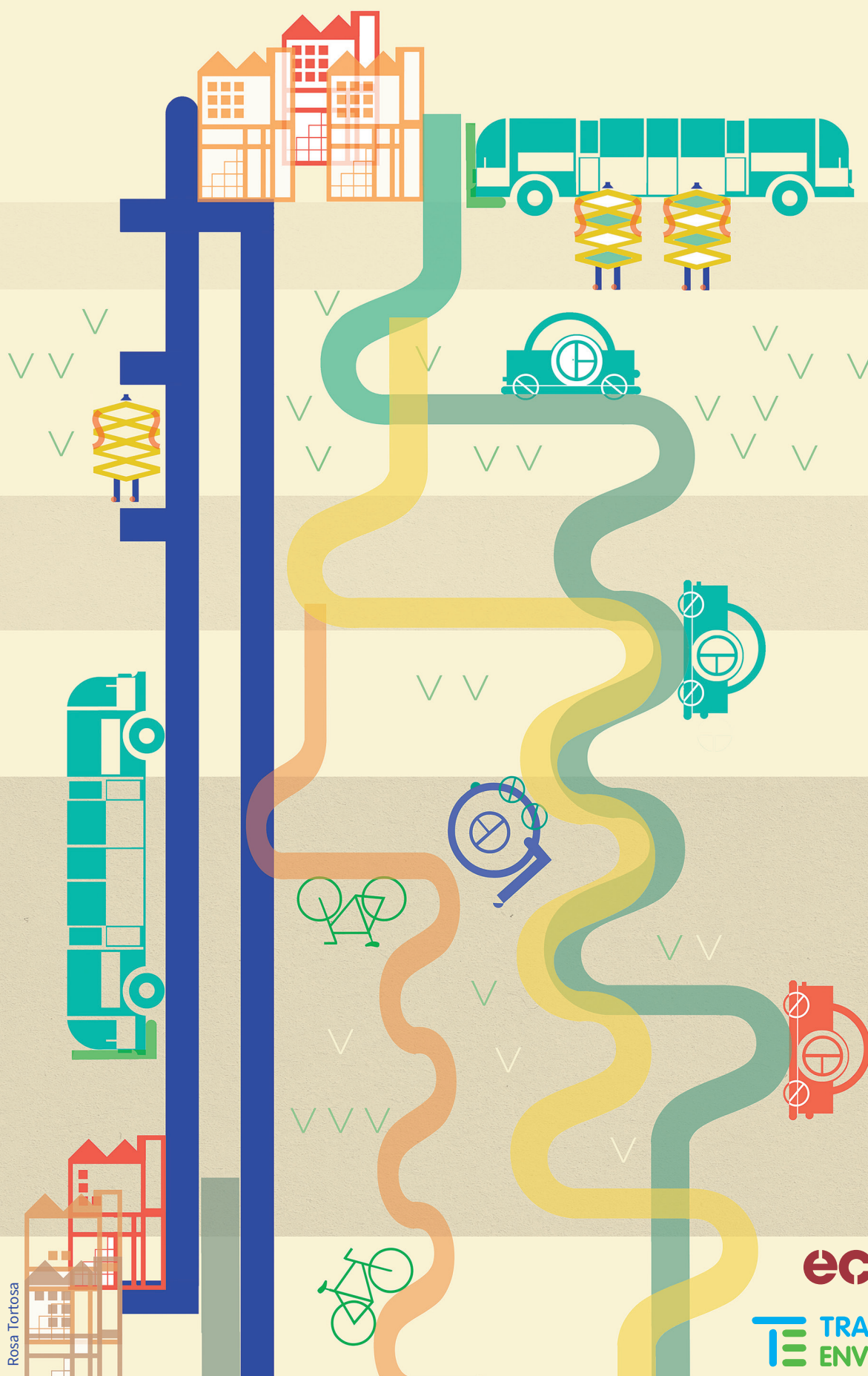


Recipe For Spain

How to start decarbonising Spanish transport



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June 2016

Executive Summary

The Effort Sharing Decision (ESD) sets a climate target of reducing emissions by 30% below 2005 levels by 2030. It comprises the emissions of sectors not included under the EU emissions trading system (non-ETS emissions) – mainly transport, buildings and agriculture. The ESD requires member states to limit their GHG emissions by meeting individual binding annual limits. This summer, the European Commission will set new individual emission targets for the member states' ESD sectors for the period 2021 to 2030 and publish a communication on the decarbonisation of transport.

Spain's anticipated 2030 reduction target for all sectors covered by the ESD will be -28%. Thus, Spain will have to decrease its transport emissions to 64 MtCO₂ eq by 2030. Based on the assumptions of our reference scenario, Spain will exceed its carbon budget in the transport sector by 31 MtCO₂ eq if it does not undertake further policy action.

The 'recipe for Spain' serves as a guideline on how to reduce emissions from transport and secure the climate target. It analyses policy measures at EU and member state levels and quantifies their contribution to decreasing GHG emissions in the transport sector. It shows that European-wide, ambitious CO₂ standards for cars, vans and heavy-duty vehicles will be key policy in the Spanish strategy to decarbonise transport – covering 34% of the Spanish effort from transport. National policy instruments will be essential to supplement EU policy and to encourage a shift of passengers and freight to cleaner transport modes as well as to internalise costs more comprehensively.

1. Context

In October 2014, EU heads of state decided that emissions not included under the EU Emissions Trading System (non-ETS emissions) – mainly transport, buildings and agriculture – must be brought 30% below 2005 levels by 2030. Those sectors are currently covered by the Effort Sharing Decision (ESD). It requires member states to limit their GHG emissions by meeting binding annual limits (annual emission allocations –AEAs). This summer, the European Commission will set new emission targets for the ESD sectors in the member states and publish a communication on the decarbonisation of transport.

The non-ETS sector represents 55% of total EU emissions with transport as the biggest ESD sector (34%). Road transport is the main contributor to climate change and accounts for 95% of the total emissions from the non-ETS transport sector.¹ Light-duty vehicles (LDV - passenger cars and vans) are the main source (around 70%) of road transport emissions, while most of the rest is from heavy-duty vehicles (HDV - trucks and buses), although their relative importance is growing².

The AEA will require significant efforts to reduce emissions by the member states in all non-ETS sectors, including transport. Thus, the member states' contribution of the transport sector will depend on their

¹ EEA greenhouse gas – data viewer, 2012 emissions data.

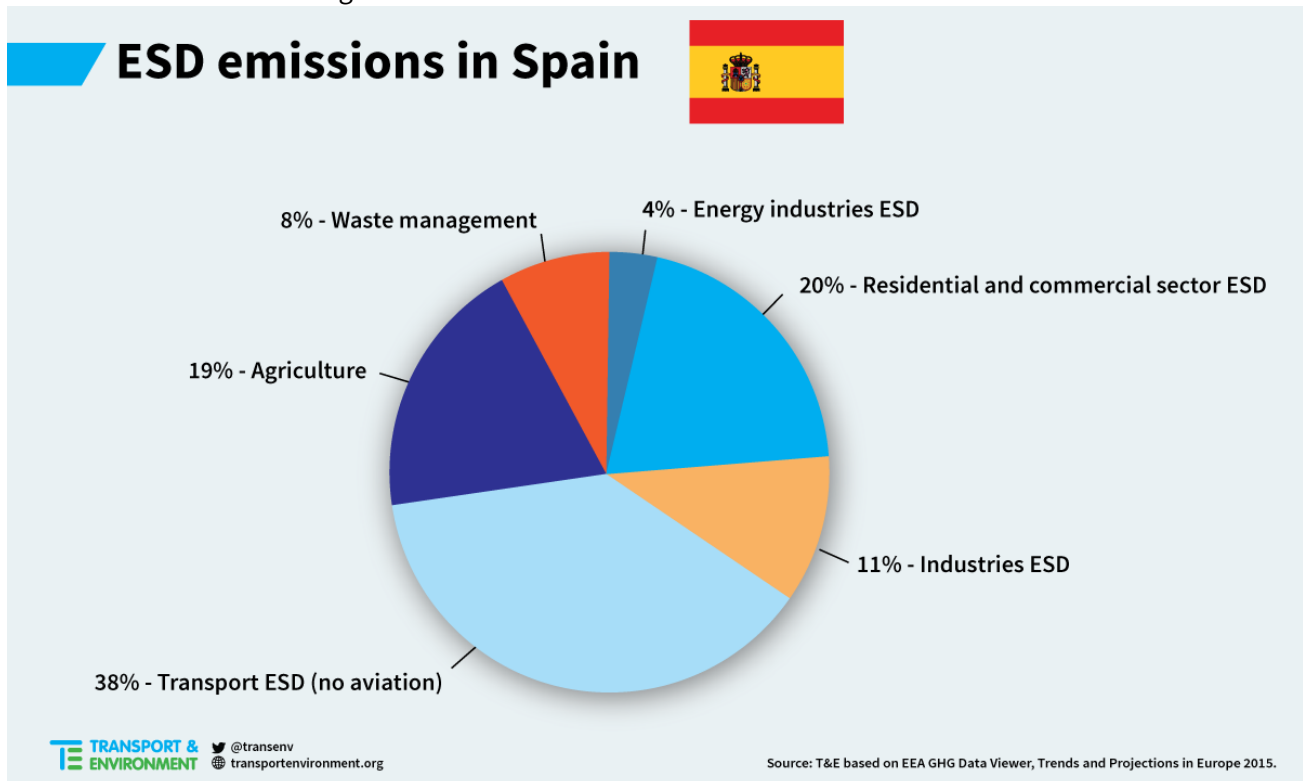
² T&E, 2015. Too big to ignore – truck CO₂ emissions in 2030. International shipping and extra-EU flights are currently not included neither in the ETS nor in the non-ETS sector.

individual 2030 target. EU measures reducing GHG emissions from the non ETS-sectors will have to be complemented with national policy action. Action must be taken at both EU and member state level to meet the 2030 ESD target.

The implementation of new, additional CO₂ emission standards for LDVs and HDVs takes place at EU level and needs the commitment from all member states. Other measures, such as the internalisation of external costs through e.g. an increase of fuel taxes, are the responsibility of the member states.

The ‘recipes for member states’ are a follow up to T&E’s ‘Road to 2030’ report from June 2015. Approximations of the individual member state 2030 targets, reference and different policy measure scenarios are based on the mentioned report and Ricardo’s recent SULTAN study.³ The SULTAN (**SU**stainab**Le** **TrAN**sport) is a high-level calculator to help provide indicative estimates of the possible impacts of policy on transport in the EU (primarily energy use and GHG emissions, also costs, energy security, NO_x and PM emissions).⁴

The ‘recipe for Spain’ analyses potential policy action and quantifies their contribution to decreasing GHG emissions. It includes both EU measures, that Spain should push for in order to get results at a national level, and measures that are only the competence of the Spanish central government. It aims to give a roadmap to the individual member states in how to get the transport sector to do a fair share towards the achievement of the ESD targets.



2. Objectives of this series of reports

- Firstly, we will quantify the gap between transport emissions projections and emissions levels needed to achieve the individual ESD 2030 targets for member states (Germany, Spain, Italy, France, Poland, and the UK).

³ Ricardo Energy & Environment, 2016. SULTAN modelling to explore the wider potential impacts of transport GHG reduction policies in 2030.

⁴ EU Transport GHG: Routes to 2050.

- Secondly, we will show how much new car, van, and heavy-duty vehicle standards will contribute towards the target from the transport sector in the individual member states and thus how much effort still has to come from other measures, either at the EU or member state level.
- Thirdly, we will calculate how many CO₂ reductions can be achieved by other measures in order to close the gap between the individual 2030 target and the emission reduction level delivered by new standards, i.e. meet the 2030 target.

The scenarios described in this paper are based on assumptions which are outlined below and do not aim to accurately predict the future. However, they do give a clear indication of what policies will have a significant impact on reducing transport emissions.

3. Effort Sharing and reference scenario

3.1. Effort sharing between member states

Individual ESD targets for member states will differ and depend on their GDP and other factors such as cost-effectiveness of GHG reductions.⁵

Member states may transfer parts of their AEA for a given year to other member states under certain conditions. However, the overall target must be met. For this report, we assumed each member state will pursue efforts to achieve its own target, proving the transport sector can make a major contribution to achieving it.

The approximated effort for each member state was calculated in T&E's 'Road to 2030' report. Spain will have to decrease its GHG emissions of the sectors under the ESD by approximately 28% by 2030 compared with 2005 levels.

3.2. Effort sharing between different sectors

This paper assumes that each sector under the ESD has to contribute a proportionate share. Thus, the overall ESD target of 30% implies a 30% emissions reduction target for the EU transport sector. However, the aggregated emission reduction target of 28% for Spain is indifferent towards how this target is being achieved. A lower reduction in one sector therefore implies that it has to be outbalanced with a higher reduction level in another ESD sector.

Assuming that all sectors are aiming at a proportionate reduction level, we considered the share that transport emissions represented in 2012 for each member state. That same percentage was applied to the individual 2030 target emissions.⁶

In the case of Spain, transport CO₂ represented 37% of ESD emissions in 2012 and in the fair share scenario this would still be the case in 2030.

Spanish CO₂ emissions in the transport sector will therefore have to decrease to 64 MtCO₂ eq. by 2030.

3.3. Reference scenario

The reference scenario, created by the European Commission and referred to in this report is presented in detail in T&E's report 'Road to 2030' from 2015.⁷ The reference scenario informs us about the impact of current and agreed policies on transport emissions until 2030. The scenario includes policies and measures adopted in the member states by April 2012 and policies, measures and legislative provisions

⁵ T&E, 2015. Road to 2030: how EU vehicles efficiency standards help member states meet climate targets, June 2015, p. 11.

⁶ T&E, 2015. Road to 2030: how EU vehicles efficiency standards help member states meet climate targets, June 2015, p. 14.

⁷ European Commission, 2013. Trends to 2050. Reference Scenario 2013.

(including on binding targets) adopted in the first half of 2012 at EU level.⁸ With these measures, the transport sector in Spain would emit 106 MtCO₂ eq. by 2030.

New reference levels have been developed since the 2030 climate and energy package has been agreed on. One amongst others was developed by Ricardo Energy & Environment which takes changes in GDP forecasts and energy consumption into account. On this basis, the reference scenario from our previous study was deemed too negative – i.e. business as usual emissions too high - compared with other studies. Therefore emissions were adjusted downwards by 10%. This means that emission projections for the Spanish transport sector in 2030 were adjusted to 95 MtCO₂ eq.

The Commission will publish a new reference scenario in the first half of 2016, but in the meantime this approach was considered the most appropriate. However, if the Commission's new reference scenario does not coincide with this positive adjustment and will be more negative in its projections, it is clear that the proposed measures in this paper will not be sufficient to achieve the 2030 target. In that case, suggested measures will have to be pursued more ambitiously and other measures will have to be introduced additionally.

3.4. The gap between a -30% target and the reference scenario

The reference scenario depicts emissions from the Spanish transport sector in 2030 without any further action taken. The expected effort sharing decision between member states would require Spain to reduce its ESD emissions by 28%. There is a gap between the projected emission level of the reference scenario and the level where transport emissions should be by 2030.

In Spain the gap in transport between the adjusted reference scenario projection (95MtCO₂ eq.) and the 2030 target (64 MtCO₂ eq.) is 31 MtCO₂ eq.

4. Ingredients

4.1. The EU ingredient: Reductions delivered by new standards

T&E developed a tool to calculate to what extent emissions would be reduced by new, additional and ambitious CO₂ standards for cars, vans and heavy-duty vehicles. The results are based on the following assumptions, all based on the NEDC testing procedure: Firstly, new car CO₂/km emissions would fall to 70g in 2025 and 55g in 2030. Secondly, new van CO₂ emissions would be reduced to 100g in 2025 and to 70g in 2030. Thirdly, for trucks our assumptions are based on the Commission's 2014 heavy duty vehicles strategy that calculated with a 35% improvement potential vs 2015 levels, if limits for 2030 are introduced before 2020.⁹ The results are very much in line with the high ambition vehicle standards scenario in Ricardo Energy & Environment's study 'SULTAN modelling to explore potential impacts of transport GHG reduction policies in 2030' published in February 2016. The results and further information can be found in T&E's 'Road to 2030' report.

The report shows that new, additional standards for cars, vans and trucks are indispensable for achieving the 2030 targets and will deliver 10 Mt CO₂ eq. reductions in Spain. If these standards are implemented by 2025 and 2030, they could cover a third of the transport gap in Spain. The introduction of HDV standards alone will make up 16% of the Spanish effort in transport by 2030 revealing their importance. Thus, additional measures for the reduction of CO₂ emissions have to be implemented at an EU or member state level to close the remaining two thirds of the gap that is 21 Mt CO₂ eq. of the emissions.

⁸ T&E, 2015. Road to 2030: how EU vehicles efficiency standards help member states meet climate targets, June 2015, p. 12

⁹ European Commission, 2014. Impact assessment accompanying strategy for Reducing Heavy-Duty Vehicles Fuel Consumption and CO₂ Emissions.

4.2. The Spanish ingredients to close the gap

T&E has calculated the potential contribution of different policy actions, some of them based on results from Ricardo's study, and came up with a recommendation of policy combinations that would deliver the remaining emissions reductions needed.

Fuel taxes are an effective measure to internalise costs from carbon emissions and reduce fuel use. Calculated reductions delivered from an increase of fuel taxation are based on a weighted, long term price elasticity (-0.44) for Euro95 and diesel.¹⁰ A litre of diesel contains more energy and carbon than a litre of petrol, which should be reflected in respective fuel prices. However, the Spanish tax price on diesel is 0.09 €/l lower than the tax price on petrol, creating wrong incentives. An increase of the price on diesel would converge the diesel price with the Euro95 price and better reflect the CO₂ intensity of diesel. Higher diesel taxes can also be justified for public health reasons since diesel cars contribute disproportionately to local air pollution. The French and the Belgium government have recently stated to create a more level playing field for diesel and petrol. They have started by raising diesel taxes this year by 0.01 and 0.035 €/l. In Spain, an increase of the diesel excise duty by 0.11 €/l would lead to a 10%-increase of the sales price based on 2014 sales price data and 2.6 MtCO₂ eq. emissions reductions by 2030 as calculated by T&E. Increased tax yields can be spent on improved infrastructure further decreasing CO₂ emissions. The resulting emission reductions would cover 13% of the remaining gap not covered by more efficient vehicles.¹¹

Further reductions may come from other policy action. Their assumed reduction potential is based on the SULTAN calculations by Ricardo. This might lead to slight inaccuracies as individual characteristics in the different national transport sector have not been included. However, the quantification of emissions reductions from certain policy action should indicate the real trend.

Measures leading to a shift to environmentally friendly transport modes seems to be a good way to complement policies encouraging technological improvement.

Therefore, policy measures have to be introduced that encourage a modal shift from cars to other cleaner modes (rail, bus, cycling, walking). Based on the assumptions of the Ricardo study, a reduction of 8% car usage in urban areas, 3% in non-urban areas and a 3% share on motorways could lead to 1.6 MCO₂ reductions in Spain.¹² A combination of urban low emission zones, city tolls, and kilometre based road charges on the general road network would be a very effective way to achieve this shift and would also be very effective in dealing with congestion.

The improvement of freight intermodality by reducing heavy truck road transport by 6% through a shift to rail by 2030, would then lead to additional GHG reductions of 0.7 MtCO₂ eq.¹³ In order to achieve the desired modal shift, target oriented transport infrastructure planning and fuller internalisation of road freight externalities (by extending and increasing the road charging system) are key to enhance the modal share of rail. A more extensive road charging system would also positively impact freight efficiency which would lead to further emission reductions in the road freight sector.

Raising awareness amongst car drivers and truckers and providing information on how to drive more fuel efficiently is a simple measure with a fairly large impact. The increased application of fuel efficient driver training with a decline in effectiveness per year has a potential of 1.5 MtCO₂ eq. emission reductions.¹⁴

¹⁰ The values for price elasticities can be found in Ricardo Energy & Environment's 'SULTAN modelling to explore the wider potential impacts of transport GHG reduction policies in 2030', 2016.

¹¹ T&E, 2015. Europe's tax deals for diesel.

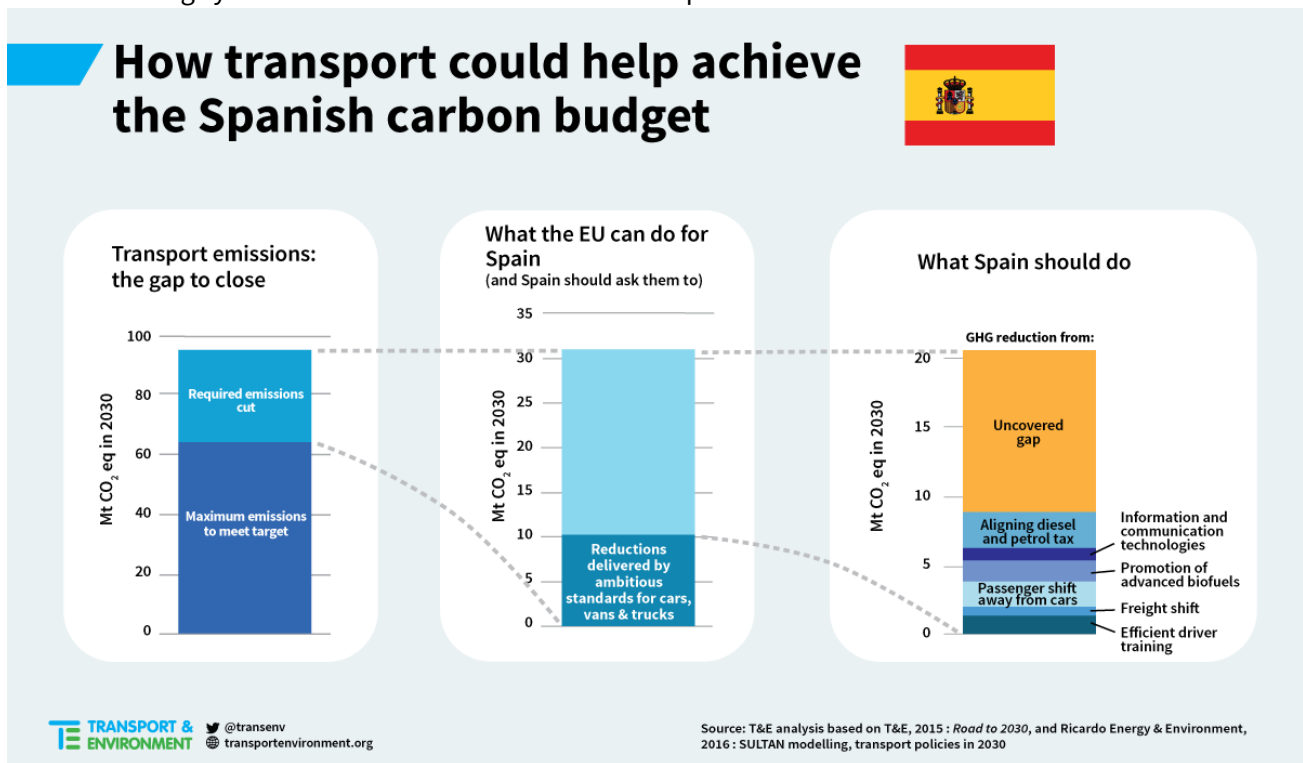
¹² Ricardo's study, p. 25.

¹³ More information on the assumptions regarding modal shift for improved freight intermodality can be found in the Ricardo study 'Using SULTAN modelling to explore the wider potential impacts of transport GHG reduction policies in 2030', pp. 25-26.

¹⁴ Ricardo's study, p. 27.

Further reductions can come from a rapid deployment of Communicating Intelligent Transport Systems (C-ITS) having an effect of 0.9 MtCO₂ eq. emission reductions.¹⁵ Biofuels too could contribute to meeting the target although it is vital that these are non-land based, 2nd generation biofuels. The ‘New Fuels’ scenario in the Ricardo study is based on two assumptions: Firstly, 1st generation biofuels should be held constant at their 2015 levels (bioethanol at ~3.4% of petrol demand and biodiesel at ~5.3% of diesel demand). And secondly, with any further growth from current levels avoiding ILUC through the implementation of EU policies to promote sustainable low-carbon liquid fuels, such as waste-based fuels, up to a level of 4% in 2030.¹⁶ Under these assumptions, GHG emissions could be decreased by another 1.6 MtCO₂ eq. in the Spanish transport sector.

Based on the outlined assumptions in this scenario, all national policy measures combined would reduce 9 MtCO₂ eq. of the emissions in the Spanish transport sector. That would cover almost another third of the total Spanish transport gap. In order to achieve the 2030 emissions target additional 12 MtCO₂ eq. would need to be reduced by pursuing policies more ambitiously and consider the introduction of other policy measures on top. Such policies are already being introduced in other member states and comprise the promotion of better spatial planning, an emission-free mobility in city centres as well as the extension of the road tolling system that is distance and emission dependent.



5. Conclusion

Based on the results of this modelling exercise, it would appear to be in Spain’s interest to support ambitious EU-wide vehicle standards (passenger cars, vans and HDVs) as they could contribute over 33% of the emission reductions required from the Spanish transport sector. Standards by 2025 play a key role in helping Spain to achieve the 2030 target in a cost-effective manner. They should be introduced in 2025 and include trucks to have a meaningful impact on the achievement of the 2030 ESD targets.¹⁷

However, policy measures encouraging efficiency enhancing technologies should be complemented with measures that trigger a change of mobility patterns and of the freight transport system.

¹⁵ Based on assumption in Ricardo’s study, p. 13.

¹⁶ Ricardo’s study, p. 4.

¹⁷ More information on the details of standards is available in T&E’s ‘Road to 2030’ report.

At national level, the promotion of modal shift of passenger and freight transport plays a crucial role in order to supplement EU policies and achieve the national ESD target. Therefore, target-oriented transport infrastructure planning and fuller internalisation of road freight externalities should be aimed for.

An increase of diesel taxation would contribute to the alignment of diesel and petrol prices and account better for the CO₂ intensity of diesel. Thereby external costs would be internalised and the increased tax yields could be spent on improved infrastructure, further decreasing CO₂ emissions. Additionally, the shift to low-emission transport modes would be further encouraged.

The provision of information to raise awareness on fuel-efficient driving is also a simple and effective way to decrease emissions. In any case, Spain will have to pursue all recommended policy measures with high ambition and consider taking additional action as it will be difficult to achieve the target.

It is clear that the transport sector plays a very important role to achieve the ESD targets. It can make its fair contribution, but other sectors still also need to do their part. This set of recommended policies for the transport sector would be the starting point for Spain to contribute towards the even more ambitious objectives agreed on in Paris last year.

Further information

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