



**European Committee
of the Regions**



Territorial Impact Assessment Zero Emission Vehicles

Staff working document



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COTER
Commission

Territorial Impact Assessment Zero Emission Vehicles

Disclaimer

This report was produced by the European Committee of the Regions secretariat to assist the rapporteur and the COTER commission in preparing the opinion *Towards zero emission road transport: Deploying alternative fuels infrastructure and strengthening CO₂ emission performance standards*. This report will be shared with the European Commission and the European Parliament.

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This territorial impact assessment report is the outcome of an expert online workshop organised by the European Committee of the Regions and ESPON EGTC on 6 and 7 December 2021.

The ESPON TIA tool is designed to support the quantitative assessment of potential territorial impacts according to the Better Regulation guidelines. It is an interactive web application that can be used to support policy makers and practitioners with identifying, *ex-ante*, potential territorial impacts of new EU legislation, policies and directives (LPDs).

This report documents results of the territorial impact assessment expert workshop on two legislative proposals towards zero emission road transport. The first is the revision of the [Directive on deployment of alternative fuels infrastructure](#). The second is the [Regulation setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles](#). It is for information purposes only. This report and the maps represent the views and experiences of the participants of the workshop. It is meant to be used for decision support only and does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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


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Acronyms and legend

CoR	European Committee of the Regions
EP	European Parliament
ESPON	European Observation Network for Territorial Development and Cohesion
LRA	Local and Regional Authority
MS	Member State(s)
NUTS	Nomenclature des unités territoriales statistiques Common classification of territorial units for statistical purposes
OIR	Austrian Institute for Spatial Planning (ÖIR)
TIA	Territorial Impact Assessment

Effects of the directives – colour code

	Positive effects
	Minor positive effects
	Neutral
	Minor negative effects
	Negative effects

Legend – direction of effects



	Increase
	Decrease

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1 Introduction

1.1 The legislative files

On 14 July 2021 the European Commission published the [Fit-for-55 package](#) which seeks to cut EU carbon emissions by 55% by 2030. Transport will be a key sector to cut emissions. This will have significant implications for all European regions, businesses and citizens alike, as well as translating the polluter pays principle into practice. The CoR is thus preparing its political position on two legislative proposals. The first is the revision of the [Directive on deployment of alternative fuels infrastructure](#). The second is the [Regulation setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles](#). These initiatives seek to introduce stricter CO₂ emission standards for cars compared to the previous regulation by requiring all new cars as of 2035 to be zero emission vehicles, meaning the end of the conventional combustion engine.

1.2 The regional dimension

Both have an important regional dimension: Alternative fuels need to be available in all regions in an interoperable and non-discriminatory form. On the other hand, the end of the internal combustion engine (ICE) as of 2035 would have an enormous impact on the regions where automotive and supplier industries are located. Since both legislative proposals are interlinked (no zero emission cars without the timely roll-out of interoperable alternative fuels refuelling infrastructure), they both need to be taken into account in this TIA. Their impact, especially the end of the ICE, needs to be measured on a regional scale in order to identify the challenges of this transformation for the regional automotive and supply industry and the jobs linked to it. This kind of mapping needs to be the basis to develop a just transition for the automotive regions.

1.3 The political mandate

The territorial impact assessment workshop that took place on 6 and 7 December 2021 and the present report aim to support the CoR's *Alliance for a just and sustainable transition of automotive regions* and also the CoR's opinion *Towards zero emission road transport: Deploying alternative fuels infrastructure and strengthening CO₂ emission performance standards* from rapporteur Adrian Teban, Mayor of Cugir (RO/EPP).

1.4 CO₂ Emission standards

In order to speed up the process to roll out zero emission vehicles, the EC proposed legislation as part of the Fit for 55 package for a revision of the *Regulation setting CO₂ emission performance standards for cars and light commercial vehicles*. The proposal sets more ambitious targets for reducing the CO₂ emissions of new cars and vans. The main change is that by 2035 all new passenger cars would need to have zero emissions. The Commission would report on the progress towards zero emission road mobility by 31 December 2025 and every two years thereafter. Based on the reporting, the Commission would have to review the effectiveness and impact of the regulation in 2028. There are a few studies on the effects this transformation will have on some specific regions hosting automotive industry and supply industry tier 1, but there is a lack of any study or qualified impact assessment on the effects this will have on regions hosting supply industry from tier 2 and below. The Commission did not provide an impact assessment on the effects the proposed legislation will have on these regions.

The three main objectives of the proposed revision are:

- to contribute to the 2030 and 2050 climate objectives by reducing CO₂ emissions from cars and light commercial vehicles;
- to speed up a wider deployment of zero emission vehicles, benefitting consumers and citizens through more affordable zero emission vehicle models and significant energy savings (lower life-cycle cost) and better air quality (especially in cities);
- to stimulate innovation in zero emission technologies and strengthen the technological leadership of the automotive value chain and stimulate employment in the EU.

Main changes to the existing regulation:

- create an EU fleet-wide target of 100% reduction in GHG emissions for all new cars and light commercial vehicles from 1 January 2035 (which would effectively end the sale of petrol and diesel vehicles);
- increase the 2030 CO₂ reduction targets for new passenger cars from 37.5% to 55% of the current baseline level of 95g/km;

- increase the 2030 CO₂ reduction targets for light commercial vehicles from 31% to 50% of the current baseline level of 147g/km, with the revision of CO₂ targets for heavy-duty vehicles to be proposed to the European Commission in 2022;
- introduce a review mechanism requiring the European Commission to review the effectiveness and impact of the new measures in 2028 and submit a report to the European Parliament and European Council.

1.5 Alternative fuels infrastructure

The proposed regulation sets a number of mandatory national targets for the deployment of alternative fuels infrastructure in the EU for road vehicles, vessels and stationary aircraft. For publicly available electric charging infrastructure for cars and vans, mandatory national fleet-based targets are set via publicly accessible recharging stations, with different targets for battery electric vehicles (BEV) and plug-in hybrid vehicles (PHEV). Distance-based targets (max 60km in between) are set for the trans-European transport network (TEN-T), for the core and the comprehensive part of the TEN-T as well as for heavy-duty vehicles in urban nodes.

The territorial dimension is not reflected in the proposal for a *Regulation on the deployment of alternative fuels infrastructure* (AFIR) as the quantitative and qualitative specifications of refuelling stations is not calculated based on local and regional specificities. Urban and rural areas face different challenges in the deployment of alternative fuels refuelling infrastructure.

1.6 Starting questions

1. The Commission's proposals on clean road transport in the Fit for 55 package do not include a detailed analysis of the territorial impact, nor do they propose any mechanism for promoting dialogue with these regions at European level with a view to developing, where appropriate, common transformation strategies. What could a European legal framework to anticipate and manage the transformation look like and on which regional indicators could it build upon?
2. The legislative proposal means the phasing-out of combustion engine cars and will therefore have a huge impact on regions with automotive industry and relevant supply industries. How can this transformation process be supported?

3. How can we guarantee a "Just transition for the automotive regions" to make sure that effects on regional jobs and growth are addressed?
4. How can existing mechanisms like the Just Transition Fund, the Social Climate Fund or the Just Transition scheme of InvestEU be put to use in addressing those effects?
5. How can interoperable technological solutions for alternative refuelling be made available throughout the EU?
6. How can the territorial dimension in the proposal for a *Regulation on the deployment of alternative fuels infrastructure* (AFIR) be better reflected? The quantitative and qualitative specifications of refuelling stations are not calculated based on local and regional specificities. Urban and rural areas face different challenges in the deployment of alternative fuels refuelling infrastructure. Technological neutrality is not a given and regions that have invested in alternative fuels other than those covered by the AFIR could face difficulties.
7. How can the interests of regional and local authorities and their strategies for deployment of alternative fuels infrastructure, which already exist in various Sustainable Urban Mobility Plans (SUMP), be fully taken into account in the definition of national policy frameworks for the deployment of alternative fuels?
8. How can cross-border provision of interoperable refuelling technologies be ensured?

2 Methodology: ESPON Quick Check

The concept of territorial impact assessment (TIA) aims to show the regional differentiation of the impact of EU policies. The ESPON TIA tool¹ is an interactive web application that can be used to support policy makers and practitioners with identifying, *ex-ante*, potential territorial impacts of new EU legislations, policies and directives (LPDs). The ESPON TIA Quick Check approach combines a workshop setting for identifying systemic relations between a policy and its territorial consequences with a set of indicators describing the sensitivity of European regions.

It helps to steer an expert discussion about the potential territorial effects of an EU policy proposal by checking all relevant indicators in a workshop setting. The results of the guided expert discussion are judgements about the potential territorial impact of an EU policy considering different thematic fields (economy, society, environment, governance) for a range of indicators. These results are fed into the ESPON TIA Quick Check web tool.

The web tool translates the combination of the expert judgements on exposure with the different sensitivity of regions into maps showing the potential territorial impact of EU policy on the NUTS3 level. These maps serve as a starting point for the further discussion of different impacts of a concrete EU policy on different regions. Consequently, the experts participating in the workshop provide important input for this quick check on potential territorial effects of an EU policy proposal.

The workshop supported the CoR's opinion *Towards zero emission road transport* based on two legislative proposals. The first is the revision of the [Directive on deployment of alternative fuels infrastructure](#). The second is the [Regulation setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles](#). The online workshop was held on 6 and 7 December 2021 and brought together a number of experts representing different organisations and LRAs.

Three moderators from the ÖIR, provided by ESPON, prepared and guided the workshop and handled the ESPON TIA tool.

¹ https://www.espon.eu/main/Menu_ToolsandMaps/TIA/

sector in the total employment is higher than one percent, all other regions will not be included in the analysis when using this typology. The experts agreed to use this in the workshop.

2.3. Picturing the potential territorial effects through indicators

In order to assess the potential effects pictured in the conceptual model, suitable indicators need to be selected related to the parameters that the experts discussed in the fields of economy, environment, society and governance. The availability of data for all NUTS3 regions is posing certain limitations to indicators that can be used. From the available indicators that the ESPON TIA Quick Check web tool offers the experts chose the following indicators to describe the identified effects.

Picturing potential territorial impacts considering economy-related indicators

- Employment in the automotive industry
- Employment in the car repair sector
- Potential accessibility by road

Picturing potential territorial impacts considering society-related indicators

- Unemployment rate
- Disposable income
- Burdensome cost of housing

2.4. Judging the intensity of the potential effects

The participants of the workshop were asked to estimate the potential effects deriving from the potential effects of the proposals towards zero emission road transport. They judged the potential effect on territorial welfare along the following scores:

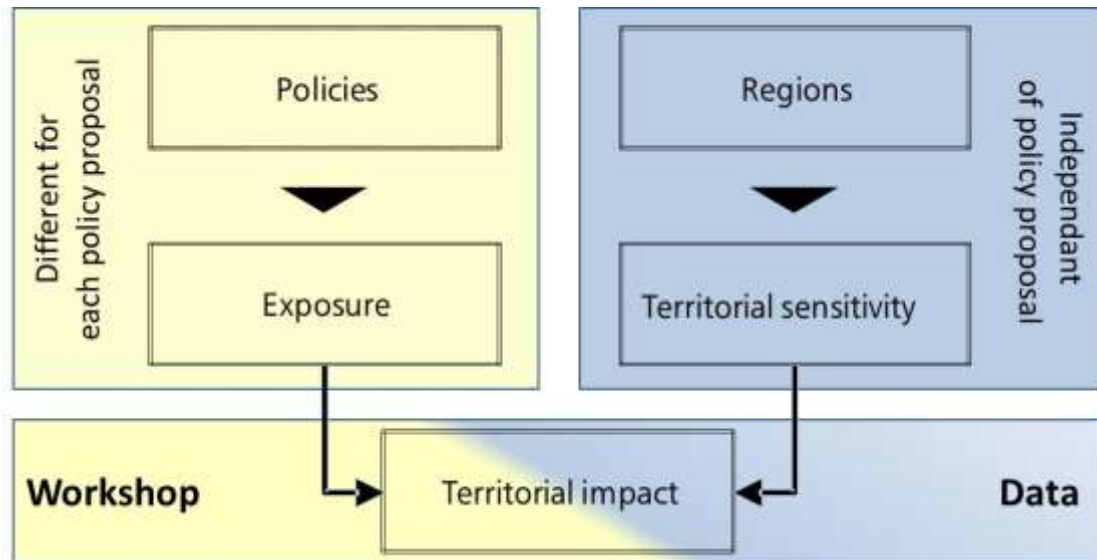
- ++ strong advantageous effect on territorial welfare (strong increase)
- + weak advantageous effect on territorial welfare (increase)
- o no effect/unknown effect/effect cannot be specified
- - weak disadvantageous effect on territorial welfare (decrease)
- -- strong disadvantageous effect on territorial welfare (strong decrease)

2.5. Calculating the potential regional impact – Combining the expert judgement with regional sensitivity

The ESPON TIA Quick Check combines the expert judgement on the potential effect deriving from the impact of the potential effects of the proposals towards zero emission road transport (**exposure**) with indicators picturing the sensitivity of regions resulting in maps showing a territorially differentiated

impact. This approach is based on the **vulnerability concept** developed by the Intergovernmental Panel on Climate Change (IPCC). In this case, the effects deriving from a particular policy measure (exposure) are combined with the characteristics of a region (**territorial sensitivity**) to produce potential territorial impacts (cf. following figure).

Figure 2: Exposure x territorial sensitivity = territorial impact



Source: ÖIR, 2015.

- "Territorial Sensitivity" describes the baseline situation of the region according to its ability to cope with external effects. It is a characteristic of a region that can be described by different indicators independently of the topic analysed.
- "Exposure" describes the intensity of the potential effect caused by the potential effects of the proposals towards zero emission road transport on a specific indicator. Exposure illustrates the experts' judgement, i.e. the main findings of the expert discussion at the TIA workshop.

2.6. Mapping the potential territorial impact

The result of the territorial impact assessment is presented in maps. The maps displayed below show potential territorial impacts based on a combination of the expert judgement on the exposure with the territorial sensitivity of a region, described by an indicator on the NUTS3 level. Whereas expert judgement is a qualitative judgement (i.e. strong advantageous effect on territorial welfare/weak advantageous effect/no effect/weak disadvantageous effect/strong disadvantageous effect), the sensitivity is a quantitative indicator.

3 Debate and Mapping exercise

3.1 Preliminary discussion on economic effects

Participants saw the implementation of the proposed legislation as presenting severe challenges both to small businesses and poorer and peripheral regions.

Indeed, in terms of regional typologies cities could be the main winners of these proposals. Implementing the charging infrastructure is easier and cheaper in densely populated regions. On the contrary, rural or depopulated regions and island regions with low population density will suffer the most, since there will be comparatively less demand.

The bigger original equipment manufacturers (OEM) will survive the transition and eventually become stronger at the expenses of suppliers who will lose parts of the value chain (via insourcing of production). Regions with a large number of SMEs and suppliers to OEMs will be the most negatively affected from an economic point of view.

Other economic impacts will also occur among users. Companies (especially in the sector of logistics and distribution) will have to adapt to the more demanding refuelling of vehicles, since thus far there are no significant improvements in sight in the capacity of electric batteries.

The cost of electric vehicles is higher than combustion engine vehicles. The technological advancements and the scale effects could lead to a reduction of prices, but since there will be increased demand for the components of electric vehicles it is unclear whether this will benefit consumers. The prices will not necessarily be reduced, which will negatively affect the poorer consumers and regions. The development of a second hand market for electric vehicles could reduce these negative effects.

Finally, there will be increased competition for consumption of electric energy. While there might be efficiency gains from the shift of combustion engine vehicles to the production of electricity via gas electric centrals, the increased demand for electricity can lead to more pressure to maintain the production of electricity through fossil fuels. The much higher demand of electricity might as well put pressure on local distribution nets.

3.2 Preliminary discussion on environmental effects

The bottlenecks created by the prohibition of other types of energy in vehicles might be compensated with better environmental standards. Nevertheless, the concept of zero emission vehicles is too focused on the exhaust pipe emissions. An accurate measurement of emissions must include the

energy production itself. Shifting CO₂ emissions from the vehicle to energy production betrays the goal of the policy.

Regions and countries dependent on coal and with low potential for renewables might suffer increased pressure to maintain or return to highly pollutant energy sources as a way to respond to the increased demand for electricity. Furthermore, regions with high installed capacity or potential for biofuels will also lose the automotive market, reducing the incentives to develop biofuel production. The Commission proposal does not take into consideration that biofuels used in combustion engines can also be zero emission in its production process.

Nevertheless, a decrease in CO₂ emissions and other pollutants could be expected in general if there is a transition towards fossil fuel-free electricity production. The biggest winners will be areas with both poor(er) air quality resulting from a high concentration of vehicles and areas with greater potential to have ubiquitous charging points for electric vehicles. Cities and highly populated areas are thus set to see the biggest improvements in their air quality.

3.3 Preliminary discussion on social and governance effects

The proposed policies risk increasing social and regional divides, since the winners tend to be regions which are already better off and larger companies, with the losers being poorer and peripheral regions. Furthermore, the jobs that will be lost will especially be among lower skilled workers.

Strong investment to re-skill workers will thus be needed. There could be opportunities in terms of provision of new services for repair and maintenance, but it could also be that many of the jobs in the automotive sector are simply lost. The re-skilling effort must thus think beyond the sector and prepare workers to shift to other areas of activity.

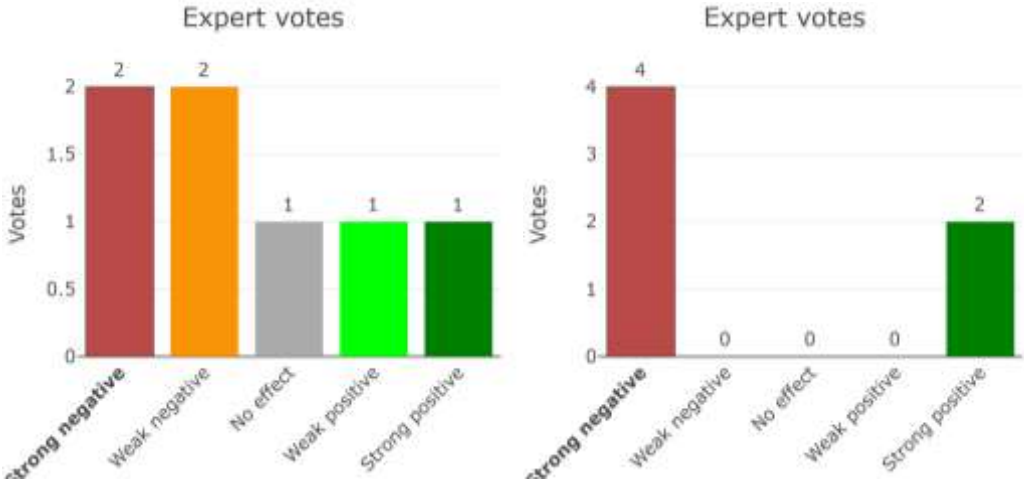
While cities will enjoy greater quality of life (and, potentially, experience economic benefits in sectors such as tourism) specific actions must be envisaged to tackle the infrastructural problems that, for example, rural areas will face. Private charging will be easier in rural areas and residential areas with single family houses with private garages. There will be a higher need for public charging points and quick charging in cities where there is less possibility for private charging. When private actors are not capable of or interested in creating the charging infrastructure in certain regions, national, regional and local authorities should intervene. Eventual limitations created by European competition legislation should to that end be derogated.

3.4 Employment in the automotive industry

The proposals towards zero emission road transport will naturally have an impact on the automotive industry. While two experts judged the influence as positive (one strong, one weak), the majority saw

a negative impact (two strong, two weak). Due to the transition from producing fossil-fuel to alternative energy vehicles the manufacturing technologies have to change. Therefore, the experts expected employment in the conventional automotive industry to be influenced negatively as automation will lead to less personnel being required to produce alternative-energy-driven vehicles. Furthermore, automotive suppliers could also be affected negatively due to the restructuring necessary for producing alternative energy vehicle parts. Enterprises that are specialised in manufacturing few components are particularly vulnerable. On the other hand, two experts indicated that new job opportunities could be evolving, such as in the battery manufacturing sector. One expert did not see this indicator as relevant.

Figure 3: Result of the expert judgement: employment in the automotive industry affected by the proposals towards zero emission road transport; right: voting for all regions, left: voting for automotive regions



Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

Several studies² have substantiated that whereas the strong focus on electrification may create significant job opportunities in energy generation and infrastructure, overall impact in automotive manufacturing is negative and jobs in the battery supply chain do not compensate the job losses. Furthermore, skills requirements and location of these jobs may be significantly different, highlighting that jobs will not always be one-on-one interchangeable. The transition will both impact employment with vehicle manufacturers and automotive suppliers, but employment with the latter category is likely

² PWC Strategy&, Electric Vehicle Transition Impact Assessment Report 2020-2040, December 2021, <https://clepa.eu/wp-content/uploads/2021/12/Electric-Vehicle-Transition-Impact-Report-2020-2040.pdf>
 The Boston Consulting Group, E-Mobility: A green boost for European automotive jobs, June 2021, P.26 https://www.platformelectromobility.eu/wp-content/uploads/2021/06/20210623-E-mobility_EU-Report_FULL_vfinal.pdf
 Fraunhofer Institut für Arbeitswirtschaft und Organisation, ELAB 2.0, December 2018: <https://www.muse.iao.fraunhofer.de/de/projekte/elab-elektromobilitaet-und-beschaeftigung.html>

to be impacted stronger³. A recent study by the Boston Consulting⁴ Group found that electrification will until 2030 lead to an employment reduction of 166,000 jobs with vehicle manufacturers, 274,000 jobs with automotive suppliers, whereas job creation in the battery and EV component sector is limited to 237,000. A recent study by PWC Strategy& highlighted that 70% of the social impact with automotive suppliers is likely to take place within the 2030-2035 timeframe and that 501,000 jobs with suppliers are at risk and that an electric only approach could lead to a net loss of 275,000 until 2040, despite 270,000 jobs related to the production of EV components and batteries⁵. The extent into which the regulatory framework will allow registration of new hybrid vehicles on the market will have significant influence on the scale and pace of social impact⁶.

The indicator "employment in the automotive industry" depicts the share of employment in this branch (manufacture, wholesale and retail) in the total working age population (15-64 years). The reference year of this indicator is 2015. Regions with a higher share of employment in the auto industry are expected to be influenced more by the proposals towards zero emission road transport. Sensitivity is thus directly proportional to the share of employment in this sector.

The following maps show the potential territorial impact of the proposals towards zero emission road transport on employment in the automotive industry. The first map combines the expert judgement of a strongly negative effect with the given sensitivity of regions in all regions. 31% of the regions are expected to face a very high negative impact. These regions are rather scattered throughout the EU, though some regional clusters (e.g. Spain, Sweden, Germany, Austria) can be detected. These regions can also be found in most of the Member States. 37% of the regions would see a highly negative impact. 32% of the regions would get a moderately negative impact.

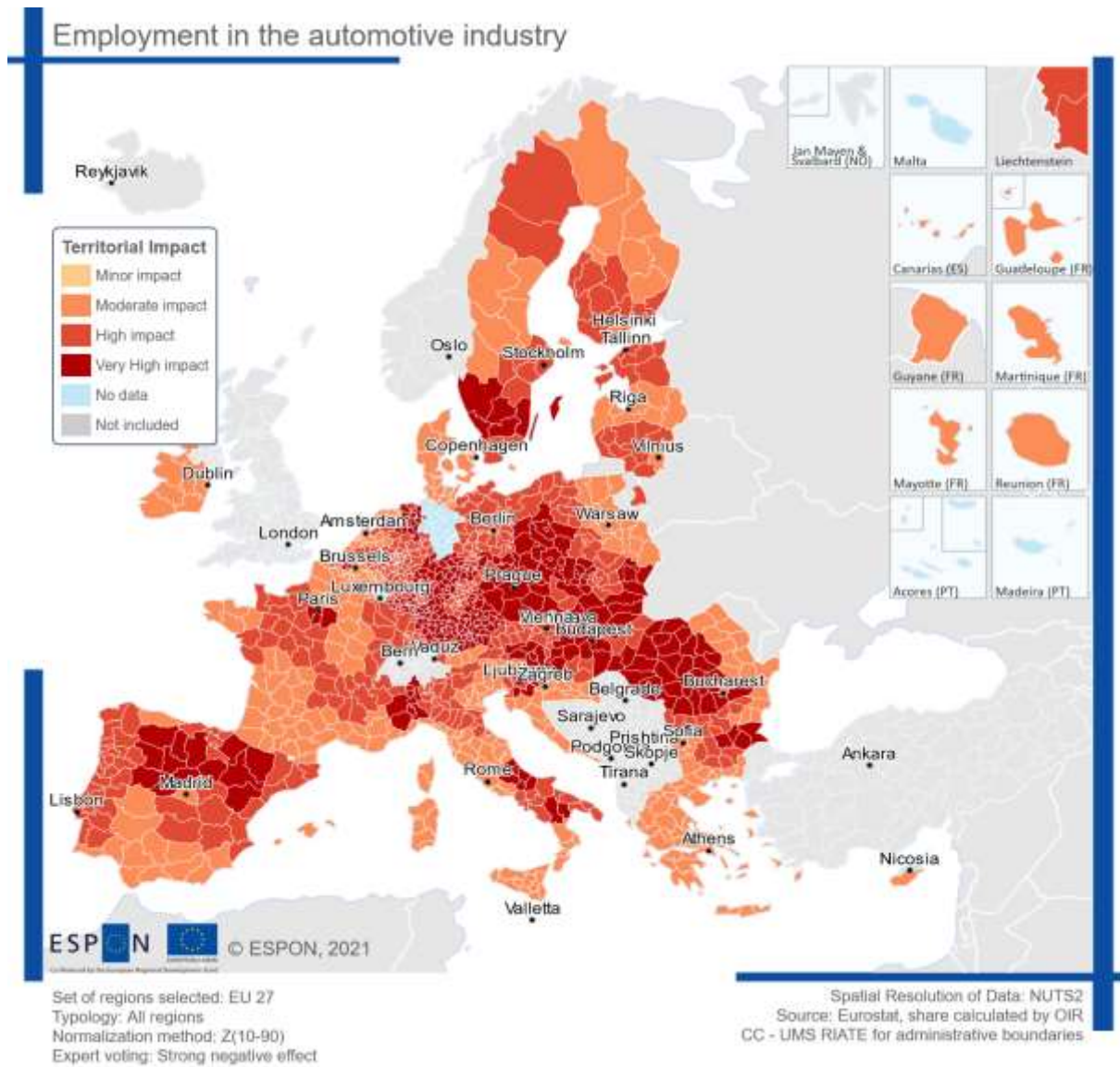
³ Fraunhofer Institut für Arbeitswirtschaft und Organisation, Beschäftigung 2030, December 2020, P.9
https://publica.fraunhofer.de/eprints/urn_nbn_de_0011-n-6154803.pdf

⁴ The Boston Consulting Group, June 2021, P.28-P.36

⁵ PWC Strategy&, December 2021, P 38

⁶ PWC Strategy&, December 2021, P-5-9

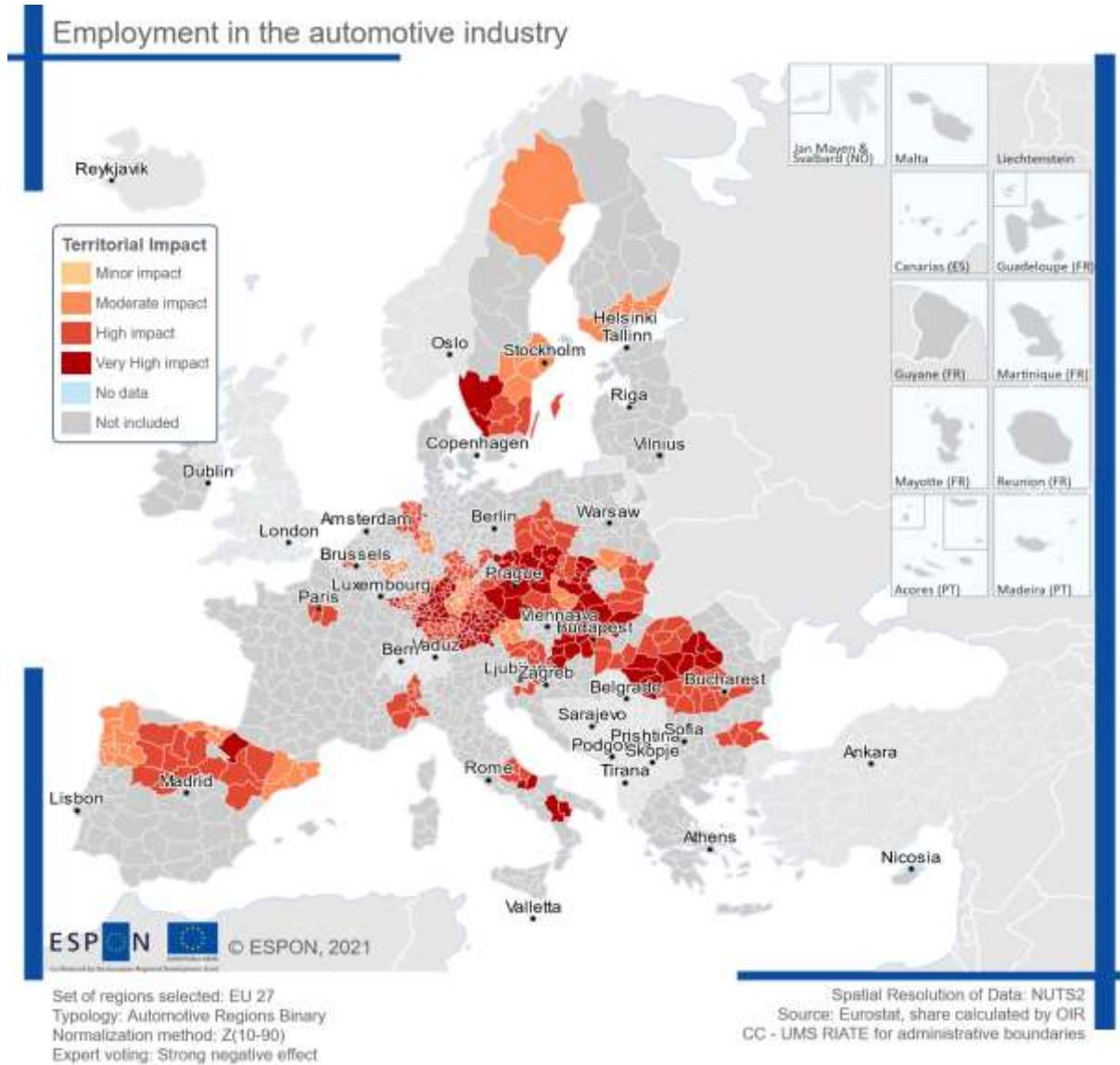
Map 1: employment in the automotive industry affected by the proposals towards zero emission road transport – expert judgement: strongly negative effect



Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

The second map combines the expert judgement of a strongly negative effect with the given sensitivity of automotive regions. The different levels of impact are rather equally distributed over the countries, although most of the regions facing the highest negative impact are located in Eastern Europe as well as in Germany. Overall 32% of the regions would have a very highly negative impact. 45% of the regions are expected to have a highly negative impact and 23% a moderately negative impact.

Map 2: employment in the automotive industry affected by the proposals towards zero emission road transport – expert judgement: strongly negative effect

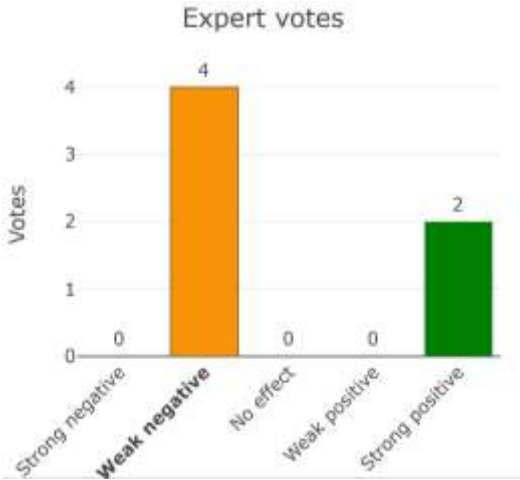


Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

3.5 Employment in the car repair sector

Similar to employment in the automotive sector indicator, the proposals towards zero emission road transport will also have an impact on the car repair industry. Due to new technologies, jobs in the conventional car repair sector could disappear, but new job opportunities where new skills are required would be created at the same time. Therefore, the experts' votes were split, with two experts seeing a strong positive effect. However, four experts deemed that the negative effects would prevail and voted for weakly negative.

Figure 4: Result of the expert judgement: employment in the car repair sector affected by the proposals towards zero emission road transport

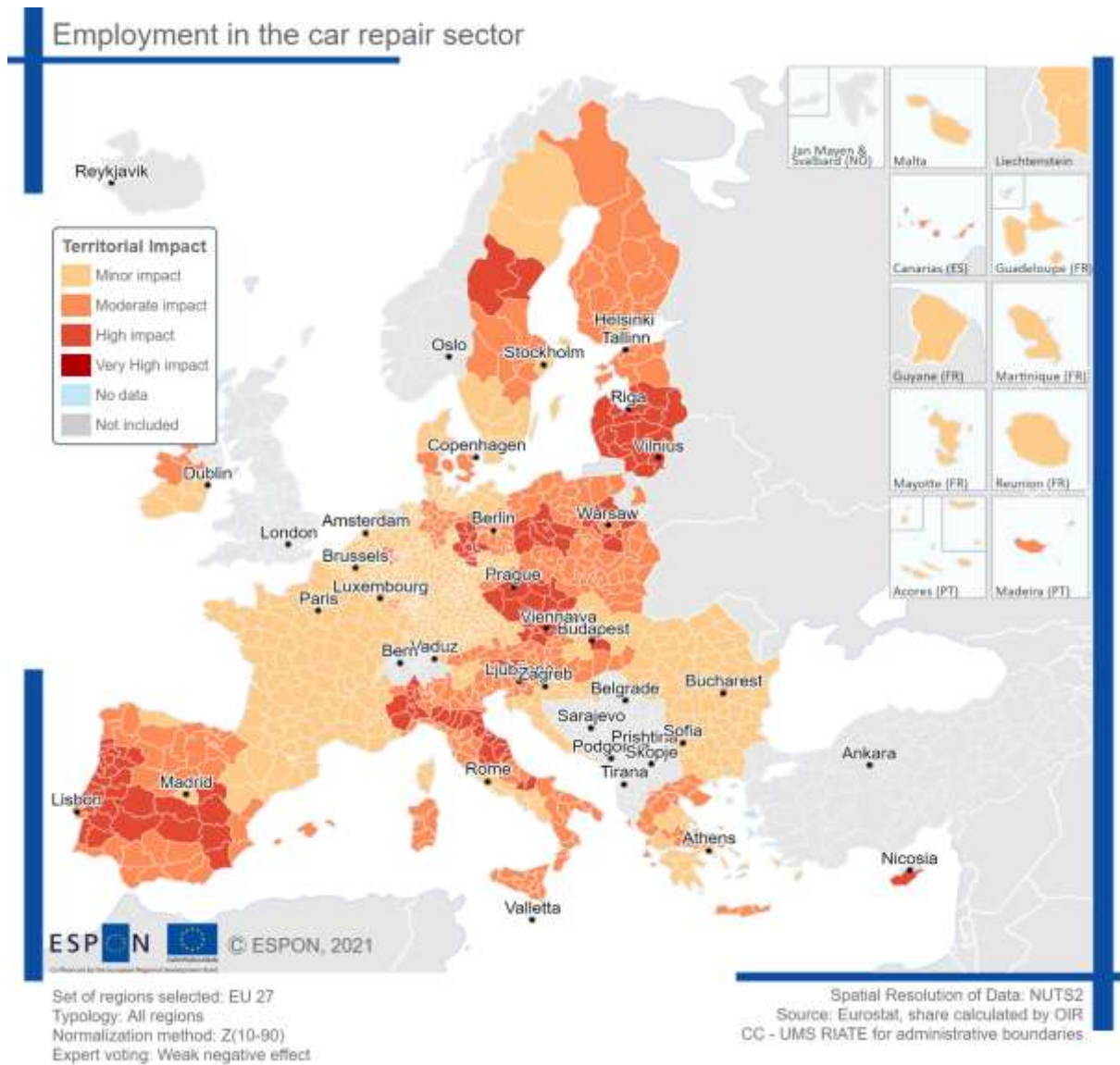


Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

This indicator shows the share of employment in the car repair sector (maintenance and repair of motor vehicles) on the total working age population (15-64 years), thus demonstrating the importance of the sector for regional employment. The reference year of this indicator is 2019. Regions with a higher share of employment in this sector are likely to be influenced more by the proposals towards zero emission road transport. Sensitivity is thus directly proportional to the share of employment in the car repair sector.

The following maps show the potential territorial impact of the proposals towards zero emission road transport on employment in the car repair sector. It combines the expert judgement of a weakly negative effect with the given sensitivity of regions. 11% of the regions would have a highly negative impact. Some Member States would be particularly negatively affected (Latvia, Lithuania, Portugal, Czech Republic and Cyprus), the others would get the highest negative impact at regional level (e.g. Spain, Italy, Austria, Slovenia and Sweden). 29% of the regions would face a moderately negative impact. Apart from the countries mentioned before, these regions are located in e.g. Ireland, Greece, Slovakia or Finland. Most of the regions (60%) would see a minor negative impact.

Map 3: employment in the car repair sector affected by the proposals towards zero emission road transport – expert judgement: weakly negative effect

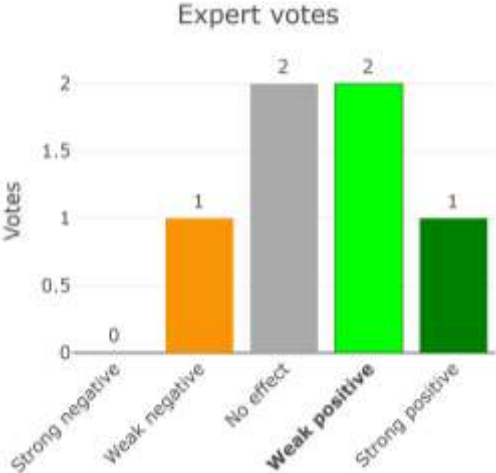


Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

3.6 Potential accessibility by road

Road accessibility was identified by the experts as one of the factors critical for deploying refuelling infrastructure. High density areas with good accessibility are likely to profit, while rather peripheral areas will likely struggle to support the necessary infrastructure and thus profit from financial support in this regard. Most of the experts consequently voted for positive (one strong, two weak). One assessed this effect as weakly negative. Two experts did not see a relevant effect.

Figure 5: Result of the expert judgement: regions considering the potential accessibility by road and the impact of the proposals towards zero emission road transport

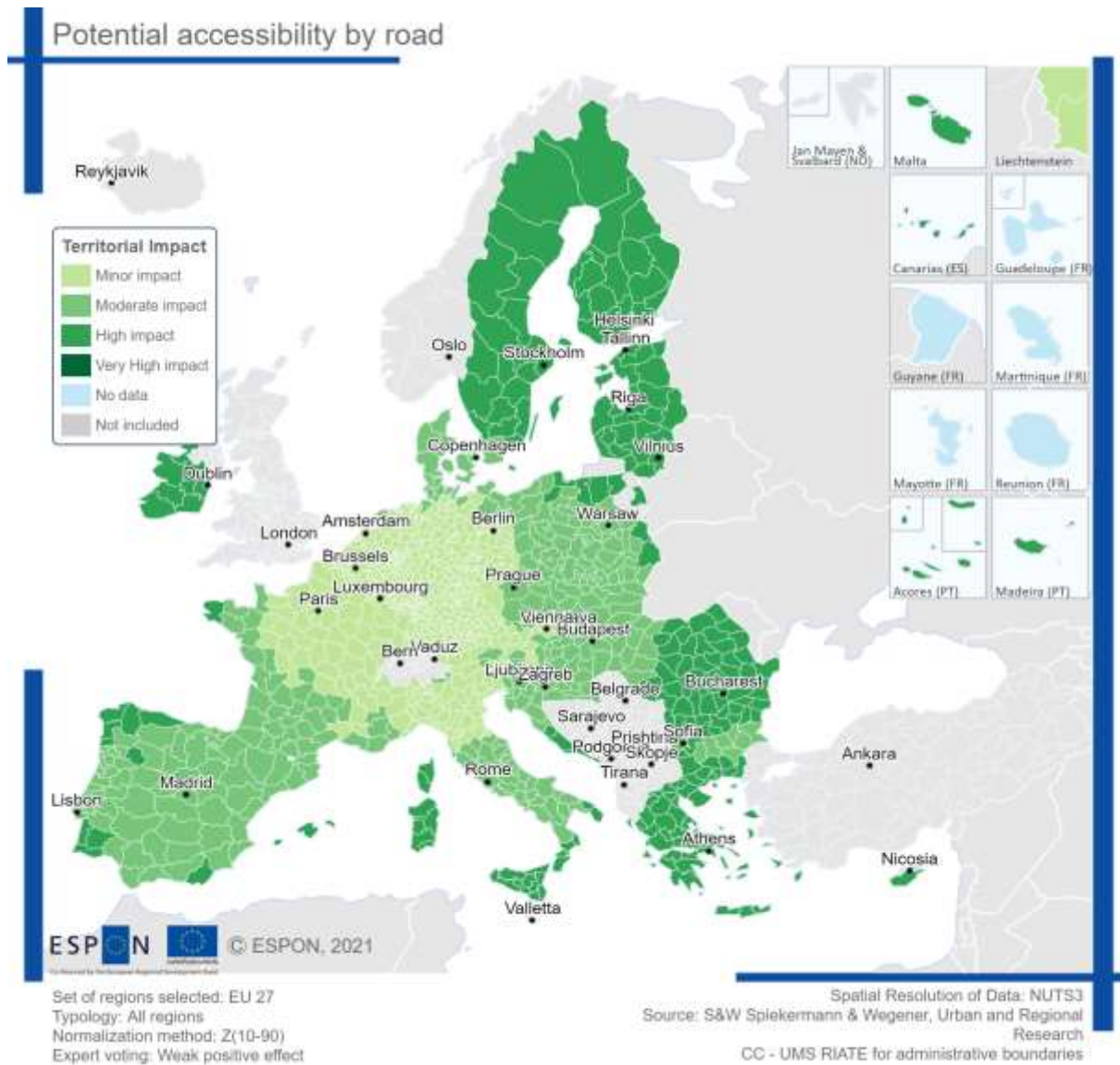


Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

The indicator "potential accessibility by road" is expressed as an index relating to the ESPON average. For each NUTS3 region the population in all destination regions is weighted by the travel time by road to go there. The weighted population is summed up to the indicator value for the accessibility potential of the region of origin. The reference year is 2014. Regions with a higher potential accessibility by road are expected to be influenced more by the proposals towards zero emission road transport. Sensitivity is thus directly proportional to the potential accessibility by road.

The following maps show the potential territorial impact of the proposals towards zero emission road transport considering the potential accessibility by road. It combines the expert judgement of a weakly positive effect with the given sensitivity of regions. It is noteworthy that the regions having the lowest impact (52%) are in the central part of Europe (Germany, Benelux countries, France, Italy and Austria), while regions getting the highest impact (21%) as well as most regions with a moderately positive impact (27%) are located outside of Central Europe.

Map 4: regions considering the potential accessibility by road and the impact of the proposals towards zero emission road transport



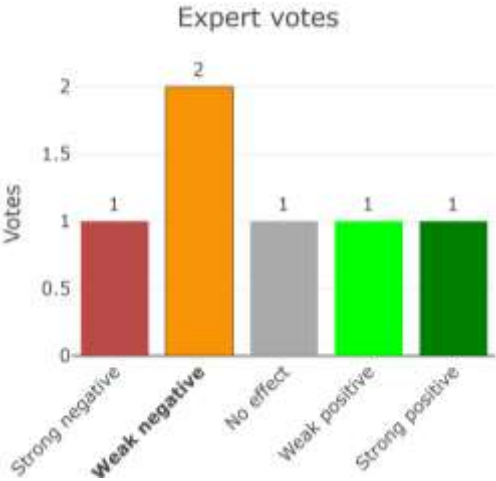
Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

3.7 Unemployment rate

As mentioned before, the proposals towards zero emission road transport will have an impact on employment. On the one hand, employment in the sectors that are directly and indirectly involved in the automotive industry could decrease, on the other hand new job opportunities could be created if re-skilling of workers is supported. Regions supporting emerging industries and supplier industries for the alternative energy road vehicles sector are also likely to profit.

Consequently, the result of the experts' voting was ambiguous. Two experts voted for positive effects (one strong, one weak), while three experts voted for negative (two weak, one strong). One did not see a relevant effect.

Figure 6: Result of the expert judgement: regions considering the unemployment rate and the impact of the proposals towards zero emission road transport

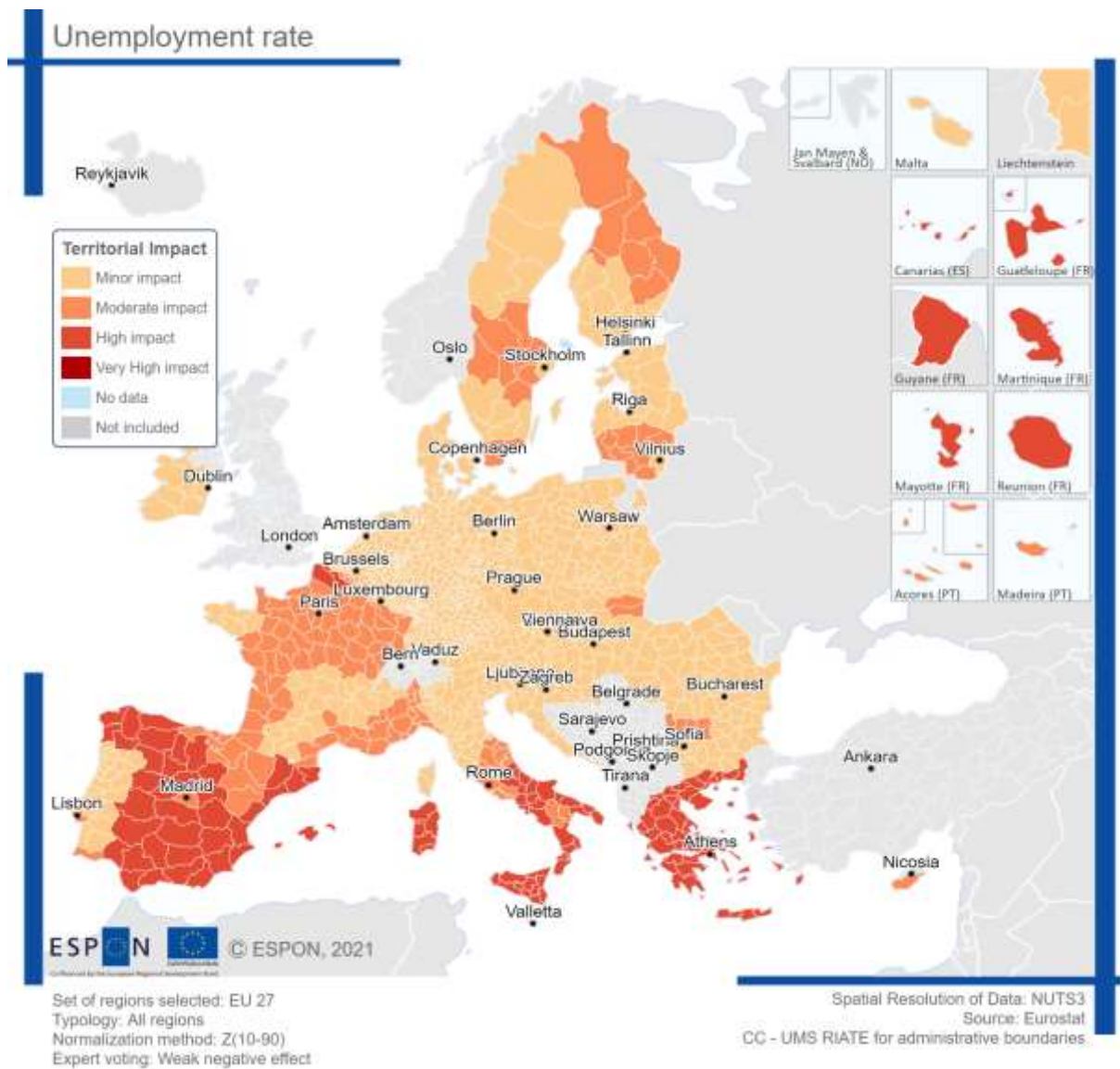


Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

The indicator "unemployment rate" is calculated by dividing the number of unemployed people by the number of the economically active population (reference year: 2019). Regions experiencing higher levels of unemployment are likely to be affected negatively by the proposals towards zero emission road transport. Sensitivity is thus directly proportional to the unemployment rate.

The following maps show the potential territorial impact of the proposals towards zero emission road transport considering the unemployment rate. It combines the expert judgement of a weakly negative effect with the given sensitivity of regions. 12% of the regions could see a highly negative impact. These regions can be found mainly in Southern Europe, e.g. in Spain, Italy and Greece. 13% of the regions would have a moderately negative impact. In particular, France, Finland and Lithuania would be moderately negatively affected, while some other Member States (e.g. Sweden, Slovakia and Bulgaria) would get a moderate impact at regional level. The majority of the regions (75%) would get a minor negative impact.

Map 5: regions considering the unemployment rate and the impact of the proposals towards zero emission road transport



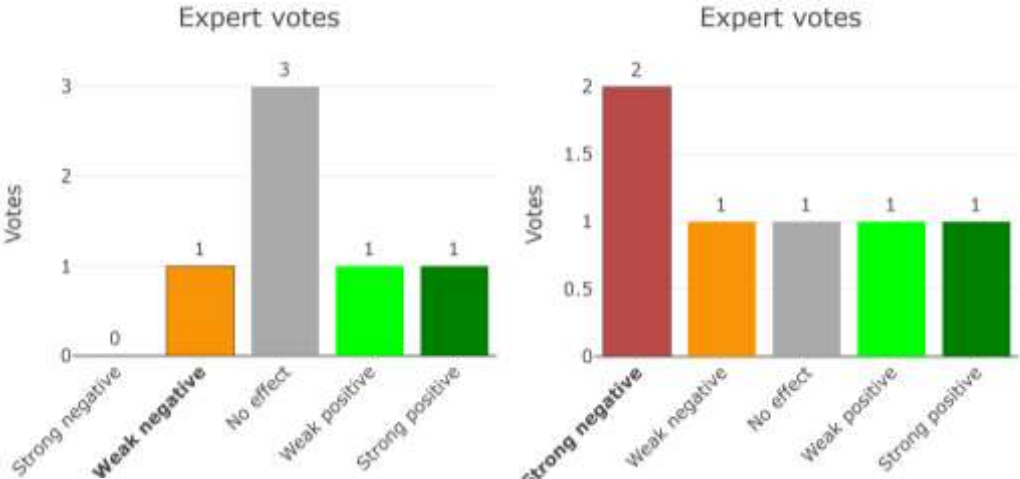
Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

3.8 Disposable income

As the automotive sector accounts for a considerable amount of income across Europe, significant changes to the industry also influence regional disposable income. The experts, however, did not agree whether this effect will be overall positive (e.g. through increased added value in the high-tech industry) or negative (e.g. through loss of jobs and overall decrease in income). In the voting for all regions, the effects were seen as predominantly positive: two experts deemed the effect as positive (one strong, one weak). One expert saw the opposite effect and voted for (weak) negative. Three experts did not expect a relevant effect. On the contrary, the voting for the automotive regions was

ambiguous. Two experts saw a positive effect (one strong, one weak), but three experts judged the effect to be negative (one weak, two strong). One expert did not consider this indicator relevant.

Figure 7: Results of the expert judgement: regions considering disposable income and the impact of the proposals towards zero emission road transport; right: voting for all regions, left: voting for automotive regions

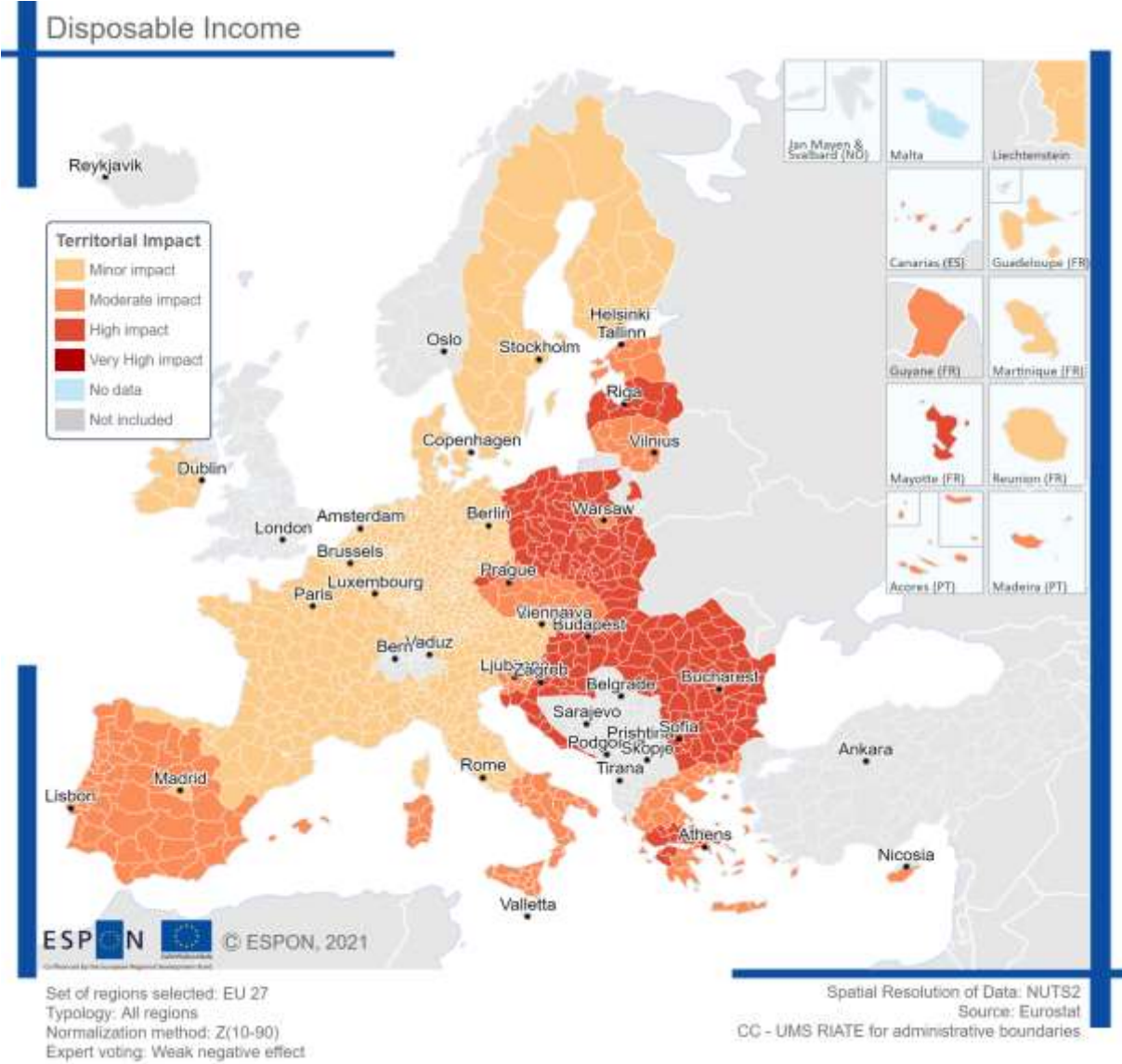


Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

The indicator "Disposable income" is expressed in euro per inhabitant (reference year: 2018). Regions with a lower income per inhabitant are likely to be influenced more by the proposals towards zero emission road transport. Sensitivity is thus directly proportional to the disposable income per inhabitant.

The following maps show the potential territorial impact of the proposals towards zero emission road transport taking into consideration disposable income. The first map combines the expert judgement of a weakly negative effect with the given sensitivity of all regions. All regions facing a highly negative impact (17%) are located in Eastern/South-Eastern Europe. While Latvia, Poland, Hungary, Croatia, Bulgaria and Romania would be affected (almost) across the country, the Czech Republic and Greece would get the highest impact at regional level. 17% of the regions are expected to have a moderately negative impact. These regions can also be found in Eastern Europe as well as in the southern part of Italy, Ireland, Portugal and Spain. 66% of the regions would get a minor negative impact.

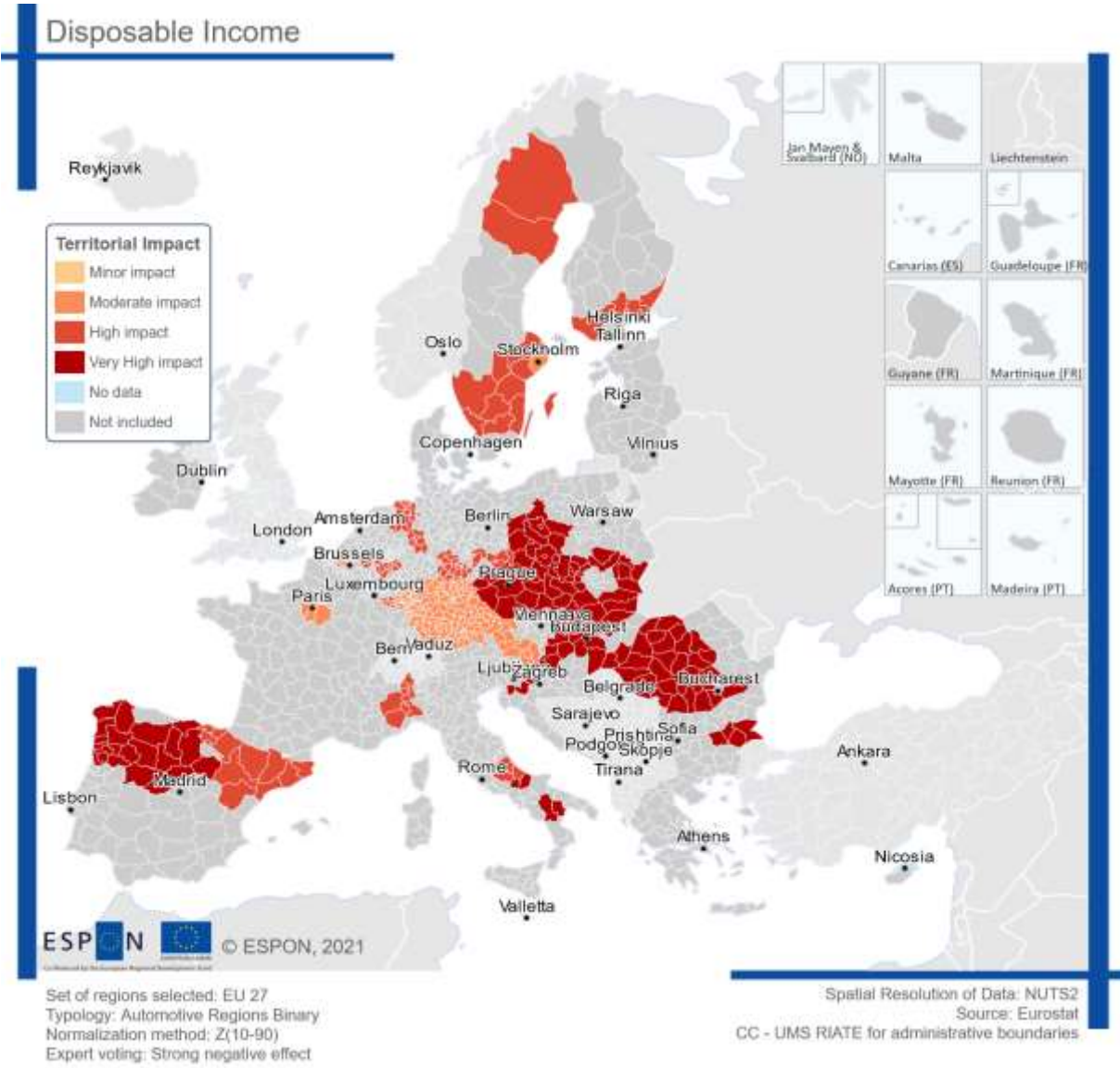
Map 6: regions considering the disposable income and the impact of the proposals towards zero emission road transport – expert judgement: weakly negative effect



Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

The second map combines the expert judgement of a strongly negative effect with the given sensitivity of automotive regions. Almost a third of the regions (30%) would get a very highly negative impact. These regions are located in the countries of Eastern Europe and in Italy and Spain. 27% of the regions are expected to have a highly negative impact. The majority of the regions (44%) would have a moderately positive impact.

Map 7: regions considering the disposable income and the impact of the proposals towards zero emission road transport – expert judgement: strongly negative effect



Source: Territorial impact assessment expert workshop, 6 and 7 December 2021

4 Conclusions and recommendations

4.1 Regional patterns of the shift in car manufacturing

The focus on tailpipe emissions as the defining element of the concept of zero emission vehicles (as opposed to a focus on the overall environmental impact of the production of vehicles) will impact negatively first and foremost those regions that supply the car industry with the parts needed for combustion engine vehicles. These regions will continue to produce the materials needed while these vehicles are not entirely phased out, which could mitigate their economic decline, but also entrap them in technology with an expiration date.

Among these regions, financial aid to overcome the damage caused by the transition might be severely limited by state aid rules. This is true especially for more affluent regions. Since the rules applicable to car manufacturing regions in, for example, southern Germany are different from those applicable in Poland or Hungary, this might also raise issues of competition fairness.

Furthermore, inside each car manufacturing region, the transition will affect various economic sectors and social segments differently. Winners and losers can thus be different inside each region. Detailed impact analysis needs to be made at a more detailed level, since the gains in some areas might hide losses that potentially will not be taken into account.

4.2 Regional patterns of the energy shift

The shift to electric vehicles will impact cities most positively, and rural regions and regions of low demographic density more negatively. Given the technological limitations of batteries, the autonomy of electric vehicles poses challenges to users that need to do longer trips. This is also reflected in some economic sectors, such as distribution and logistics. While mobility in cities will not be significantly impacted, the air quality is set to improve, something that is more relevant for urban areas than for rural ones.

Besides the challenges to mobility with electric vehicles, rural and depopulated areas are also at a disadvantage as concerns the installation of charging stations. This should be relatively straightforward in urban areas, since the scale effect makes it economically viable. Nevertheless, the initial costs are expected to be higher in cities.

In regions with less intense traffic though, the costs of installation of charging points will be less quickly paid off. With less benefits and slower implementation, and with mobility challenges resulting from the technology itself, the inhabitants of these regions might be slower to shift to electric vehicles.

4.3 Decarbonisation of energy production

Participants also raised the issue of decarbonisation of energy production. The focus on vehicles only hides the issue of production of electricity. Though there might be efficiency gains in shifting the use of fossil fuels in vehicles to electric power plants, it is not clear that this fully compensates for the investment needed to change the infrastructure and vehicles throughout the European Union. It also betrays the goal of reducing CO₂ emissions.

From a geopolitical point of view, this poses the question of stronger dependency of the European Union towards a more limited number of gas producers with different (if not opposed) interests to the EU. This can ultimately undermine citizens' trust, by the failure to address the climate challenge, the strengthening of geopolitical adversaries, the jobs lost and the costs imposed on consumers.

The shift to electric vehicles needs then to be accompanied by a policy centred on the diversification of the sources of electric energy, monitoring its prices and guaranteeing that the production of electricity will be gradually decarbonised – not simply shifting the production of CO₂ from combustion engine vehicles to electric power plants.

4.4 Technological neutrality

The absence of technological neutrality was deemed by some participants as putting challenges in place for European industry. Other major vehicle producing markets, such as the United States or China, have not limited the options available in terms of mobility. This risks putting Europe on a path of dependency in terms of technological development. While it may mean that Europe will develop faster in the production of electric vehicles and influence external markets via its regulatory influence, it can also result in more limited options and reduced competitiveness on a global scale.

4.5 Further evidence gathering

The widespread impacts in Europe, with very localised economic and labour effects in automotive regions calls for further gathering and analysis of data concerning this industrial sector. While there is data on original equipment manufacturers, the data on the several layers of suppliers is weak. Given that suppliers in general, and SMEs in particular, will be the most negatively affected sectors, it is important to understand who these are and where are they located.

In this sense, involving industry interests, trade unions of the sector and regions with strong interests in the sector is fundamental not only to, further on, support the implementation of the policy, but also to start collecting the relevant data to assess its impacts.

4.6 Support measures

Participants shared the opinion that this policy bears resemblance to the coal regions, in that its widespread potentially positive environmental impact is counterbalanced by some very localised

negative impacts on the economic and labour fields of a certain number of regions. Specific support should thus be envisaged to proactively support the transition in these regions. This support should cover both companies and the re-skilling of the labour force.

Also relevant is the fact that some of the most affected regions are comparatively rich and are thus excluded from significant support from European funds. This will also need to be tackled for two reasons. First, negatively affected companies and workers might be victims of the success of their regions. Recognising the prosperity of a region must not be made at the expenses of the least advantaged within those regions.

Second, European funds should not be seen as a zero-sum game. Not supporting industry-leading regions in this transition will not leave poorer EU regions better off – it will weaken the EU's capacity to compete with other industrial powerhouses, such as the US, China or Japan. In this sense, European funds must be tweaked so that wealthy automotive regions do not have to wait for their impoverishment in order to receive European support.



European Committee of the Regions

Created in 1994, after the entry into force of the Maastricht Treaty, the European Committee of the Regions is the EU's assembly of 329 regional and local representatives from all 27 Member States, representing over 447 million Europeans.

Its main objectives are to involve regional and local authorities and the communities they represent in the EU's decision-making process and to inform them about EU policies. The European Commission, the European Parliament and the Council have to consult the Committee in policy areas affecting regions and cities. It can appeal to the Court of Justice of the European Union as a means of upholding EU law where there are breaches to the subsidiarity principle or failures to respect regional or local authorities.

