

Inspire Policy Making with Territorial Evidence

Territorial fiche

Territorial patterns and relations in Austria

EU networks and disparities

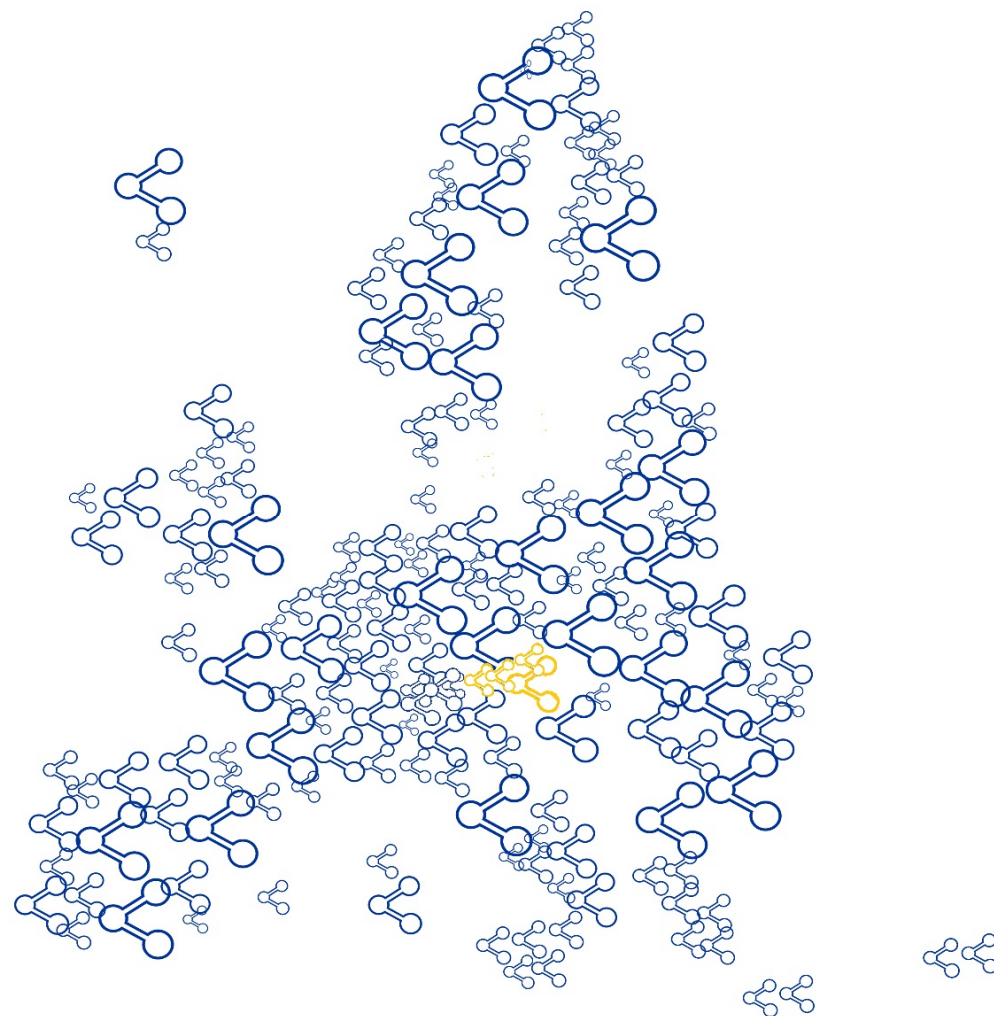
Interconnected Europe

Risk and solidarity

Sustainable use of natural resources

Inspiration

Interactive version: www.espon.eu/austria



Introductory remarks

The content of the following overview is a summary of research results from different thematic applied research projects under the ESPON 2020 programme. Its main goal is to showcase the wide range of ESPON research and, by zooming-in on a specific country, raise interest for the scientific results at a national and regional scale.

The indicators and analyses in this document represent the data availability at the time when the research was undertaken and are not based on the most recent data. In a few cases, for some rather basic indicators that could easily be reproduced, more up-to-date information was used. It is therefore important to note that this overview is mainly a collection of available findings with different time stamps and not an up-to-date, comprehensive analysis.

This document was created during the Coronavirus crisis. All the maps in this document are based on data before the Coronavirus and might therefore not reflect the situation in 2020.



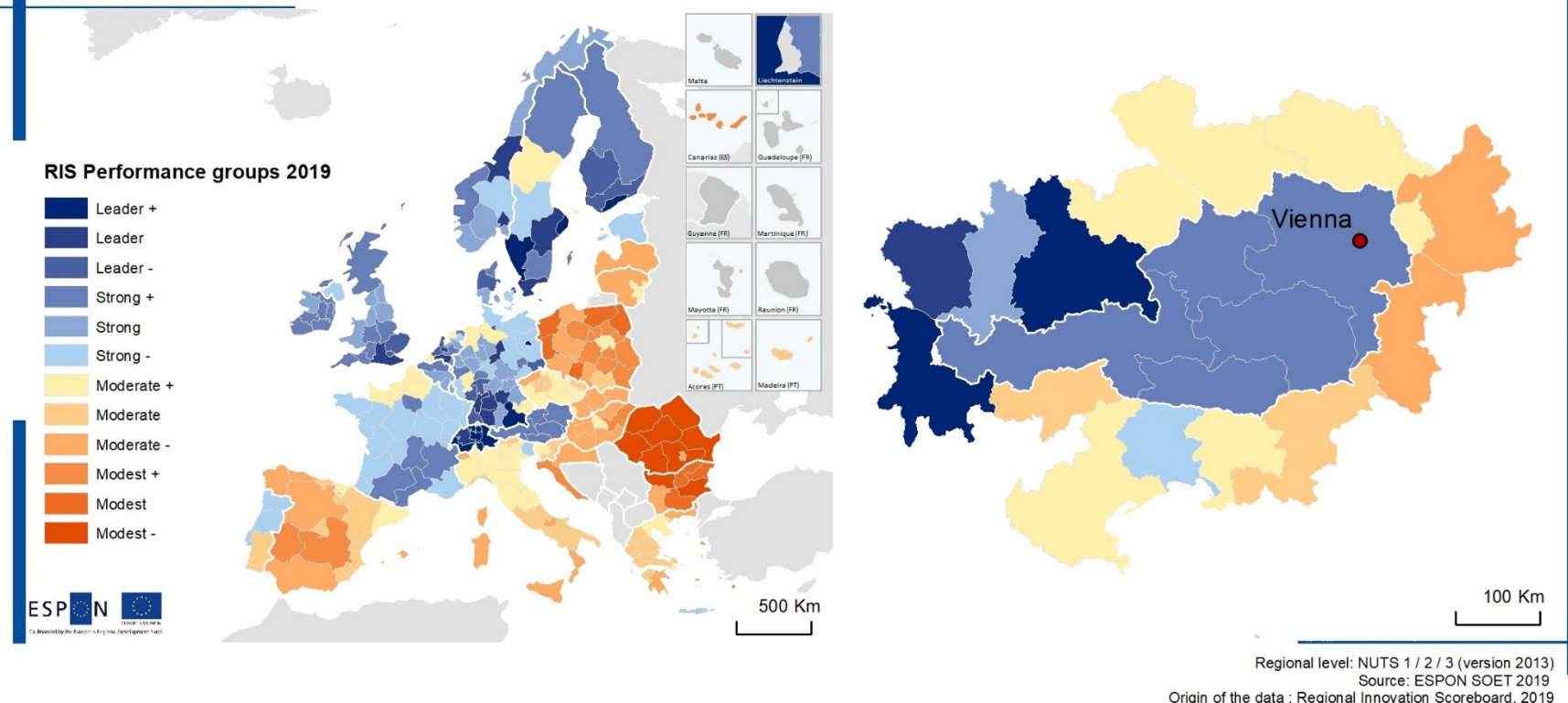
EU networks and disparities

Regional innovation
Knowledge economy
Economic fragmentation

FDI flows
Labour migration
Attractiveness for migration

This chapter focuses on the territorial networks and disparities in Europe. Regional innovation, knowledge economy (KE) and economic fragmentation show the similarities and the discrepancies between regions by determining clusters of similar or different regions in Europe. Foreign direct investments, labour migration and the attractiveness of regions in the context of migration emphasise the connection and networks between Europe and the world. Austria has a strong performance in regional innovation and a competitive and KE-related economy. It is also attractive in the context of migration. The topics in this chapter tell us the story of a connected and simultaneously fragmented Europe, where the centre-periphery polarisation of European regions in terms of regional innovation, growth and socio-economic performance is visible through ESPON evidence.

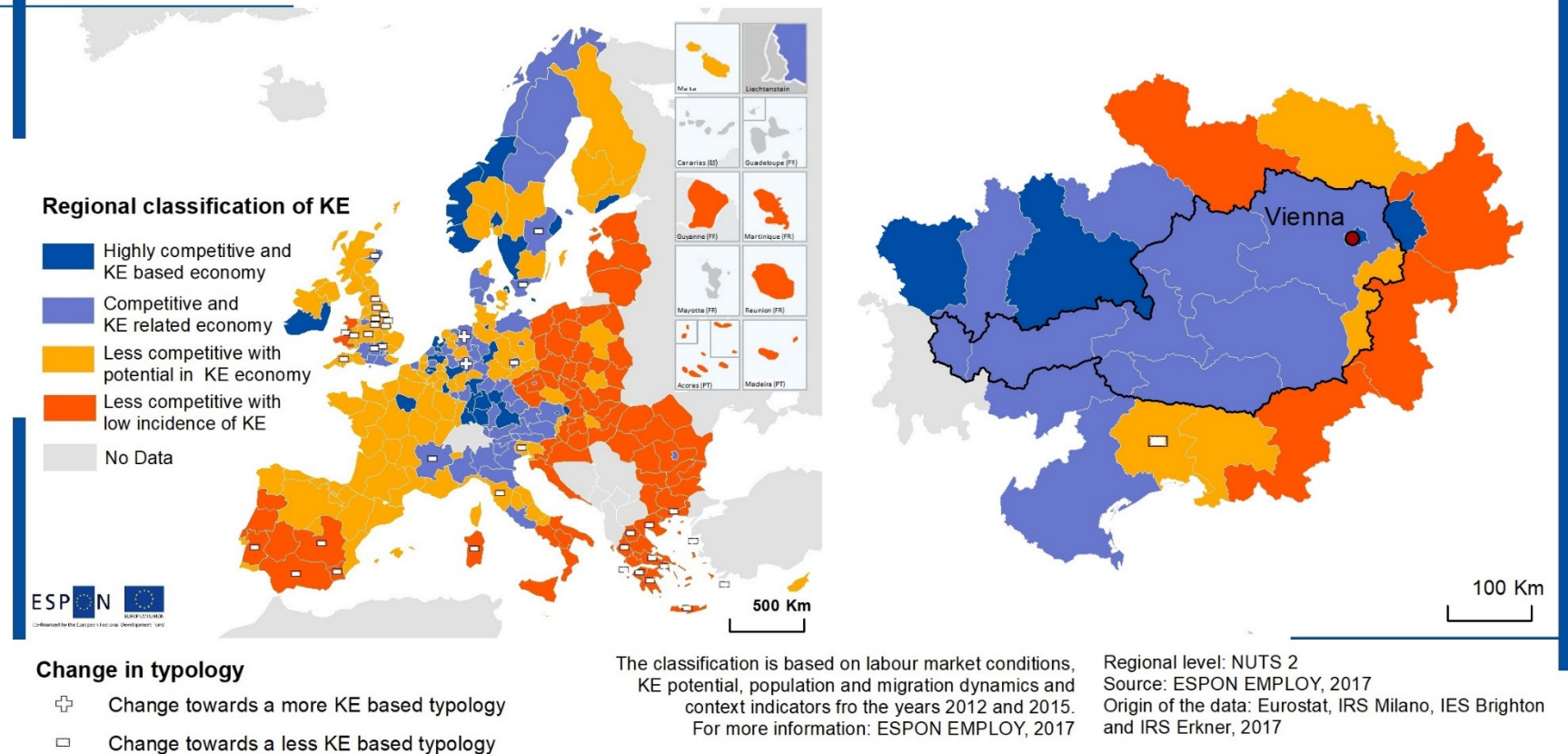
Regional Innovation Scoreboard 2019



The Regional Innovation Scoreboard approach emphasises the performance of regions with respect to innovation. It proposes four regional performance groups, measured along indicators concerning framework conditions, investments, innovation activities, and effects on employment and sales. There are five typologies at the EU level which reflect the territorial pattern of innovation and the intensity and mix of innovation activities in 2019. Science-based areas are located in Austria, Belgium, Denmark, and Germany. Applied science areas are in regions in central and northern Europe, such as Austria, Belgium, Denmark, Estonia, France, Ireland, Luxembourg, and Poland. Smart technological application areas can be found in Italy, Netherlands, Spain, and Sweden. Mediterranean areas together with Poland and Slovakia are smart and creative diversification areas. Bulgaria, Hungary, Italy, and Romania are imitative innovation areas.

Austria has an overarching strong innovation performance. Regions in Vienna are mainly science-based and have high levels of scientific activity, highly educated human capital and good accessibility to innovation. Austria also belongs to the typology of applied science areas wherein regions are strong knowledge producers, with a high level of applied sciences and a high degree of knowledge coming from regions with a similar knowledge base. Regions in neighbouring countries are more likely to have a lesser innovation performance and so belong to the typology of imitative innovation areas.

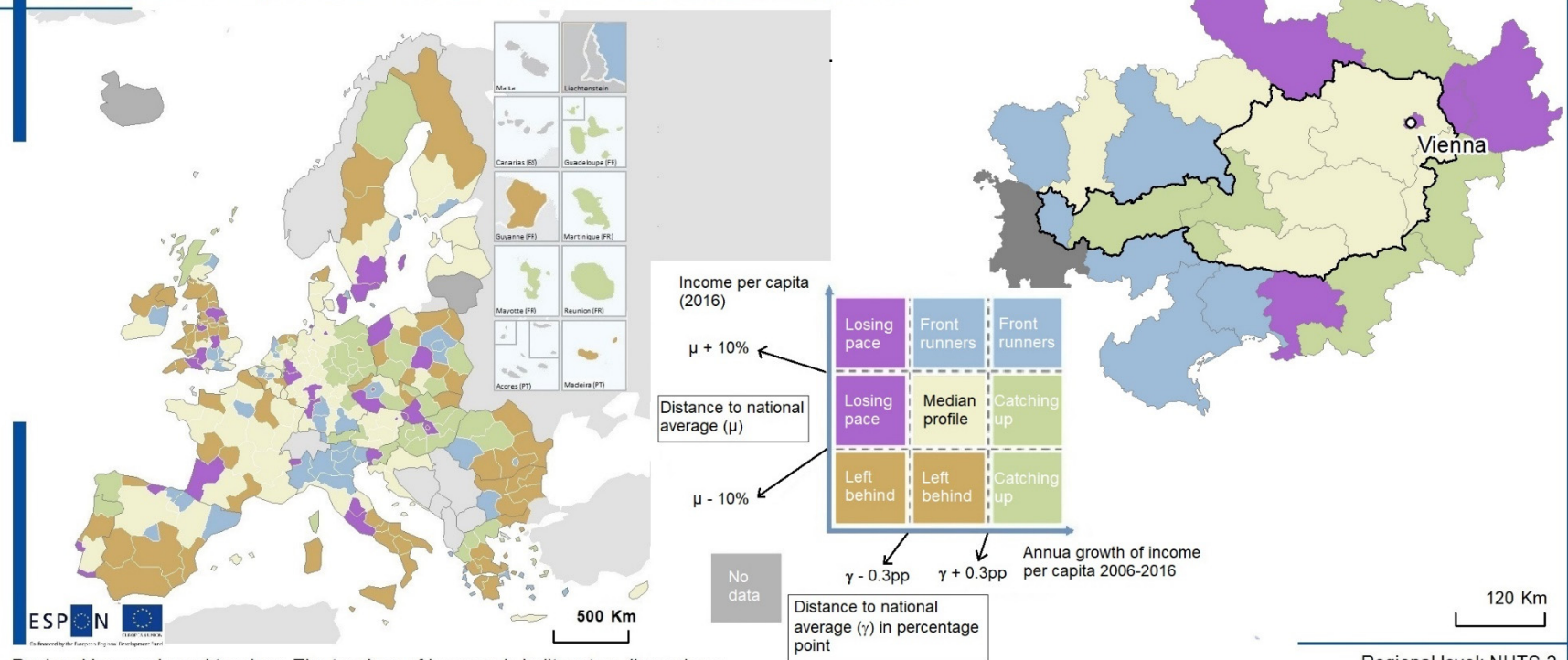
Knowledge economy (KE) clusters, 2012 - 2015



Higher levels of innovation and entrepreneurial culture contribute to the economic resilience of regions. Major urban centres and second-tier cities are significant in promoting the resilience of a country's economy, because these are important growth poles for smart, sustainable and inclusive growth, have good development potentials, and sometimes perform better than the capital city. This map shows that highly competitive Knowledge Economy (KE) regions in the period of 2012-2015 are located in the pentagon area, extended to Dublin, the coast of Norway, Helsinki and Bratislava. The Mediterranean and eastern European countries have less competitive regions with low incidences of KE and have been more affected by the economic crisis in 2008.

Most Austrian regions are competitive and have a KE-related economy. The Vienna region is classified as highly competitive, due to the concentration of highly skilled human capital and the implantation of science and research infrastructures. High levels of innovation and entrepreneurial culture and an adaptive economy contribute to the resilience of Austrian metropolitan regions such as Vienna. The eastern neighbour regions are generally less competitive, with less KE areas than Austria. Austria's knowledge economy is more aligned with its western and north-western neighbours.

Interregional comparison of income evolution between 2006 and 2016



Regional income-based typology. The typology of incomes is built on two dimensions:
 (1) the level of income per inhabitant compared to national average in 2016;
 (2) the growth of income per inhabitant between 2006 and 2016 compared to national average.
 The aim of the indicator is to identify the relative position of regions in comparison with their national context.

Regional level: NUTS 2
 Source: ESPON Territorial Reference Framework
 Spatial Foresight, 2019
 Origin of the data: Eurostat, 2019

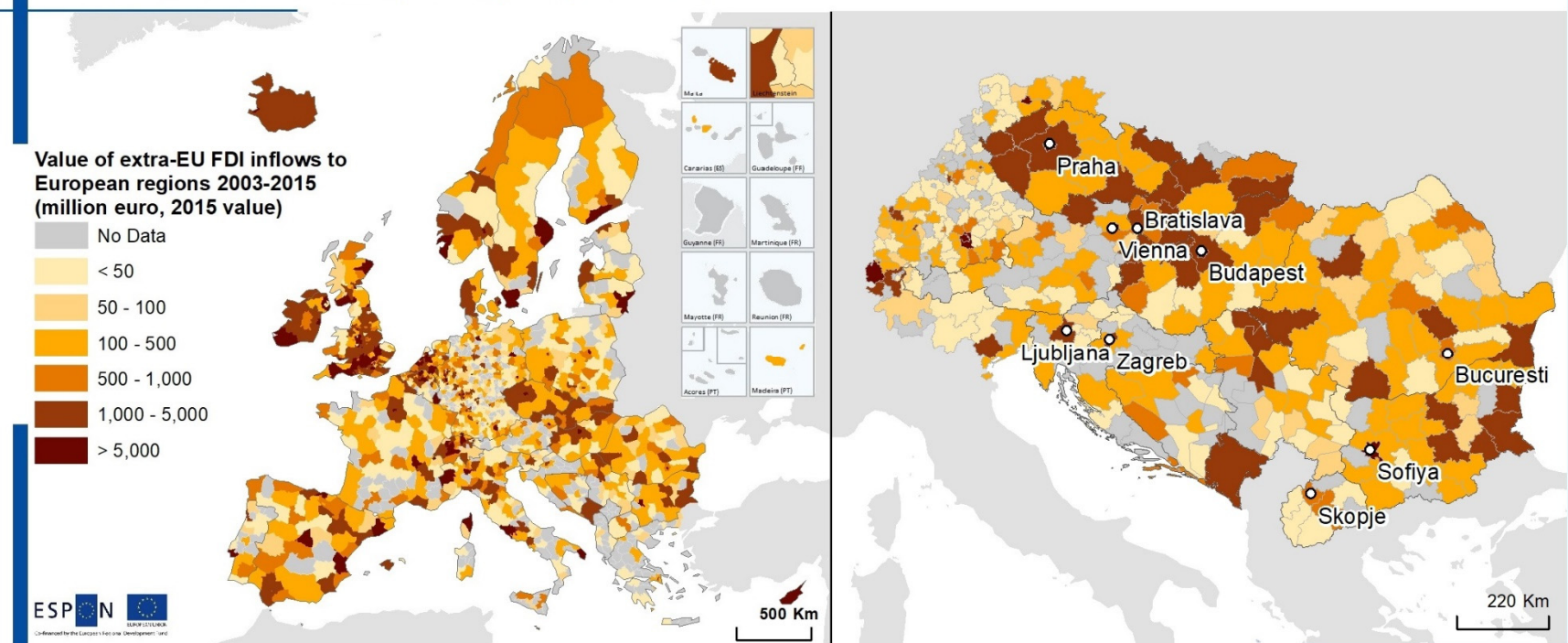


This map indicates the relative income growth per capita during the 2006-2016 period. It thus reveals trends relative to each region. Southern Germany, Northern Italy, Catalonia, Dublin, London, Warsaw region, Sofia, Bucharest are front-runners, while southeast and southern European regions, together with former industrial regions in France, the United Kingdom, and rural central Europe are left behind.



Austrian neighbouring regions in the East are either catching up or losing pace, whereas neighbouring regions in the West are "front runners". The majority of Austrian regions have medium level of income per capita and are representative of the national context.

Extra FDI inflows across European regions, 2003 - 2015



Regional level: NUTS 3
Source: The world in Europe, global flows towards Europe, 2017
Origin of the data: Copenhagen Economics based on BvD's Zephyr and the Financial Times databases, 2016

Deal value originating from outside Europe, both Greenfield projects and M&A deals (around half of the M&A deals did not have a reported deal value – the total deal value is reported for the GF and M&A projects that had a reported deal value).

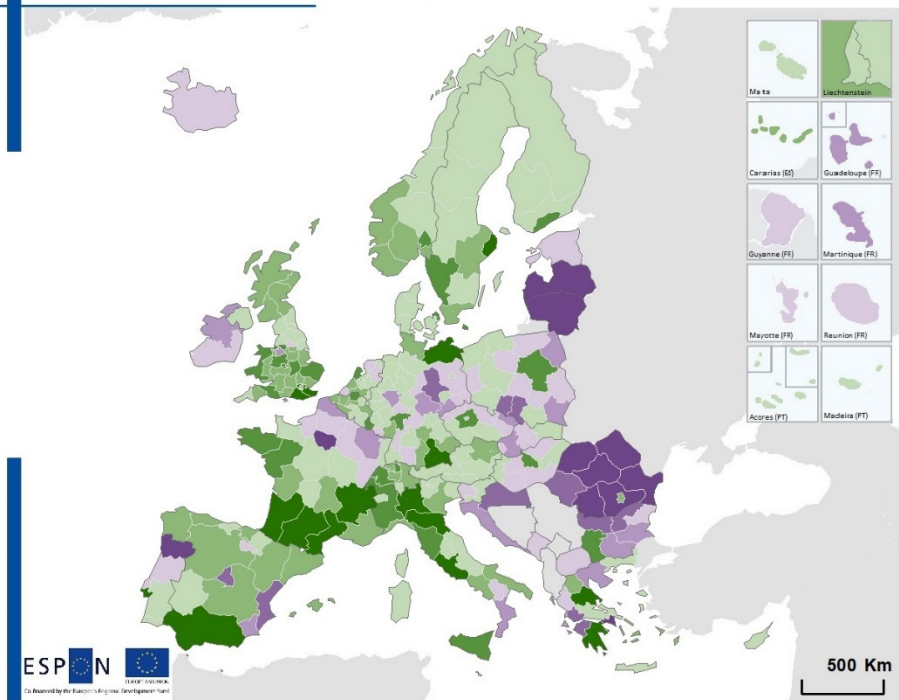


Foreign direct investment (FDI) is considered as a key factor in economic growth. Generally, capital metropolitan regions are more likely to be attractive for FDI. This map shows the extra-EU inflows of greenfield investments in 2003-2015. These investments take place when a new foreign firm establishes itself in the region and sets up new production facilities, e.g. to access new markets or to reduce its costs of production. This type of FDI stimulates economic activity during the construction phase and expands the capital stock in the region. Greenfield investments tend to take place in emerging economies with expanding markets or in countries with an abundance of important resources and are more frequent in rural or peripheral areas. FDI originating outside Europe brings new capital to Europe, stimulates employment and boosts productivity in local firms.

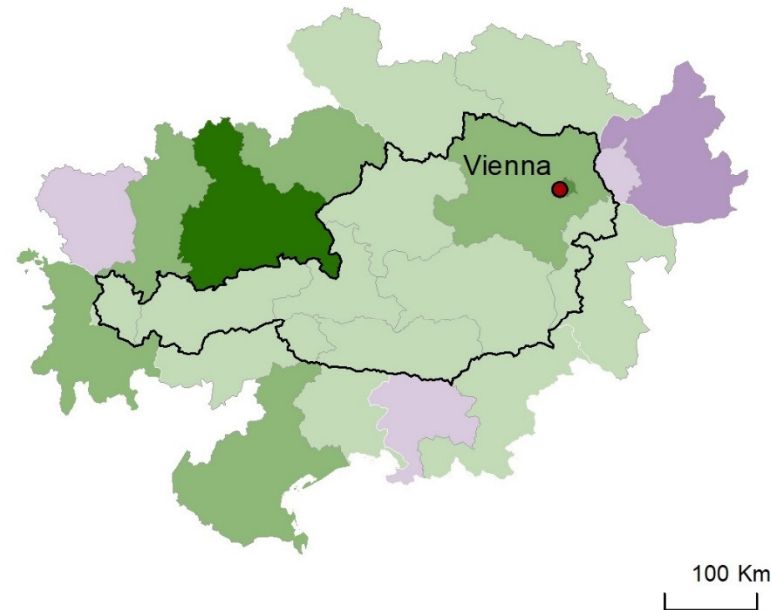


In the 2003-2015 period, the highest value of extra-EU FDI inflows of greenfield investments in Austria can be found in the region of Vienna. The regions around Vienna have also a relatively high value of extra-EU FDI inflows due to the spillover effect, which makes the regions around the capital attractive for FDIs. The eastern and north-eastern neighbour regions in Czech Republic, Slovakia and Hungary have relatively high values of extra-EU FDI inflows of greenfield investments to European regions.

Net migration within the European Union between 2011 and 2015



Net migration (in 1,000 inhabitants)



Regional level: NUTS 2
 Source: ESPON database
 Origin of the data: Eurostat, 2016

The net migration plus adjustment is calculated as the difference between the total change and the natural change of the population.

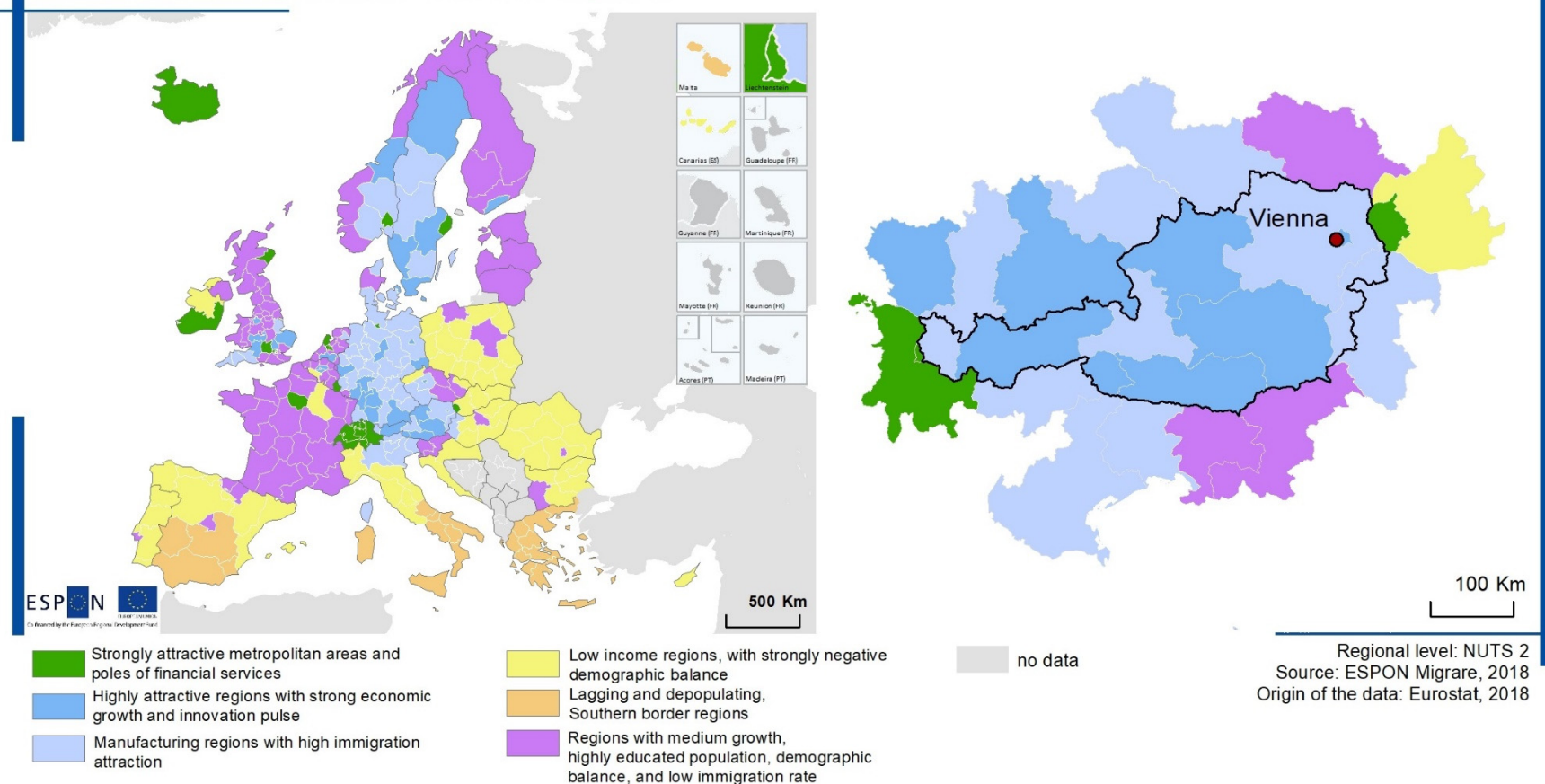


Over the past two decades, a positive net migration balance in the EU-28 can be observed. Increased urbanization and concentration of employment explain this trend. Conversely, declining industrial regions have become inner peripheries. Spain, Italy, Poland, Romania and Bulgaria face severe out-migration trends (i.e. poor economic and labour market conditions, high old-age dependency rates and low fertility rates). The former EU-15 (+ Norway, Iceland and Switzerland) are in-migration countries (except for north-eastern France and parts of Ireland).



Austria has an overall positive net migration value, similar to nearly all of its neighbouring regions, with the exception of the regions sharing a border with Slovakia. Vienna and Lower Austria have the highest net migration on a national level in 2011-2015.

Attractiveness of regions in the context of migration



The socioeconomic integration of migrants into the EU is closely linked to the absorption capacity of its territories in terms of economic and job market performances. The dynamic of migration differs between urban and rural areas and there is a discrepancy in the policies targeting socio-economic integration of migrants and asylum seekers. Clusters have been defined from an economic viewpoint according to variables reflecting the labour market absorption potential of regions, such as the socio-economic performance of receiving regions, the skills and qualification of asylum seekers and refugees, and the reception and active inclusion policies in place. Metropolitan regions with a strong local economy

(Germany, Austria, the Netherlands, Iceland, Norway, Sweden, and Northern Italy) are particularly attractive. Regions where the demography is balanced and the population is educated (Finland, UK, France) are less attractive. On the contrary, southern and eastern regions with a negative demography balance are less attractive.



With high socioeconomic performance, 2018 Austria was one of the most attractive countries to migrate to. This situation contrasts with its neighbouring countries to the east and southeast which have a lower income and a negative demographic balance.



Interconnected Europe

Accessibility by rail

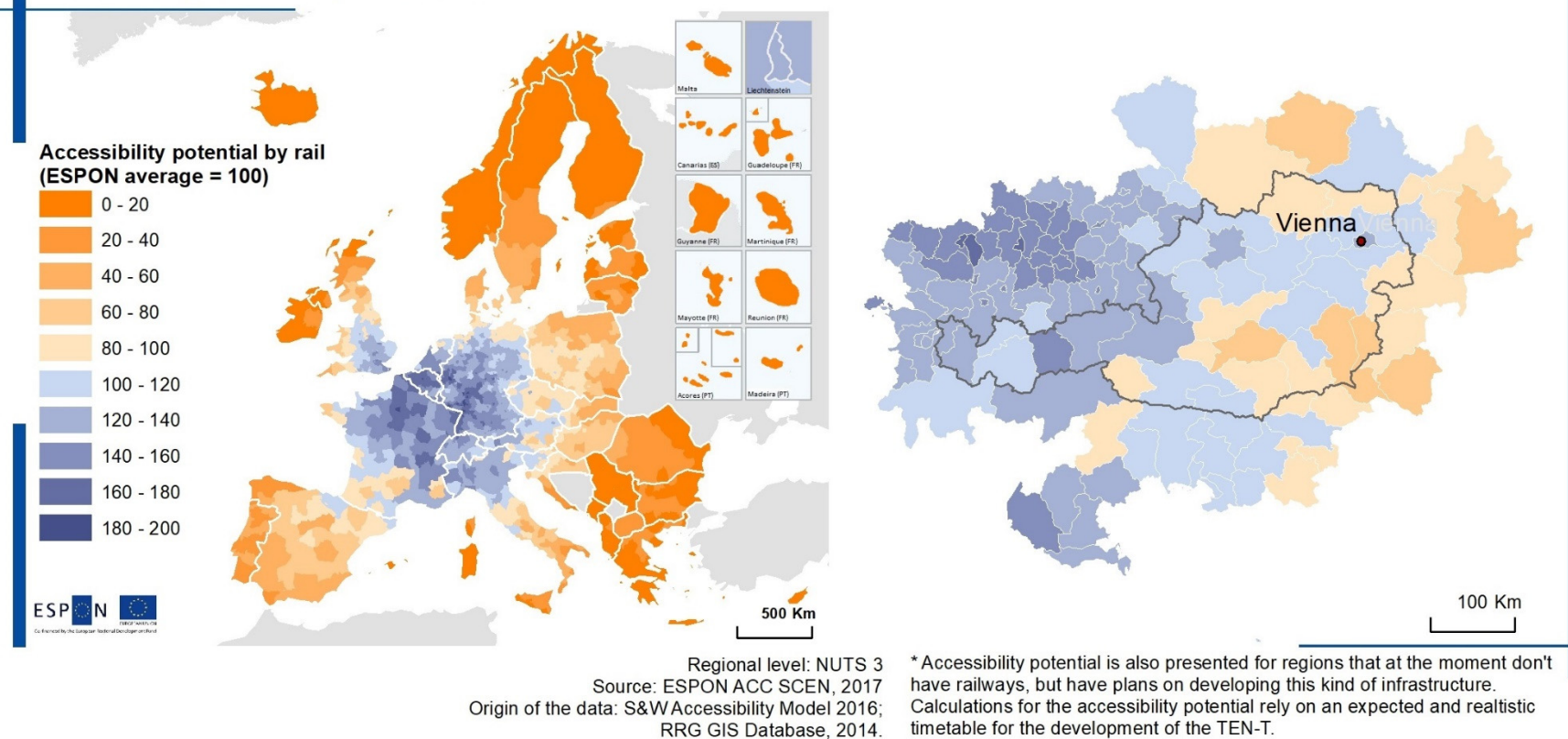
Global accessibility

Broadband connectivity

Tourism intensity

The chapter “Interconnected Europe” focuses on the ways in which European regions achieve the objective of a more interconnected Europe. ESPON evidence on accessibility by rail, global accessibility, broadband connectivity and tourism intensity show that connections between European regions can take many forms. In the context of Austria, the connectivity of its mountainous regions highlights the challenges and opportunities of regions with topographical specificities. ESPON data makes evident that Austria is well connected despite its topographical challenges. The topics in this chapter tell the story of an interconnected and accessible Europe through road, rail and air as well as through broadband connectivity.

Accessibility potential by rail in 2030

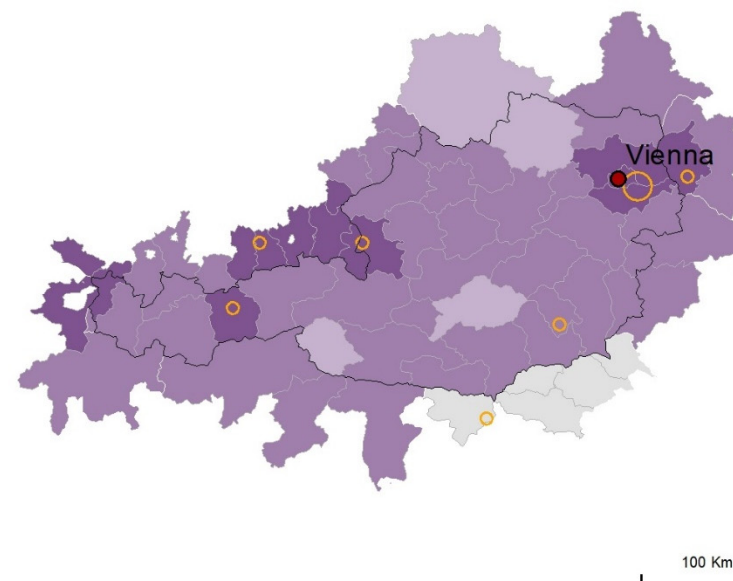
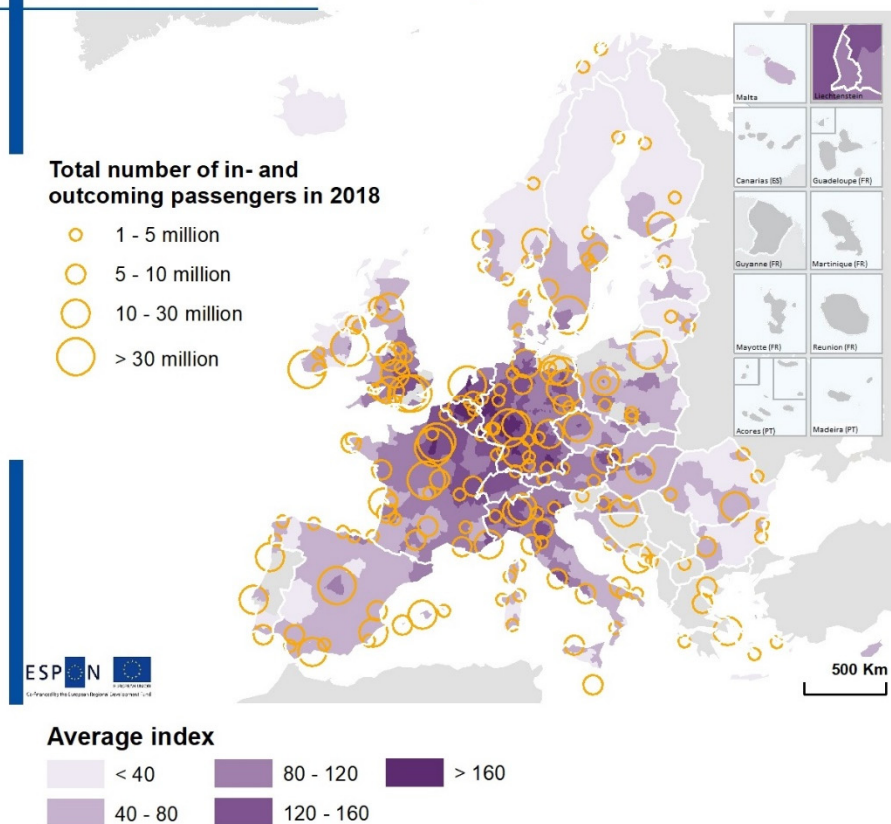


The European core (“Pentagon”) has the highest values in terms of international and regional accessibility due to the high density of motorways and high-speed rails. The economic performance of the European territory is directly dependent on accessibility provided by the TEN-T (Trans-European Transport network). Romania, Bulgaria, Spain, and the Nordic states remain less accessible due to the fewer number of corridors, while the Carpathians and the Balkans are less accessible due to less developed corridors. Projections for 2030 show that the accessibility potential of mountain regions, such as the Alpine regions, by rail or road will reach the ESPON average.



The topographical specificities of Alpine regions in Austria affect the availability of connections through road and rail. Territories with geographic specificities remain less accessible due to the challenges associated with cost-efficient transport infrastructure, topographic conditions and low population densities. Nonetheless, mountain regions in the Alpine Mountain range have increasingly better accessibility thanks to the developed network of road and rail TEN-T corridors. In the South and in the more mountainous regions of Styria and Burgenland, the accessibility is lower than in the more metropolitan Vorarlberg, Tyrol, Upper Austria and Vienna.

Global accessibility and main airports



Number of passengers:
Level: Airports
Source: Eurostat, 2020

Accessibility index:
The index is calculated as the average index from the Spiekermann & Wegener study (2014) combining the accessibility by road, rail and air.
Source: ESPON S1W, 2014 | Level: NUTS 3

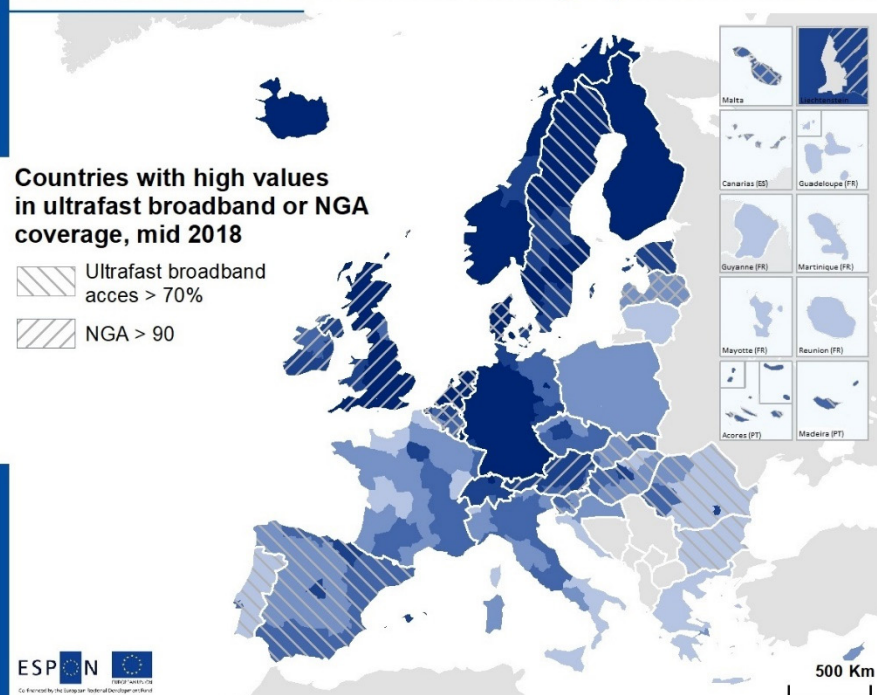


Good accessibility is a precondition for economic development, and is based on the assumption that the attractiveness of a destination increases with size, and declines with distance, travel time or cost. This map shows the accessibility index of regions by road, rail and air and the total number of in- and outgoing passengers in 2018. Indicators used in this map are trade relationships, export and import rates, FDI and the connection (linkages and travel time) to global hotspots outside Europe or to other European gateways to the world. The necessary transport effort (determined by the time and costs of transport) thus shows the extent of how European regions are embedded in the global economy, seen from an



Austria has a global accessibility potential above the European average, especially in metropolitan regions. The Twin City region Vienna – Bratislava and the metropolitan regions of Graz, Salzburg, Innsbruck, and Vorarlberg have high accessibility potential.

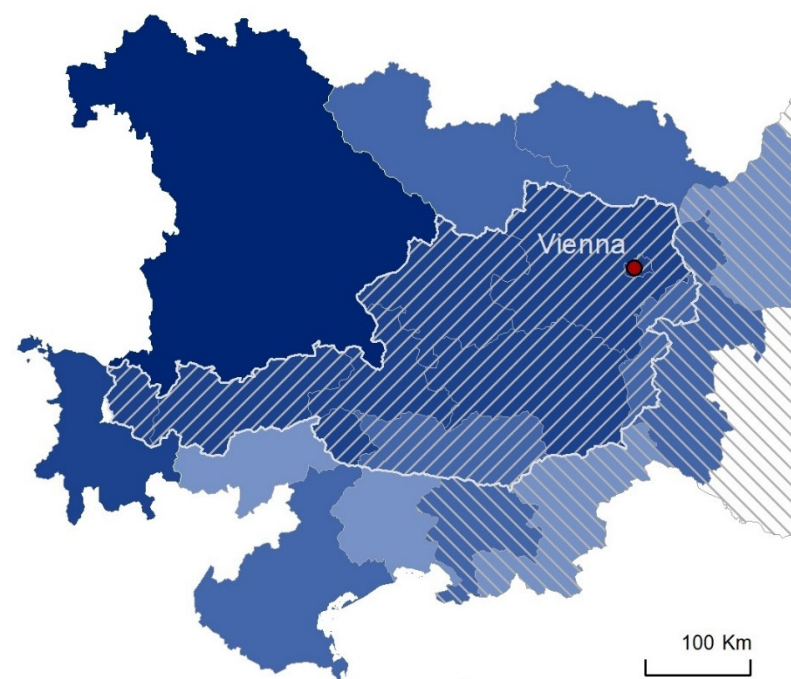
Broadband access in households and high speed internet coverage



Proportion of households with broadband access, 2017 (% share of all private households)*



The EU2020 target of 100% broadband access coverage is comparable to the challenges of physical accessibility, wherein peripheries are less connected than core areas. On a European level, the core countries are generally better connected with up to over 90% of households having broadband access in 2017, while southern countries only cover 75-85% of households. Regional disparities within countries exist and can be linked to the urban-rural divide, income disparities and demographic factors.

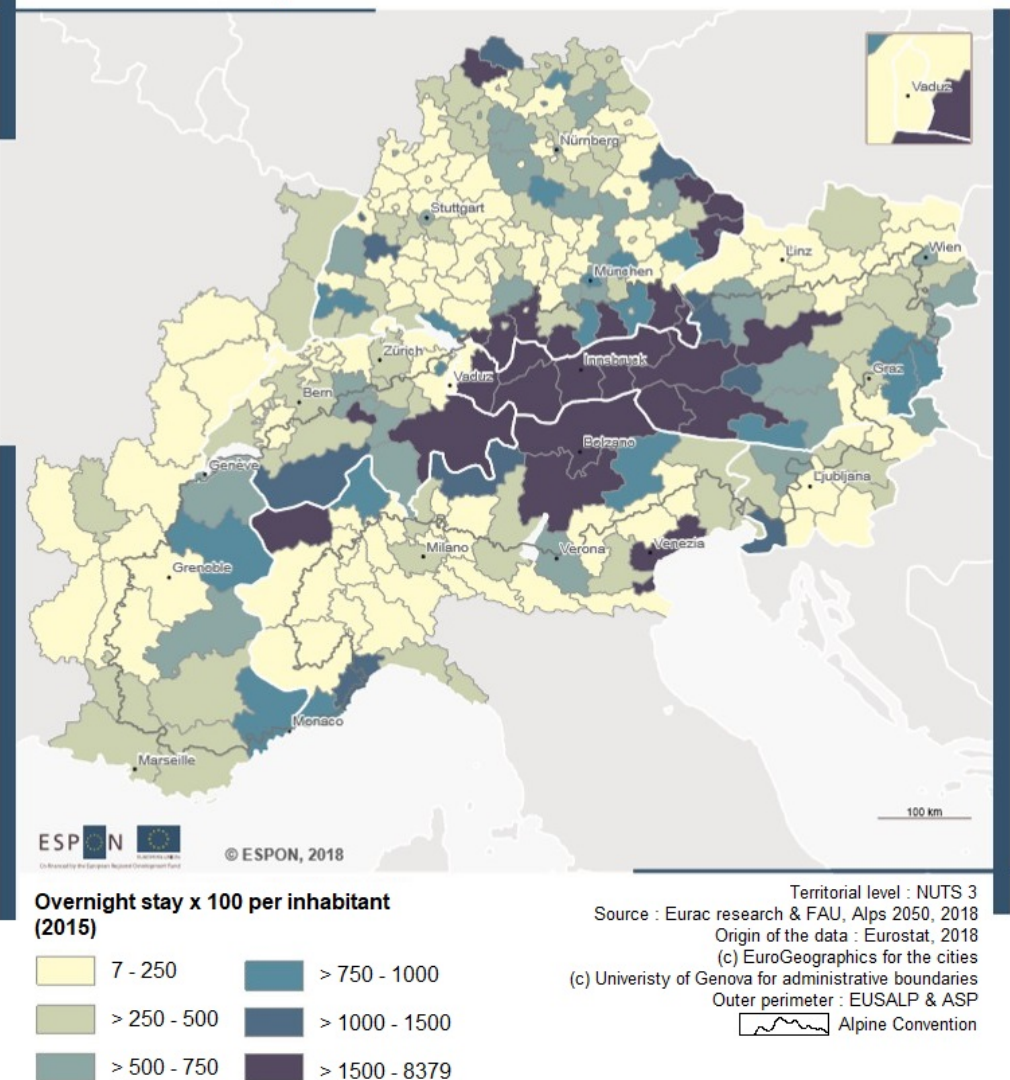


Regional level: NUTS 2 / 1 / 0
Source: ESPON SOET (2019)
Origin of the data: Eurostat, DESI index, 2019

* The availability of broadband is measured by the percentage of households that are connectable and thus refers to coverage.

Austria is among the core countries with a high proportion of households with broadband coverage and also Next Generation Access (NGA) with over 90 megabits-per-second access available in all Austrian regions. There are no high disparities between regions. Compared to its eastern and southern neighbouring countries, Austria has a higher proportion of households with broadband access, which also contributes to its competitiveness in the Knowledge Economy.

Tourism intensity



This map shows the tourism intensity of the Alpine regions in 2015, calculated based on the population-based tourism function index (overnight stays*100/population) in the year 2015.

The Alpine region was a hotspot of tourism before the COVID-19 crisis. The economic performance of the Alpine region is therefore very strong and above the European average. The highest number of overnight stays in 2015 was in the higher points of the Alpine mountain line, while lowlands had significantly fewer overnight stays in the same period.

Tourism intensity in the Alps is significantly higher than in lowland urban areas. However, there are discrepancies between the intensity of tourism in the inner-Alpine and pre-Alpine areas, wherein the inner-Alpine areas have higher tourism intensity due to their prominent destinations, such as Vorarlberg, Tyrol, and southern Tyrol. The higher tourism intensity in the inner-Alpine area is also linked to the strong presence of the tourism sector and the relatively low population density.



Risk and solidarity

Climate change impact

Adaptive capacity

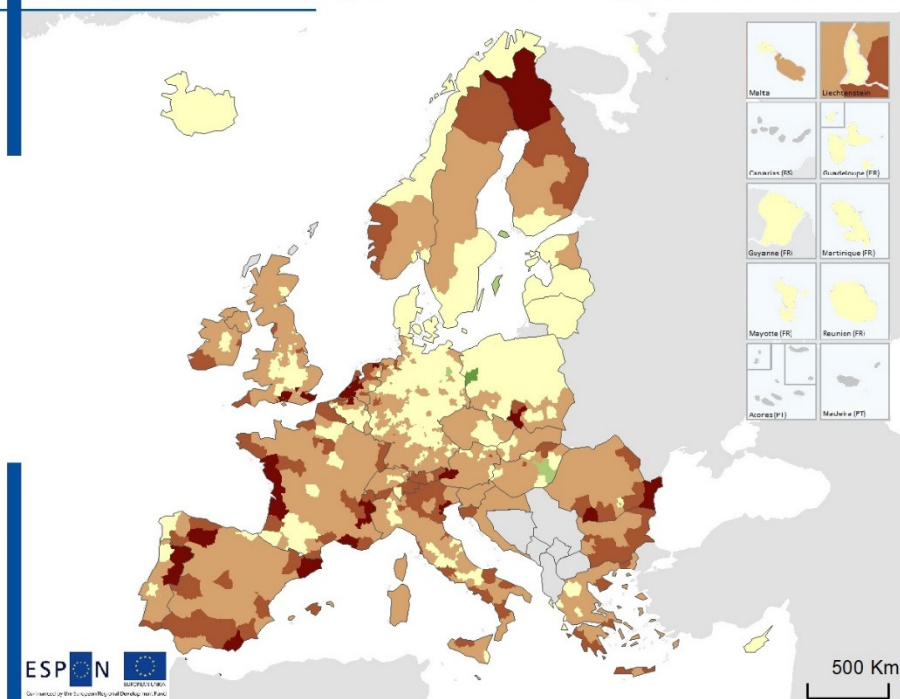
Eco-system services

Renewable energy

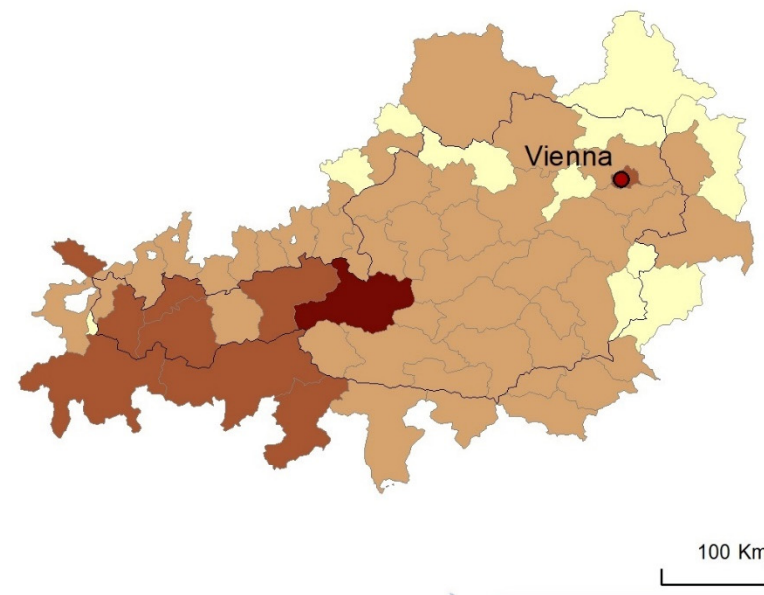
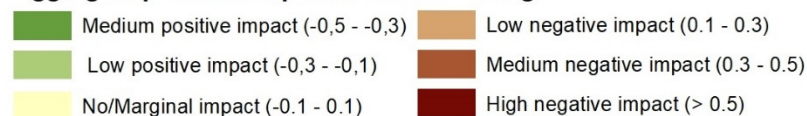
Solar energy

The chapter “Risk and solidarity” focuses on the potential risks which European regions face through the impact of climate change and highlights how these impacts can be mitigated through solidarity between European regions. ESPON evidence demonstrates that not all regions will be impacted by climate change in the same way and some regions have better mitigation structures than others. In this context, Austria’s mountainous topography will be especially impacted by climate change, however most Austrian regions have high adaptive capacity to climate change and some Austrian regions have high renewable energy potential. This chapter tells the story of how European regions can face the challenges of climate change together.

Aggregate potential impact of climate change from 2071 to 2100



Aggregate potential impact of climate change



Regional level: NUTS 3

Origin of data: EEA, 2012, 2013, 2014; E-PTR 2012; OSM2014; GISCO 2006; Eurostat 2011, 2013, 2014; JRC 2006, 2012, 2013, 2014; USGS 2011, DIVA 2004, ATSR2014; Statistics Iceland 2011; Bundesamt für Statistik 2011, 2014; Amt für Statistik Liechtenstein 2014; HESTA 2014.
Source: ESPON CLIMATE updated, 2015



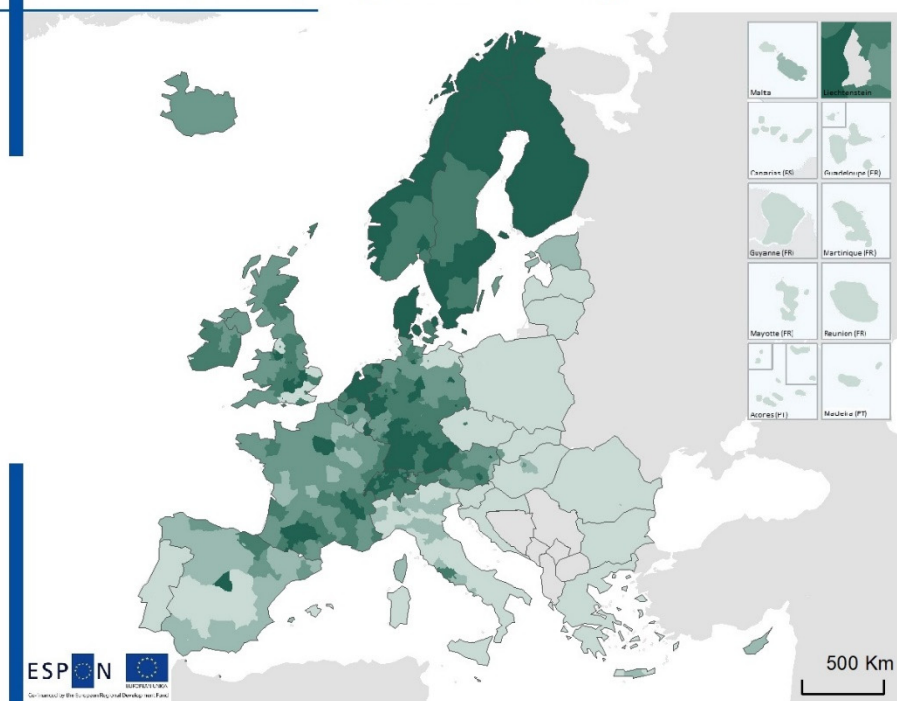
Climate change impacts the majority of European regions and there are differences in the capacity to respond to these changes through mitigation, adaptation and resilience measures. The potential impact of climate change is aggregated into the degree of exposure (the extent to which a region is facing natural hazard or climate change impacts), the sensitivity of the region (the economic, social and ecological damage potential which is assessed in this context, by using the regional GDP per capita) and their capacities to respond (the ability to react to and mitigate which, in this context, is addressed by taking into account national GDP per

capita). The impact of climate change concentrates mainly along regions with natural borders (rivers, mountains, coastal regions).

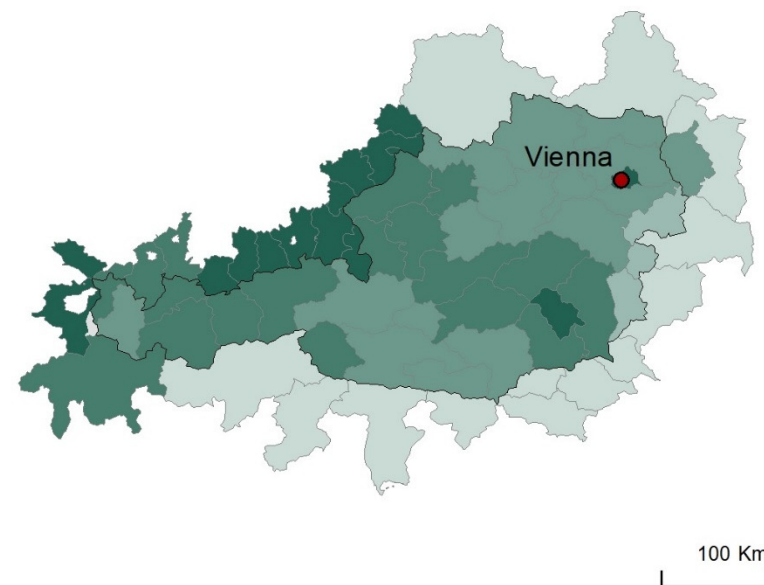
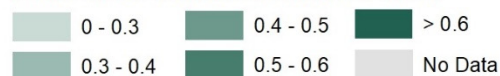


In Austria, the potential negative impact of climate change is highest in mountainous regions in western parts of Austria, which can affect the tourism and heritage sector. The Salzburg region has the highest level of negative impact among Austrian regions, while Tyrol and Vorarlberg have a medium level of negative potential impact of climate change projected in 2071-2100.

Overall adaptive capacity to climate change



Ratio-scale variable between 0 and 1



Regional level: NUTS 3

Origin of data: EEA, 2012, 2013, 2014; E-PTR 2012; OSM2014; GISCO 2006; Eurostat 2011, 2013, 2014; JRC 2006, 2012, 2013, 2014; USGS 2011, DIVA 2004, ATSR2014; Statistics Iceland 2011; Bundesamt für Statistik 2011, 2014; Amt für Statistik Liechtenstein 2014; HESTA 2014.

Source: ESPON CLIMATE updated, 2017

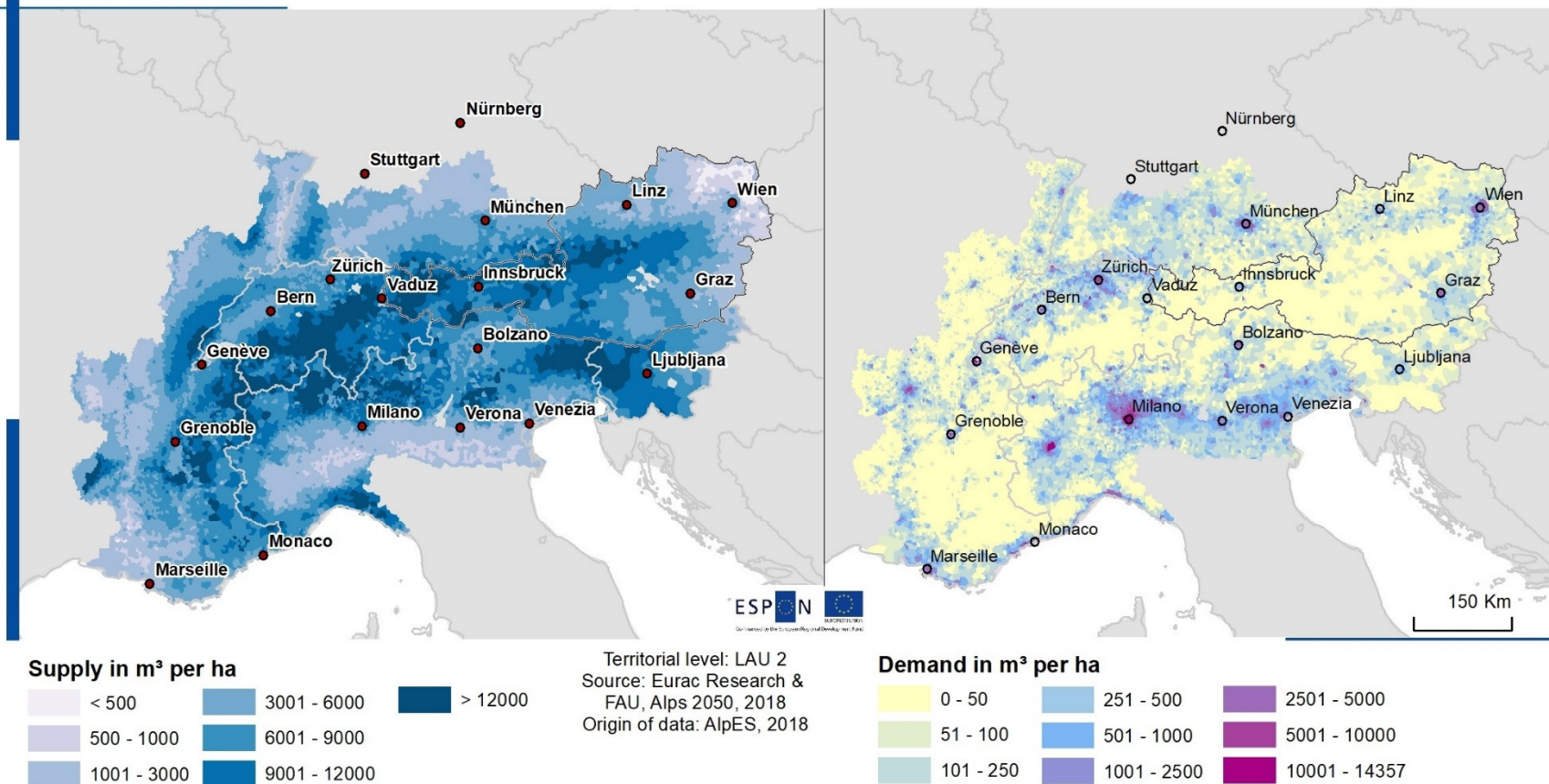


This map shows the overall adaptive capacity of the European regions in 2017. The overall adaptive capacity is an aggregate indicator composed of indicators from the ESPON Climate project (indicators include annual mean temperature, annual mean precipitation, change of inundation through river flooding etc.). The overall adaptive capacity is calculated as a weighted combination of economic capacity, infrastructural capacity, technological capacity, knowledge and awareness, and institutional capacity. The Scandinavian peninsula and countries in the core of Europe have a generally high adaptive capacity to climate change.



The rise in temperatures in the Alpine regions of Austria causes a retreat of glaciers, change in seasonal mean temperature and precipitation patterns, and a decline in snow cover, which requires adaptation and resilience measures. Urban agglomerations in Austria, such as Vienna and Graz, tend to have higher adaptive capacity to climate change.

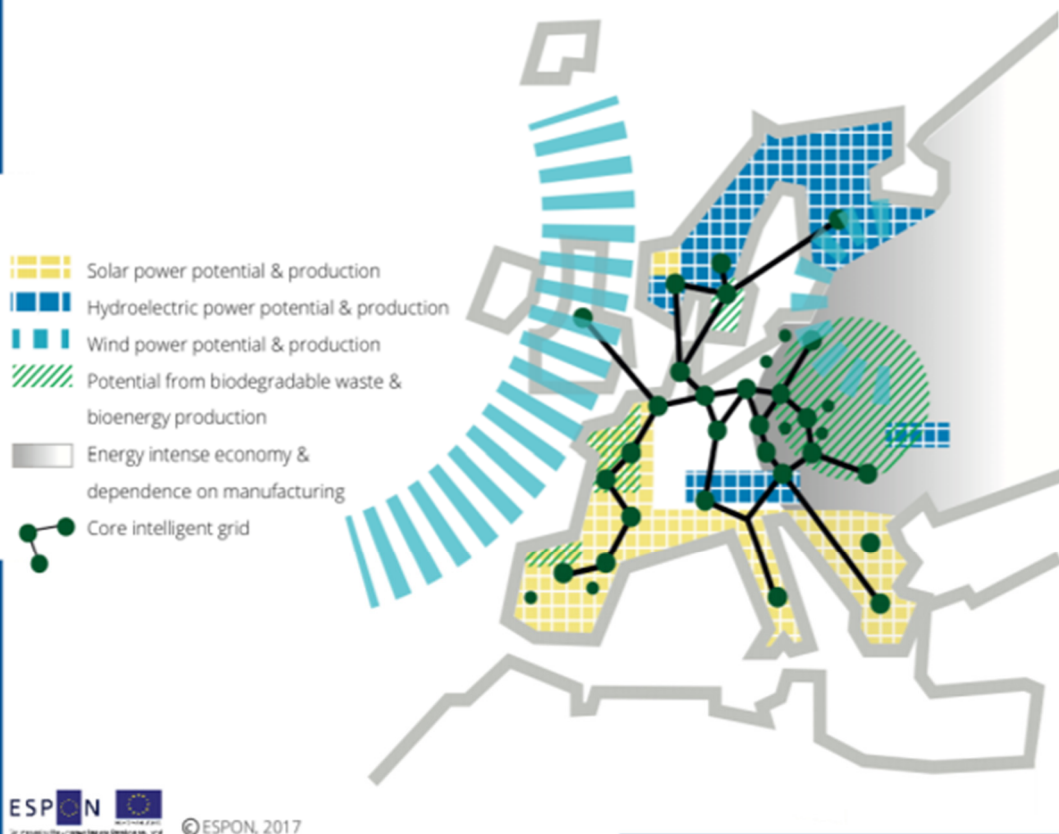
Eco-system services - drinking water



The concept of ecosystem services reflects on the benefits that humans gain from the natural environment in daily life. They are built on functioning ecosystems like forest, grassland, or aquatic ecosystems, and they are important in terms of drinking water or leisure supply. This map illustrates the drastic difference in the supply-and-demand-relations through the example of drinking water supply and demand in m³ per hectares. The drinking water supply and demand shows that drinking water supply is highest in the Alpine mountain range, while demand is highest in urbanized and metropolitan areas, located in the lowlands.

The discrepancy between supply and demand indicates that drinking water demand is linked to the settlement system, while the drinking water supply is linked to the morphological structure of the Alpine region, and therefore urban areas rely heavily on the supply of geographically more isolated areas. This characteristic is also recurrent in the Alpine regions of the neighbouring countries. The map also shows the pressure on natural resources, like drinking water from the metropolitan regions surrounding the Alpine region.

Renewable Energy: Integrated Place- & Network-based Territorial Foresight



Source: MCRIT, Spatial foresight
Possible European Territorial Futures (2017)

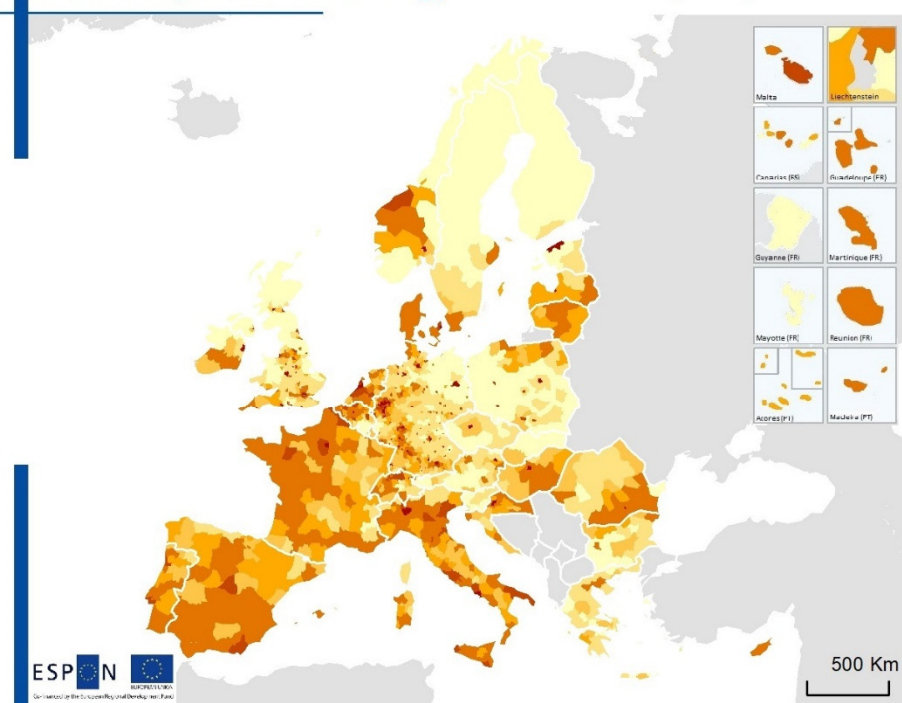


This foresight map illustrates the challenges and possible disparities resulting from a fully renewable energy system in an integrated place-based and network-based approach. Place-based refers to the increasingly important role of consumers, while network-based refers a hierarchical distribution system, with electricity flowing one way from generators to end consumers.

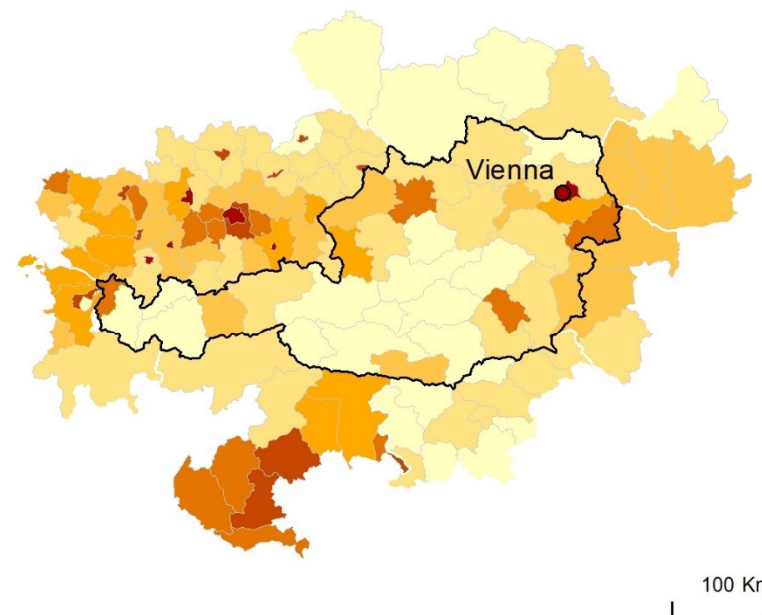
Wind power will be the focus of Europe's energy supply. Areas around North Sea have significant installed onshore and offshore wind power capacity. Solar power will become an important renewable energy source because of its high-power density and significant biophysical potential. Biofuels and biogas will mainly be present as transport fuels. France, Germany, Poland, Sweden, Finland, and Spain have high bioenergy potential. Hydroelectricity, in particular for pumped-storage hydropower will also continue to be important. The Alps and Scandinavia have significant hydropower generation and high potential.

Austria has, similarly to the Alpine region, high hydropower potential, a high bioenergy potential from forestry and a relatively high solar power potential.

Potential photovoltaic energy



Photovoltaic energy potential (MWh/km²)



Regional level: NUTS 2 & 3
 Source: ESPON Locate, Territorial Futures, 2017
 Origin of data: European Commission, JRC, EMHRES dataset part 1, wind power generation, 2016

This map shows the photovoltaic energy potential of European regions. The potential photovoltaic energy is higher in southern Europe than in northern Europe. Sweden, Finland, the UK, and Poland have the lowest photovoltaic energy potential with under 100-megawatt hour per km² in some regions. The highest potential is around the Mediterranean Sea, on the Iberian Peninsula and in the Balkans, with over 1600-megawatt hours per km².

Austria's photovoltaic energy potential is generally low, with the exception of metropolitan areas, such as Vienna, Linz, Graz and Feldkirch. The highest value for photovoltaic energy potential in Austria can be found in the lowlands, while the mountainous regions have a lower solar energy potential value.



Sustainable use of natural resources

Green Infrastructure

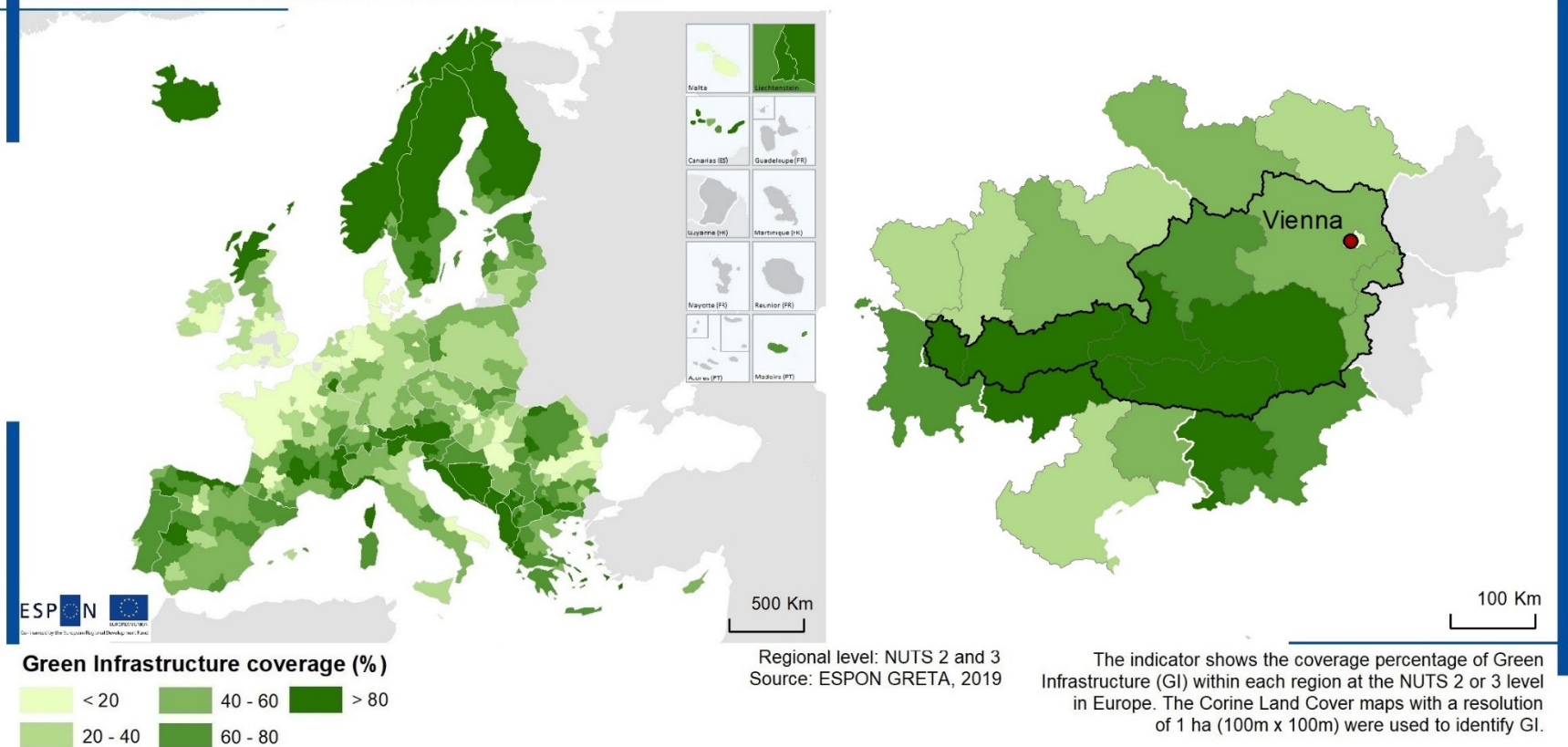
Protected areas


Land-use and artificial areas

Waste management and circular economy

The chapter “Sustainable use of natural resources” focuses on green infrastructure, protected areas, land-use and artificial areas, waste management, and circular economy as well as their contribution to a more sustainable Europe. However, ESPON evidence shows that not all regions have the same resources and opportunities for sustainable solutions. In this context, Austrian regions are well situated when it comes to sustainable use of natural resources. This chapter tells the story of the importance of natural resource management in all European regions.

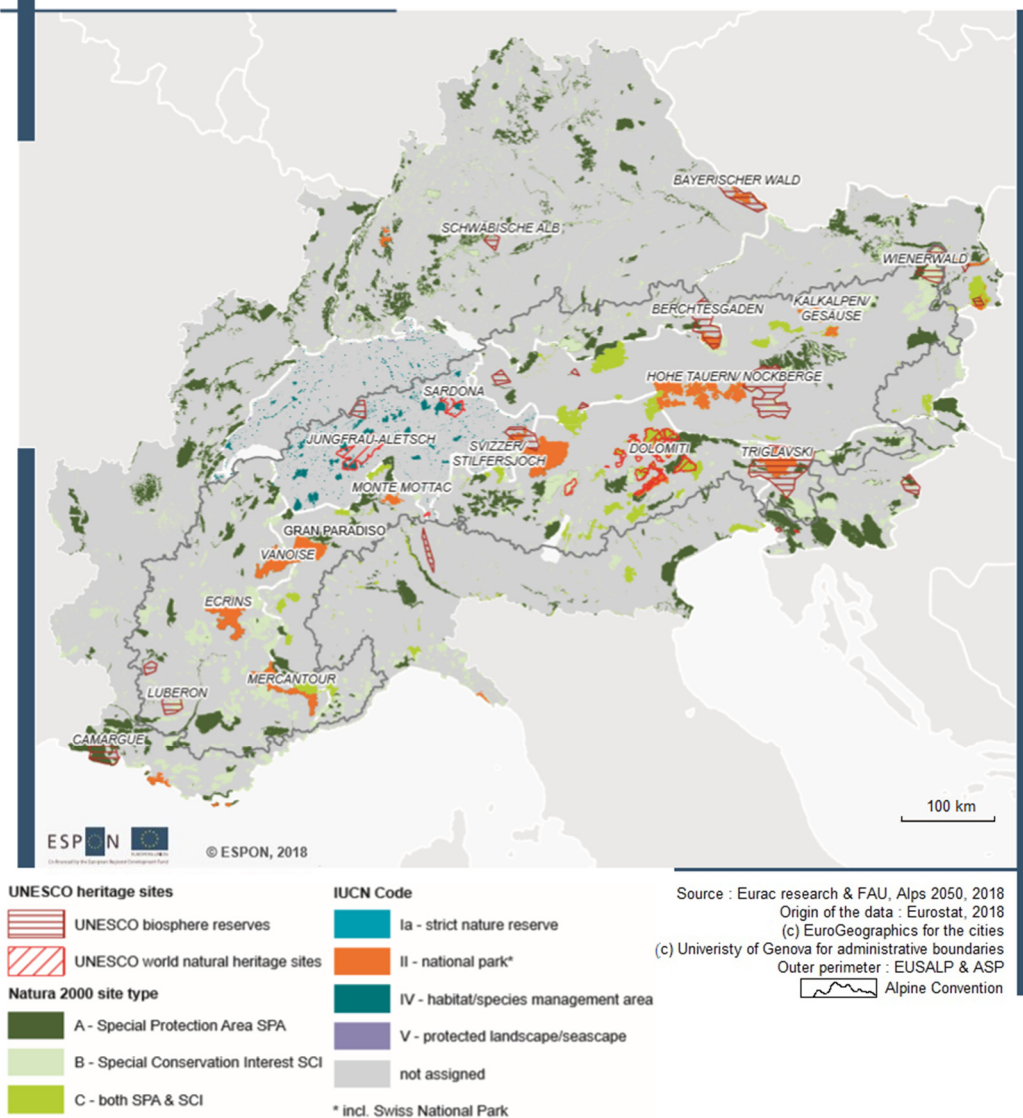
Spatial distribution of green infrastructure in 2012.



 Green infrastructure (GI) is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. This map visualises the differences in the spatial distribution of GI across European regions in 2012. Regions along the Northern Sea have relatively low GI coverage while it is high in Nordic countries, the Balkan countries along the Adriatic Sea, and in the eastern Alpine regions. Generally, regions in southern Europe had a high percentage of GI coverage in 2012.

 The majority of Austrian regions have a high coverage of green infrastructures and a stable level of green areas within cities. GI is also a valuable instrument to ensure ecological connectivity between regions. In the Austrian Alpine region, ecological connectivity, biodiversity and ecosystem services are priority areas. Ecosystem services such as tourism services (ski and winter sports) are especially important for Austria.

Protected areas

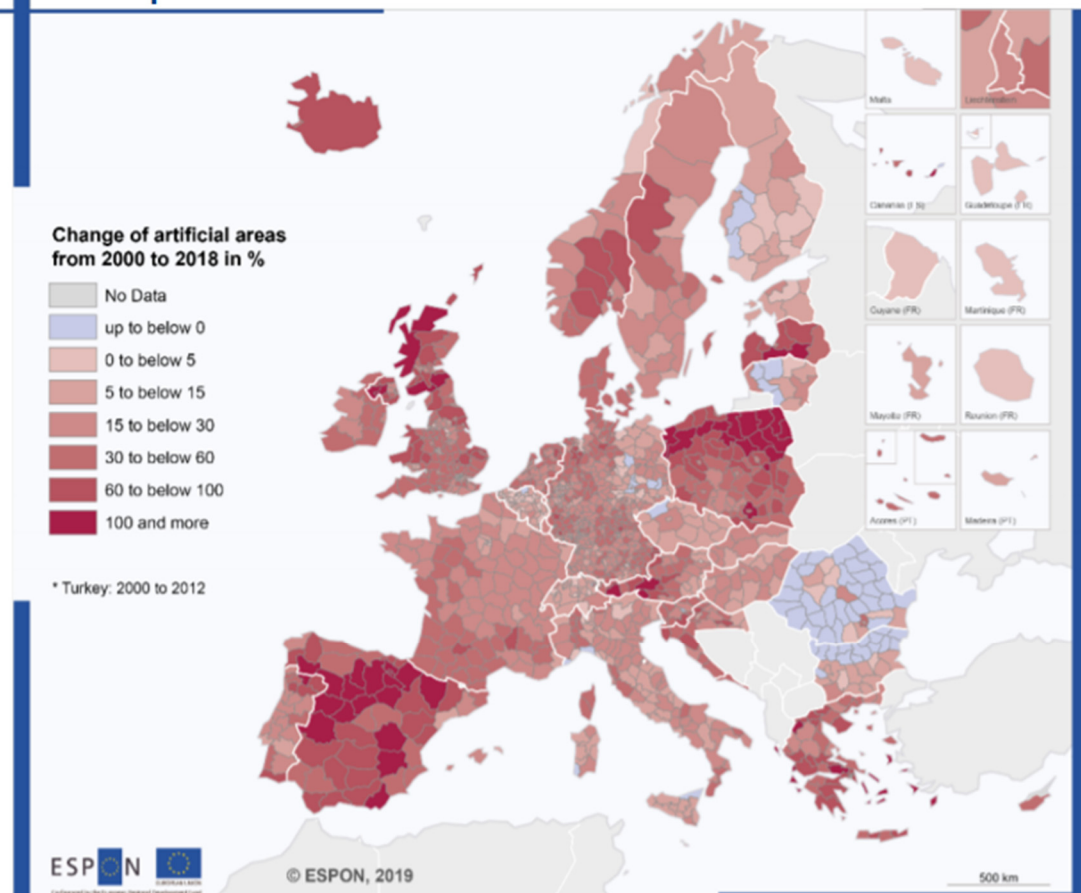


Protected areas in the Alpine regions are increasingly involved in the objectives of biological and cultural diversity. They are integrated into the regions' social and economic objectives and contribute to a balance between urban regions and protected areas. This map shows that in the Alps 2050 perimeter, different national protection regimes are in place, such as UNESCO biosphere reserves or world natural heritage sites, Natura 2000 site types and IUCN (International Union for conservation of nature) typologies, such as strict nature reserve, national park, habitat/species management area or protected landscape/seascape. National parks are much more frequent in Austria, France, and Italy, whereas Germany and Switzerland have fewer national parks in the Alps, and those that are present are mostly relatively small in size. The different implementation paths of the EU protection directives display very different average sizes and shares of protected areas within the different countries.



In Austria, the inner-Alpine areas are more likely to be object of protection measures, such as national parks, UNESCO world natural heritage sites or biosphere reserves.

Development of Artificial Areas



Regional level: NUTS 3
Source: ESPON SUPER, 2019
Origin of the data: Corine Landcover, 2019



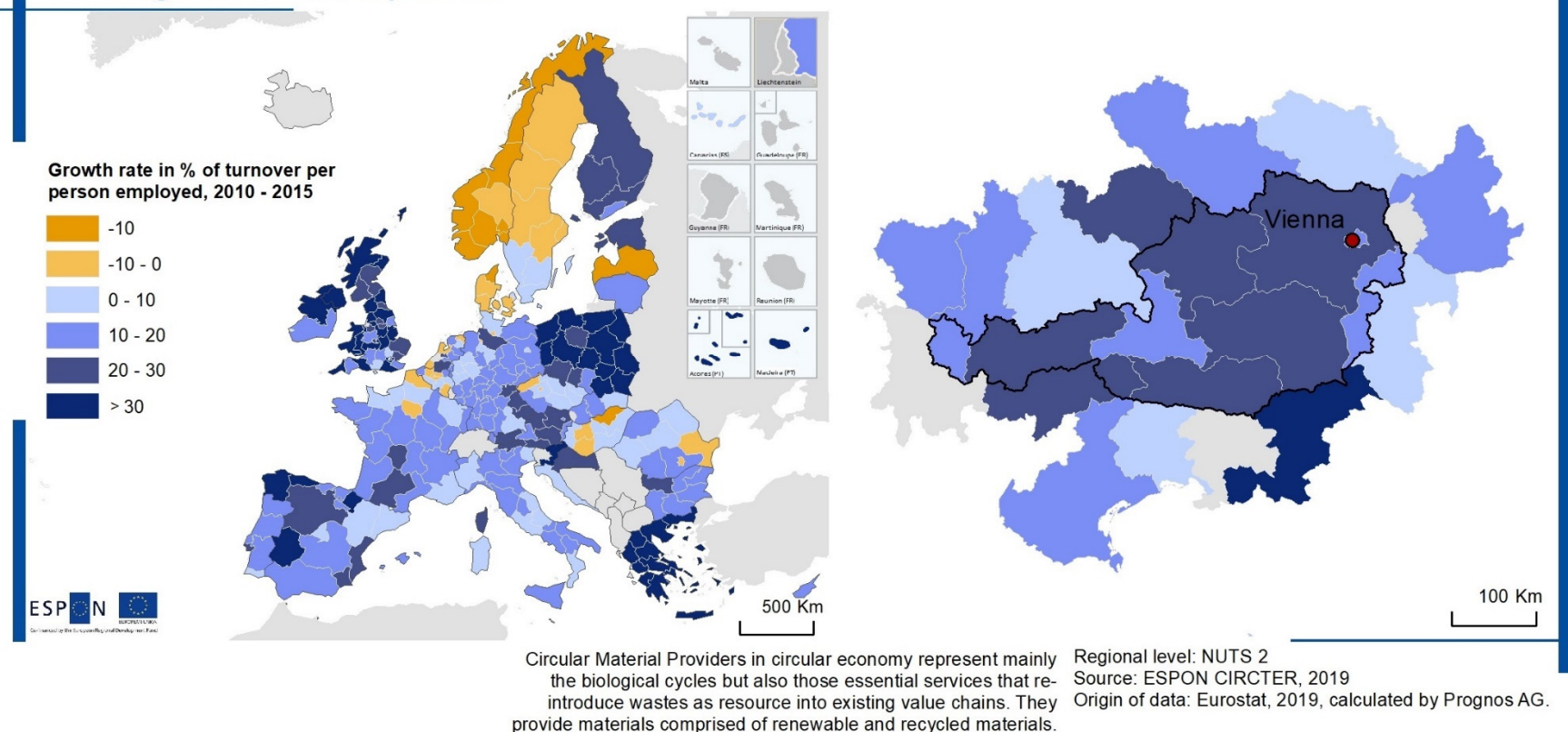
This map shows the change of artificial areas from 2000 to 2018 based on Corine Landcover data.

Artificial areas can refer to different types of artificial land use classes or clusters, such as urban fabric, industrial/commercial, infrastructure, urban green, construction and mineral extraction/dumpsites. The changing landscape of Europe allows us to observe the hotspots of urbanisation in Europe. Overall, approximately 1.263.000 ha were converted to urban use between 2000-2018 on European territory. On a European level, regions in Spain, Poland and the UK saw the biggest development in artificial land.



In Austria, urban green was the predominant new land cover type with a 48% change between 2000-2018. The highest percentage of change in artificial areas took place in the Tyrol and Salzburg regions, whose change in artificial areas in 2000-2018 is above average in both national and EU perspectives.

Turnover growth of material providers



This map shows the growth rate of turnover of material providers per person employed in 2010-2015. Specific indicators were developed and used for this map based on the ESPON CIRCTER project. Organic farming, sustainable forestry, and the provision of wood materials, waste collection, and recycling services are examples of the circular economy material providers sector. Circular economy providers make an important contribution to the economic structure of regions, with up to 13% of employment in some European areas. Sustainable agricultural and forestry activities have an important role, especially in rural areas. Thus, this map also shows the mechanisation, intensification and specialisation of forestry and

agriculture. Poland, Greece and regions in Spain have an above average turnover growth of material providers.



In general, Austria is well positioned compared to its neighbouring countries in the turnover growth of material providers. However, it might be losing pace compared to countries with a bigger growth rate in the circular economy field. In Austria, the percentage of turnover of material providers has increased by up to 20-30% in certain regions in a period of five years (2010-2015).



**For final inspiration:
Stimulating debates on territorial challenges at all levels**

Spatial Development Plans

Territorial vision 2050

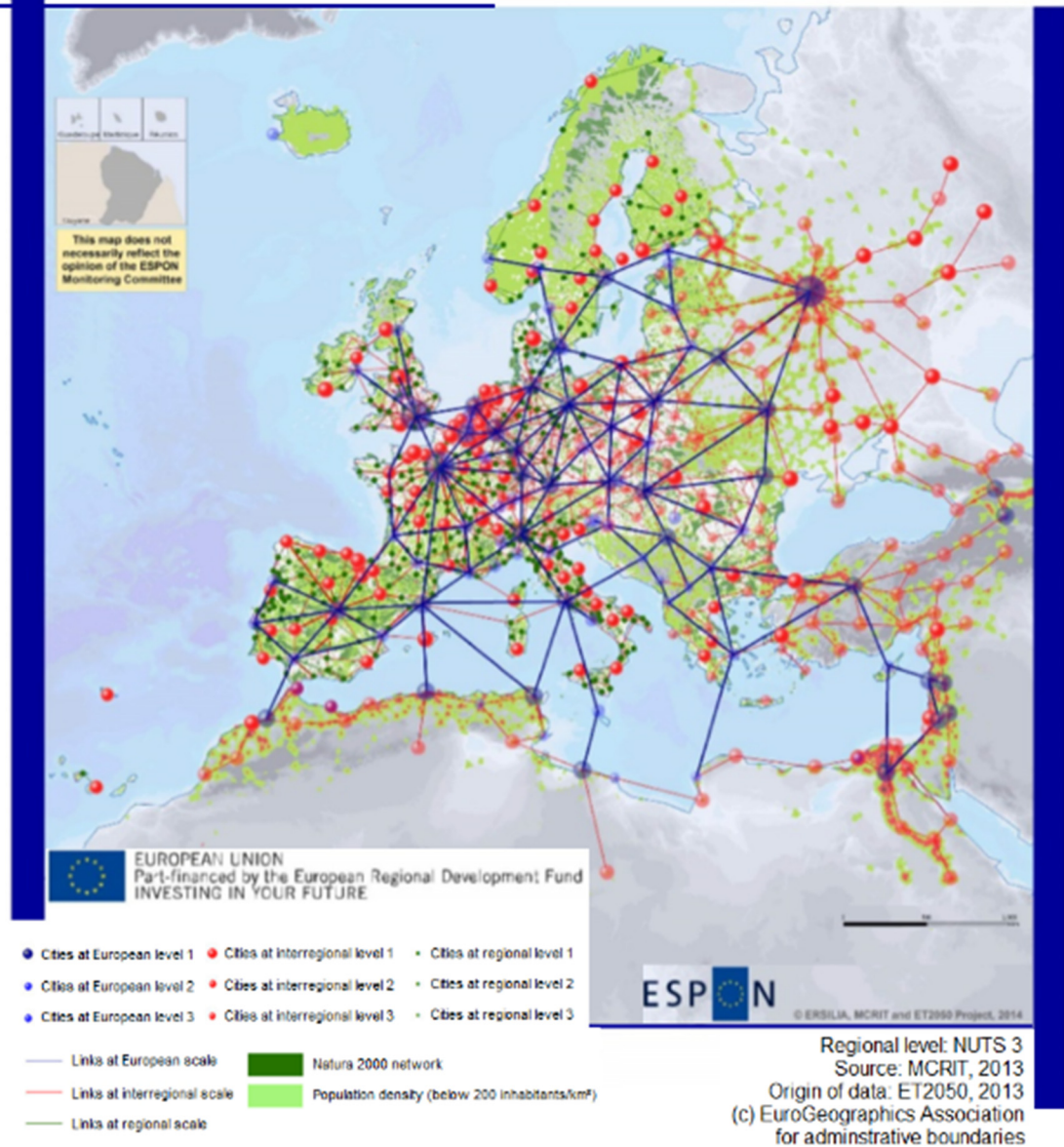
Macroregional and cross-border vision

This final chapter offers an inspiration for further debate on Austria's territorial challenges at all levels. The European, national, macroregional and cross-border perspectives provide an understanding of the territorial dynamics of Austrian regions within the context of Europe.

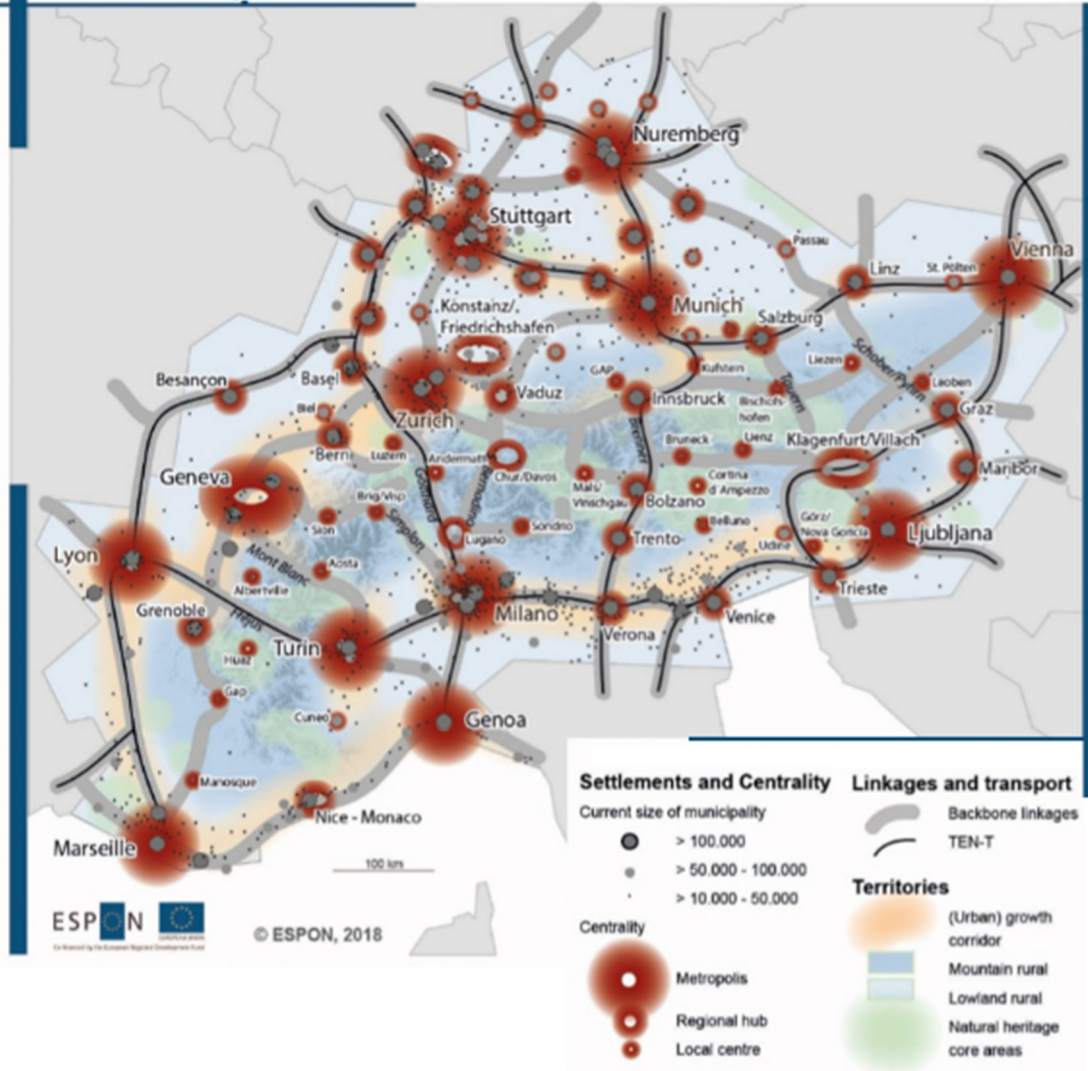
National and Regional Spatial Development Plans 2019



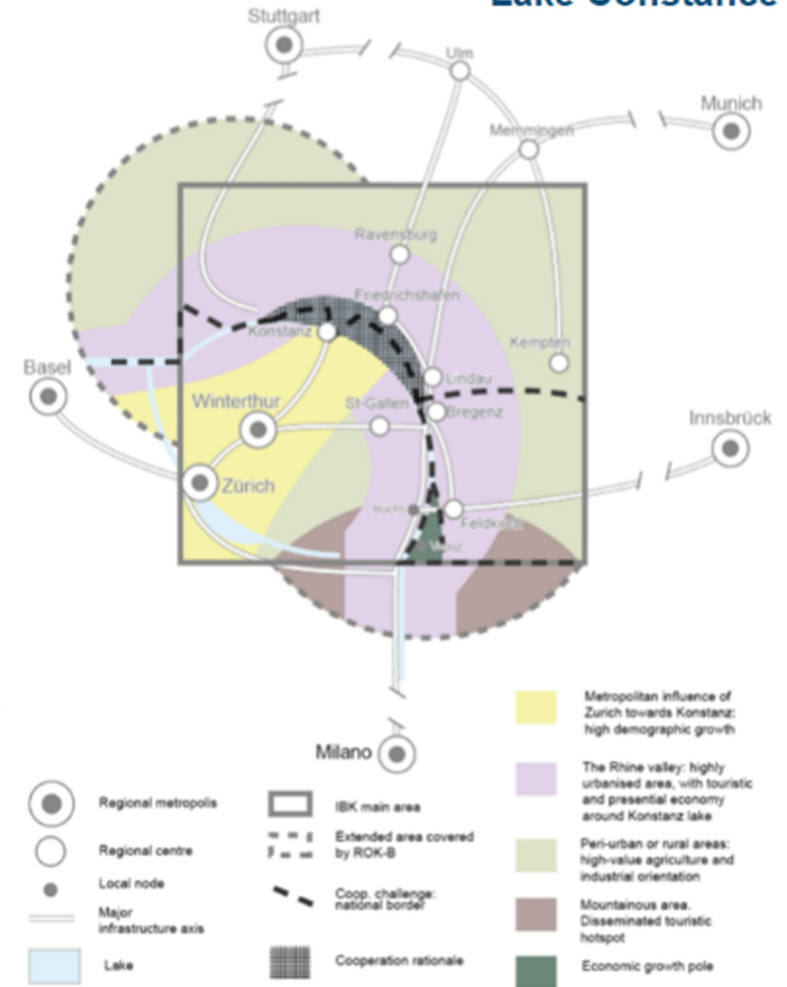
Territorial Vision 2050



Vision Alps 2050



Mapshot Spatial Development Commission Lake Constance



Source: ESPON ACTAREA (2017)

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Disclaimer:

The content of this publication does not necessarily reflect the opinion of the ESPON 2020 Monitoring Committee.

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