

# Trucking into a Greener Future





## 01. Approach

# Stakeholder consultation guided the scenario analysis

## STAKEHOLDERS CONSULTED THROUGHOUT THE PROJECT

- on data
- on assumptions about the future
- on scenarios to model

## STAKEHOLDERS INCLUDE

- vehicle and component manufacturers
- infrastructure providers
- logistics experts
- NGOs

## DATA INPUTS

Data on volume of energy needed to provide mobility service



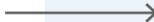
Data on cost & efficiency of energy-converting technology



Data on price of oil, gas and electricity



Economic projections

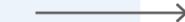


## EXPERT PANEL



Reviews:

- Data
- Scenarios
- Assumptions



## STOCK MODEL

Calculates the stock of capital assets & energy consumption per sector on an annual basis



## SIMULATION MODEL



## MODEL OUTPUTS

- Employment impact across sectors
- Impacts on household budgets
- Changes to consumption, GDP
- Changes to energy trade balance
- Changes to CO<sub>2</sub>, NO<sub>x</sub>, particulates



## 02. Impacts on the vehicle fleet

# The four technology scenarios

## TECH ICE

- A rapid deployment of fuel efficient vehicles into new ICE vehicles
- No change in the types of powertrains sold

## TECH FCEV

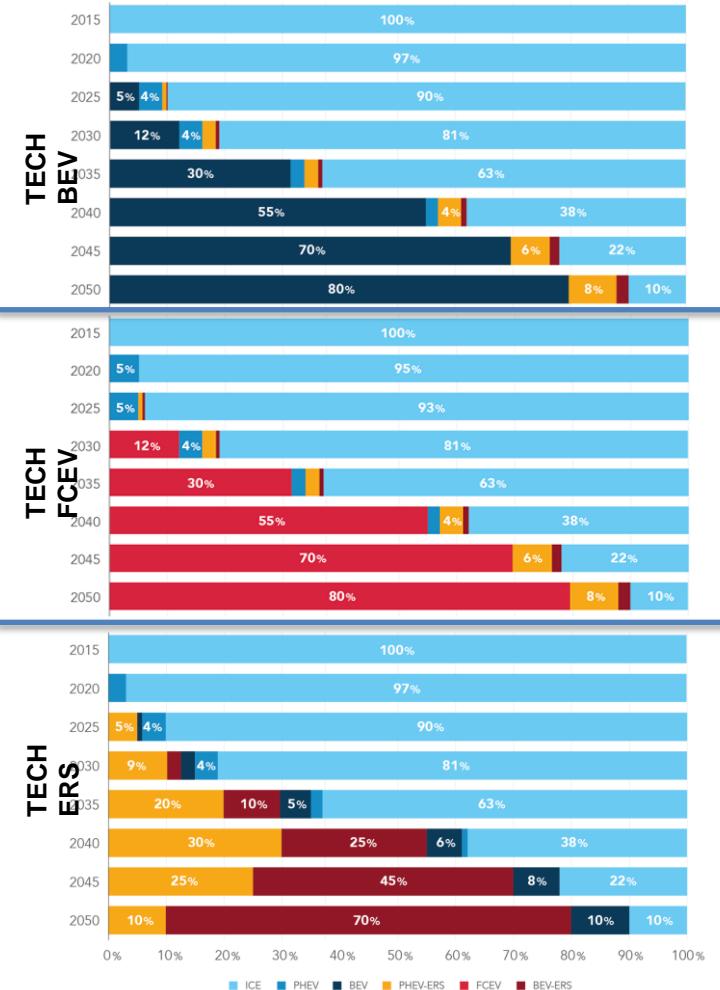
- A rapid deployment of fuel efficient vehicles into new ICE vehicles
- A shift away from ICEs and towards FCEVs for new heavy goods vehicles, particularly post-2030

## TECH BEV

- A rapid deployment of fuel efficient vehicles into new ICE vehicles
- A shift away from ICEs and towards BEVs for new heavy goods vehicles, particularly post-2030

## TECH ERS

- A rapid deployment of fuel efficient vehicles into new ICE vehicles
- A shift away from ICEs and towards ERS-enabled vehicles for new heavy goods vehicles, particularly post-2030

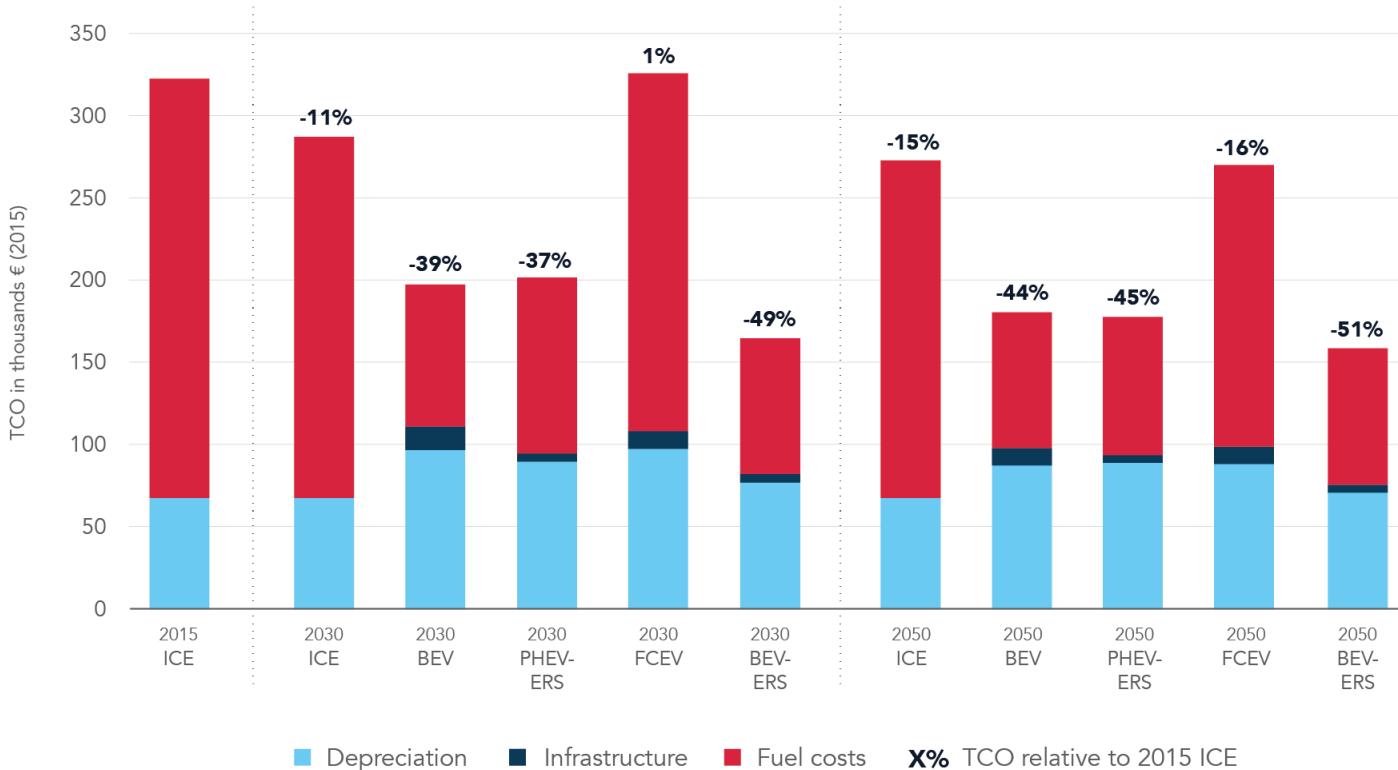


# Advanced powertrains can represent a low-cost option for road freight

ADVANCED  
POWERTRAIN VEHICLES  
ARE ALREADY  
COMPETITIVE WITH  
TRADITIONAL VEHICLES  
ON A TOTAL COST OF  
OWNERSHIP BASIS.

Reaching maturity would allow these technologies to offer substantially lower costs.

However, vehicle purchase prices will be higher in all cases; the tradeoff comes against lower running costs.

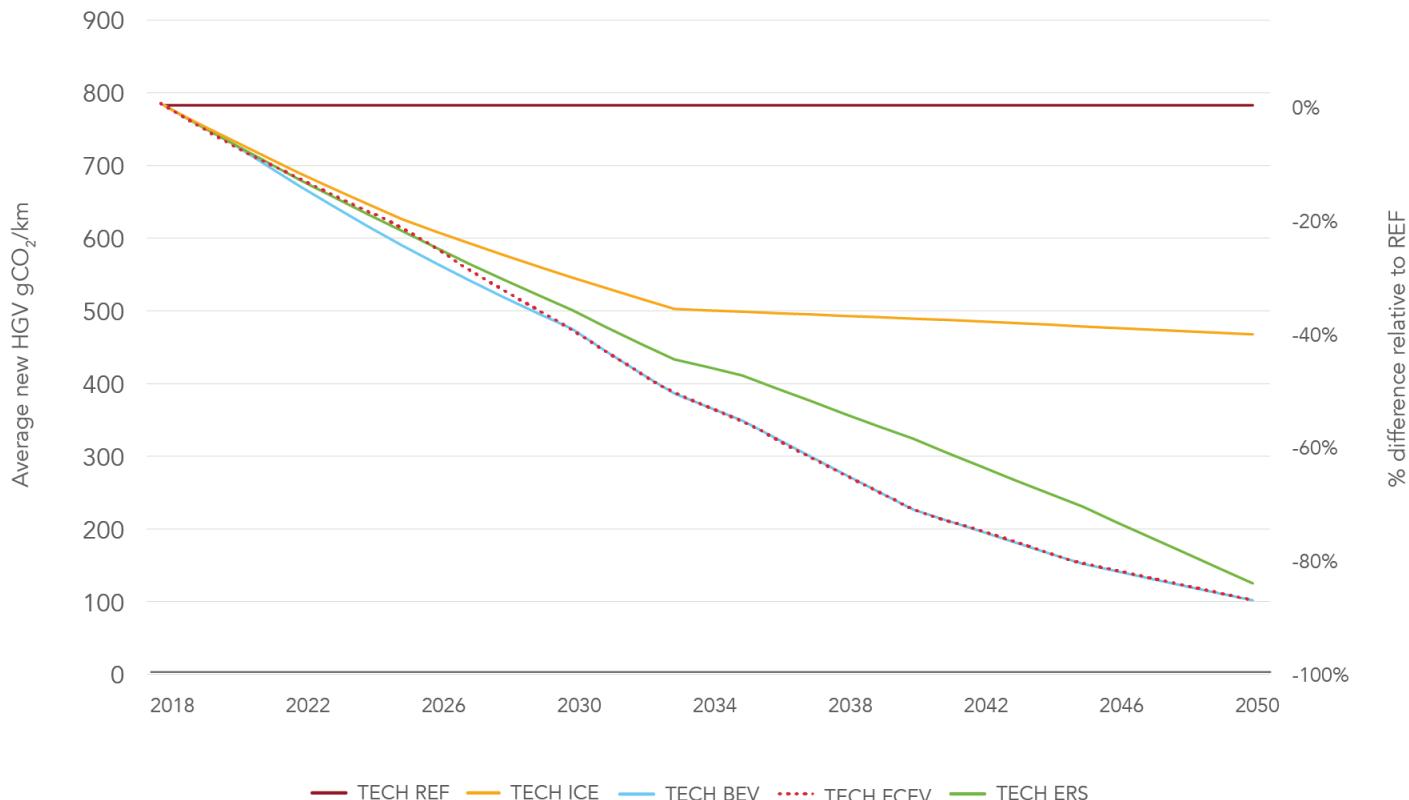


# CO<sub>2</sub> emissions from the vehicle fleet can be cut substantially

FUEL EFFICIENT  
TECHNOLOGIES OFFER  
SUBSTANTIAL  
POTENTIAL TO CUT  
EMISSIONS FROM NEW  
VEHICLES BY 2030.

Beyond 2030, the deployment of advanced powertrains is necessary to ensure gains continue.

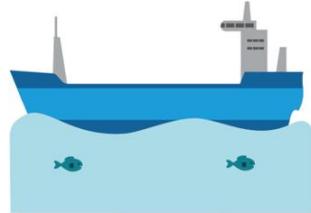
In the absence of such measures, CO<sub>2</sub> emissions in the TECH ICE scenario are back at 2018 levels by 2050.





## 03. Socioeconomic implications for Europe

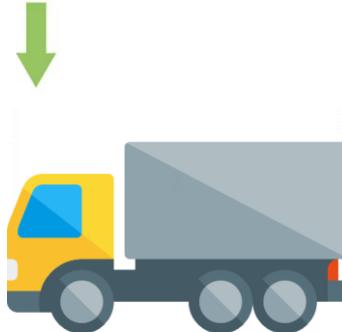
# The economics of decarbonising freight transport



Less diesel and gasoline is used, reducing the capital leaving the European economy



Low carbon technologies are more efficient, so costs faced by hauliers are reduced, and savings are either held as industry profits or passed on (ultimately) to consumers



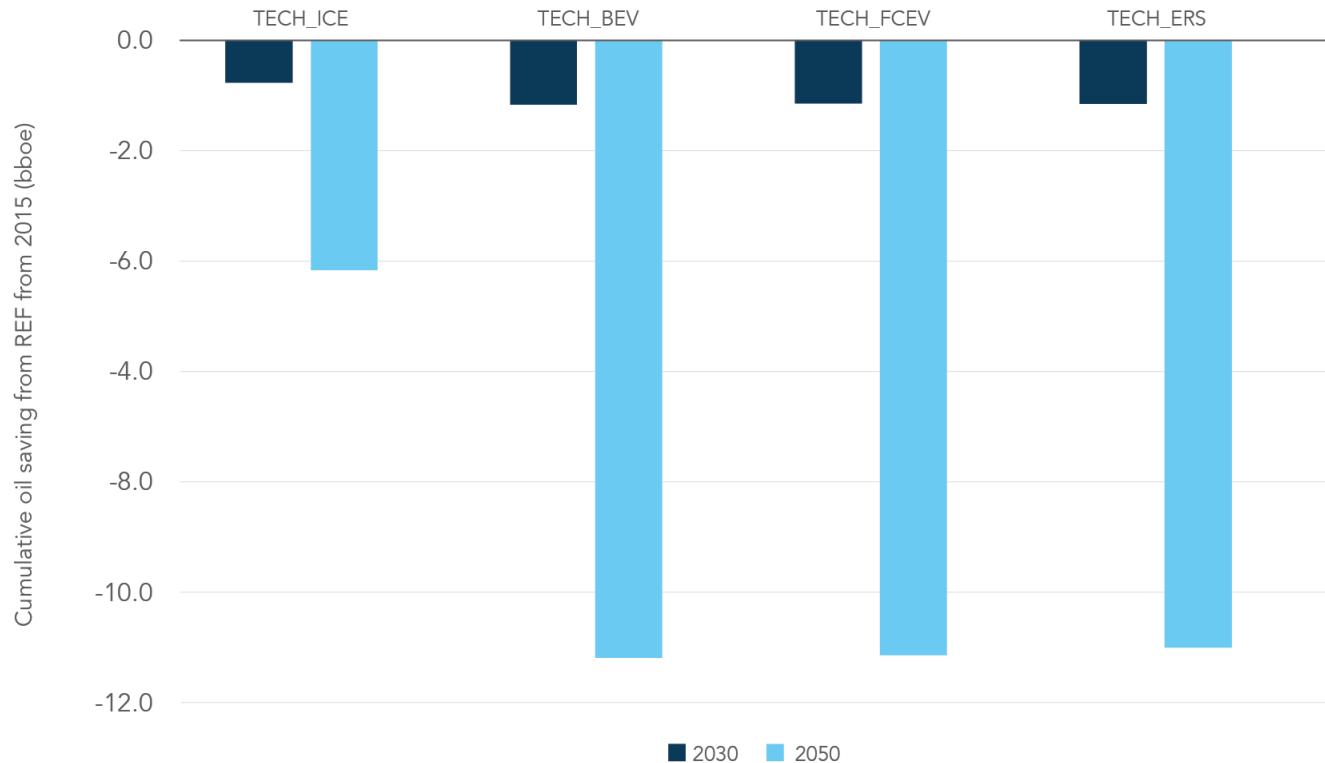
Hauliers spend more on vehicles, boosting domestic output

# The reduction in oil demand is substantial by 2050

SHIFTING TO ADVANCED  
POWERTRAINS SHIFTS  
DEMAND AWAY FROM  
IMPORTED OIL

More than 11 billion barrels  
of oil equivalent can be  
removed from the European  
economy by 2050

Shifting this expenditure to  
elsewhere in the economy  
boosts European output  
and employment.

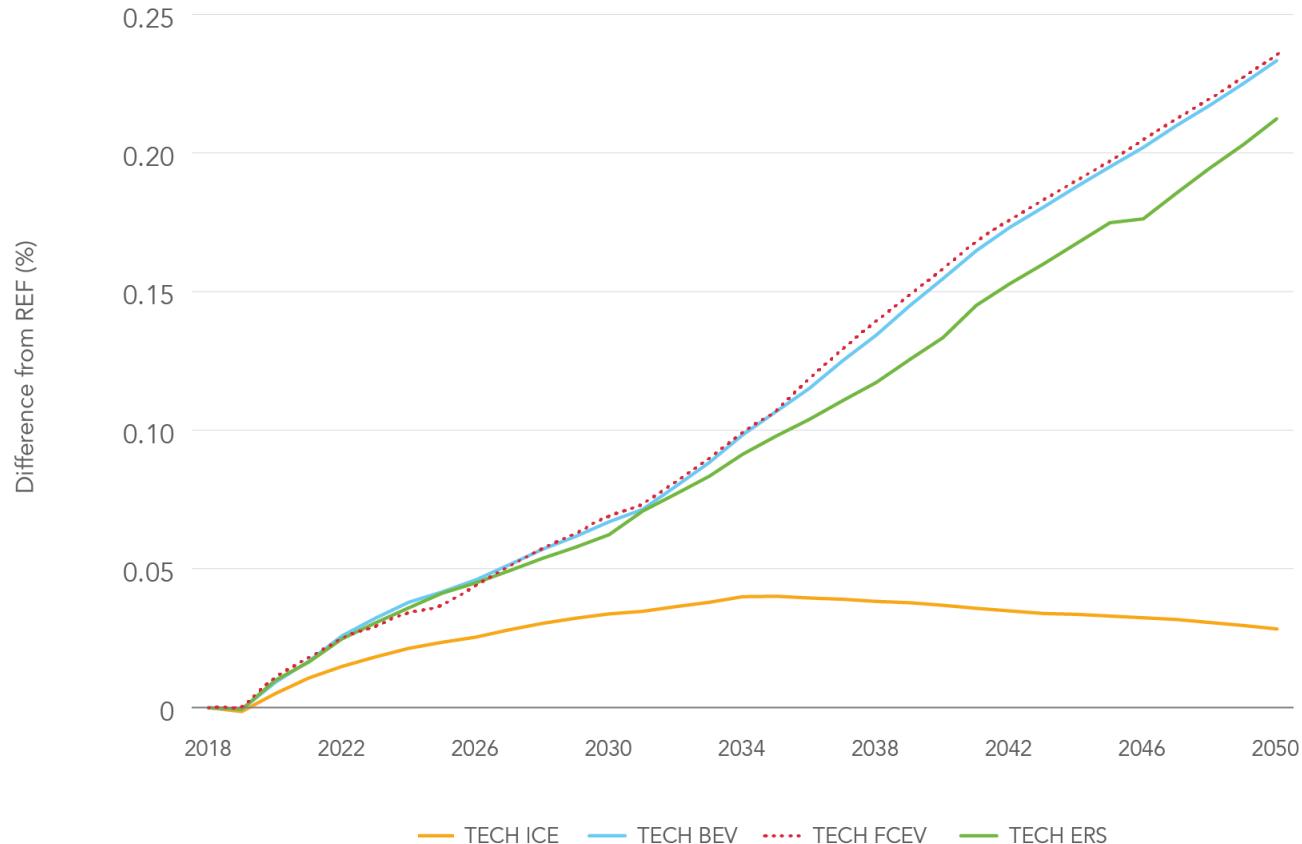


# The transition leads to a small net increase in GDP

THE NET IMPACT FOR  
THE EUROPEAN  
ECONOMY IS POSITIVE

Compared to the alternative of not improving the CO<sub>2</sub> efficiency of freight vehicles, a transition to low carbon technologies will lead to small increases in GDP

The deployment of more advanced powertrains after 2030, and the subsequent sharp reduction in oil imports, leads to greater benefits accruing in this period



# The net impact on employment is small but positive

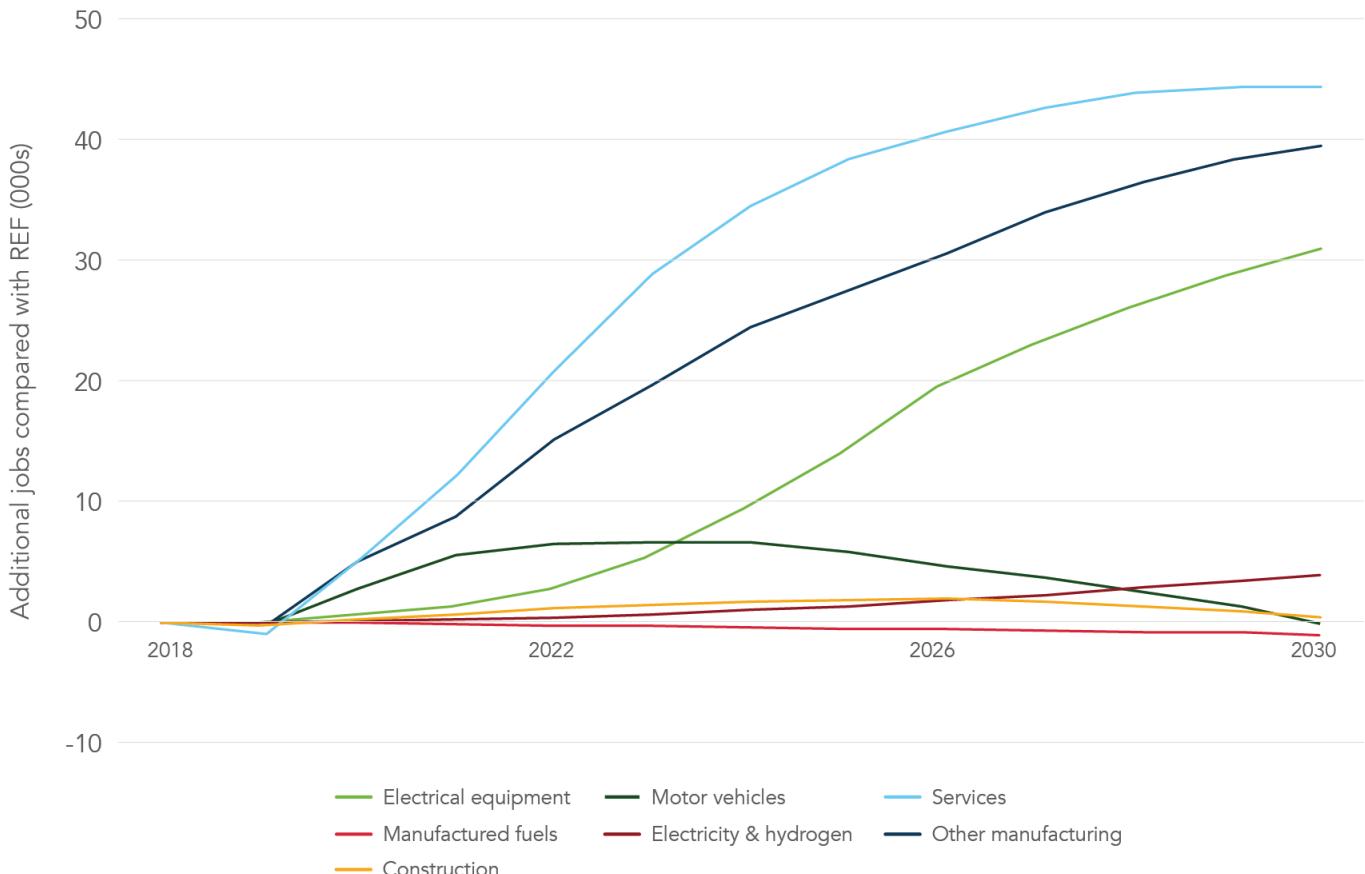
## THE JOBS IMPACT VARIES BY ECONOMIC SECTOR

The oil supply sector sees a reduction in employment

Vehicle assembly sees very little change in employment to 2030, as more complex and dual-powertrain vehicles are required

Vehicle parts manufacturers see fairly significant gains in new supply chains

Service sector jobs dominate the impact

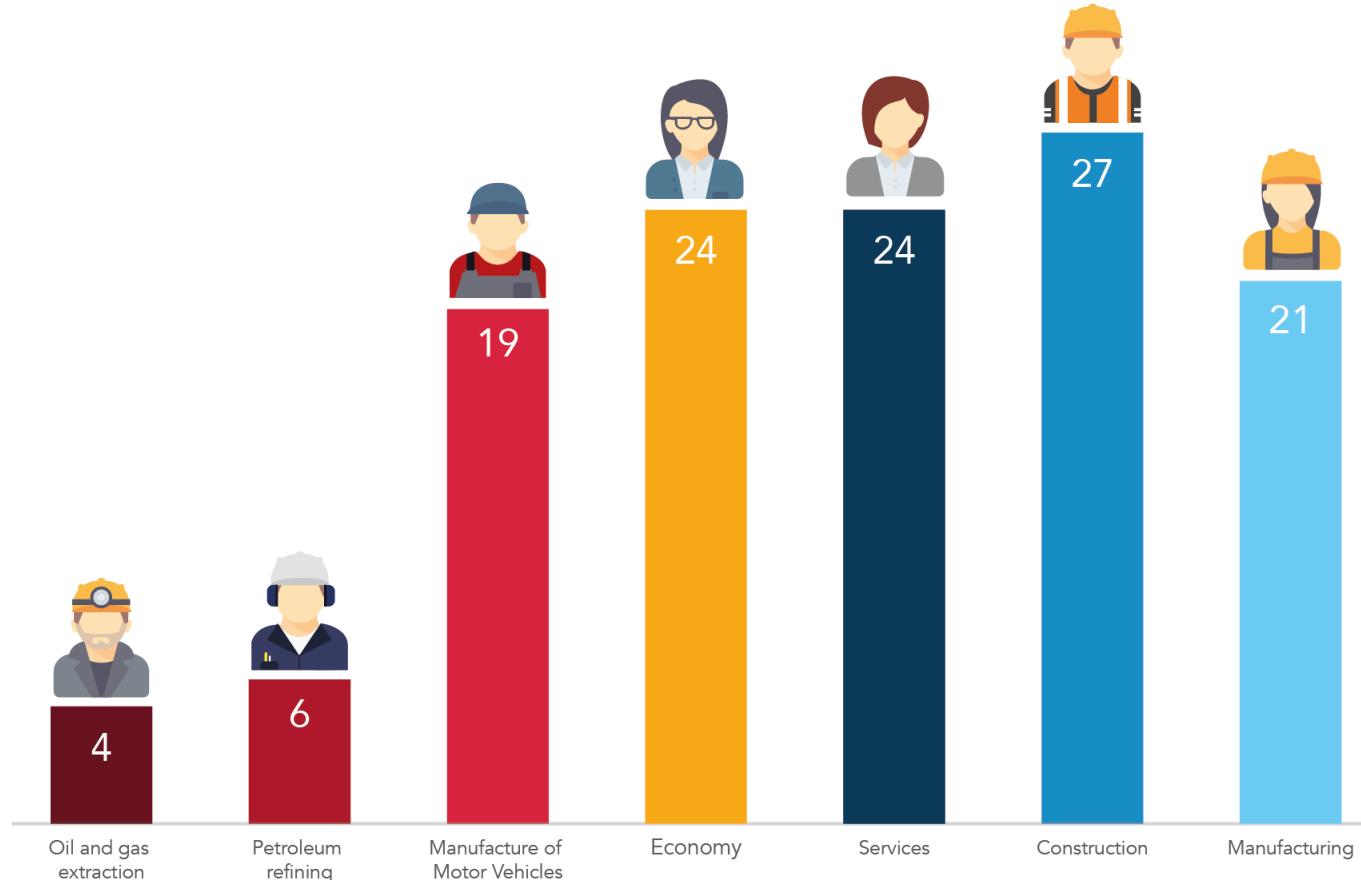


Jobs are created because of the improvement in GDP and due to the structure of the economy

THE EMPLOYMENT RESULTS REFLECT THE STRUCTURE OF THE ECONOMY

For every million Euros spent there are relatively few jobs created in Oil and gas extraction (4) or Refining (6) compared to the average for the whole economy (24)

74% of all European employment is in services and so the additional value retained in Europe as a result of the increased consumer expenditure from the transition largely benefits this part of the economy

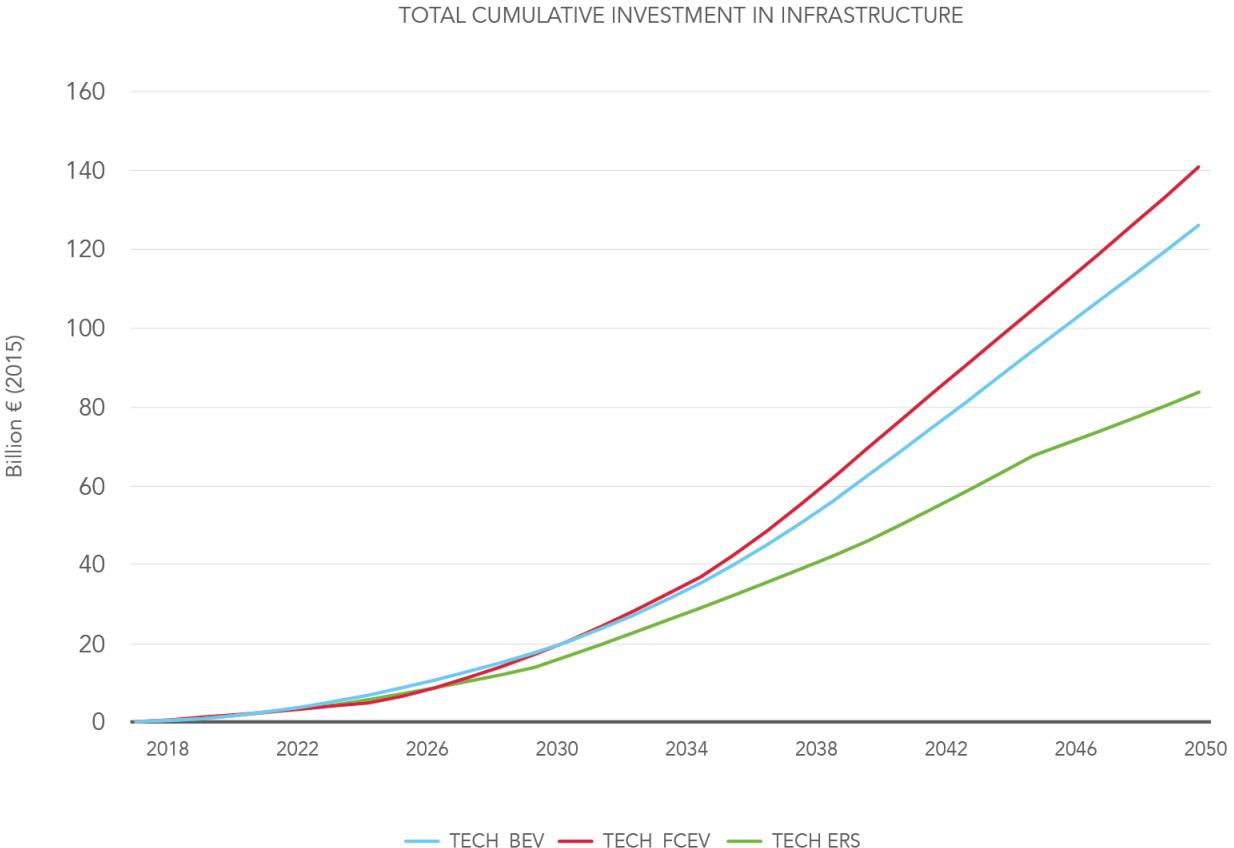


# Investment requirements are substantial but manageable

NEW SUPPORTING  
INFRASTRUCTURE WILL  
BE REQUIRED FOR ALL  
POWERTRAINS

Total investment of up to  
€140 billion will be required  
by 2050 to supply the new  
fleet.

Much of this can be  
provided by the private  
sector, such as depot  
chargers, high-speed  
electric chargers and  
hydrogen refueling stations  
on highways.



# The implications for Germany

THE BENEFITS IN GERMANY ARE  
LIKELY TO BE LARGER IN RELATIVE  
TERMS

German trucks drive longer distances  
than the EU average; almost 724,000 km  
in the first five years of ownership (versus  
EU average of 530,000 km).

German fuel costs are slightly higher  
than the EU average.

Electricity costs are *substantially* higher –  
but this still represents a shift to domestic  
activity





## 04. Concluding remarks

# Concluding remarks

## A TRANSITION TO LOW CARBON FREIGHT TRANSPORTATION IS TECHNOLOGICALLY FEASIBLE

Technological solutions to low and zero carbon emissions vans and HGVs are known, and are starting to enter the market.

Many fuel efficient technologies are already cost effective, while some advanced powertrains are on course to be cost-competitive in the coming years (and will be competitive in certain segments sooner)

## THE TRANSITION PRESENTS MODEST ECONOMIC BENEFITS

All of the technology transitions that were examined yielded net positive economic outcomes, which is made possible by the reduction in spending on imported oil.

The economic benefit from reducing emissions from road freight represents a WIN-WIN for Europe.

## THERE ARE STILL CHALLENGES TO BE OVERCOME BY POLICYMAKERS TO DELIVER THIS TRANSITION

Policy makers need to focus on managing the transition:

- 1) Ensuring that supporting infrastructure is developed
- 2) Introducing common standards across all technologies
- 3) Helping hauliers to adapt to and manage the change in the cost profile of the switch to low-carbon mobility options



## More information

Fuelling Europe's Future technical and summary reports available online



<https://www.camecon.com/how/our-work/trucking-into-a-greener-future/>



@CambridgeEcon



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## Disclaimer

*The stakeholders who contributed to this study shared the aim of establishing a constructive and transparent exchange of views on the technical, economic and environmental issues associated with the development of low-carbon technologies for vans and Heavy Goods Vehicles (HGVs). The objective was to evaluate the boundaries within which vehicle technologies can contribute to mitigating carbon emissions from trucks in Europe. Each stakeholder contributed their knowledge and vision of these issues. The information and conclusions in this report represent these contributions, but should not be treated as binding on the organisations involved.*



# Trucking into a Greener Future

Jon Stenning