ESPON

# TPM
# Territorial Performance Monitoring
## Annexes

Quantitative Analysis
Dublin

Targeted Analysis 2013/02/13

Interim Report | Version 31/August/2011

EUROPEAN UNION
Part-financed by the European Regional Development Fund
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This report presents the interim results of a Targeted Analysis conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

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This basic report exists only in an electronic version.

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# 1. Methodology

In this section on quantitative benchmarking, the regions are examined under the key indicators listed above in a European, national and neighbourhood perspective.

Benchmarking an entire region as a single unit in comparison to other groupings of European countries requires some consolidation of statistical units, instead of comparing each region at its lowest possible statistical level. Since the selected regions are predominantly composed of several NUTS 3 regions, NUTS 2 or NUTS 1 regions were chosen for this benchmarking in order to capture an overall picture of their performance. Since the regions highly differ in size, population and most relevantly in their statistical reference levels, a short introduction to each region and its statistical characteristics is given.

As first approach to quantitative benchmarking, the ESPON HyperAtlas is used as analytical tool in order to simply calculate the benchmarking values of each indicator in European, national and neighbourhood deviation. This tool also allows for a quick mapping of the collected data and thus provides a comprehensive overview over the data. However, due to characteristics of the HyperAtlas as benchmarking toolkit, which only allows indicators consisting of two datasets, a nominator and a denominator, the prototype of a second, very simple, benchmarking tool has been developed for this project: the ESPON TPM regional benchmarking tool. In addition to the same type of benchmarking as the HyperAtlas, this tool allows to calculate benchmarking values for indicators which are only available already calculated and cannot be split into two single datasets due to their nature or data unavailability can be used in this spreadsheet-based tool since they cannot be uploaded to the HyperAtlas. These two methods differ in the number of reference scales and in their resulting benchmarking values since they use different approaches. However, comparability is ensured, especially through a rough classification and illustration in a graphical way, in this case through traffic lights.

The quantitative benchmarking values were derived from setting each region's performance for one indicator in relation to the overall European / national / regional performance. Thus, the values are measured against the benchmarking values and classified into 3 categories: good, average and bad. As mentioned before, the two benchmarking tools used in this study differ in their approach; benchmarking values generated by the *HyperAtlas* vary around a reference value of 100 and were classified as followed: *benchmarking value = > 110 = good, 90-110= average, < 90 bad.* This approach has the advantage of reflecting the customary approach in EU comparisons. However, it has the disadvantage giving quite different results depending on the overall order of magnitude of the indicator.[1] The second tool, on the other hand, uses another approach:

[1] Take the following example concerning unemployment: region A has an unemployment rate of 4,5%, and region B an unemployment rate of 7,5% compared to a reference value of 6%. The respective

the regional deviation to the reference value is compared to the standard deviation across all of Europe at the lowest available scale. Values thus vary around 0, with e.g. -0,5 indicating a negative deviation (less than the reference value) of half of the standard deviation and 2 indicating a positive deviation of twice the standard deviation. This makes comparisons between benchmarking results of different indicators more robust. For the classification of benchmarking results, we used the following general thresholds: *< -0.1 bad, < 1 good*. According to these categories, the three traffic lights have been chosen to represent the performance in a graphical way. However, one has to be careful when interpreting the calculated values since depending on the indicator (and depending on the political interpretation of the indicator), the direction of what is considered as "good" and "bad" might change. This is why for each indicator a short description and the proposed direction of its interpretation have been provided in the introductory part of this report. Additionally, arrows of the same three colours indicate the change in time for some indicators. The direction of the arrows might vary for each deviation, since it's a measure of relative performance compared to the evolution of the same indicator at the reference level.

As using the two mentioned methods does not provide a more detailed perspective, mapping the indicators on a regional level allows for further differentiation within the regions, according to the underlying data preciseness and shall thus be suggested as another way of monitoring.

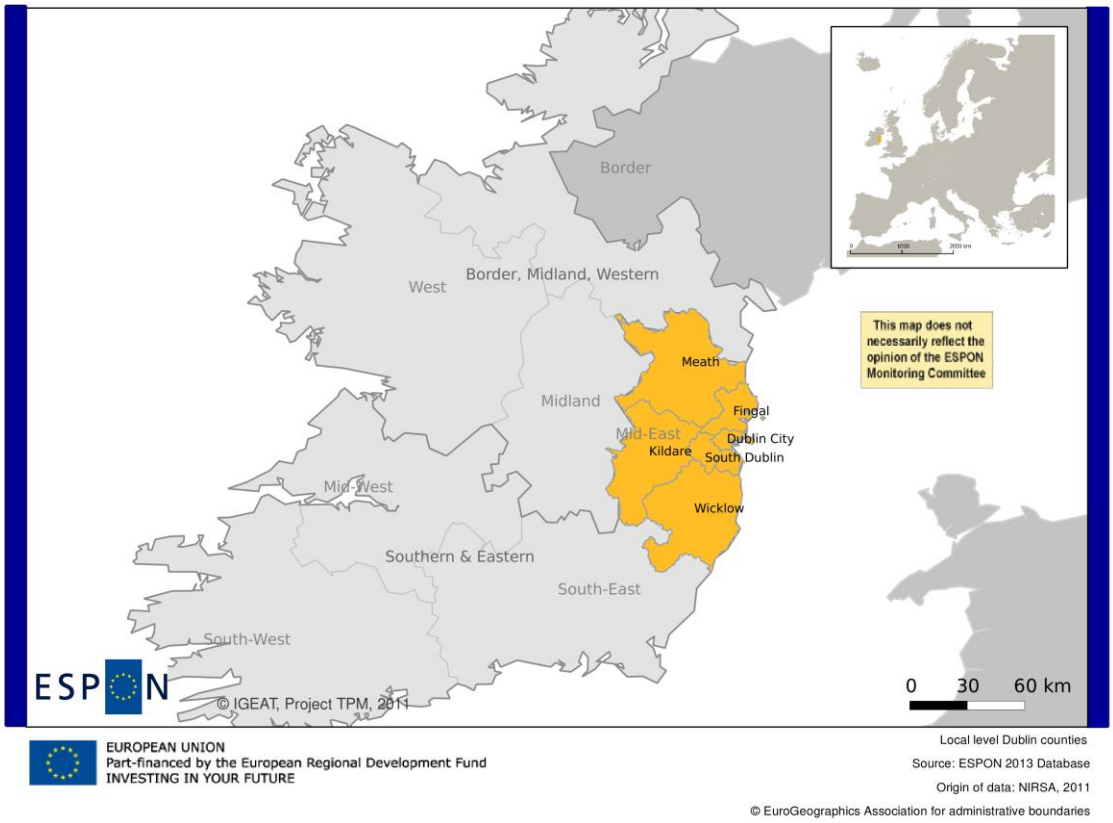
# 2. Introduction to the region for quantitative benchmarking

The Greater Dublin Area (GDA) is comprised of the city of Dublin and various counties surrounding the city: Dublin City, Dun-Laoghaire-Rathdown, South Dublin, Fingal, Meath, Kildare and Wicklow. Thus, the term GDA refers to an area of 6982 km², which makes up 10% of Ireland's total area. With over 1.8 million inhabitants, GDA's population equates to 39.3% of Ireland's population in 2011.
In regional administrative terms, the area of GDA is located in the NUTS 3 regions Mid-East and Dublin and thus in the NUTS 2 region Southern and Eastern Ireland. It is almost completely surrounded by the NUTS 2 region Border, Midland, Western.
However, since benchmarking the Greater Dublin Area quantitatively on its own bears some difficulties due to data availability and comparability to the other four selected regions, the NUTS 2 level has been chosen for the analysis comprised of the selected key indicators.
The benchmarked NUTS 2 region comprises 3.250.720 people on an area of 36.544 km². Its population density amounts to 88.95 inhabitants per

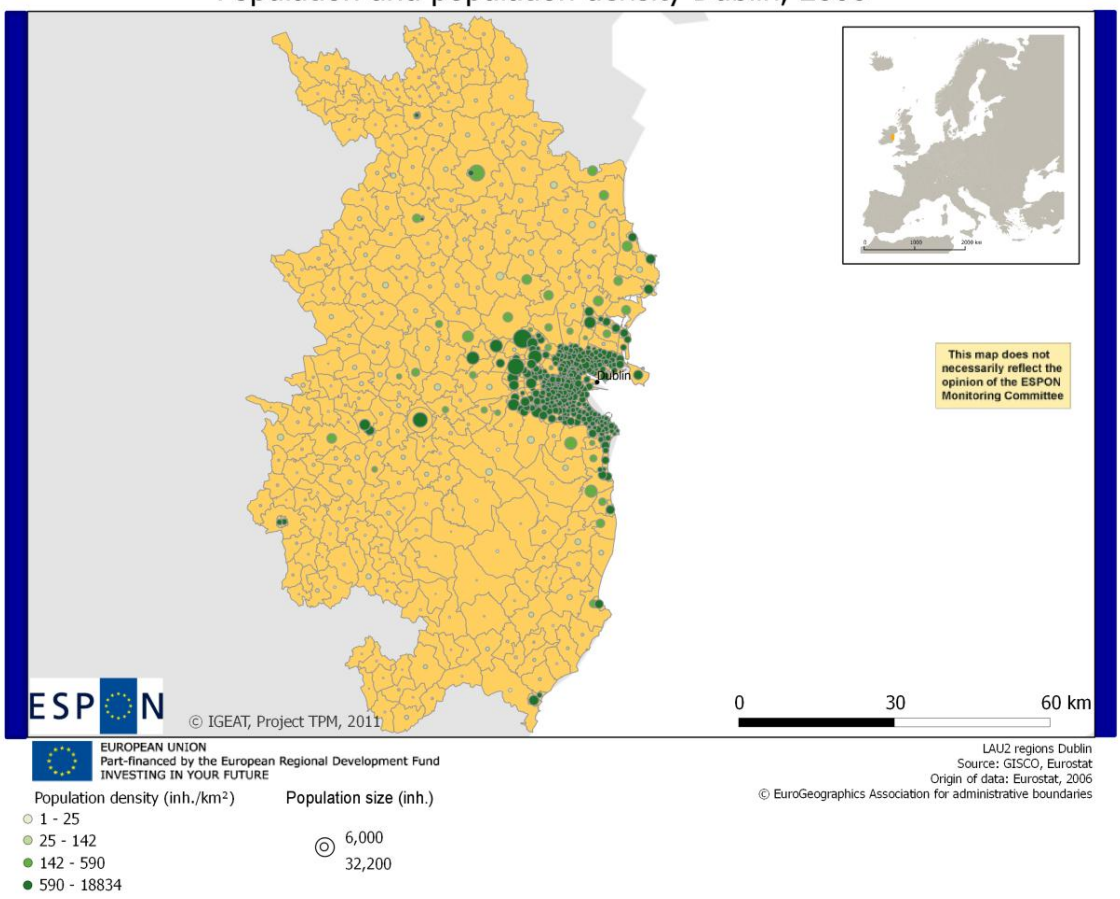
benchmarking values would thus be 4,5/6*100=75 and 125. If you represent the exact same fact by its complement, i.e. the employment rate, you would get the following results: (A) 95,5/94*100=102, (B) 92,5/94*100=98. Both regions would thus seem much closer to each other in the second case, although the indicator shows the same reality.

km². Therefore, GDA's population accounts to 55% of the NUTS 2 region's population on only 19% of the total NUTS 2 area.

Local map Dublin




Population and population density Dublin, 2006



# 3. Synthesis of quantitative benchmarking

## 3.1 Globalisation

Regional benchmarking in a European perspective provides the overall impression of need for improvement in economic aspects in Dublin, at least in terms of the entire NUTS 2 region which comprises the Greater Dublin Area, but is obviously much larger than the actual GDA. Striking is the bad performance in the following economic fields: expenditure on R&D, relative number of patents filed, employment in the manufacturing and professional activities sector, the average salaries per economic sector, tourism aspects, accessibility by car and plane as well as unemployment. In the contrary, employment in the information and communication sector as well as migration into the NUTS 3 regions and the share of population with tertiary education achieve the best benchmarking values for the European deviation.
When looking at the comparison to the national level, Ireland, some red traffic lights were exchanged by yellow ones, indicating average achievement. For instance, the employment situation seems better, just as the salary and the accessibility aspects tend more towards average performance. Benchmarking Dublin in relation to its neighbouring regions, its performance is categorized as "good" for more indicators, such as unemployment rate, employment and the share of population born outside the EU. However, tourism and the relative number of patents filed still fall below the average, as in all deviations and thus mark the indicators in which Dublin is doing badly at all comparative scales.
All in all, the benchmarking results are highly diverse, depending on the examined deviation and thus, need to be looked at more closely in order to find the fields of challenges and opportunities of the region.

## 3.2 Demography

Dublin's demographic structure is predominantly positioned above all benchmarking averages: in the European perspective a very high share of young population, very low share of elderly people, very low median age as well as high population growth between the years 1999 and 2009. The national comparison reveals just an average ranking of Dublin's demographic structure but exceeds most expectations in relation to its neighbouring regions.
Overall, benchmarking Dublin's demography reveals a very satisfying result with few fields for improvement.

## 3.3 Climate change

In terms of European benchmarking of the challenge of climate change, Dublin accomplishes differing results: on the one hand, its performance regarding soil sealing, concentration of particulate matter as well as ozone

concentration and the change in minimum (January) and mean temperature (July) is very good. However, the share of NATURA 2000 areas and the change in maximum (July) temperature, on the other hand, reveal very bad benchmarking values, especially on the European perspective.
Compared nationally, climate change presents a real challenge for the region since all benchmarking values lay below or close to national averages. Only the change in maximum temperature in July earns Dublin a good national position: the temperature increased in relation less than in other European regions. However, as mentioned before, the interpretation of temperature indicators as a measure for climate change has to be seen with caution since the impacts may vary from region to region and thus affect the direction of evaluating this benchmarking.
The neighbourhood perspective reveals the same need for improvement in order to being able to cope with the challenges of climate change. However, in terms of typology benchmarking, Dublin's situation seems much brighter since its performance lies predominantly in line with other regions categorized in the same climate change type.
All in all, Dublin is positioned quite well among other European regions and only shows some challenges that need to be tackled in terms of climate change.

## 3.4 Energy

Looking at energy aspects in Dublin leads to predominantly very good monitoring results: Except for the relatively low potential for solar energy resources, the region has relatively many hours of potential wind energy per year, a comparably low share of the GDP as fuel costs for freight traffic as well as a low employment rate in energy intensive industries in comparison to other European regions. The national comparison, however, puts the region's performance into perspective again, since it varies between averagely and bad. Nonetheless, monitoring Dublin in relation to other regions classified as « cool and windy, but working » in the ESPON energy typology, reveals its position above average for any indicator.
Hence, Dublin's position in this monitoring of energy indicators can in sum be described as very good with some challenges on the European and national scale.

# 4. Quantitative regional benchmarking

## 4.1 Globalisation

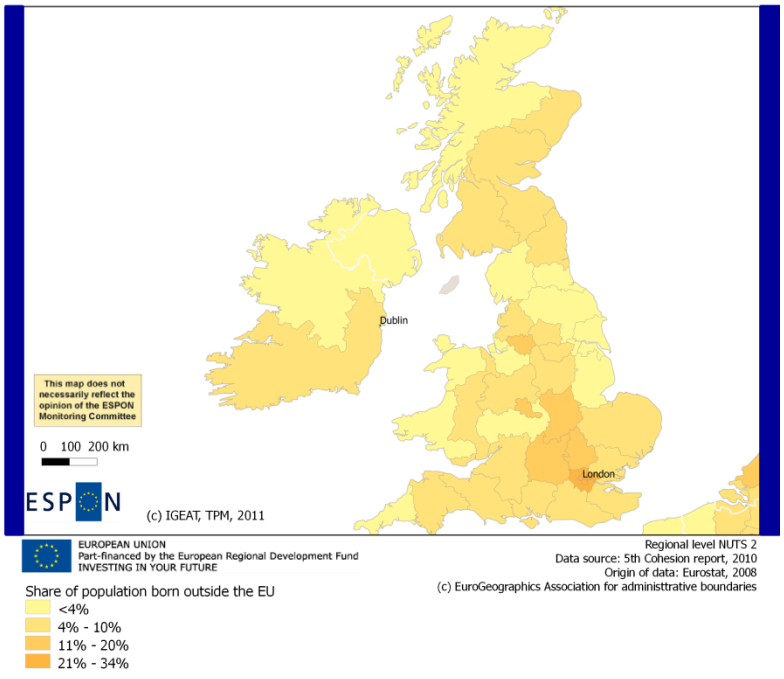
### a) Comparative analysis globalisation

| **Globalisation** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Indicator* | *value* | *EU* | | *National* | | *Neighbour-hood* | | *Typology* | |
| Population born outside the EU, 2006 | 6% | 84 | | 112 | | 172 | | | |
| Internet access, 2009 | 57% | 113 | | 107 | | 129 | | | |
| Expenditure on R&D, 2007 | 1.20% | 76 | | 100 | | 99 | | | |
| Relative number of patents, 2005 | 0.01% | 46 | | 88 | | 66 | | | |
| *Average salary per economic sector, 2008* | | | | | | | | | |
| Manufacturing (C) | 34,324 € | 147 | | 87 | | 97 | | | |
| Information, communicatio n (J) | 27,750 € | 92 | | 106 | | 131 | | | |
| Professional, scientific, technical activities (M) | 50,930 € | 222 | | 104 | | 116 | | | |
| Employment per economic sector, 2008 | | | | | | | | | |
| Manufacturing (C) | 8.70% | 77 | | 96 | | 87 | | | |

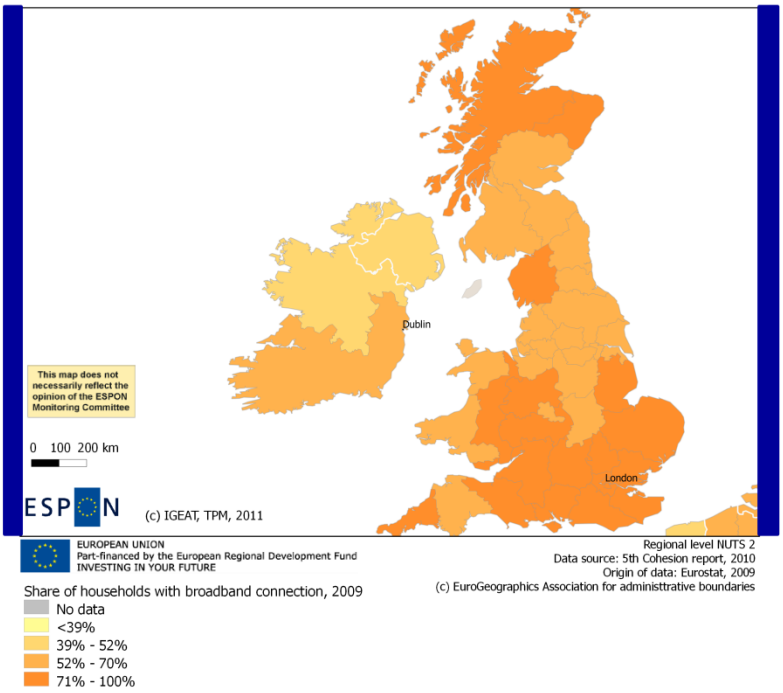
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Information, communication (J) | 3.90% | 160 | | | 116 | | | 219 | | |
| Professional, scientific, technical activities (M) | 4.80% | 83 | | | 98 | | | 95 | | |
| Tourism occupancy, 2009 | 9.90% | 45 | | | 99 | | | 98 | | |
| Tourism non-residents | 16.9% | 71 | | | 39 | | | 23 | | |
| Daily population accessible by car, 1999 | 353 | -0.34 | | | -0.01 | | | | | |
| Migration into NUTS 3 regions | 11.93 | 1.54 | | | -0.39 | | | | | |
| Accessibility to passenger flights | 4.406 | -0.81 | | | 0.00 | | | | | |
| Tertiary education, 2007 | 32.90% | 163 | | | 106 | | | 126 | | |
| Early school leavers, 2007 | 14.40% | 105 | | | 97 | | | 88 | | |
| Unemployment rate, 2009 | 11.3% | 126 | | | 96 | | | 87 | | |
| Change in unemployment rate, 2000-2009 | +207% | 303 | | | 104 | | | 111 | | |

## b) Regional maps globalisation

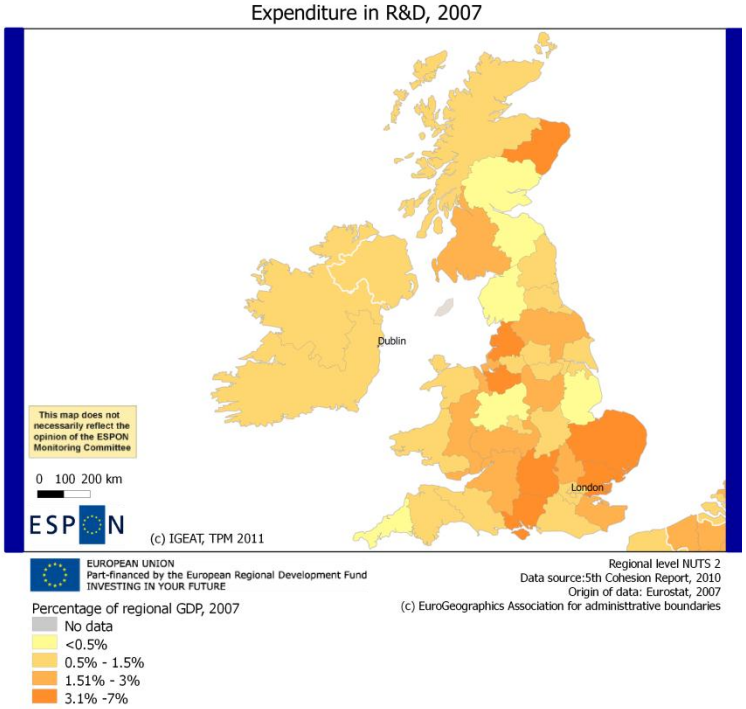
Share of population born outside the EU, 2008



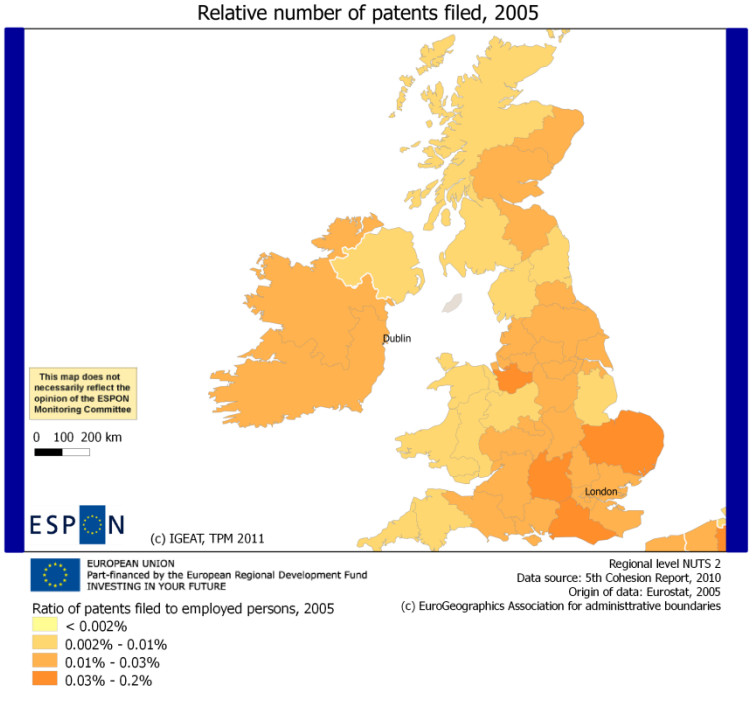

Broadband connection, 2009



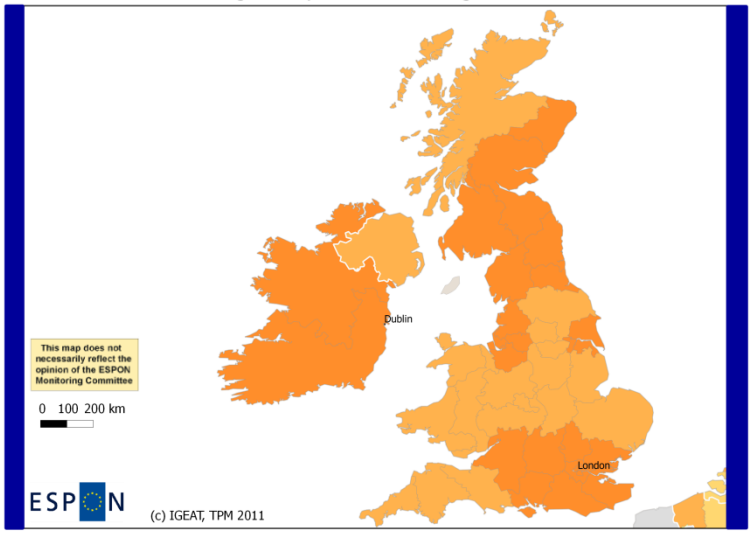

Expenditure in R&D, 2007




Relative number of patents filed, 2005



Average salary in manufacturing sector, 2008

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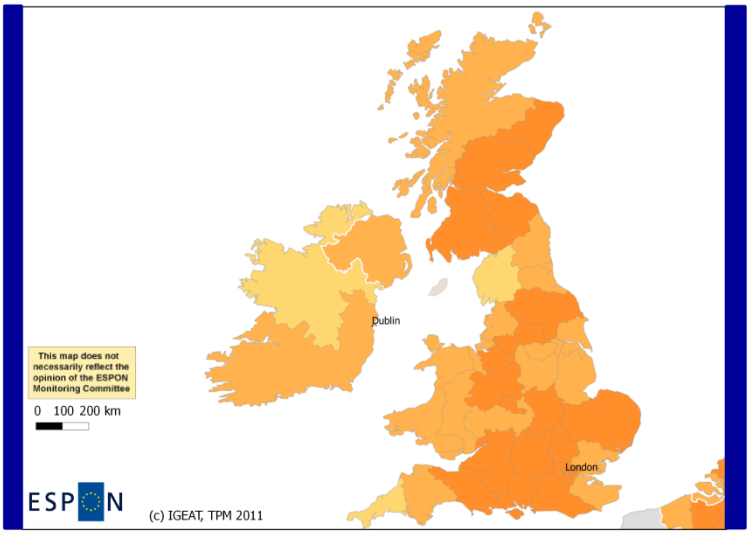
Regional level NUTS 2
Data source: Eurostat, 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

salary manufacturing / number of employed persons in the sector (€)
- < 1000
- 1000 - 16000
- 16000 - 30000
- >30000
- No data

Average salary per sector: information and communication, 2008

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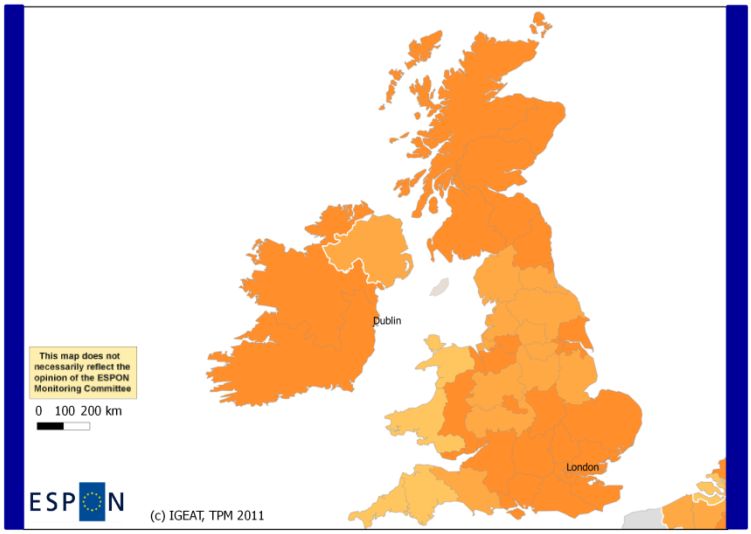
Regional level NUTS 2
Data source: Eurostat, 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

salary in this sector / number of employed persons in the sector (€)
- 1538 - 6742
- 6742 - 22738
- 22738 - 32205
- > 32205
- No data

Average salary per sector: Professional, scientific and technical activities, 2008

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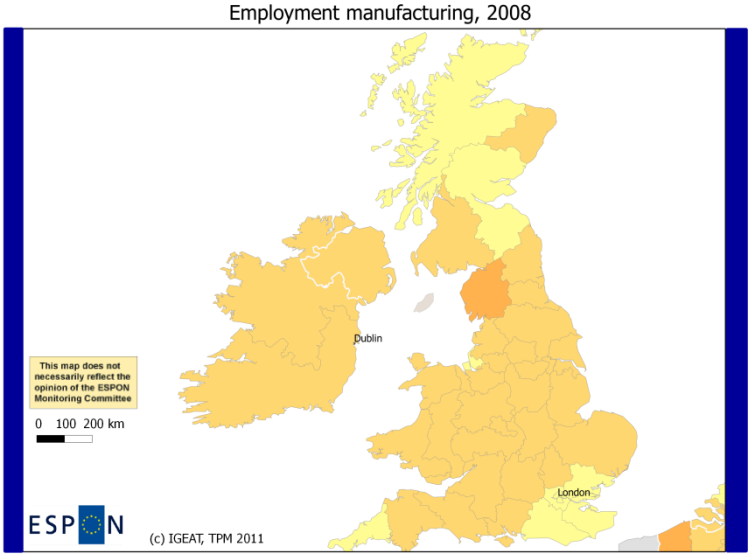
Regional level NUTS 2
Data source: Eurostat, 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

salary in this sector / number of employed persons in the sector (€)
- 1538 - 6742
- 6742 - 22738
- 22738 - 32205
- > 32205
- No data

Employment manufacturing, 2008

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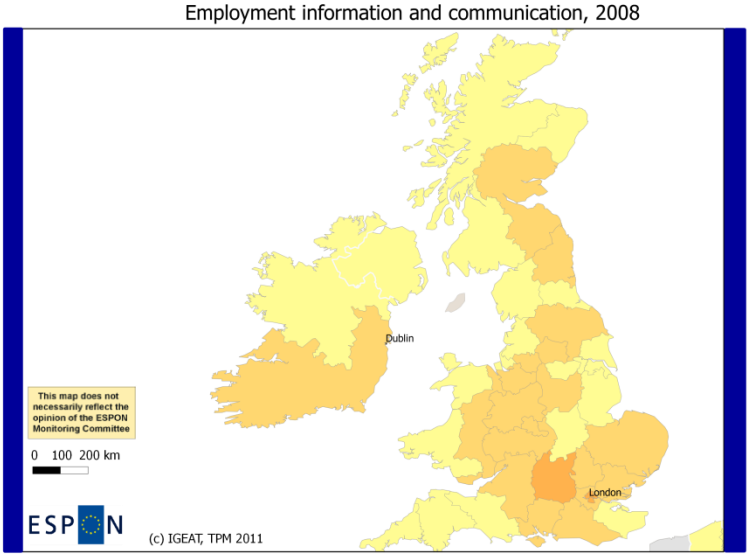
Regional level NUTS 2
Data source: Eurostat 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

Share of employment in manufacturing
- No data
- < 6%
- 6% - 12%
- 13% - 20%
- 20% - 30%

Employment information and communication, 2008

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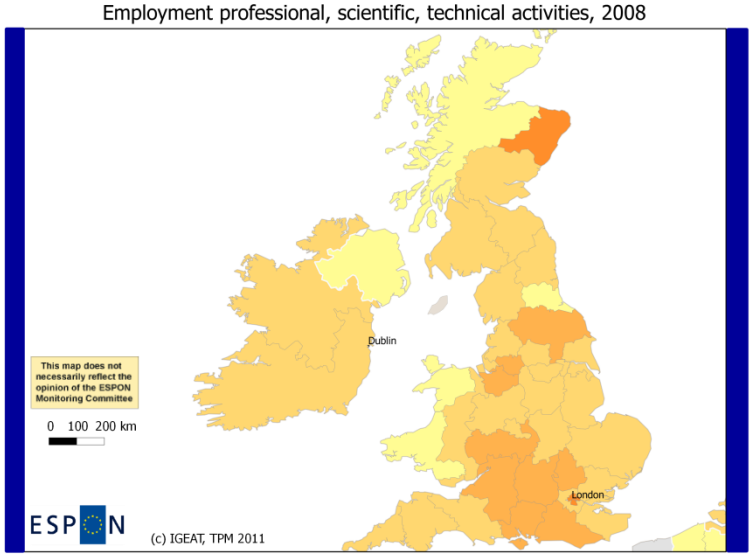
Regional level NUTS 2
Data source: Eurostat 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

Share of employment in information and communication sector
- No data
- < 1.8%
- 1.8% - 5%
- 6% - 11%
- <11%

Employment professional, scientific, technical activities, 2008

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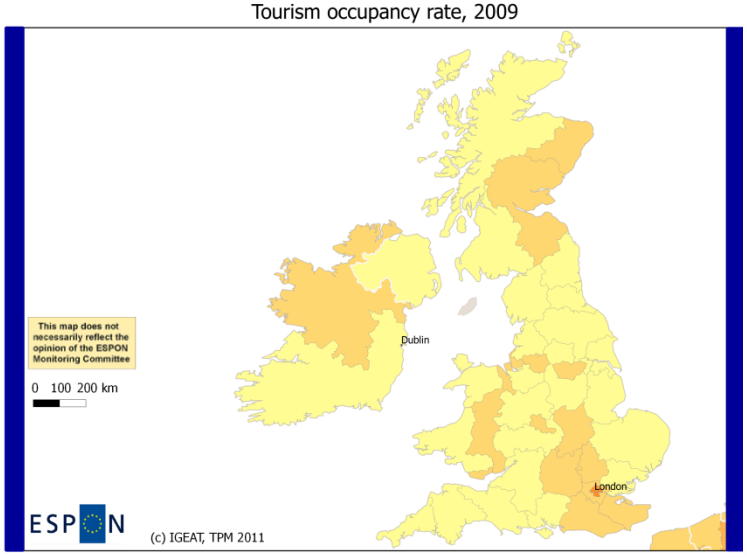
Regional level NUTS 2
Data source: Eurostat 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

Share of employment in professional, scientific, technical activities
- No data
- <3%
- 3% - 5%
- 5.5% - 10%
- 10.5% - 19.5%

Tourism occupancy rate, 2009

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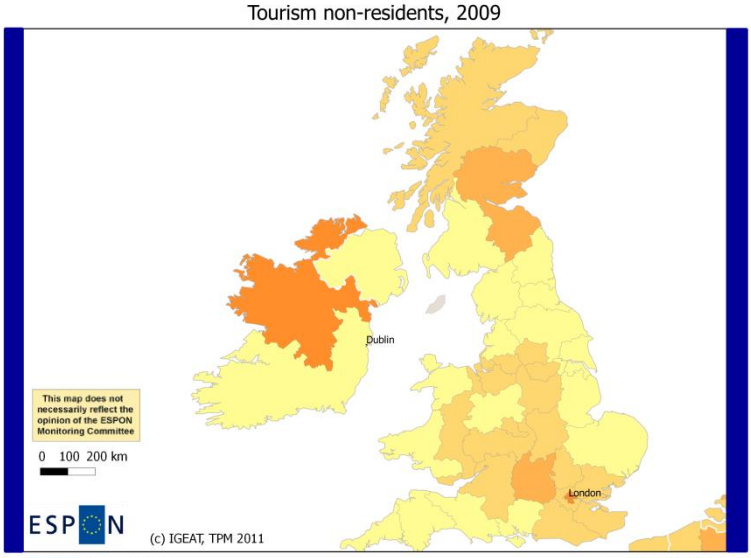
Regional level NUTS 2
Data source: Eurostat, 2011
Origin of data: Eurostat, 2009
(c) EuroGeographics Association for administrative boundaries

Number of nights spent by tourists / yearly available bed places, 2009
- No data
- <23%
- 23% - 45%
- 46% - 60%
- 61% - 95%

Tourism non-residents, 2009

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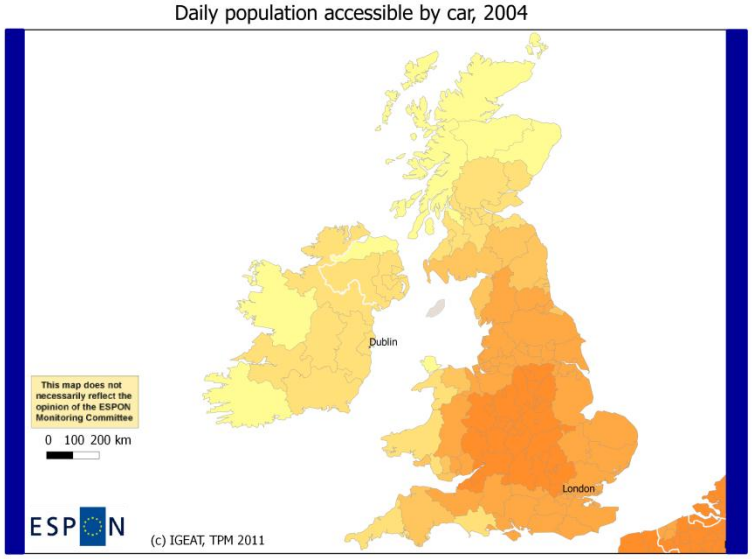
Regional level NUTS 2
Data source: Eurostat 2011
Origin of data: Eurostat, 2009
(c) EuroGeographics Association for administrative boundaries

Share of nights spent by non-residents, 2009
- No data
- <20%
- 20% - 40%
- 41% - 60%
- 61% - 95%

Daily population accessible by car, 2004

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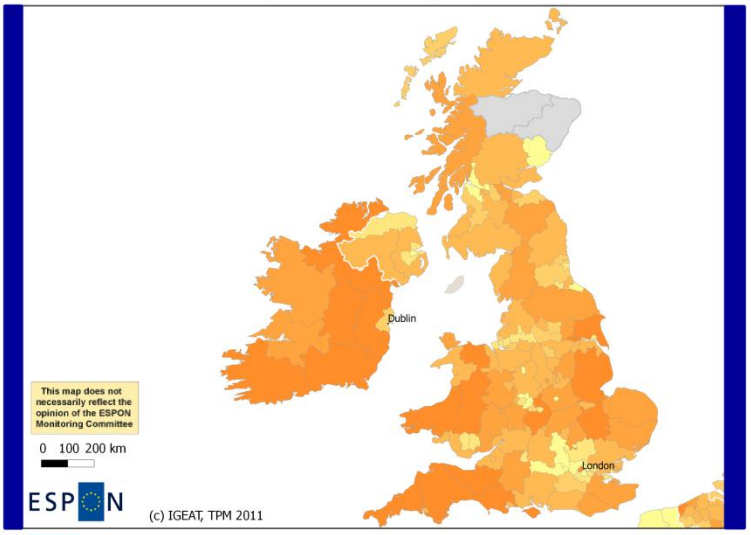
Regional level NUTS 3
Data source: ESPON 2013 Database
Origin of data: ESPON Project EDORA, 2004
(c) EuroGeographics Association for administrative boundaries

daily population accessible by car, 2004
- < 2500
- 2500 - 9000
- 9000 - 20000
- 20000 - 40000
- < 40000

Net migration NUTS 3 regions, 2001-2007

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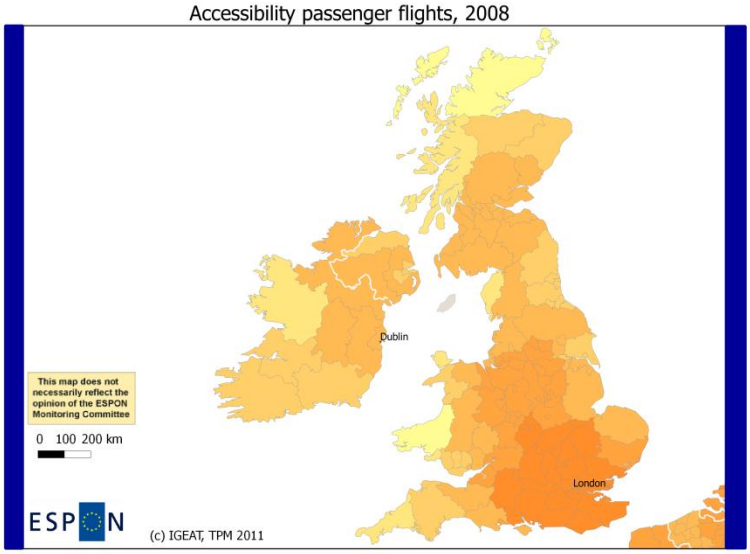
Regional level NUTS 3
Data source: 5th Cohesion Report, 2010
Origin of data: Eurostat, ESPON
(c) EuroGeographics Association for administrative boundaries

net migration per million inhabitants (annual average)
- < -1.5
- -1.5 - 0
- 0 - 1.5
- 1.5 - 5
- 5 - 10
- > 10
- No data

Accessibility passenger flights, 2008

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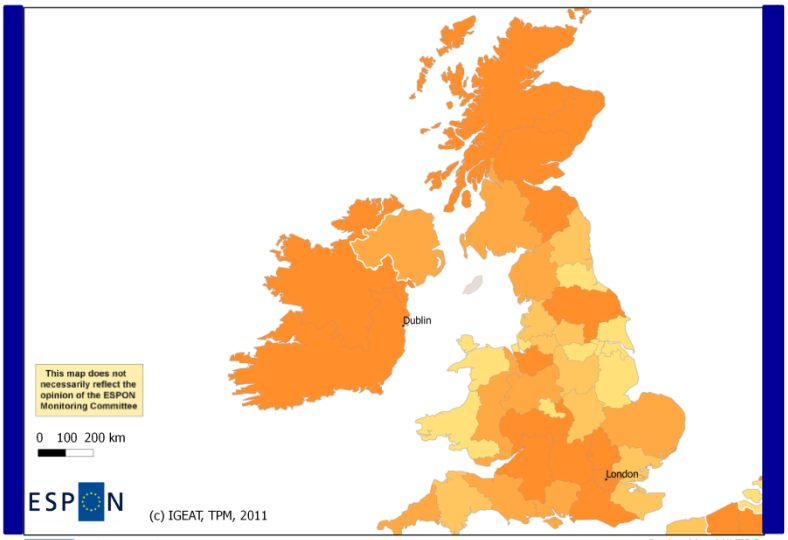
Regional level NUTS 3
Data source: ESPON 2013 Database
Origin of data: ESPON Project TIPTAP, 2010
(c) EuroGeographics Association for administrative boundaries

Population weighted average of passenger flights per day travel time to the closest airport < 90 min
- 0 - 50
- 50 - 150
- 150 - 350
- 350 - 800
- 800 - 1500
- 1500 - 3500

Share of population with tertiary education, 2009

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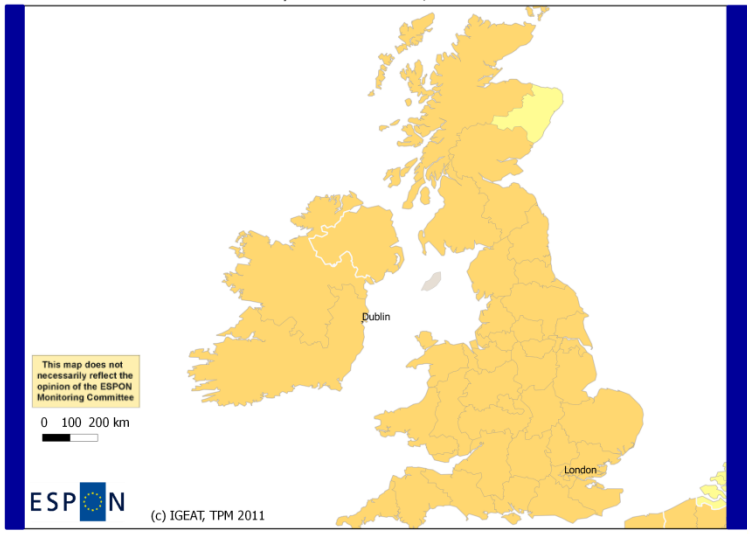
Regional level NUTS 2
Data source: 5th Cohesion report, 2010
Origin of data: Eurostat, 2009
(c) EuroGeographics Association for administrative boundaries

Share of population with tertiary education
- No data
- <15%
- 15% - 19%
- 20% - 22%
- 23% - 26%
- 27% - 41%

Early school leavers, 2007

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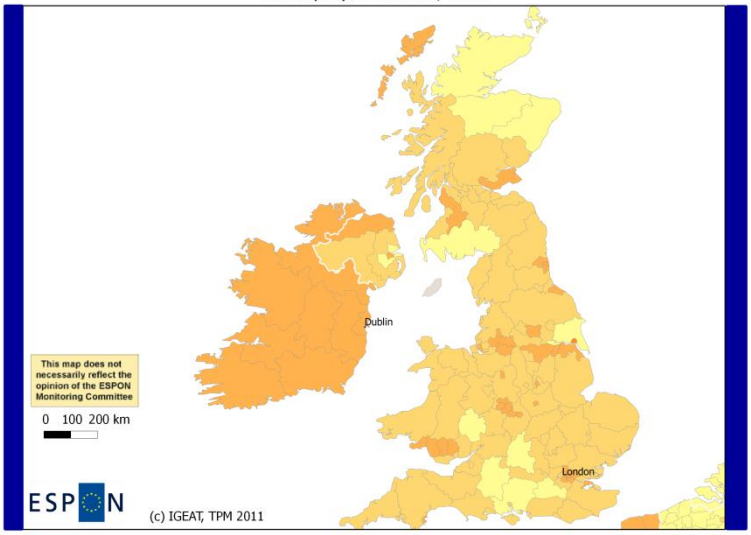
Regional level NUTS 2
Data source: 5th Cohesion Report, 2010
Origin of data: Eurostat, 2007
(c) EuroGeographics Association for administrative boundaries

Share of early school leavers of population aged 18-24, 2007
- 2% - 10%
- 11% - 20%
- 21% - 30%
- 31% - 47%

Unemployment rate, 2009

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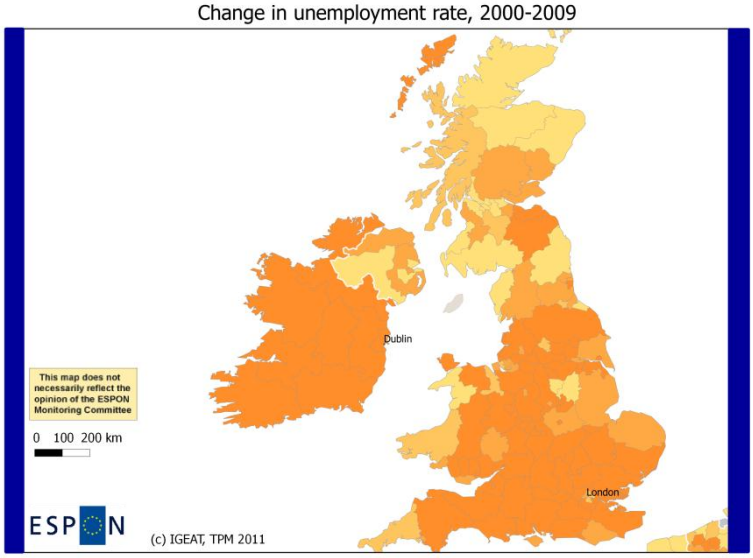
Regional level NUTS 3
Data source: Eurostat 2011
Origin of data: Eurostat, 2009
(c) EuroGeographics Association for administrative boundaries

Unemployment rate of population older than 15, 2009
- No data
- < 5%
- 5% - 9%
- 10% - 15%
- 16% - 29%

Change in unemployment rate, 2000-2009

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Regional level NUTS 3
Data source: Eurostat, 2011
Origin of data: Eurostat, 2009
(c) EuroGeographics Association for administrative boundaries

Change of unemployment rate 2000-2009
- No data
- -358% - - 200%
- -199% - -1%
- 0% - 10%
- 11% - 30%
- 31% - 98%

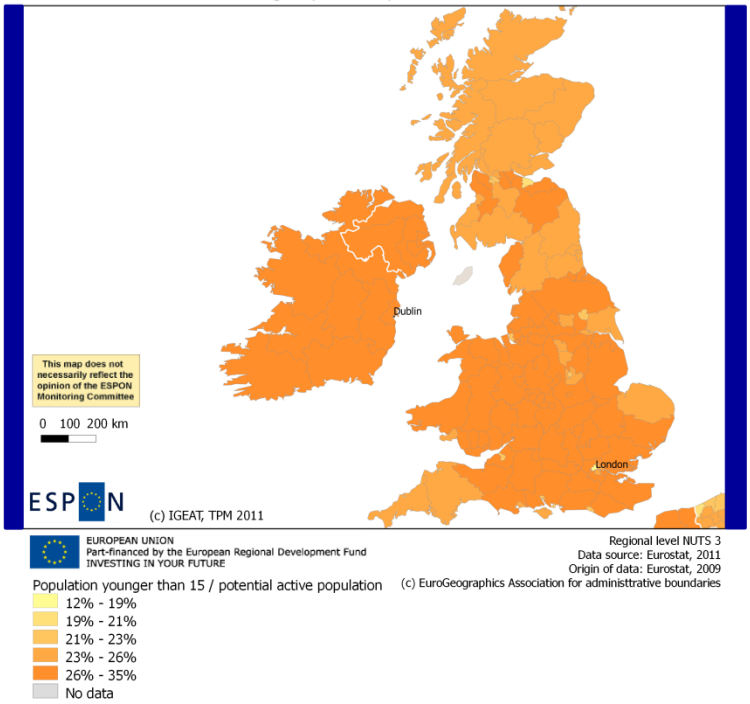
## 4.2 Demography

### a) Comparative analysis

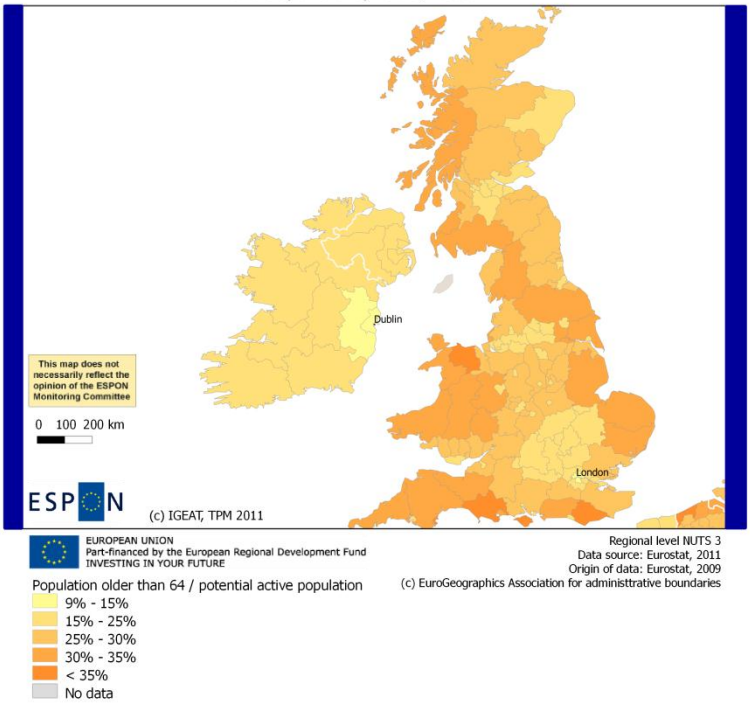
| **Demography** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Indicator* | *value* | | *EU* | | *National* | | *Neighbour-hood* | | *Typology* | |
| Young age dependency ratio, 2009 | 30% | 130 | | | 98 | | 93 | | 126 | |
| Old age dependency ratio | 16% | 61 | | | 96 | | 86 | | 74 | |
| Life expectancy, 2004 | 78.26 | 0.02 | | | 0.00 | | | | -0.57 | |
| Median age, 2008 | 33 | 2.65 | | | 0.1 | | | | 1.63 | |
| Population growth, 1999-2009 | +18% | 114 | | | 99 | | 97 | | 100 | |

### b) Regional maps demography

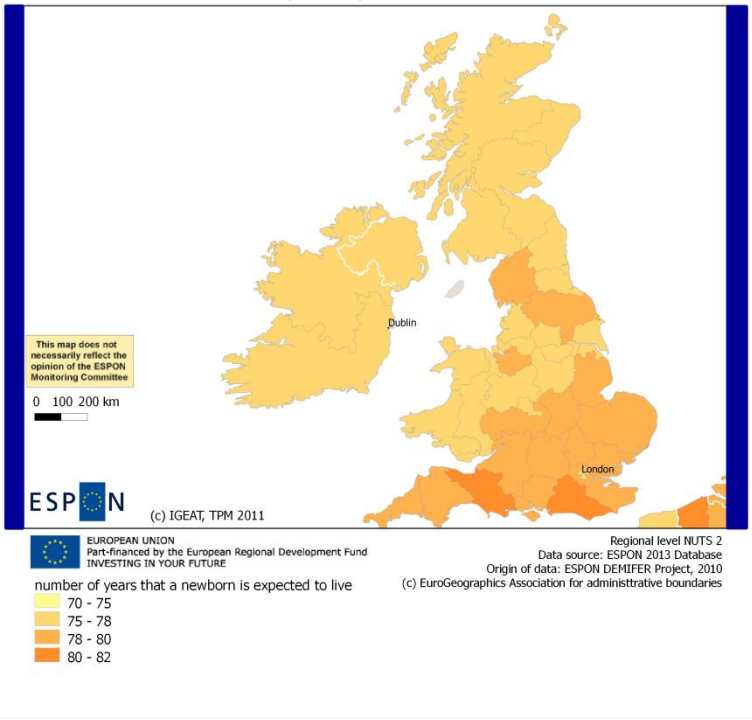
Young dependency ratio, 2009




Old dependency ratio, 2009



Life expectancy at birth, 2004

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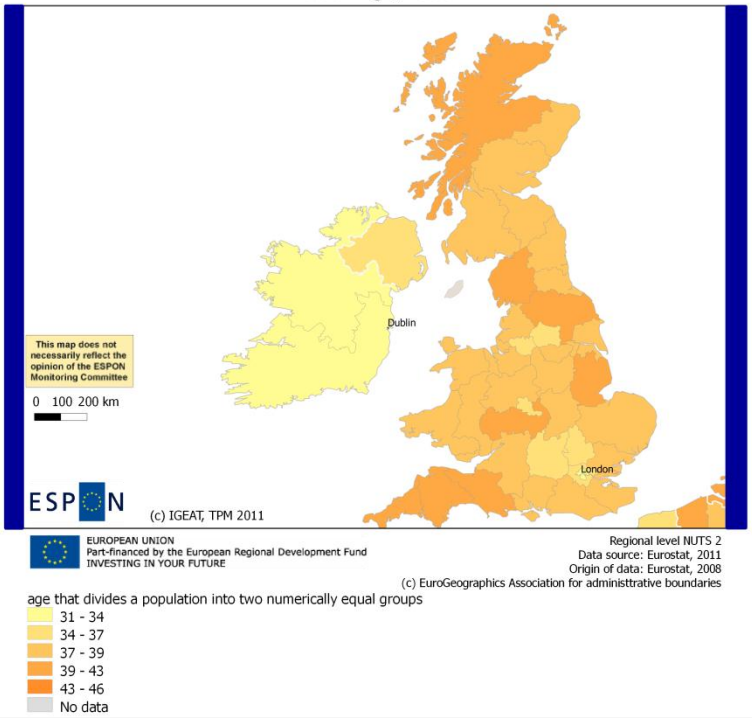
Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ESPON DEMIFER Project, 2010
(c) EuroGeographics Association for administrative boundaries

number of years that a newborn is expected to live
- 70 - 75
- 75 - 78
- 78 - 80
- 80 - 82

Median Age, 2008

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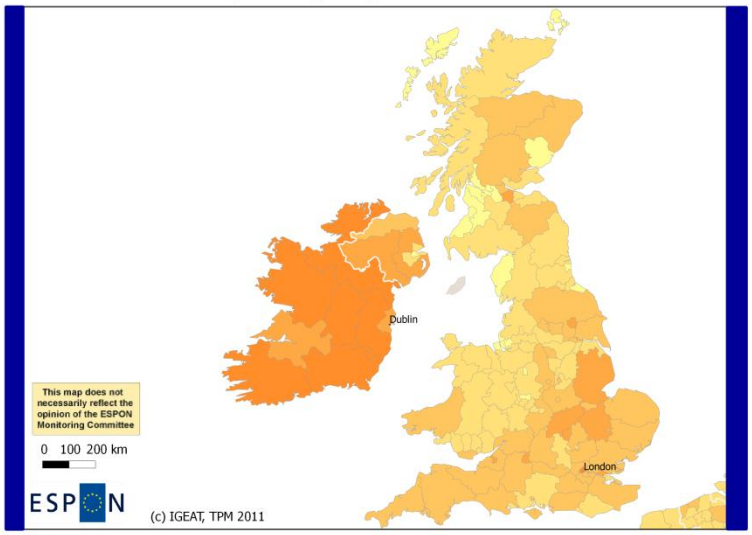
Regional level NUTS 2
Data source: Eurostat, 2011
Origin of data: Eurostat, 2008
(c) EuroGeographics Association for administrative boundaries

age that divides a population into two numerically equal groups
- 31 - 34
- 34 - 37
- 37 - 39
- 39 - 43
- 43 - 46
- No data

Population growth, 1999-2009

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Regional level NUTS 3
Data source: Eurostat, 2011
Origin of data: Eurostat, 1999, 2009
(c) EuroGeographics Association for administrative boundaries

change in population 2009/1999
- < 0 %
- 0 - 5 %
- 5 - 10 %
- 10 - 15 %
- >15 %
- No data

## 4.3 Climate Change

a) Comparative analysis

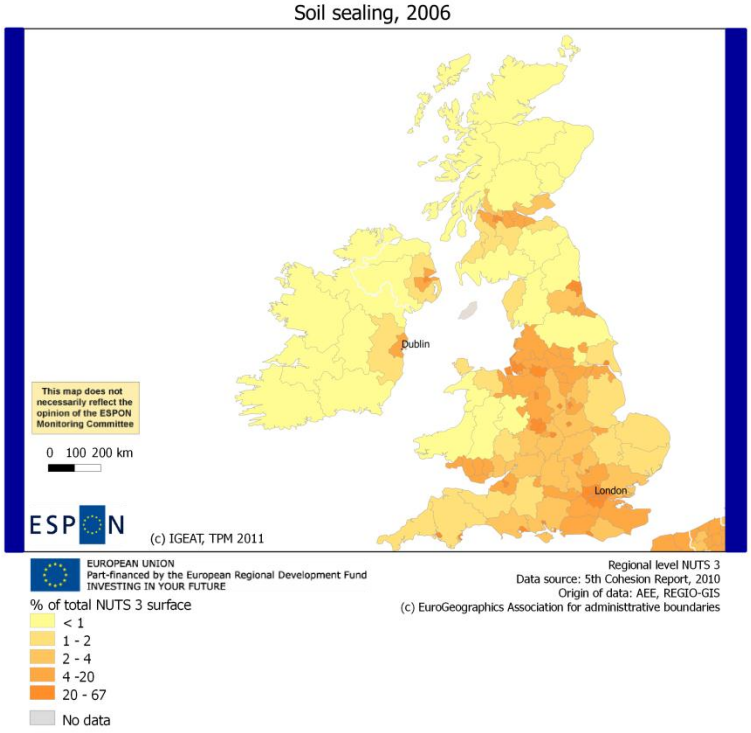
**Climate Change**

| *Indicator* | *value* | *EU* | *National* | *Neighbourhood* | *Typology* |
|---|---|---|---|---|---|
| Soil sealing, 2006 | 1.5% | 73 | 120 | 154 | 101 |
| NATURA 2000 areas, 2009 | 8.70% | 52 | 79 | 64 | 115 |
| Concentration of particulate matter on surface level, 2009 | 7.72µg/m³ | 1.34 | -0.1 | | 1.44 |
| Ozone exceedance days, 2008 | 4.72 days | 0.47 | -0.07 | | 0.18 |
| Potential energy consumption for heating, 1981-2009 | -6% | 95 | 96 | 97 | 96 |
| Change in minimum temperature January 1994-2008 | -0.6°C | 0.24 | -0.03 | | 0.08 |
| Change in maximum temperature July 1994-2008 | +1.24°C | -0.44 | 0.25 | | -0.51 |

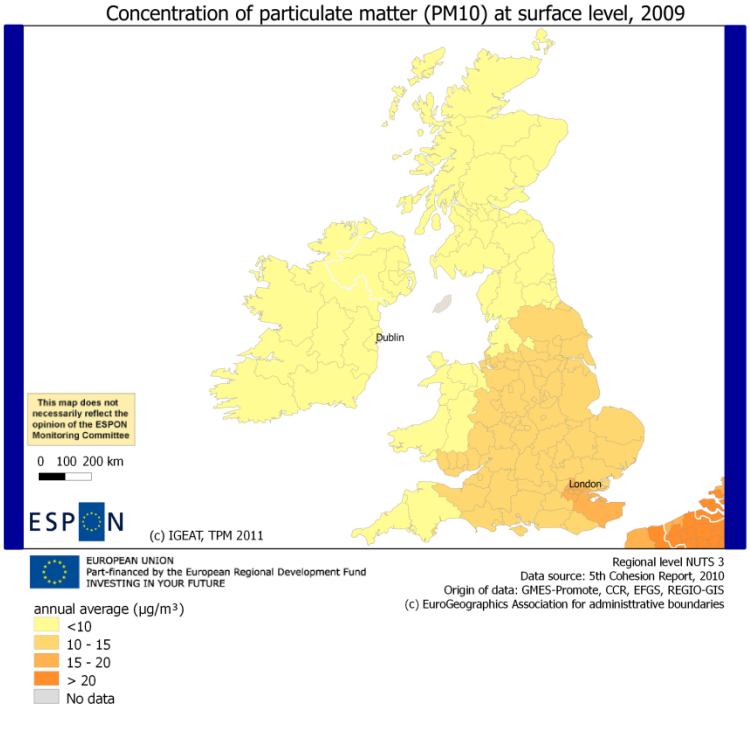
| | | | | | | |
|---|---|---|---|---|---|---|
| Change in mean temperature January 1994-2008 | +0.78°C | 0.02 | | 0.01 | | -0.16 | |
| Change in mean temperature July 1994-2008 | -0.04°C | 0.89 | | 0.08 | | 0.94 | |

## b) Regional maps climate change

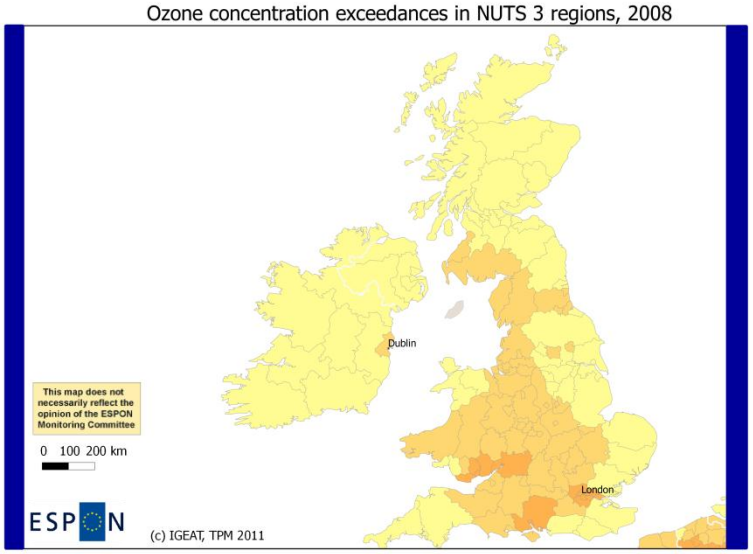
Soil sealing, 2006




Concentration of particulate matter (PM10) at surface level, 2009



Ozone concentration exceedances in NUTS 3 regions, 2008

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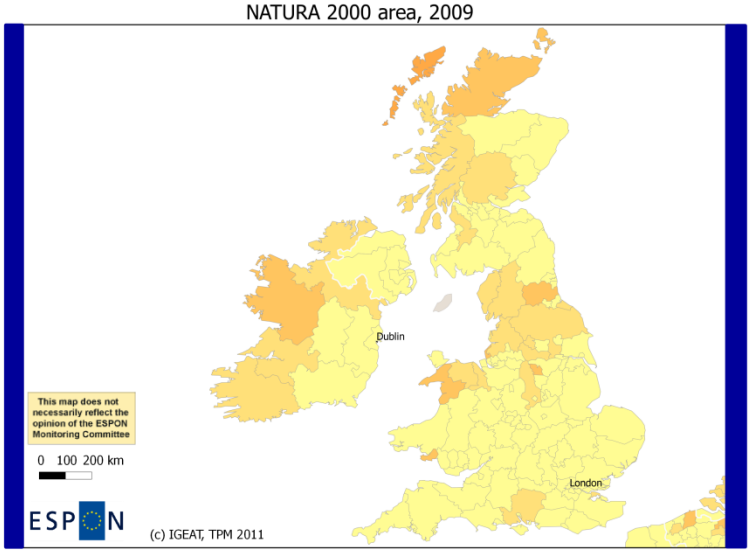
Regional level NUTS 3
Data source: 5th Cohesion Report, 2010
Origin of data: GMES-Promote, Eurostat, CCR, REGIO-GIS
(c) EuroGeographics Association for administrative boundaries

days exceeding 120 µg/m³
- < 5
- 5 - 10
- 10 - 30
- > 30

NATURA 2000 area, 2009

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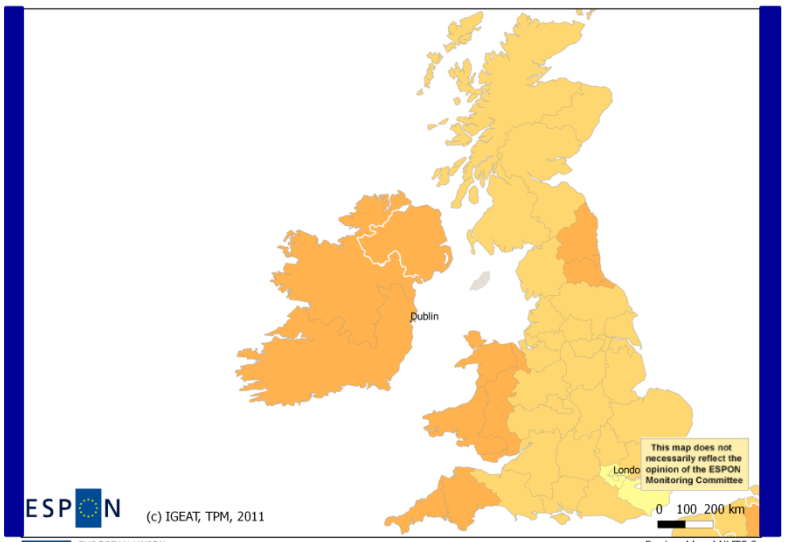
Regional level NUTS 3
Data source: 5th Cohesion Report, 2010
Origin of data: AEE, REGIO-GIS
(c) EuroGeographics Association for administrative boundaries

% of total NUTS 3 surface
- <7
- 7 - 16
- 16 - 27
- 27 - 39
- 39 - 74

Change in heating degree days, 1981 - 2009

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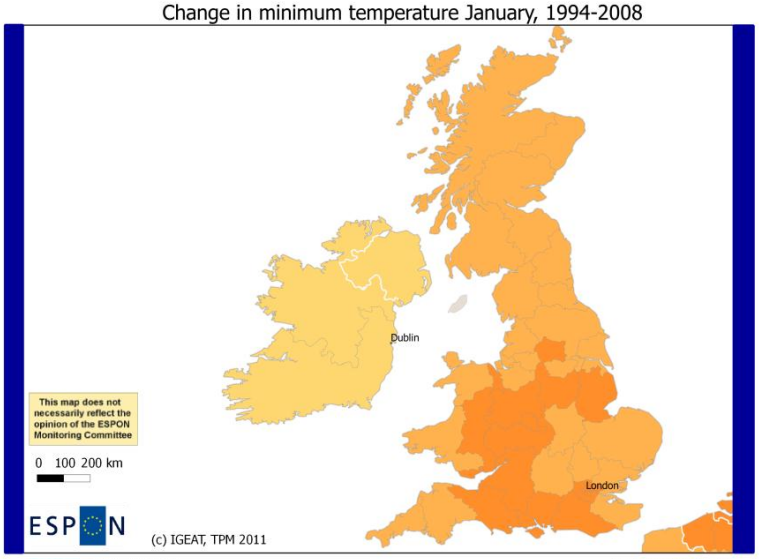
Regional level NUTS 2
Data source: Espon 2013 Database
Origin of data: Eurostat, 2009
(c) EuroGeographics Association for administrative boundaries

Change in Heating Degree Days, 1981-2009
- No data
- -70% - -21%
- -20% - -11%
- -10% - -1%
- 0% - 11%

Change in minimum temperature January, 1994-2008

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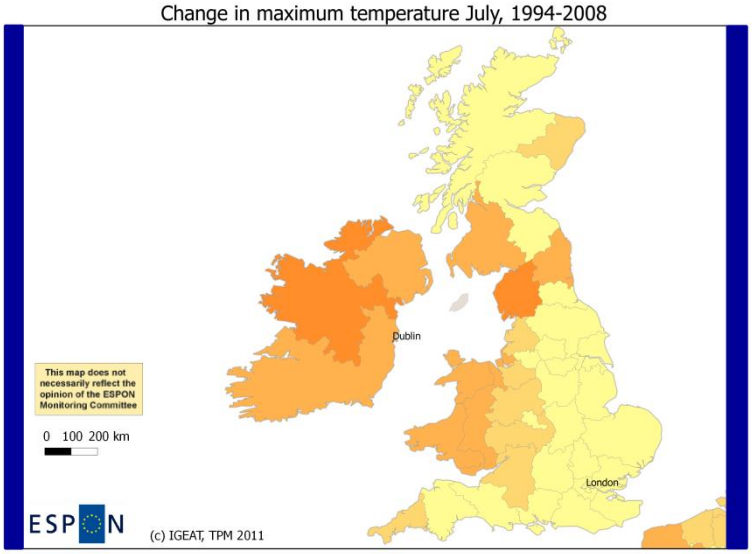
Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ReRisk ESPON Project, 2010
(c) EuroGeographics Association for administrative boundaries

Change in minimum temperature January (°C)
- < -1.4 °C
- -1.4°C - +0.4°C
- +0.4°C - + 2.9°C
- > +2.9°C
- No data

Change in maximum temperature July, 1994-2008

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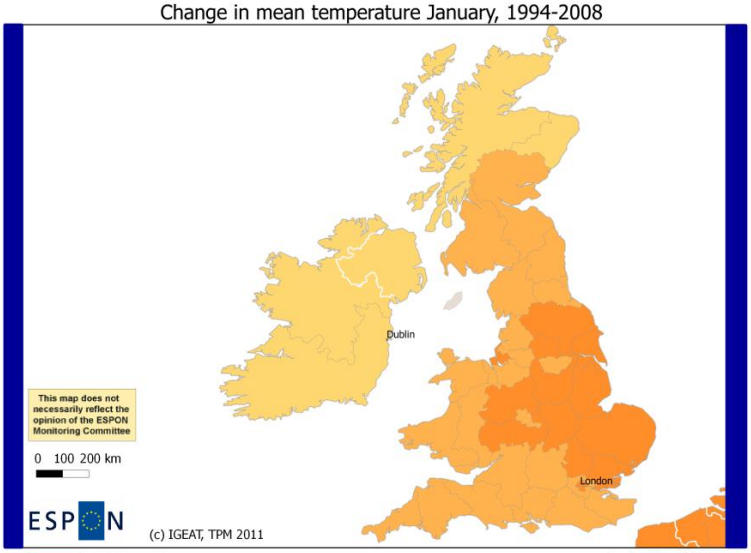
Change in maximum temperature July (°C)
-2.8°C - 0°C
0°C -+0.8°C
+0.8°C - +1.6°C
+1.6°C - +3.5°C
No data

Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ReRisk ESPON Project, 2010
(c) EuroGeographics Association for administrative boundaries

Change in mean temperature January, 1994-2008

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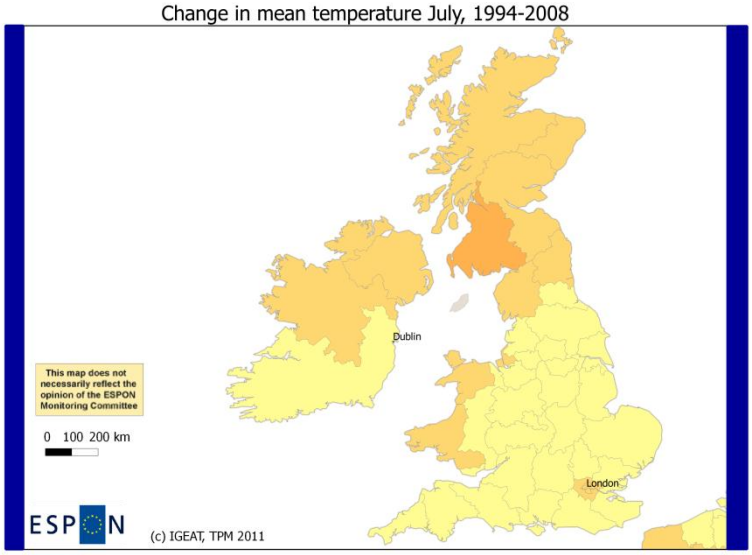
Change in mean temperature January (°C)
-1.5 °C - -0.1°C
-0.1°C - +0.9°C
+0.9°C - +1.6°C
+1.6°C - +2.8°C
No data

Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ReRisk ESPON Project, 2010
(c) EuroGeographics Association for administrative boundaries

Change in mean temperature July, 1994-2008

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Change in mean temperature July (°C)
-0.7°C - 0°C
0°C - +0.3°C
+0.3°C - +0.6°C
+0.6°C - +1.7°C
No data

Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ReRisk ESPON Project, 2010
(c) EuroGeographics Association for administrative boundaries

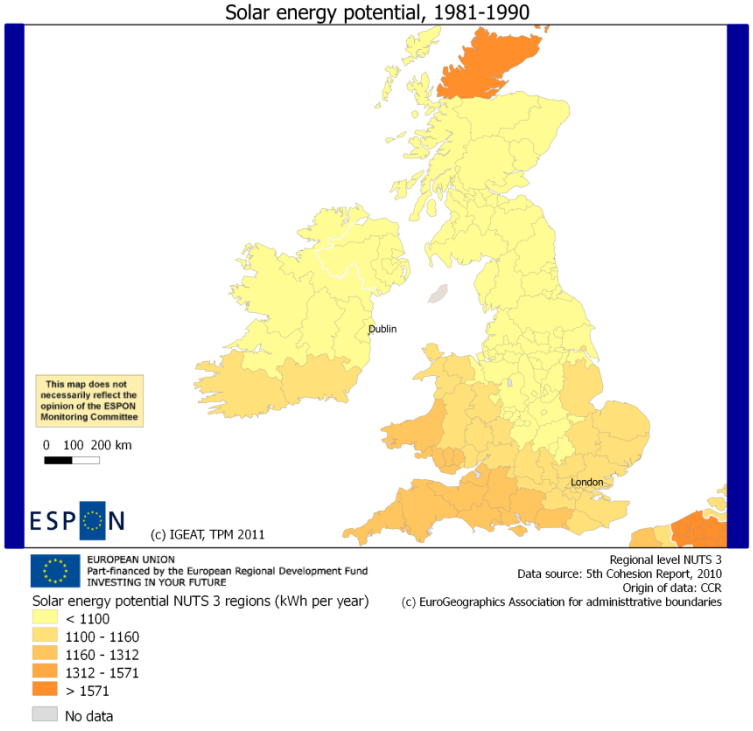
## 4.4 Energy

### a) Comparative analysis

| **Energy** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Indicator* | *value* | *EU* | | *National* | | *Neighbour-hood* | *Typology* | | |
| Solar energy resources, 1981-1990 | 1150 kWh/m2 | -0.49 | | 0.08 | | | 0.11 | | |
| Wind energy potential, 2005 | 2725h | 1.5 | | -0.09 | | | 0.88 | | |
| Fuel costs of freight traffic as % of GDP, 2005 | 1.12% | 0.79 | | 0.19 | | | 0.72 | | |
| Employ-ment in energy intensive industries, 2005 | 0.24% | 0.44 | | -0.42 | | | 0.85 | | |

## b) Regional maps energy

Solar energy potential, 1981-1990

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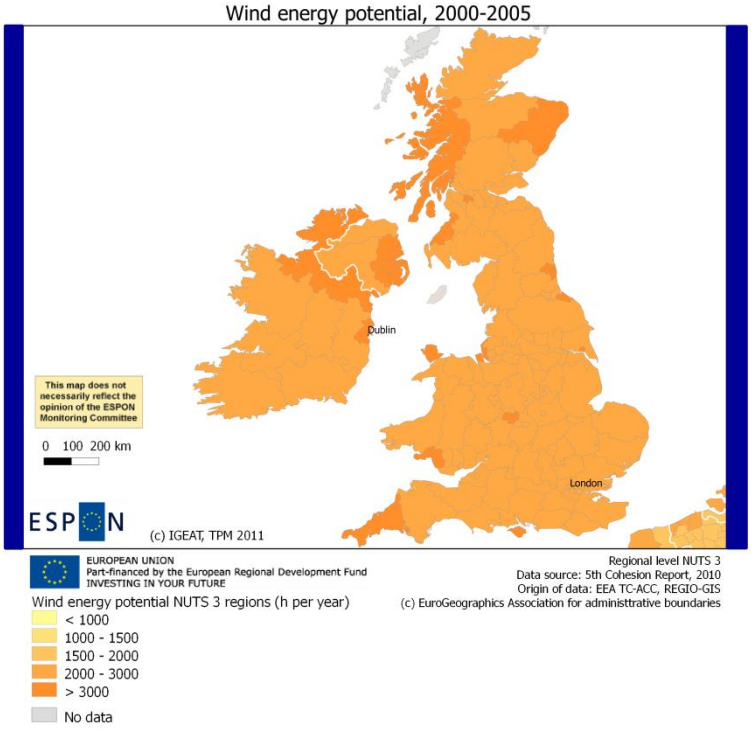
Regional level NUTS 3
Data source: 5th Cohesion Report, 2010
Origin of data: CCR
(c) EuroGeographics Association for administrative boundaries

Solar energy potential NUTS 3 regions (kWh per year)
- < 1100
- 1100 - 1160
- 1160 - 1312
- 1312 - 1571
- > 1571
- No data

Wind energy potential, 2000-2005

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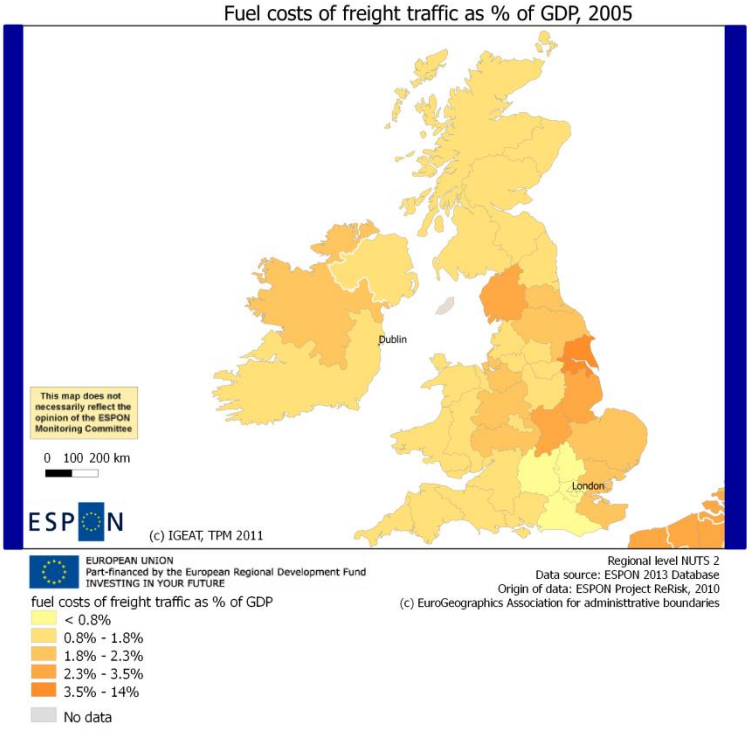
Regional level NUTS 3
Data source: 5th Cohesion Report, 2010
Origin of data: EEA TC-ACC, REGIO-GIS
(c) EuroGeographics Association for administrative boundaries

Wind energy potential NUTS 3 regions (h per year)
- < 1000
- 1000 - 1500
- 1500 - 2000
- 2000 - 3000
- > 3000
- No data

Fuel costs of freight traffic as % of GDP, 2005

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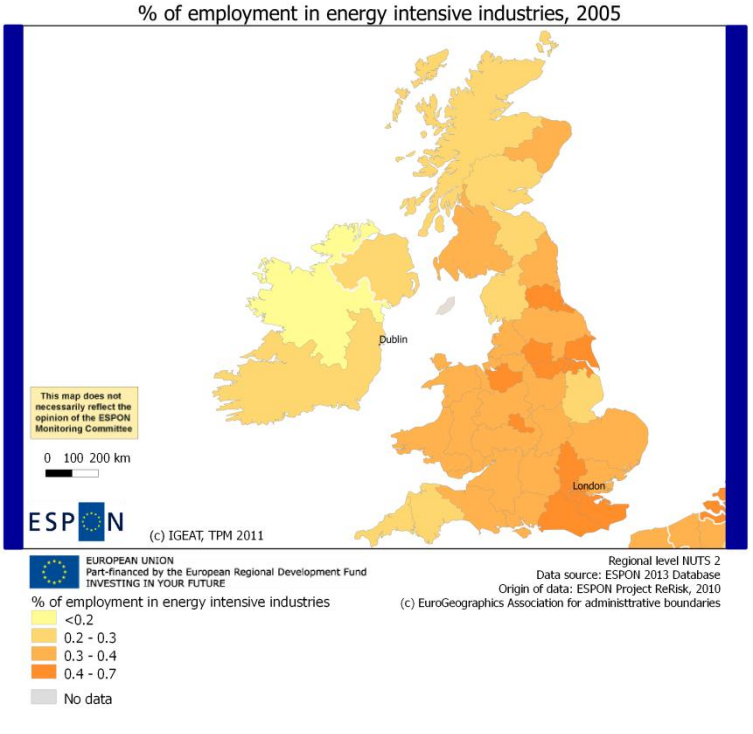
Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ESPON Project ReRisk, 2010
(c) EuroGeographics Association for administrative boundaries

fuel costs of freight traffic as % of GDP
- < 0.8%
- 0.8% - 1.8%
- 1.8% - 2.3%
- 2.3% - 3.5%
- 3.5% - 14%
- No data

% of employment in energy intensive industries, 2005

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Regional level NUTS 2
Data source: ESPON 2013 Database
Origin of data: ESPON Project ReRisk, 2010
(c) EuroGeographics Association for administrative boundaries

% of employment in energy intensive industries
- <0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.7
- No data

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ISBN