Fuelling Europe’s Future

How the transition from oil strengthens the economy

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01. Approach

Stakeholder consultation to guide scenario analysis

STAKEHOLDERS CONSULTED THROUGHOUT PROJECT
- on data
- on assumptions about the future
- on scenarios to model

STAKEHOLDERS INCLUDE
- automotive sector
- battery sector
- energy sector
- trade union
- consumer organisations
- NGOs

CORE SCENARIOS
- Reference (REF)
- Current Policy Initiatives (CPI)
- Technology deployment (TECH)

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_2, NO_X, particulates

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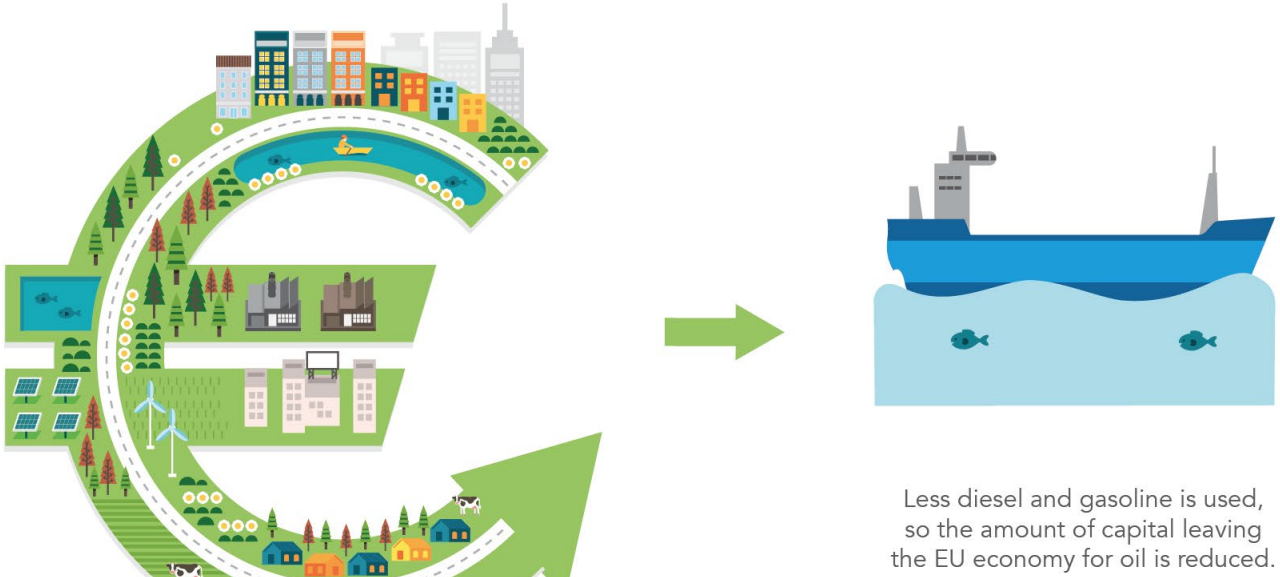
02. Outcomes

Low-carbon technologies change the nature of spending on mobility

SPENDING ON IMPORTED OIL IS REDUCED

By 2030, EU spending on imported oil is reduced by €49bn in the TECH scenario compared to the REF scenario



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Low-carbon technologies change the nature of spending on mobility

MORE IS SPENT ON THE EXTRA TECHNOLOGY IN THE VEHICLE

Drivers have to spend more on the technologies in the car required to bring about the transition, whether this is a hybrid motor, more fuel efficient tyres or battery electric vehicles

Typically this generates demand for car manufacturers and suppliers, but a key uncertainty remains the extent to which batteries are manufactured in Europe

Household spending on vehicles is increased. This value is mostly captured by EU companies and recirculated to the economy, although uncertainties remain about the location of battery cell manufacturing.

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Low-carbon technologies change the nature of spending on mobility

OVERALL LESS IS SPENT ON MOBILITY

For the economy in aggregate, the fuel savings outweigh the extra spending on the car

Over time, this means that consumers have more to spend on other goods and services in the economy.

Some of this generates demand for EU goods and services but some of it is spent on imports

Some of this is spent on electricity and hydrogen, with higher probability of being produced domestically

Low-carbon technologies are more efficient, so household spending on energy for mobility is reduced.

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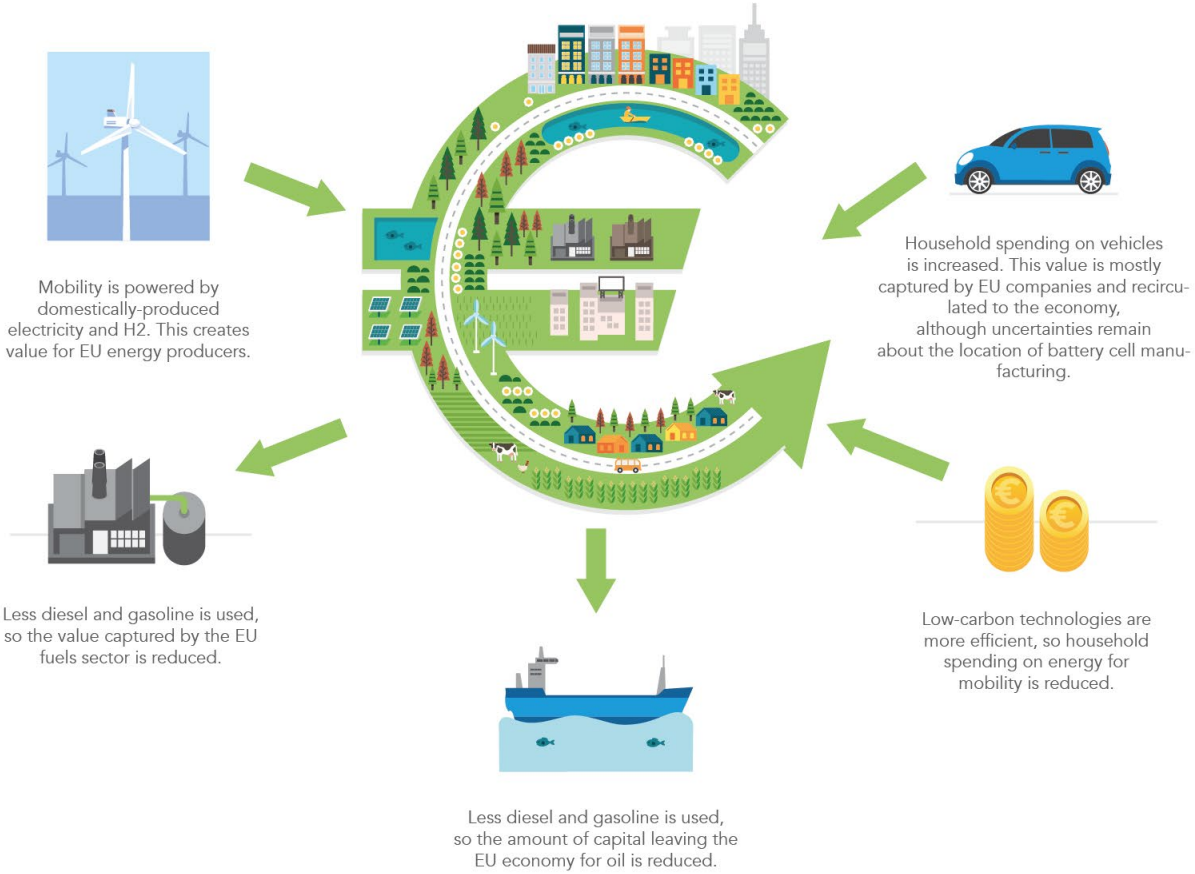
Key impacts and Interactions

OVERALL, THIS IS EXPECTED TO HAVE A POSITIVE IMPACT ON THE ECONOMY BECAUSE

The supply chains of the goods and services that meet the extra expenditure have more domestic content than petrol and diesel

They also have a higher employment content, which leads to larger multiplier effects



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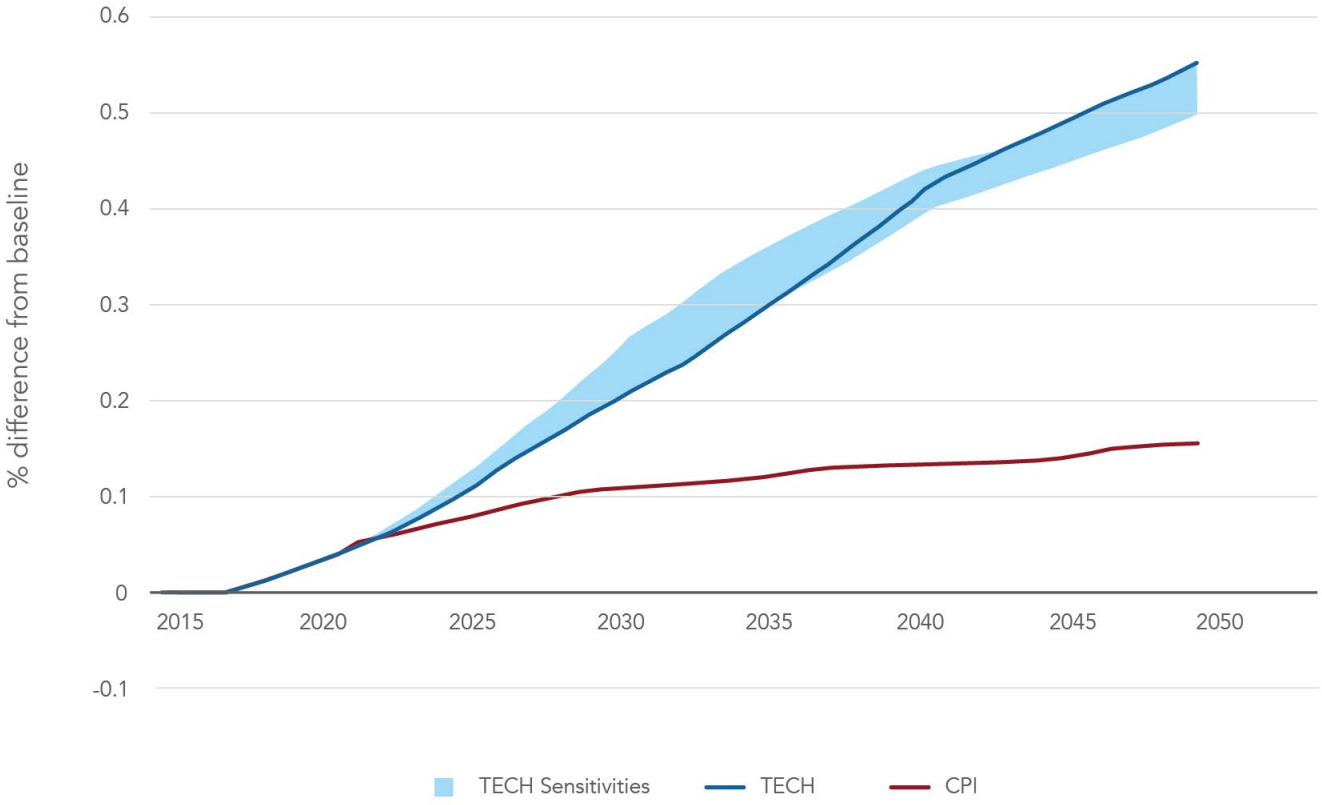
The transition leads to a small net increase in GDP

THE NET IMPACT FOR THE EUROPEAN ECONOMY IS POSITIVE

Compared to the alternative of not improving the CO_2 efficiency of passenger cars, a transition to low-carbon cars will lead to small increases (0.1-0.2%) in GDP by 2030

A transition that pushes beyond 95 gCO_2 per km (and the proposed legislation to 2030) will yield greater net economic benefits in all the TECH scenarios tested



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The net impact on employment is small but positive - by 2030, 206,000 jobs are created

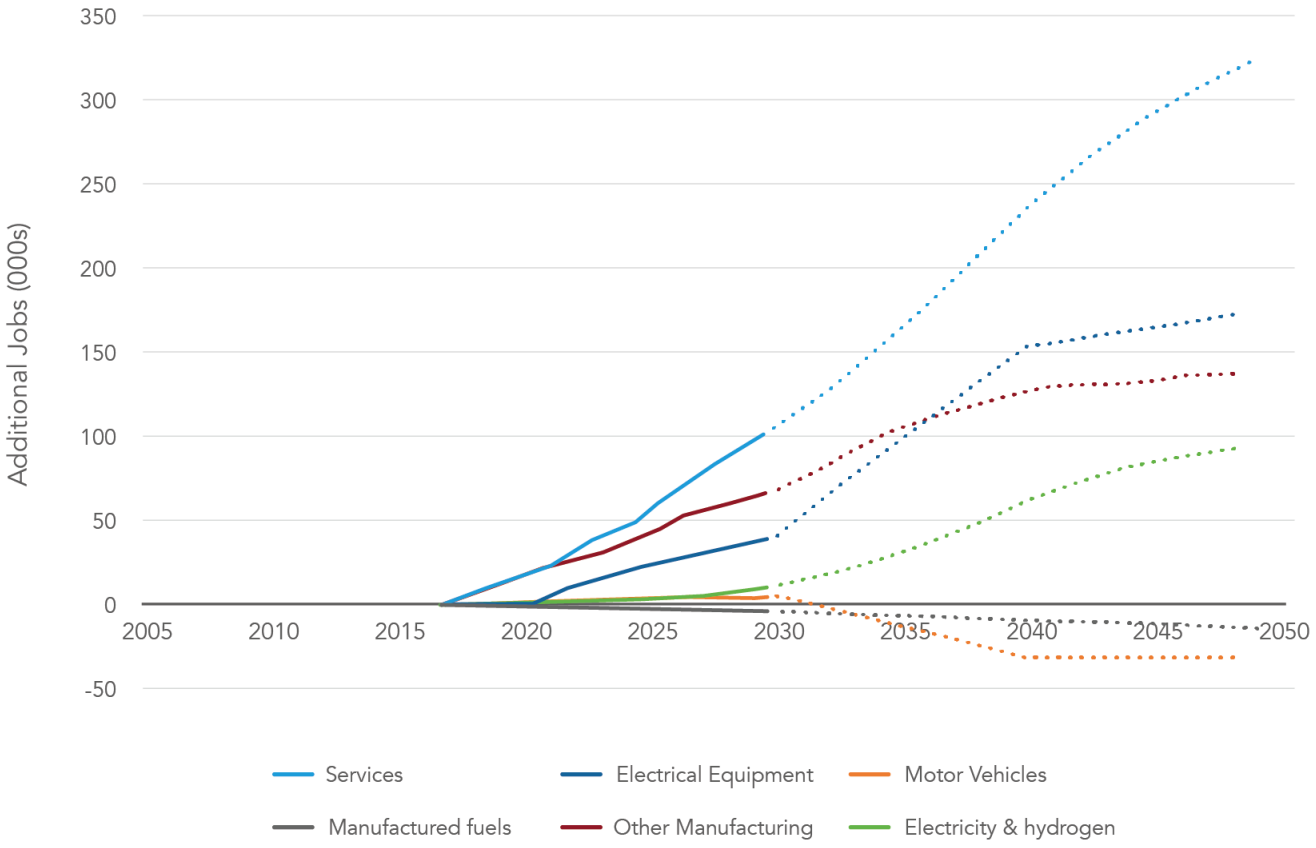
THE JOBS IMPACT VARIES BY ECONOMIC SECTOR

The oil supply sector sees a reduction in employment

Vehicle assembly sees very little change in employment to 2030, but thereafter the dominance of relatively simple electric vehicles leads to a reduction in employment

Vehicle parts manufacturers see fairly significant gains

Service sector jobs dominate the impact



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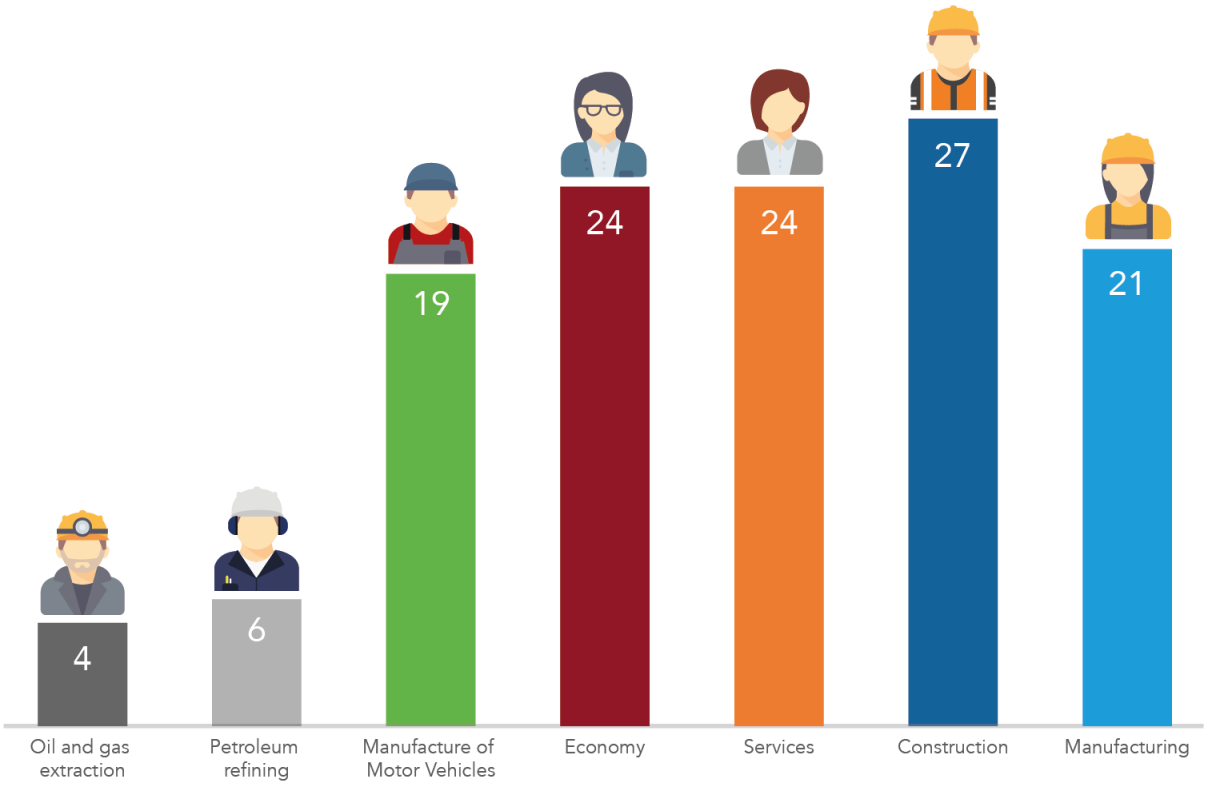
Jobs are created because of the improvement in GDP and because of the structure of the economy

THE EMPLOYMENT RESULTS REFLECT THE STRUCTURE OF THE ECONOMY

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

Some 74% of all European employment is in services and so the additional value retained in Europe as a result of the transition away from oil. The modelling shows that 50% of the increase in net employment are services jobs



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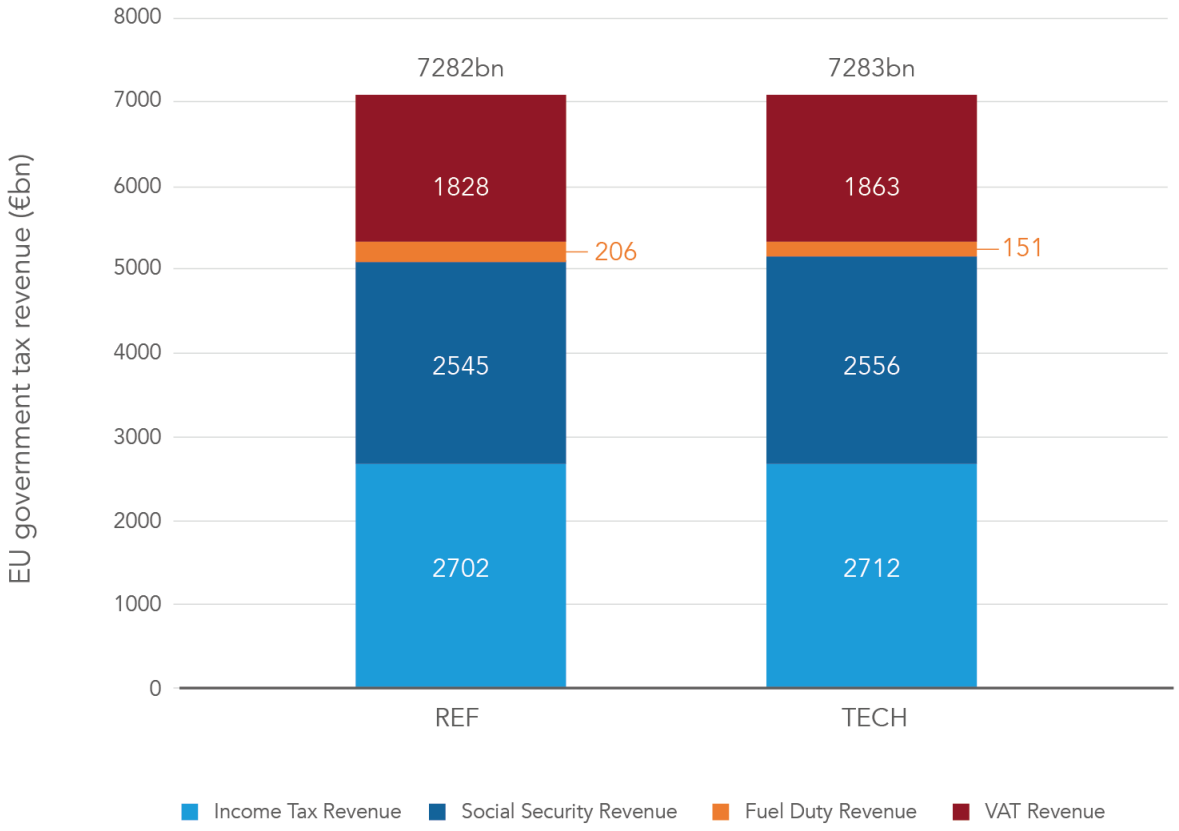
Government finances are not affected much by the loss of fuel duty

FUEL DUTY WILL BE REDUCED BY €55BN BY 2030

It is inevitable that fuel duty revenues will be reduced with lower carbon cars unless fuel duty rates are increased

However, the whole economy modelling analysis suggests that there will be compensatory tax revenues from income tax, VAT and social security as a result of the net increase in consumer spending, GDP and employment



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Smart Charging for plug-in electric vehicles matters

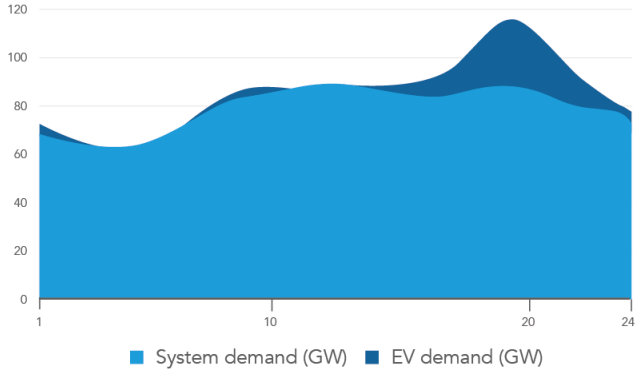
IF ELECTRIC VEHICLE CHARGING IS NOT MANAGED, IT WILL REQUIRE AN INCREASE IN GENERATING CAPACITY

However, investing in smart charging infrastructure technology today will allow electric vehicle charging to be spread over times of low demand

Our analysis shows this investment to be cost effective, with net benefits as large as €650 per electric vehicles by 2030 in countries such as France

UNMANAGED CHARGING

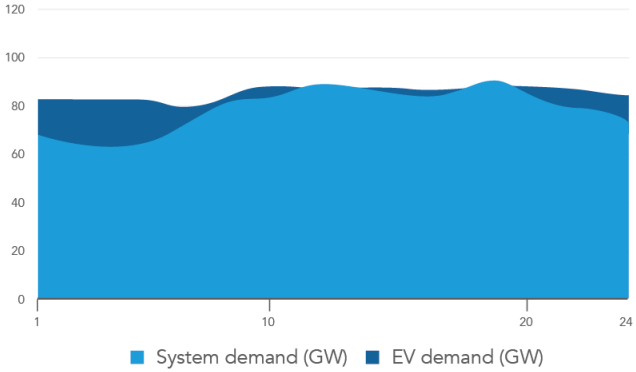
Demand profile (January 2050)



Unmanaged charging increases demand and network load at peak times

SMART CHARGING

Demand profile (January 2050)



Smart charging avoids an increase of peak demand and enables EVs to provide balancing services

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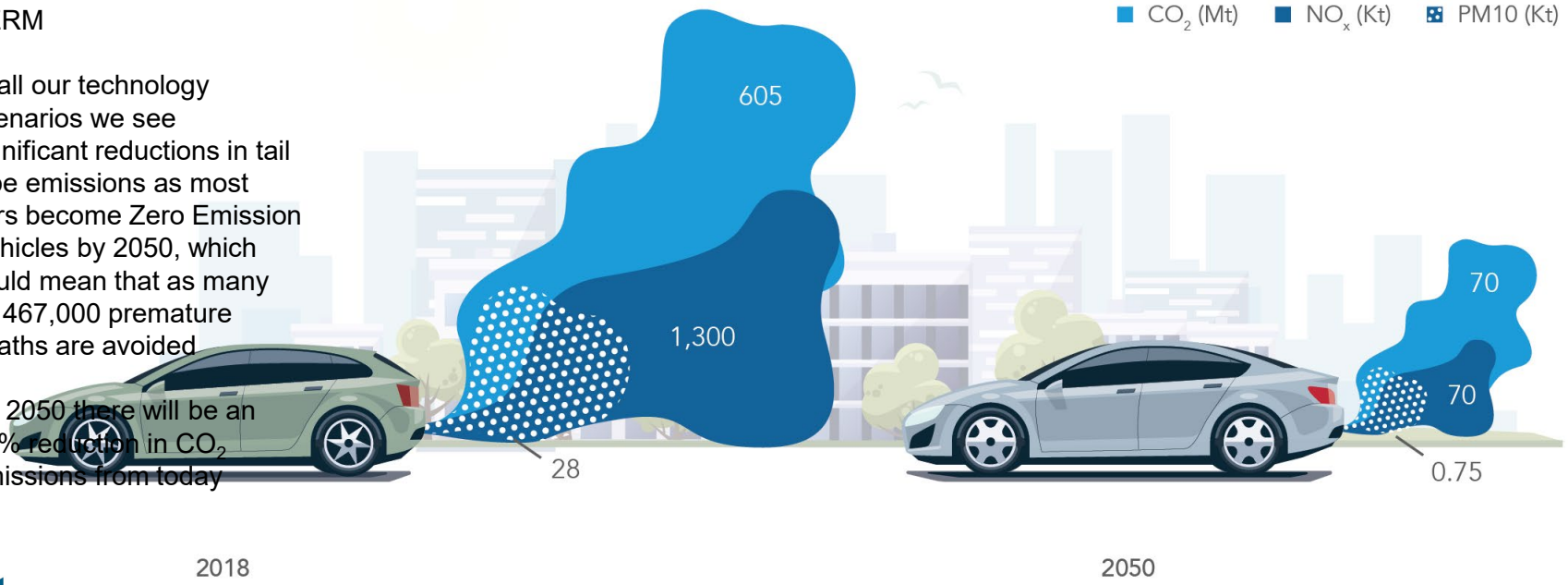
Air quality is significantly improved, while carbon emissions are substantially lowered

AIR QUALITY IN EUROPEAN CITIES WILL DRAMATICALLY IMPROVE IN THE LONG TERM

In all our technology scenarios we see significant reductions in tail pipe emissions as most cars become Zero Emission Vehicles by 2050, which could mean that as many as 467,000 premature deaths are avoided

By 2050 there will be an 88% reduction in CO_2 emissions from today



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03. Concluding Remarks

Concluding remarks

BENEFITS

THE TRANSITION BRINGS ECONOMIC AND ENVIRONMENTAL BENEFITS

1) All the technology transitions we looked at yielded net positive economic outcomes, which is made possible by the reduction in spending on imported oil.

2) A faster transition to zero emission vehicles would dramatically improve air quality in Europe's cities.

CHALLENGES

HOWEVER, THE TRANSITION ALSO GENERATES CHALLENGES

1) Loss of fuel duty revenues

2) Loss of employment possible in certain sectors

3) Substantial public charging infrastructure requirements

4) Increase in electricity demand and impact on grid

5) Competitiveness: where will the batteries be produced?

POLICIES

CHALLENGES REMAIN FOR POLICY-MAKERS TO OVERCOME

1) Support the deployment of sufficient infrastructure to inspire consumer confidence

2) Promote integration of electric vehicles with the grid, so that it is "smart" and mutually reinforcing

3) Mitigate the impact of job losses in traditional combustion engine manufacturing and petroleum refining through skills re-training and regional

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04. More information

More information

Fuelling Europe's Future technical and summary reports available online

https://www.camecon.com/how/our-work/fuelling-europes-future/

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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 cars. The objective was to evaluate the boundaries within which vehicle technologies can contribute to mitigating carbon emissions from cars across Europe. Each stakeholder contributed their knowledge and vision of these issues. The information and conclusions in this report have benefitted from these contributions, but should not be treated as necessarily reflecting the views of the companies and organisations involved.

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