European Committee
of the Regions

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Territorial Impact Assessment

Revision of the Energy Performance of Buildings Directive

Staff working document

European Committee of the Regions

Online workshop
26-27 January 2022

ENVE
commission

Territorial Impact Assessment

Revision of the Energy Performance of Buildings Directive

Disclaimer

This report was produced by the European Committee of the Regions secretariat to assist the rapporteur and the ENVE commission in preparing the opinion on *Amending the Energy Performance of Buildings Directive (EPBD) to meet the new 2030 climate targets,* for which the rapporteur is André Viola (FR/PES), Councillor of the Department of Aude. This report will be shared with the European Commission and the European Parliament.

The findings of this report are not binding on the European Committee of the Regions and do not prejudice the final content of its opinions. This report is for information purposes only.

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This territorial impact assessment report is the outcome of an online expert workshop held by the European Committee of the Regions and ESPON EGTC on 26 and 27 January 2022.

The ESPON TIA Tool is designed to support the quantitative assessment of potential territorial impacts in line with the Better Regulation guidelines. It is an interactive web application that can be used to support policy makers and practitioners in identifying ex ante potential territorial impacts of new EU Legislation, Policies and Directives (LPDs).

This report documents the results of the territorial impact assessment expert workshop on "Amending the Energy Performance of Buildings Directive (EPBD) to meet the new 2030 climate targets". It is for information purposes only. This report and the maps set out the views and experiences of the workshop participants. It is meant to be used for decision support only and does not necessarily reflect the views of the members of the ESPON 2020 Monitoring Committee.

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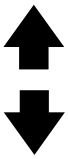
Acronyms and legend

CoR	European Committee of the Regions
EP	European Parliament
EPDB	Energy Performance of Buildings Directive
ESPON	European Observation Network for Territorial Development and Cohesion
LRA	Local and Regional Authority
MS	Member State(s)
NUTS	Nomenclature 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 Context

On 14 July 2021, the European Commission published the Fit-for-55 package which seeks to cut EU carbon emissions by 55% by 2030.

The Energy Performance of Buildings Directive 2010/31/EU (EPBD) is the main EU-level legal instrument for decarbonising the Member States' building stock. Since its adoption, the EPBD has been closely connected with the EU climate targets and has been aligned to reflect their evolution. Its central role in reaching climate targets is explained by the fact that buildings are responsible for approximately 40% of the EU's energy consumption and 36% of its CO_2 emissions. In this context, the core aims of the directive – to systematically enhance the energy performance of buildings and to increase the level and depth of renovations – has remained unchanged since its introduction.

The 2010 EPBD was a recast of the 2002/91/EC Directive, underpinned by the action plan for the energy and climate framework for 2020. Later, a targeted revision of the EPBD was launched as part of the clean energy for all Europeans package and adopted in 2018. The forthcoming second revision is envisaged for the second part of the Fit for 55 package, due at the end of 2021, in order to align the directive with the latest EU climate targets and to deliver the Renovation Wave action plan.

The successes and failures of the EPBD have been determined by its ability to make a lasting change on the ground, which is strongly related to the effectiveness of transposition and implementation measures. The ex post analysis of the EPBD found that by and large it has fulfilled both its general and specific goals. However, reports and studies reveal that there is significant unexploited energy-efficiency potential in buildings renovation. This is notably due to sub optimal transposition, lack of adequate funding and other barriers. That said, the EPBD has been characterised by gradual improvement, including timely expansions of its scope, combined with increased clarity, support for implementation and growing internal and external coherence. At present, the Renovation Wave action plan is introducing a holistic approach to boost renovation and mobilise stakeholders at all levels in order to double the rate and increase the depth of buildings refurbishment.

1.2 Political mandate

This workshop was organised in support of the CoR's opinion *on Amending the Energy Performance of Buildings Directive (EPBD) to meet the new 2030 climate targets.*

With the release of the Renovation Wave, the EU has a strategy for making the building stock fit for the ambitious targets of the Climate Law. Nevertheless, it is with the revision of the EPBD that this strategy will offer tangible opportunities and obligations. It is therefore crucial to ensure that this revision fully transposes the main principles of the Renovation Wave, while ensuring that adequate accompanying mechanisms are put in place to support its implementation. The EPBD revision must promote a shift in policies and lead to a profound change towards low and zero emission buildings, at both construction and management phase, and define a clear roadmap for zero emission buildings by 2050.

This endeavour becomes even more crucial in the context of the Fit for 55 package, which proposes to extend the Emissions Trading System to the entirety of the building sector.

The size of the transformation and its regional impact requires the utmost attention in order to ensure that the measures do not end up exacerbating the issues related to energy poverty and do in fact contribute to the post-pandemic green recovery.

1.3 Inception Impact Assessment and fundamentals of the revision

The European Commission expects that increasing the renovation rate and depth will have positive impacts on economic growth, investments, innovation and competitiveness. The reduction in energy demand and the reduced need for fossil fuel imports would also enhance energy security.

Increasing the renovation rate and depth would also create jobs at local level. According to the International Energy Agency, investment in energy efficiency in buildings can create 12-18 jobs per million euro of investment, more than in other areas of energy policy. To create new jobs and address existing shortages of qualified staff, investments in skills will be needed. Work in the construction sector carries comparatively high occupational safety and health risks, which compliance with legislation on worker protection should keep in check.

Improving the energy performance of buildings leads to lower energy bills for consumers, thereby contributing to the alleviation of energy poverty. Renovation can also improve the comfort and health conditions of inefficient buildings, making buildings healthier and improving wellbeing and productivity. Renovation can make buildings more accessible for persons with disabilities and older persons. However, it requires significant upfront investment, which is more challenging for low-income households, and can have negative impacts on the affordability of housing. Options need to be carefully designed and flanked by financing and other support measures to minimise such negative impacts and keep the cost balance neutral for residents.

Improving the energy performance of buildings is a key driver to reduce greenhouse gas emissions and mitigate climate change. Buildings can even turn into a carbon sink through green infrastructure such as green roofs and the use of nature-based building materials that can store carbon. Through the reduction of energy consumption and a switch away from the use of fossil fuels in buildings, air pollution is expected to be reduced.

Building renovation can reduce pressure for greenfield construction, helping preserve nature and biodiversity. Renovating buildings implies resource use and construction waste; however, compared to demolition and new construction, renovation generates less waste and material extraction.

The revision of the EPBD is still in the making. It is expected to touch upon the following topics:

- Revision of EU targets and introduction of an EU-wide framework for minimum energy performance standards
- Implementation of the Renovation Wave
- Connection with new ETS for buildings
- Fight against energy poverty
- Strengthening provisions for alternative fuel infrastructure

1.4 Past work of the CoR on this topic

On 11 November 2015, the CoR conducted an Urban Impact Assessment on the Energy Performance of Buildings Directive, with the results of the report timed to fit in with the schedule of the then DG ENER. Before this workshop, a questionnaire was conducted by the European Commission, in order to prepare for the urban impact assessment. The conclusions of the workshop and the preceding questionnaire are available on the CoR's website[1].

Furthermore, a series of opinions have in the past been issued concerning this topic:

- Amending the Energy Efficiency Directive to meet the new 2030 climate targets, Rafał Kazimierz Trzaskowski (PL/EPP), ongoing
- Amending the Renewable Energy Directive to meet the new 2030 climate targets, Andries Gryffroy (BE/EA), ongoing
- Making ETS and CBAM work for EU cities and regions, Peter Kurz (DE/PES), ongoing
- A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives, Enrico Rossi (IT/PES), 2021
- Energy efficiency and buildings, Michiel Rijsberman (NL/RE), 2019
- Multilevel governance and cross-sectoral cooperation to fight energy poverty Kata Tüttő (HU/PES), 2019.

[1] https://cor.europa.eu/en/our-work/Documents/Territorial-impact-assessment/energy-performance-buildings.pdf .

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 Tool[2] is an interactive web application that can be used to support policymakers and practitioners in identifying potential ex ante territorial impacts of new EU Legislation, 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.

This approach 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, in different thematic fields (the economy, society, the 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 at NUTS 3 level. These maps serve as a starting point for further discussion on different impacts of a specific EU policy on different regions. Consequently, the experts participating in the workshop provide important input for this quick check on the potential territorial effects of an EU policy proposal.

The workshop on "Amending the Energy Performance of Buildings Directive to meet the new 2030 climate targets" (hereafter 'EPBD'; in chapter 2, this refers to the amended version of the EPBD) was held on 26 and 27 January 2022 in the form of an online event, and brought together a number of experts representing different organisations and LRAs.

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

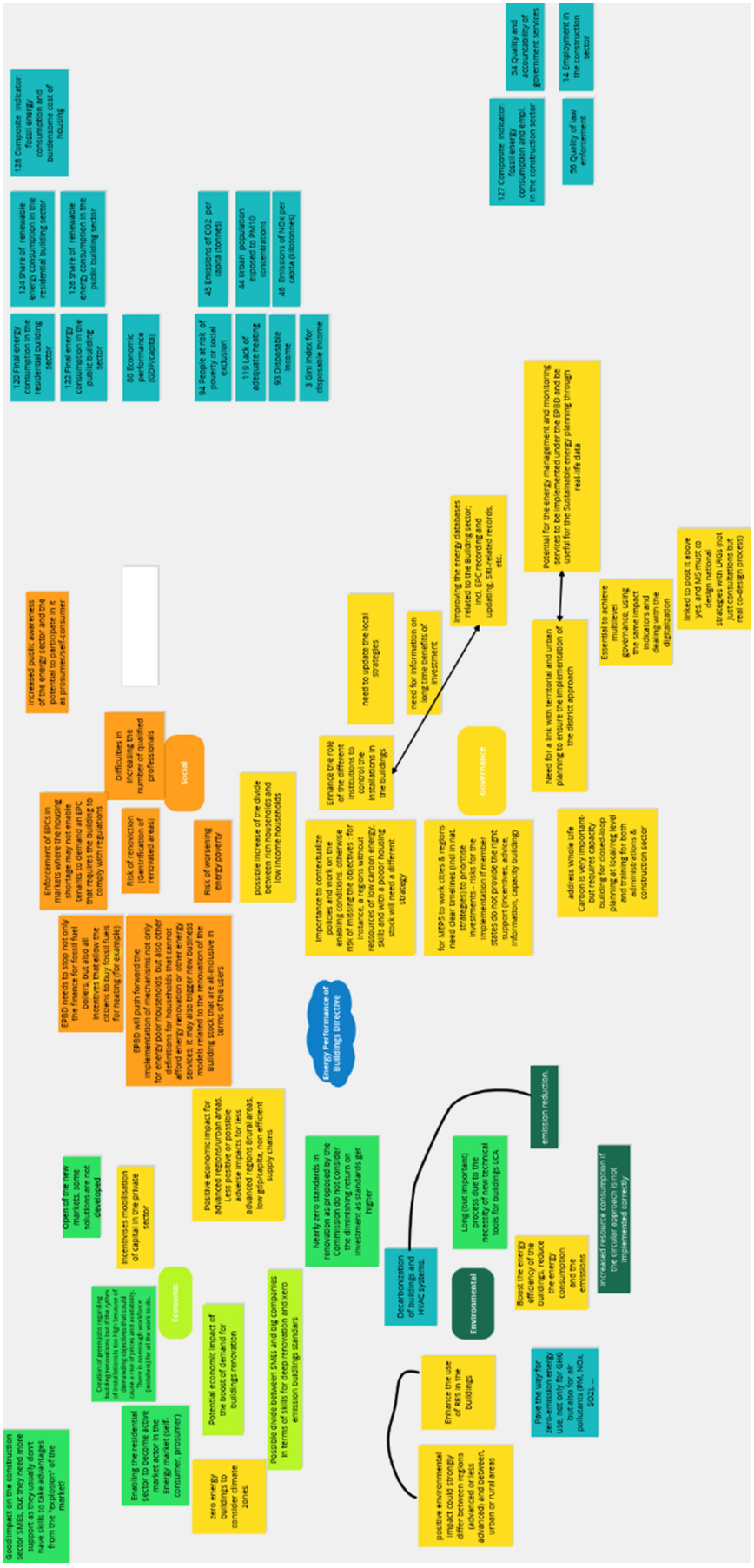
2.1 Identifying the potential territorial effects in terms of economic, societal, environmental and governance aspects – drafting a conceptual model

In the first stage of the TIA workshop, the participating experts discussed the potential effects of the EPBD, using a territorial or place-based approach.

This discussion revealed potential territorial impacts of the EPBD, using economic, societal, environmental and governance indicators. The participants identified potential linkages between implementation of the strategy and the effect on territories, including interdependencies and feedback loops between different effects (see figure below).

[2] https://www.espon.eu/main/Menu_ToolsandMaps/TIA/

Figure 1: Workshop findings: Systemic picture



Source: Territorial impact assessment expert workshop, 26 and 27 January 2022, OIR

2.2 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 for the parameters that the experts discussed in the fields of the economy, the environment, society and governance. The availability of data for all NUTS 3 regions poses certain limitations on the 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 in terms of environmental indicators

- Final energy consumption in the residential building sector
- Final energy consumption in the public building sector
- Share of renewable energy consumption in the residential building sector
- Share of renewable energy consumption in the public building sector
- Composite indicator: fossil energy consumption and burdensome cost of housing
- CO_2 emissions per capita
- NOx emissions per capita

Picturing potential territorial impacts in terms of economic indicators

- Economic performance (GDP per capita)

Picturing potential territorial impacts on the basis of societal indicators

- People at risk of poverty or social exclusion
- Lack of adequate heating
- Disposable income

2.3 Judging the intensity of the potential effects

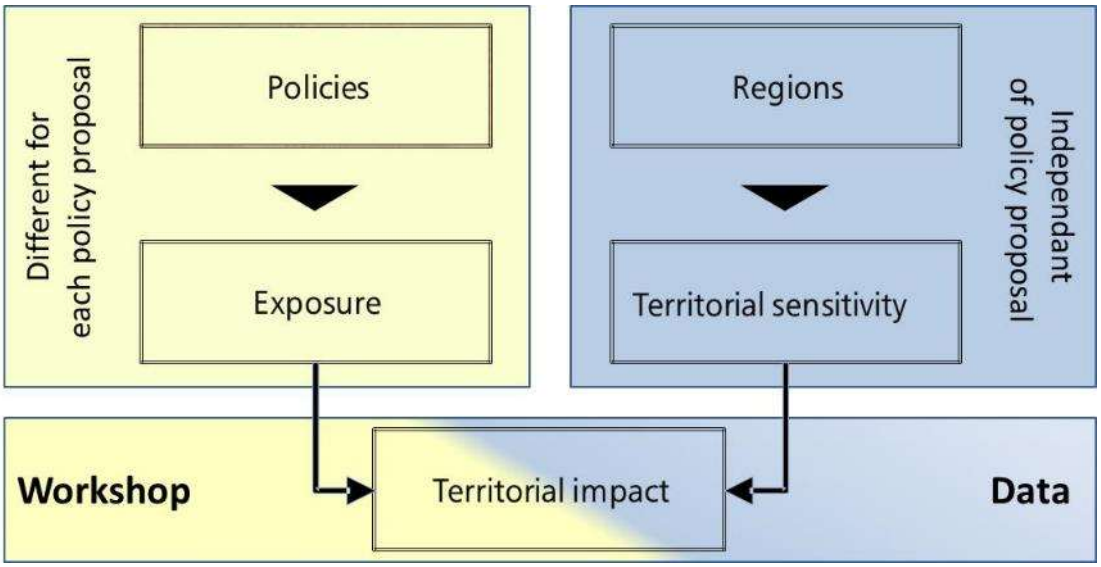
The workshop participants were asked to estimate the potential effects of the EPBD. They judged the potential effect on territorial welfare using the following scores:

- ++ 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)

2.4 Calculating the potential 'regional impact' – Combining the expert judgement with regional sensitivity

The ESPON TIA Quick Check combines the expert judgement on the potential impact of the EPBD (exposure) with indicators describing 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 (see illustration below).

Figure 2: Exposure x territorial sensitivity = territorial impact



Source: OIR, 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 regardless of the topic analysed.
- 'Exposure' describes the intensity of the potential effect of the EPBD on a specific indicator. Exposure illustrates the experts' judgement, i.e. the main findings of the expert discussion at the TIA workshop.

2.5 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 exposure with the territorial sensitivity of a region, described by an indicator at NUTS 3 level. Whereas the expert judgement is a qualitative judgement (i.e. a strong advantageous effect on territorial welfare/moderate advantageous effect/no effect/moderate disadvantageous effect/strong disadvantageous effect), sensitivity is a quantitative indicator.

3 Debate and qualitative analysis

3.1 Opening remarks

André Viola, CoR rapporteur for the opinion on "Amending the Energy Performance of Buildings Directive (EPBD) to meet the new 2030 climate targets", started by saying just how urgent it was to implement the Fit for 55 rules. He also acknowledged the burden placed on cities and regions and therefore the need to make sure that the revision of the EPBD is future-proof and fit for the diversity of EU territories.

Sorcha Edwards from Housing Europe stood in for the president, Bent Madsen, to share the views of public, social and cooperative housing providers across Europe. Her main statement was that the directive takes a blanket approach when it needs to be tailored to the context (rural or urban area, existing local resources, fabric of the buildings, etc.). Therefore, she recommended a 'district approach' as a way of ensuring a fair transition, giving the example of Potsdam and Bordeaux. The energy transition could also be an opportunity to turn areas into hubs of potential. She called for a recategorisation of building certificates and for fair and transparent pricing to combat energy poverty.

Gaspard Demur, from DG ENERG at the European Commission, spoke about the importance of the CoR and of local and regional authorities in the implementation of the Renovation Wave. He saluted the joint action plan co-signed by the European Commission and the European Committee of the Regions.

He referred to the main goals of the Fit for 55 package: reduce greenhouse gas emissions, provide a long-term vision for buildings and tackle the problem of energy poverty.

He spoke about the main strands of the revision: boosting renovation rates through energy performance certificates; developing sustainable finance and alleviate energy poverty (with EUR 70 billion from the recovery plans going to energy efficiency and renovation passports for individual buildings to keep track of investments); decarbonising thanks to zero emission buildings becoming the standard for new buildings; and modernising through a system-integration approach using various indicators (smart readiness indicators, indoor air quality, etc.).

He then presented the provisions, differentiating between new and existing buildings. Nearly zero emission buildings will be transformed into zero emission buildings. Incentives will be included to encourage the development of renewables and efficient district heating as well as energy communities. The concept of lifecycle global warming potential of new buildings will be introduced to take account of overall emissions, not only those of the building but also those produced by the destruction or construction of the building. Finally, charging stations for vehicles and parking spaces for bikes must be provided. Existing buildings are the main challenge: they will need to have, as a minimum, a class F certificate by 2027 (2030 for residential buildings) and a class C certificate by 2030 (2033 for residential buildings). The rest is up to Member States, notably through national building renovation plans, in application of the definition of 'deep renovation for existing buildings'. The energy performance certificates would also allow for harmonisation between countries.

Finally, Dorthe Nielsen, Executive Director at Eurocities emphasised the role of cities in contributing to the climate neutrality goal, recognising that even though they had been supported in the past to renovate their building stock, some limits persist. In terms of energy poverty, she mentioned the difficulty in identifying households at risk with the current plans. Therefore, public funding opportunities

and private financing options should be tailored. Finally, she said that urban planning needed to see buildings as part of a mobility system.

Following those opening remarks, the experts expressed their first ideas on the expected effects of the directive on a virtual whiteboard. They did so in relation to four areas: economy, social, environment and governance.

3.2 Preliminary discussions on potential effects

When it comes to the potential economic effects, experts expressed concerns about the challenge of tackling the asymmetry between EU regions as well as the potential divide that could be created between SMEs and big companies in terms of skills. However, experts also expected relatively positive effects: GDP is expected to increase, there would be an incentive for the private sector to mobilise capital and demand for building renovation would be boosted, thus creating green jobs.

The observations on the potential social effects are more pessimistic. New business models might be created but it will be difficult to increase the number of qualified professionals. What is feared the most is the risk of increasing the social divide between richer households and those with lower incomes. It seems that even households not yet in a situation of energy poverty could also find it difficult to pay to renovate their buildings. Finally, specific difficulties could occur in the event of housing shortages.

What is mostly expected, with the increase in resource consumption such as building materials, is an increase in demand for renewable energies as well as the reduction of emissions.

Most concerns focused on governance. The revision of the directive would increase the cost of governance by requiring the collection of information or the establishment of control mechanisms but would also increase the efforts needed. Therefore, capacity building and tailored technical assistance for public authorities is required. There is a lot at stake as insufficient work on the enabling conditions could result in the goals of the directive not being met. This is why governance should also contribute to increasing public awareness about the energy sector and inform people about the long-term benefits of renovating.

The experts then had to choose the indicator best depicting the causality between the revised directive and the effects on the ground.

3.3 Summary of territorial impacts

For each indicator, the experts voted from "strong advantageous" to "strong disadvantageous" to express their view on the extent to which the directive might have an advantageous (or not) effect on the target of the indicator. The maps obtained thanks to the votes on the indicators show the sensitivity of each region and will be described in detail in the next chapter.

The experts expect the directive to stimulate new economic activities, and are likely to yield the greatest benefits for the poorer regions of Europe in terms of GDP. This means bigger growth for eastern and southern regions as well as many rural regions in France. On the other hand, this could entail more benefits for people with higher incomes in Eastern and Southern Europe; the southern regions of Spain especially could suffer a negative impact, as the implementation of the directive would increase the amount of people at risk of poverty and social exclusion. Southern Europe and a small part of Northern Europe would be impacted positively in terms of adequate heating, whereas the rest of Europe would only see a minor impact.

The drive to substitute fossil fuels would imply an environmentally positive impact in Poland. The impact seems much stronger in the Mediterranean area than in Northern and Central Europe.

When it comes to final energy consumption in the residential building sector, we observe strong positive impacts in Central and Northern Europe as well as in some countries like Italy and Greece. The impact is less visible in the Iberian Peninsula and in eastern parts of the European Union. For the public building sector, strong positive impacts can be observed in Central and Northern Europe, unlike in Southern Europe.

As for the indicator on the share of renewable energy consumption for residential buildings, the impacts seem to be potentially more positive in Ireland, Central Europe and along the coastlines of countries such as Spain, France, Italy, Croatia and Greece, whereas there are fewer positive impacts in Northern Europe, Romania and Bulgaria.

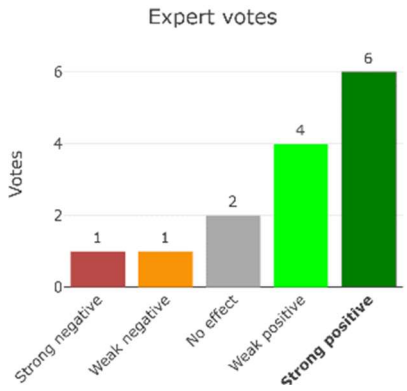
As for public buildings, fewer positive impacts can be observed in Northern Europe as well as in Central Europe from Germany to Hungary. Stronger positive impacts are situated along the coastlines and in countries such as France and Italy.

4 Expected environmental effects

4.1 Share of renewable energy consumption in the residential building sector

Most of the experts agreed that the EPBD would lead to a decarbonisation of the building stock in the EU, meaning in this context that the share of renewable energy sources in the building sector would increase. However, they remarked that for a better assessment the residential building sector should also be differentiated by type of housing, as positive effects are more likely in tenant-owned than in rental properties. Furthermore, the potential for the building sector to actively contribute to the production of renewable energy is also likely to be exploited during renovation. This would consequently increase consumption of renewable energy in the buildings as well. Six experts saw a strong positive effect and four a weak positive effect on energy consumption in the residential building sector. On the other hand, two experts expected a negative effect from the EPBD and voted for strong and weak negative, respectively. Two experts did not anticipate any influence by the EPBD in terms of renewable energy consumption on the residential building sector.

Figure 3: Result of the expert judgement: regions considering the share of renewable energy consumption in the residential building sector and the impact of the EPBD

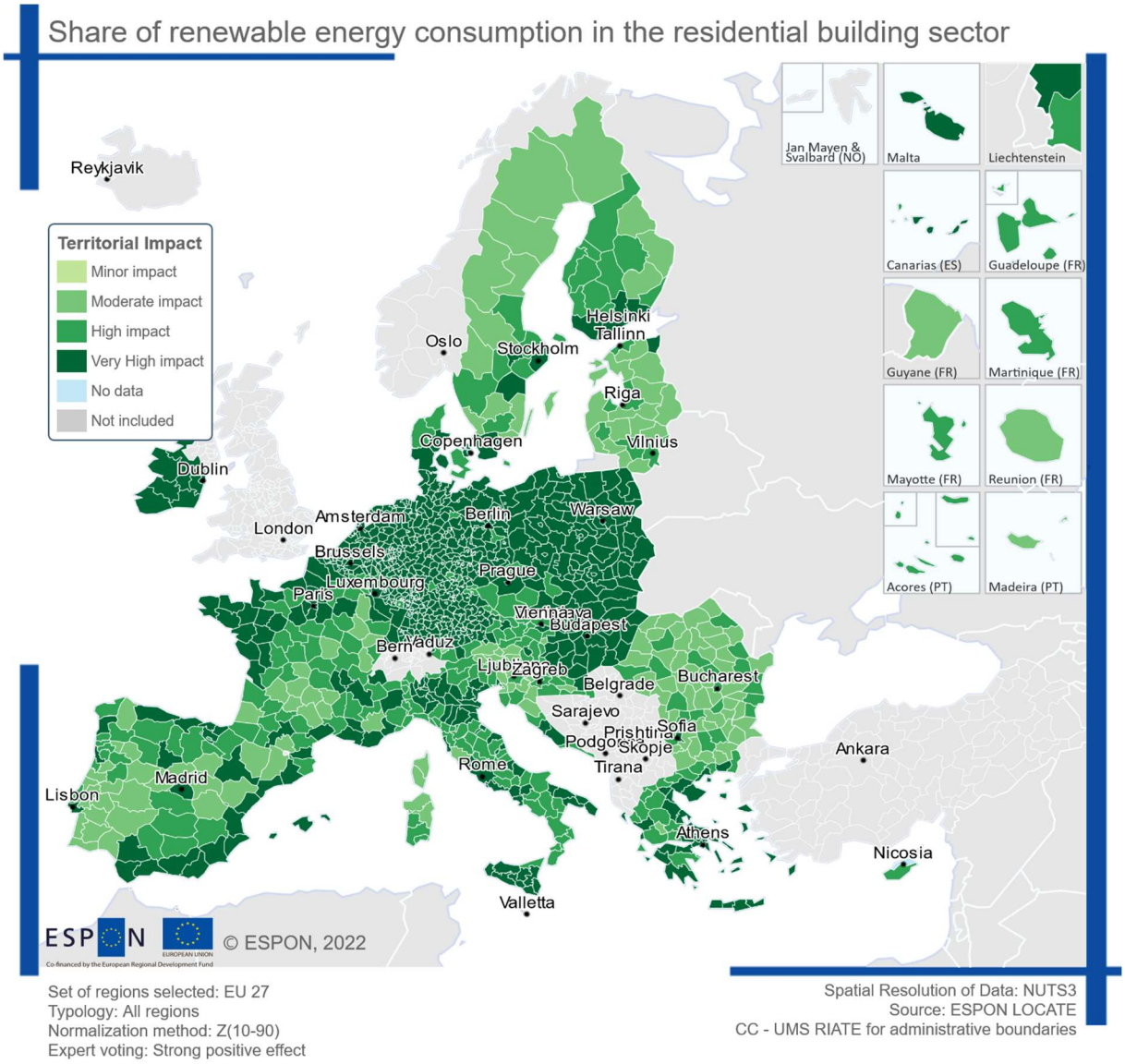


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

The indicator depicts the share of renewable energy carriers in final energy consumption for space heating, cooling and water heating (excluding electricity) in the residential building sector (reference year: 2012). Regions with a lower share of renewable energy consumption in the residential building sector are considered to be affected more positively by the EPBD. Sensitivity is thus inversely proportional to the share of renewable energy carriers in final energy consumption in this sector.

The following map shows the potential territorial impact of the EPBD considering the share of renewable energy consumption in the residential building sector. It combines the expert judgment of a strong positive effect with the given sensitivity of regions. The majority (67%) of regions could experience a very high positive impact. While Germany, Poland, Slovakia, Hungary, the Benelux states and Ireland particularly are affected positively, most of the other Member States are expected to see the highest impact only in some regions. 21% of regions would have a high positive impact. These regions are rather scattered over Europe. 13% of regions would have a moderate positive impact.

Map 1: regions considering the share of renewable energy consumption in the residential building sector and the impact of the EPBD – expert judgement: strong positive effect

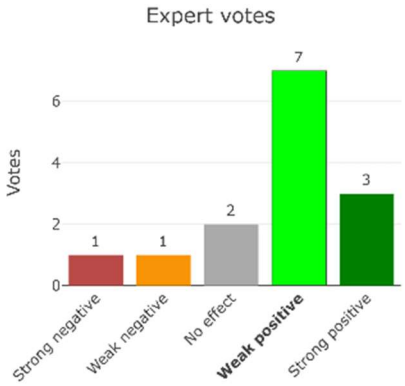


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

4.2 Share of renewable energy consumption in the public building sector

The experts concluded that the EPBD would not only have an effect on renewable energy consumption in the residential building sector, but also in the public building sector. Furthermore, the potential for the building sector to actively contribute to the production of renewable energy is also likely to be exploited during renovation, particularly of public buildings. This would consequently increase the consumption of renewable energy in the buildings as well. However, the experts expected that the EPBD would have a weaker effect in the public building sector than in the residential building sector. Consequently, the voting was slightly less unambiguous. Three experts voted for strong positive and seven for weak positive. On the other side, two experts (one strong, one weak) judged the effect to be negative. Two experts did not see a relevant effect of the EPBD.

Figure 4: Result of the expert judgement: regions considering the share of renewable energy consumption in the public building sector and the impact of the EPBD

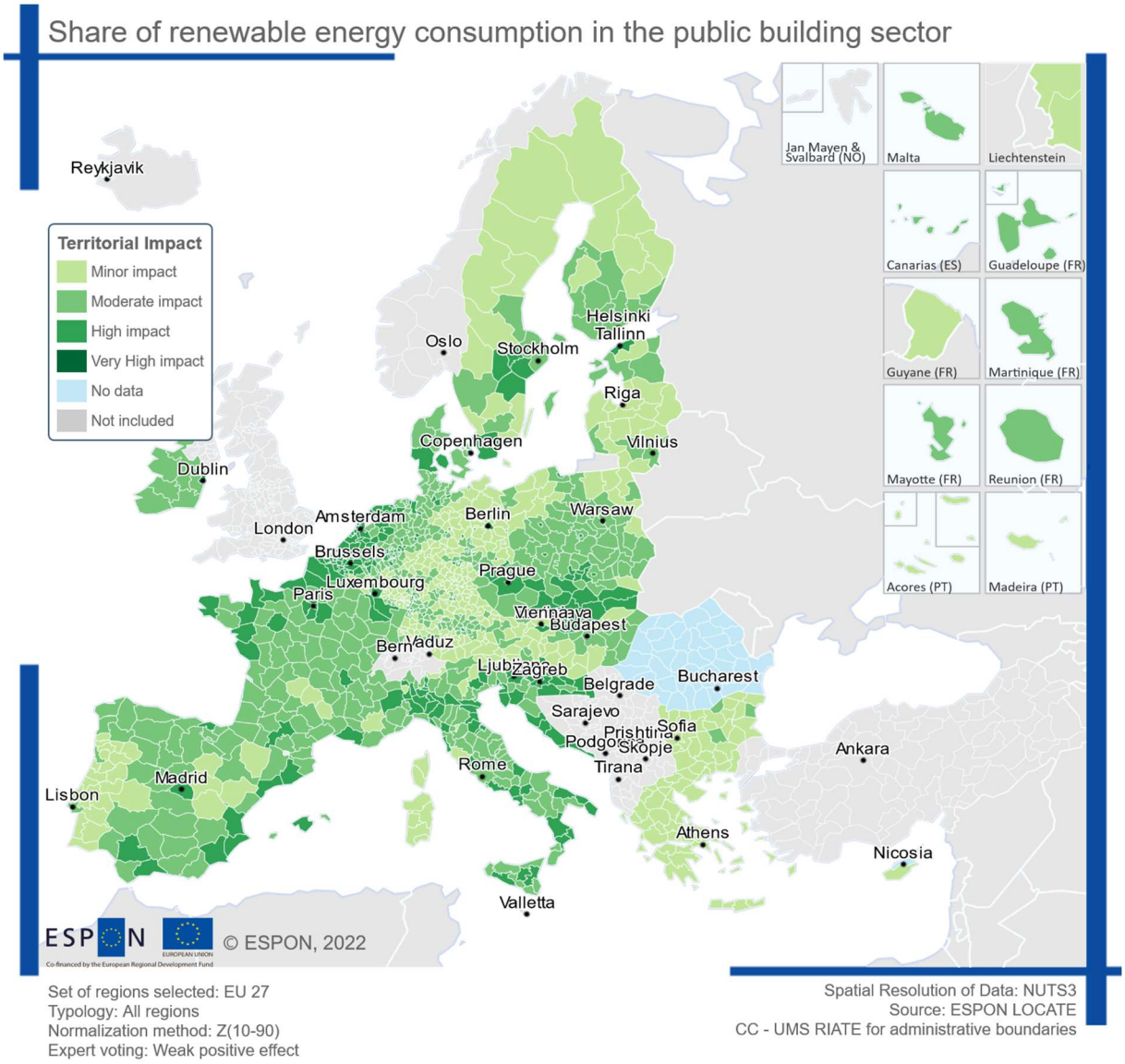


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

This indicator shows the share of renewable energy sources in final energy consumption in the public building sector (reference year: 2012). Like the indicator described before, it includes space heating, cooling and water heating (excluding electricity). Regions showing a lower share of renewable energy carriers in the public building sector are supposed to be more sensitive. Sensitivity is thus indirectly proportional to the share of renewable energy carriers in this sector.

The following map shows the potential territorial impact of the EPBD considering the share of renewable energy consumption in the public building sector. It combines the expert judgment of a weak positive effect with the given sensitivity of regions. 25% of regions could experience a high positive impact. These regions are located in countries such as Sweden, Germany, the Czech Republic, Slovakia, Slovenia, the Benelux states, France and Italy. 43% of regions would see a moderate positive impact and 32% a minor positive impact.

Map 2: regions considering the share of renewable energy consumption in the public building sector and the impact of the EPBD – expert judgement: weak positive effect

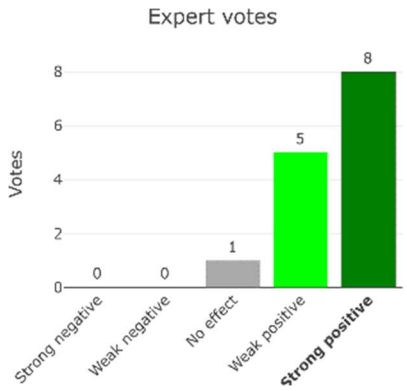


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

4.1 Final energy consumption in the residential building sector

Most of the experts agreed that the EPBD would not only lead to decarbonisation of the building stock in the EU, but also to a decrease in the overall energy consumption by promoting energy-efficient renovations. Reports and studies point to a substantial unexploited energy-efficiency potential in buildings renovation caused by different barriers such as sub optimal transposition or lack of adequate funding. Furthermore, a slower uptake of renovation efforts in rental properties was pointed out, which leaves unexploited potential. Therefore, the majority of the experts expected a positive (eight strong, five weak) effect for the residential building sector. One expert did not see any relevant effect.

Figure 5: Result of the expert judgement: regions considering the final energy consumption in the residential building sector and the impact of the EPBD

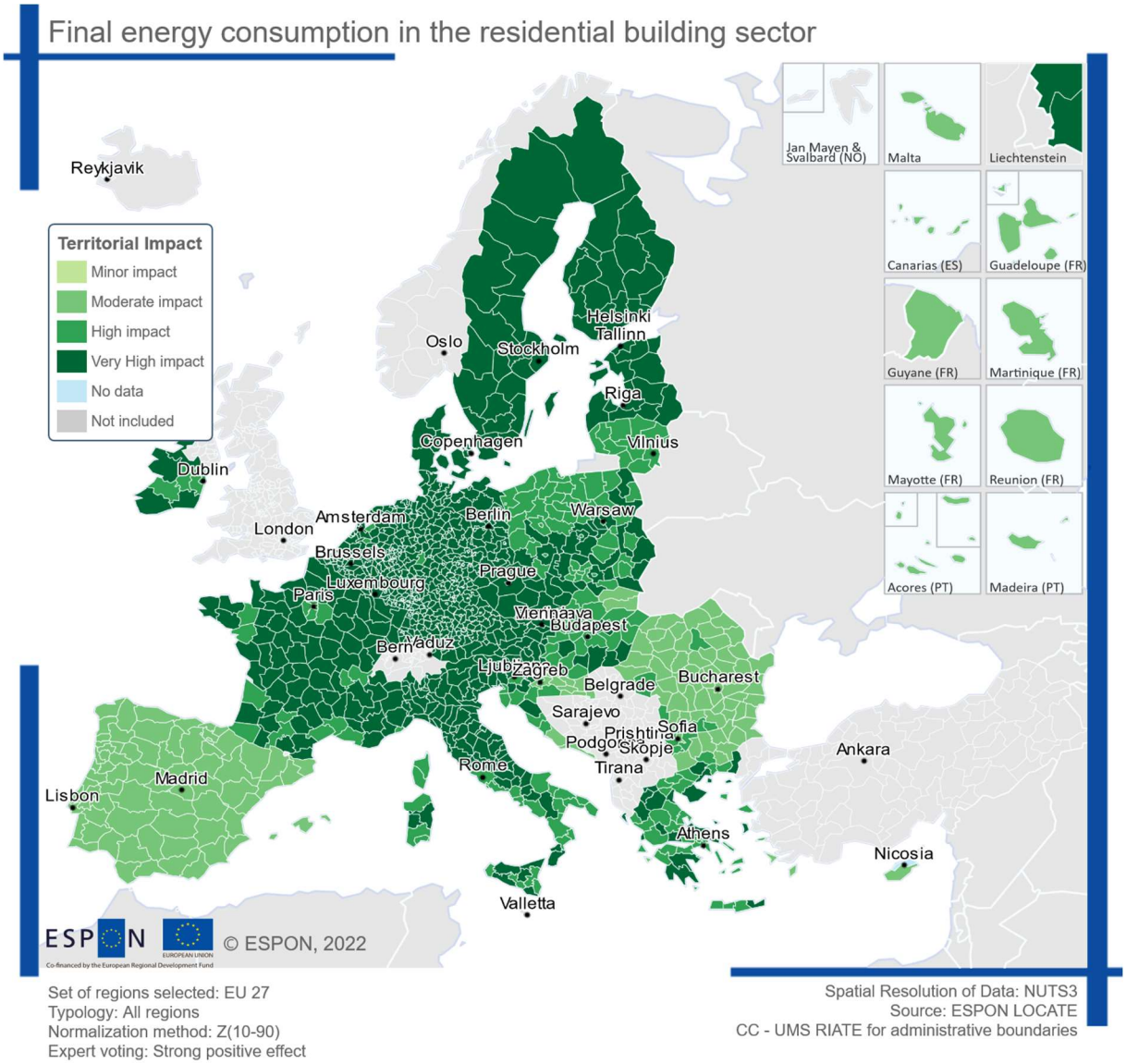


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

The indicator pictures the sensitivity of a region according to the final energy consumption for space heating, cooling and water heating in the residential building sector. It is measured in MWh per capita (reference year: 2012). Regions showing higher final energy consumption in the residential building sector are expected to be more sensitive. Sensitivity is thus directly proportional to the final energy consumption in this sector.

The following map shows the potential territorial impact of the EPBD considering the regional final energy consumption in the residential building sector. It combines the expert judgment of a strong positive effect with the given sensitivity of regions. Most of the Member States would experience a very high positive impact. Countries that are particularly affected positively are located mostly in Central and Northern Europe, such as Sweden, Finland, Denmark, Estonia, Latvia, Germany, the Czech Republic, the Netherlands, Belgium Austria, Luxemburg, Italy and France. Ireland, Poland, Hungary, Slovenia, Croatia, and Greece would have the highest impact only for some regions. 15% of regions could still see a high positive impact. Most of them can be found in the aforementioned countries. Another 15% would experience a minor positive impact. Most of them are located in Portugal, Spain, Romania and Bulgaria.

Map 3: regions considering the final energy consumption in the residential building sector and the impact of the EPBD – expert judgement: strong positive effect

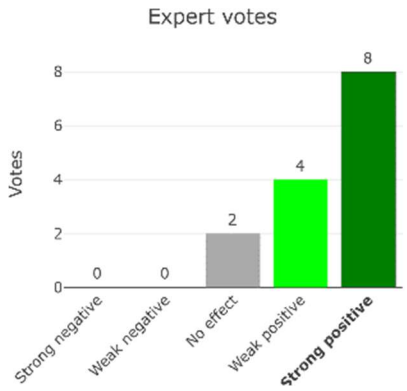


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

4.2 Final energy consumption in the public building sector

Based on the same reason as described for the residential building sector, the experts agreed that the EPBD would also lead to a minimisation of energy consumption in the public building sector. Promotion of energy saving policies and increased renewable energies are likely to contribute to this. The voting was again unequivocal: eight experts saw a strong positive effect and four a weak positive effect. Two experts did not consider the influence as relevant.

Figure 6: Result of the expert judgement: regions considering the final energy consumption in the public building sector and the impact of the EPBD

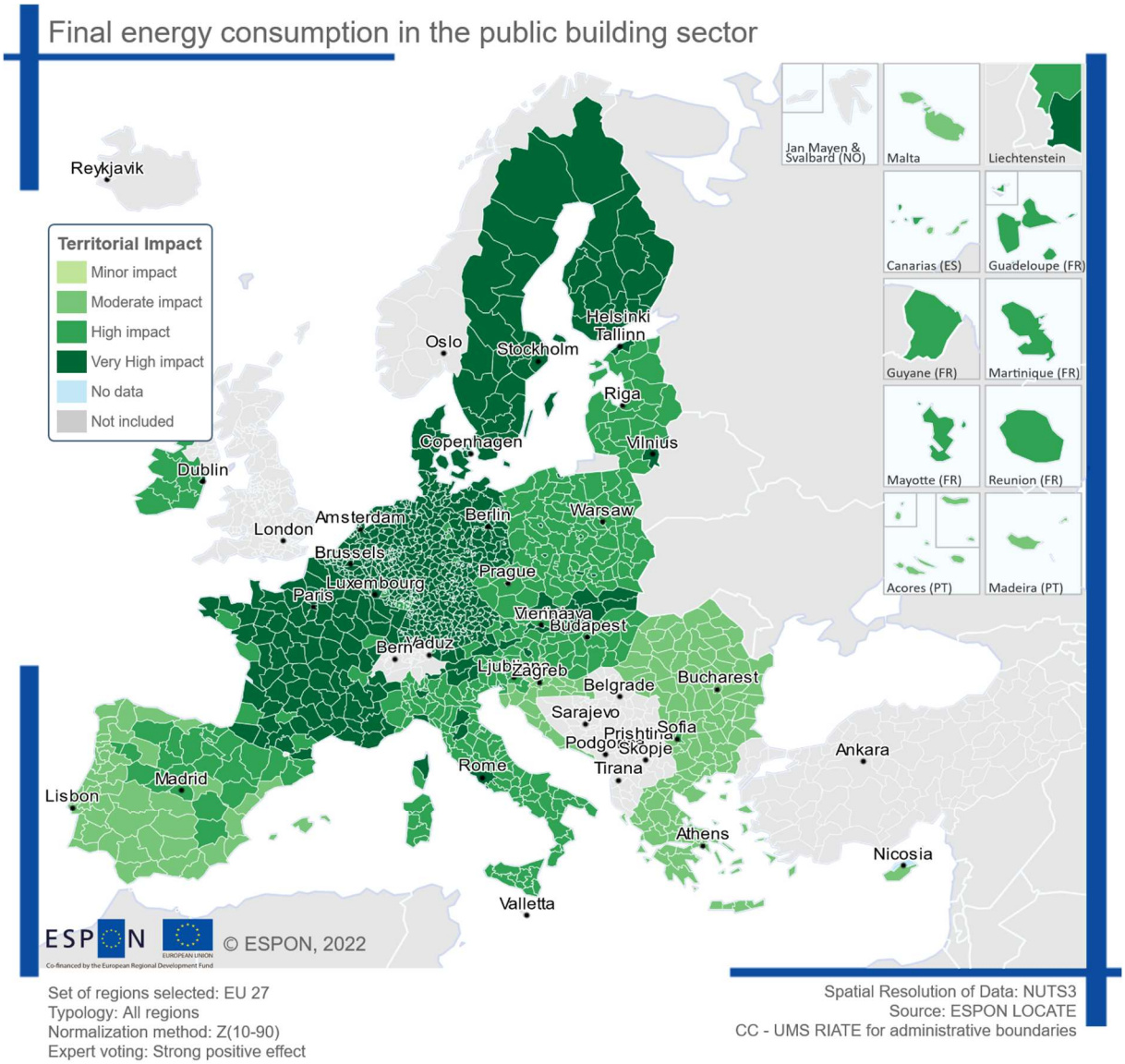


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

The indicator pictures the sensitivity of a region according to the final energy consumption in the public building sector. As the last indicator, it comprises space heating, cooling and water heating and is measured in MWh per capita (reference year: 2012). Regions showing higher final energy consumption in the public building sector are expected to be more sensitive. Sensitivity is thus directly proportional to final energy consumption in this sector.

The following map shows the potential territorial impact of the EPBD considering regional final energy consumption in the public building sector. It combines the expert judgment of a strong positive effect with the given sensitivity of regions. 57% of regions would experience a very high positive impact. Regions in Central and Northern Europe, such as Sweden, Finland, Denmark, Germany, the Benelux states, France and Slovakia in particular are likely to experience a positive impact. Other Member States (e.g. Estonia, Lithuania, Poland and Italy) are expected to experience the highest positive impact only for some regions. Among these countries, it is striking to note that mainly their metropolitan areas would see the highest impact. 26% of regions are expected to experience a high positive impact and 17% a minor positive impact.

Map 4: regions considering the final energy consumption in the public building sector and the impact of the EPBD – expert judgement: strong positive effect

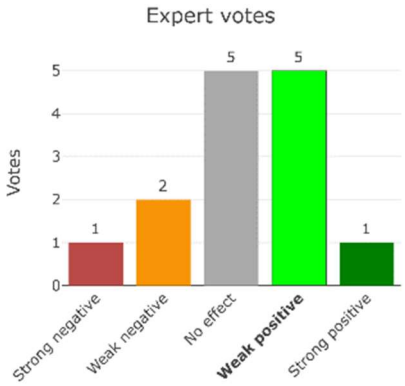


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

4.3 Composite indicator: fossil energy consumption and burdensome cost of housing

Most of the experts agreed that the EPBD could lead to an increase in the share of renewable energy sources and a decrease in fossil energy fuels in the building sector, respectively. Furthermore, measures implemented that lead to the improvement of the energy performance of buildings would decrease energy costs. This would support people affected by burdensome costs of housing in particular. Consequently, regions with a high share of fossil energy consumption in the residential building sector and a high share of people affected by burdensome costs of housing could experience a positive impact. Six experts voted for positive (one strong, five weak). However, three experts judged the effect to be negative (two weak, one strong), citing an increase in rent as one result of implementing measures which would negatively influence people suffering from burdensome costs of housing. Five experts did not see a relevant effect.

Figure 7: Result of the expert judgement: regions considering the composite indicator “fossil energy consumption and burdensome cost of housing” and the impact of the EPBD

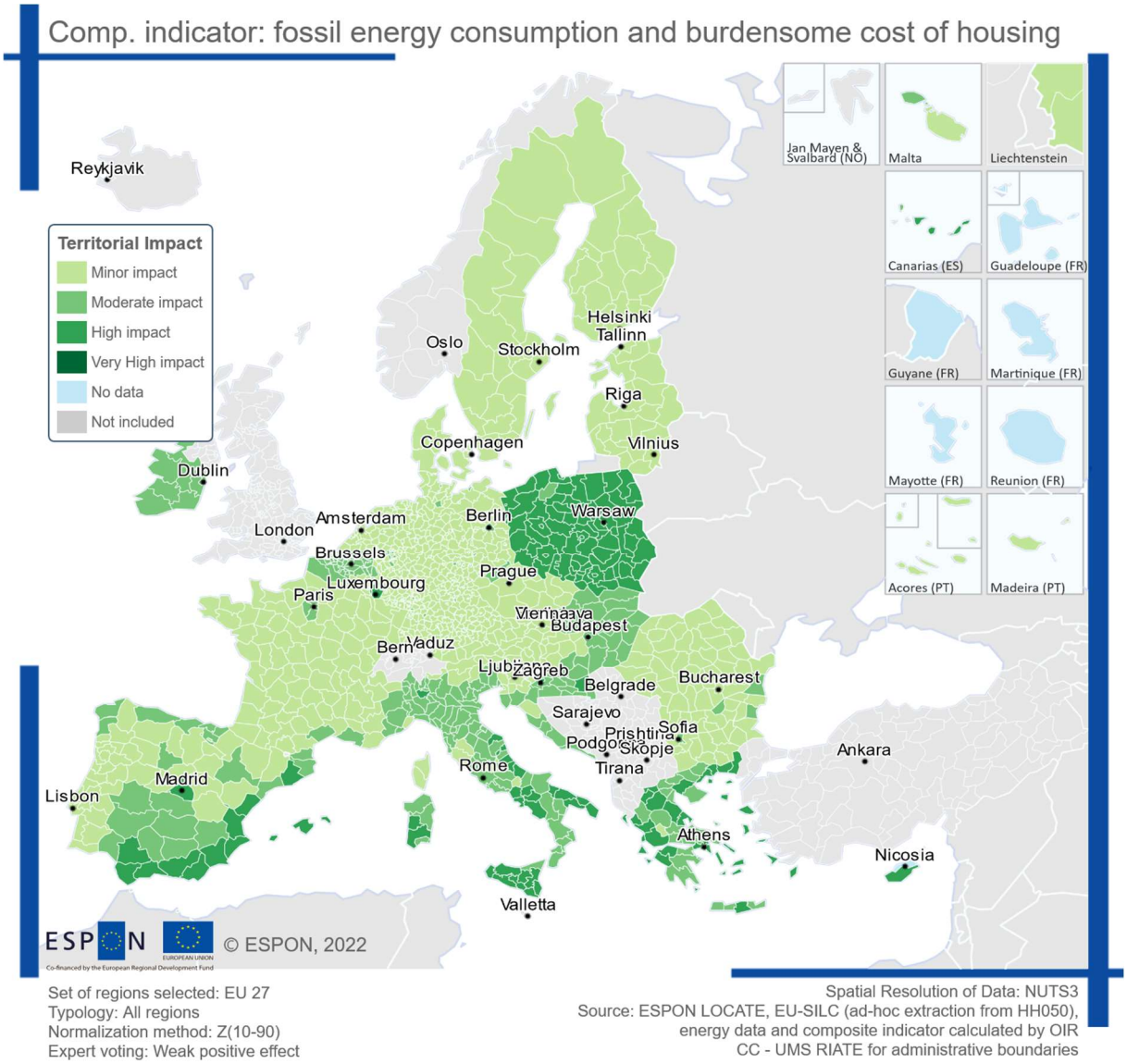


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

This composite indicator is the sum of the normalised share of fossil energy consumption in the residential building sector (reference year: 2012) and the normalised share of people affected by burdensome costs of housing (reference year: avg. 2017/18). The share of fossil energy consumption is calculated by subtracting the share of renewable energy consumption in the residential building sector (ESPON LOCATE data) from the total energy consumption (100%). People who are affected by burdensome costs of housing saw costs for mortgage repayment or rent, insurance and service charges as a heavy financial burden. Regions showing a higher value of this composite indicator are expected to be more sensitive. Sensitivity is thus directly proportional to the value of the composite indicator.

The following map shows the potential territorial impact of the EPBD considering the composite indicator 'fossil energy consumption and burdensome cost of housing'. It combines the expert judgment of a weak positive effect with the given sensitivity of regions. 13% of regions could experience a high positive impact. Poland, Cyprus and Luxembourg in particular would be affected positively as well as parts of Spain, Italy, Croatia and Greece. The regions which are affected positively are thus located mainly in Eastern and Southern Europe, and coastal regions are affected more strongly than others in the same country. The other regions would experience either a moderate positive (22%) or minor positive (65%) impact.

Map 5: regions considering the composite indicator "fossil energy consumption and burdensome cost of housing" and the impact of the EPBD – expert judgement: weak positive effect

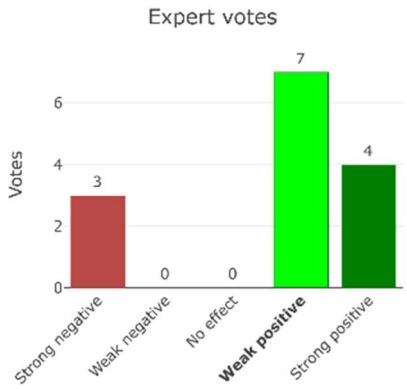


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

4.4 CO_2 emissions per capita

The building sector in the EU is responsible for about 36% of CO_2 emissions, and is thus a major factor in overall emissions. Measures to increase energy efficiency or to reduce energy use will in turn reduce CO_2 emissions from buildings and thus overall CO_2 emissions. Furthermore, buildings themselves could become a carbon sink, for instance through green façades or nature-based building materials that are able to store carbon. Consequently, the majority of the experts judged the effect to be positive (four strong, seven weak). On the other hand, three experts assessed the effect as strong negative, potentially based on the increased construction and renovation efforts promoted.

Figure 8: Result of the expert judgement: emissions of CO_2 per capita affected by the EPBD

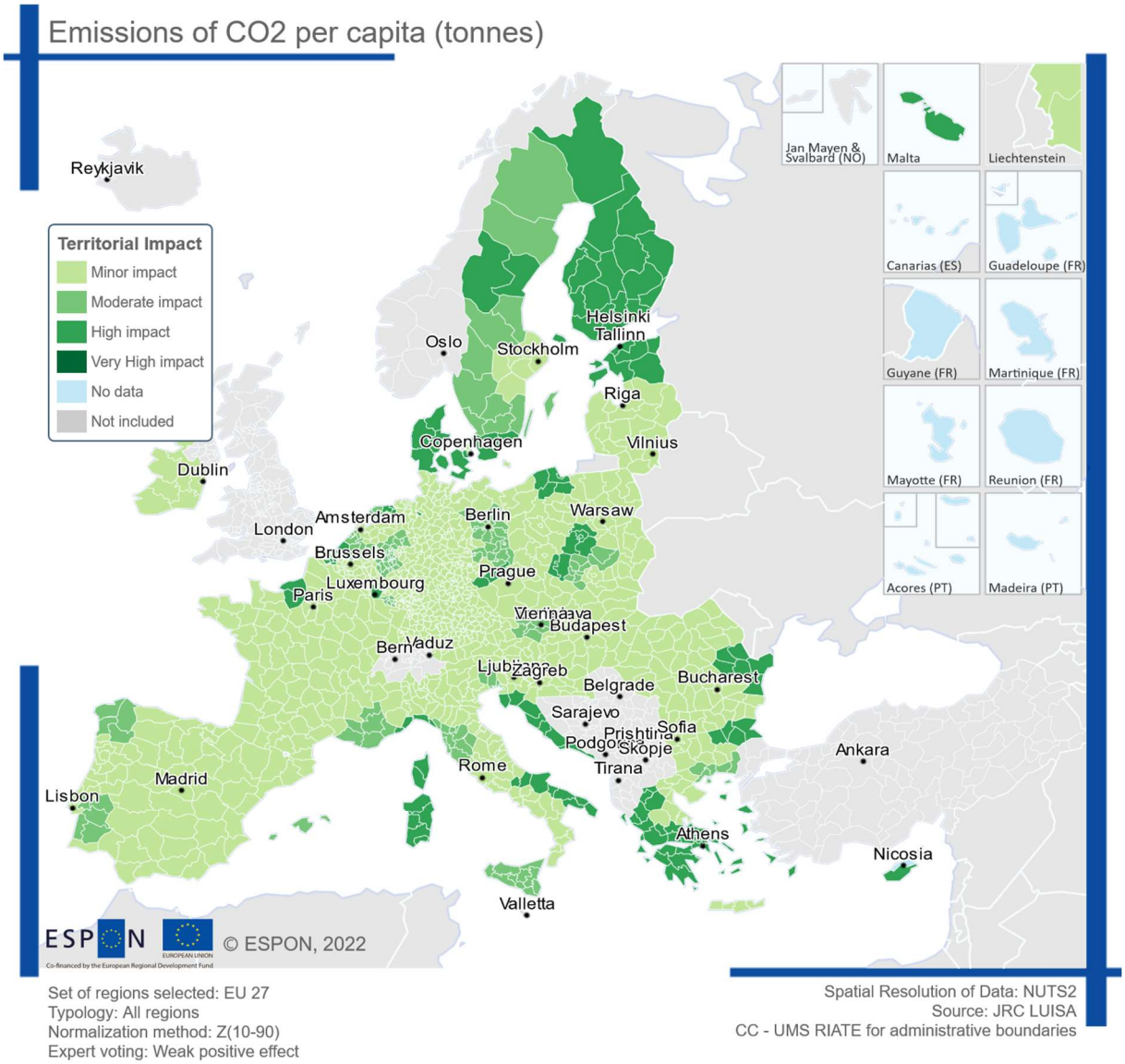


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

The indicator pictures the sensitivity of a region according to the yearly emissions of CO_2 in tonnes per capita (reference year: 2020, projected). Regions showing higher concentrations of CO_2 per capita are expected to be more sensitive. Sensitivity is thus directly proportional to CO_2 emissions per capita.

The following map shows the potential territorial impact of the EPBD on CO_2 emissions per capita. It combines the expert judgement of a weak positive effect with the given sensitivity of regions. 12% of regions could experience a high positive impact. Finland as a whole as well as multiple regions in Denmark, Estonia, Croatia, Greece and Cyprus would benefit the most. Sweden, Poland, Romania, Bulgaria, Italy, the Netherlands, Belgium and France could experience the highest impact for some regions only. 14% would see a moderate positive impact and 74% a minor positive impact. It should be noted that many of regions that would experience the highest impact in terms of reduction of CO_2 emissions are port or industrial regions. Sparsely populated regions with high CO_2 emissions per capita in Sweden and Finland also showed high impacts due to the low numbers of inhabitants, resulting in a high level of CO_2 per capita.

Map 6: Emissions of CO_2 per capita affected by the EPBD – expert judgement: weak positive effect

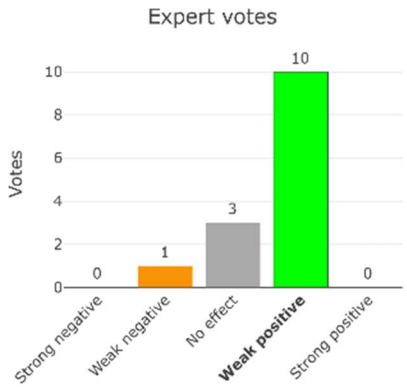


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

4.5 NOx emissions per capita

The combustion of fossils fuels such as coal or petroleum causes NOx emissions. Many households still use these energy carriers for heating. Measures that increase energy efficiency or promote the shift from using fossils fuels to renewable energy sources could decrease the emission of NOx as a carry-over effect. Again, the majority of the experts deemed that the EPBD will indirectly contribute to a reduction of this pollutant and therefore voted for weak positive effects. One expert saw a weak negative effect and three did not consider this indicator to be relevant.

Figure 9: Result of the expert judgement: emissions of NOx per capita affected by the EPBD

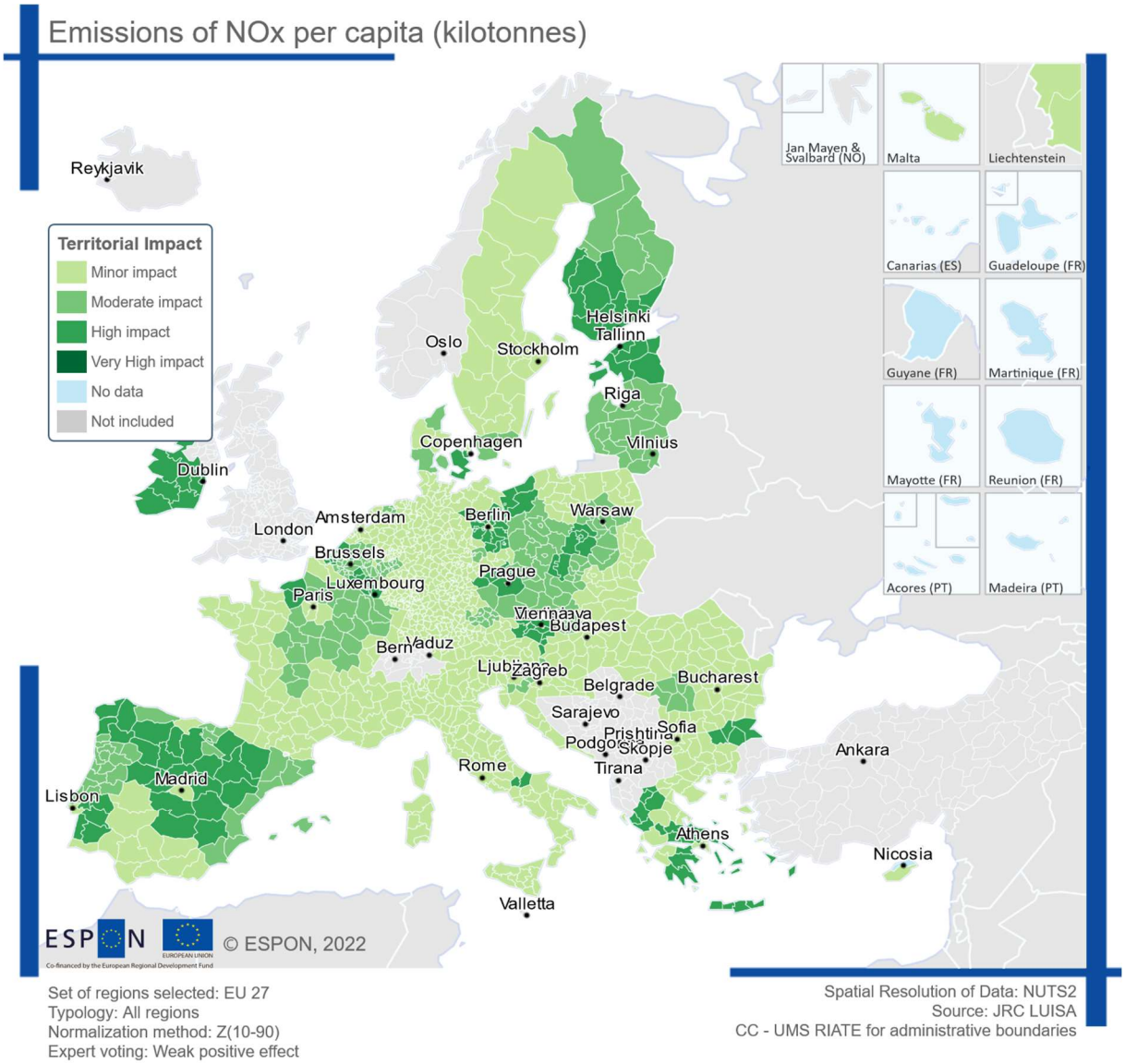


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

The indicator pictures the sensitivity of a region according to the yearly emissions of NOx in kilotonnes per capita (reference year: 2020, projected). Regions showing higher concentrations of NOx per capita are expected to be more sensitive. Sensitivity is thus directly proportional to NOx emissions per capita.

The following map shows the potential territorial impact of the EPBD on NOx emissions per capita. It combines the expert judgement of a weak positive effect with the given sensitivity of regions. 13% of regions could experience a high positive impact. Apart from Ireland and Estonia, where all regions are highly affected, many regions in Spain, Finland and Greece would be also be affected highly positively. Furthermore, clusters of regions experiencing a high impact can be found in Portugal, France, Belgium, Germany, Poland, the Czech Republic, Austria and Bulgaria. 17% of regions would see a moderate positive impact and the majority a minor positive impact. A striking pattern is a lower impact in urban regions (especially capital regions such as Paris, Madrid, Athens and Berlin), while the surrounding suburban regions show a higher impact.

Map 7: Emissions of NOx per capita affected by the EPBD – expert judgement: weak positive effect



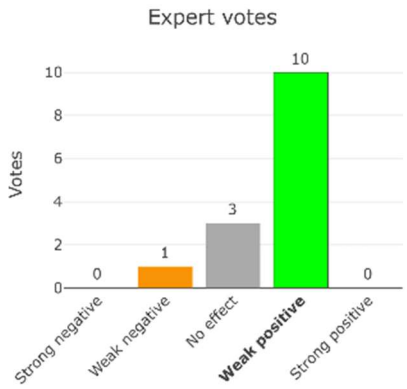
Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

5 Expected economic effects

5.1 Economic performance (GDP per capita)

Most of the experts anticipated that the regional economy could be affected positively by the increase in the renovation rate. Local firms in the construction and innovation sector would do well out of it and jobs could be preserved or created. Furthermore, innovative solutions for building-based energy production, innovative material development and other related development efforts would promote jobs in the R&D sector. Finally, the reduction of energy costs for households would increase disposable income and lead to a stimulation of the economy as a carry-over effect. Consequently, ten experts voted for weak positive. One expert saw the opposite effect and voted for weak negative. Three experts assessed the impact as not relevant.

Figure 10: Result of the expert judgement: regions considering the economic performance (GDP per capita) and the impact of the EPBD

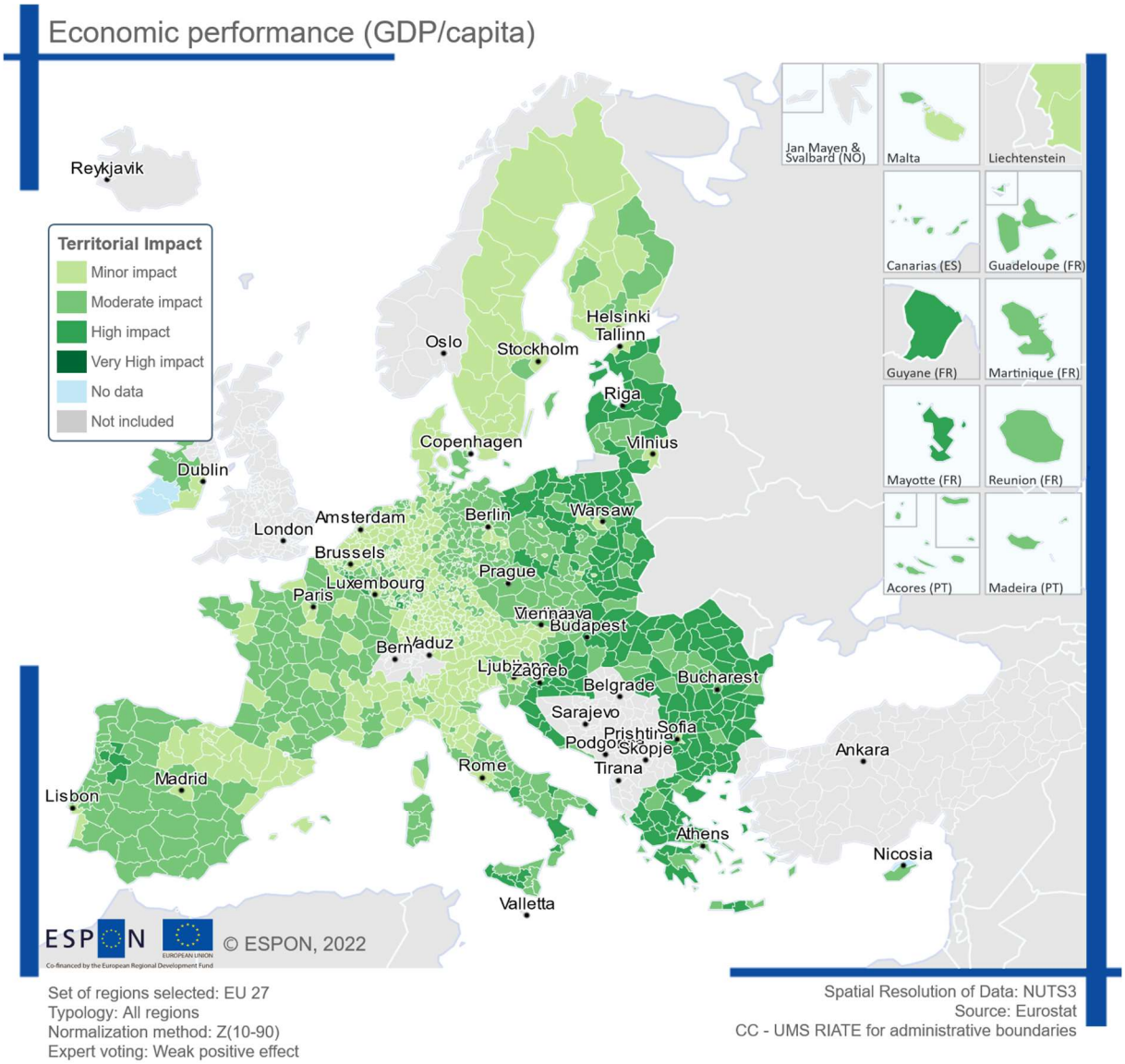


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

This indicator shows the gross domestic product (GDP) at current market prices. It is measured in purchasing power standard per inhabitant (reference year: 2018). Regions with a low GDP per capita are expected to benefit more from the EPBD. Sensitivity is thus inversely proportional to GDP per inhabitant.

The following map shows the potential territorial impact of the EPBD considering the GDP per capita. It combines the expert judgment of a weak positive effect with the given sensitivity of regions. 17% of regions are expected to experience a high positive impact. Most of these regions can be found in Eastern and South-Eastern Europe. Some regions in Portugal, Italy, Belgium and Germany would be also affected positively. 40% of regions would experience a moderate positive impact and 44% a minor positive impact. Strikingly, several urban regions (in particular capital regions) would see less of an effect than their surrounding regions.

Map 8: regions considering the economic performance (GDP per capita) and the impact of the EPBD – expert judgement: weak positive effect



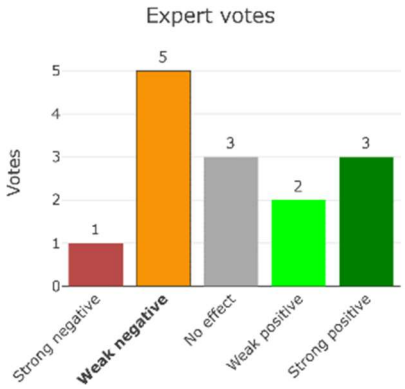
Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

6 Expected societal effects

6.1 People at risk of poverty or social exclusion

As outlined for other indicators, measures that lead to the improvement of the energy performance of buildings would decrease energy costs. This would support people affected by energy poverty, in particular low-income households for which energy costs make up a significant share of their household expenses. On the other hand, despite the funding opportunities, investment in energy measures could still not be affordable for low-income households and thus increase the gap between low-income and high-income households. As a consequence, the result of the expert's voting was ambiguous. Five experts judged the effects to be positive (three strong, two weak) and six experts to be negative (five weak, one strong). Three did not see a relevant effect.

Figure 11: Result of the expert judgement: people at risk of poverty or social exclusion affected by the EPBD

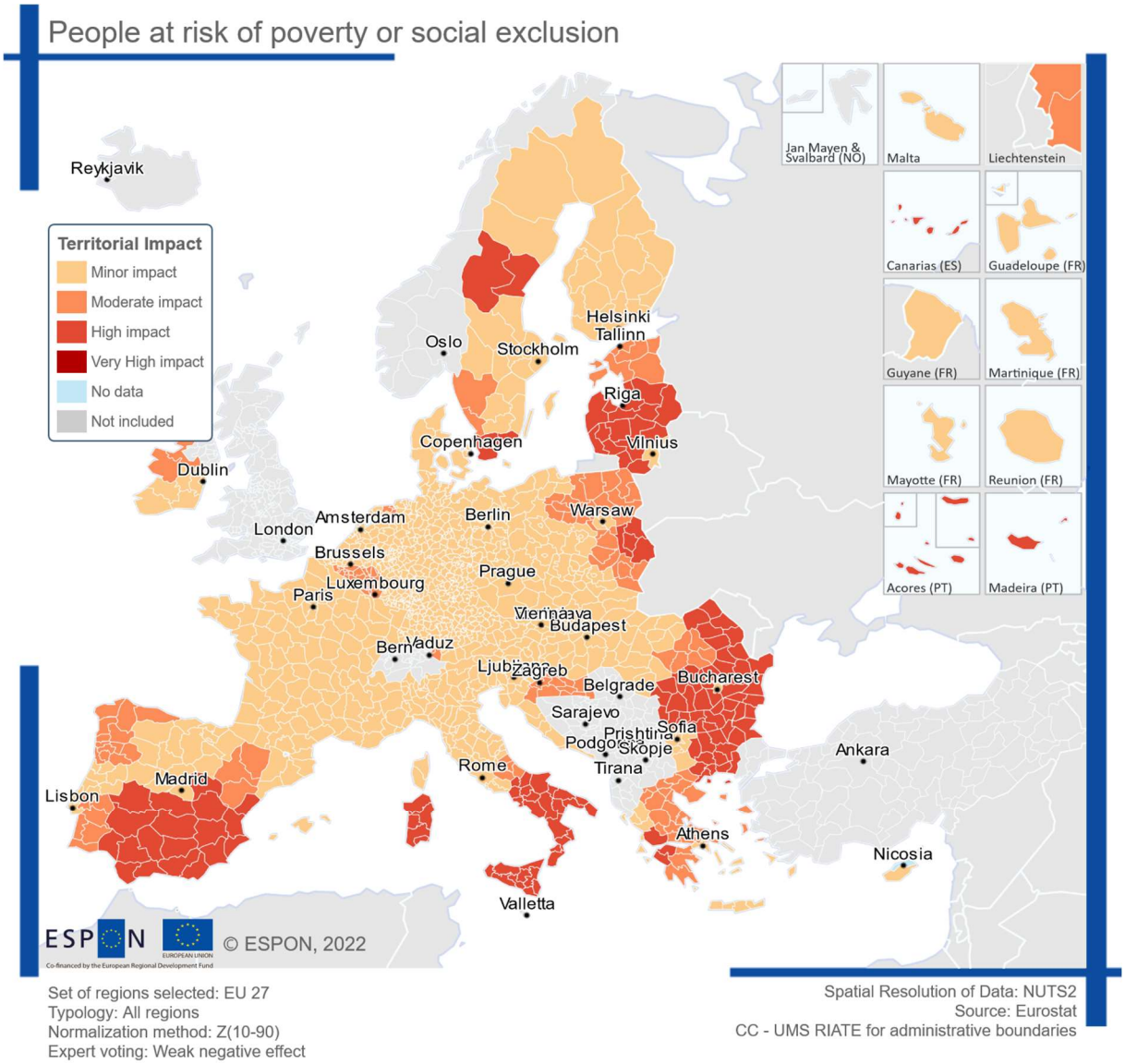


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

The indicator pictures the sensitivity of a region according to the share of people at risk of poverty or social exclusion (reference year: 2019). It comprises persons who are at risk of poverty after social transfers, severely materially deprived and/or living in households with very low work intensity. Regions showing a higher share of people at risk of poverty or social exclusion are expected to be more sensitive. Sensitivity is thus directly proportional to the share of this population group.

The following map shows the potential territorial impact of the EPBD on people at risk of poverty or social exclusion. It combines the expert judgement of a weak negative effect with the given sensitivity of regions. The impact on 12% of regions could be highly negative, almost all of which are located in Eastern or Southern Europe. Larger parts of Spain, Italy, Bulgaria and Romania would experience a high negative impact. Sweden, Poland and Greece would be affected highly negatively only for some regions. 11% of regions would see a moderate negative impact. These regions can be detected as clusters in Member States such as Portugal, Ireland, Belgium, Sweden and in Eastern Europe. The majority (77%) of regions would experience a minor negative impact.

Map 9: people at risk of poverty or social exclusion affected by the EPBD – expert judgement: weak negative effect

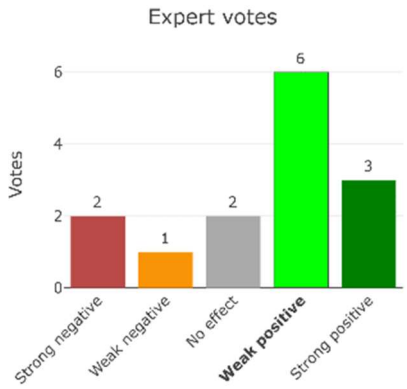


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

6.2 Lack of adequate heating

Similar to energy poverty, the lack of adequate heating was discussed ambiguously by the experts. They saw either a positive or negative impact of the measures on people affected by lack of adequate heating, based on the consideration that either renovation measures would increase the affordability of heating for low-income households, or low-income households would not be able to afford renovation measures and thus could be left behind. The result of the voting was less unambiguous, though. Nine experts voted for positive (three strong, six weak) and three for negative (one weak, two strong). Two experts did not consider the effect to be relevant.

Figure 12: Result of the expert judgement: regions considering people affected by lack of adequate heating and the impact of the EPBD

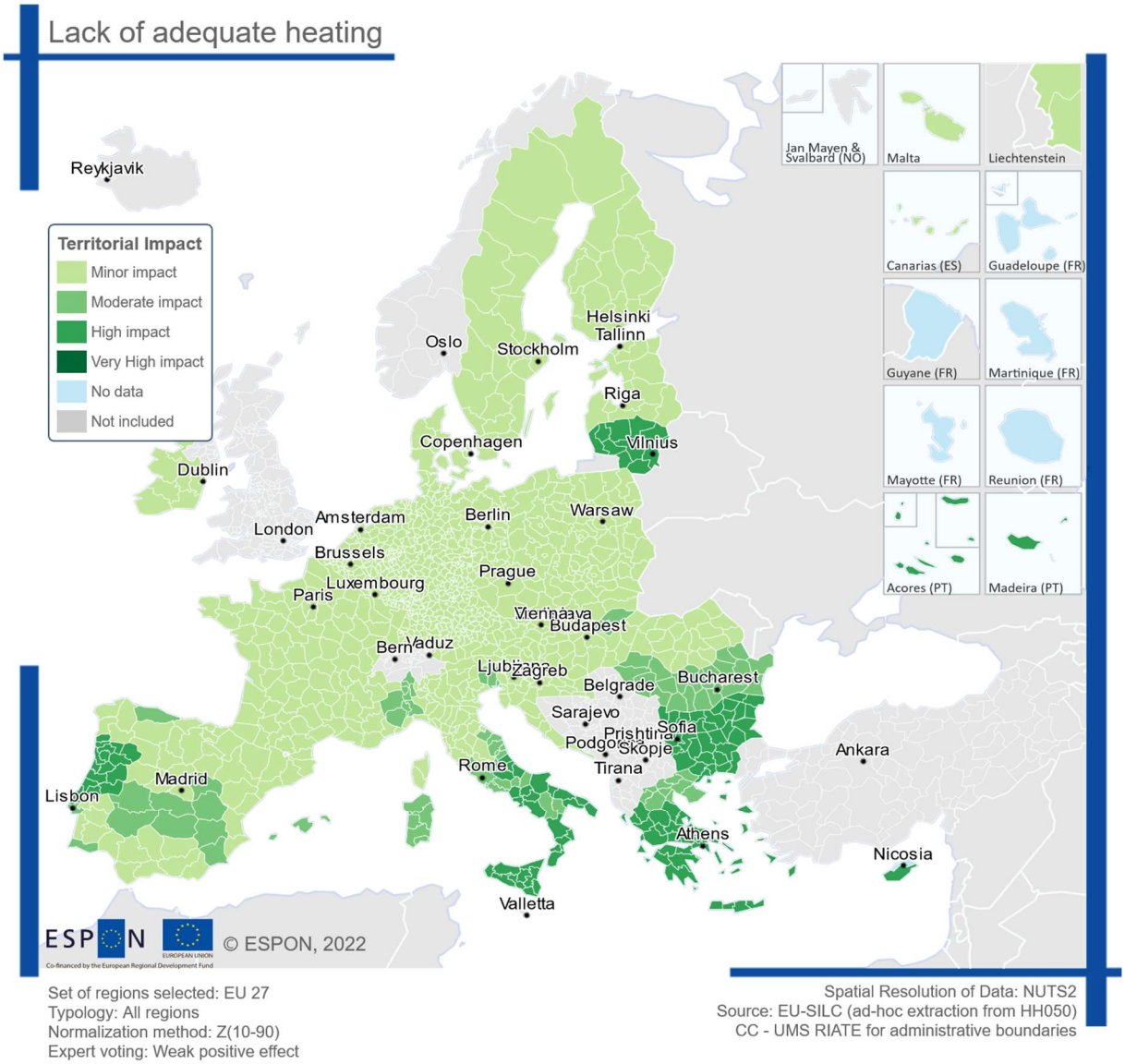


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

This indicator shows the percentage of people who said that they lived in a household which is not economically able to keep its home adequately warm (reference year: avg. 2017/18). Regions with a higher share of people who are affected by lack of adequate heating are expected to be more sensitive. Sensitivity is thus directly proportional to the percentage of this population group.

The following map shows the potential territorial impact of the EPBD on people affected by lack of adequate heating. It combines the expert judgment of a weak positive effect with the given sensitivity of regions. 11% of regions could gain a high positive impact, located in particular in Eastern and Southern Europe. Lithuania, Bulgaria, Greece and Cyprus would be particularly positively affected, while Portugal and Italy would experience a high positive impact at regional level. The vast majority of regions would only have a moderate positive (7%) or minor positive (82%) impact.

Map 10: regions considering people affected by lack of adequate heating and the impact of the EPBD – expert judgement: weak positive effect

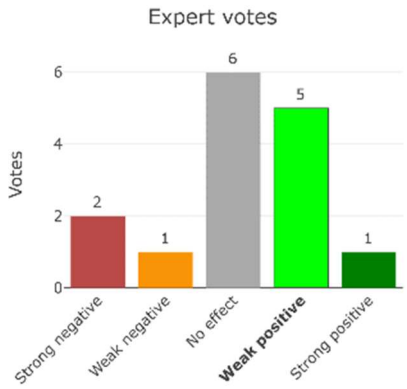


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

6.3 Disposable income

Based on discussions outlined in the context of several indicators (Lack of adequate heating, People at risk of poverty or social exclusion), the EPBD could support households investing in energy efficiency measures. The measures implemented could reduce energy costs for households, which would increase their disposable income. As energy costs make up a higher share of the expenses for low-income households, this effect would be more important for them. Six experts saw a positive effect (one strong, five weak) and three a negative effect (one weak, two strong). Six did not see a relevant effect.

Figure 13: Result of the expert judgement: regions considering the disposable income and the impact of the EPBD

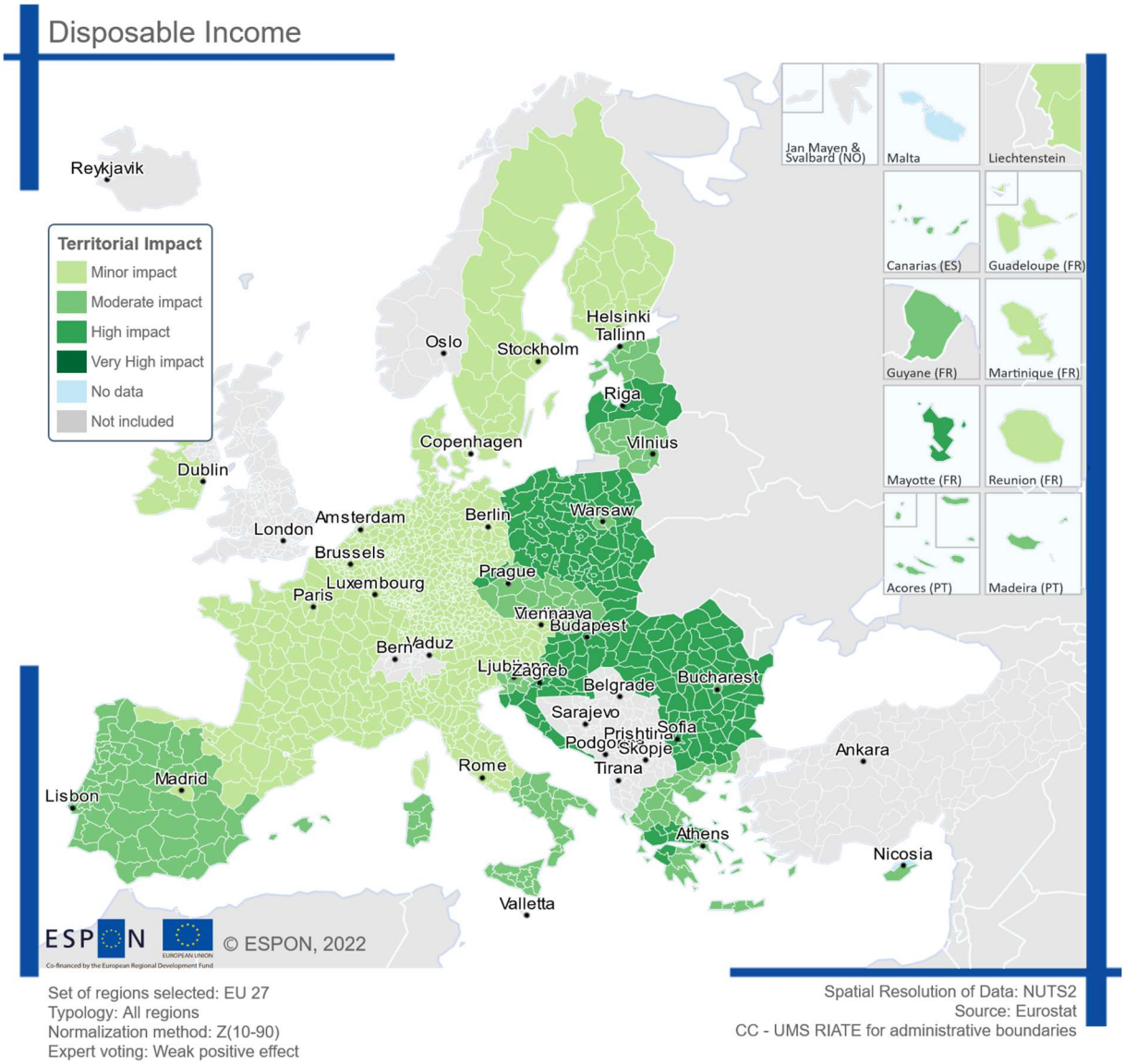


Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

This indicator depicts the disposable income in euro per inhabitant (reference year: 2018). Regions with lower disposable income per capita are expected to benefit more from the EPBD. Sensitivity is thus inversely proportional to disposable income per inhabitant.

The following map shows the potential territorial impact of the EPBD considering disposable income per capita. It combines the expert judgment of a weak positive effect with the given sensitivity of regions. 17% of regions would experience a high positive impact. Most of these countries can be found in Eastern and South-Eastern Europe. 17% of regions seeing a moderate positive impact are also located in these parts of Europe as well as in parts of Italy and the Iberian Peninsula. 66% of regions would experience a minor positive impact.

Map 11: regions considering the disposable income and the impact of the EPBD – expert judgement: weak positive effect



Source: Territorial impact assessment expert workshop, 26 and 27 January 2022

7 Conclusions and policy recommendations

7.1 Conclusions

The revision of the directive would create winners and losers depending on the region, with a distinction between long term and short term. A short-term loser might for example have to pay extra money for the transition period but would benefit from reduced energy costs in the long run. Overall, the directive is ambitious and will at least drive the renovation of public buildings and help prioritise the renovation of the worst performing buildings first.

The need for awareness and support

More investment in renovations will be possible with better financial literacy. Better awareness on loans for renovations and possibilities to include renovation works within mortgages would help households to contribute in the collective to improve the environmental footprint of private buildings. More generally, awareness is necessary to make the renovation process seem less complex, alongside technical assistance. Support would also need to be provided directly to cities.

One solution could be the development of community communication campaigns in order to raise awareness, not only about the energy consumption of buildings but also about how energy bills work, and how to use and live in highly energy efficient buildings to maximise the impact of energy measures. A better definition (and recognition) of energy poverty among EU states would also be a first step in protecting the most vulnerable households as it would ensure that funds are used to that end.

One solution put forward to involve individuals and stakeholders is the use of one-stop-shops as well as a process of co-creation. Participation in renovation projects can promote collective choices and make sure the costs are offset by energy savings as much as possible. An expert gave the example of Catalonia where, for big construction projects, the population needs to be consulted and approve the project.

To adopt a district approach, it is important to rely on proximity actors such as municipalities (or others depending on the local ecosystem). An expert gave the example of the use of one-stop-shops used in the Bulgarian national renovation programme for residential buildings between 2012 and 2016 in order to speed up the renovation and implementation.

Financing is crucial and can be provided either through schemes taking the burden off owners or through financial support to tenants as they are not the ones deciding on the investments. Incentives, such as beneficial rates, are also needed to encourage landlords to take action. The financial incentives are important because lower income households might not see savings in their energy costs, as for the same amount of money they could finally fulfil their unmet needs.

For administrations, financial support should be paired with alleviation of administrative burdens.

Tailored approaches for regions, cities and sectors

The approach should be adapted to the features of the country and the region as, for now, the Member States are largely responsible for the implementation of the directive.

Lifecycle CO_2 reduction is also important. According to the experts, the lifecycle of renovation is not sufficiently covered by the directive. There are no data on the whole life carbon footprint of buildings or on capacity building for closed-loop planning. It was also pointed out that although there is a common framework, methodological guidance for calculating emissions is currently mostly up to the Member States, especially for energy passports.

Another concern is territorial and urban planning: a building is never isolated but always part of a bigger structure or district. Here, the power of the EU is fairly limited. Different approaches are needed when it comes to territorial and urban planning as conditions on the ground are different (history, architecture, etc.) and should include energy production as well as mobility. Indeed, the renovation of buildings also implies planning mobility around them (charging points for cars, parking spaces for bikes, etc.).
According to an expert, the urban/rural divide should be addressed by those renovations.
There are also challenges specific to communities such as multi-family buildings. Here, there is space for governance to define the number of votes needed to install a PV system.

Re-skilling the workforce

Having enough qualified workers to renovate buildings is a major challenge. Experts suggested a common framework to ensure that workers can work all over Europe, especially as skilled workers are not necessarily located in the places where they are most needed and certification as well as training should be designed to ensure a high standard of work, from the design phase to the renovation phase. Finally, how can we make sure that people needing it the most will undertake the renovation process and that big projects will not always be prioritised to the detriment of smaller, but as much needed, ones?
Encouraging the skilling of workers requires financing but also a change in the perception of the sector to make it more attractive for young people and women. According to the experts, this would require work on branding (from "installer" to "energy efficiency expert" for example).

Inadequate data

The participants also noted that more data are needed to further develop the analysis of the impact of this legislation. The following indicators were not available at the time of the workshop, but were deemed important for future impact assessments:

- final energy consumption divided into sectors;
- final energy consumption divided into owners/tenants, or income group;
- more granular indicators on energy poverty.

7.2 Summary of recommendations

→ Define and recognise energy poverty as an EU concern;

→ Put in place incentives and financing schemes;

→ Keep the administrative burden as low as possible;

→ Prioritise buildings with the highest energy saving potential;

→ Provide guidelines for energy communities and enabling regulatory frameworks;

→ Pave the way for reporting on whole life carbon emissions from buildings, including creating a database, coupled with capacity building for the public sector with training materials for municipal staff and construction workers;

→ Encourage efforts to take the mobility framework into account when renovating buildings, with charging points and bike parking spaces;

→ Recognise the potential leading role of one-stop-shops and increase technical assistance for set up and operation;

→ Work on the branding and gender balance of the green jobs created;

→ Emphasise the importance of training for the workforce and create certifications.

CdR_4709/03-2022

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.

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