Million USD**

THANK YOU



January 2019