



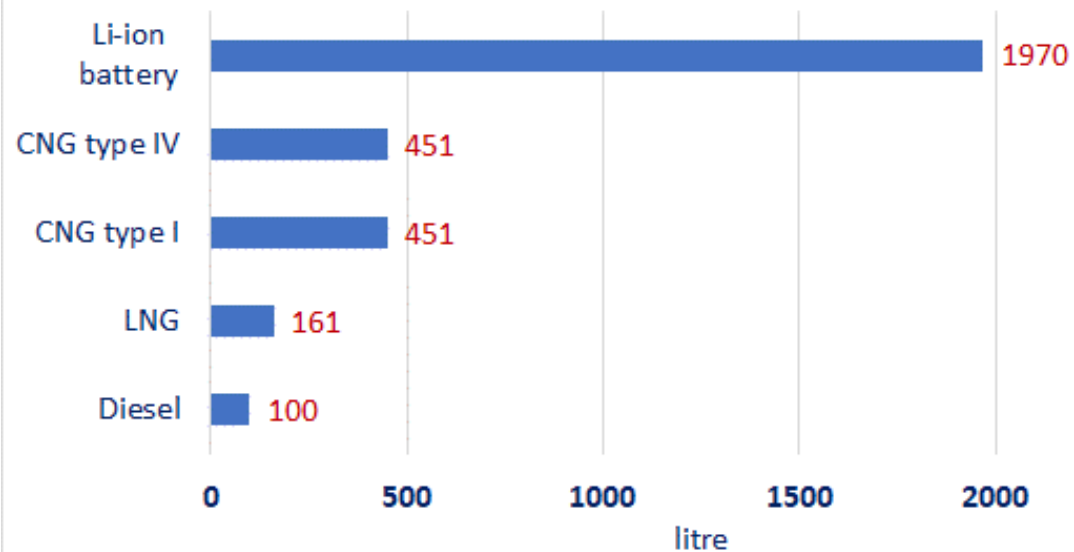
**NGVA**  
— Europe  
for sustainable mobility

# NGVA Europe CEN SFG Sector Fora Gas Wobbe Index

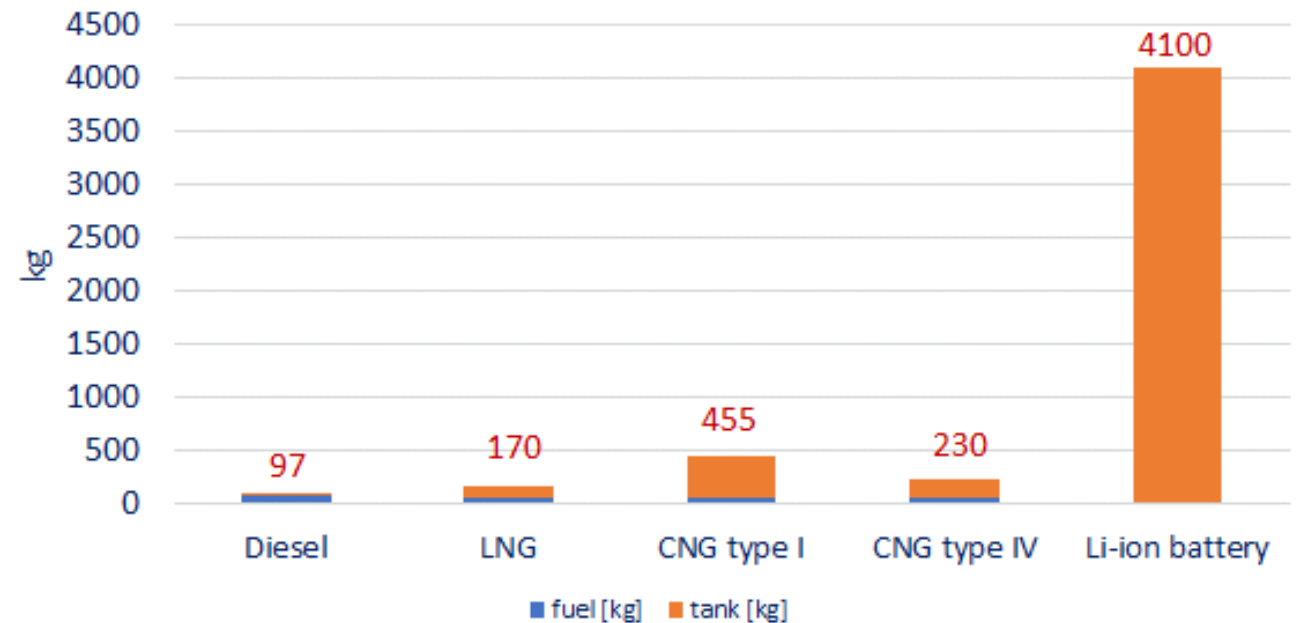
Brussels, 23rd March 2018

## What it means to replace 100 litres diesel fuel...

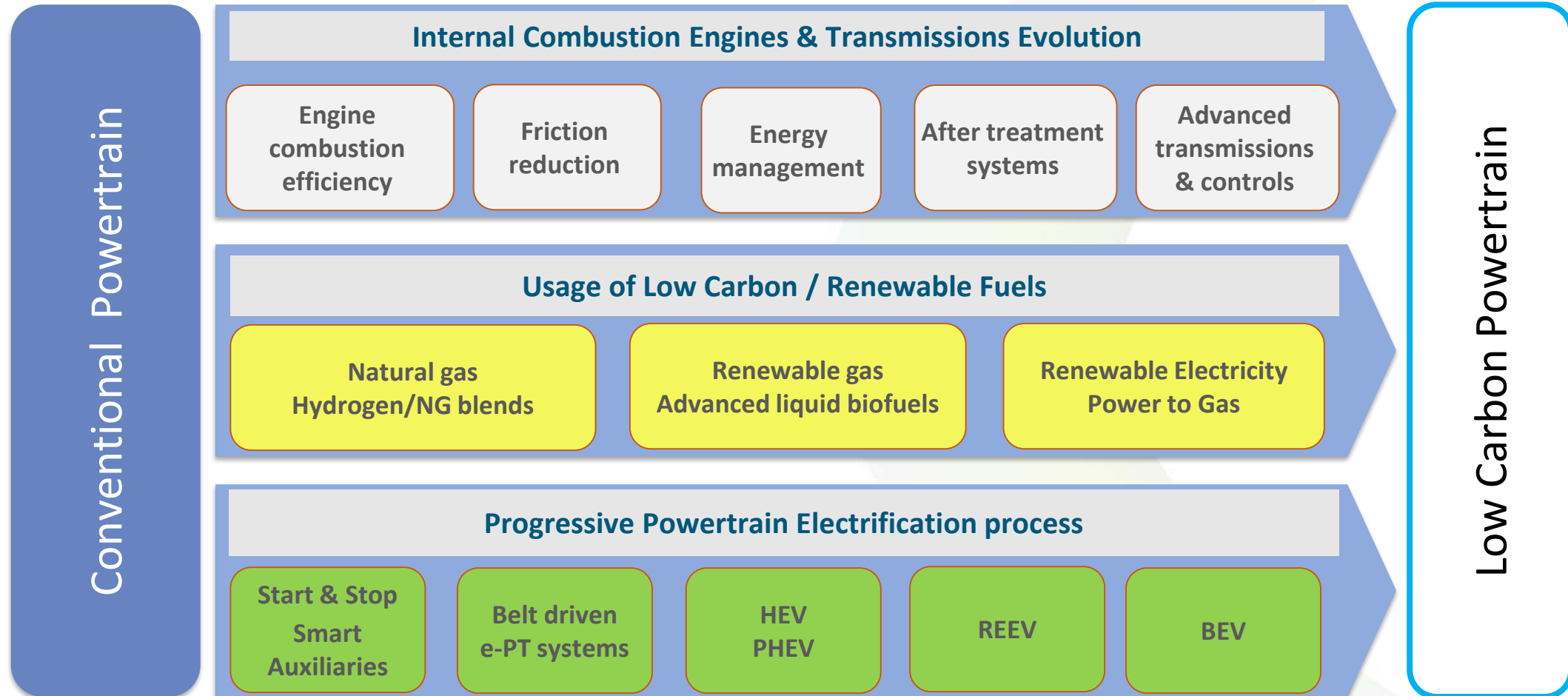
Volume needed to replace 100l. Diesel fuel



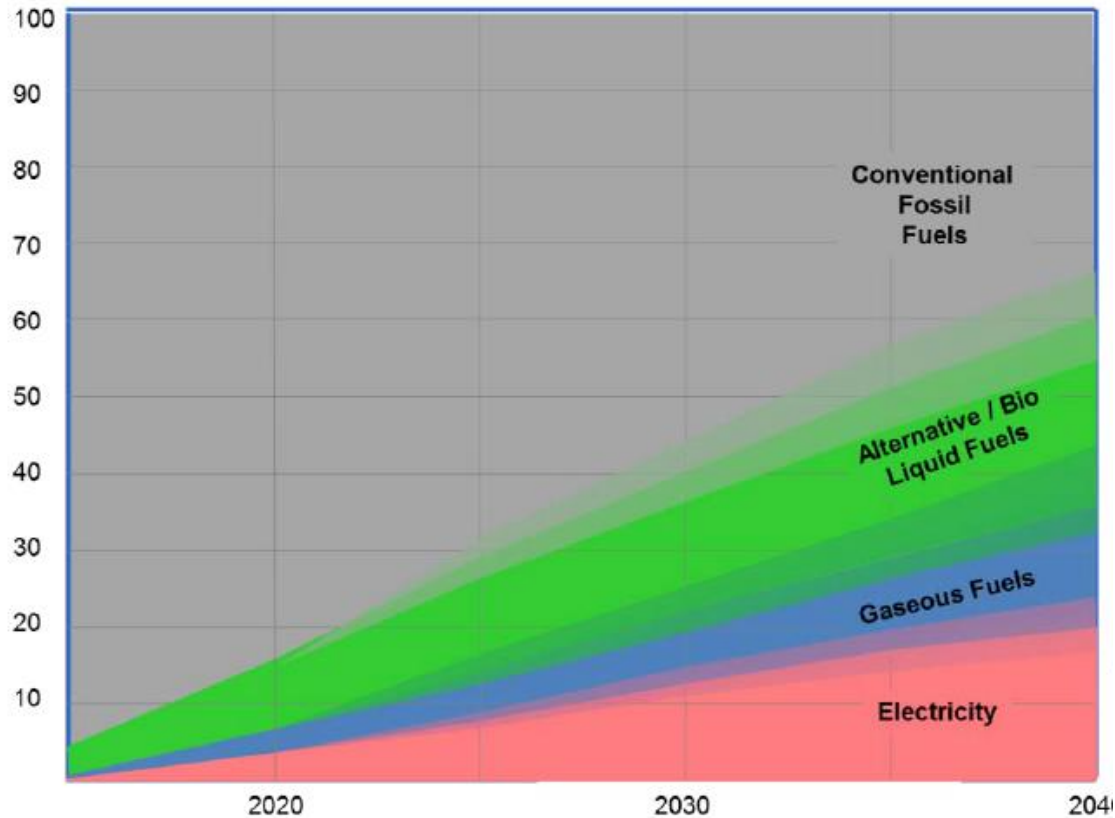
Impact in terms of weight



Assumption for Li-ion battery:  
500 Wh/l  
240 Wh/kg

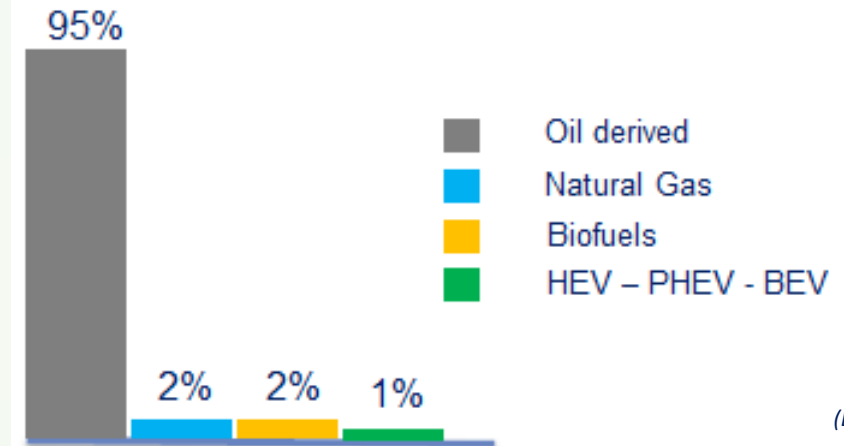


Roadmap of EU road transport energy towards 2040



(ERTRAC roadmap – Energy & Environment WG - June 2016)

Current Global Transportation Matrix

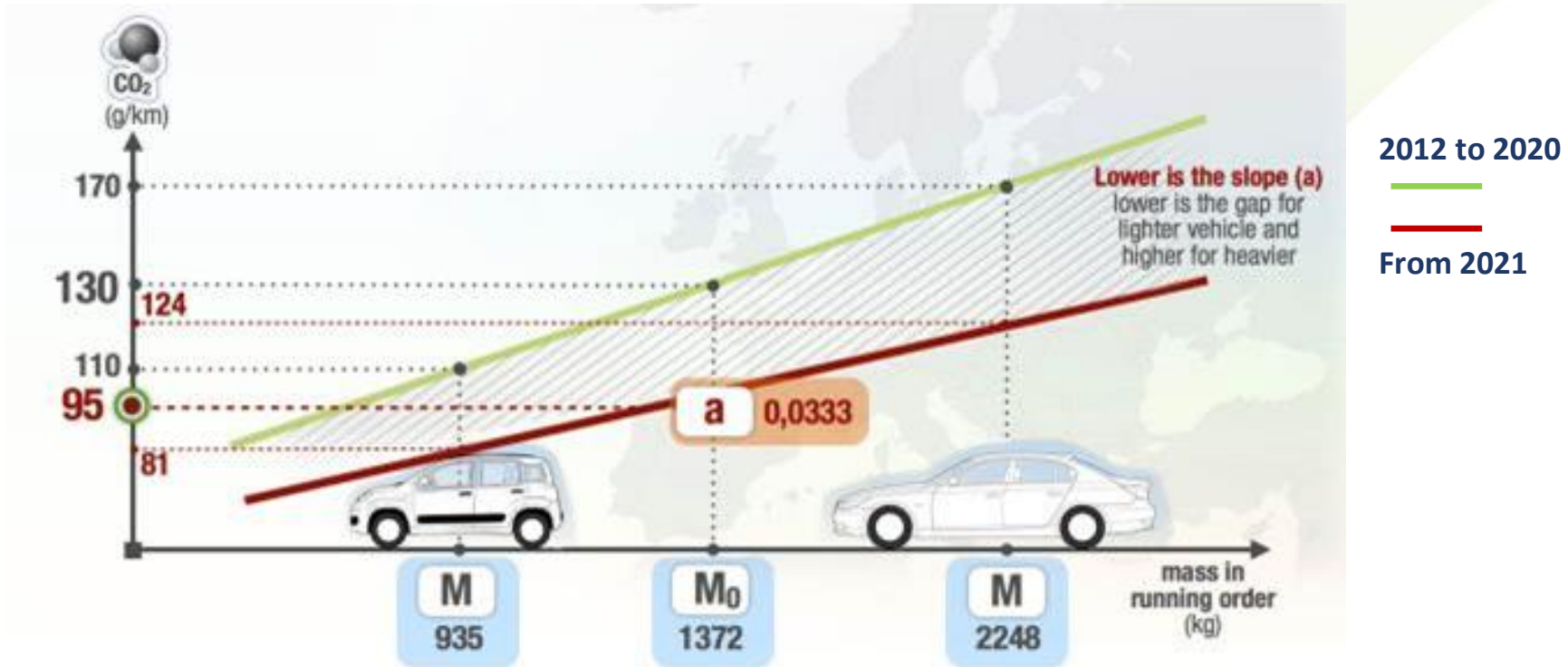


(EIA report – 2016)

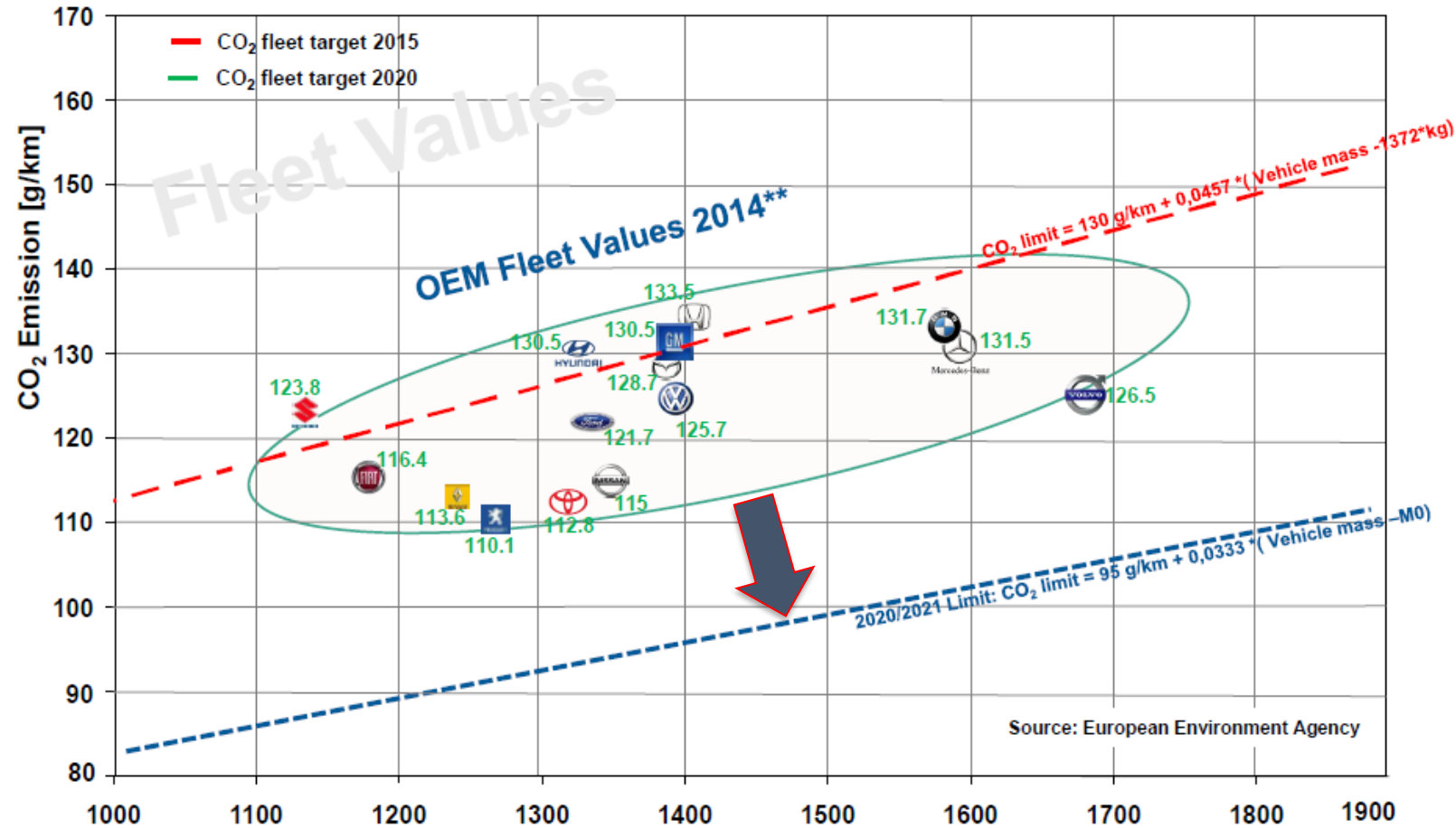
Road transport system is asked to move from **the current oil derived monopoly** towards a more complex system composed by different propulsion systems, based on both Internal Combustion Engines and electrified powertrains.

# CO<sub>2</sub> regulation

## Driving the market



- The targets are function of the vehicle mass weight
- CO<sub>2</sub> calculation is carried out at fleet level
- Penalties at fleet level if target is exceeded: 95€ per CO<sub>2</sub> g/km

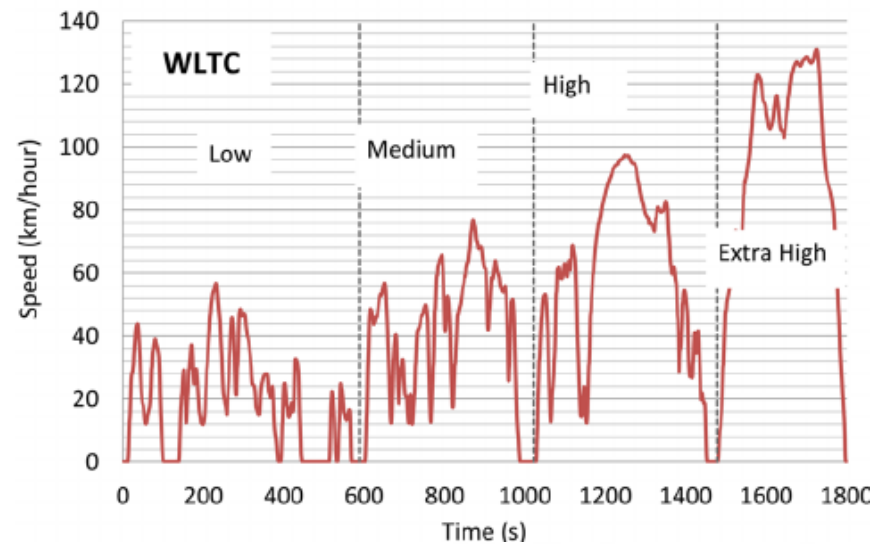
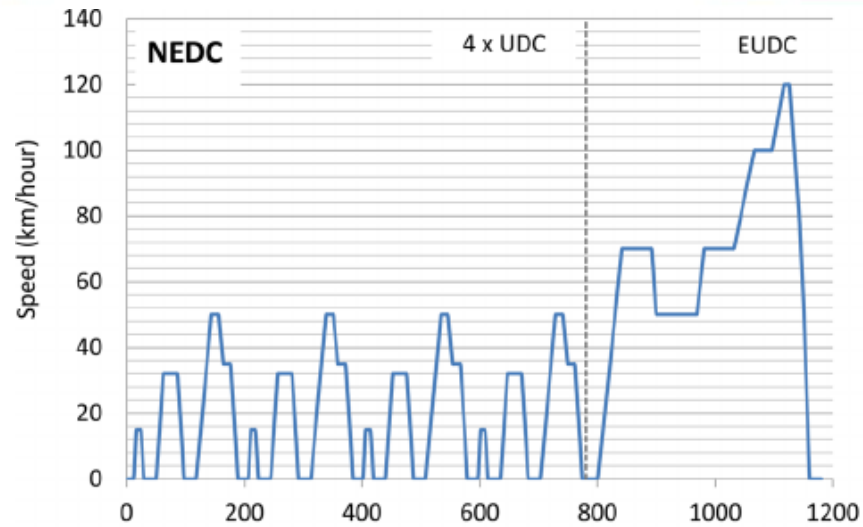


\*adapted to vehicle mass 2015: 1372kg / 2016: 1392.4 kg  
Graph 2020 limit: M0=1372kg as assumption

Average fleet weight; Vehicle weight [kg]

\*\*Source: T&E Report Sep. 2013, +update





## FROM NEDC TO WLTP: WHAT WILL CHANGE?

### TEST CYCLE

**NEDC**  
Single test cycle



**WLTP**  
Dynamic cycle more representative of real driving

### CYCLE TIME

**NEDC**  
20 minutes



**WLTP**  
30 minutes

### CYCLE DISTANCE

**NEDC**  
11 kilometre



**WLTP**  
23.25 kilometre

### DRIVING PHASES

**NEDC**  
2 phases, 66% urban and 34% non-urban driving



**WLTP**  
4 more dynamic phases, 52% urban and 48% non-urban

### AVERAGE SPEED

**NEDC**  
34 kilometre per hour



**WLTP**  
46.5 kilometre per hour

### MAXIMUM SPEED

**NEDC**  
120 kilometre per hour



**WLTP**  
131 kilometre per hour

### INFLUENCE OF OPTIONAL EQUIPMENT

**NEDC**  
Impact on CO<sub>2</sub> and fuel performance not considered under NEDC



**WLTP**  
Additional features (which can differ per car) are taken into account

### GEAR SHIFTS

**NEDC**  
Vehicles have fixed gear shift points



**WLTP**  
Different gear shift points for each vehicle

### TEST TEMPERATURES

**NEDC**  
Measurements at 20-30°C

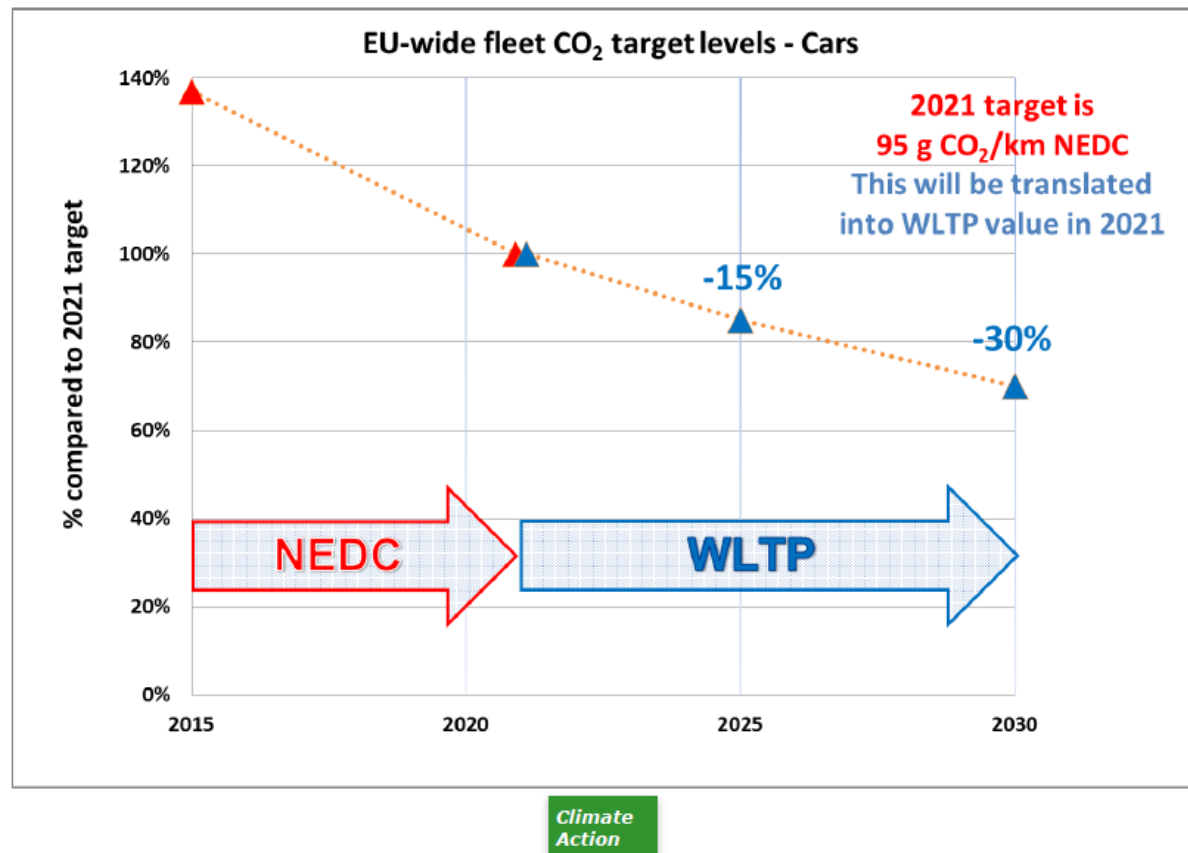


**WLTP**  
Measurements at 23°C, CO<sub>2</sub> values corrected to 14°C

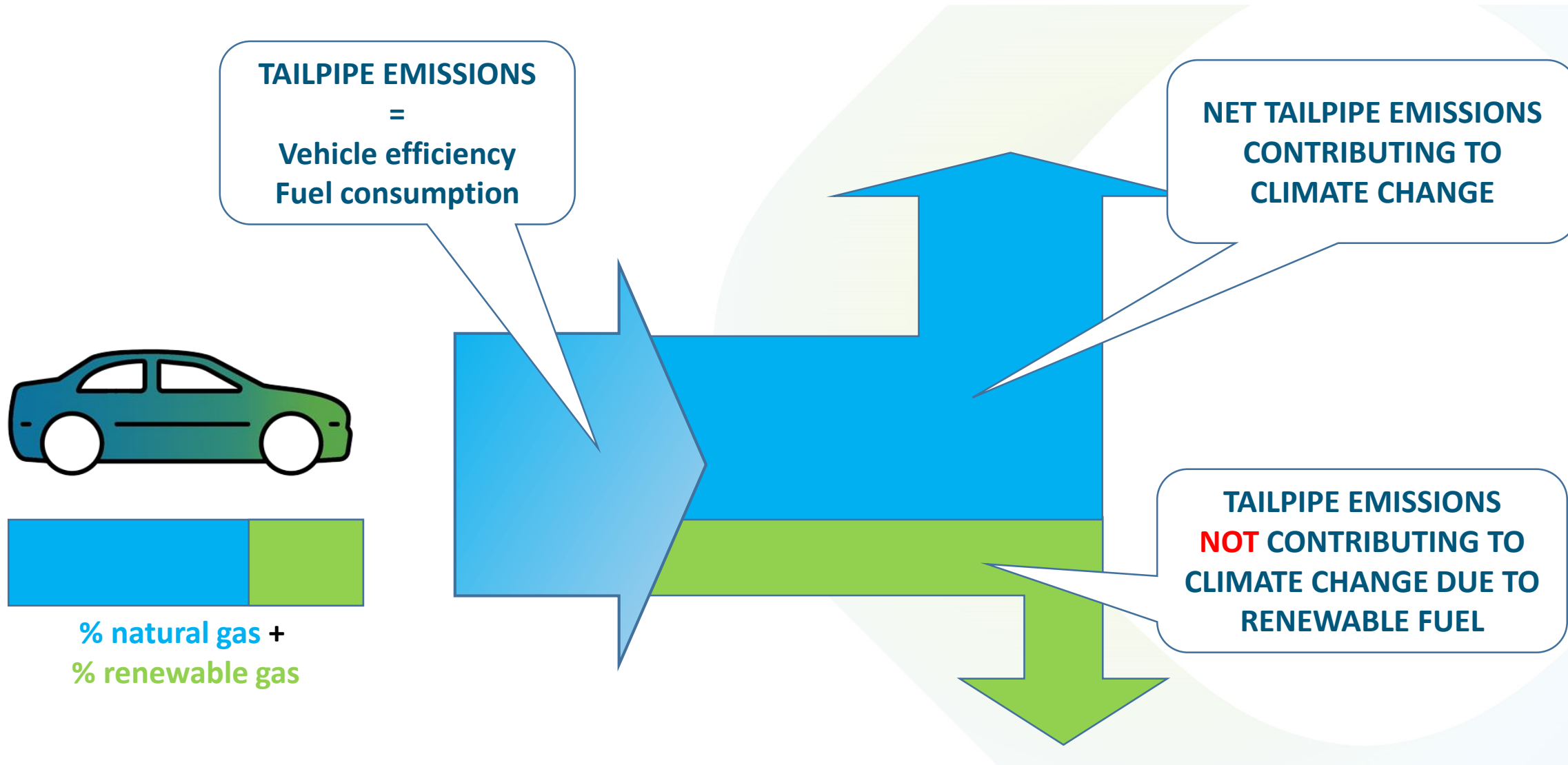




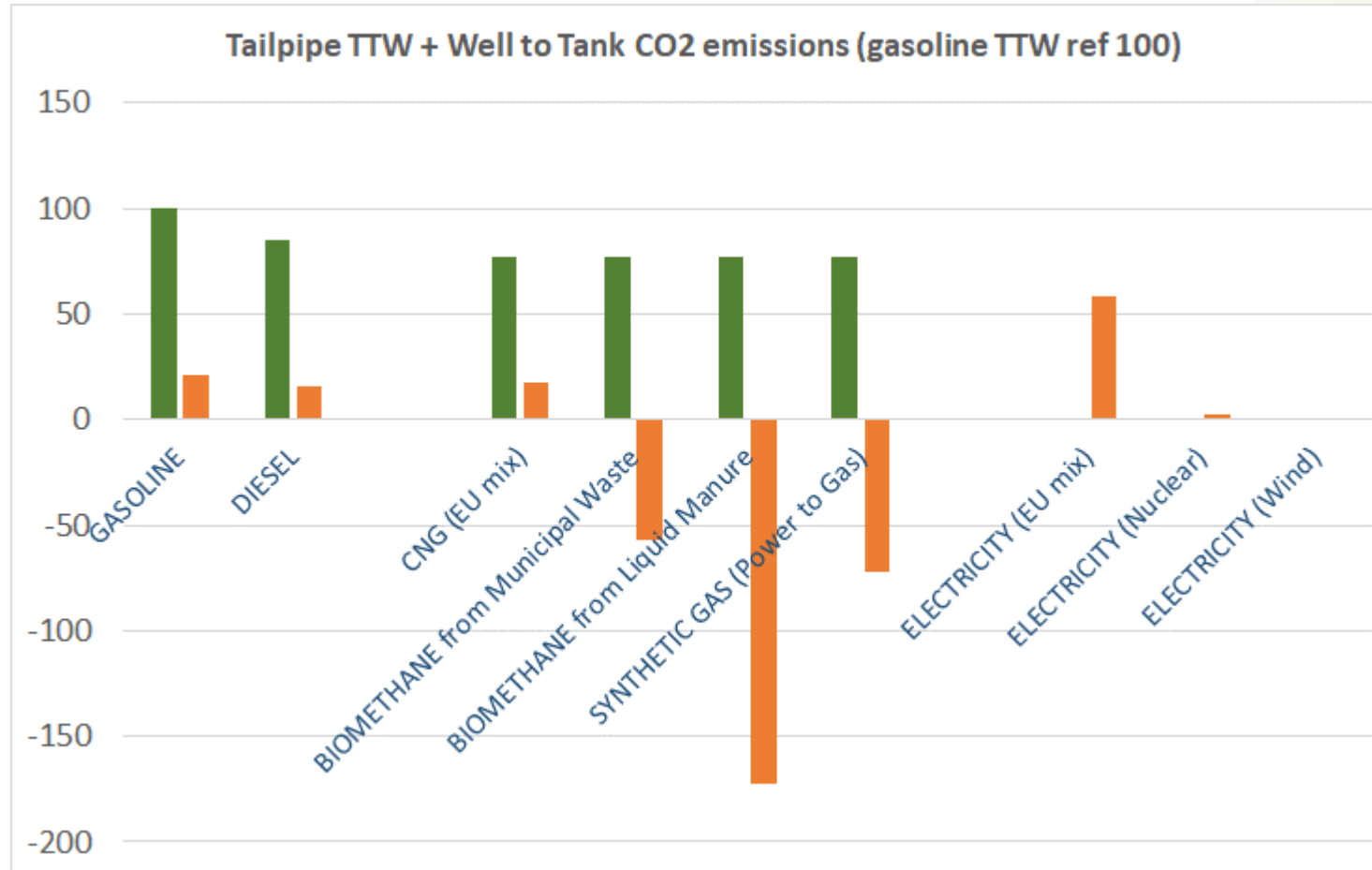
## New EU fleet-wide 2025 and 2030 targets - cars



# Tailpipe emissions always adequate ?



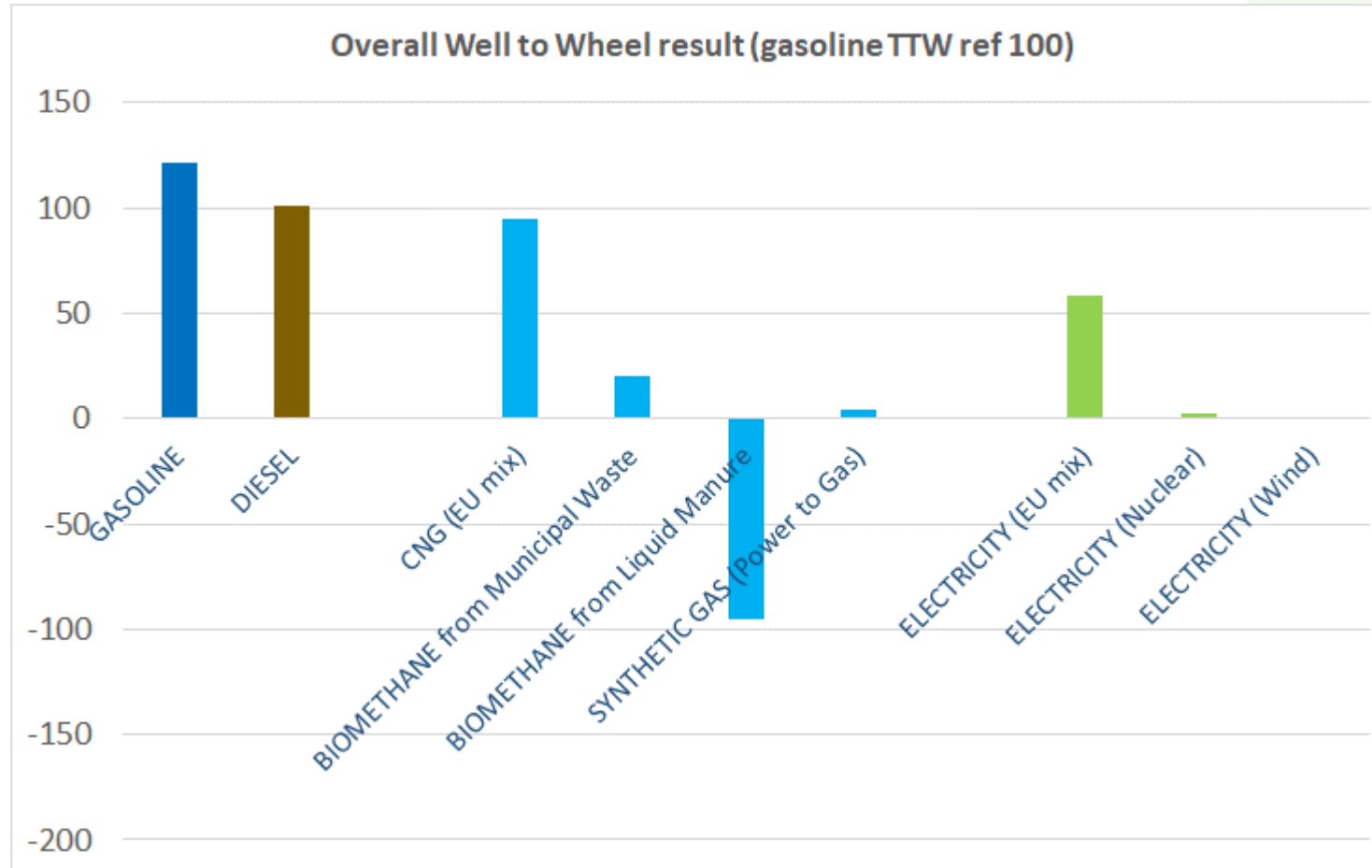
## Looking to tailpipe emissions + Well to Tank contribution



Today CO<sub>2</sub> emissions from electricity generation is 465 g/kWh as EU mix

Source: NGVA elaboration data from Thinkstep GHG Intensity Study + JEC Well to Wheel Study Version 4

## Looking to the overall picture (Well to Wheel)



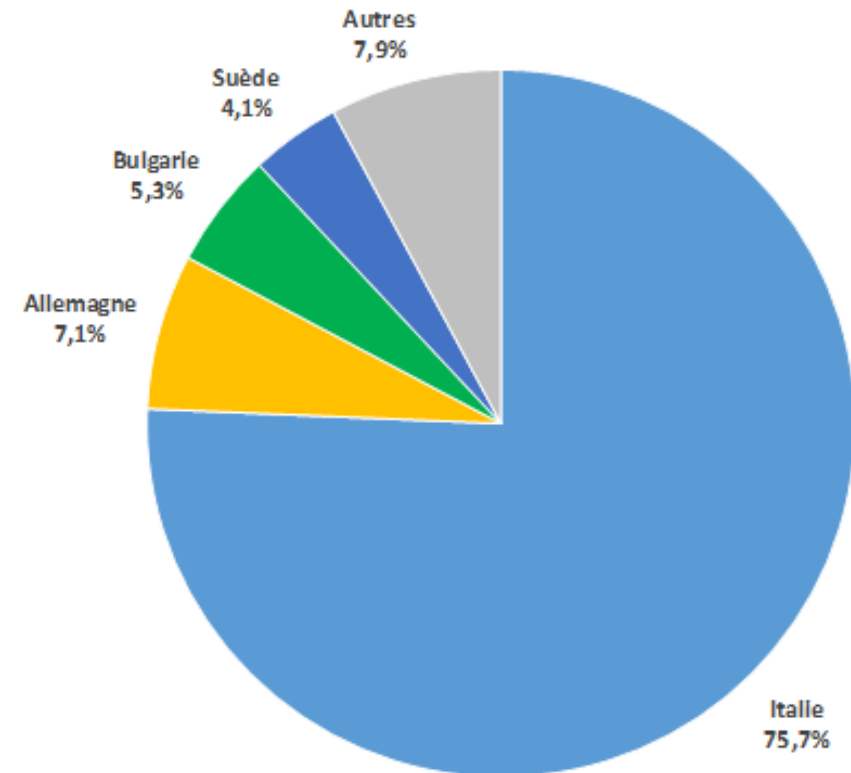
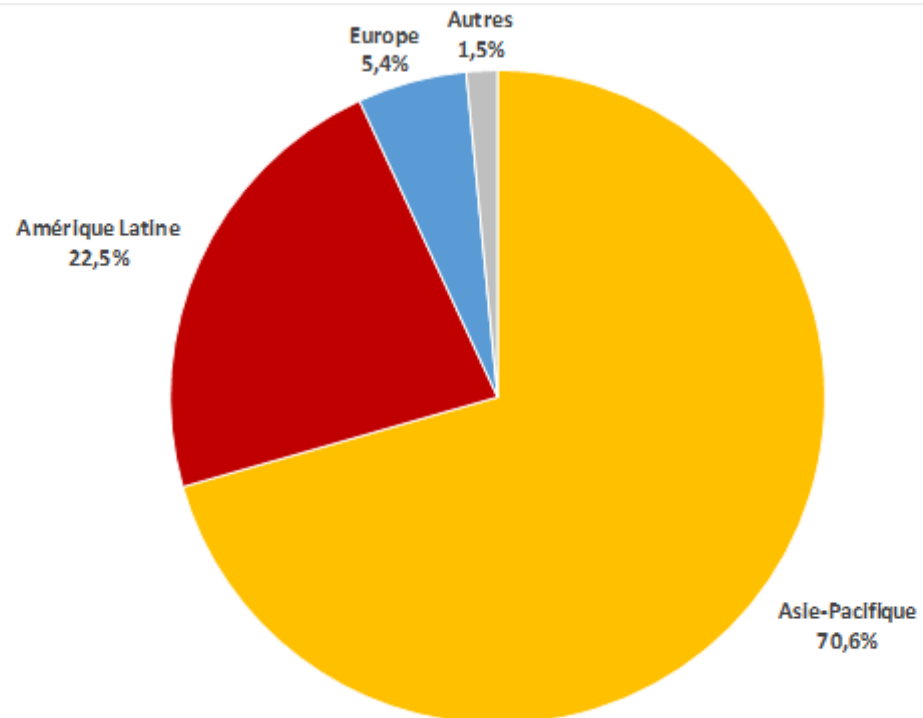
Renewable gas can provide a significant contribution to transport decarbonisation

Today's CNG and LNG vehicle technologies are ready to run 100% renewable!

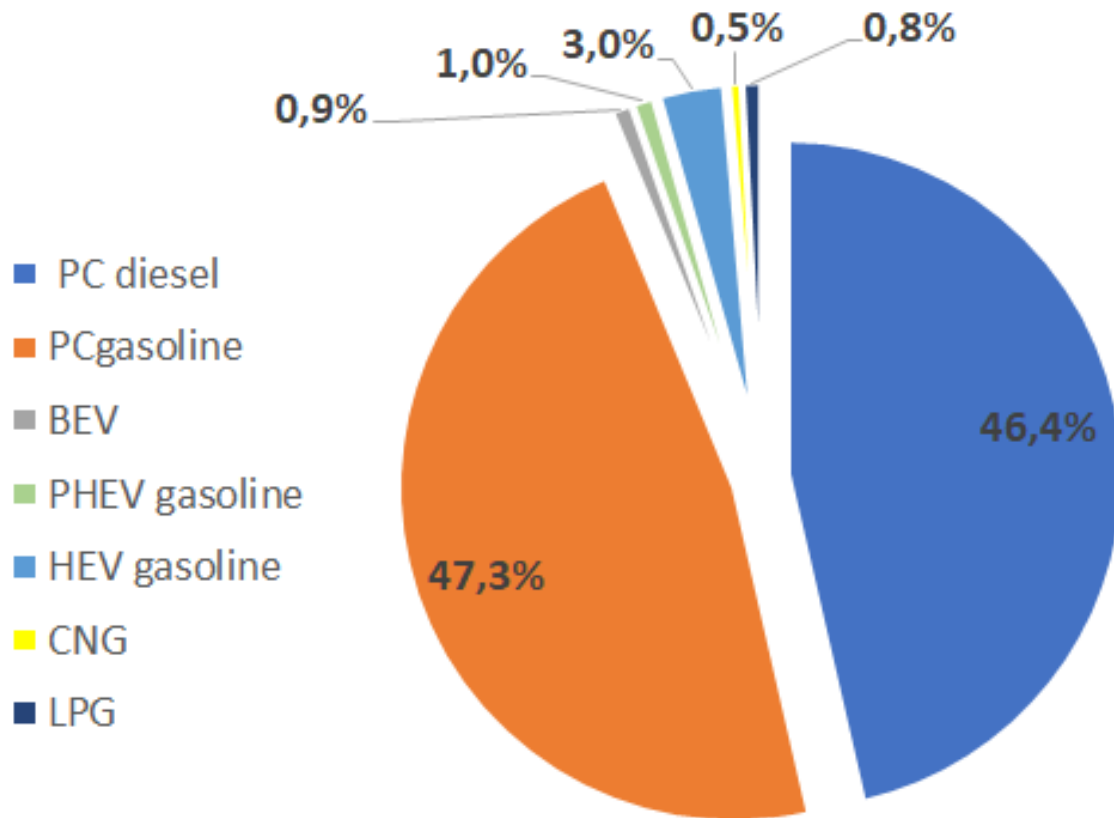
Source: NGVA elaboration data from Thinkstep GHG Intensity Study + JEC Well to Wheel Study Version 4

## NGVs (1,3 million) distribution in Europe

### Total NGVs worldwide 24,5 million



% registration – year 2016 – EU28+EFTA  
(15 100 000 vehicles)



Natural Gas Vehicles  
represent approx. 0,5 %  
market share

Natural gas consumption  
from the NGVs fleet in EU is  
close to 2 bcm.









**NGVA**  
— Europe  
for sustainable mobility



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