NGVA Europe
for sustainable mobility

ZERO CO_2 IS NOT ENOUGH

RENEWABLE GAS – A KEY SOLUTION FOR THE EU DECARBONIZATION ROADMAP IN TRANSPORT

GASDAGARNA 2021

May 2021

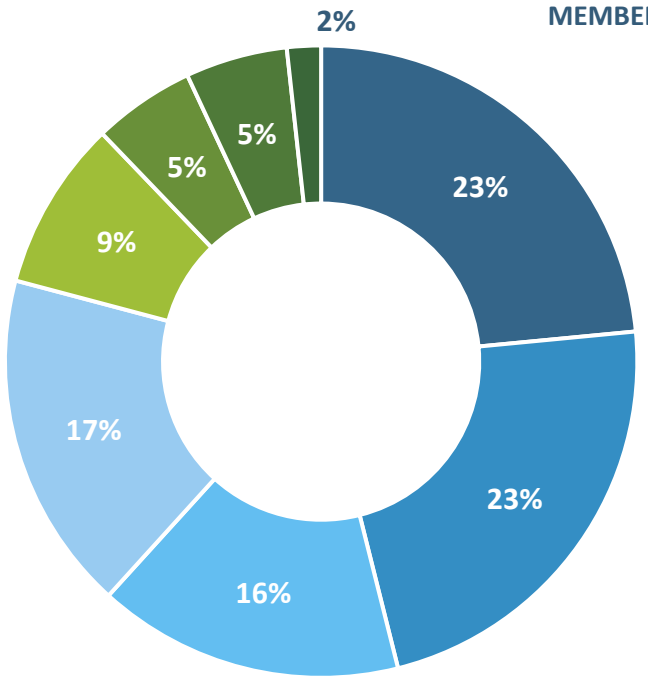
www.ngva.eu

Natural & bio Gas Vehicle Association

Who we are

114 members

27+4 countries



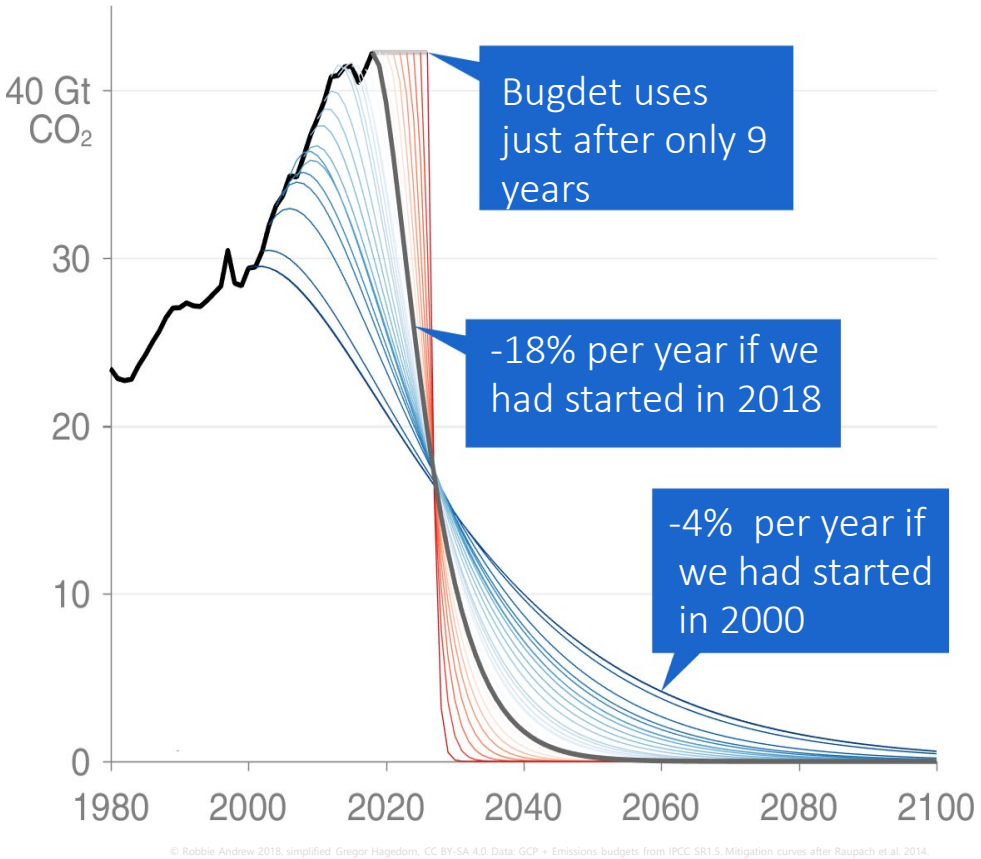
MEMBER COMPOSITION

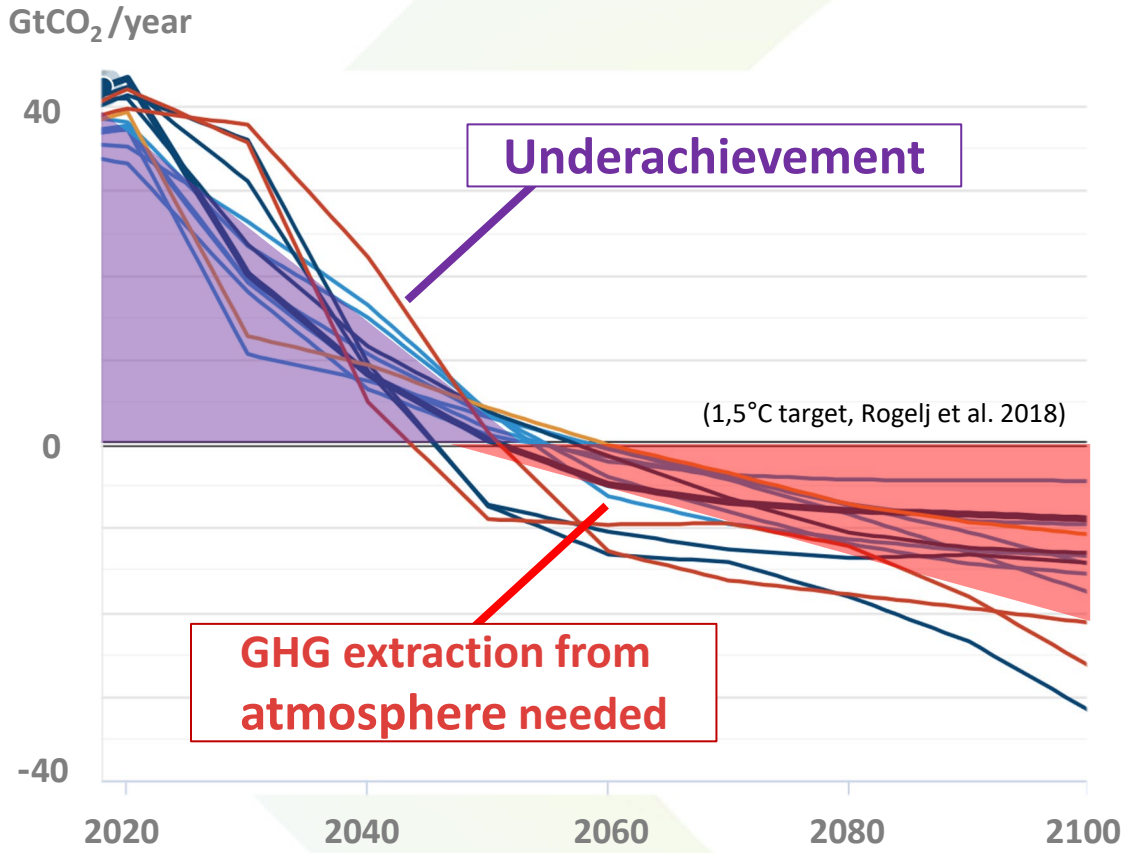
- Gas Companies
- Station infrastructure and components
- Vehicle Components
- Associations
- Research and Engineering Services
- OEMs
- Fleet operators
- Others

Board Members

Air Liquide creative oxygen · FordonsGas · enagas · ENERGIGAS SVERIGE Swedish Gas Association · ENGIE · eni · e·on Gas Mobil · FCA FIAT CHRYSLER AUTOMOBILES · gasmobil · GAZPROM · GRDF GAZ RÉSEAU DISTRIBUTION FRANCE · GRTgaz · HEXAGON · IVECO · LANDIRENZO · PLASTIC OMNIUM · RAG · SEAT · SCANIA · Shell LNG · snam · Swagelok · TOTAL COMMITTED TO BETTER ENERGY · uniper · VOLVO · Westport Fuel Systems · ZUKUNFT GAS

1,5--Target: Extraction of Green House Gasses mandatory

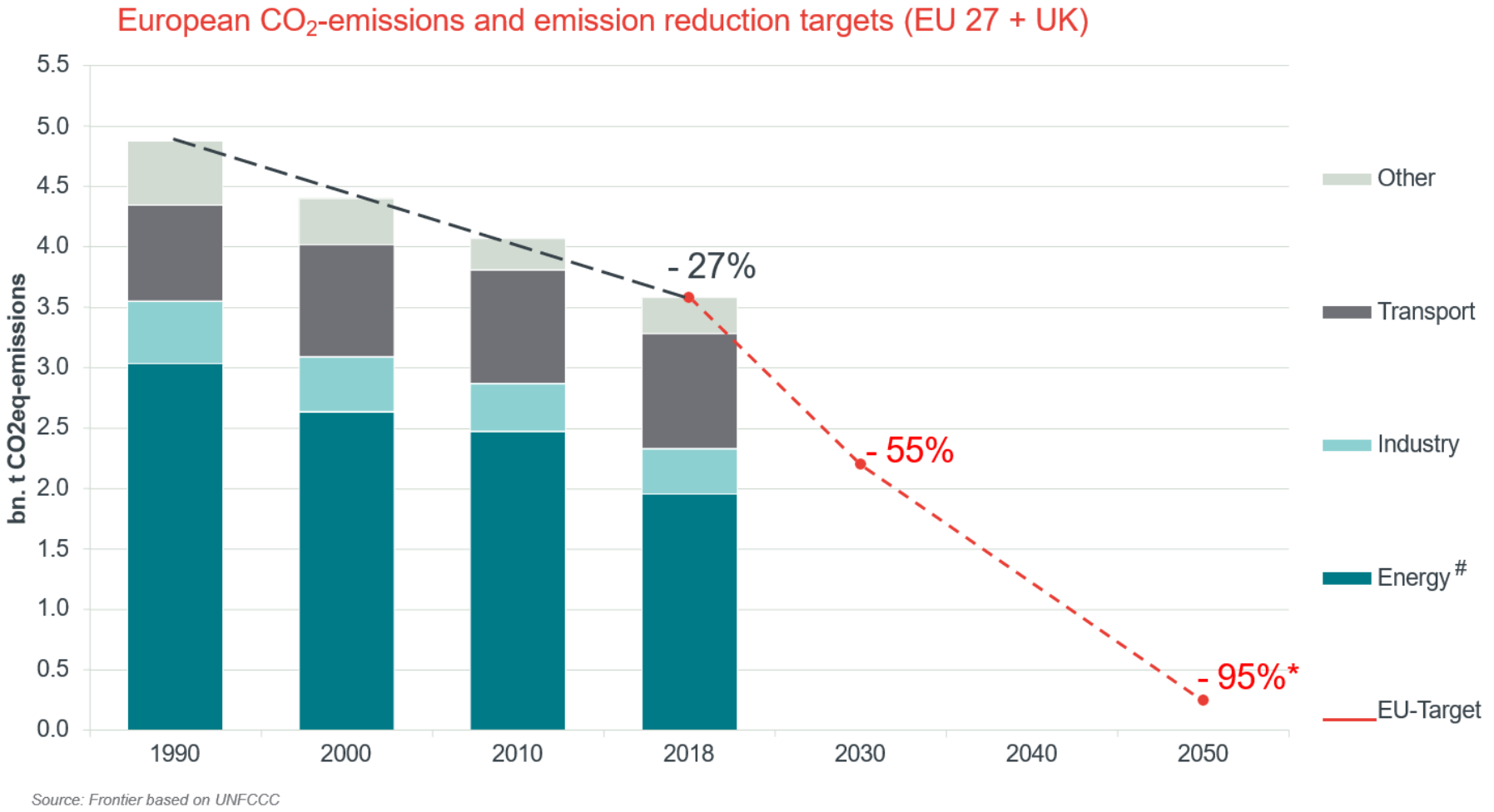




ZERO CO_2 IS NOT ENOUGH

*UN Climate Conference Paris 2015

EU targets: -55% CO2 by 2030 with significant part in transport



Source: Frontier based on UNFCCC

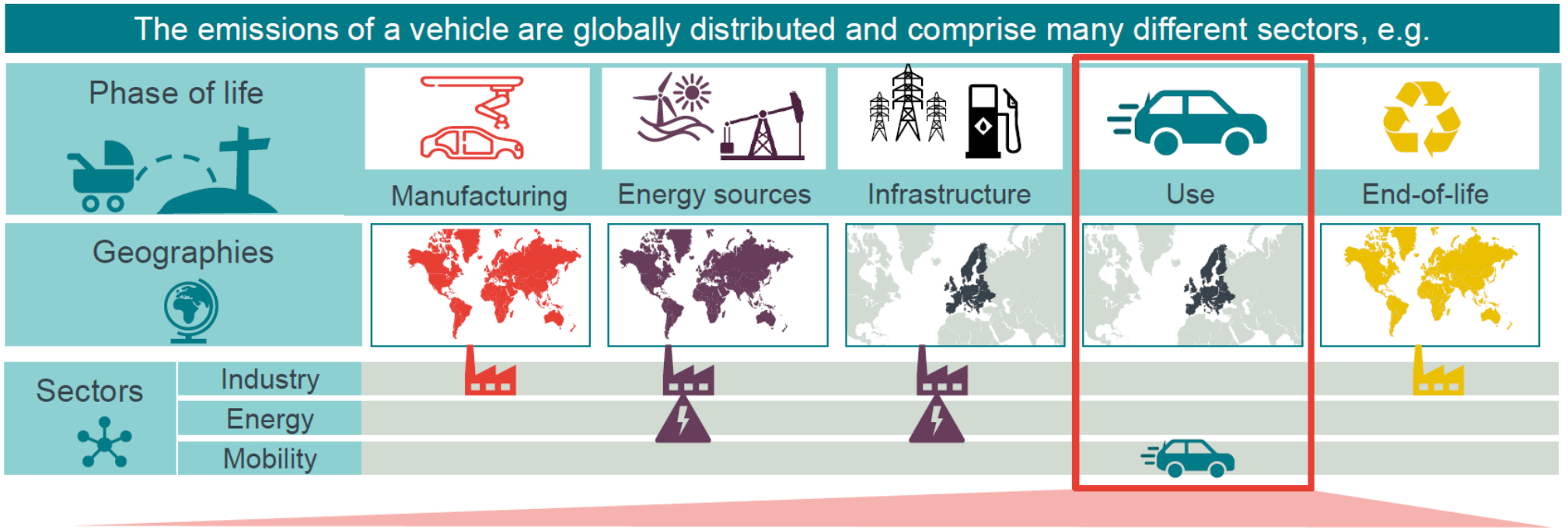
** Compared to 1990, no legally binding target for 2050 agreed*

 # Energy includes emissions from energy use in industry

Our new study with ‘Frontier Economics’

Available on our website at ngva.eu and with explanations on YouTube

Current legislation focused only on tailpipe emissions



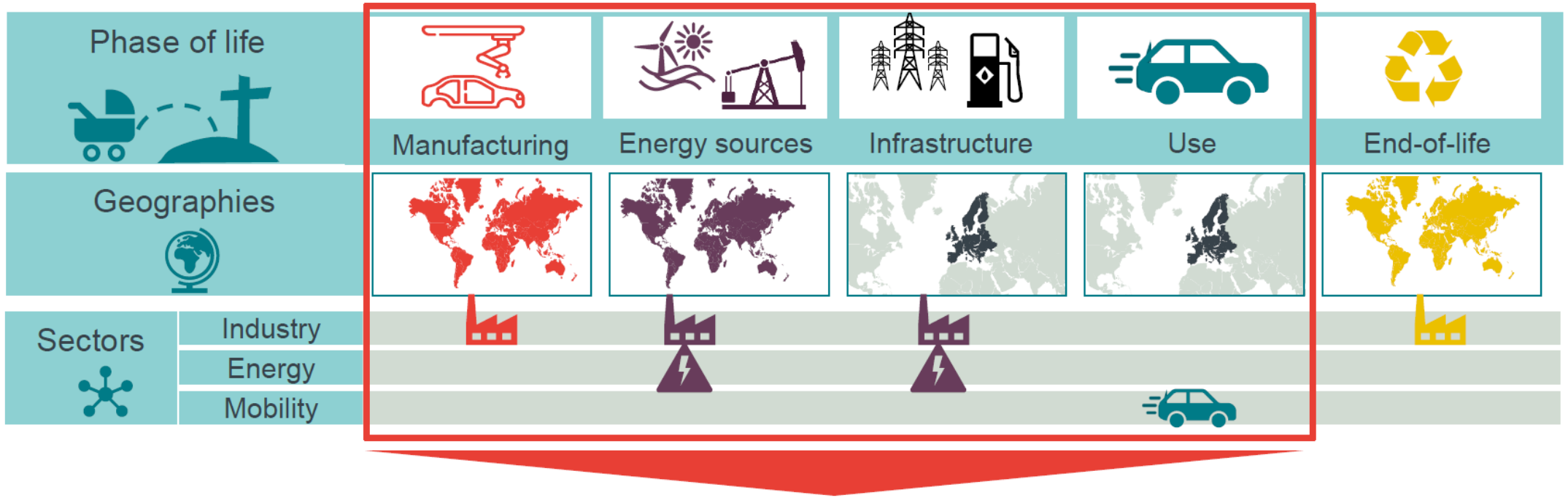
Example: **EU fleet targets** focuses on tailpipe emissions ("tank-to-wheel"):

- **Zero emissions for electric vehicles**, irrespective of CO_2 emissions during electricity production
- **Fossil reference** for combustion engine vehicles, even if running on **renewable fuels**

➔ Not reflecting whole picture and thus risking an efficient transition to carbon neutral mobility

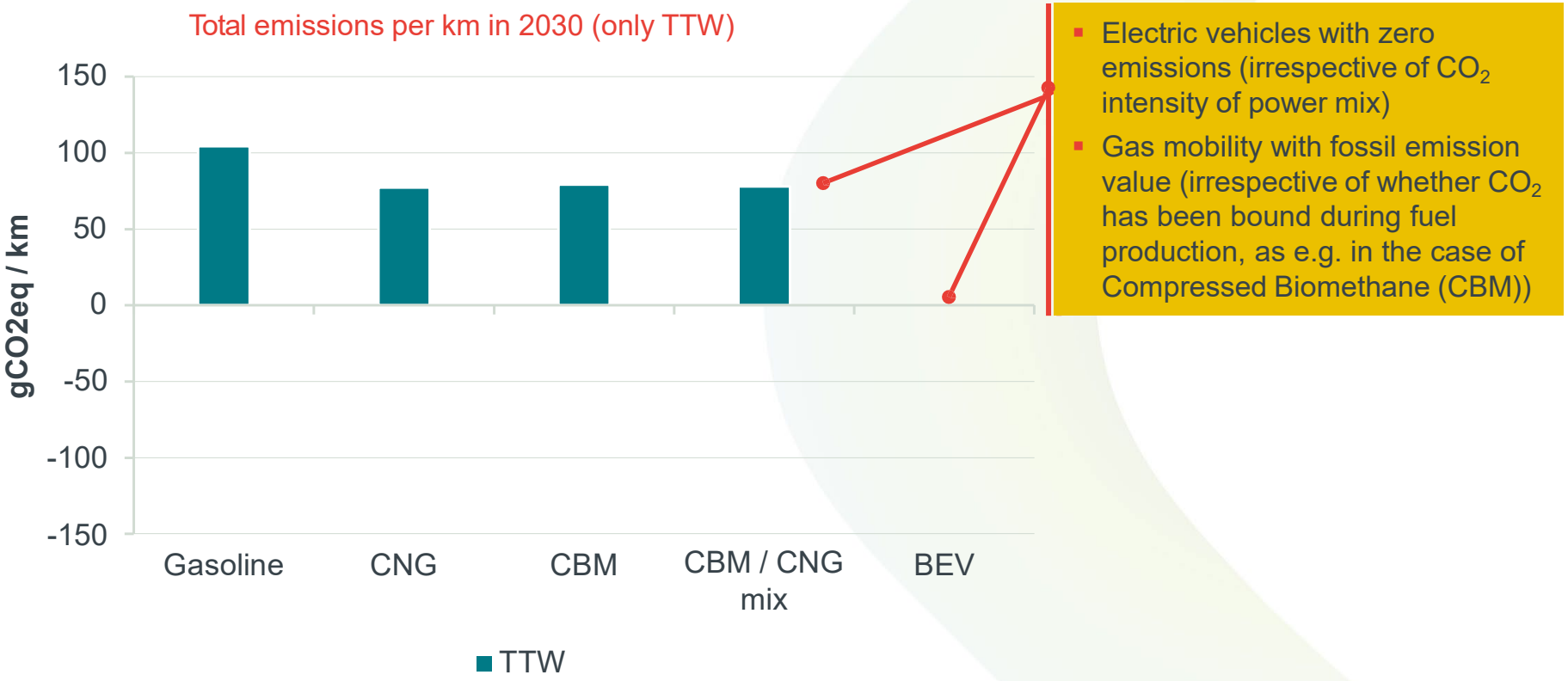
… and some stakeholders even want to get rid of the combustion engine altogether – irrespective of whether the used fuel is renewable

Newest study by FE covers whole value chain



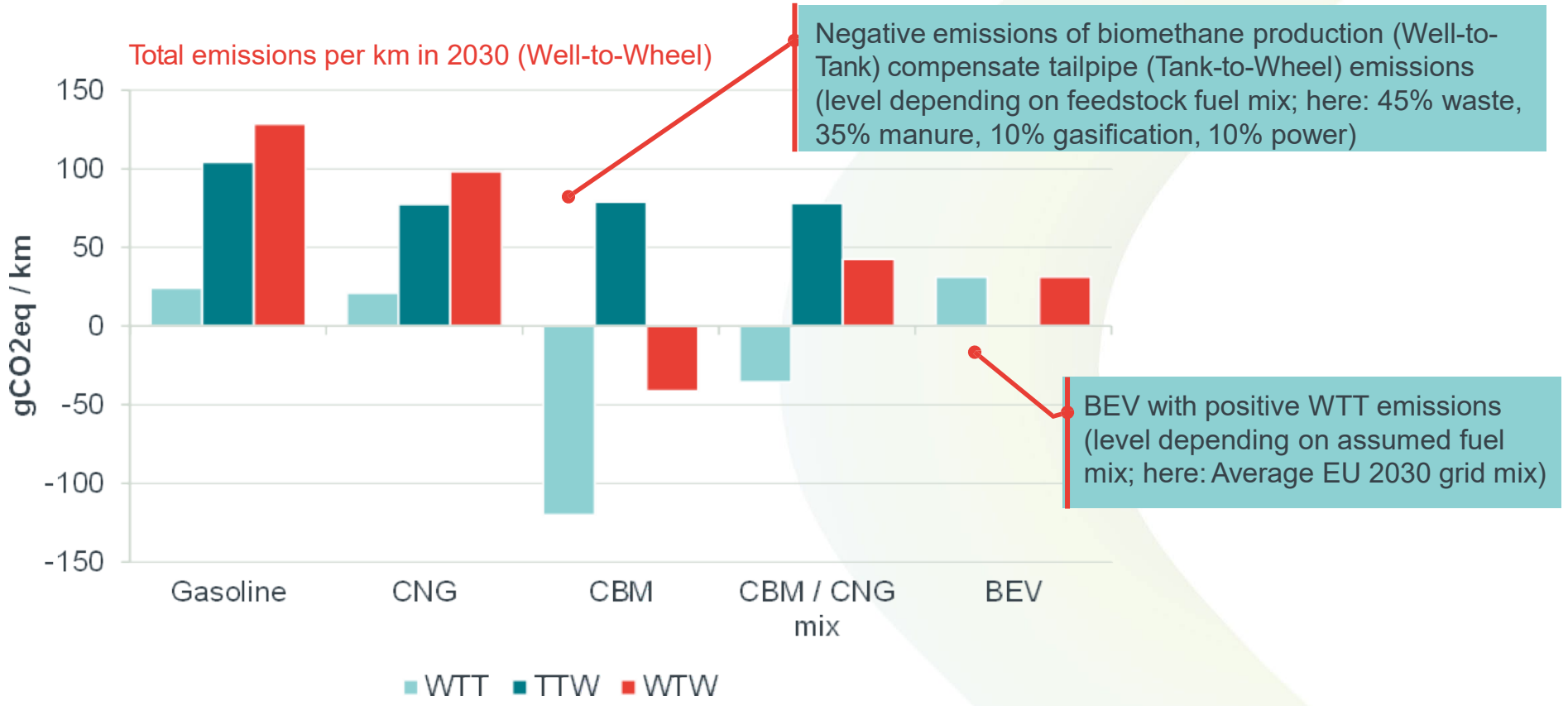
- Analyse emissions and costs along the value chain and across geographies and sectors for a typical passenger car and a truck with different powertrains and fuels
  - ➔ Calculation of “carbon abatement costs” of alternative technologies compared to a fossil reference
- Enable information basis to allow for cost-effective achievement of climate targets (“value for money” approach)

A comparison of Tank-to-Wheel emissions – which are the sole reference of EU fleet targets – suggests a clear picture…



- Electric vehicles with zero emissions (irrespective of CO_2 intensity of power mix)
- Gas mobility with fossil emission value (irrespective of whether CO_2 has been bound during fuel production, as e.g. in the case of Compressed Biomethane (CBM))

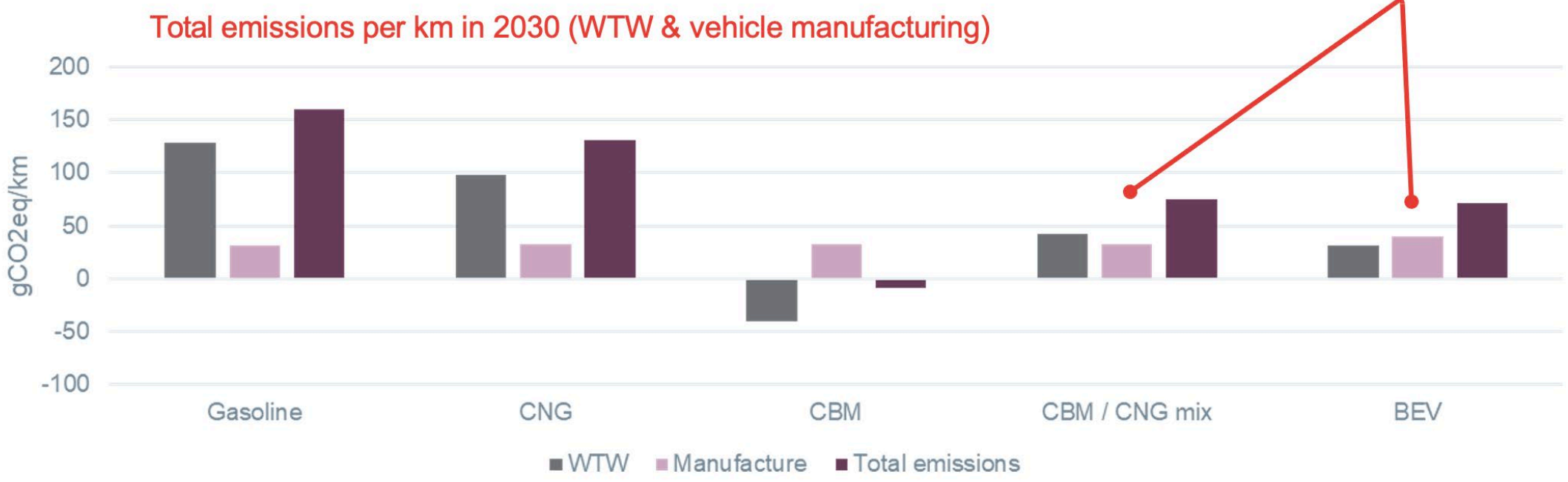
… but when also taking Well-to-Tank emissions into account, the total (Well-to-Wheel) emissions are much closer for gmobility and BEV…



… with a 40/60 bio/fossil gas mix compared to a BEV powered by the average EU 2030 electricity grid mix

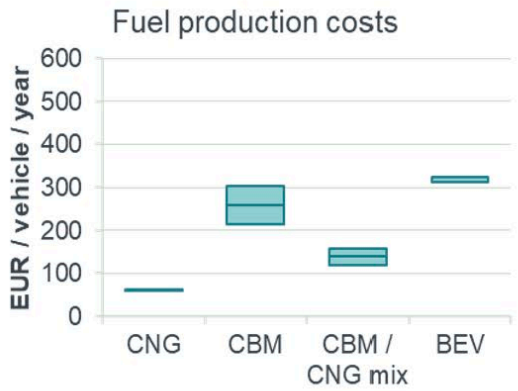
BEV and gmobility on a similar level when also taking vehicle manufacturing emissions into account

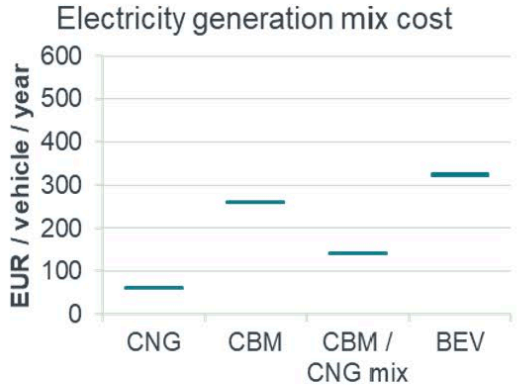
Slightly higher manufacturing emissions for BEV due to emissions in battery production

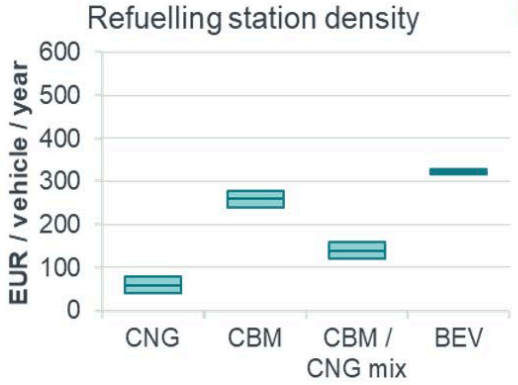


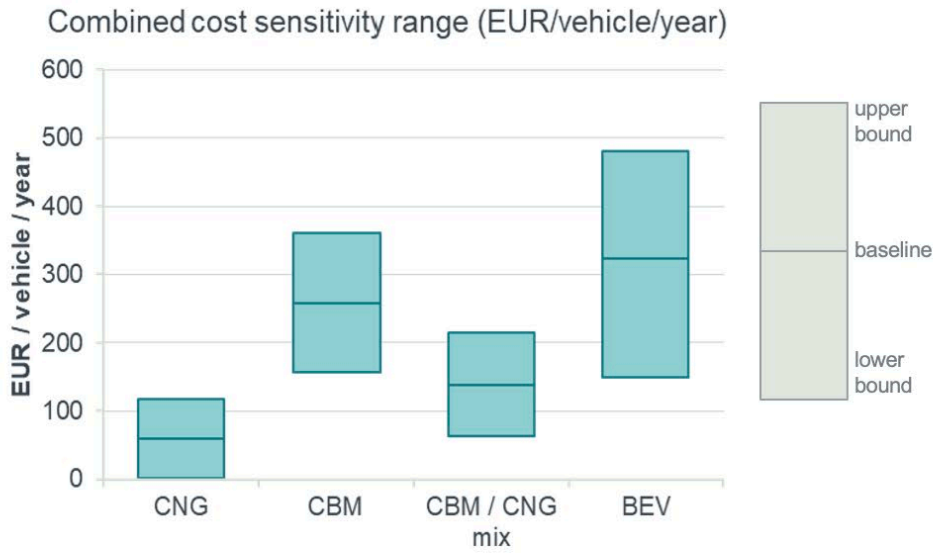
Carbon abatement cost sensitivity analysis reveals significant uncertainty about future emissions and costs, which are highest for BEV

Vehicle manufacturing costs (which constitutes large part of total cost) with significant uncertainty, particularly in the case of BEV









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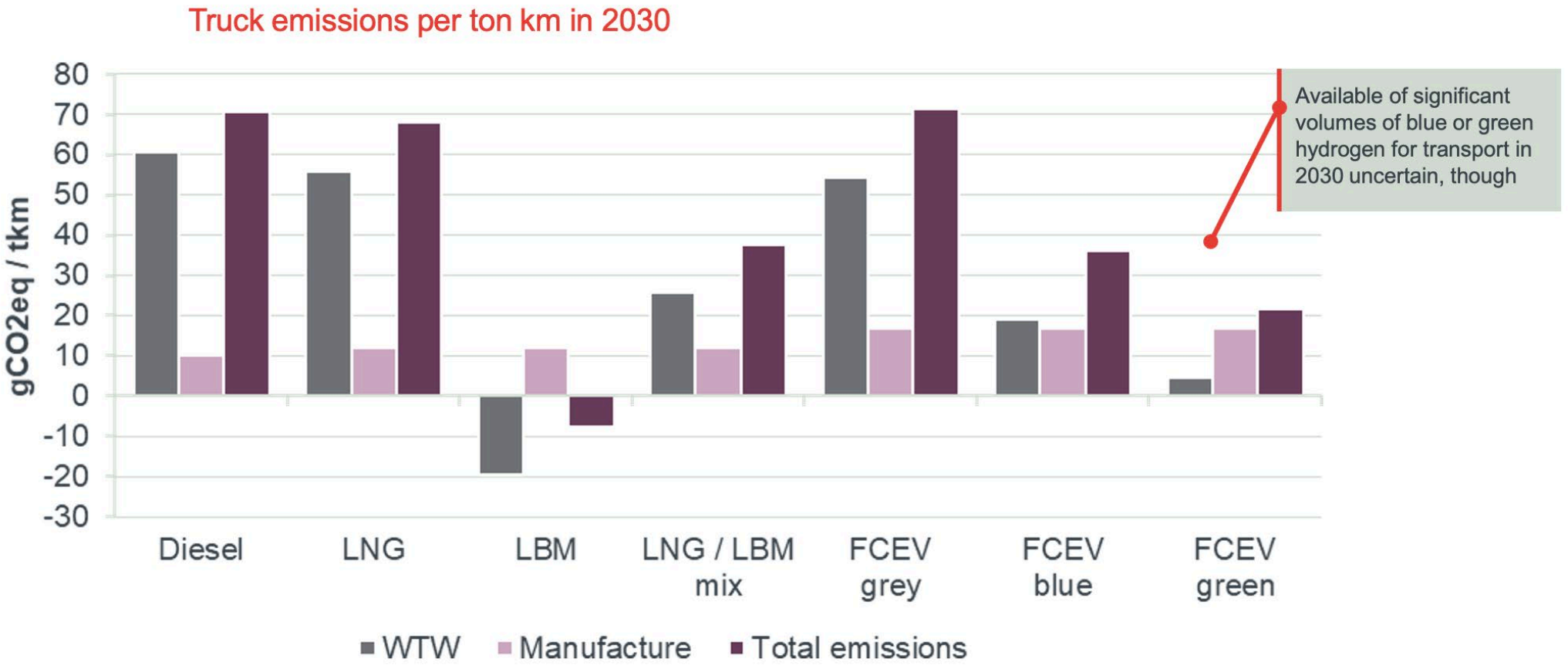
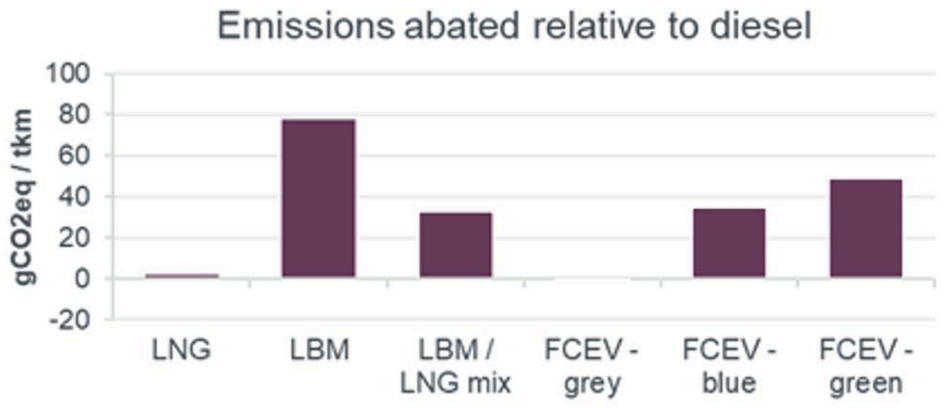
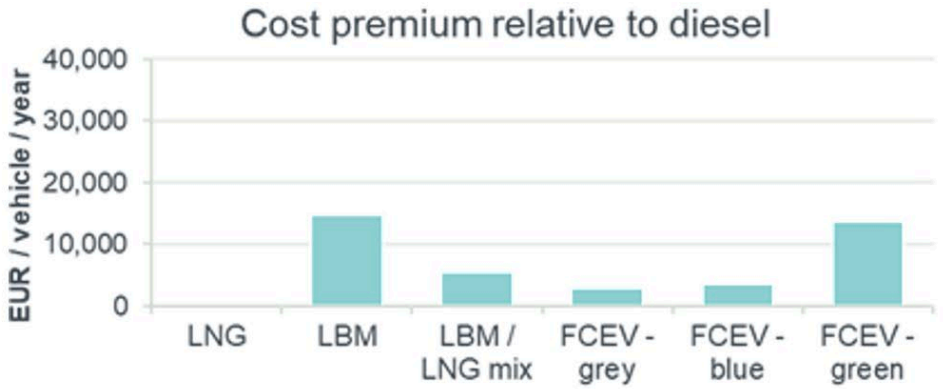
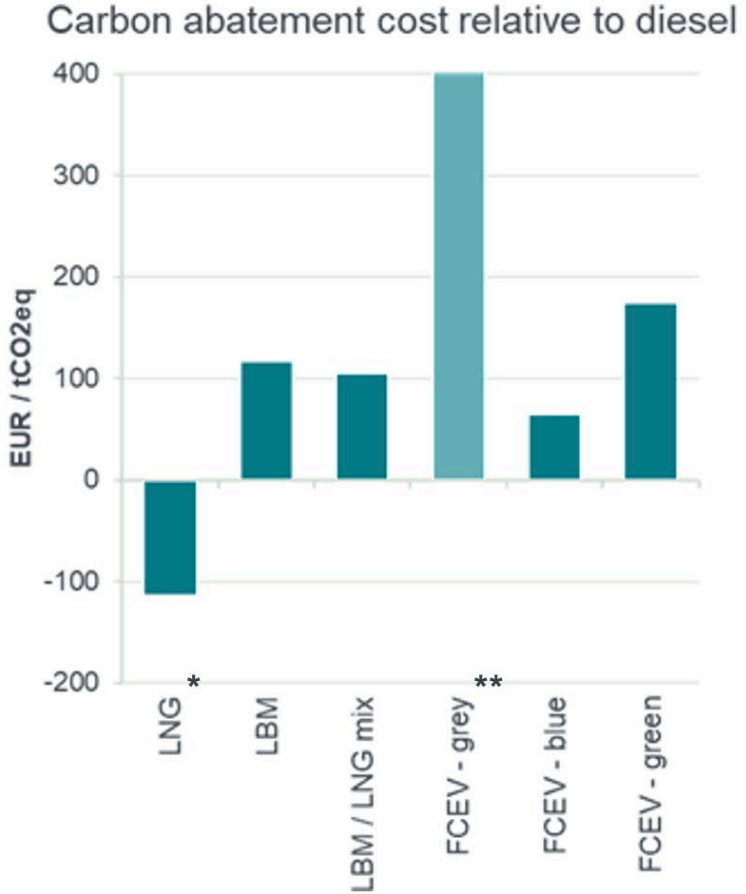
Trucks – emissions: Gas mobility using bio-LNG and FCEV fuelled by low-carbon hydrogen can <u>both</u> support decarbonisation in 2030



Trucks – carbon abatement costs of gas mobility are low compared to FCEV vehicles powered by grey and green hydrogen

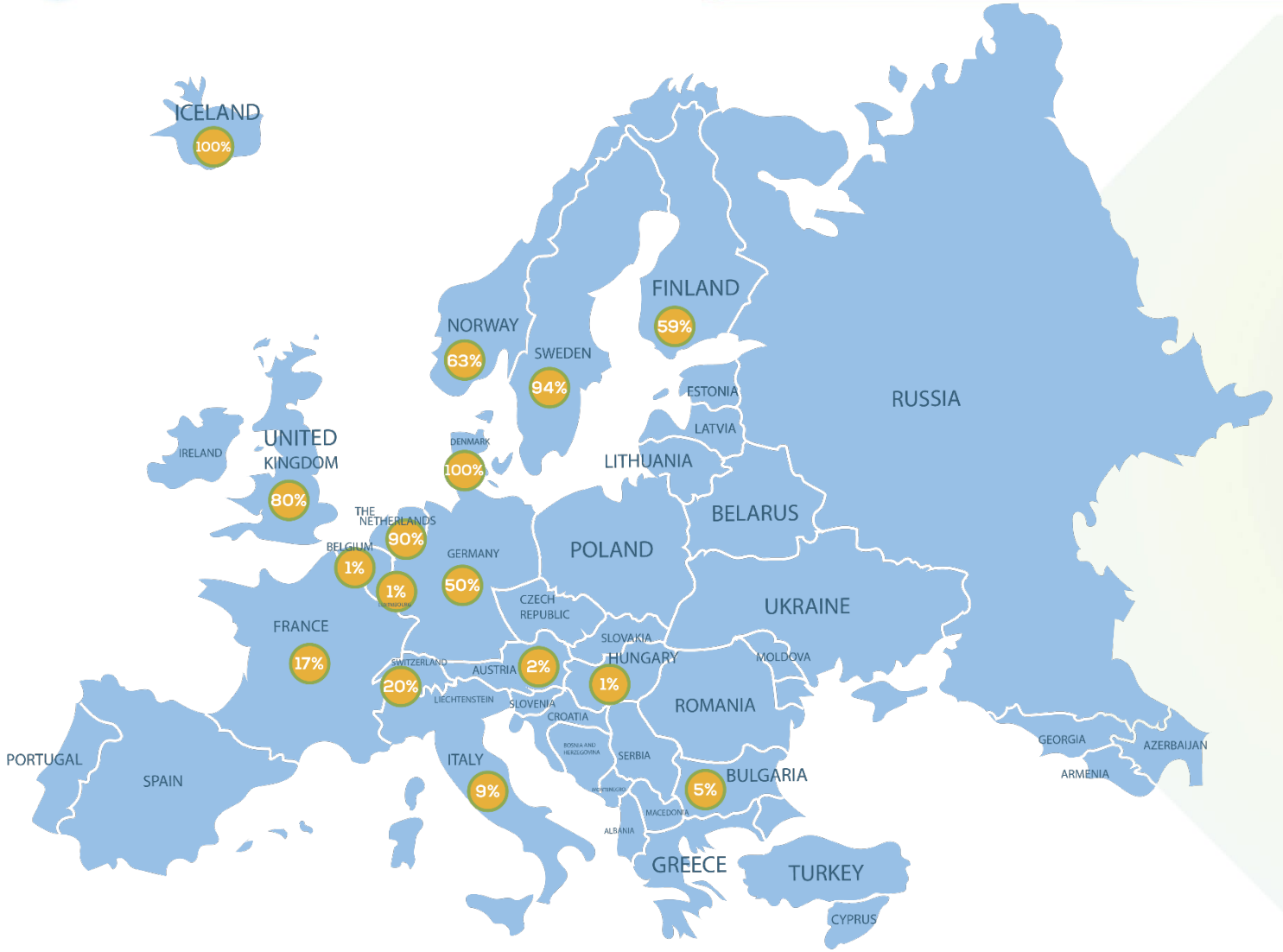






Gas mobility can contribute to decarbonising heavy duty transport at comparably low cost and should be enabled to be part of the mix

Biogas in road transport is fast developing in the EU

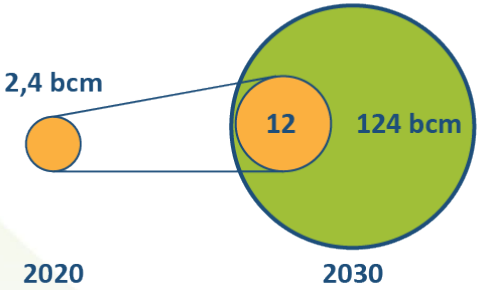


Data: March 2020, gibgas/NGVA Europe

Biogas consumption from the road transport sector = 2,4 bcm (23,4 TWh)

17% Average bio-share value at EU Level

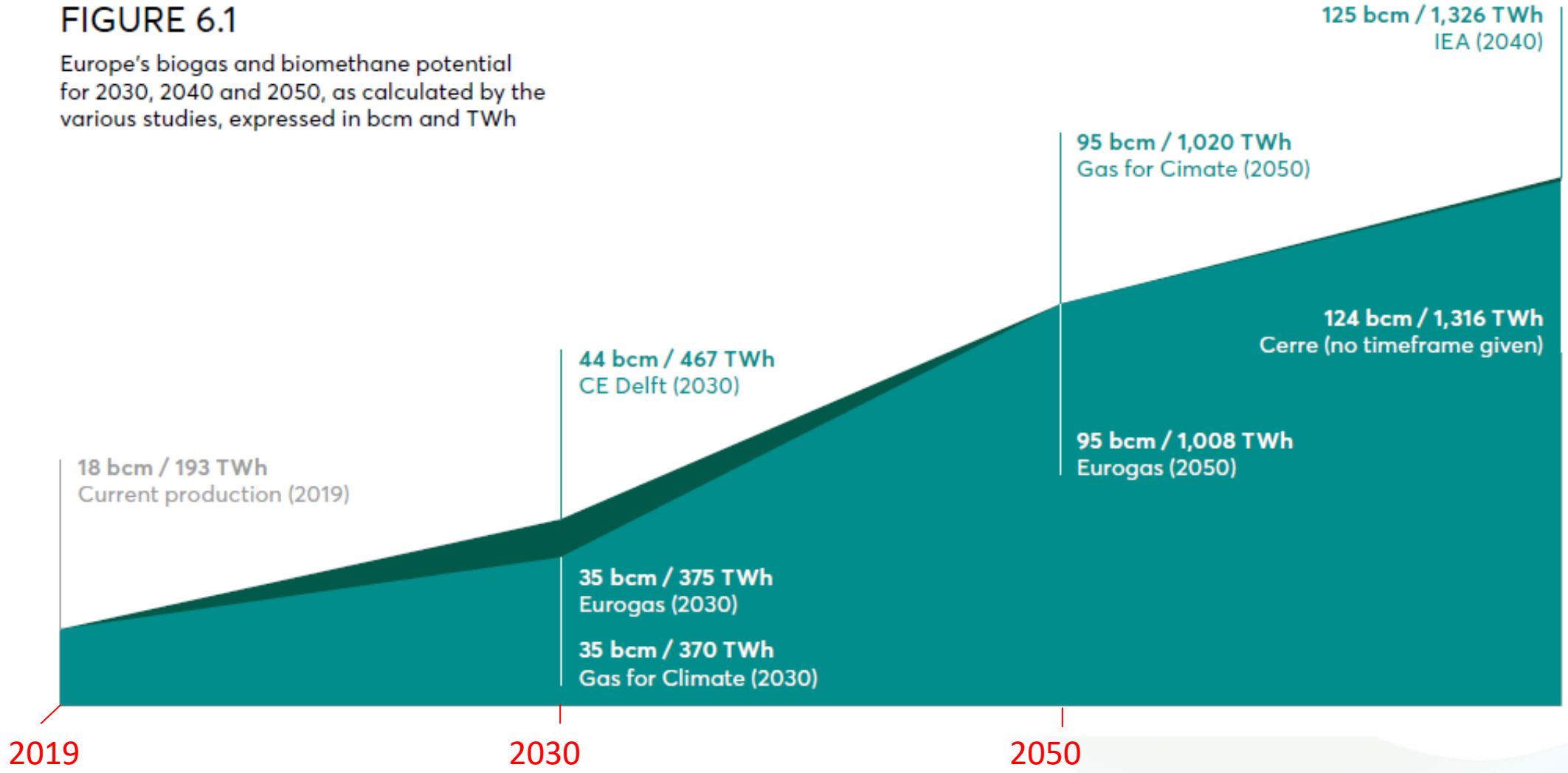
Current and future consumption from road transport vs potential



Biomethane is available and scalable

FIGURE 6.1

Europe's biogas and biomethane potential for 2030, 2040 and 2050, as calculated by the various studies, expressed in bcm and TWh

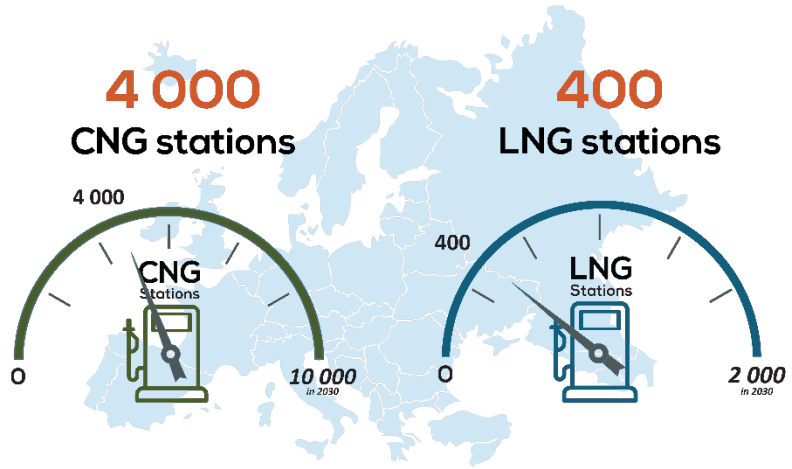


Supported by a strong and developing refuelling stations network

Already today:

4 000 CNG stations

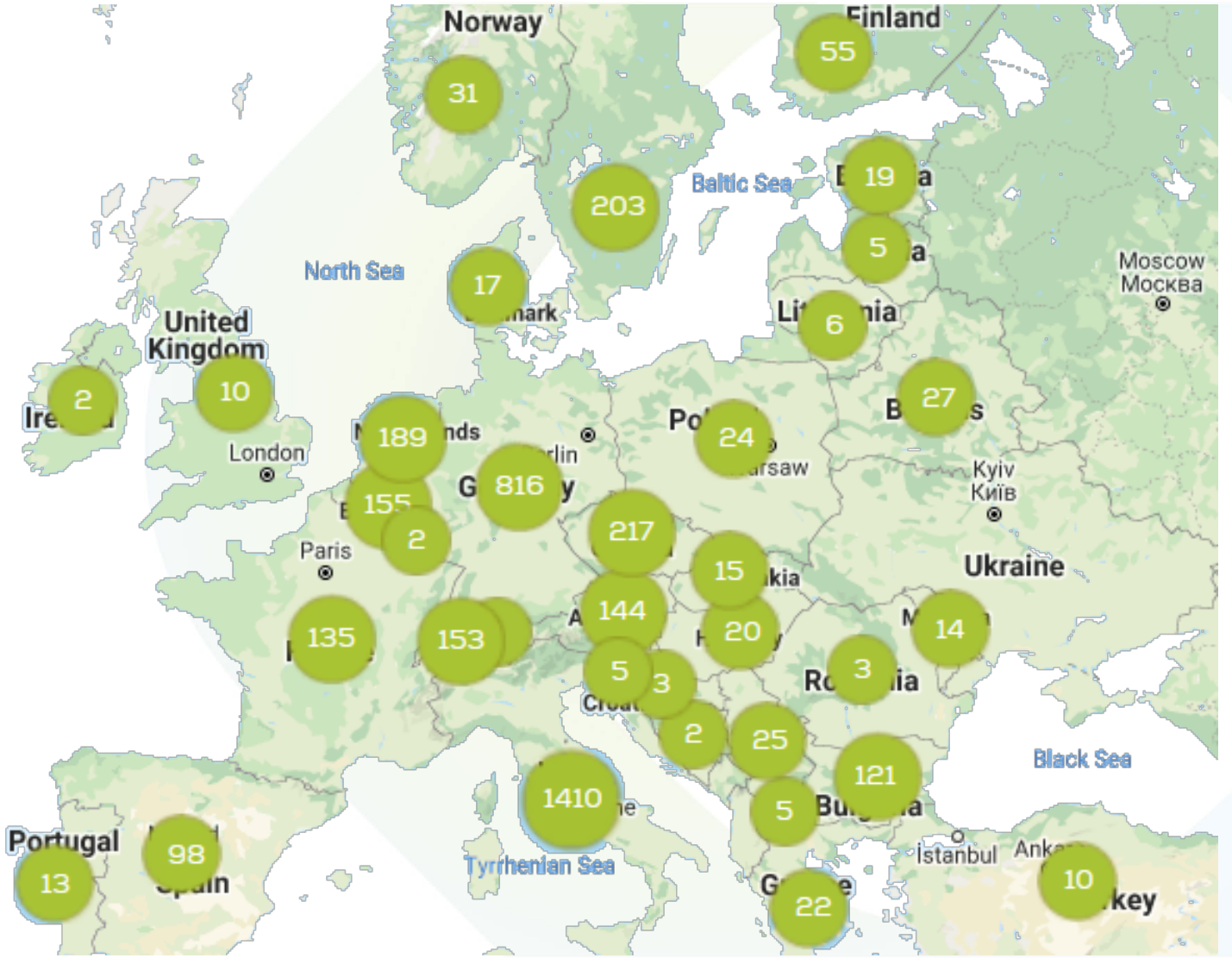
400 LNG stations



By 2030:

10 000 CNG stations

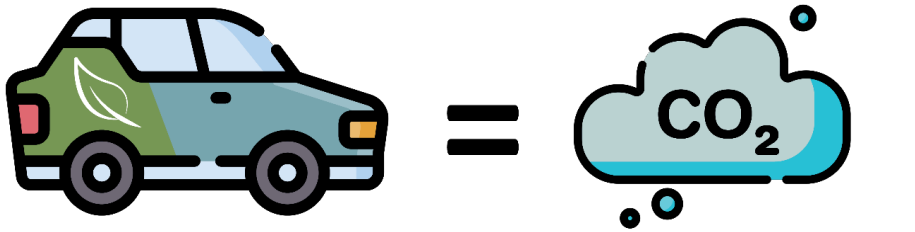
2 000 LNG stations



With impressive GHG emission reductions from now on, and for the future

Already today:

1.5 million gas vehicles

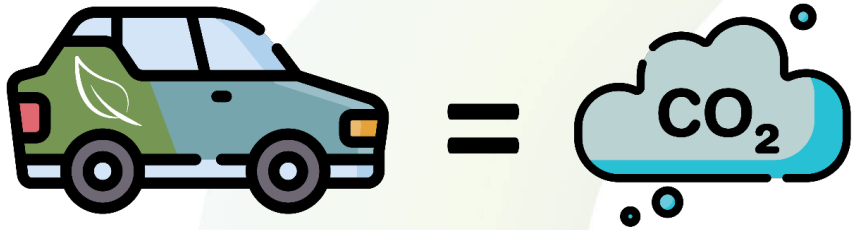


17% BIO

-40% CO_2 emissions*

By 2030:

13.2 million gas vehicles



40% BIO

-55% CO_2 emissions*

By 2050:

80% BIO

-100% CO_2 emissions*

FIT FOR 55

CARBON NEUTRALITY

*on a WtW basis compared to diesel

gmobility today: available, affordable, low emission

Gas mobility is readily available and scaleable now…

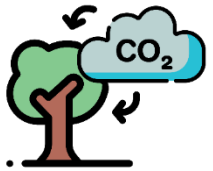
Gas-fuelled **vehicles** are readily available and mature in all relevant transport categories, including all levels of passenger and light duty transport as well as heavy duty transport or busses

Gas mobility can build on existing **infrastructure** such as (LNG and pipeline) import, transport, distribution and storage infrastructure with sufficient capacity for providing further demand from transport

Gas mobility can leverage on substantial **fuel supply** potentials:

- Existing natural gas supply might be used as a bridging fuel
- In addition, biomethane or synthetic methane could be used on an increasing scale

15 Mt CO_2 avoided in 2030



CO_2 reduction equivalent to 755 million trees

More than 4.5 billion € fuel cost saving per year

Up to 1 million jobs in Europe

Total EU production capacity of >1 200 TWh

… and could contribute to reducing CO_2 emissions in the next years already

NGVA Europe

for sustainable mobility

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