



ECO-GATE

European COrridors for natural GAs Transport Efficiency

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Enginyers Industrials Catalunya - El futur del gas renovable a Espanya
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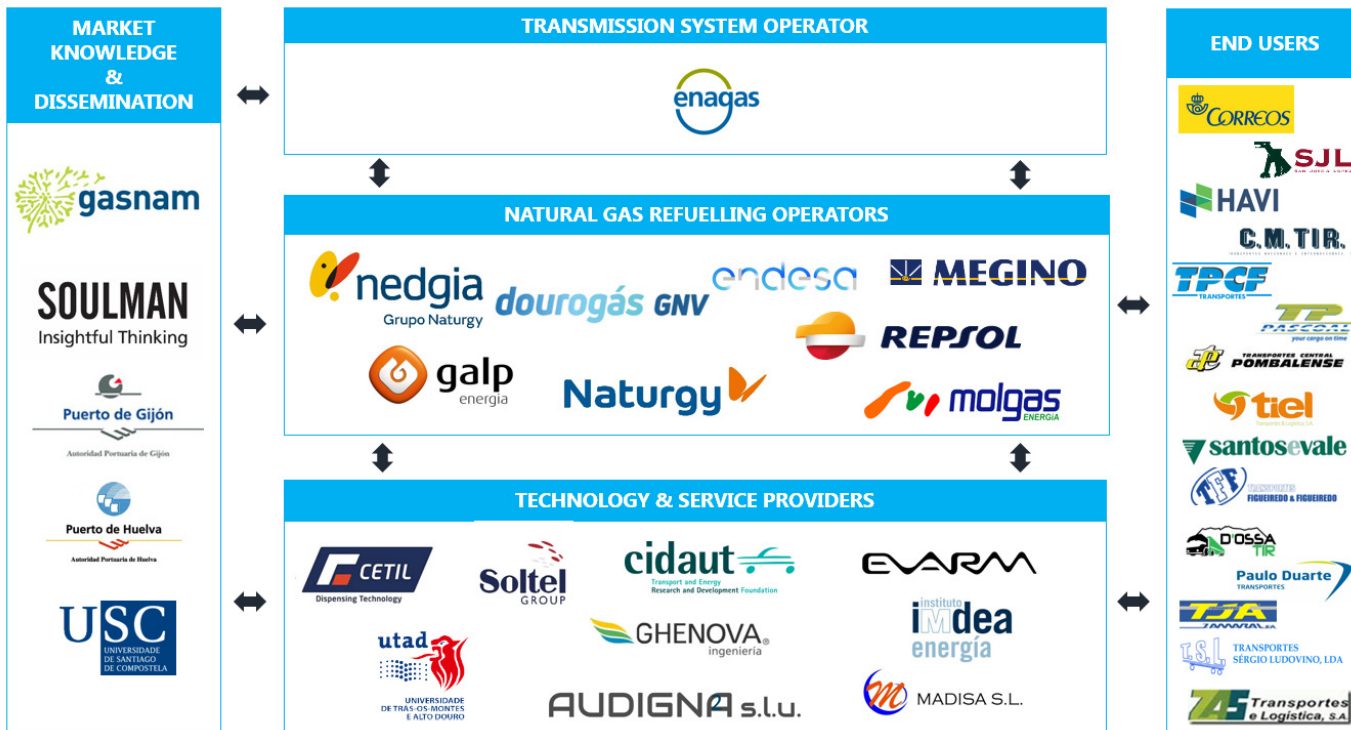
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Grupo Naturgy

ECO-GATE > EUROPEAN CONSORTIUM

- 38 Companies/Organisms: 21 Spain + 16 Portugal + 1 France/Germany
- Multidisciplinary and Complementary competencies: from “NG Operators” to “End Users”



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Grupo Naturgy

ECO-GATE > STAKEHOLDERS SUPPORT

- 39 Companies/Organisms: Spain + Portugal + France + Germany
- Hauliers companies to ensure the use of the CNG/LNG refuelling stations and thus, perform the trial and study
- All type of associations, vehicle manufactures, bio-methane producers, technological centres, etc



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ECO-GATE > OVERALL OBJECTIVE

Study conventional and renewable natural gas vehicle market in the whole Atlantic Corridor, and its interconnection with Rhine-Danube Corridor until Heddeshheim, and the Spanish Mediterranean Corridor through new technologies and innovative solutions for:

Supply logistic services
Cleaner fuel composition
Refuelling infrastructure
Vehicle and components manufacturers
Operational process



This study in the form of real-life trial aims to allow quick deployment of this alternative cleaner fuel by significantly bringing unit cost down while improving understanding of client's needs.

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ECO-GATE > SPECIFIC OBJECTIVES

- Deployment of a European wide network of 21 L-CNG refuelling stations in Portugal, Spain, France and Germany, enhanced with innovative solutions for the natural gas market:
 - placed at strategical points located along the whole **Atlantic Corridor**, from Portugal to France
 - interconnection of the **Atlantic Corridor with the Rhine-Danube Corridor**
 - placed at strategic locations along the Spanish **Mediterranean Corridor**

- Deployment of **1 Biomethane supply point** at the Atlantic Corridor

- Deployment of **1 H-CNG supply point** at the Atlantic Corridor.

- Introducing and implementing **14 advanced and innovative solutions on the L-CNG infrastructure, vehicles and NG logistics services**
 - Equipments Implementation
 - Dispensation Systems
 - Platforms Systems
 - Renewable & Cleaner Fuels And Vehicles

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ECO-GATE > MAP OF REFUELLING STATIONS



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ECO-GATE > MIXTURES OF CONVENTIONAL NATURAL GAS WITH BIOMETHANE

- Biomethane injected into natural gas distribution network
- Development of the Guarantees of Origin for renewable gas in Spain
- Demonstration of the eco-efficiency of renewable gas for mobility



Depuradora Butarque



ECO-GATE Edar de Butarque



Economía Circular:

Depuración de aguas residuales
Producción de gas renovable
Uso como combustible en vehículos



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Grupo Naturgy

ECO-GATE > MIXTURES OF CONVENTIONAL NATURAL GAS WITH BIOMETHANE

- Biogas: waste-water treatment Plant CANAL ISABEL II
- Upgrading Plant: amines + process analysers + chromatograph
- Biomethane injected into natural gas distribution network: 5 GWh/year
- Guarantees of Origin for renewable gas
- Bio-CNG refueling station connected to natural gas distribution network: tank 1920 liters / 250 bar



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ECO-GATE > MIXTURES OF CONVENTIONAL NATURAL GAS WITH BIOMETHANE

➤ Eco-efficiency of Biomethane for mobility

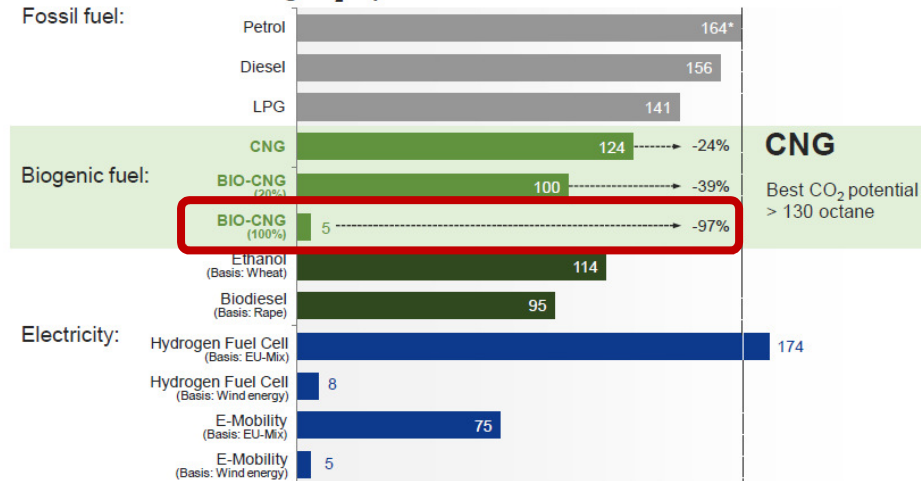
GHG-Emission WTW (gCO₂ eq/km)

Source: JEC (JRC + EUCAR + CONCAWE)

- JRC European Commission's Joint Research Centre
- EUCAR European Council for Automotive R&D
- CONCAWE Group Conservation Clean Air&Water Europe



GHG-Emission WTW in gCO₂ eq/km



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ECO-GATE > MIXTURES OF CONVENTIONAL NATURAL GAS WITH H2

- Mixtures CNG/H2
- Compression of the mixtures and refueling
- % H2 maximum effectiveness
- CO2 and NOx emissions reduction



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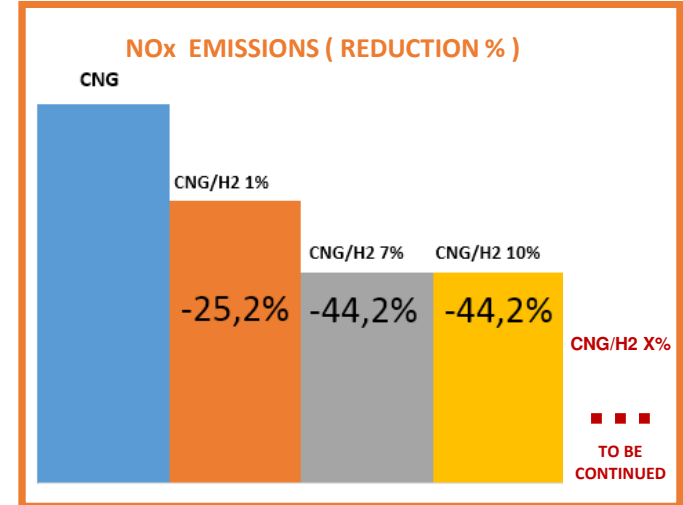
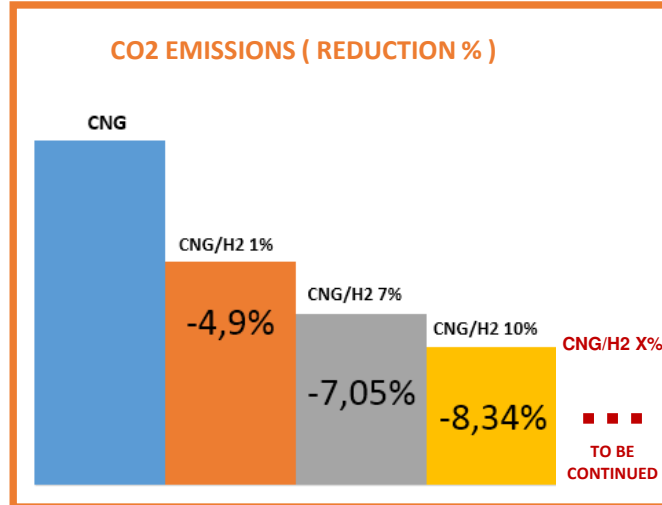


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ECO-GATE > MIXTURES OF CONVENTIONAL NATURAL GAS WITH H2

H-CNG Supply point

- Electrolyser PEM 500 NL – 6 bar
- Gas Mixer 0-100% H2
- Mixing Tank 100 liters / 5 bar
- Compressor 800 bar
- CNG Tank 55 liters / 350 bar
- Dispensation System





Thank you for your kind attention!

David Fernández

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