Welcome and Agenda

03.00-03.05	Introduction to the meeting
	PART 1: the streamSAVE methodologies
03.05-03.20	Presentation by Pedro Moura (ISR-UC, Portugal) about the final streamSAVE methodology for EVs
03.20-03.25	Q & A
	PART 2: Experience sharing about energy savings from EVs
03.25-03.45	Presentation by Matteo Prussi (DENER, Politecnico di Torino, Italy) about “Well-to-Wheels analysis of future automotive fuels and powertrains in the European context”
03.45-03.55	Q & A
	PART 3: Full demo of the streamSAVE Training Module
03.55-04.05	Demo done on the case of Electric Vehicles by Maria Lopez Arias (CIRCE, Spain)
04.05-04.15	Q & A
04.15-04.20	Wrap-up

Note: Discussions will be under Chatham House Rule: the minutes will not mention any name or country. All discussion points included in the minutes will be anonymized.

PART 1: the streamSAVE methodologies

Electric Vehicles and Related Infrastructure

Methodology for "Fuel Switching with Electric Vehicles"

Pedro Moura - ISR-UC

pmoura@isr.uc.pt

3rd PA Dialogue Group, December 7, 2021

This project has received funding from the Horizon 2020 programme under grant agreement n°890147. The content of this presentation reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Scope of the methodology

Target

- Fuel switching between conventional and electric vehicles
- Savings ensured with higher conversion efficiency
- Fuel switching between fossil fuels and electricity, which is increasingly generated based on renewable resources

Objective

- To develop a common uniform methodology to calculate the savings with electric vehicles (fuel switching)
- Considering different types of vehicles (cars, vans, buses, trucks) and different options of fuel (including hybrid options)

Calculation of Final Energy Savings (Article 7)

Calculation of final energy savings (Article 7)

Final Energy Savings

$$TFES = \left(sFEC_{ref} - sFEC_{eff}\right) * \frac{DT}{100} * n * f_{BEH}$$

Reference Vehicle — Efficient Vehicle — Distance & Quantity — Behavioural Effects

$TFES$	Total final energy savings [kWh/a]
$sFEC_{ref}$	Specific final energy consumption of the reference vehicle [kWh/100 km]
$sFEC_{ref}$	Specific final energy consumption of the efficient vehicle [kWh/100 km]
DT	Average yearly distance traveled with the vehicle [km/a]
n	Number of efficient vehicles purchased [dmnl]
f_{BEH}	Factor for correction of behavioural effects (e.g. rebound effects [%]

Calculation of final energy savings (Article 7)

Conversion of Fuel Consumption

- Including Hybrid Options

$$sFEC = \underbrace{sFC * NCV}_{\text{Fuel Consumption}} * \left(1 - Share_{DT,E}\right) + \underbrace{sEC}_{\text{Electricity Consumption}} * \underbrace{Share_{DT,E}}_{\text{Share of the Demand}}$$

$sFEC$	Specific final energy consumption of the vehicle [kWh/100 km]
sFC	Specific fuel consumption of the vehicle [l/100 km]
sEC	Specific electricity consumption of the vehicle [kWh/100 km]
NCV	Net Calorific Value for the fuel used in the vehicle [kWh/l]
$Share_{DT,}$	Share of the distance traveled using electricity in the vehicle [%]

Calculation of final energy savings (Article 7)

Indicative Values

- Based on the CO_2 emission standards

Year	Cars gCO_2/km	Vans gCO_2/km
2020	95.0	147
2025	80.8	125
2030	59.4	103

EC (2021) CO_2 Emission Performance Standards for Cars and Vans. https://ec.europa.eu/clima/policies/transport/vehicles/regulation_en

- The methodology ensures a regular update of values and the most recent data of monitoring of CO_2 emissions can be used

EEA (2021) Monitoring of CO_2 emissions from passenger cars – Regulation 2019/631
https://www.eea.europa.eu/data-and-maps/data/co2-cars-emission-18
EEA (2021) Monitoring of CO_2 emissions from vans – Regulation 510/2011
https://www.eea.europa.eu/data-and-maps/data/vans-14

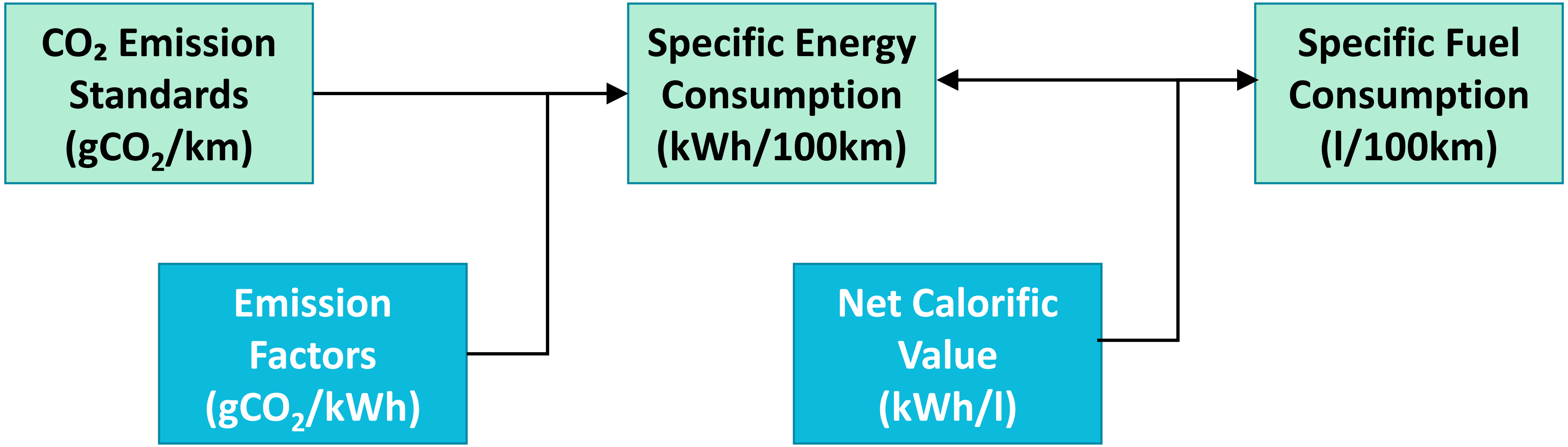
- For buses and trucks, the preliminary average CO_2 baseline for heavy-duty vehicles was used (56 gCO_2/tkm)

ACEA (2020) CO_2 emissions from heavy-duty vehicles Preliminary CO_2 baseline (Q3-Q4 2019) estimate.
https://www.acea.be/uploads/publications/ACEA_preliminary_CO2_baseline_heavy-duty_vehicles.pdf

Calculation of final energy savings (Article 7)

Indicative Values

- The CO_2 emissions values can be replaced by national values or even by specific values for the replaced vehicles
- The specific energy consumption can also be calculated with fuel consumption data
- An excel tool will be provided to ensure the savings calculations and the use of national values



Calculation of final energy savings (Article 7)

Indicative Values

NCV	[kWh/l]
Petrol	9.23
Diesel	10.27
Liquefied petroleum gases	7.23
Natural gas liquids	6.25

Net Calorific Value

$f_{GHG,ec}$	[g CO_2e/kWh]
Motor gasoline	249.48
Gas/Diesel oil	266.76
Liquefied petroleum gases	227.16
Natural gas liquids	231.12
Electricity	133.3

Specific CO_2 Emissions

Data Source

- Annex VI of the Regulation on the monitoring and reporting of greenhouse gas emissions (2018/2066/EU). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.334.01.0001.01.ENG

Calculation of final energy savings (Article 7)

Indicative Values

$sFEC_{ref}$	[kWh/100 km]
Car – Petrol (2020)	38.08
Car – Diesel (2020)	35.61
Car – LPG (2020)	41.82
Car – LNG (2020)	41.10
Car – PHEV (2020)	25.29
Car – Petrol (2025)	32.39
Car – Diesel (2025)	30.29
Car – LPG (2025)	35.57
Car – LNG (2025)	34.96
Car – Petrol (2030)	23.81
Car – Diesel (2030)	22.27
Car – LPG (2030)	26.15
Car – LNG (2030)	25.70
Van - Diesel (2020)	55.11
Van - Diesel (2025)	46.86
Van - Diesel (2030)	38.61
Truck and Bus - Diesel	312.53

Specific energy consumption of the reference vehicle

Calculation of final energy savings (Article 7)

Indicative Values

$sFEC_{eff}$	[kWh/100 km]
Car BEV	12.4
Van BEV	24.6
Truck and Bus BEV	130.2

Specific energy consumption of the efficient vehicle

Data Sources

- Cars - JEC (2020) Tank-to-Wheels Report v5: Passenger cars https://publications.jrc.ec.europa.eu/repository/handle/JRC117560
- Vans - EV-database (2021) Energy consumption of full electric vehicles. Electric Vehicle Database https://ev-database.org/cheatsheet/energy-consumption-electric-car
- Truck and Bus - JEC (2020) Tank-to-Wheels Report v5: Heavy duty vehicles https://publications.jrc.ec.europa.eu/repository/handle/JRC117564

Calculation of final energy savings (Article 7)

Indicative Values

DT	[km/a]
Car	13740
Van	17480
Bus	55570
Truck	77800

Distance traveled

Data Sources

- Road traffic statistics by type of vehicles Eurostat (2021) Transport Database. https://ec.europa.eu/eurostat/web/transport/data/database
- Number of vehicles by type ACEA (2021) Vehicles-in-use-Europe 2021. European Automobile Manufacturers' Association https://www.acea.be/uploads/publications/report-vehicles-in-use-europe-january-2021.pdf

Behavioural aspects

- Direct rebound effects occur when a decrease in the cost of using a product results in increased use.
- More efficient engines make it possible to build more economical vehicles -> the engines become more powerful or when the vehicle is driven more frequently or at a higher speed.
- Highly dependent on the specific technology, users, prices, etc, and are preferably based on empirical data (e.g. surveys).

Calculation of Impact on Energy Consumption (Article 3)

Calculation of impact on energy consumption (Article 3)

Final Energy Consumption of the Reference Vehicle

$$FEC_{ref} = sFEC_{ref} * \frac{DT}{100} * n * f_{BEH}$$

Final Energy Consumption of the Efficient Vehicle

$$FEC_{eff} = sFEC_{eff} * \frac{DT}{100} * n * f_{BEH}$$

Calculation of impact on energy consumption (Article 3)

Final Energy Savings

$$TFES = \left(sFEC_{ref} - sFEC_{eff}\right) * \frac{DT}{100} * n * f_{BEH}$$

Primary Energy Savings

$$TPES = FEC_{ref} * \sum_{ec}\left(share_{ec} * PEF_{ec}\right) - FEC_{eff} * \sum_{ec}\left(share_{ec,} * PEF_{ec}\right)$$

$share_{ec}$	Share of final energy carrier on final energy consumption [dmnl]
PEF_{ec}	Primary Energy Factor of the used energy carrier [dmnl]

Calculation of Greenhouse Gas Emissions Savings

Calculation of Greenhouse Gas Emissions Savings

Greenhouse Gas Emissions Savings

$$GHGSAV = FEC_{ref} * \sum_{ec} \left(share_{ec,ref} * f_{GHG,ec} \right) - FEC_{eff} * \sum_{ec} \left(share_{ec,eff} * f_{GHG,ec} \right)$$

$share_{ec}$	Share of final energy carrier on final energy consumption [%]
$f_{GHG,ec}$	Emission factors of final energy carrier [t CO_2e/kWh]

Overview of costs related to the action

Overview of costs related to the action

Indicative values for costs:

[euro2021]	Investment costs
Small Car – ICE	16,855
Small Car – BEV	25,510
Mid-Size – ICE	22,690
Mid-Size – BEV	30,690
Large Car – ICE	50,840
Large Car – BEV	81,610
Van – BEV	53,660
Bus – BEV	235,200

[euro2021/a]	Maintenance costs
Car – ICE	794
Car – BEV	397

Indicative values for the several cost components, excluding taxes

Data Sources

– LeasePlan (2020). 2020 Car Cost Index. https://www.leaseplan.com/en-es/blog/2020-car-cost-index/ accessed on 2021/06/17

Q&A

Methodologies for
"Fuel Switching with Electric Vehicles"

3rd PA Dialogue Group, December 7, 2021

PART 2: Experience sharing about energy savings from EVs

JEC **WTW** v5

–

HDV: a case study

Well-to-Wheels analysis of future automotive fuels and powertrains in the European context

Prussi, Matteo

Politecnico di Torino

JEC WTW – **Goal and scope**

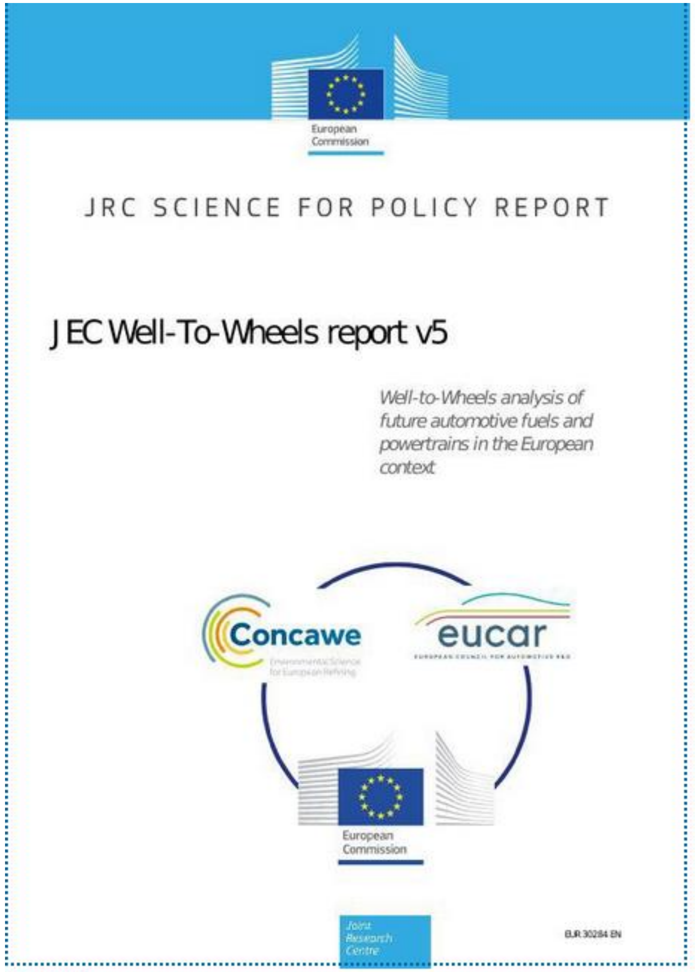
https://ec.europa.eu/jrc/en/jec

The **JEC** (**J**RC-**E**UCAR-**C**oncawe) is a long-standing **collaboration** between the European Commission's **J**oint **R**esearch **C**entre, **EUCAR** and **CONCAWE**.
Objectives of the **JEC are:**

- the **evaluation** of **energy use** and **GHG emissions related to engine** and vehicle technologies**, fuel production routes** and final quality**,** and the **interaction** between them**;**

- **provide** the **European Union** with **scientific WTW facts, supporting** the **sustainability development of European vehicle and refining industries.**

JEC WTW – Goal and scope



©EU

In this brand new update, version 5, you will find:

- **New fuel production pathways**, including new conversion technologies, new fuels and new feedstocks. Complemented by the update of version 4 pathways.

- **Heavy-duty vehicles**, included for the first time in the report. Long-haul and regional trucks have been added to the updated passenger car model.

JEC WTW

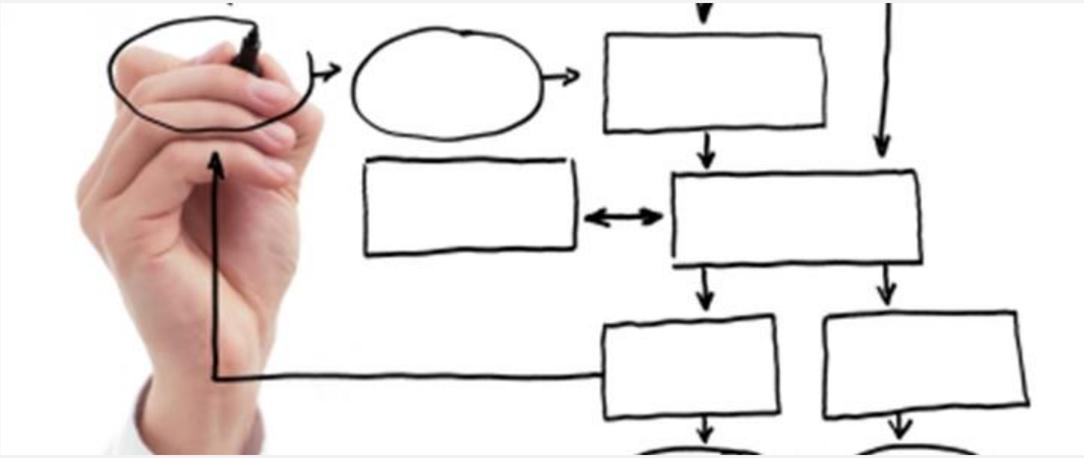
The **JEC WTW has been used as source** for:

- DG-MOVE report "**State of the art on alternative fuels transport systems in the European Union - 2020 update**",

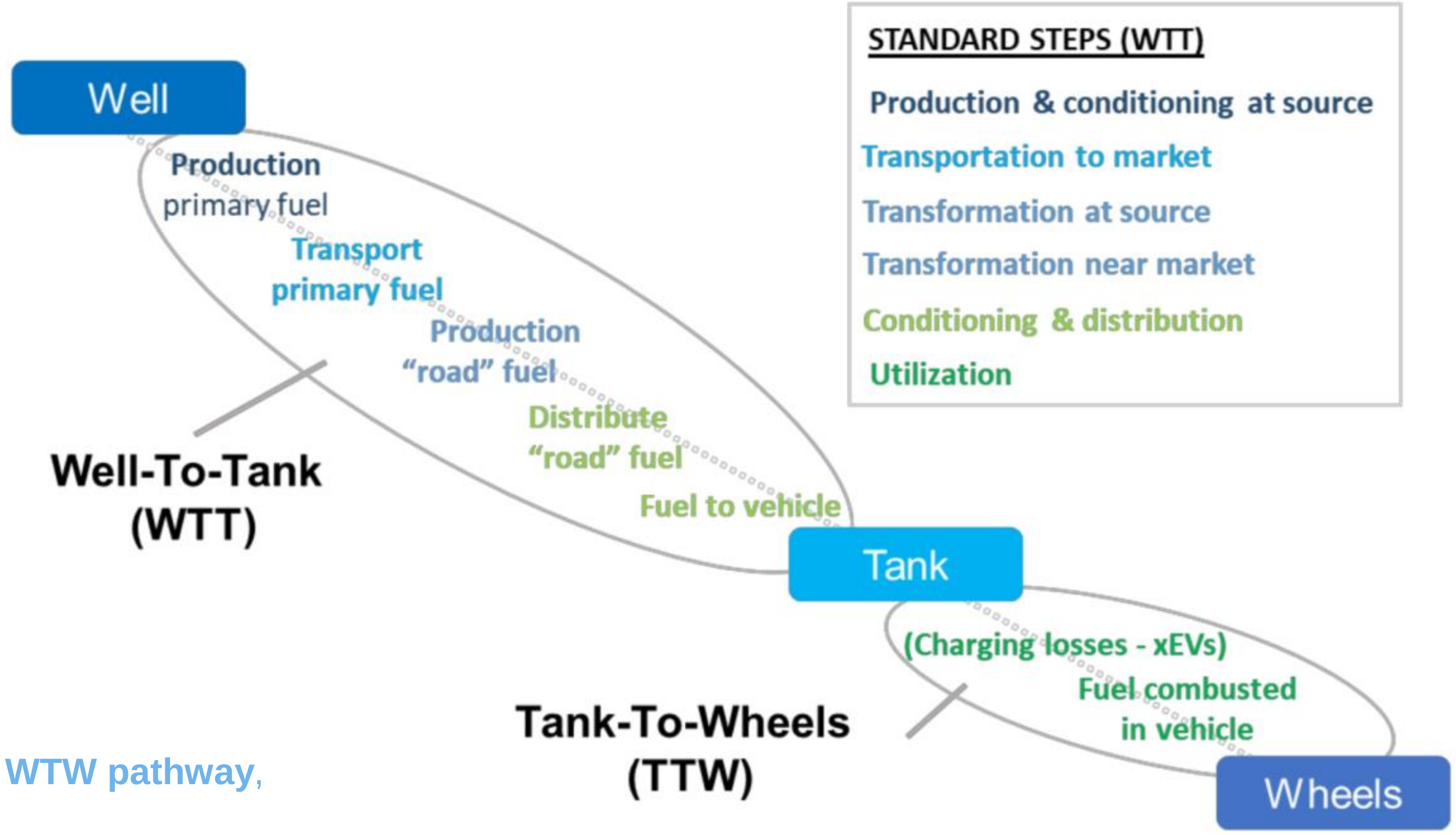
- DG-CLIMA study "**Determining the environmental impacts of conventional and alternatively fuelled vehicles through LC**A", performed by a consortium led by RICARDO.

- Data have been supplied for work of the **IPCC WG3 LCA data** (call for data on climate footprints and costs of mitigation options within the transport sector).

Methodological approach



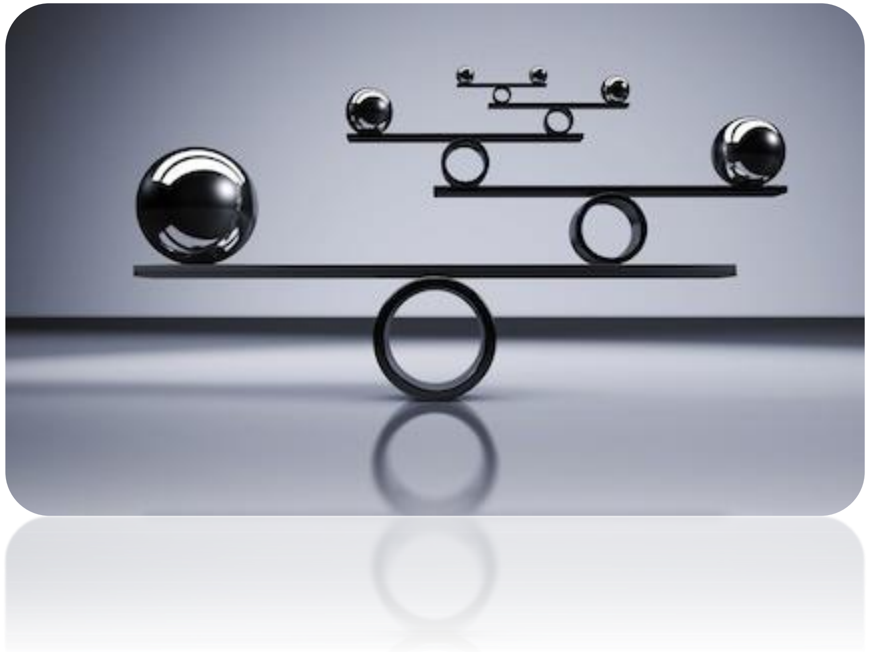
JEC WTW v5. Scheme



For each WTW pathway, calculate:

- **Total energy required**
- **Total GHG emitted**

WTW vs LCA



- **JEC** is **not a full LCA** and it **focuses** on CO2eq **emissions**.

- In JEC study are **not considered**:
  - emissions related to plants and vehicles building and manufacturing;
  - plants and vehicles end of life.

- Important **implication** of this **approach**:
  - for **electricity** and derived fuels (e.g. H2 and e-fuel) emission are **free of CO2eq emissions** produced from **wind** and **PV**.

Time Horizon

- **JEC** investigates this upcoming decade, in particular:
  - **current situation** (values labeled as 2016 but updated at **2018**)
  - **2030** time horizon (labeled as 2025+)

DECADE OF ACTION

Meth.choices: Co-product emissions: JEC vs REDII

A given (fuel) production process may produce multiple products*

* Co-products

Different routes can have very different implications in terms of energy, GHG, or cost

…and it must be realised that economics – rather than energy use or GHG balance – are likely to dictate which routes are the most popular in real life.

Co-products in RED and RED Recast

- **RED and RED Recast allocate GHG emissions to biofuels and co-products by energy content** (LHV), i.e.:
  - Emissions are allocated to the main product and on co-products on the basis of their respective energy contents

☑ **Allocation methods have the attraction of being simpler to implement**

☒ Any benefit from a co-product depends on what the by-product substitutes: allocation methods take no account of this

Co-products in JEC WTW Methodology

- **JEC methodology uses a substitution method**, i.e.:
  - All energy and emissions generated by the process are allocated to the main or desired product;
  - The co-product generates an energy and emission credit equal to the energy and emissions saved by not producing what the co-product is most likely to displace.

☑ **Closer representation of “real-life”: economic choices of stakeholders**

☒ Uncertainty: outcomes dependent on fate of co-products

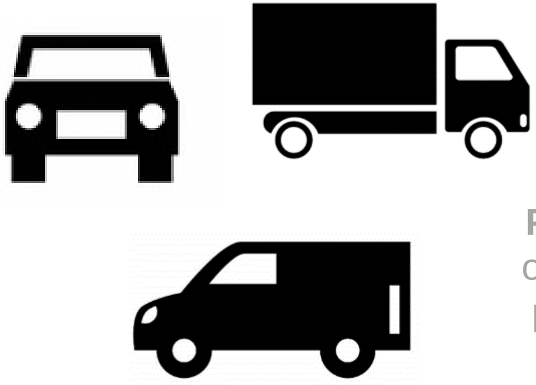
WTW Integration

WTT
fuel
gCO2 / MJ

> 250 Resource to fuel pathways

TTW
Powertrain
efficiency
MJ / km

FLEET



Penetration
of alternative
powertrains

>60 powertrains combinations

- > 1500 possible combinations!

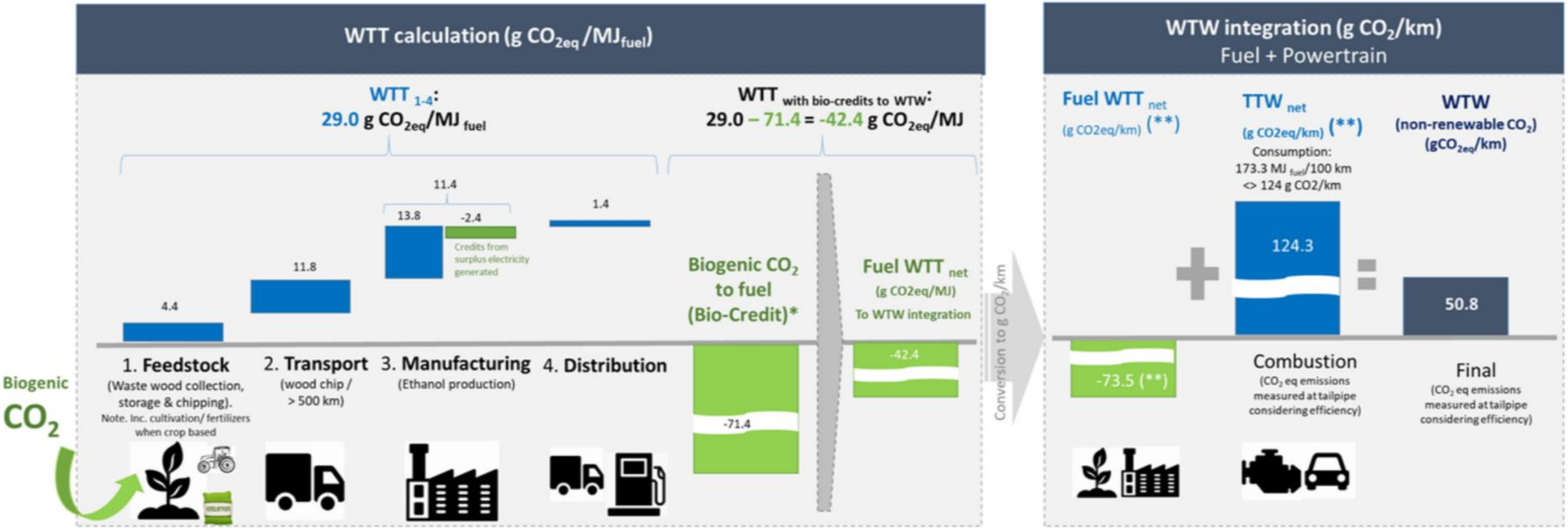
Pathways selection criteria

For **each fuel group** (i.e. ethanol, biodiesel, etc.) we selected a maximum of **5 WTT pathways** for WTW integration

Criteria to select pathways		**Icon**
Reference fuel for comparison	Conventional fuel: the alternative can be compared against (e.g. regular diesel).	
GHG emissions - Max **(Maximum value - gCO_{2eq}/MJ)**	Value close to the maximum allowed GHG Emissions, according to RED recast. As a general rule, WTT pathways with significantly higher GHG Emissions are not included in the comparison[5].	
GHG emissions - Min **(Minimum value - gCO2eq/MJ)**	The route offering the minimum WTT GHG emissions. This value, along with the maximum route mentioned above, determine the WTT range of the production routes explored towards a final fuel.	
Representative pathway	Selected pathway for the final fuel. Chosen by consensus within the JEC as example of one of the commercially available routes depending on the case (e.g. most frequent in Europe, higher share in the current mix, etc.).	
Special interest	Selected examples of interesting new pathways/ feedstock.	
Technology Readiness Level	TRL > 6 [(*)]	(no icon)

Note. [(*)] In this WTW report we have focused on WTT feedstock/conversion routes at or close to be ready for commercialization. Therefore, WTT pathways with Technology Readiness Level (TRL) <6 have been excluded for the present WTW comparison (For additional comparisons, we would suggest the reader to refer back to the individual WTT and TTW reports where all the results for individual pathways/powertrain modelled are detailed).

WTW integration



(*) CO_2 released back to the atmosphere when 1 MJ of the fuel is totally combusted. Equivalent to the amount of CO_2 initially captured by the tree during the photosynthesis process (zero net effect)

(**) WTT fraction related to the amount of fuel consumed in a specific powertrain:
$WTT_{net\ to\ WTW}$ = -42.4 (g CO_{2eq}/MJ) x 173.3 MJ $_{fuel}$/100 km <> - 73.5 g CO_{2eq}/km

HEAVY DUTY VEHICLES (HDV)

MAIN RESULTS

HDV in JEC v5

- Baseline year for vehicle simulations 2016 and the outlook 2025+
- **Powertrain**: Diesel (CI Compression Injection), Dual fuel (PI Port Injection + gas), Hybrid, **Battery** electric, **Fuel cell** electric, Electric road (**Catenary** Electric Vehicle)
- **Fuels**: Conventional (Diesel), alternatives diesel fuels (Biodiesel (B100), Paraffinic diesel (HVO hydrotreated vegetable oil, paraffinic diesel, eFuel) and ED95, Gaseous fuels (DME Di-Methyl-Ether), OME (Oxy-methylene-ethers), LNG (liquefied natural gas)/LBG (liquefied biogas), CNG (compressed natural gas)/CBG (compressed biogas), **Electricity**, **Hydrogen**
- Two applications using **VECTO** test cycle:
  - **Long haul 325kW** (VECTO **group 5**)
  - **Regional haul 220kW** (VECTO **group 4**)

Specifications reference models 2016 & 2025+

	Group 4	Group 5
Curb mass (90% Fuel + driver) [kg]*	5800	7550
Curb mass body/trailer [kg]	2100	7500
Engine power [kW]	220	325
Displacement [ccm]	7700	12700
Max. Torque [Nm]	1295 (1100 -1600 rpm)	2134 (1000-1400 rpm)
Rated speed [rpm]	2200	1800
Idling speed [rpm]	600	600
Engine peak BTE (%)	44.3	45.8
RRC [N/kN] (Steer/Drive/Trailer)	5.5/6.1/---	5.0/5.5/5.0
CdxA [m2]/vehicle height [m]	5.6/4	5.57/4
Transmission type	AMT	AMT
Efficiency indirect gear	96%	96%
Efficiency direct gear	98%	98%
Axle Ratio	4.11	2.64
Axle Efficiency	96%	96%
Advanced Driver Assistance Systems (ADAS)	---	Predictive Cruise Control (PCC)** + Eco-roll***

* This definition refers to the mass as specified under the 'actual mass of the vehicle' in accordance with Commission Regulation (EC) No 1230/2012 (1) but without any superstructure
** Predictive cruise control manages and optimises the usage of the potential energy during a driving cycle
*** Eco-roll reduce the engine drag losses by disengaging the engine from the wheels during certain downhill conditions

	Group 4	Group 5
Curb mass (90% Fuel + driver) [kg]*	5665	7485
Curb mass body/trailer [kg]	2035	7365
Engine power [kW]	220	325
Displacement [ccm]	7700	12700
Max. Torque [Nm]	1295 (1100 -1600 rpm)	2134 (1000-1400 rpm)
Rated speed [rpm]	2200	1800
Idling speed [rpm]	600	600
Engine peak BTE (%)	45.6	47.2
RRC [N/kN] (Steer/Drive/Trailer)	5.02/5.57/---	4.57/5.02/4.57
CdxA [m2]/vehicle height [m]	5.39/4	4.96/4
Transmission type	AMT	AMT
Efficiency indirect gear	96%	96%
Efficiency direct gear	98%	98%
Axle Ratio	4.11	2.64
Axle Efficiency	96%	96%
ADAS	PCC** + Eco-roll***	PCC + Eco-roll

* This definition refers to the mass as specified under the 'actual mass of the vehicle' in accordance with Commission Regulation (EC) No 1230/2012 (1) but without any superstructure
** Predictive cruise control manages and optimises the usage of the potential energy during a driving cycle
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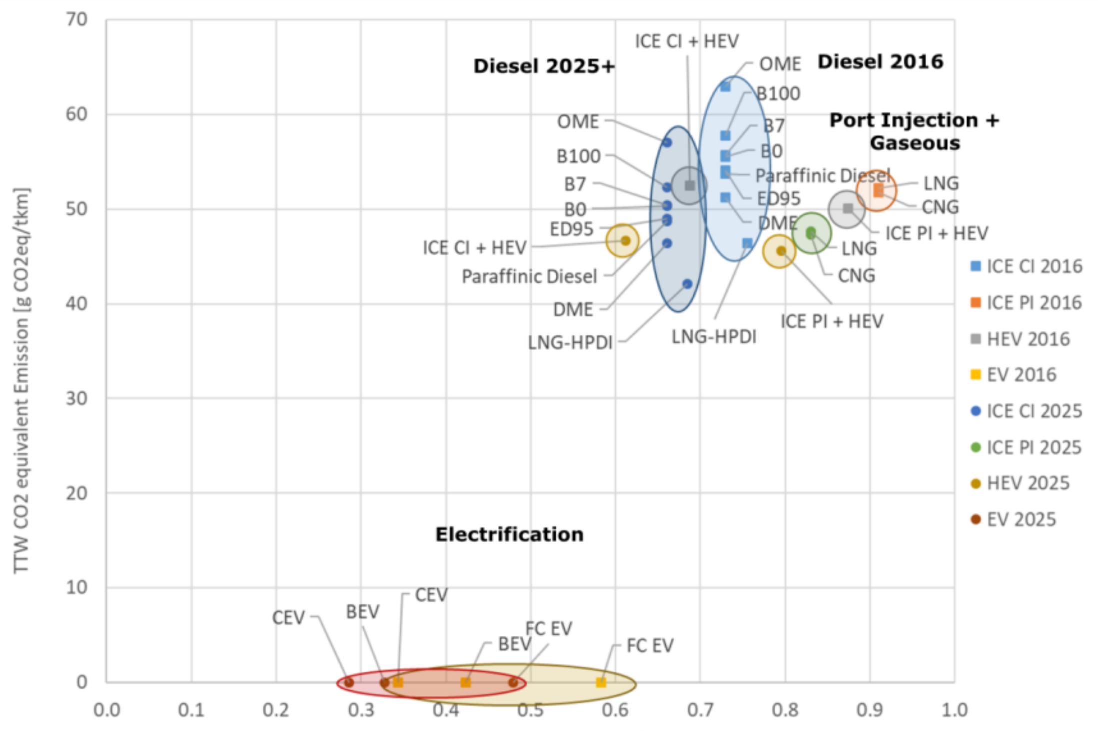
Fuel and powertrain configurations considered

Fuel \ Powertrain	ICE CI (Diesel)	ICE PI (Gasoline)	ICE CI + HEV	ICE PI + HEV	BEV	FCEV	CEV (electric road)
Diesel B0	Both						
Diesel B7 market blend	Both		Both				
DME	Both						
ED95	Both						
Electricity					Both		Both
Biodiesel (B100)	Both						
Paraffinic Diesel	Both						
CNG		Both		Group 4			
Hydrogen						Both	
LNG (EU mix.)	Both	Both		Group 5			
OME	Both						

TTW - Results

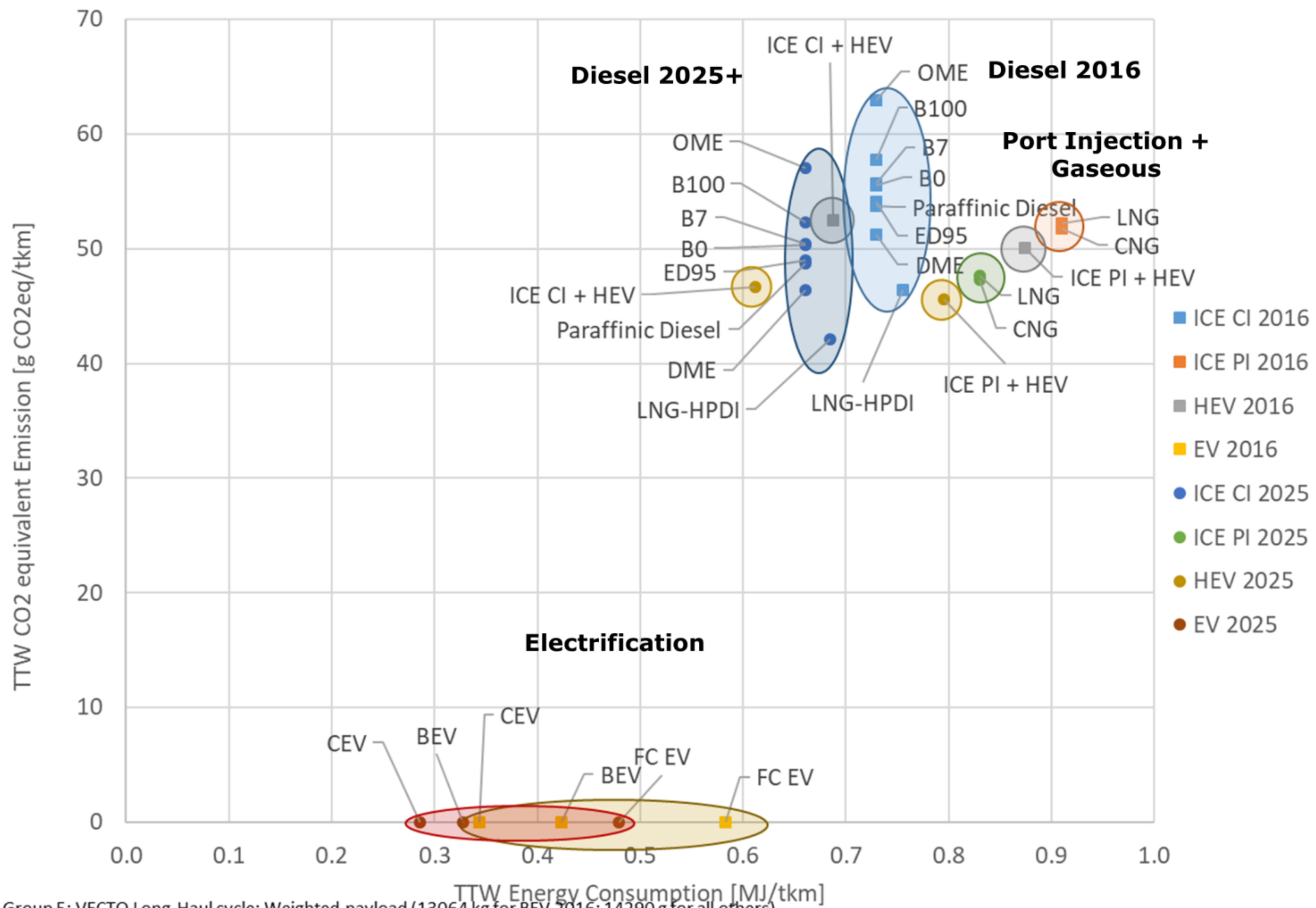


Group 5; VECTO Long-Haul cycle; Weighted payload (13064 kg for BEV 2016; 14290 g for all others)
Analysed propulsion systems do vary in performance criteria like operating range, payload capacity or fuelling time

When **upstream emissions** are **not considered** (TTW):

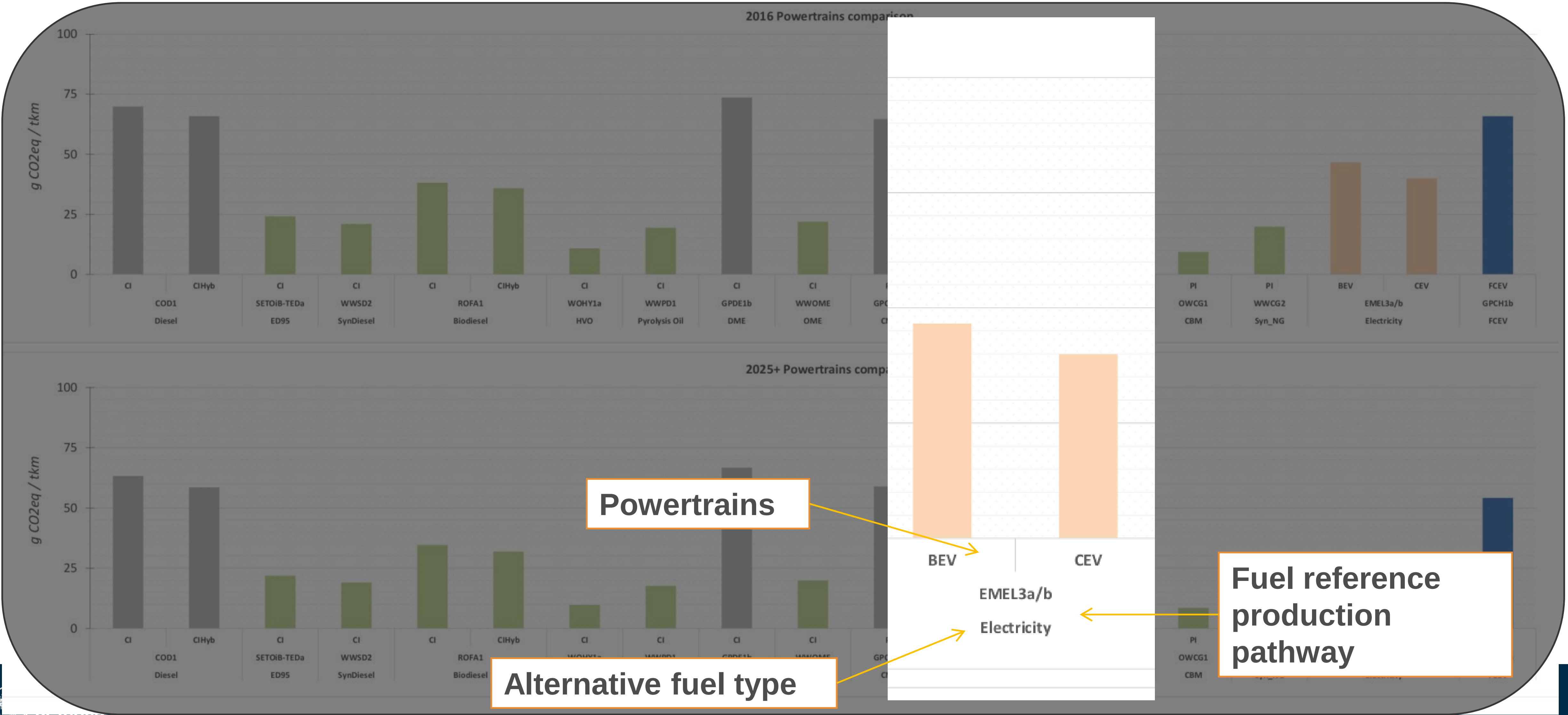
- **Fully electric** and **fuel cell alternatives** offer **zero TTW GHG emissions** and **significantly higher energy efficiency, up to 2.5 times** for **catenary electric vehicle** (CEV, electric road).

TTW results

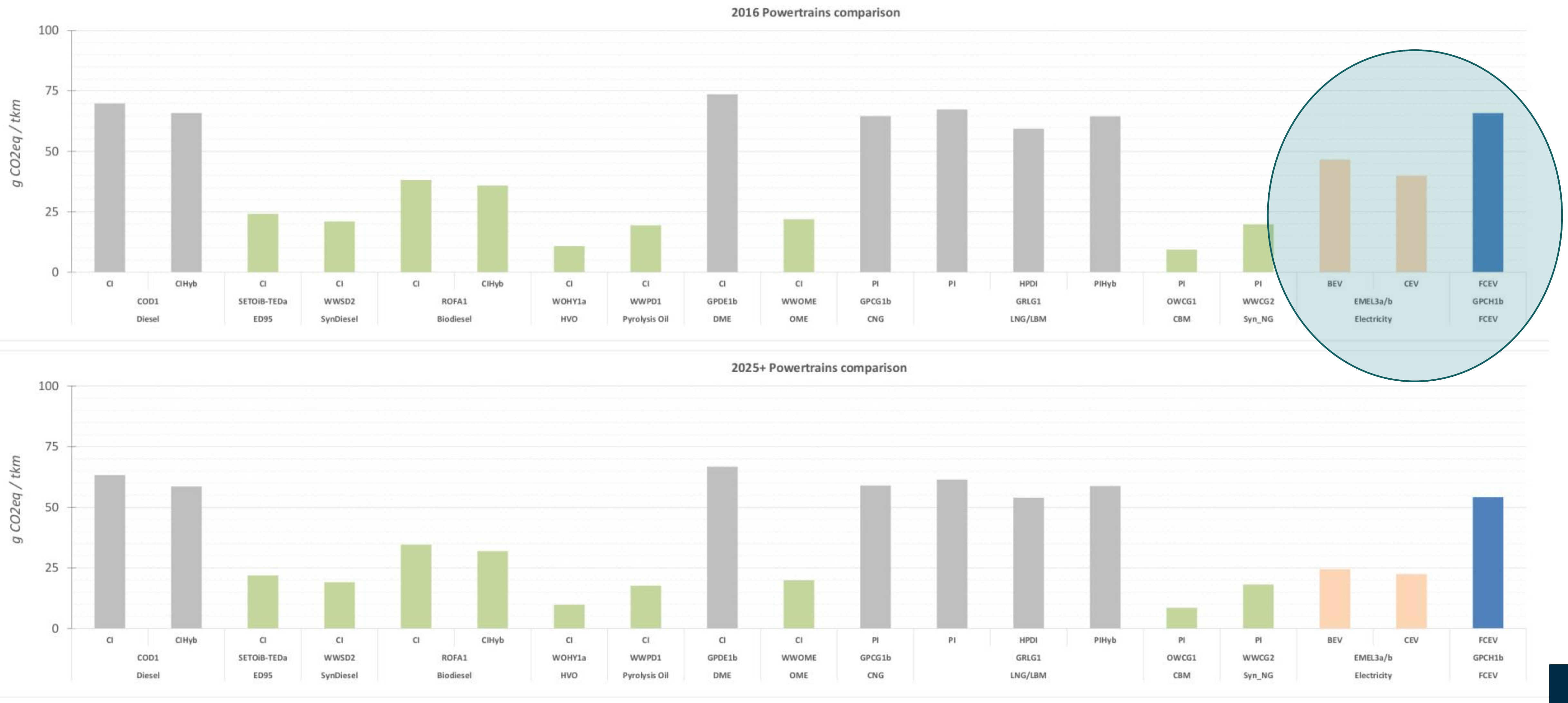


Group 5; VECTO Long-Haul cycle; Weighted payload (13064 kg for BEV 2016; 14290 g for all others)
Analysed propulsion systems do vary in performance criteria like operating range, payload capacity or fuelling time

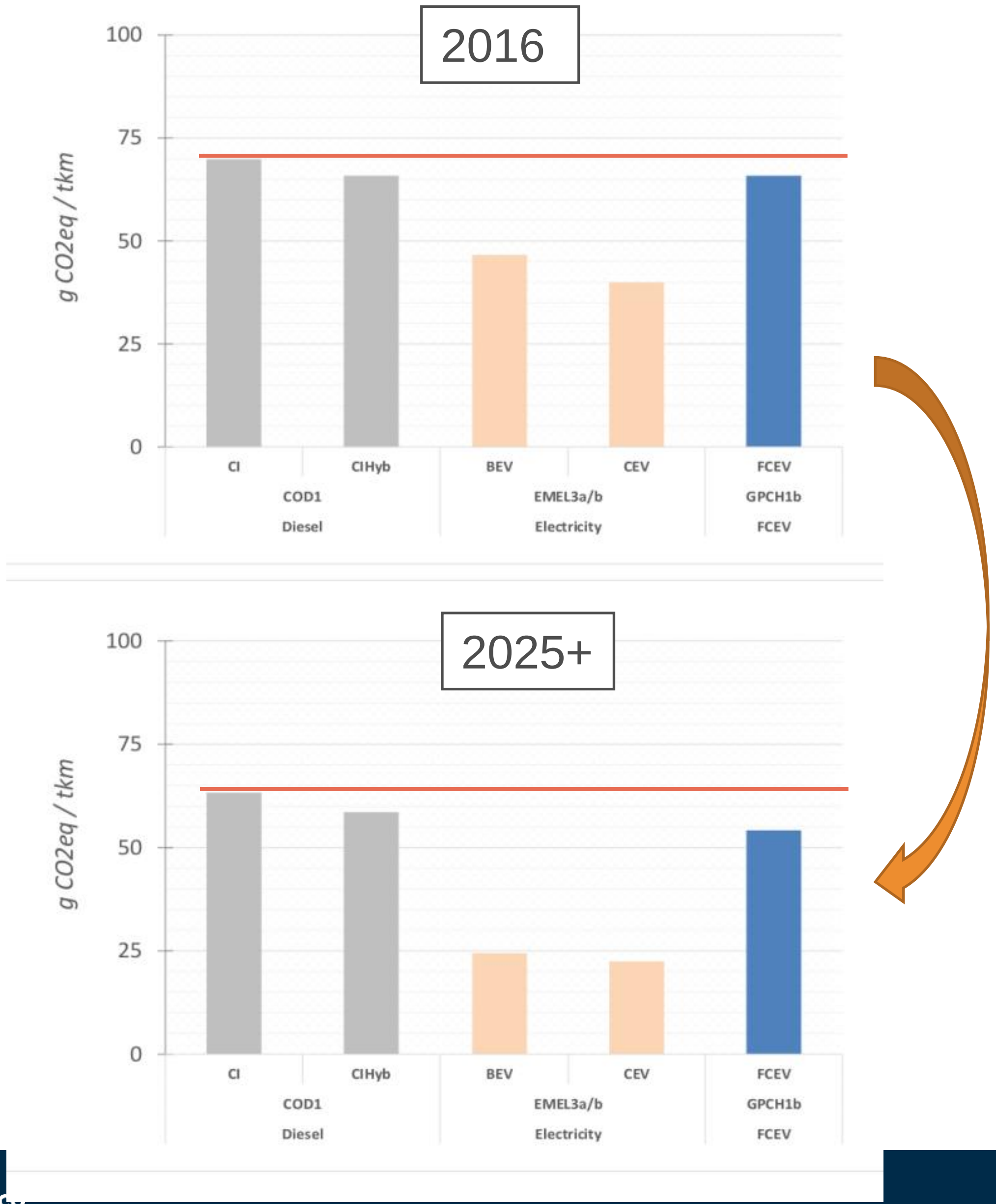
HDVs WTW – Powertrains (2016 – NEDC / 2025+ WLTP) - Type 5



HDVs WTW – Powertrains (2016 – NEDC / 2025+ WLTP) - Type 5



PC WTW – Powertrains - Type 5



EU electricity **mix** is used as a **proxy**.

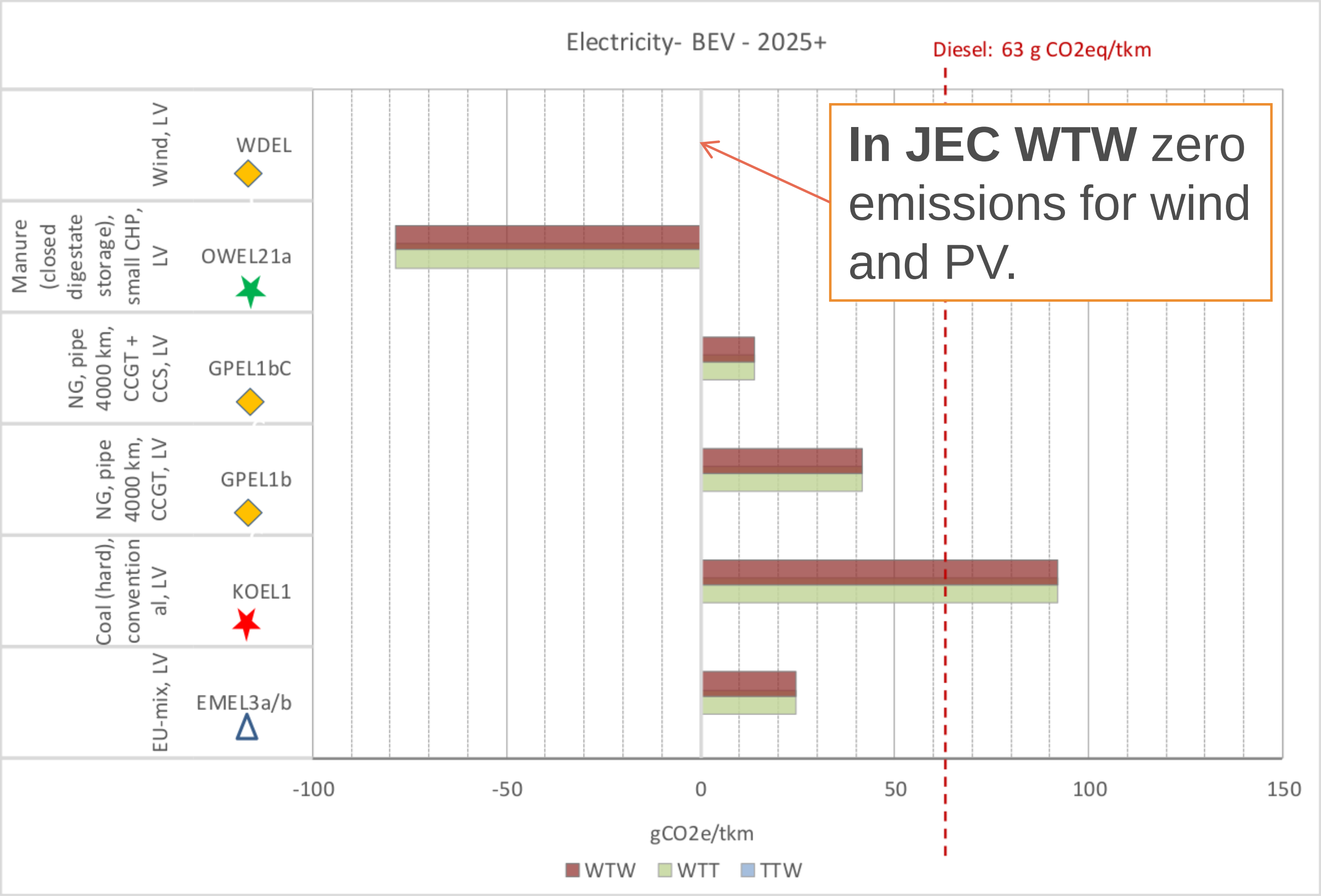
EU-ETS and **European Green Deal** are expected to push for **reducing GHG intensity** of EU **energy mix**, **far beyond** what modeled on the base of the current status of knowledge.

In the **transition**, the **reaction** of the **whole electricity production system** will **define** GHG **emissions**, **related to** a **marginal increase** in electricity demand for **road sector**.

Electricity in Battery Vechicles

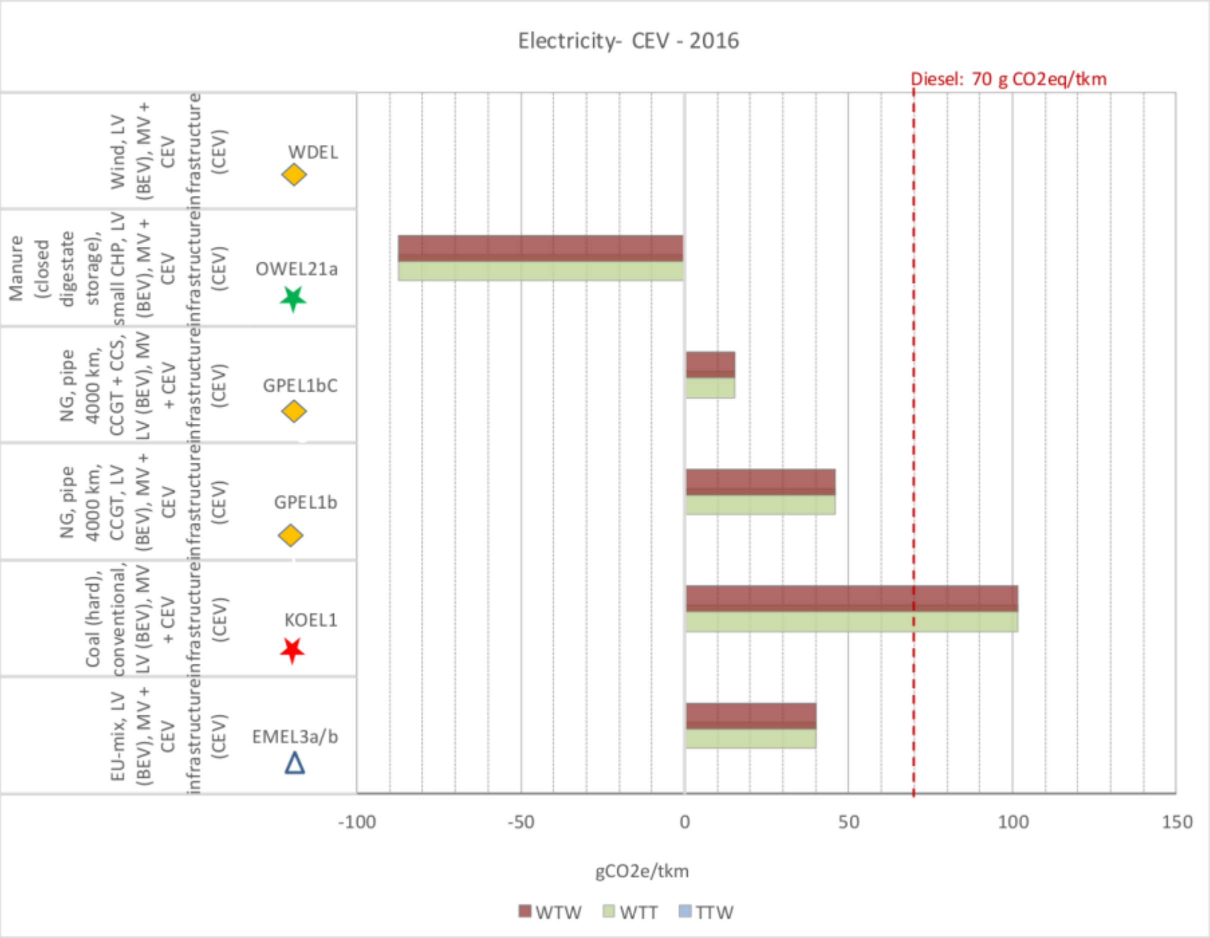
Additional demand from transport, in the **transition** towards a fully green electricity production system**, may lead to displace 1 green kWh from a sector to another (**economic value/4X multip.**). If** the **production generation is limited, system may react consuming fossil resources.**

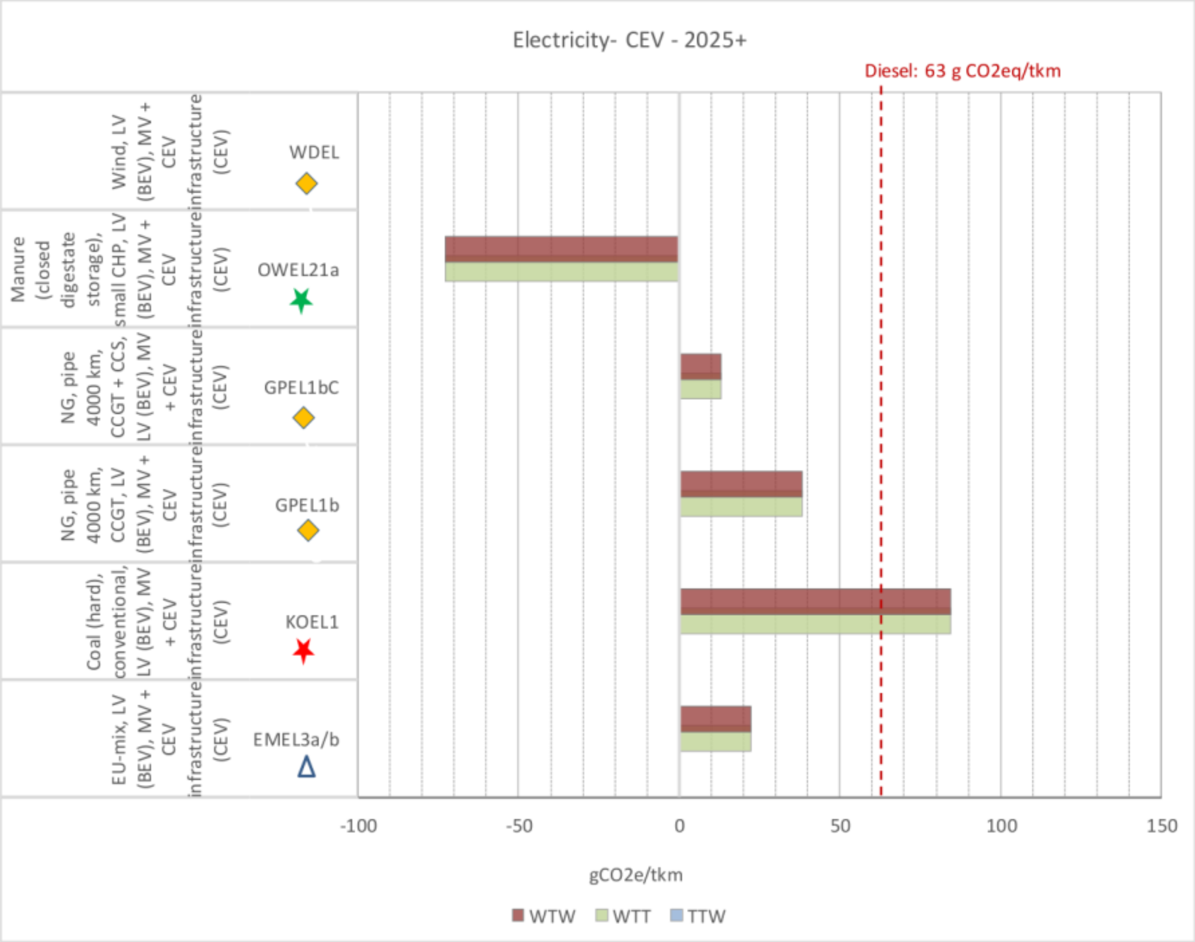
BEV using **EU mix** are already **able to provide a significant saving against** standard **ICE/diesel.**



In JEC WTW zero emissions for wind and PV.

Electricity driven powertrains - Catenary





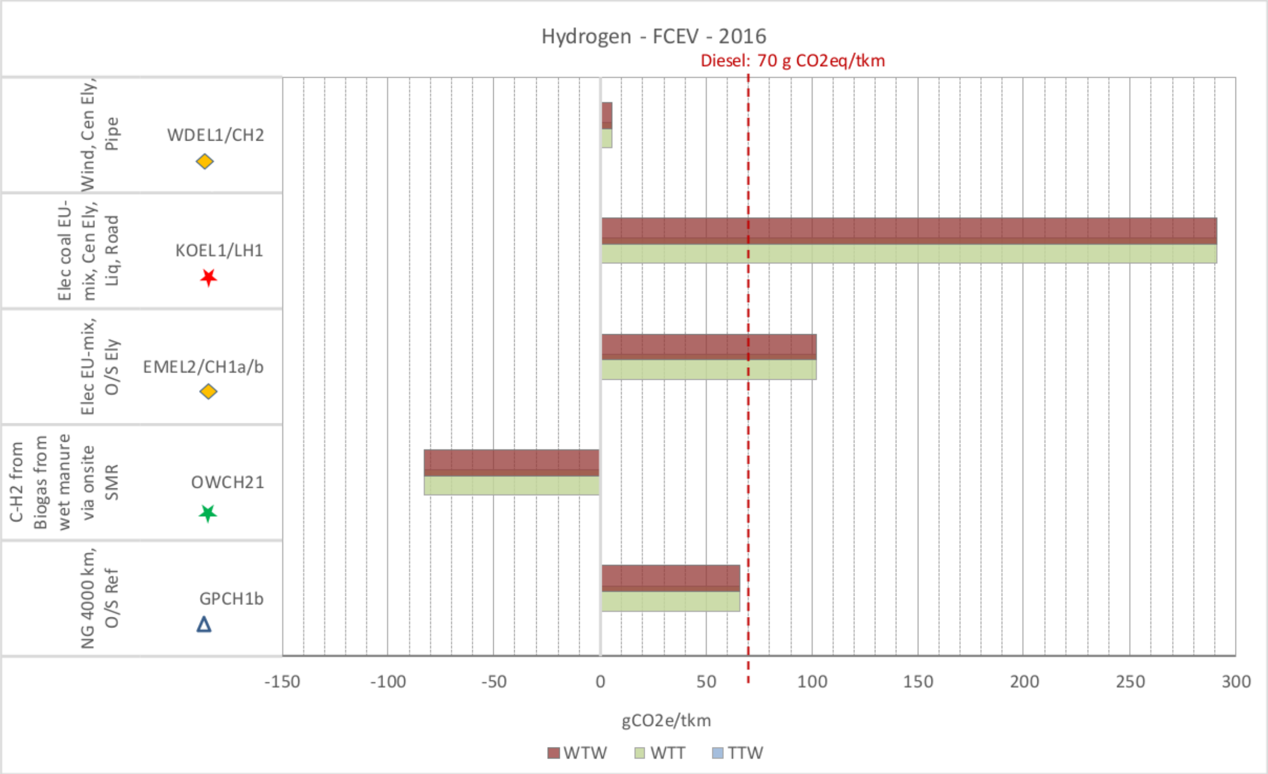
CEV are **mainly operated** at **catenary** mode and **partly at battery (BEV) mode**

Main outcomes – fuel comparison

1. **Electricity** and **Hydrogen** are energy vectors, so their WTW potential to lower **CO2 emissions depend on the primary source of energy used** for the production.

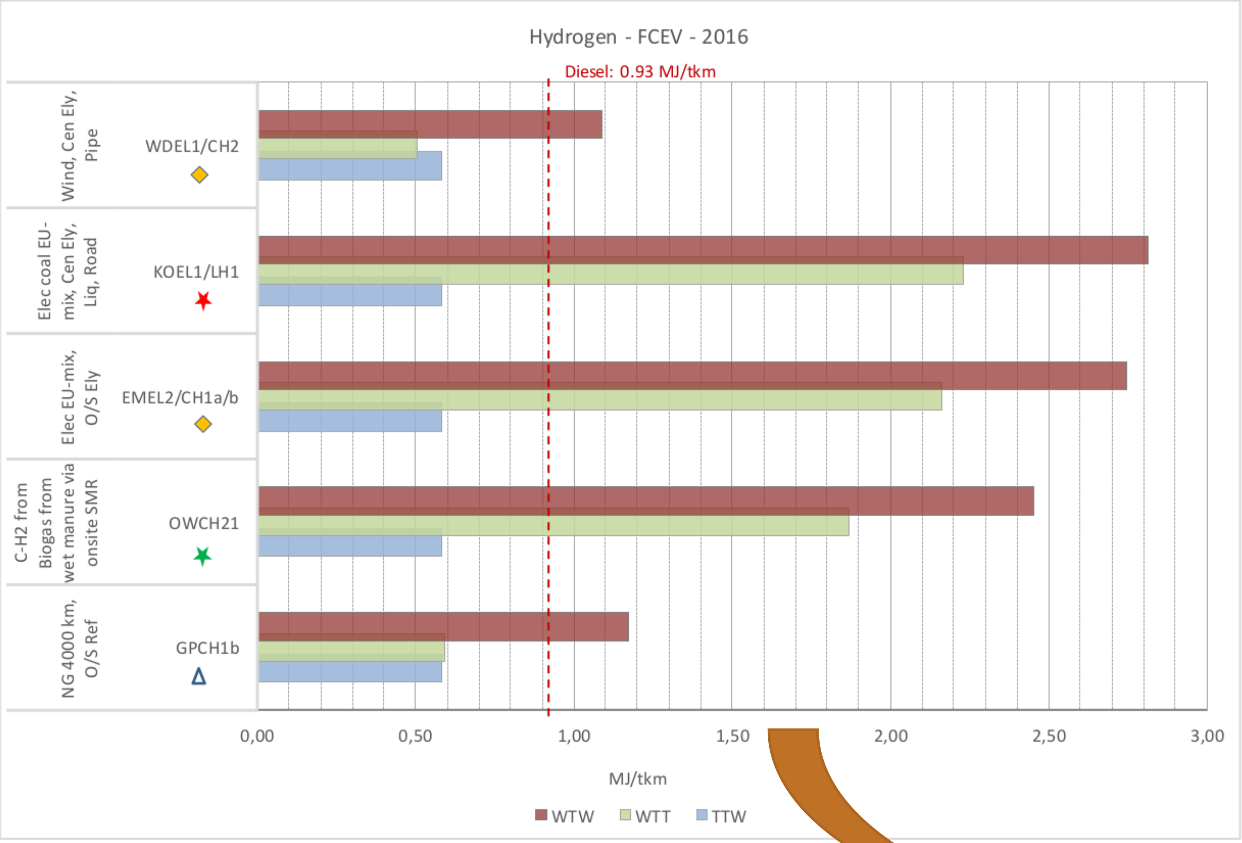
2. The use of **renewable electricity** for **xEVs** and **H2** production for **FCEV** offer **one of the lowest WTW intensive combinations**.

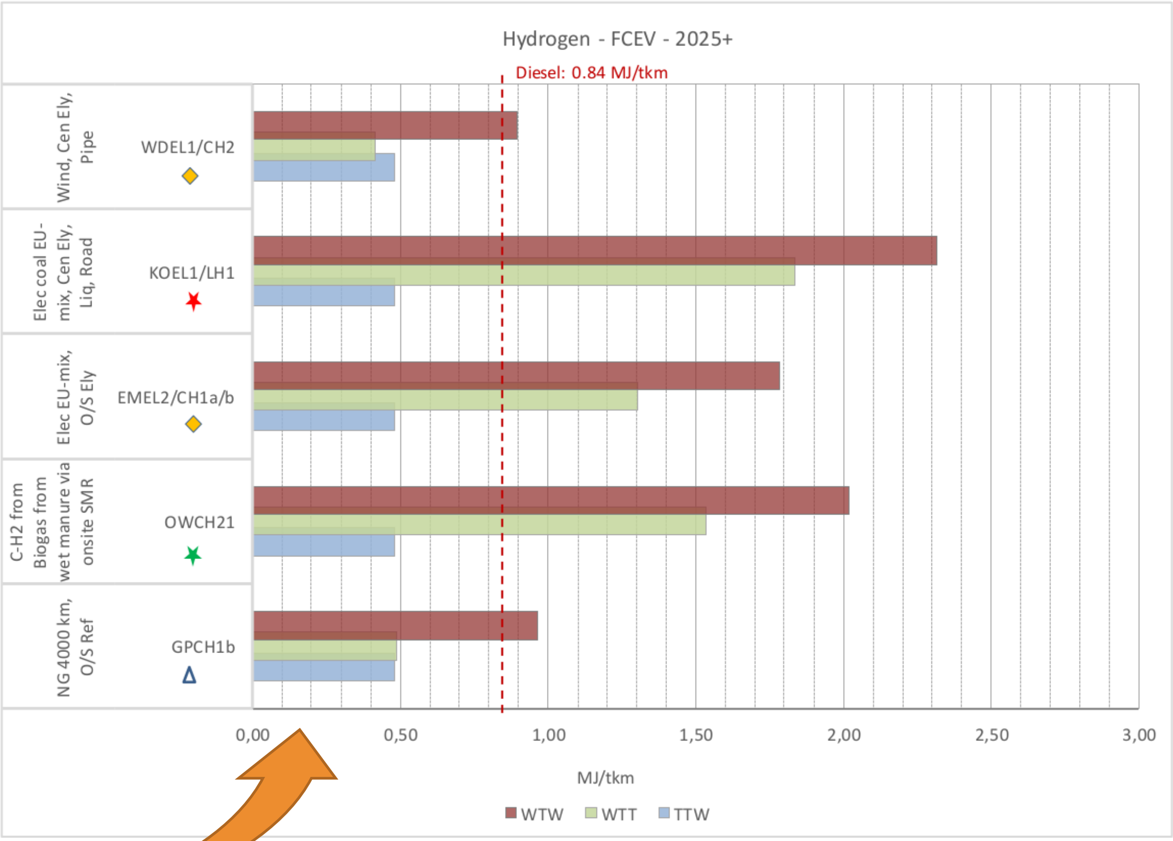
Hydrogen - FCEV Emissions



Hydrogen is assumed to be produced from electricity, via electrolysis. **Emissions are then determined by the electricity production pathway.**

Hydrogen - FCEV Energy expanded



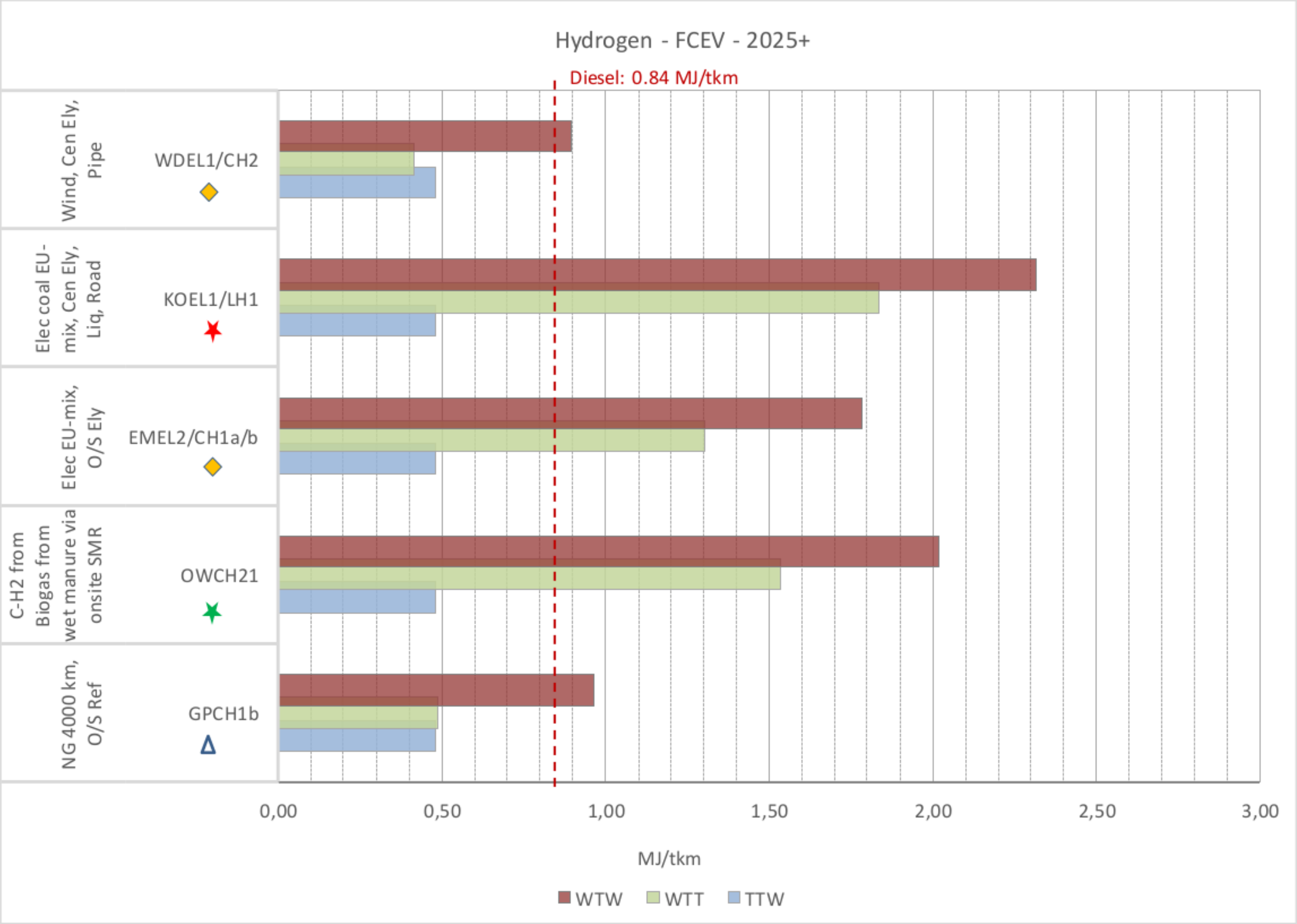


Strong **reduction in energy demand** expected for all the analysed pathways.

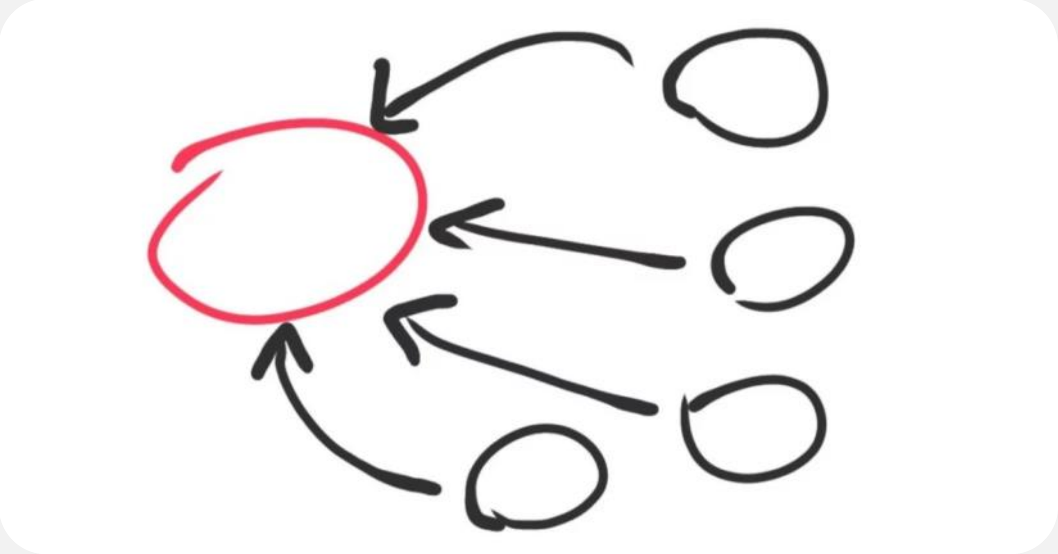
Hydrogen - FCEV Energy expanded

The **WTW energy use** for **FCEV** combined with the selected pathways **is higher than that for conventional diesel** used **in CI engines**.

Significant amount of **primary energy required** for **H2 production** using electrolysis => overall **system efficiency issue.**



Conclusions



Conclusions

- When the **WTT** and **TTW results** are **combined**, **factors** such as the **conversion pathways**, the **feedstock/resource** used, together with the **specific powertrain** technology in the 2015/2025+ **timeframe** have a **strong impact** on the final **results**.

- **Electricity** in BEV and PHEV, **e-fuels** in ICE as well as **Hydrogen** in FCEV are **promising options but** their potential for **GHG saving** is **mainly determined** by the pathway of the **electricity production** and/or by the **system reaction** from **displacement** of the **kWh from a sector** (i.e industry) to **another** (i.e. transport).

Thank you

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Q&A

Experience sharing about energy savings from EVs

3rd PA Dialogue Group, December 7, 2021

PART 3: Full demo of the streamSAVE Training Module

Full Demo

streamSAVE Training Module

Maria Lopez Arias – CIRCE

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3rd PA Dialogue Group, December 7, 2021

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Full demo of the streamSAVE Training Module

Refrigeration systems

Calculate

This methodology is valid for new installations of air- or water chilled central compression refrigeration units in compliance with the new Ecodesign regulations. It is based on the Seasonal Energy Performance Ratio (SEPR) of high-temperature process chillers at the rated refrigeration capacity of the unit.

Building Automation & Control Systems

Calculate

This methodology is valid for calculating the impact of installing or upgrading BACS on the energy demand of building(s). It is based on the BAC factor method and can be used for calculating savings in residential and non-residential buildings, for five types of end-use (heating, cooling, domestic hot water, ventilation and lighting) and for the three climate regions. A factor for rebound effects is foreseen.

Electric vehicles

Calculate

This methodology targets the fuel switching between conventional and electric vehicles. The conventional options include vehicles using diesel, petrol and LNG, as well as hybrid options. The more efficient options include electric vehicles. Therefore, the savings are not only ensured with higher conversion efficiency but also with the ensured fuel switching between the use of fossil fuels and electricity, which is increasingly generated based on renewable resources. Therefore, such fuel switching is able to ensure a reduction of fossil fuel consumption, with the associated primary energy savings and reduction of GHG emissions.

Lighting systems

Simplified Approach | Engineering Approach

This methodology deals with the replacement of existing road lighting systems to more energy efficient technologies. It provides two different formulas for the calculation of energy savings of the implementation of measures that account not only for the replacement of existing light points but also for the installation of lighting control technologies. The methodology can be applied in all Member States, following the provided indicative values and indications.

Heat recovery

On-site applications | On-site process | District heating

Savings calculation methodologies covered by this Priority Action focus on heat recovery from industrial processes used on-site and in district heating grids. There is a wide spectrum of heat consuming applications in industry that are suitable for heat recovery actions; therefore, it is not feasible to define one representative application. Methodologies have been prepared for the following three cases:

- Heat recovery for on-site use in industry - use of excess heat for on-site applications
- Heat recovery for on-site use in industry - feedback of excess heat into a process
- Heat recovery for feed-in to a district heating grid

https://streamsave.flexx.camp/training

Q&A

Full demo of the streamSAVE Training Module

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Next steps

Methodologies

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Next steps

- Meeting minutes
  - please feel free to send us your suggestions, either in the online forum or to dialogues@streamsave.eu
- All information will be included on the platform
  - in case you are not registered yet, we will show you how
- Training Module: now available → you can provide feedback directly in the platform
- The discussions continue in the online forum

Next Dialogue Activities

- + 2 dialogue workshops in first semester 2022,
- and a new cycle of dialogue groups starting from March 2022

Feedback

- Please, fill out our quick feedback survey

- You may also leave us a longer message
  - Via forum on the streamSAVE platform
  - Via the anonymous form (link in the chat)
  - Via dialogues@streamsave.eu
    - Please accept as sender

- To receive more info → register on the streamSAVE platform: https://streamsave.flexx.camp/signup-0818ml

Project Partners

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Agence de l'Environnement et de la Maîtrise de l'Energie

LGi
sustainable innovation

Thank you

Get in touch for more information!

Project coordinator - Nele Renders, VITO

All project reports will be available for download on the streamSAVE website www.streamsave.eu

Email the project at contact@streamsave.eu

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