



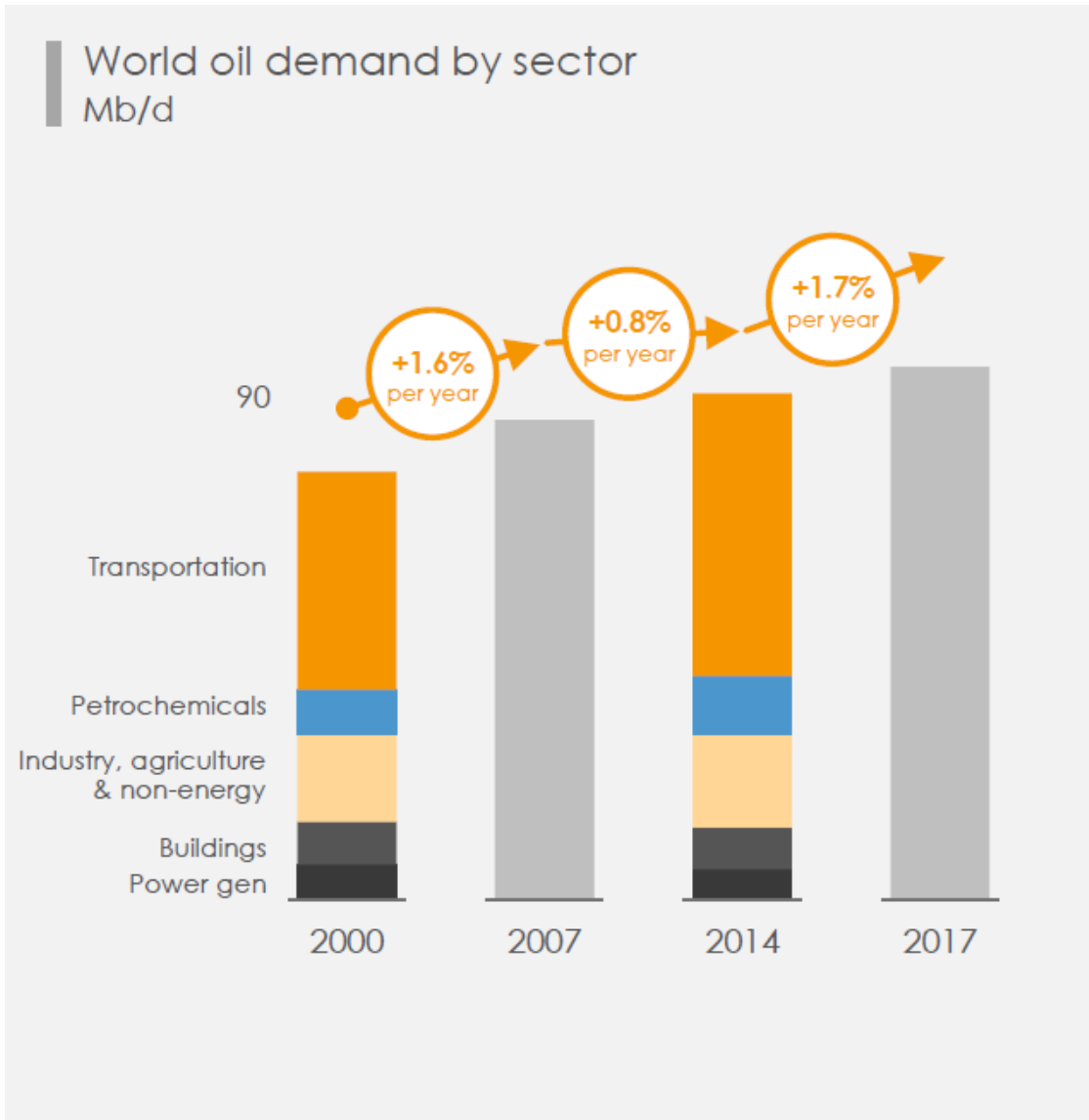
# LA DISTRIBUTION DES CARBURANTS DU FUTUR

Agnès DUMESGES

VP Product Marketing

Fondation Tuck – Lundi 18 juin 2018

# TRANSPORT REPRESENTS MORE THAN 50% OF OVERALL OIL DEMAND

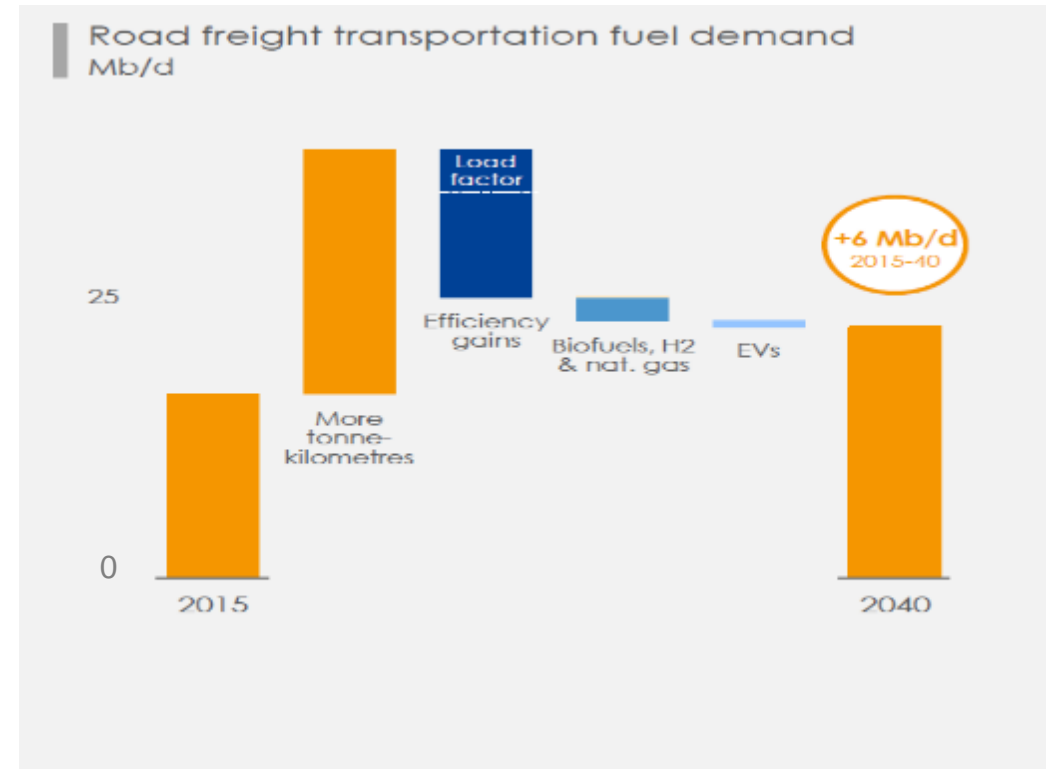
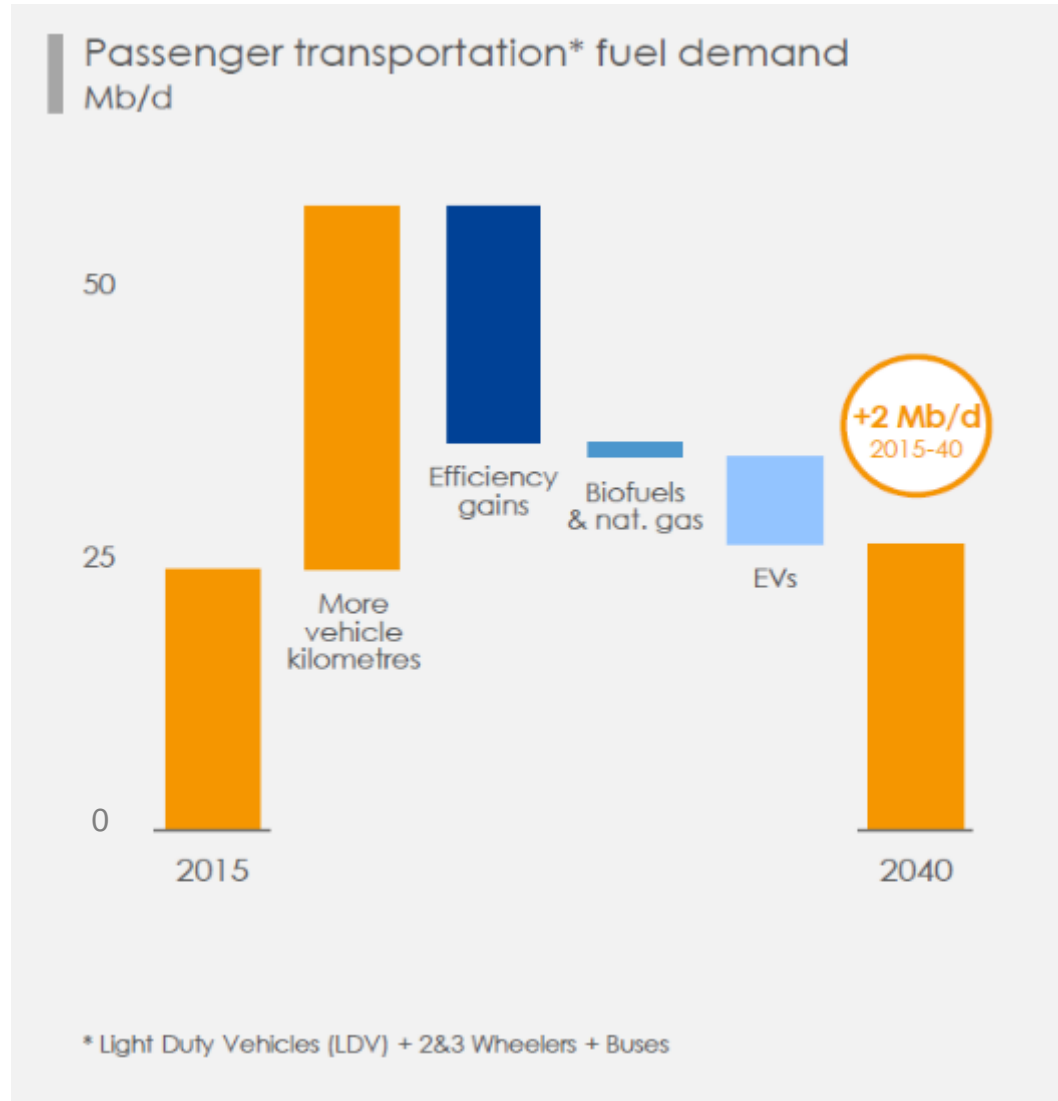


**Rapid non-OECD economic development**

**Clear elasticity of oil demand to price:**  
acceleration since 2014 after oil price drop

**Growth concentrated in transportation,** but also petrochemical feedstock and industry


# EFFICIENCY GAINS ARE THE MAIN DRIVER TO COMPENSATE A GROWING DEMAND FOR ROAD TRANSPORT FUELS



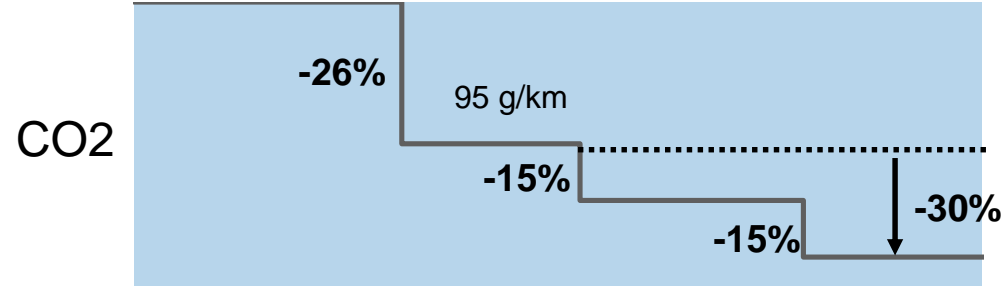
# CO2 IS AN UPCOMING CHALLENGE FOR OEMS ...

European targets of GHG emissions reduction against global warming



 **2021**

Regulation 443/2009  
→ **95 g CO<sub>2</sub> / km** max  
for new cars

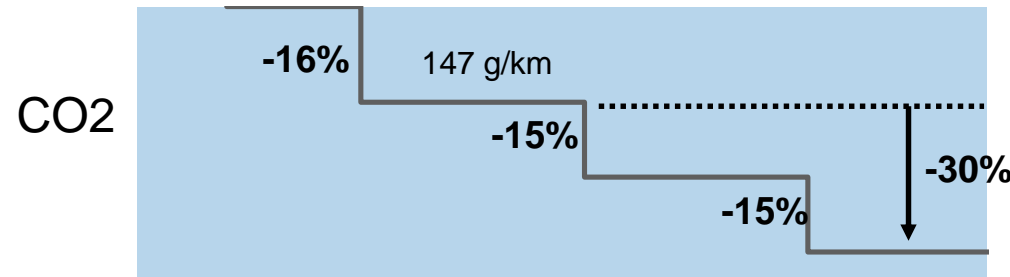


Proposal  
Nov. 17

**95 € per g/km of  
exceedance for  
each newly  
registered vehicle**

 **2020**

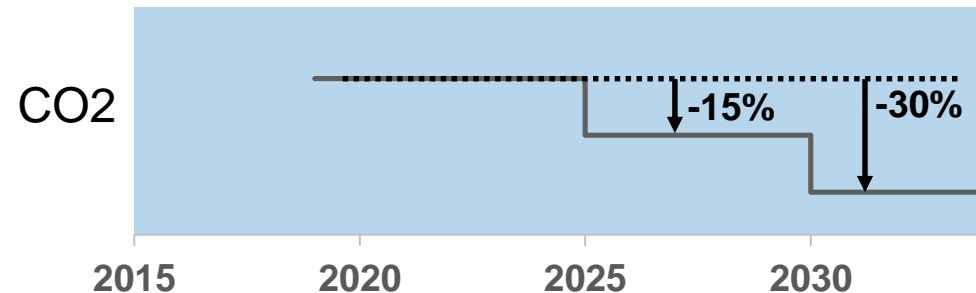
Regulation 510/2011  
→ **147 g CO<sub>2</sub> / km** max  
for new LDV



Proposal  
Nov. 17

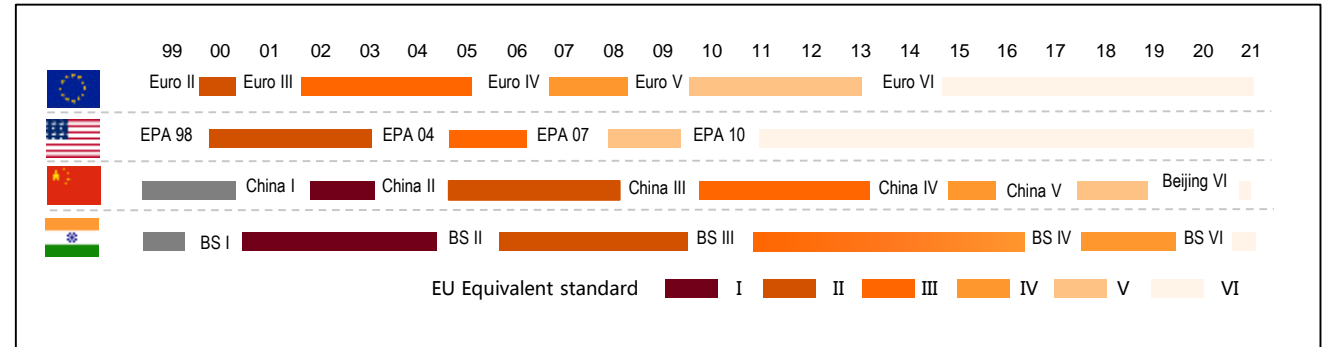
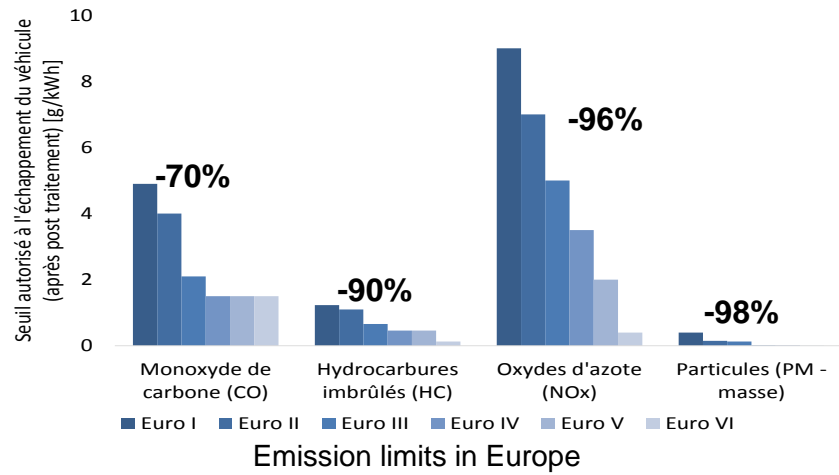
 **2030**

Proposition:  
**-30%** en 2030 / 2019



Proposal  
May 18

# ...ALONG WITH POLLUTANTS



**C40 CITIES**  
C40 cities involved in transportation initiative

# HOW TO TAKE THESE CHALLENGES INTO ACCOUNT?

## 3 Solutions for sustainable Mobility

### Increased energy efficiency of vehicles

→ Still significant gains to harvest in the medium/long term

### Incorporation of fuel products of renewable origin

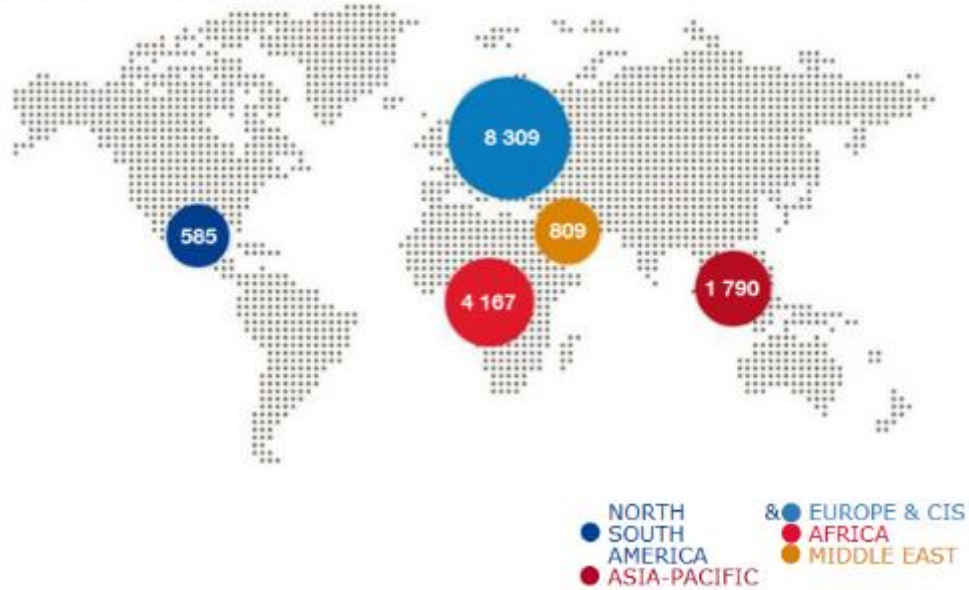
→ Decrease of GHG emissions

### Technology diversification

→ A direct effect on local pollutant emissions

# TOTAL IS COMMITTED THROUGH THESE 3 AXIS

SERVICE STATIONS



**WORLD**

 ~ **16 000**

Increased energy efficiency of vehicles

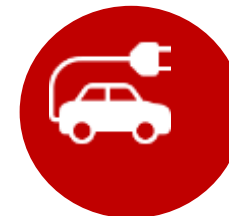


Incorporation of renewable origin fuel



biofuels blended  
in gasoline & diesel

Technology diversification



# PREMIUM FUELS: EXCEPTIONAL ENGINE CLEANLINESS

Increased energy efficiency of vehicles



PREVENTS UP TO **93%** OF THE FOULING\*

Wouldn't it be nice if driving could clean your engine?

With TOTAL EXCELLIUM New Generation, clean your engine and provide longstanding protection to make it more efficient, more economical and less polluting.

The fuel that cleans your engine km after km



THE FUEL THAT CLEANS YOUR ENGINE KM AFTER KM

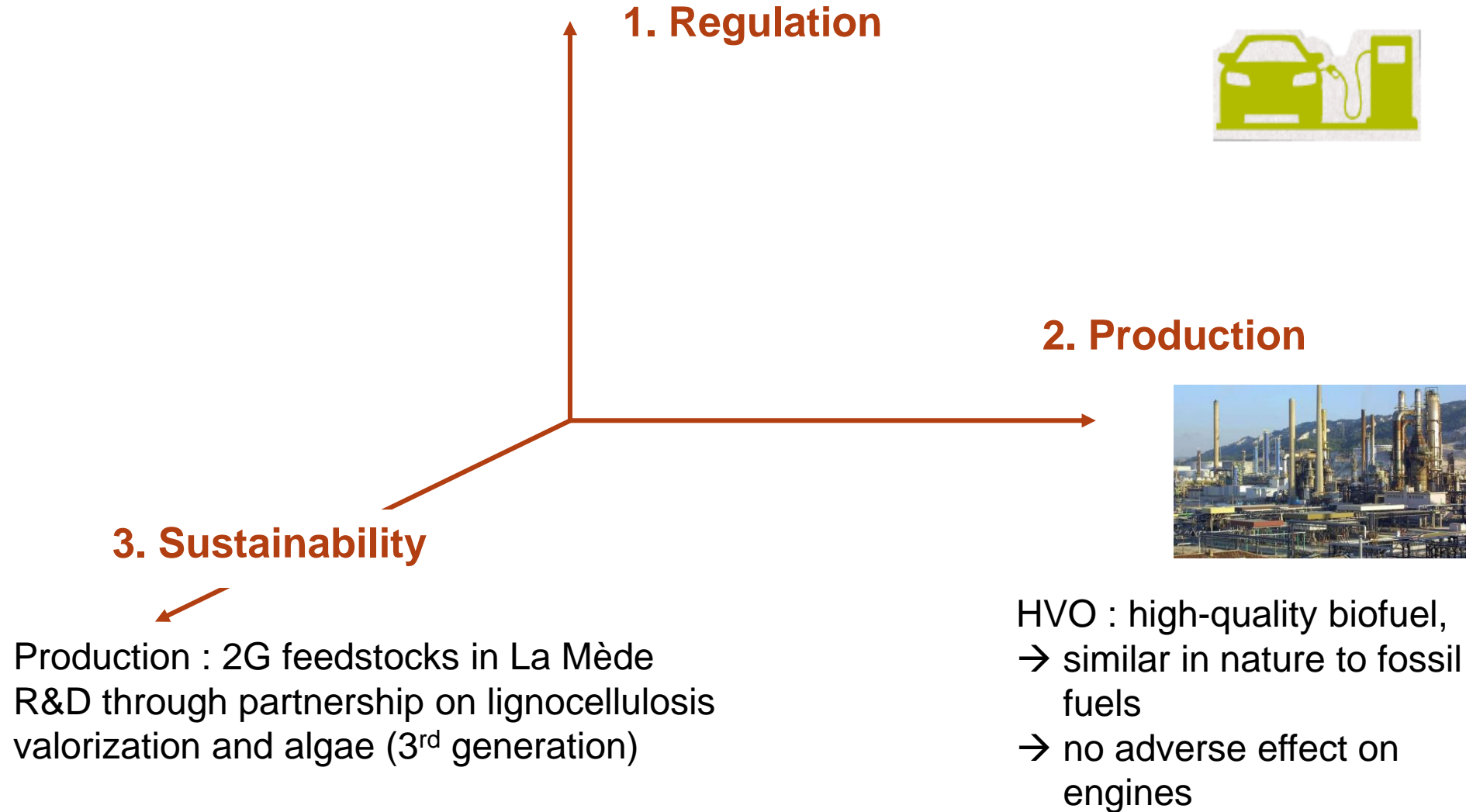


UP TO **4.4%** REDUCTION IN CONSUMPTION



# BIOFUELS: PART OF THE TOTAL STRATEGY FOR CLIMATE

Incorporation of  
renewable origin fuel



# NATURAL GAS FOR VEHICLES: COMPETITIVE AND GO FOR MARKET

Technology diversification



Compressed at 200 bar  
**CNG**  
(1L Diesel ⇔ 5L CNG)

Liquefied at -160°C  
**LNG**  
(1L Diesel ⇔ 1.8L LNG)

<b>CNG logistics</b>		Gas pipeline network
<b>CNG vehicle storage</b>		Pressurised cylinders
<b>CNG vehicles</b>		(P <sub>max</sub> < 400 hp*)
<b>CNG range</b>	300-570 km	

<b>LNG logistics</b>		Transport by truck
<b>LNG vehicle storage</b>		Cryogenic tank
<b>LNG vehicles</b>		(P <sub>max</sub> < 400 hp*)
<b>LNG range</b>	700-1500 km	
<b>LNG Special feature</b>	Boil-off	

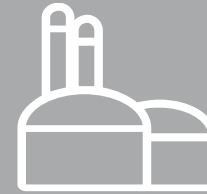
\*IVECO Stralis NP

- Natural gas meets the most stringent environmental standards
- Biomethane incorporation lowers the carbon content

# NATURAL GAS : the short term credible alternative to diesel especially for road transportation



**NGV manufacturer  
existing offers**



**Existing supply  
infrastructures**  
*Gas pipeline network  
LNG truck filling*



**NGV user cost**  
*Total Cost of  
Ownership*



**Environmental issues**  
Favorable C/H ratio

# ELECTRIC CHARGING POINTS WILL FIT CUSTOMER USES

Technology diversification

150 kW

## Private charging points

> 85% of charges

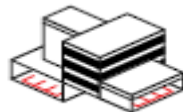
### MAIN CHARGING (back time task)



Home



Condos

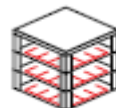


Workplace

## Public charging points

Slow charge  
→ 10% of charges

### CONVENIENCE CHARGING



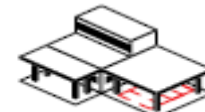
Shopping centers



Street / Car park

Fast charge  
→ <5% of charges

### EXTENSION OF RANGE



Service stations

**SUPER FAST charging point**

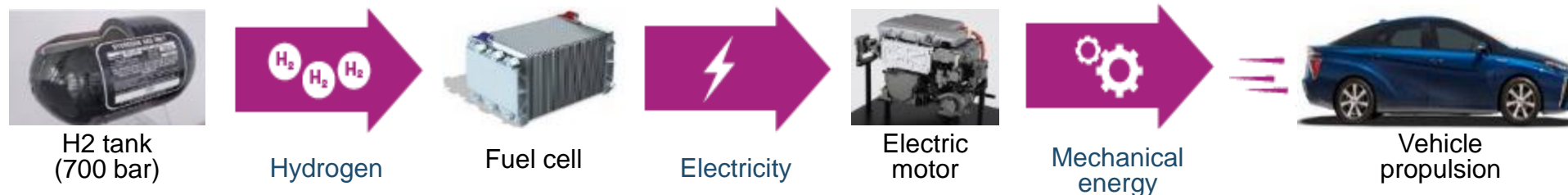
Tesla supercharger 120kW

100 km	9 – 12 min
30 min	240 – 330 km

Fast charging points will mainly be installed along major highways for top-up or emergency charges on longer distances.

# H2 PROSPECTIVE – FCEV A SOLUTION TO EXTEND EV AUTONOMY BUT STILL CHALLENGES TO FACE

Technology  
diversification



**BEV – 2020**  
(eg. Renault ZOE)



  
**200-300 km**


  
**100 km <=> 10 min  
@150 kW**

  
**22 400€  
+battery rental: 79€/month**

**FCEV - H2**  
(eg. Toyota Mirai)



**500 km** 

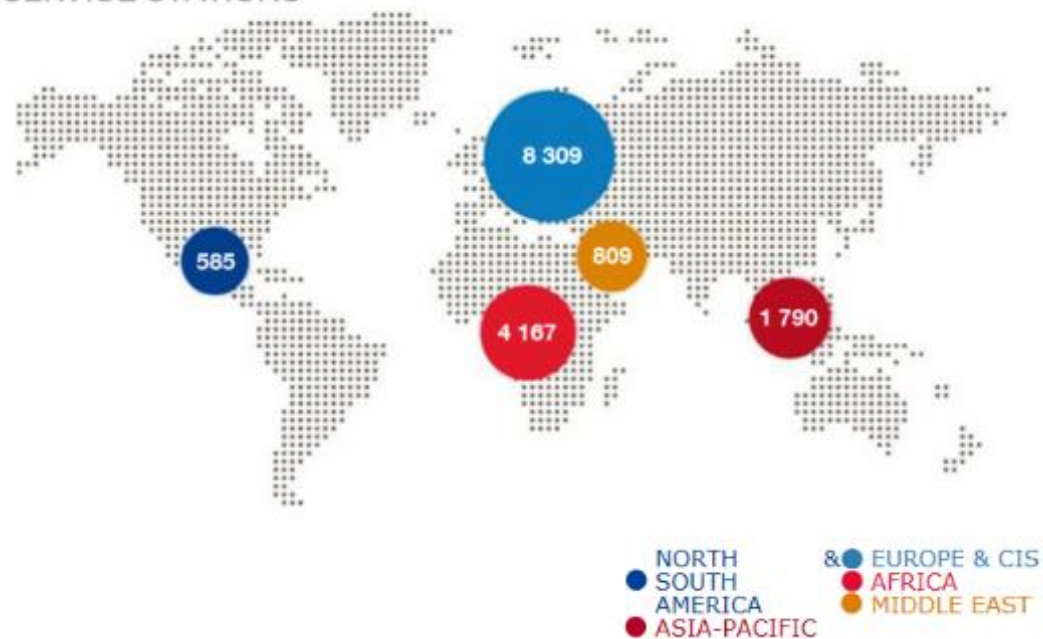
**400 km <=> 4 min** 

**78 500€<** 



# A NEW ENERGY MIX IN TOTAL SERVICE STATIONS

SERVICE STATIONS



WORLD

 ~ 16 000



60% → 80%



2,3 Mt biofuels blended in gasoline & diesel

**GNV**



**200+**

Europe

Target : 450 NGV stations in Europe



**100** stations

Europe with fast charging (50kW)

Target : 300 stations with super fast charging points (150kW+)

**H<sub>2</sub>**



**17**

Europe

Target : ~100 H2 stations



