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## Proposal for a modernised ESPON Cartographic Design

Christine Zanin, Nicolas Lambert

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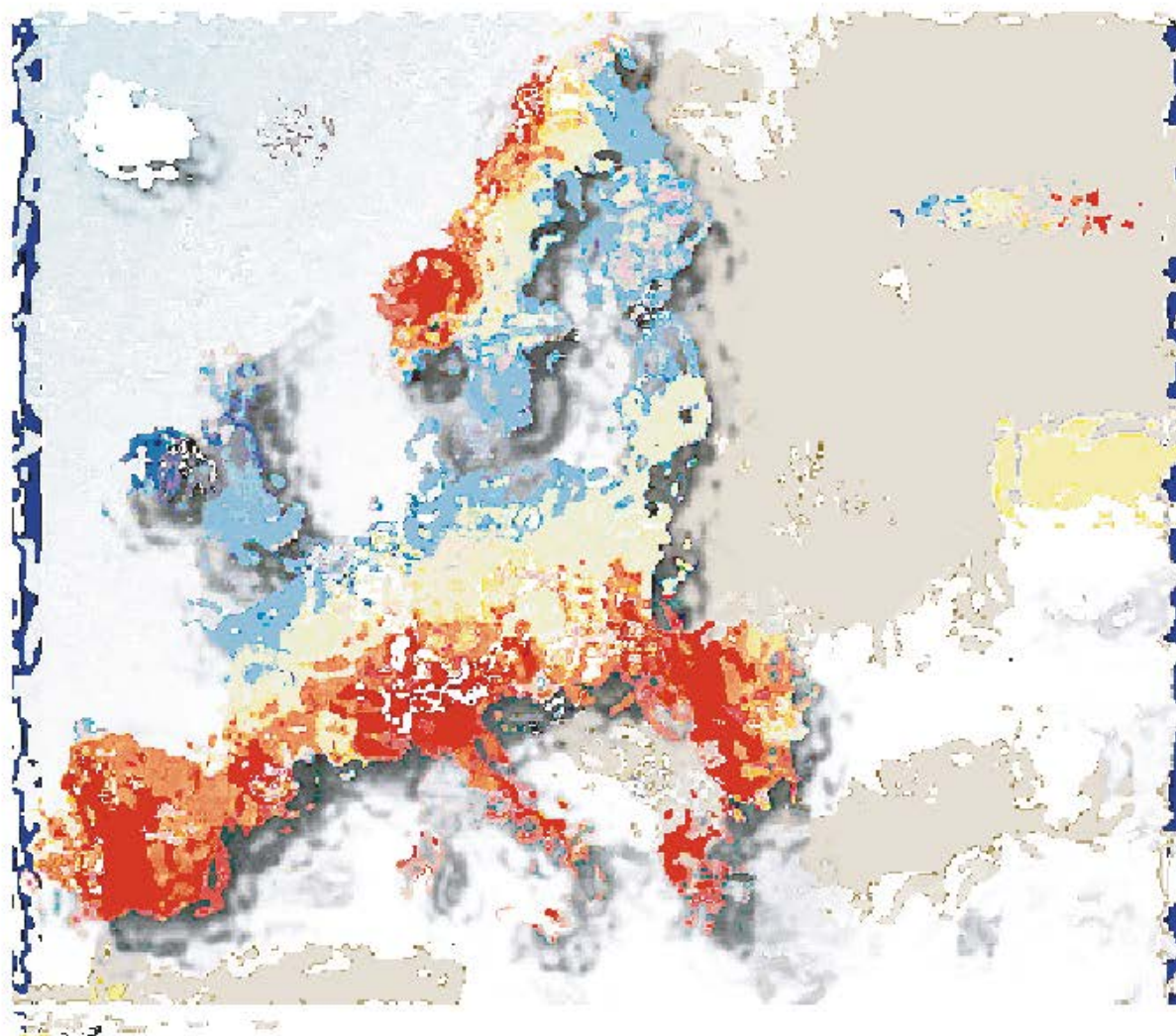
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Nicolas Lambert  
Christine Zanin



## Proposal for a modernised **ESPON CARTOGRAPHIC DESIGN**

Dec 2013



ADDITIONAL DELIVERY FOR THE  
ESPON CARTOGRAPHIC LANGUAGE PROJECT

*This report is task 6 of ESPON ECL Project. 2013*

# LIST OF AUTHORS

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A cartographic language is a graphic method, which uses properties of the visual image to show differences, order and proportionality between geographical data. It allows conveying more pragmatic spatial information from the map, and transmitting geospatial information in a more vividly and accurately way. The ESPON Mapping guide (Task 4) aims to:

- Demonstrate that a cartographic language can be a source of innovation, as long as semiotic rules are respected;
- Propose some keys elements to design and produce maps;
- Propose an approach focusing on the key points needed for the construction of maps. Thus, for each type of representation, the map maker or designer has to understand issues that underlay the map: explanations of the mapping type, the mapping process, the appropriate data, strengths and weaknesses of the method, some software that could be used, and a homemade map proposition.

**This following proposal is an additional task that complements the ESPON ECL Task 4 report.**

We propose to re-design 10 ESPON maps from the Second ESPON 2013 Synthesis Report, (1) on the basis of all the mapping guide recommendations and (2) respecting the ESPON corporate identity. This proposal is intended to mean a reflection on a compromise between scientific and political issues.

This work focus on three main aspects:

- Aesthetical considerations (colors, symbol style, graphic effects, etc.);
- Layout and map staging (legend, titles, etc.);
- Enhancing statistical and geographical information.

Even if those aspects might be incompatible among themselves and since already stated a map kit too prescriptive is a hindrance to creativity and innovation, this Deliverable 6 aims to provide a constructive consensus to meet and as much as possible the political demand without sacrificing principles underpinning scientific mapping.

Each represented map systematically depicts all ESPON member states (including remote territories). The northern part of the Cyprus Island will be represented in white with the label « no data available »; the blue stripes on both sides of the map will be maintained. However, to enhance the efficiency of the cartographic message, a generalised based map is used. As much as possible, the legend is displayed within the map. Some graphical tricks are used to enhance spatial structures.

**MAPS ISSUED FROM THE Second ESPON 2013 Synthesis Report**  
*Territorial insight: Where to focus what types of investments*

Map 01: Territorial patterns of innovation (p21)

Map 02: E-commerce, 2010 (p26)

Map 05: Greenhouse gas emissions in 2010 (p38)

Map 06: On-shore wind energy costs (p40)

Map 07: Land change hotspots, 1990-2006 (p44)

Map 09: Regions affected by directive on air quality (p51)

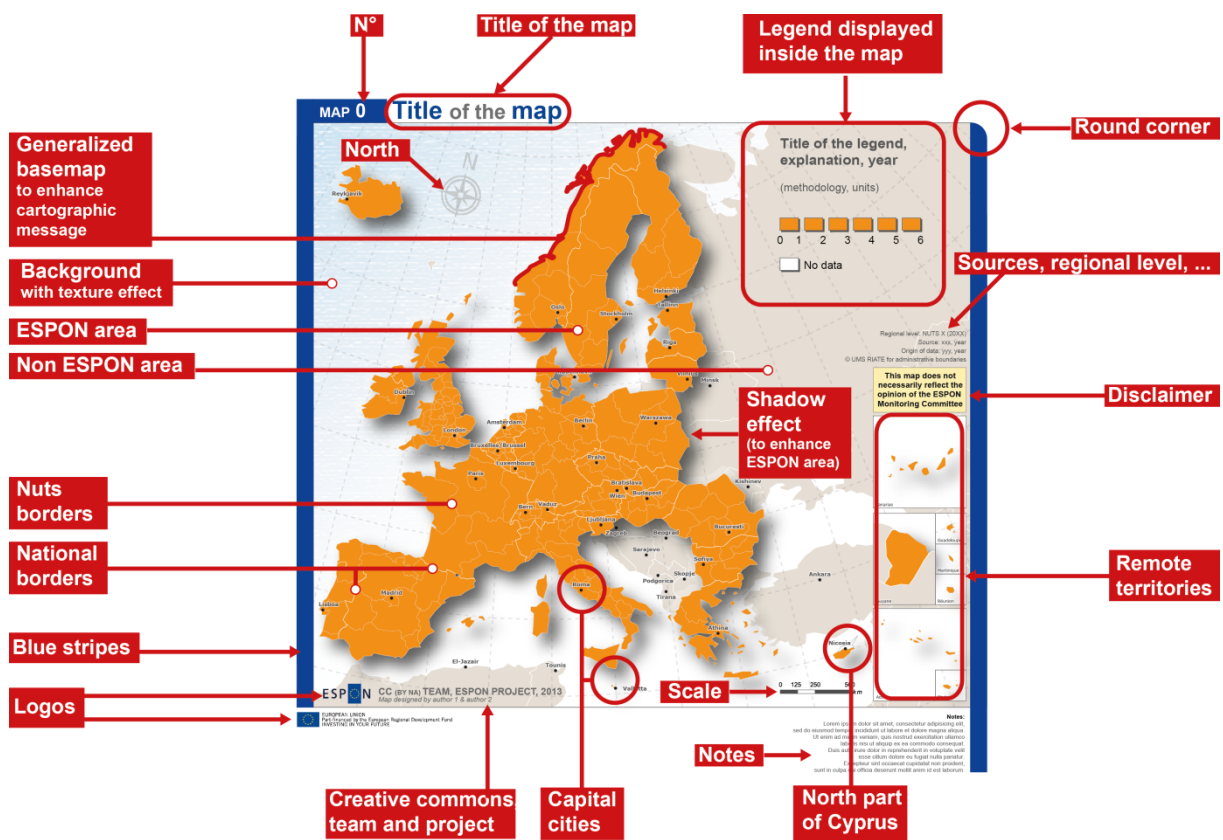
Map 14: Old age dependency rate, 2011 (p66)

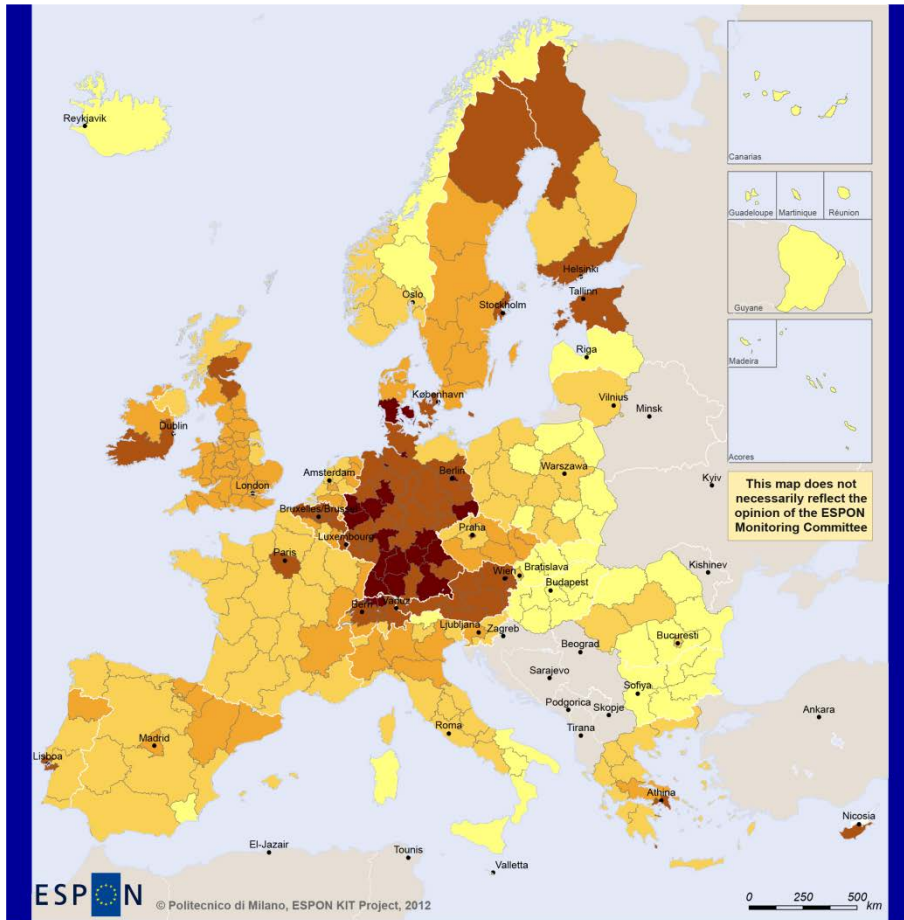
Map 15: Number of women per 100 coeval men, 2008 (p68)

Map 21: Interreg C III and IV partners (p85)

Map 22: Interreg C III and IV lead partners (p86)

# Proposal for a modernised ESPON cartographic template





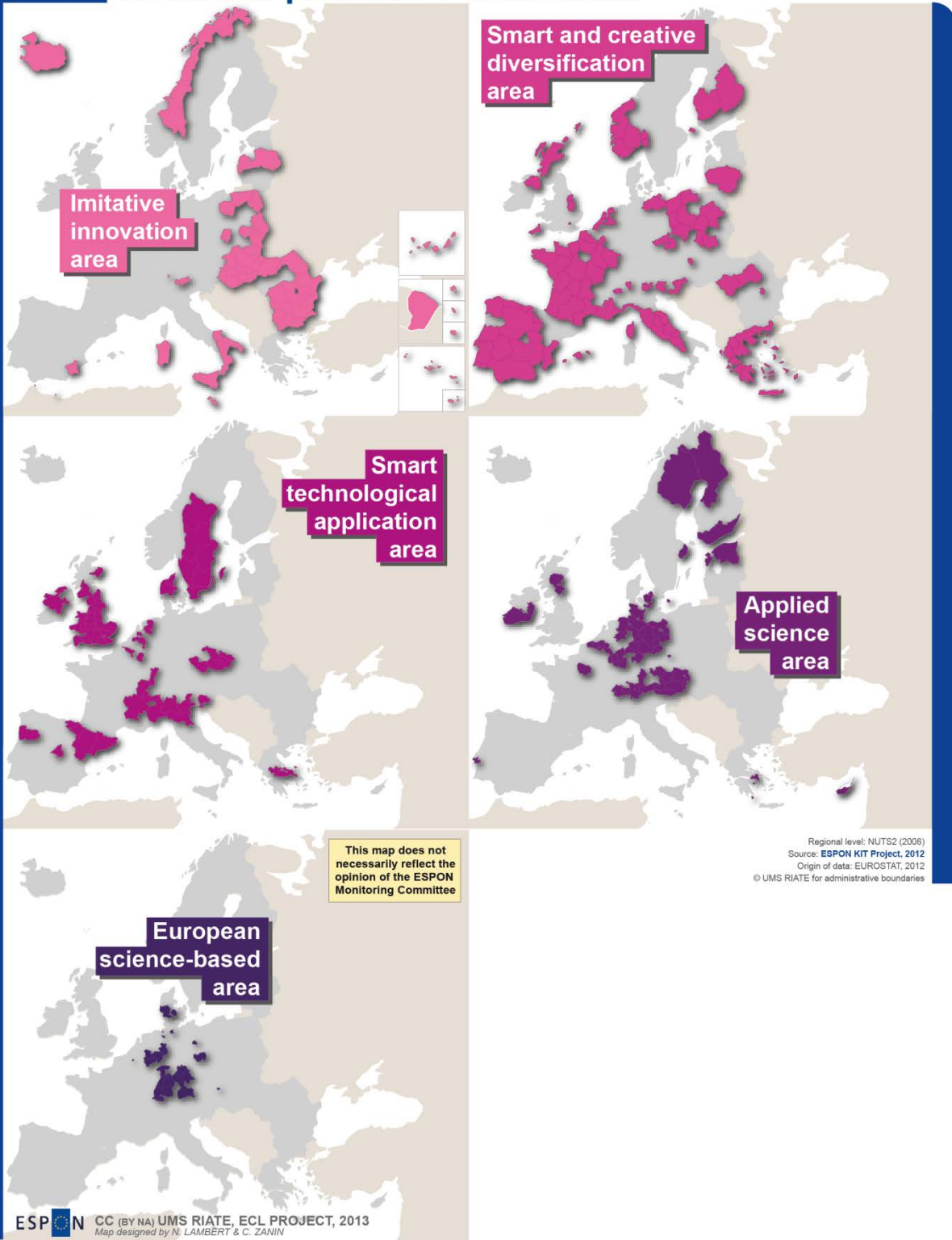

 EUROPEAN UNION  
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Regional level: NUTS2  
 Source: ESPON KIT Project, 2012  
 Origin of data: EUROSTAT, 2012  
 © EuroGeographics Association for administrative boundaries

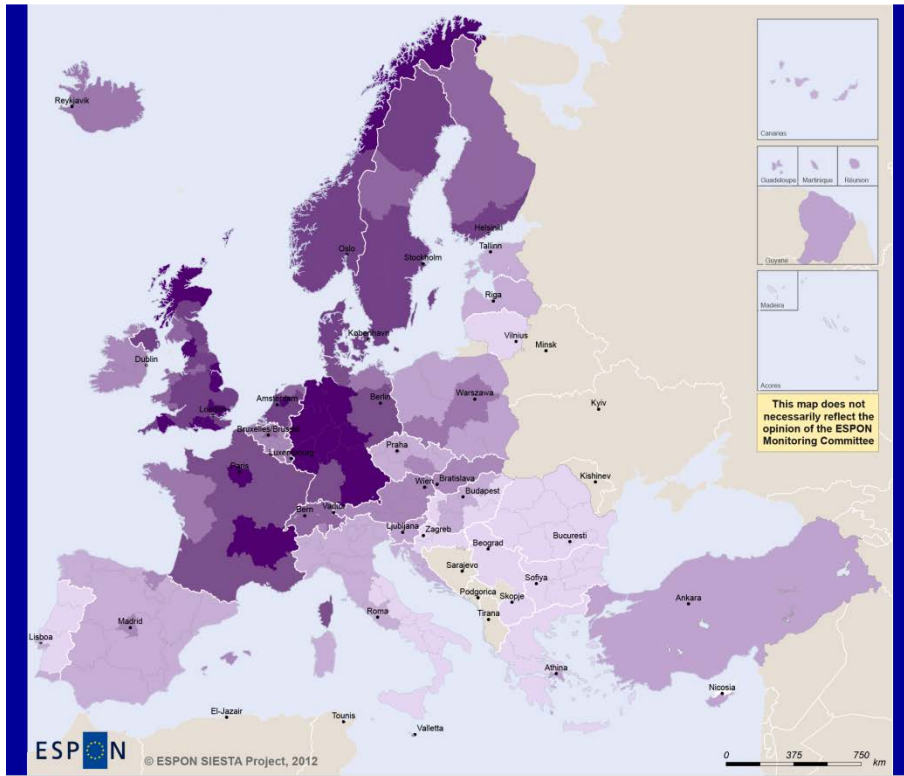
**Types of innovation regions**

-  Imitative innovation area
-  Smart and creative diversification area
-  Smart technological application area
-  Applied science area
-  European science-based area
-  No data

**MAP 1 Territorial patterns of innovation**





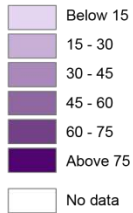


ESPON  
 © ESPON SIESTA Project, 2012

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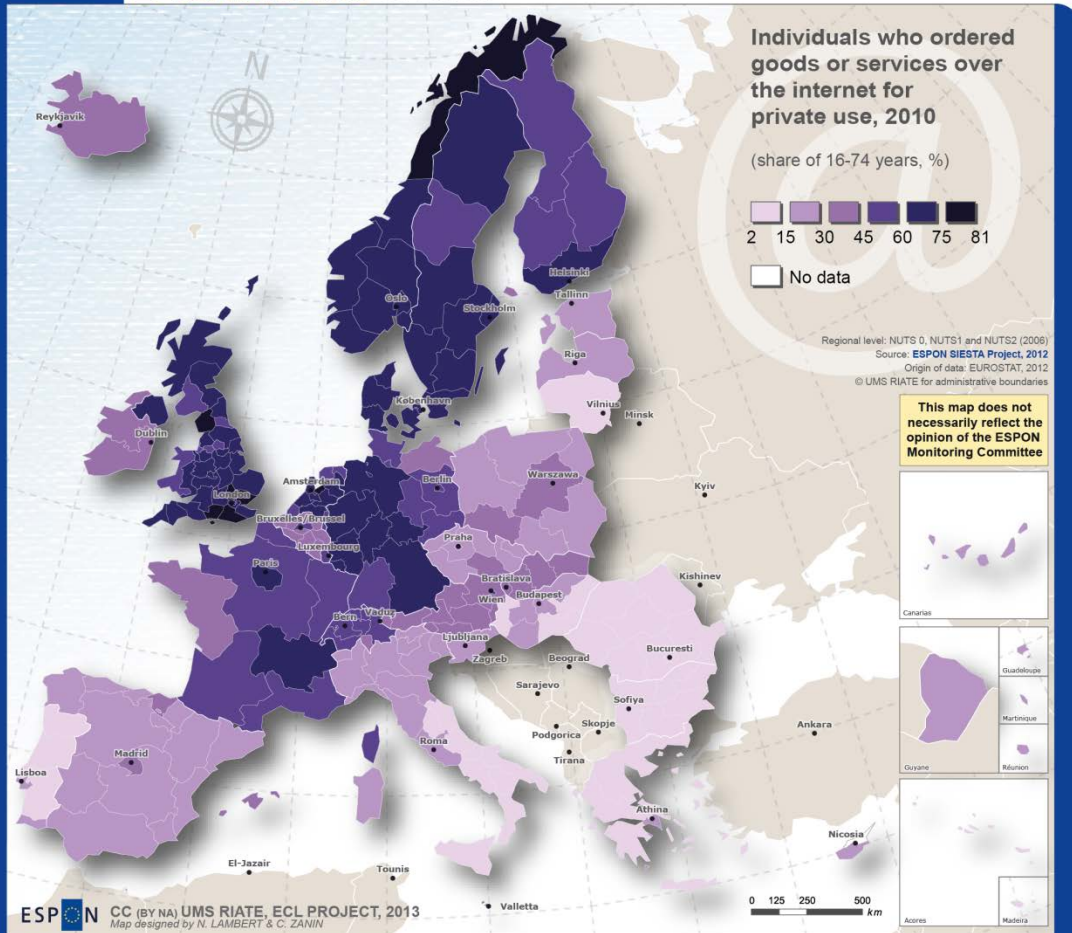
Regional level: NUTS0, NUTS1 and NUTS2  
 Source: ESPON SIESTA Project, 2012  
 Origin of data: EUROSTAT, 2012  
 © EuroGeographics Association for administrative boundaries

**Individuals who ordered goods or services over the internet for private use, 2010 (share of 16-74 years, %)**



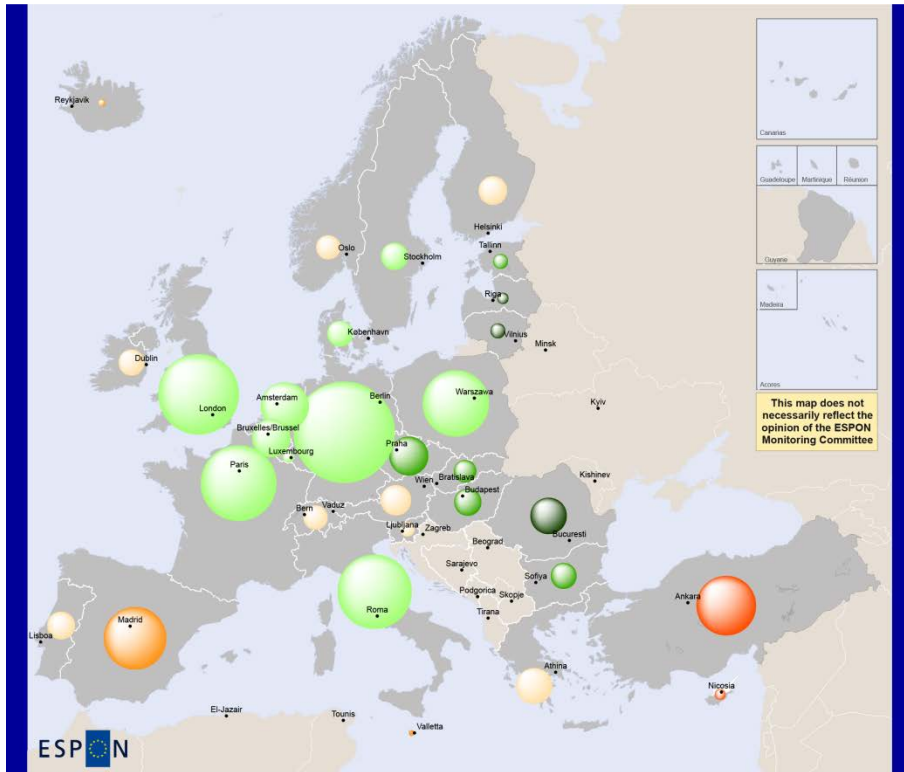
Notes:  
 DE, FR, EL, RS and PL are shown at NUTS1 level.  
 TR is shown at country level and data for this country were provided by Turkstat.  
 Data for CH was provided by Swiss Statistics web site:  
<http://www.bfs.admin.ch/bfs/portal/en/index.html>  
 Data for BH11, BG12, BG13, BG21, BG22, BG23 and FI2 are not available for 2010.  
 These regions are shown for 2007.  
 TR data corresponds to 2011.  
 UKE1 data are not available for 2010 and are shown for 2009.

**MAP 2 E-commerce in 2010**



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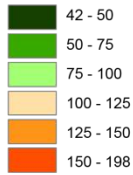
**Notes:**  
DE, FR, EL, RS and PL are shown at NUTS1 level.  
TR is shown at country level and data for this country were provided by Turkstat.  
Data for CH was provided by Swiss Statistics web site: <http://www.bfs.admin.ch/bfs/portal/en/index.html>  
Data for BH11, BG12, BG13, BG21, BG22, BG23 and FI2 are not available for 2010. This regions are shown for 2007.  
TR data corresponds to 2011.  
UKE1 data are not available for 2010 and are shown for 2009.



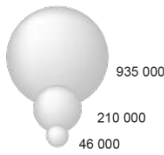
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Regional level: NUTSO  
Source: EEA  
Origin of data: EEA, 2013  
© EuroGeographics Association for administrative boundaries

**Variation of GHG emissions  
1990-2010 (index 1990 = 100)**



**Greenhouse gas emissions, 2010  
in thousands tons of CO<sup>2</sup> equivalent**



Notes:  
The aggregated greenhouse gas emissions are expressed in units of CO<sub>2</sub> equivalents. 2009 for TR.

The indicator does not include emissions and removals related to land use, land use change and forestry (LULUCF); it does not include emissions from international aviation and international maritime transport. CO<sub>2</sub> emissions from biomass with energy recovery are reported as a Memorandum Item according to UNFCCC Guidelines and not included in national GHG totals.

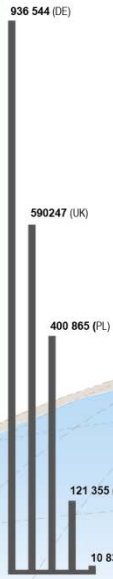
The EU as a whole is committed to achieving at least a 20% reduction of its greenhouse gas emissions by 2020 compared to 1990. This objective implies:

- Reduction of 21% in emissions from sectors covered by the EU ETS (emissions trading scheme) compared to 2005 by 2020;
- Reduction of 10% in emissions for sectors outside the EU ETS.

To achieve this 10% overall target each Member State has agreed country-specific greenhouse gas emissions limits for 2020 compared to 2005 (Council Decision 2009/406/EC).

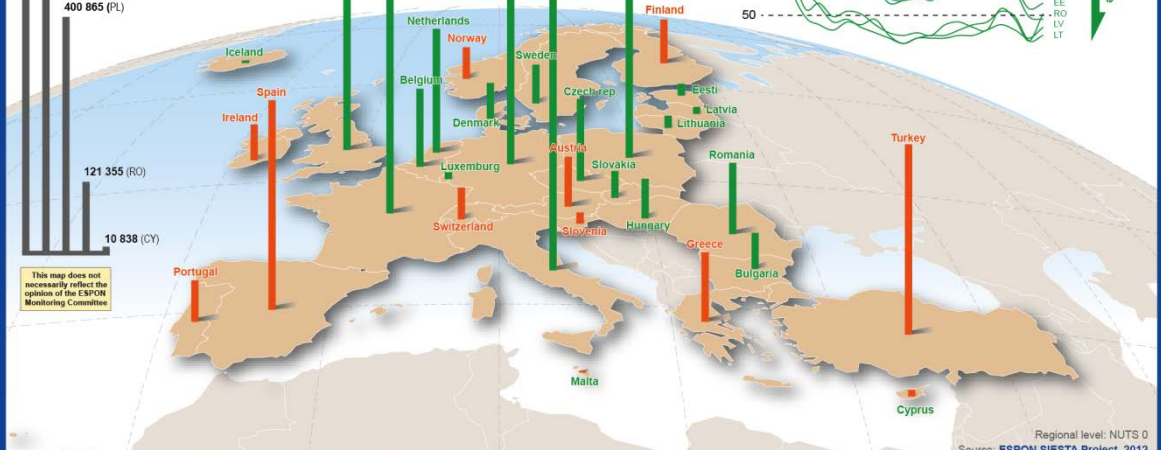
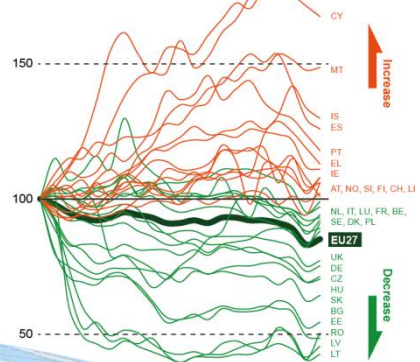
# MAP 5 Greenhouse gas emissions

## Emissions in 2010 (in thousands tons of CO<sub>2</sub> equivalent)



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

## Variation of emissions 1990-2010 (index 1990 = 100)



ESPON CC (BY NA) UMS RIATE, ECL PROJECT, 2013  
Map designed by N. LAMBERT & C. ZANIN

Regional level: NUTS 0  
Source: ESPON SIESTA Project, 2012  
Origin of data: EEA, 2013  
© UMS RIATE for administrative boundaries

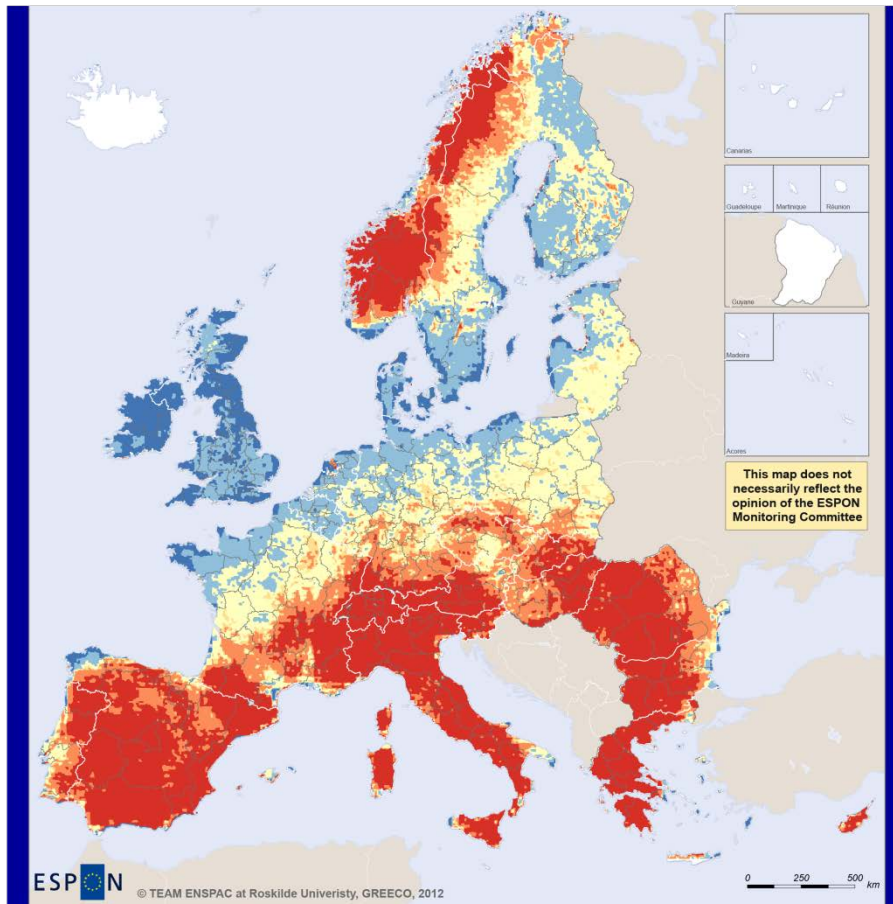
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### Notes:

The aggregated greenhouse gas emissions are expressed in units of CO<sub>2</sub> equivalents: 2009 for TR. The indicator does not include emissions and removals related to and use, land use change and forestry (LULUCF); it does not include emissions from international aviation and international maritime transport. CO<sub>2</sub> emissions from biomass with energy recovery are reported as a Memorandum item according to UNFCCC Guidelines and not included in national GHG totals. The EU as a whole is committed to achieving at least a 20% reduction of its greenhouse gas emissions by 2020 compared to 1990. This objective implies:

- Reduction of 21% in emissions from sectors covered by the EU ETS (emissions trading scheme) compared to 2005 by 2020;
- Reduction of 10% in emissions for sectors outside the EU ETS.

To achieve this 10% overall target each Member State has agreed



ESPON  
© TEAM ENSPAC at Roskilde University, GREECO, 2012

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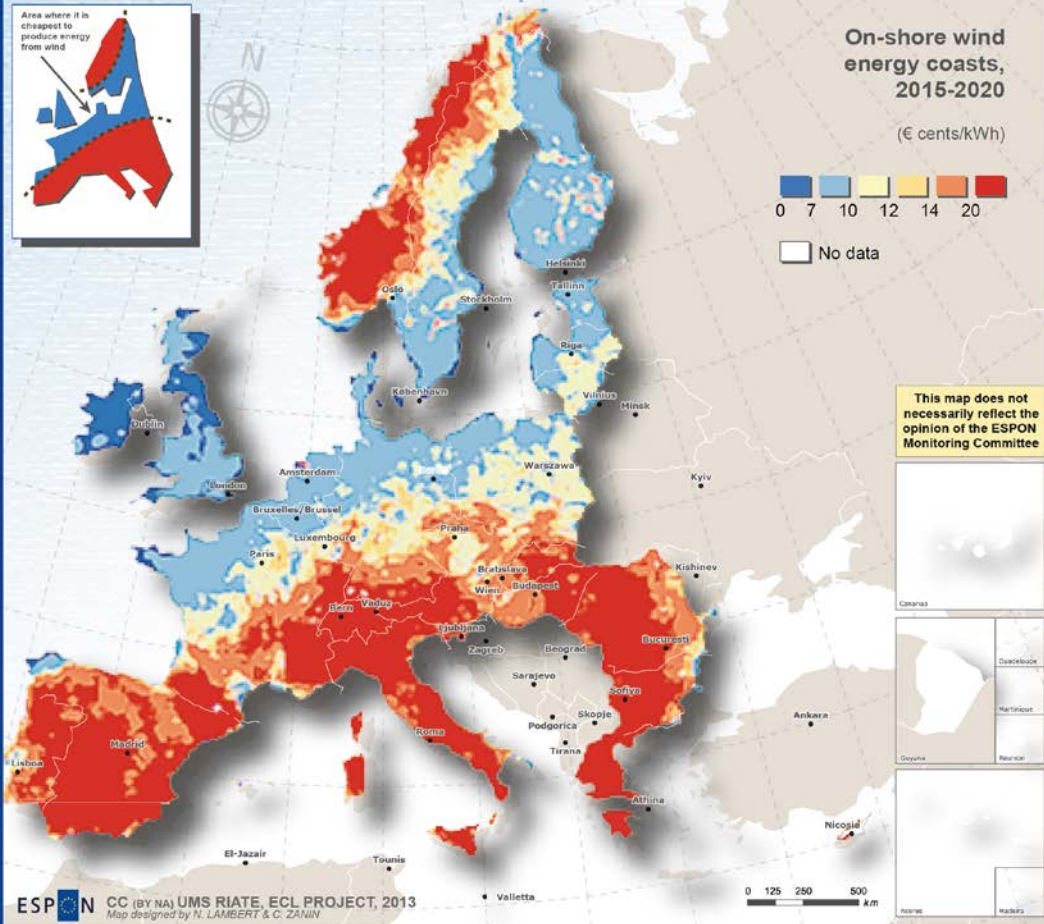
Regional level: Grid  
Source: ESPON Database, ESPON GREECO Project, Roskilde University, 2013  
Origin of data: European Environmental Agency, 2009 and International Energy Agency, 2012  
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**On-shore wind energy costs, 2015-2020**  
(€ cents/kWh)

- 0 - 7
- 7 - 10
- 10 - 12
- 12 - 14
- 14 - 20
- Above 20
- No data

Notes:  
The map presents the levelised cost of electricity generated by onshore wind turbines of the most efficient type expected to be installed in the period 2015-2020 (3.5MW wind turbines).  
The wind data are collected from European wind speed measurement stations used in an assessment of the European wind power potential by the European Environmental Agency (2009) and adjusted to the wind energy potential expected at 100 m above ground depending on land cover class and landscape roughness. The cost data are from the International Energy Agency (2012).  
The levels of remuneration in the form of feed-in tariffs and other financial arrangements differ widely by country but 8 and 10 c/kWh could be useful reference levels for the 2015-2020 period

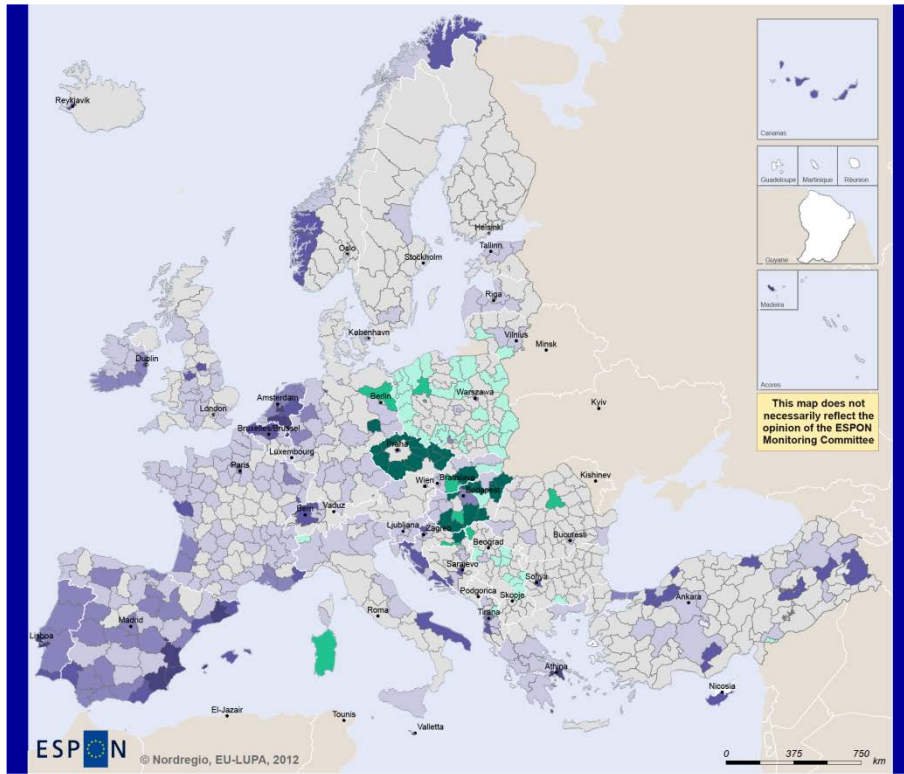
# MAP 6 Wind power



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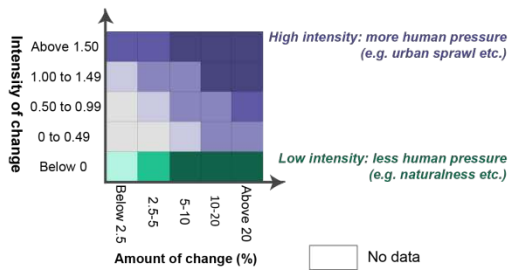
Geographical level: Grid  
Source: ESPON Database, ESPON GREECO Project, Hochschule University, 2013  
Origin of data: European Environmental Agency, 2009 and International Energy Agency, 2012  
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**Notes:**  
The map presents the levelised cost of electricity generated by on-shore wind turbines of the most efficient type expected to be installed in the period 2015-2020 (3.5MW wind turbines).  
The wind data are collected from European wind speed measurement stations used in an assessment of the European wind power potential by the European Environmental Agency (2009) and adjusted to the wind energy potential expected at 100 m above ground depending on land cover class and landscape roughness. The cost data are from the International Energy Agency (2012).  
The levels of remuneration in the form of feed-in tariffs and other financial arrangements differ widely by country but 9 and 10 c/kWh could be useful reference levels for the 2015-2020 period.



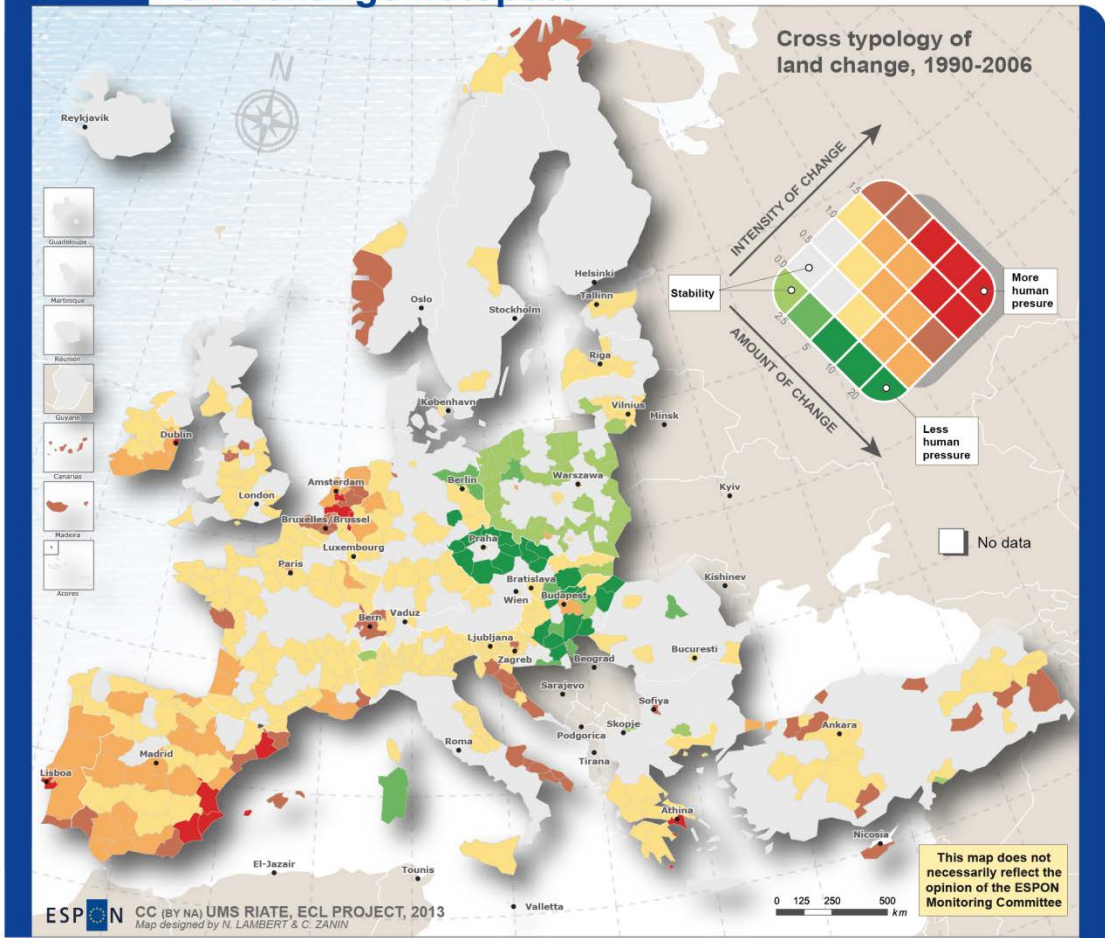
ESPON  
 © Nordregio, EU-LUPA, 2012  
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 Regional level: NUTS2/3  
 Source: Nordregio, 2012  
 Origin of data: ESA, 2011  
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**Land change hotspots 1990-2006**



Notes:  
 Reference period: 1990-2006  
 except EL (1990-2000), AL, BA, CH, FI, IS, MK, NO, SE, TR (2000-2006)  
 The x-axis shows the amount of land that has underwent change during the given years (in percent) while the y-axis indicates the change in intensity that resulted from those changes. Therefore, regions in grey represent those with relatively stable land cover characteristics. Increasingly darker shades of green or purple identify "hotspots" of change where high intensifications or extensifications are coupled with increasing levels of overall land change are evident.

# MAP 7 Land change hotspots

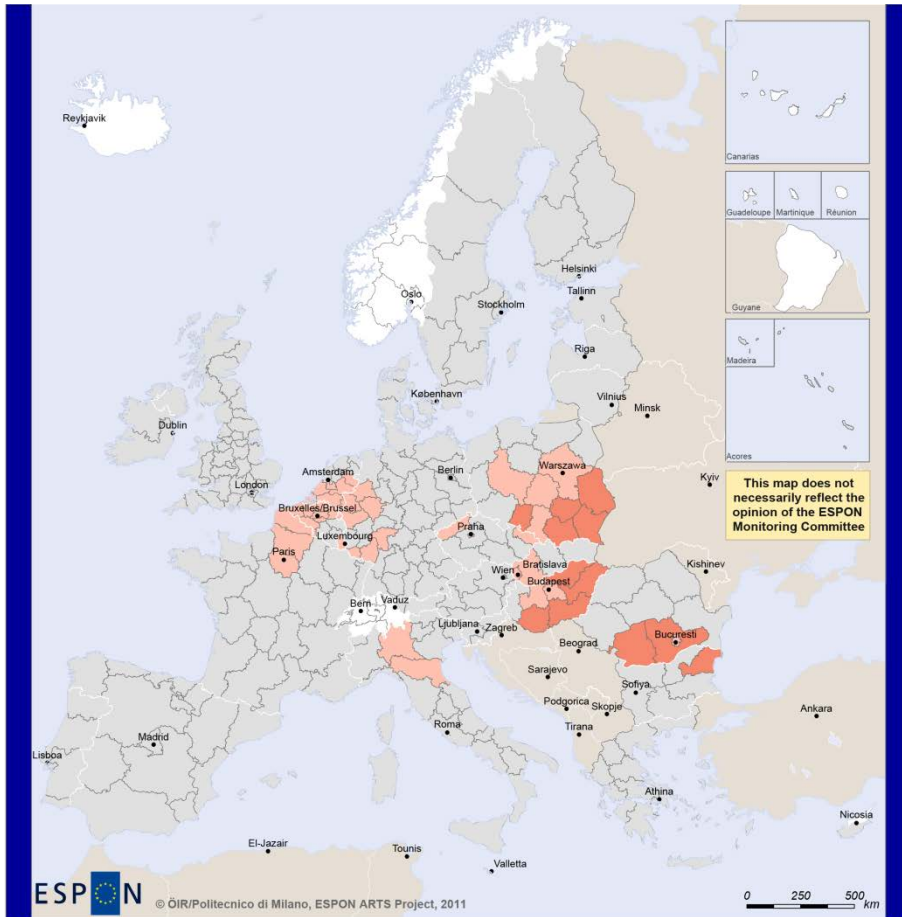


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 Map designed by N. LAMBERT & C. ZANINI

Regional level: NUTS 2/3  
 Source: Nordregio, EU-LUPA, 2012  
 Origin of data: EEA, 2011  
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**Notes:**  
 Reference period: 1990-2006 except EL (1990-2000), AL, BA, CH, FI, IS, MK, NO, SE, TR (2000-2006)  
 The x-axis shows the amount of land that has undergone change during the given years (in percent) while the y-axis indicates the change in intensity that resulted from those changes. Therefore, regions in grey represent those with relatively stable land cover characteristics. Increasingly darker shades of green or purple identify "hotspots" of change where high intensifications or extensifications are coupled with increasing levels of overall land change are evident.





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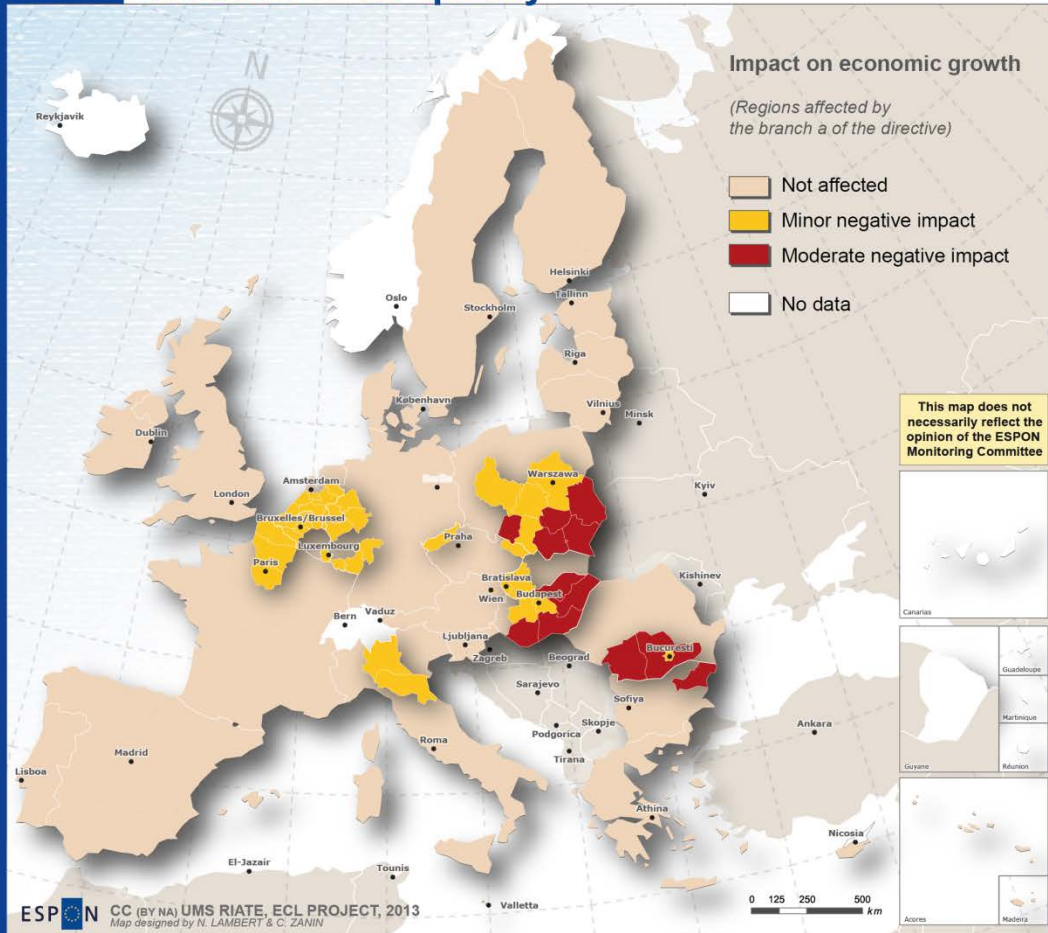
Regional level: NUTS2  
Source: ESPON ARTS Project, 2012  
Origin of data: ESPON Database, EUROSTAT, EEA (Corine Land Cover), 5th Cohesion Report, BOKU University, DG AGRI  
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**Regions affected by Directive on air quality  
branch a (negative impact on economic growth)**

- Not affected
- Minor impact
- Moderate impact
- No data

Note:  
With regard to branch a, the assumption is that the measures are successful in reducing traffic in non-compliance areas, and hence in reducing emissions of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. Indirect effects are perceptible in the environment due to less contamination of soil and water and a reduction of acid rain (which also harms historical buildings, and hence cultural heritage, and natural habitats of species and agricultural crops). Traffic reduction measures are also seen as potentially improving urban quality of life, human health, and hence, indirectly, promote economic growth. It could also reduce economic activity in the same urban areas. This could either harm growth or just shift it to more sustainable modes, which may actually have a positive effect on the economy. The measures are expected to increase the complexity of spatial projects in urban areas, which could also negatively impact economic growth.

## MAP 9 Directive on air quality

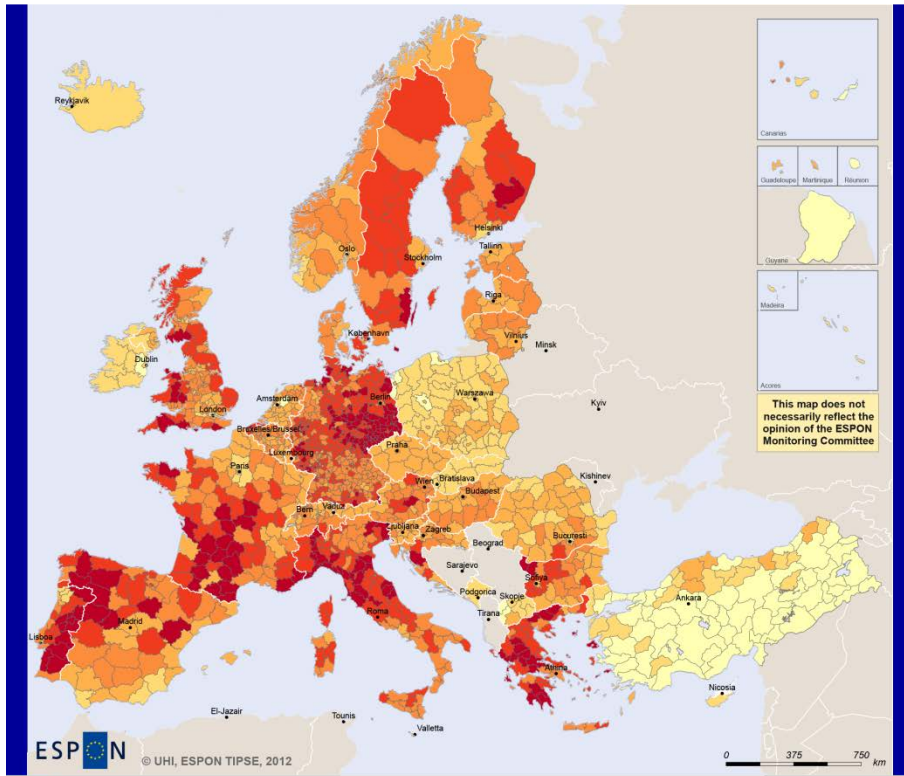


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Regional level: NUTS2  
Source: ESPON ARTS Project, 2012  
Origin of data: ESPON Database, EUROSTAT, EEA (Corine Land Cover), 5th Cohesion Report, BOKU University, DG AGRI  
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**Notes:**

With regard to branch a, the assumption is that the measures are successful in reducing traffic in non-compliance areas, and hence in reducing emissions of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. Indirect effects are perceptible in the environment due to less contamination of soil and water and a reduction of acid rain (which also harms historical buildings, and hence cultural heritage, and natural habitats of species and agricultural crops). Traffic reduction measures are also seen as potentially improving urban quality of life, human health, and hence, indirectly, promote economic growth. It could also reduce economic activity in the same urban areas. This could either harm growth or just shift it to more sustainable modes, which may actually have a positive effect on the economy. The measures are expected to increase the complexity of spatial projects in urban areas, which could also negatively impact economic growth.

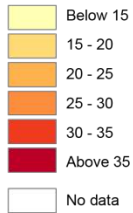


ESPON  
 © UHI, ESPON TIPSE, 2012

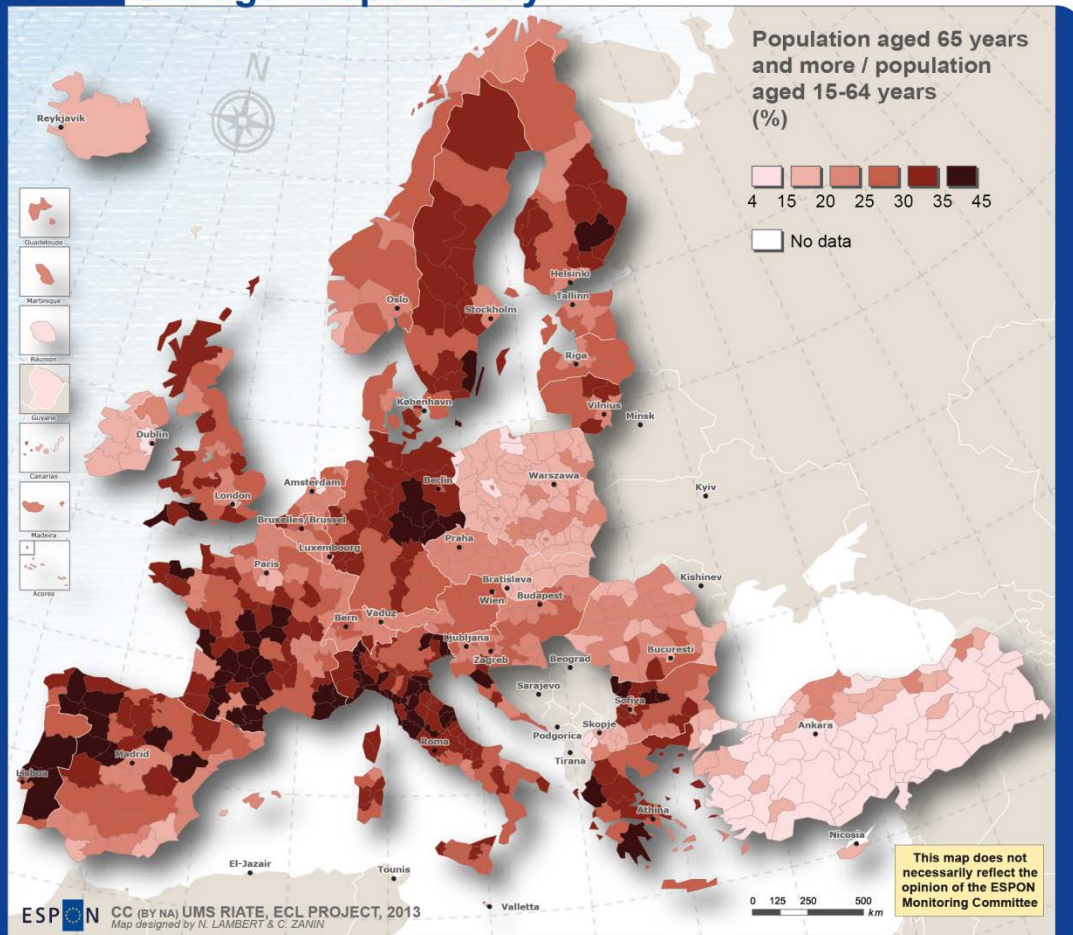
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Regional level: NUTS3  
 Source: ESPON TIPSE, 2010  
 Origin of data: Eurostat, 2012  
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**Old age dependency rate, 2011**  
 Population aged 65 years and more / population aged 15-64 years (%)

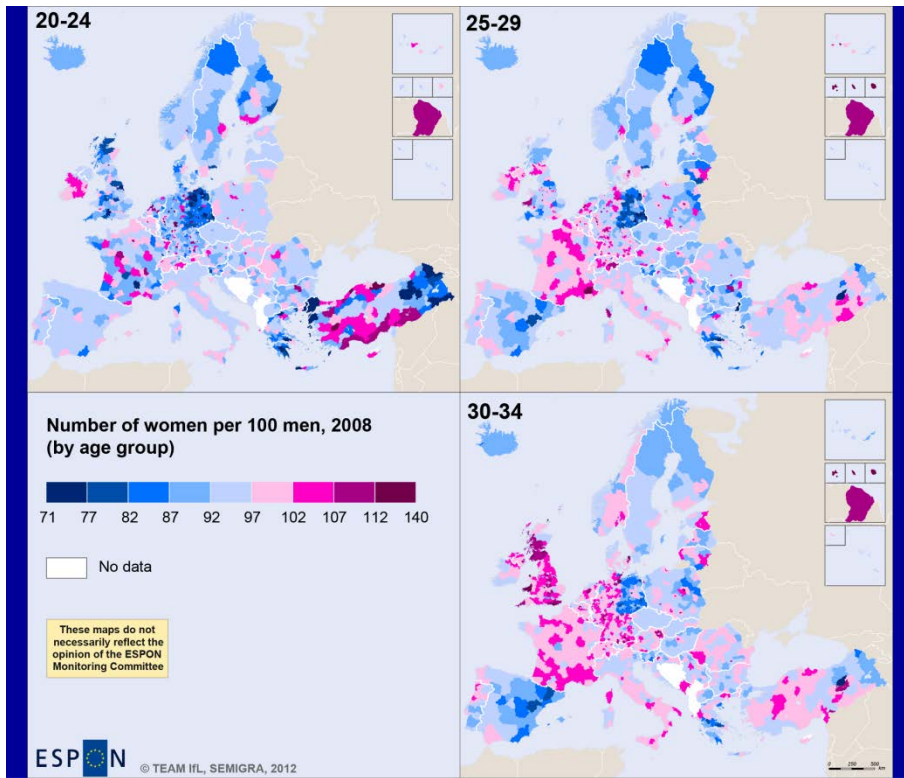


# MAP 14 Old-age «dependency»



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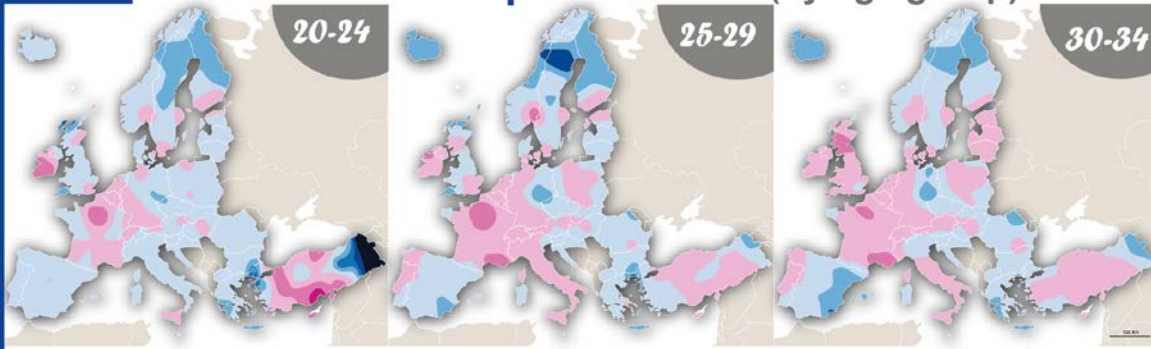
Regional level: NUTS 2/3 (2010)  
Sources: ESPON TIPSE, 2012  
Origin of data: Eurostat, 2013  
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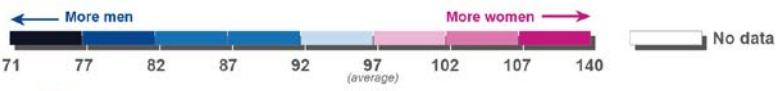
Regional level: NUTS 3  
Source: Own calculations, 2011  
Origin of data: EUROSTAT and national statistical offices, 2011  
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**MAP 15** Number of **women per 100 men** (by age group)



Number of women in the age group 20 to 24, 25 to 29 and 30 to 34 per 100 coeval men, 2009

(smoothed by gaussian potential - span 100 km)

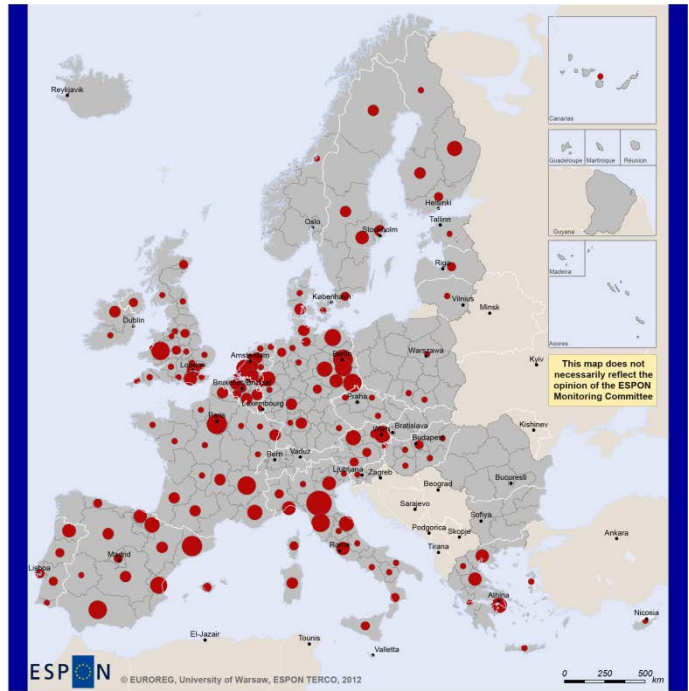


This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

ESPON CC (BY NA) UMS RIATE, ECL PROJECT, 2013  
Map designed by N. LAMBERT & C. ZANIN

Regional level: NUTS2 with smoothing  
Source: ESPON SEMIGRA, 2012  
Origin of data: EUROSTAT  
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**Number of lead partners in INTERREG IIIC and IVC programmes, situation in January 2011**

- 12
- 6
- 2

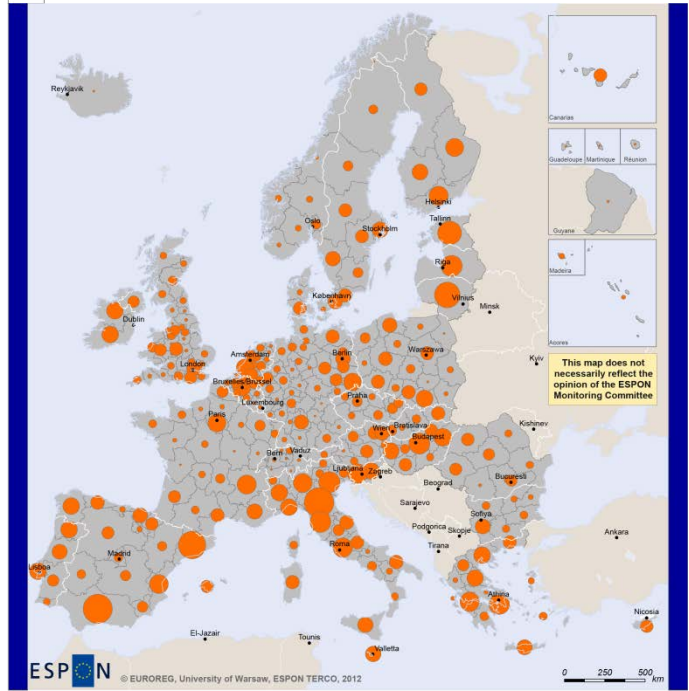
□ No data

Regional level: NUTS 2  
Source: ESPON Database, EURORREG, University of Warsaw, 2012  
Origin of data: EURORREG, University of Warsaw, 2012  
© EuroGeographics Association for administrative boundaries

Notes:  
INTERREG is designed to stimulate cooperation between member states of the European Union on different levels and is financed under the European Regional Development Fund (ERDF). INTERREG III refers to the third programming period (2000-2006) and INTERREG IV to the fourth programming period (2007-2013).

Interregional cooperation (Strand C of the INTERREG Programme) aims to improve the effectiveness of regional development policies and instruments through large-scale information exchange and sharing of experience (networks). This is financially the smallest strand of the INTERREG Programme. The programmes cover all EU Member States.

Under INTERREG IIIC and IVC initiative 384 projects were implemented (as of January 2011), that had over four thousand partners.



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**Number of project partners in INTERREG IIIC and IVC programmes, situation in January 2011**

- 89
- 40
- 10

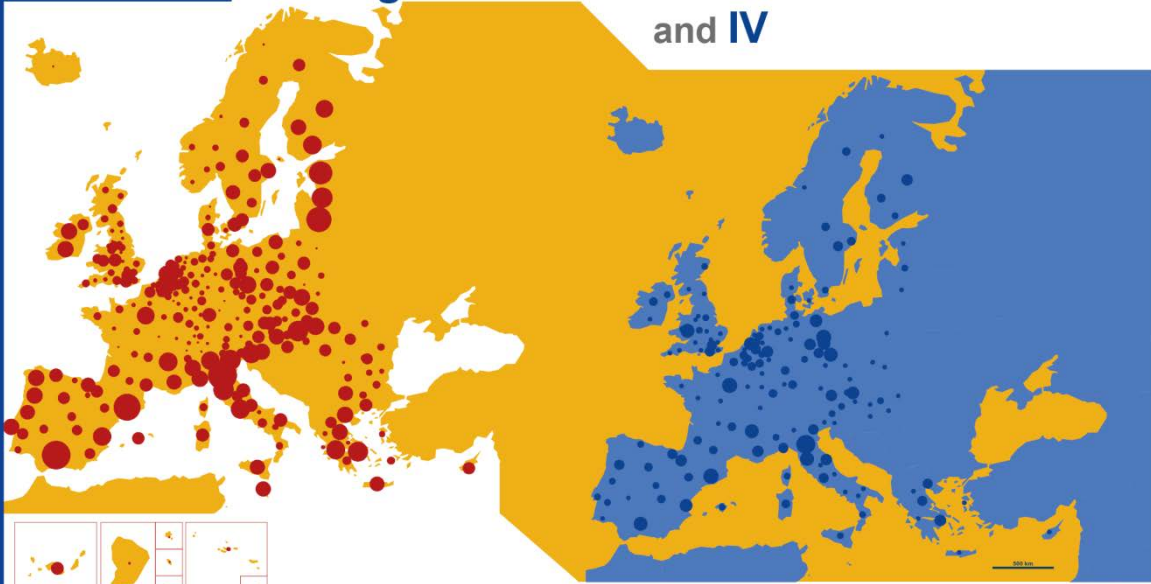
□ No data

Regional level: NUTS 2  
Source: ESPON Database, EURORREG, University of Warsaw, 2012  
Origin of data: EURORREG, University of Warsaw, 2012  
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Under INTERREG IIIC and IVC initiative 384 projects were implemented (as of January 2011), that had over four thousand partners.



Number of **project partners** in INTERREG III C and IVC programmes, situation in January 2011



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Map designed by N. LAMBERT & C. ZANIN

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Number of **lead partners** in INTERREG III C and IVC programmes, situation in January 2011



Regional level: NUTS 2  
Source: **ESPON TERCO, 2012**  
Origin of data: EUROREG, University of Warsaw, 2012  
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**Notes:**

INTERREG is designed to stimulate cooperation between member states of the European Union on different levels and is financed under the European Regional Development Fund (ERDF). INTERREG III refers to the third programming period (2000-2006) and INTERREG IV to the fourth programming period (2007-2013).

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Under INTERREG III C and IVC initiative 384 projects were implemented (as of January 2011), that had over four thousand partners.





**ESPON will achieve three goals in using a generalised base map:**

- 1- Enhance the ESPON visual identity (no one use it within European organisations, so it will be a strong identity for ESPON to do so) ;
- 2- From a scientific point a view, it's proved that a use of a generalised base map improves a lot the efficiency of the stated message;
- 3- The lightweight format of a generalised base map is well adapted to be integrated to ESPON tools and all maps produced in the ESPON program (whatever the technical solution chosen).