

# Scenarios for a climate neutral Belgium by 2050

CFDD – FRDO Webinar

The electrification of mobility

17/1/2022

Climate Change Service  
Federal Public Service Health,  
Food chain safety and Environment



# THE NEW 2050 PATHWAYS EXPLORER

Choose an example pathway

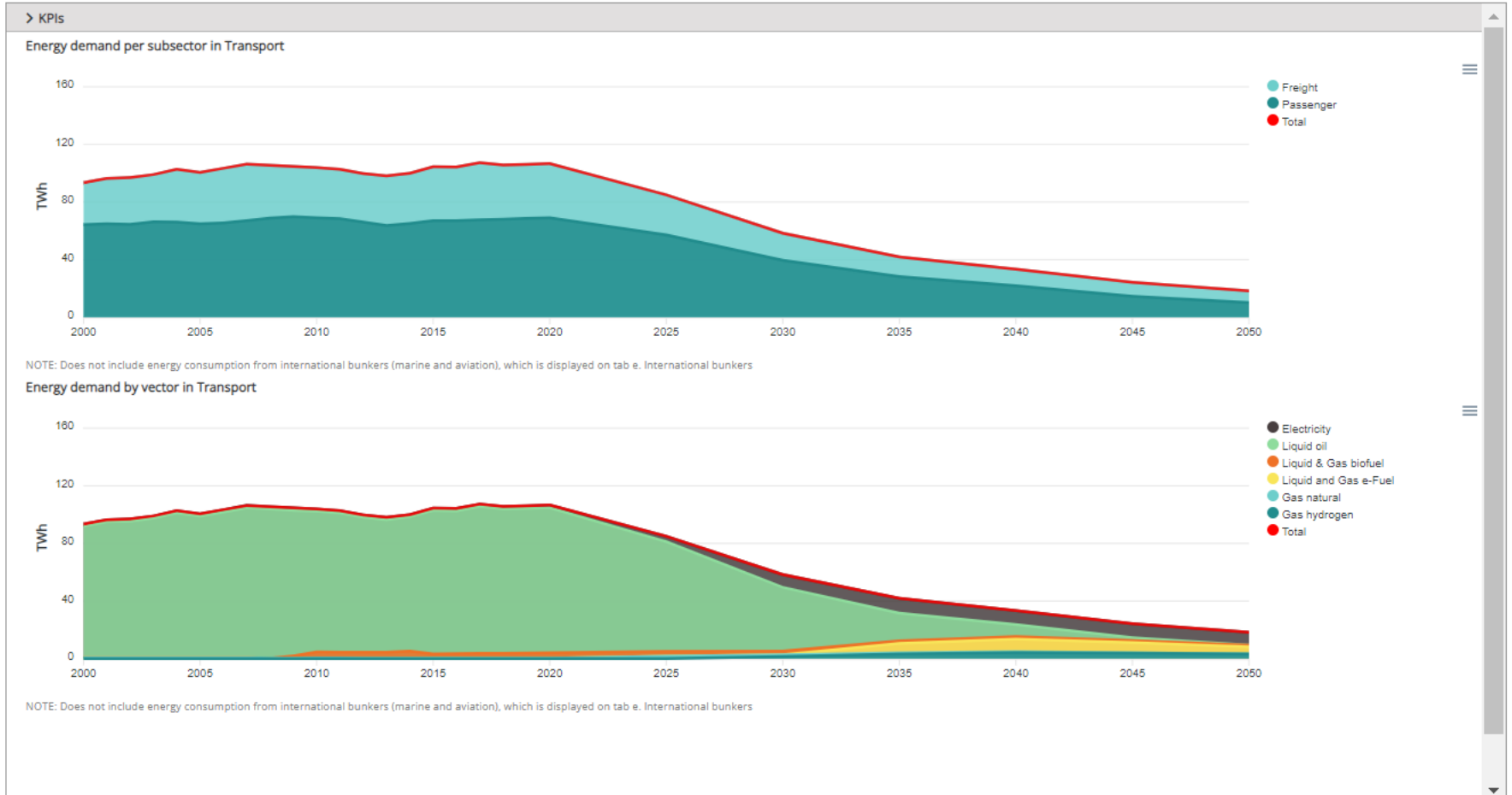
CORE -95%

Total | Buildings | **Transport** | Industry | Energy production | Food and AFOLU | Air

b. Energy Demand

Belgium

Key behaviours	1	2	3	4
Travel	1	2	2.8	4
Passenger distance	1	2	3	3.3
Mode of transport	1	2	2.5	4
Occupancy	1	2	3	3.3
Car own or hire	1	2	3	4
Buildings	1	2	3	4
Diet	1	2	3	4
Consumption	1	2	3	3.3
Transport	1	2	3	4
Freight Transport	1	2	3	3.3
Energy Efficiency	1	2	3	3.5
Freight mode	1	2	3	3.5
Technology evolution	1	2	3	4
Vehicles utilization and load factor	1	2	3	3.5
Passenger Transport	1	2	3	3.1
Energy Efficiency	1	2	3	3.5
Automation of LDVs	1	2	3	3.5
Technology evolution	1	2	3	4
Technology and fuels	1	2	2.6	4
Buildings	1	2	2.6	4
Residential	1	2	2.7	4
Services	1	2	2.4	4
Heating and cooling behaviours	1	2	3	4
Hotwater demand	1	2	3	4
Deployment of cooling systems (Non-residential)	1	2	3	4
Buildings envelope	1	2	3	4
Low-carbon heating solutions	1	2	2.7	4



# A SET OF 3 MAIN SCENARIOS REACHING 95% GHG BY 2050, ACCOMPANIED WITH 5 COMPLEMENTARY SCENARIOS

REFERENCE

The Reference scenario is based on business-as-usual evolutions

Starting from the CORE 80 scenario defined in 2013, the CORE 95 scenario goes further thanks to new societal changes & new developments in technologies

This scenario goes further into lifestyle changes such as transport demand, housing area per person or changes in diets

BEHAVIOUR

CORE 95  
-95% GHG in  
2050

TECHNOLOGY

This scenario goes further into technology developments such as energy efficiency, innovative technologies deployment, synthetic fuels & hydrogen

ENERGY MIXES  
ELEC H2 EFUELS BIO

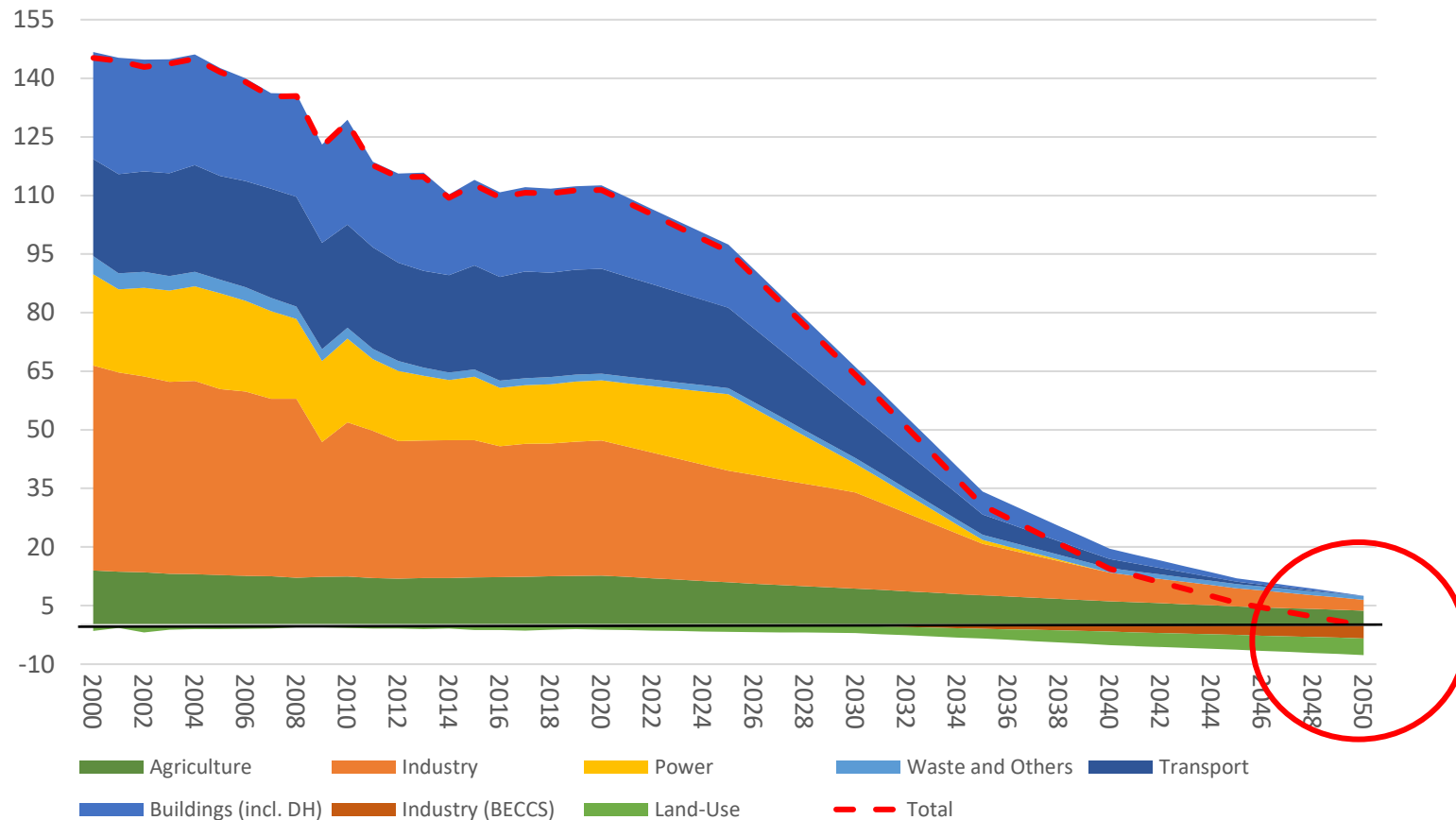
HIGH ENERGY  
DEMAND

Based on the CORE 95 scenario, these scenarios explore alternative energy mixes

This scenario allows to analyse the impact on energy supply of a high total energy demand

# It is technically feasible to reach climate neutrality by 2050 in Belgium and several trajectories can be pursued

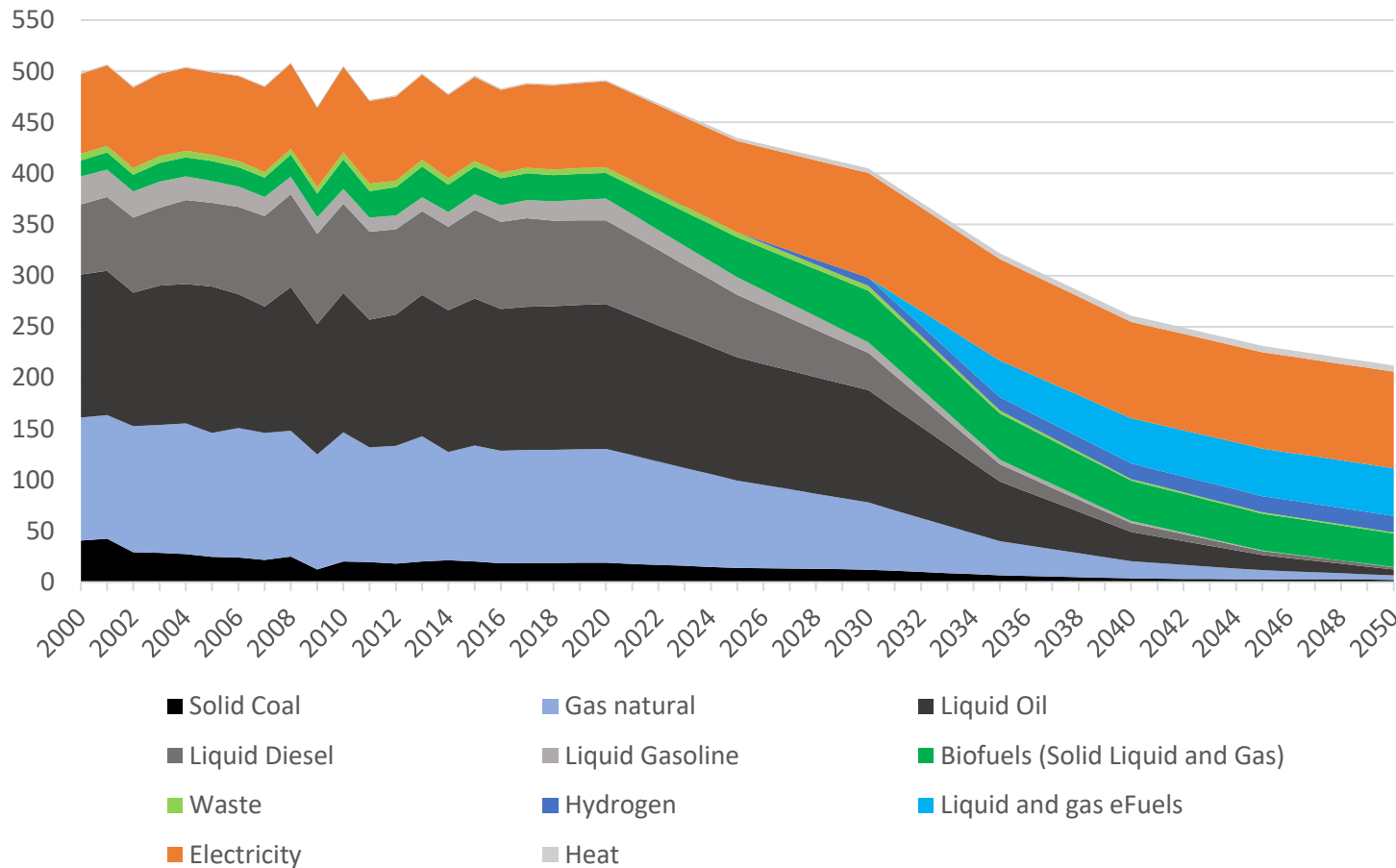
Total GHG emissions 2000-2050 (MtCO<sub>2</sub>e) – CORE 95 scenario



- Climate neutral scenarios lead to a reduction of GHG emissions of about **95% wrt 1990** in 2050
- All sectors** contribute to the reduction
- Structural changes** are required not only in the energy system but **also in consumption, transport and diet patterns**
- Societal and technological changes are both necessary

# Fossil fuels are gradually being phased out and replaced by carbon-free or carbon neutral energy sources

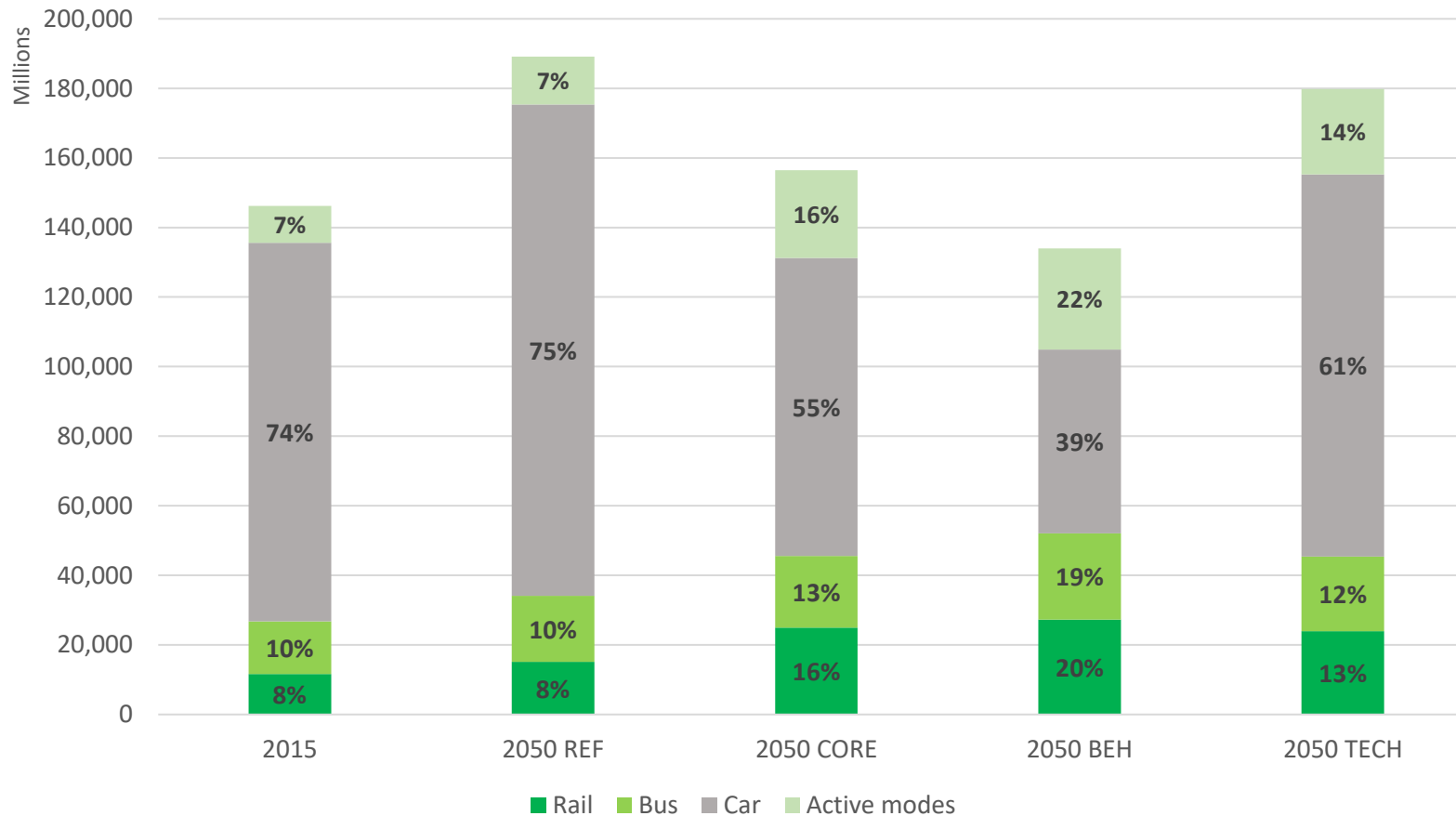
Evolution of final energy demand per vector CORE-95 scenario  
(in TWh, incl. feedstocks)



- In 2015, fossil fuels accounted for 77% to total final energy demand
- By 2050, this share **drops to 7%** in the CORE scenario, i.e. a decrease of 95%
- Limited remaining fossil fuels used in industrial processes and as feedstock & are combined with CCUS
- While in absolute **levels electricity** consumption does not increase drastically, its share of final energy demand becomes very important throughout the analyzed scenarios
- **Biomass** to be used mainly in industry (as feedstock) and where electrification is (too) difficult to achieve (partly in some buildings and specific vehicles in the transport sector)
- **H2/e-fuels**: idem as biomass

Strong modal shift for passengers towards public transport and active modes which, together with reduced demand, higher occupancy and increased usage per vehicle leads to a strong decrease of the total number of cars by 2050

Passenger transport demand (pkm) - modal share



- Behavioural changes lead to **reduced transport demand wrt REF scenario**
  - -17% in CORE
  - -29% in BEH
  - -5% in TECH
- Modal shift **away from the use of cars**, from 75% in REF to 55% in CORE
- Increased **use of rail**, from 8% to 16% in CORE
- Increased **use of bus**, from 10% to between 12 and 19%
- Increased **use of active modes**, from 7% to between 14 and 22%

# THANK YOU!

[www.climatechange.be/2050](http://www.climatechange.be/2050)

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