# Mobile Pipeline® solutions for biomethane


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Our vision

**CLEAN AIR EVERYWHERE**

Our purpose

**DRIVING ENERGY TRANSFORMATION**

Our values

**INTEGRITY & DRIVE**

# About Hexagon Agility

**Vertically Integrated**

Designing, developing, manufacturing and servicing

**Our Solutions**

Clean vehicle solutions and gas transportation

**Market Leader**

Natural gas fuel systems & cylinders in North America

**70,000+**

commercial vehicles on the road

**1,800 modules**

worldwide

**10 Locations**

worldwide

**700+**

employees

**Wholly-owned subsidiary of Hexagon Composites ASA (OSLO: HEX)**

25% owned by Mitsui – strong profitability and capital resources



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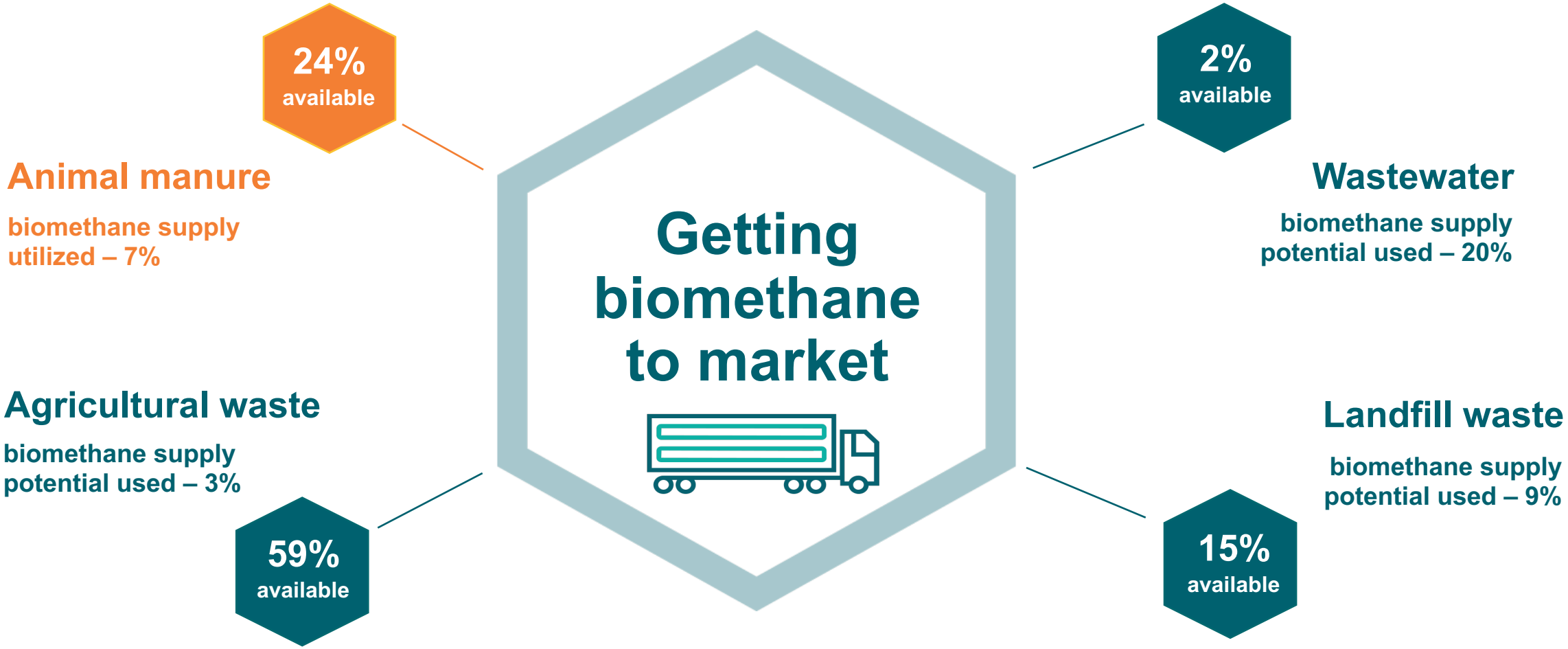
# Biomethane sources




25% of all man-made methane emissions can be reduced using Anaerobic Digestion Technology



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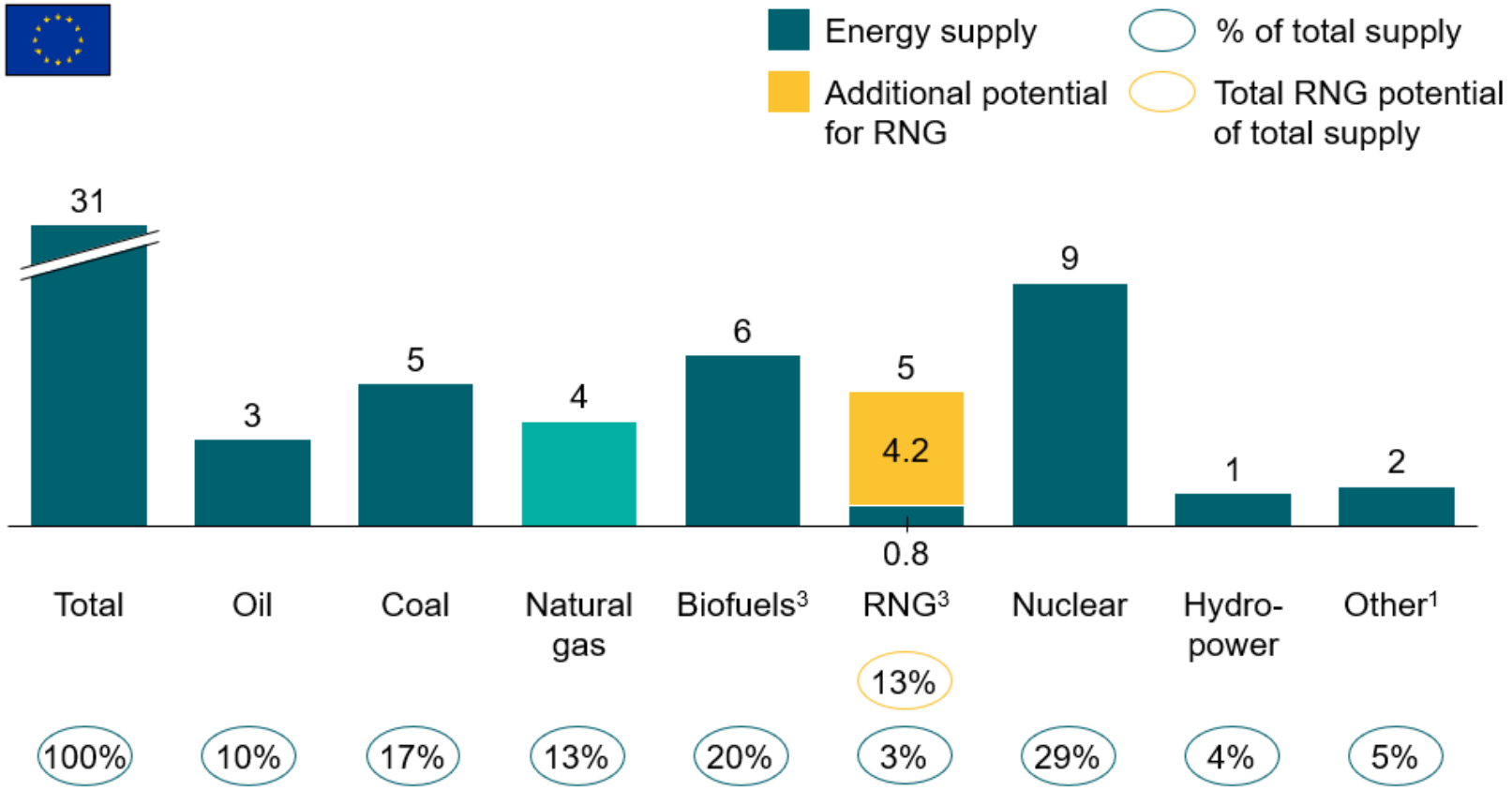
# European energy supply in 2018




1. Other includes geothermal, solar, wind, tide/wave/ocean, heat and other sources, 2. Liquid and solid biofuels, 3. Considers all biomass for either bio-gas or bio-methane
production, 2018 figures excluding RNG, 4. Additional potential for RNG not included since it is not realized today

Source: IEA Key World Energy Statistics 2020

**5 EJ**

Total biomethane potential including current biomethane supply (0.8 EJ) and additional untapped potential for biomethane (4.2 EJ)

**13%**

total biomethane potential of energy supply in Europe



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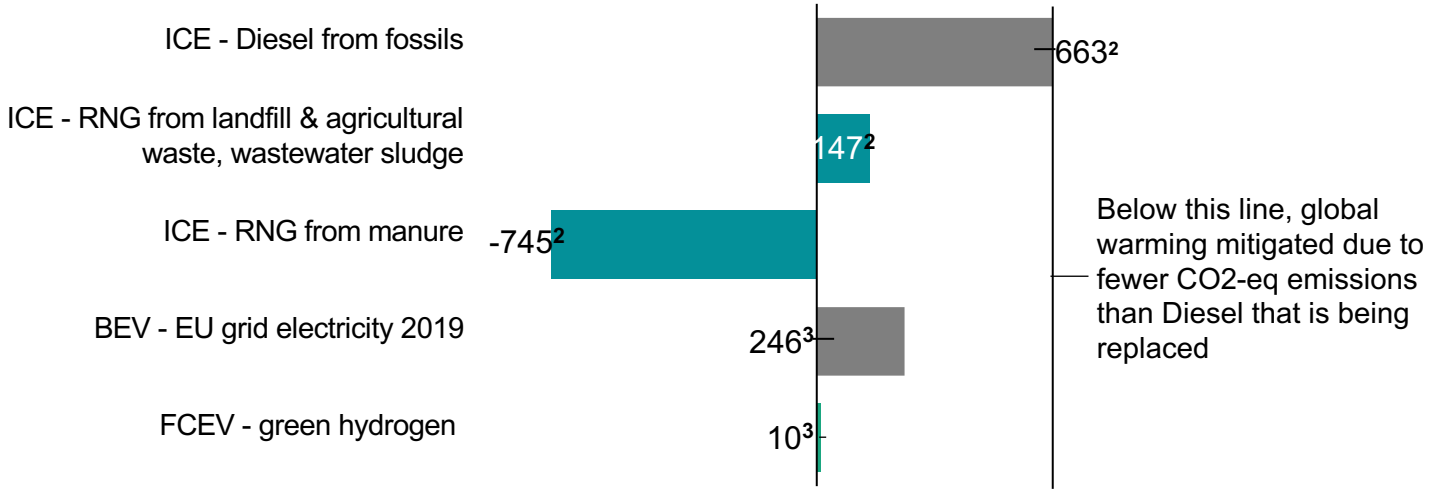
# RNG from manure is the only energy carrier with negative $CO_{2\text{-eq}}$ emission potential

**Well-to-wheel $CO_{2\text{-eq}}$ emissions, in g/km for class 7 truck[1]**




1. Reference vehicle 18 t rigid truck, Mercedes-Benz Actros, 7.7 liter displacement, 200 kW, 1,100 NM, average payload 65% – diesel fuel consumption averaged based on web fleet, BEV and FCEV energy demand synthesized from various publications considering driving cycle, efficiency improvement and payload correction;
2. RED II, Annex VI, published 21.12.2018;
3. JEC Well-to-Wheels Report v5, 2020 – synthetics based on pathways with electricity and $CO_2$ from renewables;
4. Considering well-to-wheel emissions of $CO_{2}$- equivalent omitted

Source: 3rd party consultant

RNG usage **reduces global warming by capturing methane** otherwise emitted to the atmosphere.

Depending on biomass source **RNG has an 80-200% reduction in $CO_{2\text{-eq}}$ emissions** on a well-to-wheel basis

# The basics of Mobile Pipeline®

The module is filled with low carbon RNG at the production site


Full module travels to the injection site

## How it works

Module is offloaded to the pipeline


Empty module returns to fill site

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# Mobile Pipeline enables safe transport of CNG and RNG (biomethane)

**Pipeline to Stranded User**
Energy Intensive
Industrial Plants
Oil & Gas

Asphalt, Ceramics, Papermills,
Food Production, Beverages,
Power Generation, O&G Drilling

**Stranded Gas to Pipeline**
Renewable Natural Gas
Flare Gas Capture

Off-grid landfills and Agriculture
Flare gas from oil production
Off-shore flare gas

**Pipeline to Pipeline**
Pipeline constrained urban areas

NY / Boston metro areas
Grid integrity / Emergency response
Keeping homes warm &
business running

**Mobile Refueling**
Mobile refueling stations

Accelerate NGV Adoption
Reduce station costs
Lower refueling costs



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# Mobile Pipeline serving biogas facilities in Europe and US







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# Key takeaways

**16%**

total biomethane potential in Europe is developed today

**Repower Europe demands more biomethane**

**We solve the infrastructure problem**



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# Let’s get started.

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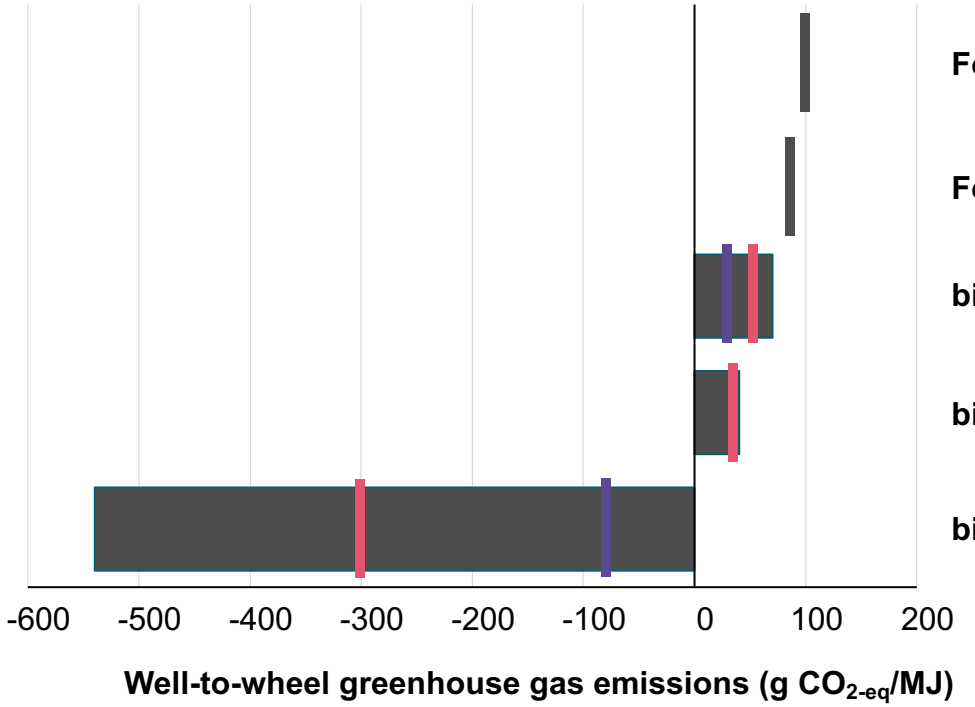
# US and EU regulators consider manure to be the most GHG emission saving biomethane raw material[1]

Range | Average US CARB[1] | Default value EU[2]

**Well-to-wheel greenhouse gas emissions at US and EU regulators**




| | Savings of biomethane vs. fossil diesel[3], in g $CO_{2\text{-eq}}$/MJ (%) |
|---|---|
| Fossil diesel | Baseline: 94 (100%) |
| Fossil natural gas | 5-20 (5%-21%) |
| biomethane from landfill wast | 45-80 (48%-85%) |
| biomethane from wastewater[4] | ~65 (69%) |
| biomethane from manure | 190-400 (202%-426%) |

1. Based on raw data from CARB (2020a), modified by WRI (World Resources Institute),
2. REDII Annex V, VI,
3. Range build using average values in US and EU,
4. EU n/a, similar value than landfill and US value for wastewater expected

## Key takeaways

biomethane from landfill, wastewater and manure save greenhouse gas (GHG) emissions compared to fossil diesel

Both in publications of US and EU regulators, manure has negative GHG emissions while landfill and wastewater have positive yet small GHG emissions

biomethane from manure avoids more emissions than it generates, leading to a net-negative GHG emission intensity

biomethane from landfill waste and wastewater also with significant GHG emission reduction compared to fossil diesel of roughly -70 g/MJ

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