

Temperature-controlled logistics: a challenging opportunity for alternative propulsion

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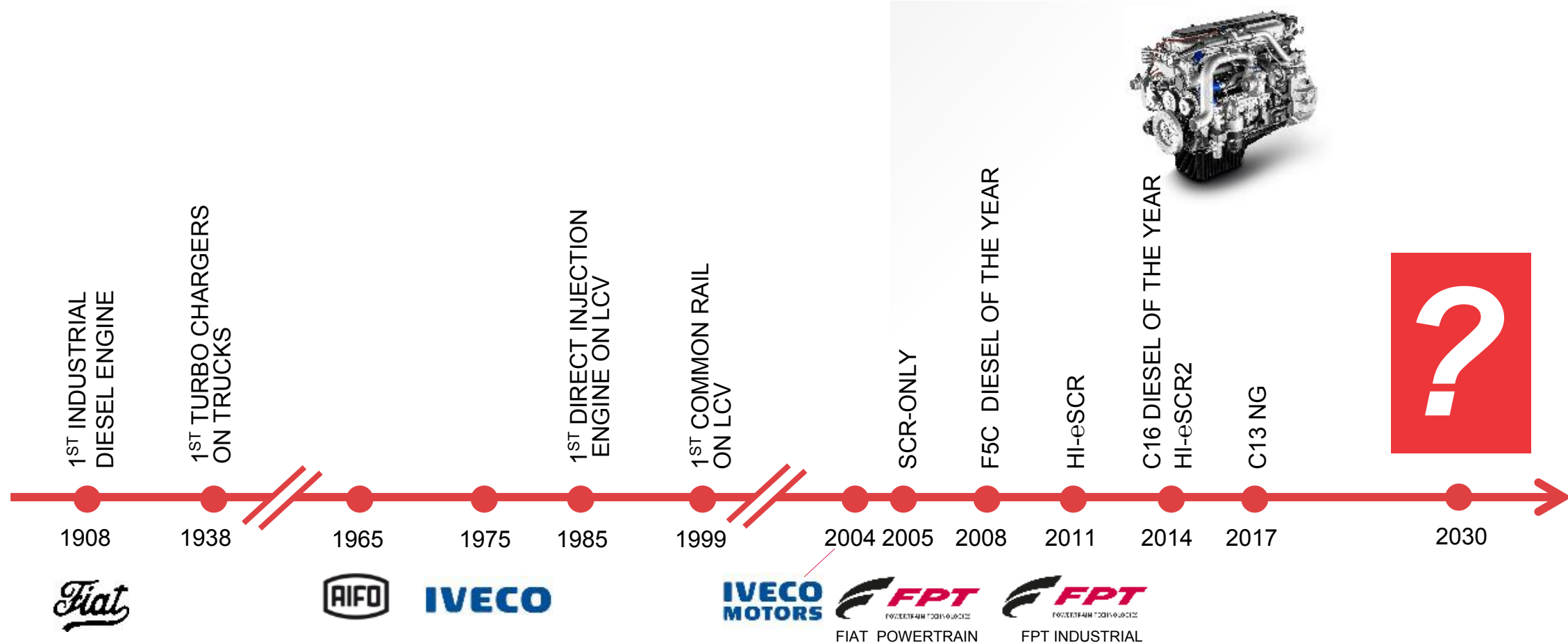
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FPT Brand Manifesto



FPT: more than 100 years powered by innovation

How will the engine of the future look like?



Innovation is often derived from disruptive thinking applied on “standard technology”.

Future challenge of on-road transportation

Engine innovation main drivers

Global warming fight

European On-Road legislation

- Light Duty and Heavy Duty CO2 Regulation
 - 2025: -15% CO2 reduction
 - 2030: -30% CO2 reduction
- Carbon footprint to become a tool for corporate sustainability index and for food producers



Urban Air Quality Improvement

Local Authorities enforcing:

- PM city limits
- Diesel ban in some areas or highways
- Incentives for Hybrid and ZEV



Technological path

Technology recipe to achieve targets enhancing customers competitiveness

EXCELLING IN CONVENTIONAL ENGINE TECHNOLOGIES



DIESEL



NATURAL GAS

- ▶ *Stretch efficiency and performance of Diesel*
- ▶ *Exploit full potential of Natural Gas technology*



Best in class Diesel



Advanced NG combustion

INTRODUCING ZERO- EMISSION PROPULSION SOLUTIONS



ELECTRIFICATION

- ▶ *Enhance PWT Efficiency*
- ▶ *Diversify energy vectors*
- ▶ *Key enabler to meet CO2 reduction*



BEV



HYBRID



H2 Fuel Cells truck

PWT SYSTEM APPROACH



PWT INTEGRATED SYSTEM

- ▶ *PWT optimization towards mission profile*
- ▶ *Design, integration and control to reach optimum efficiency*



Model-based Control



Connectivity

Offer best-in-class Gas and Diesel powertrain solutions and expand product portfolio towards the E-PWT

FPT Powertrain solution for temperature controlled logistics

From engine and driveline manufacturer to powertrain integrated solutions provider

Efficiency



Productivity



Availability



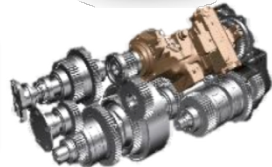
Flexibility to mission (type of goods, season, stop numbers...)

Access of long haulage trucks to restricted zones

Zero-emission local distribution / E-commerce last mile delivery

High efficiency in extra-urban areas: low TCO, high performance

Silent operation



Electrified Powertrain



E-drives



Battery/FC



Electronic Comp.



CURSOR X

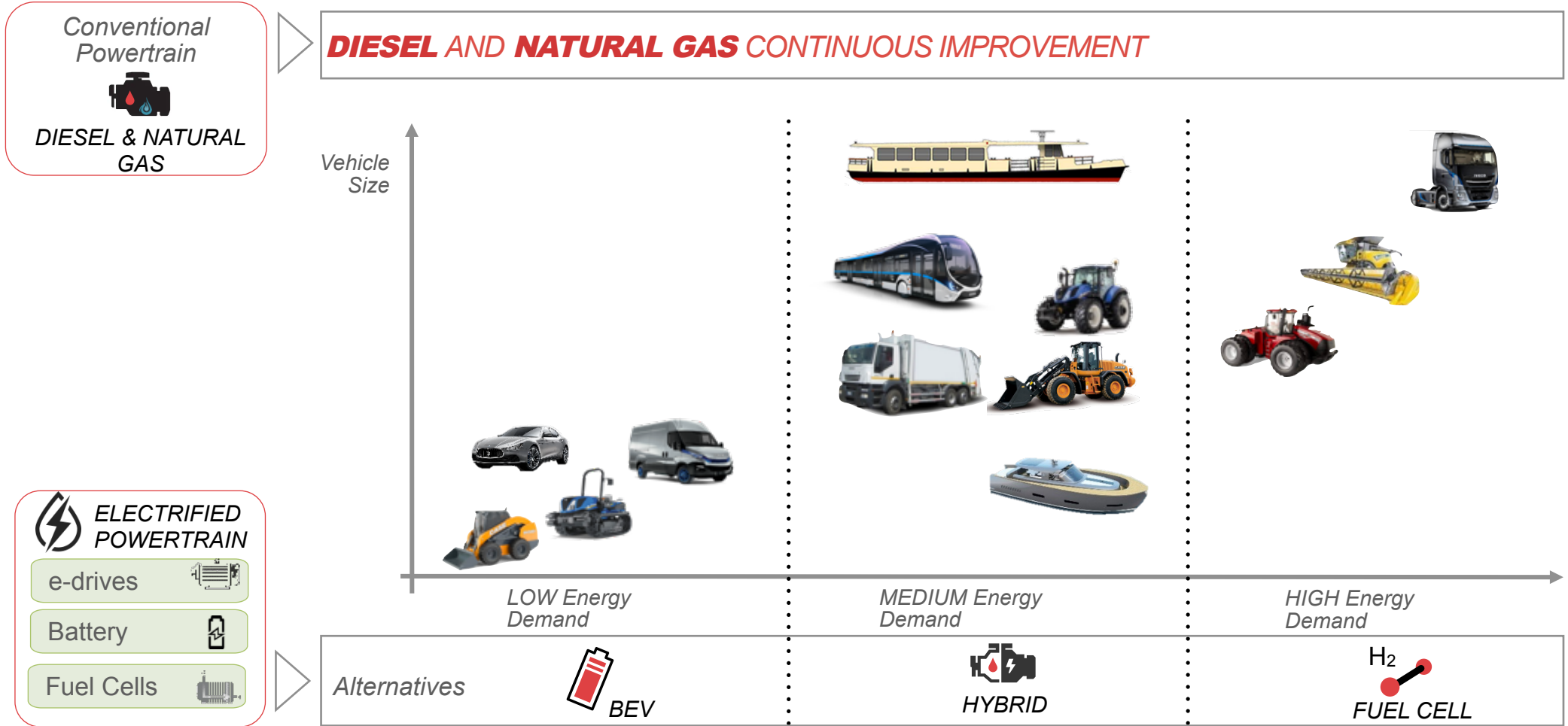


**Modular
Multi-power
Multi-application
Mindful**

**There is no unique solution meeting sustainability and business profit at the same time.
The engine of the future will be modular, multi-power, multi-application, tailored on customer needs**

Multipower portfolio to cover all missions and applications

A modular approach to deliver broad range of electrified PWT solutions



Natural Gas: a key milestone on the pathway to zero-emission

FPT: more than 20 years of experience in natural gas technology

PERFORMANCE



- Diesel like performance
- Up to 460HP with 13L Cursor engine (powering IVECO Stralis NP 460)
- Quiet operation

ENVIRONMENTAL SUSTAINABILITY



- Almost zero PM
- 50% NOx reduction on average vs Diesel
- 8% CO₂ reduction vs Diesel, reaching 90% with Bio-Methane

COST OF OWNERSHIP



- Fuel cost
- 100% mature technology

INFRASTRUCTURE



- Refueling station increase for both CNG and LNG
- Bio-Methane stations already available and growing

AUTONOMY



- IVECO Stralis NP 460 reaches the record 1600km autonomy range with double LNG tank solution



FIC



N60



C9



N67



C13



BUS



LCV



MCV



HCV

Natural Gas offering available on the entire product range.

NG technology represents today an available alternative but also a long term solution towards CO₂ neutrality

Introducing Electric and Hybrid powertrain solutions

A modular approach to deliver broad range of electrified PWT solutions



F1 NG Hybrid

Natural Gas serial hybrid for City Bus

3 liters Natural Gas Engine replacing a 7L engine



eGenerator



eMotor



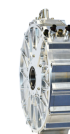
Battery Pack



F1 Engine BEV & Hybrid

*Electric for urban delivery
in Zero emission Zone*

*Hybrid for general
purpose applications*



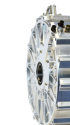
eMotor



Battery Packs



F1 engine



eMotor



Battery Pack

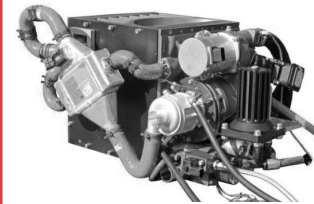
Fuel Cell: a long term zero-emission solution for HD applications

H2 is the most promising fuel to achieve long haulage at high payload and access ZERO emission zone

On Road long distance	Fuel Cell	Battery
Target refill range	> 400 km	
Average power	190 – 270 hp	
E-System weight	2,5 tons	7 – 9 tons ✗
Packaging	Suitable	Suitable
Refill time	10-20 min	2 hrs ✗



Fuel Cell system and Powetrain



FPT and IVECO are leading a 5-yr EU Research Project to operate Fuel Cell Trucks in a real customer fleet



FPT and IVECO partnership with Nikola Truck will further reinforce fuel cell competence and support competitiveness in this future technology.



THANK YOU