

# ESPON Contact Point Luxembourg

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## 2. ECP Information and Progress Meeting

### Presentation of new projects

**12.12.2003**

**DATUR**

**1 Rue de Plébiscite, Luxembourg**

# ESPON Contact Point Luxembourg

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- First outcomes and progresses made in some selected projects of the 2nd ESPON tendering round:
  - ESPON 1.3.1  
The spatial effects and management of natural and technological hazards in general and in relation to climate change
  - ESPON 1.3.2  
Territorial trends of the management of the natural heritage
  - ESPON 1.1.4  
The spatial effects of demographic trends and migration
  - ESPON 2.1.4  
Territorial trends of energy services and networks and territorial impact of EU energy policy

# **ESPON Contact Point Luxembourg**

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**Simone Reinhart**

**ESPON 1.3.1:**

**THE SPATIAL EFFECTS AND MANAGEMENT OF  
NATURAL AND TECHNOLOGICAL HAZARDS IN  
GENERAL AND IN RELATION TO CLIMATE  
CHANGE**

**Lead Partner:**

**Geologian Survey of Finland**

# ESPON 1.3.1: State of the art (I)

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## ■ Natural hazards

- Floods ✓ DEVELOPED
- Volcanic activities ✓ DEVELOPED
- Earthquakes ✓ DEVELOPED
- Landslides/avalanches still in process
- Droughts - appears impossible
- Forest fires still in process
- Extreme precipitation ? needs more research
- Extreme temperatures ? needs more research
- Winter storms ✓ DEVELOPED

## ESPON 1.3.1: State of the art (II)

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- Technological hazards
  - Nuclear power plants √ DEVELOPED
  - Production plants of hazardous goods data refused
  - Hazardous waste deposits no data
  - Maritime transport of hazardous goods still in process
  - Large Dams ? partly finished

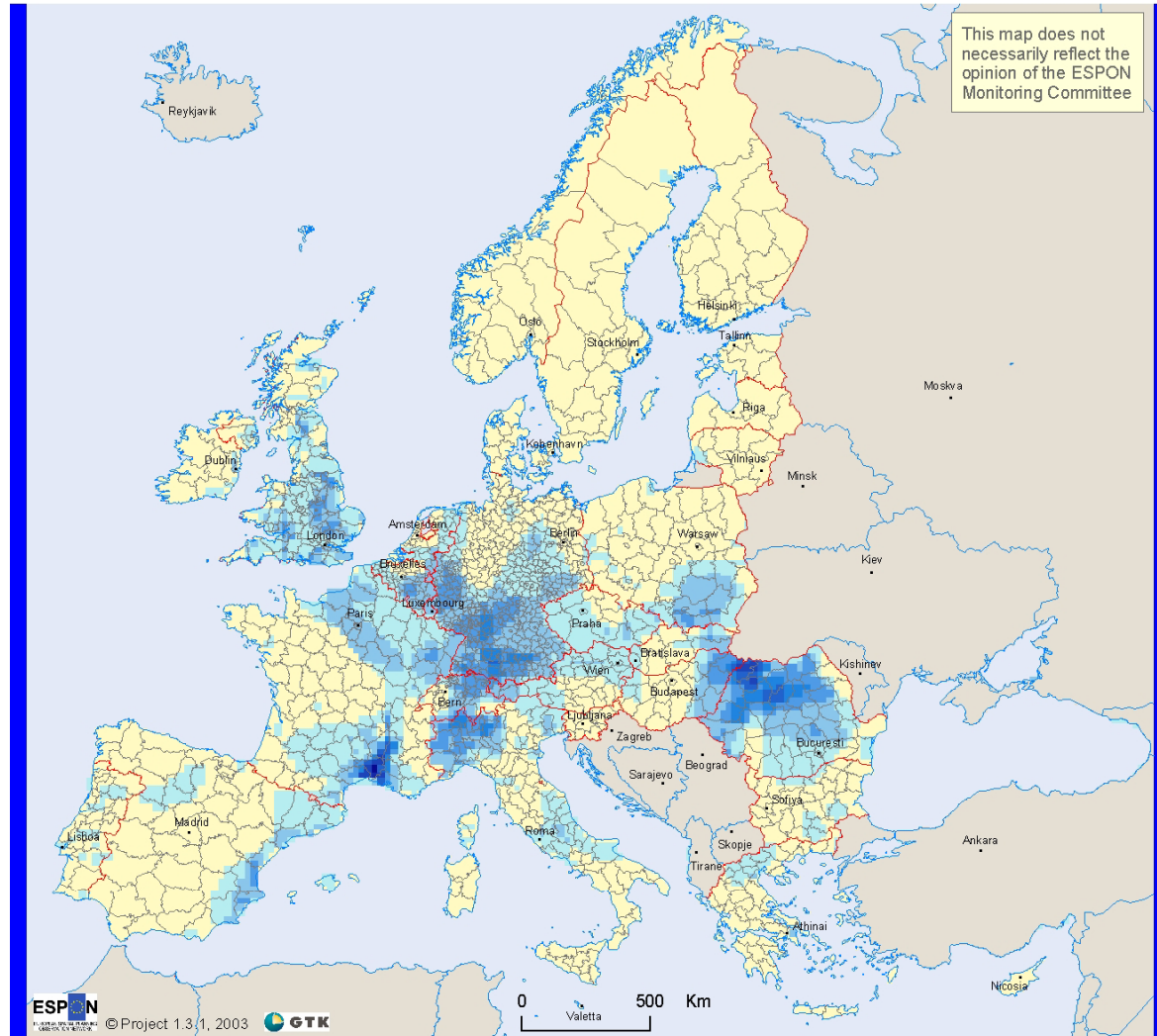
# ESPON 1.3.1: Indicators for floods

Natural and technological hazards	Driving forces  Indicators of influence factors on hazards and damage potentials	Pressure  Indicators of hazards and damage potentials	State  Indicators of spatial risk / spatial security	Impact  Indicators of disaster	Response  Indicators of disaster response / risk management (indicators of prevention, mitigation, preparedness, response, recovery)
<b>Floods</b>	<ul style="list-style-type: none"> <li>• Growth of population and GDP in areas that have been flooded</li> <li>• Increase of factors that influence floods (e.g. settlement extension, climate change)</li> </ul>	<ul style="list-style-type: none"> <li>• Areas that have been flooded</li> <li>• Population density/GDP (in areas that potentially can be flooded)</li> </ul>	<ul style="list-style-type: none"> <li>• Combined indicator of Population density/GDP and flooded areas according to flood frequency since 1985</li> </ul>	<ul style="list-style-type: none"> <li>• Clasification of flooded areas according to flood frequency since 1985</li> </ul>	<ul style="list-style-type: none"> <li>• E.g. Building restrictions (retention areas) / safety measures in flooded areas</li> </ul>

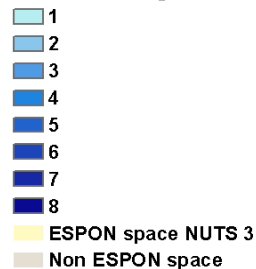
# ESPON 1.3.1: Map of flood events (I)

Large river flood  
events  
recurrence  
1987-2002 in  
Europe

Large river flood events recurrence 1987-2002 in Europe



Number of large flood events



Origin of the data: © EuroGeographics Association for the administrative boundaries  
Large flood areas © Dartmouth Flood Observatory  
Flood areas © ESA - Earth observation- Earth online

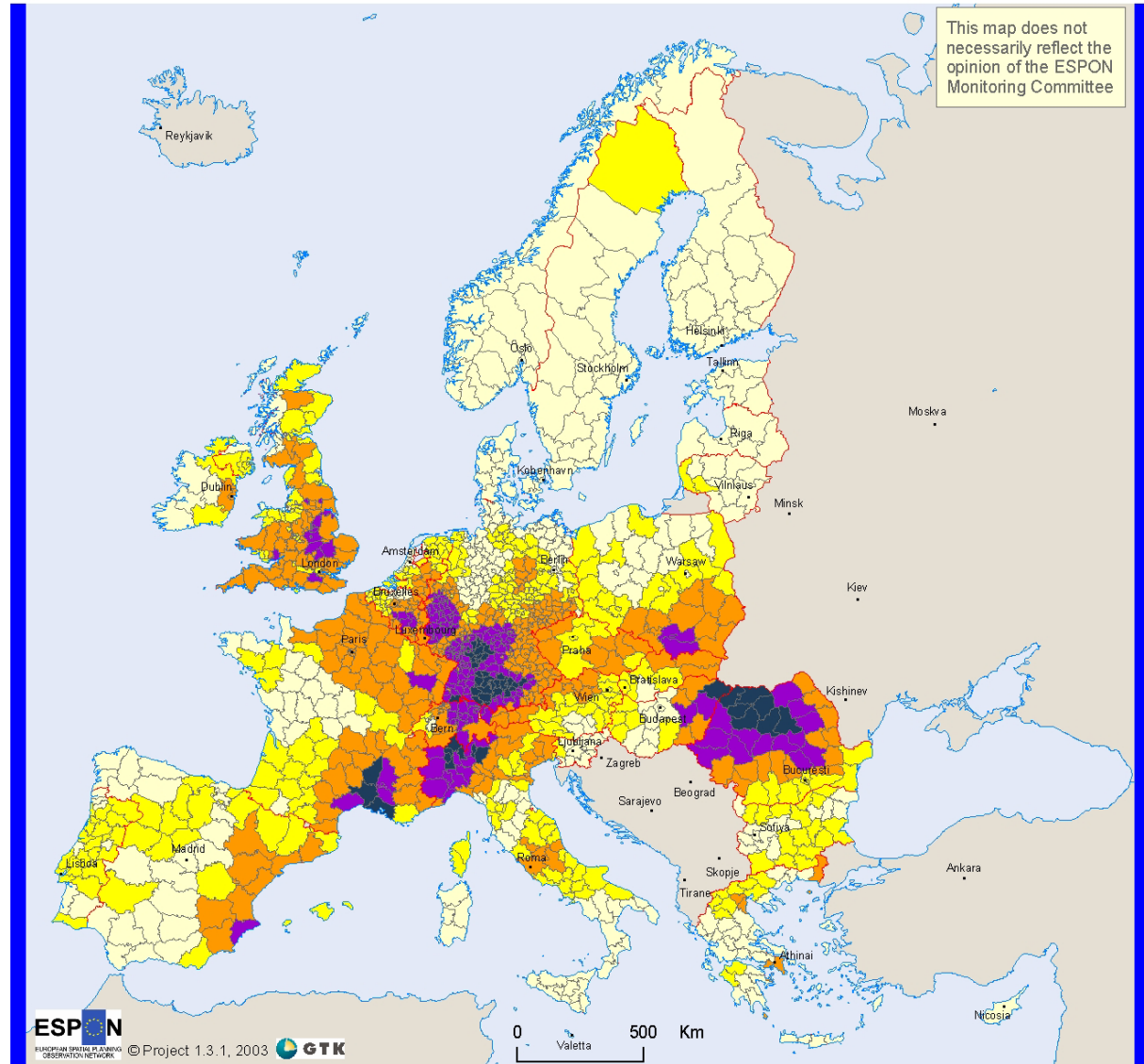
Source: ESPON Data Base

This map shows the large, discrete flood events in Europe during 1987-2002. However, repeated flooding in some regions is a complex phenomenon and this map is a compromise between aggregating and dividing such events. The flood events from the years 1989, 1990, 1991, 1995 (except Rhine) and 1996 have not been taken into account because of the lack of data. The information presented in this map is derived mainly from remote sensing source.

# ESPON 1.3.1: Map of flood events (II)

Large river  
flood hazards  
in Europe  
(NUTS 3)

Large river flood hazard in Europe (NUTS 3)



**Flood hazard intensity**

- Very low
- Low
- Moderate
- High
- Very high
- Non ESPON space

Origin of the data: ©EuroGeographics Association for the administrative boundaries  
 Large flood areas ©Dartmouth Flood Observatory  
 Flood areas ©ESA - Earth observation- Earth online

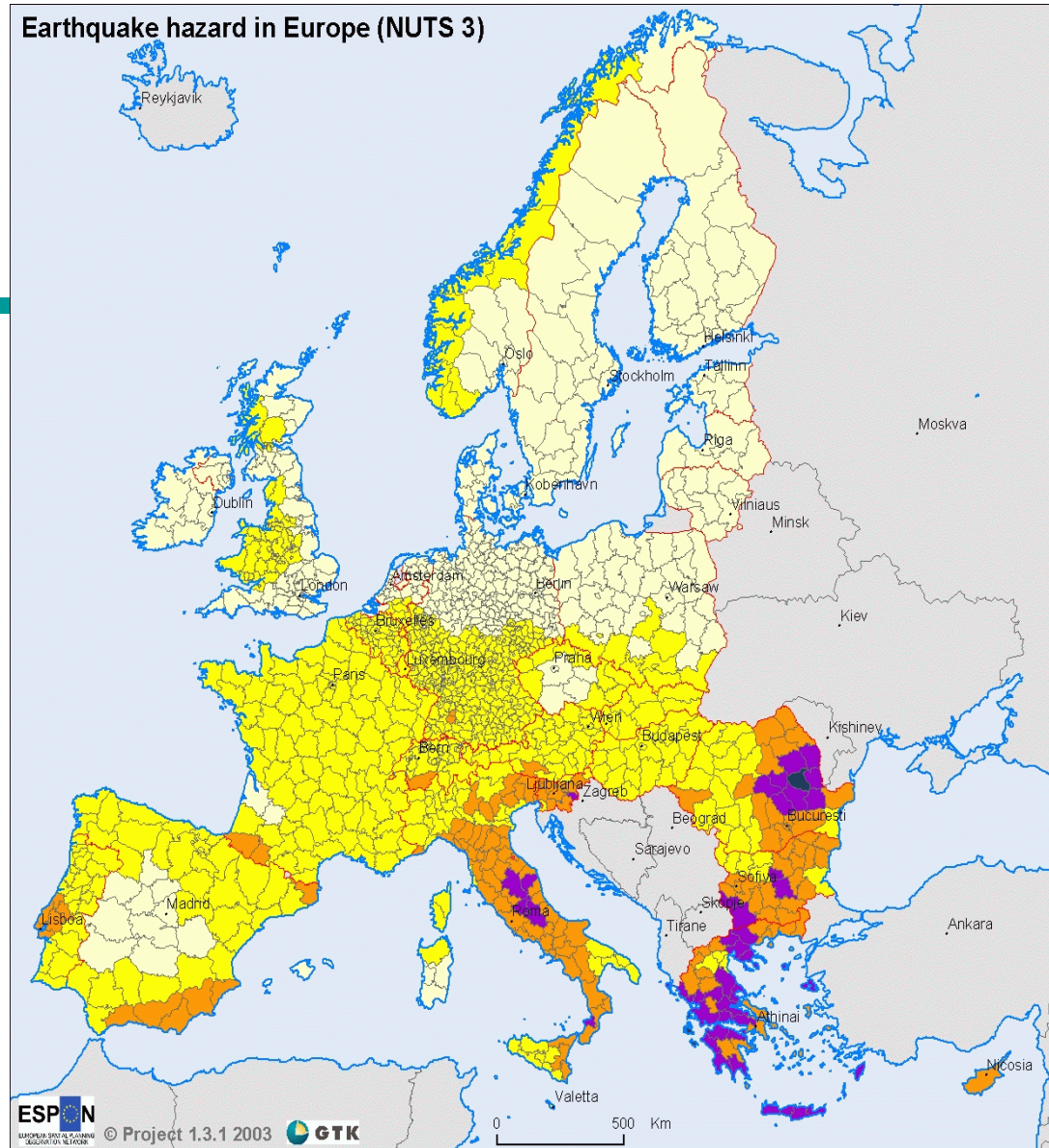
Source: ESPON Data Base

This map shows the hazard intensity based on average number of large flood events on NUTS 3 level during 1987-2002. Each NUTS3 region has been given an average of the large flood event that fall inside it. To the first class "Very low hazard intensity" only the regions without large flood events are included.

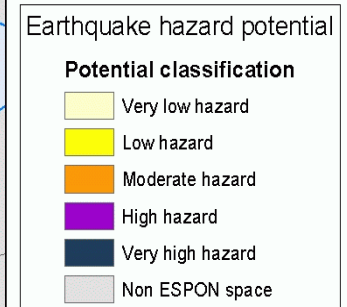


# ESPON 1.3.1: Map of earthquakes

## Earthquake hazards in Europe (NUTS 3)

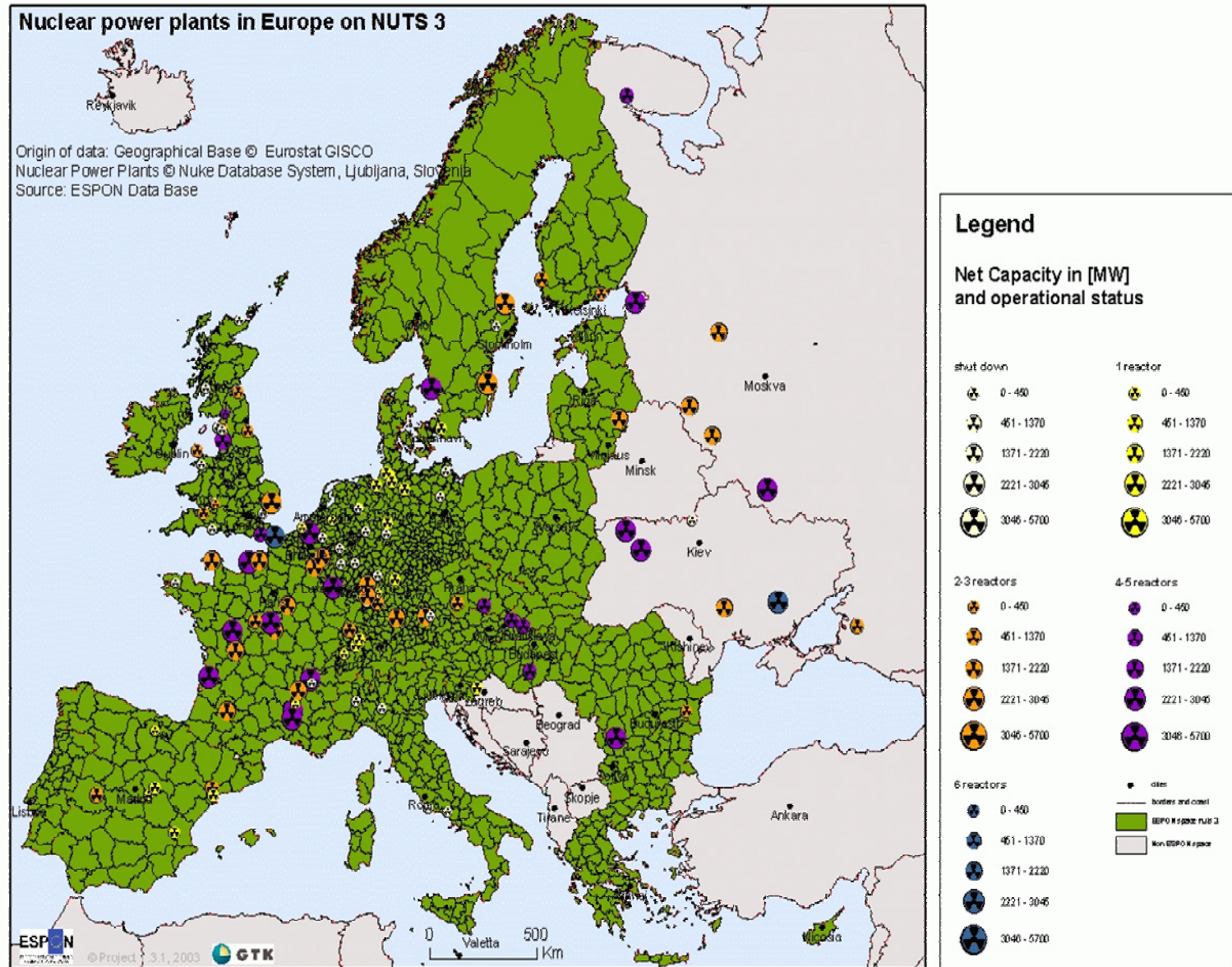


The classification is based on the average value of pga/acceleration of gravity (%) in a NUTS 3 area.



# ESPON 1.3.1: Map of nuclear power plants

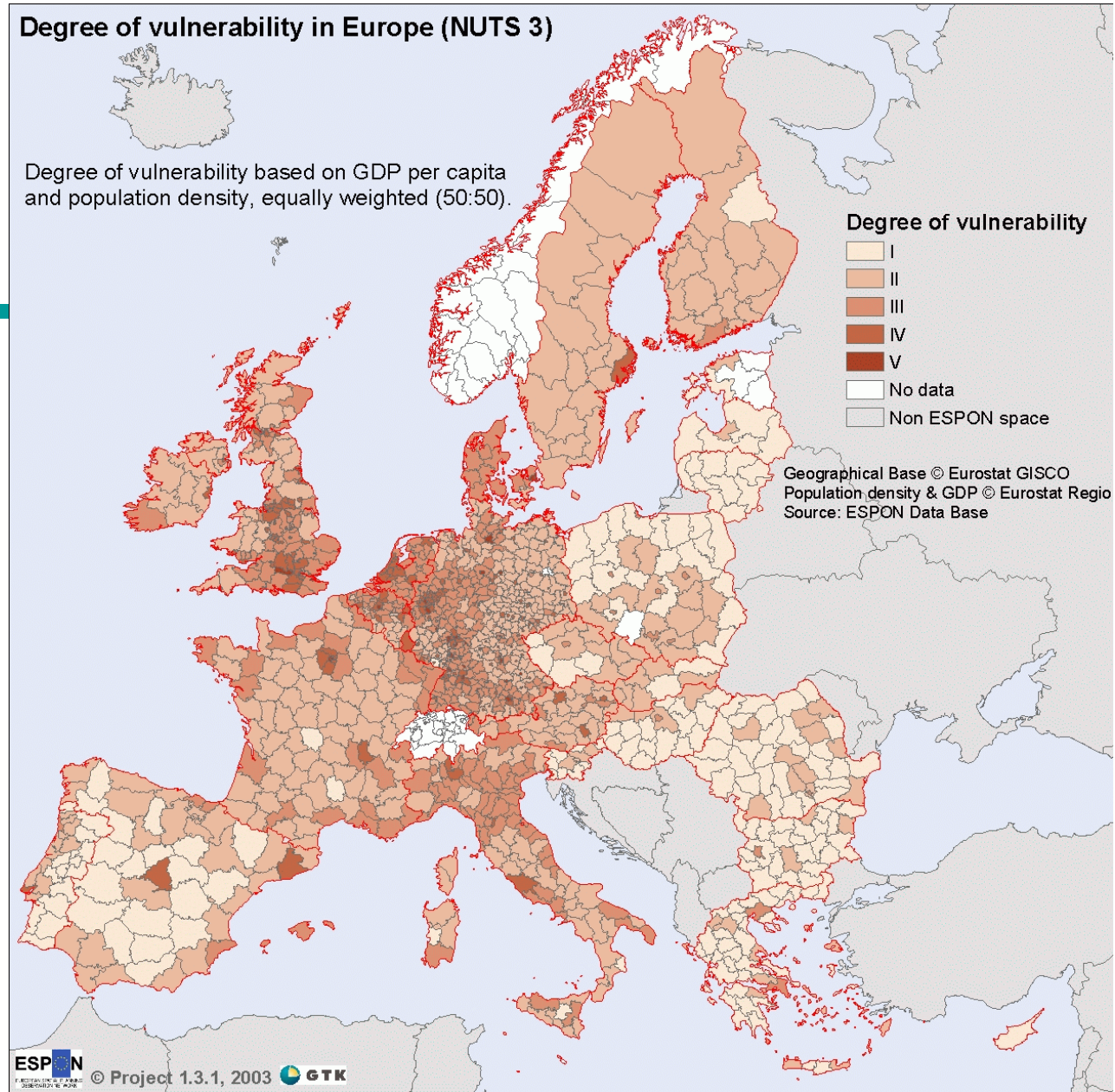
## Nuclear power plants in Europe (NUTS 3)



## ESPON 1.3.1: Map of vulnerability

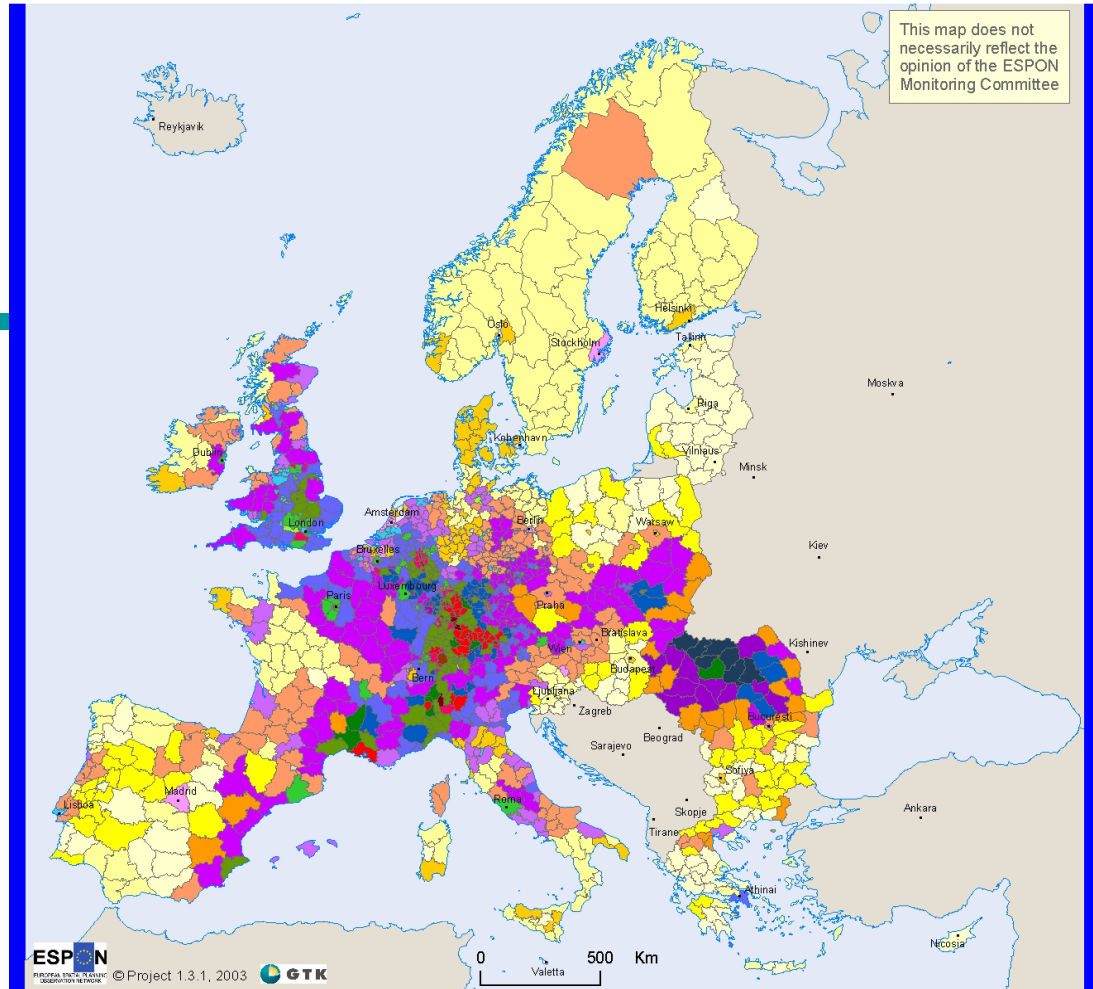
### Degree of vulnerability in Europe (NUTS 3)

Degree of vulnerability based on GDP per capita and population density, equally weighted (50:50).



# ESPON 1.3.1: Map of flood risk

Flood risk in  
Europe (NUTS 3)



Origin of the data: ©EuroGeographics Association for the administrative boundaries  
Large flood areas ©Dartmouth Flood Observatory  
Flood areas ©ESA - Earth observation- Earth online

Source: ESPON Data Base

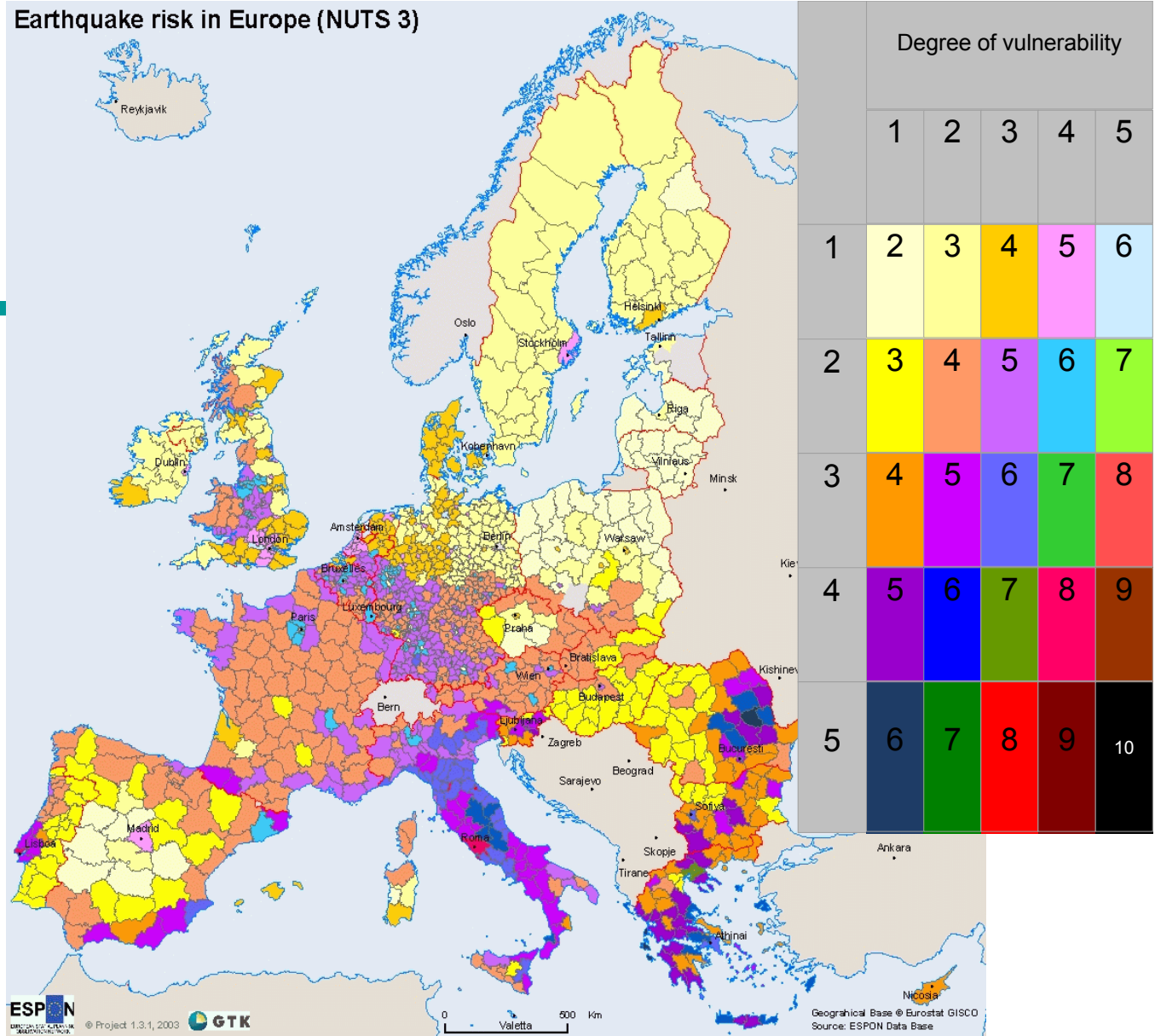
### Typology of the regions

Legend of risk maps	Degree of vulnerability				
	1	2	3	4	5
Intensity of river floods	1	2	3	4	5
1	2	3	4	5	6
2	3	4	5	6	7
3	4	5	6	7	8
4	5	6	7	8	9
5	6	7	8	9	10

# ESPON 1.3.1: Map of earth- quake risk

Earthquake  
risk in Europe  
(NUTS 3)

Earthquake risk in Europe (NUTS 3)



## ESPON 1.3.1: Work to do

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- Finalize indicators, according to data availability
- Focus on climate change
- Test applicability of indicators in pilot areas
- Develop response strategies
- Formulate EU policies
- Cooperate with other TPG's – what are the implications of hazards on spatial development?

# **ESPON Contact Point Luxembourg**

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**Simone Reinhart**

**ESPON 1.3.2:  
TERRITORIAL TRENDS OF THE MANAGEMENT OF  
THE NATURAL HERITAGE**

**Lead Partner:  
Royal Haskoning, The Netherlands**

## ESPON 1.3.2: Europe's environment (I)

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### ■ Threats

- half of European breeds are at risk of extinction
- European trends in farm structure, farm management and farmland species have resulted in species-rich agricultural habitats declining considerably during recent decades
- increasing land-use pressures from transport, urbanization and intensive agriculture
- diminishing remaining semi-natural remote areas
- land privatization and restitution (Central and Eastern Europe and EECCA)



## ESPON 1.3.2: Europe's environment (II)

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- Protection
  - region with the highest proportions of breeds are under active conservation
  - 600 different types of designation of protected areas, and more than 65 000 designated sites
  - designated sites under national designations in central and eastern European countries represent 9% of the total region area; in western countries this is 15%

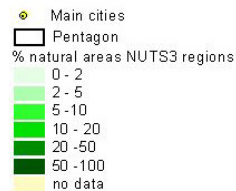
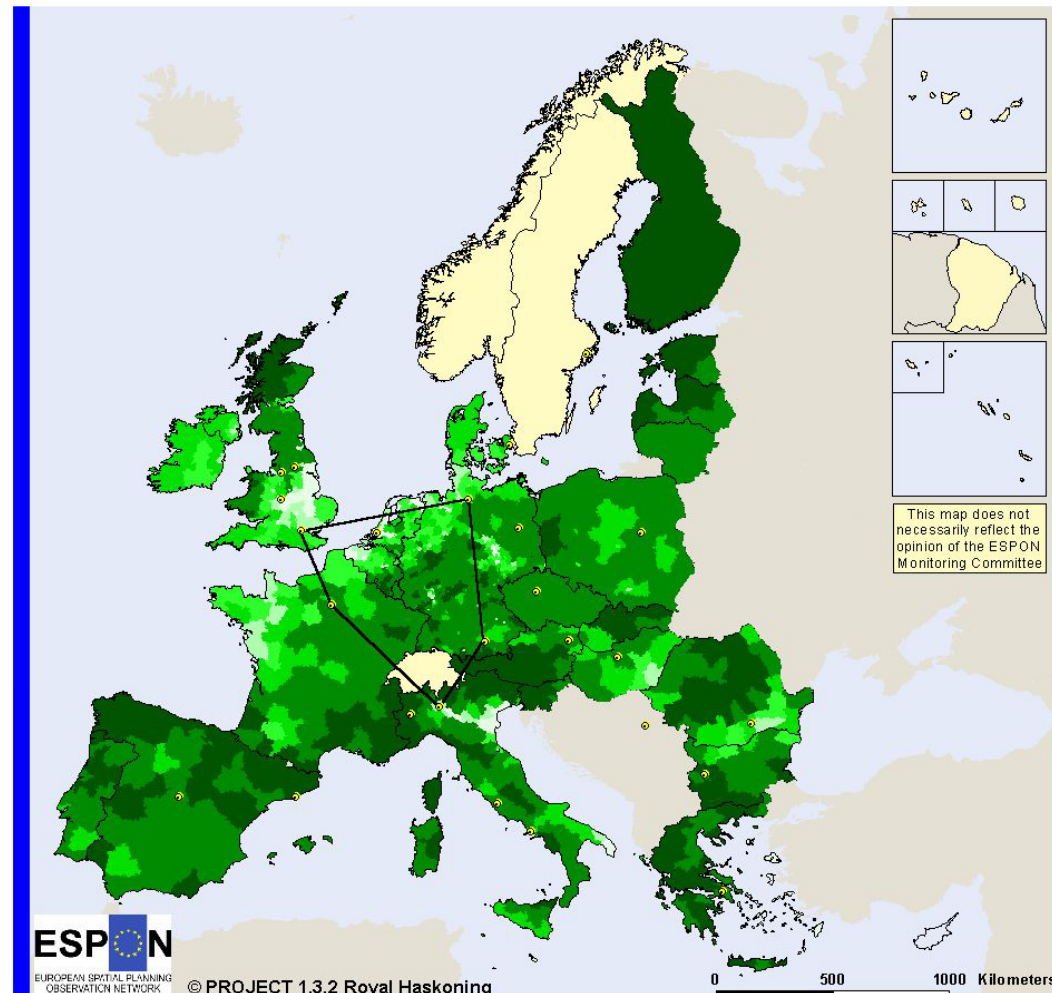
## ESPON 1.3.2: Spatial developments

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- Spatial developments
  - continuous pressure on area occupied by natural heritage both in terms of total area covered and fragmentation
  - large natural areas found Finland, the Alps, the Cantabrian mountains, the Pyrenees, the Carpathians, Greece and Scotland
    - dominance of mountainous regions is obvious
    - relative inaccessible and remote locations of these areas protect against development pressures
  - in rest of Europe natural areas are highly fragmented

# ESPON 1.3.2: Map of physical structure (I)

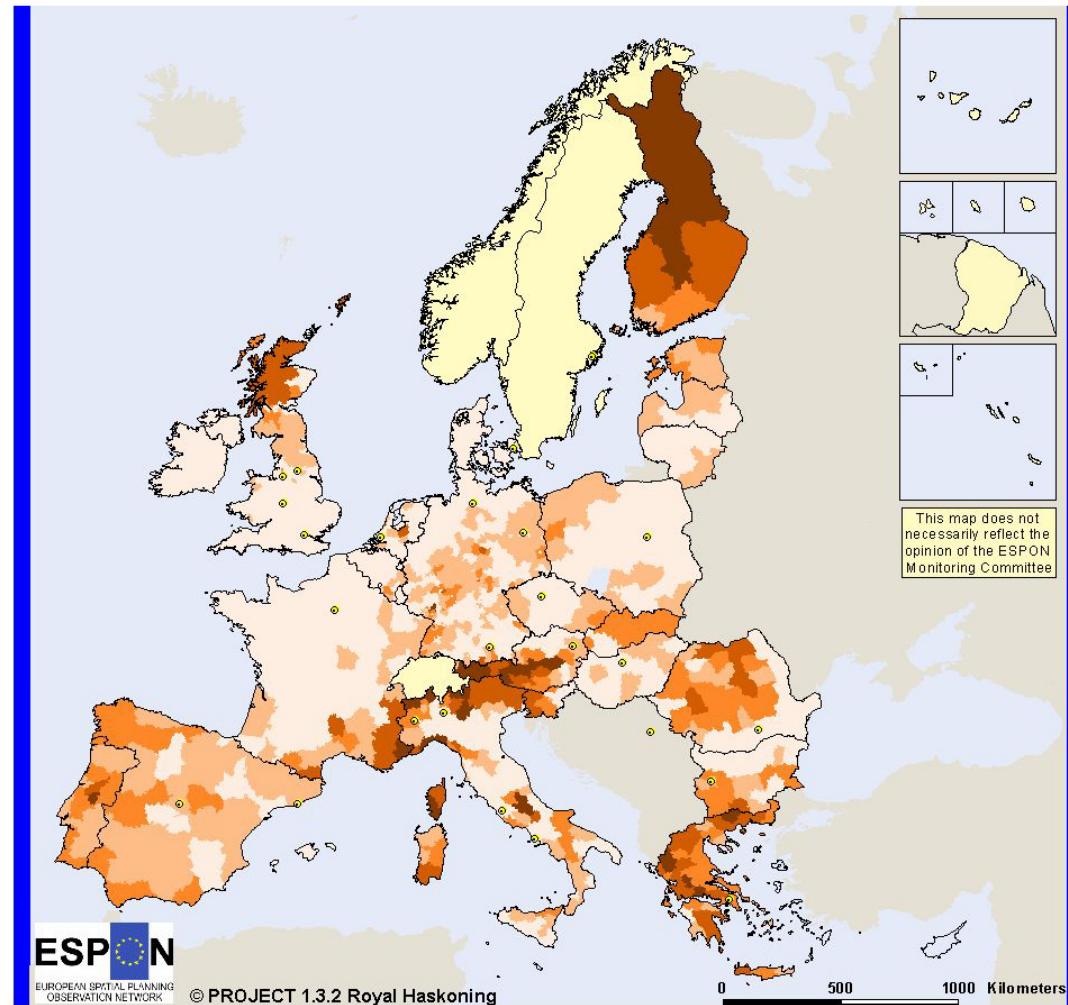
Percentage of  
natural area for  
NUTS 3 regions



© EuroGeographics Association for the administrative boundaries  
Sources: IUCN, Eurostat, ESPON Data Base, EEA

# ESPON 1.3.2: Map of physical structure (II)

Mean size of natural  
area for NUTS 3  
regions

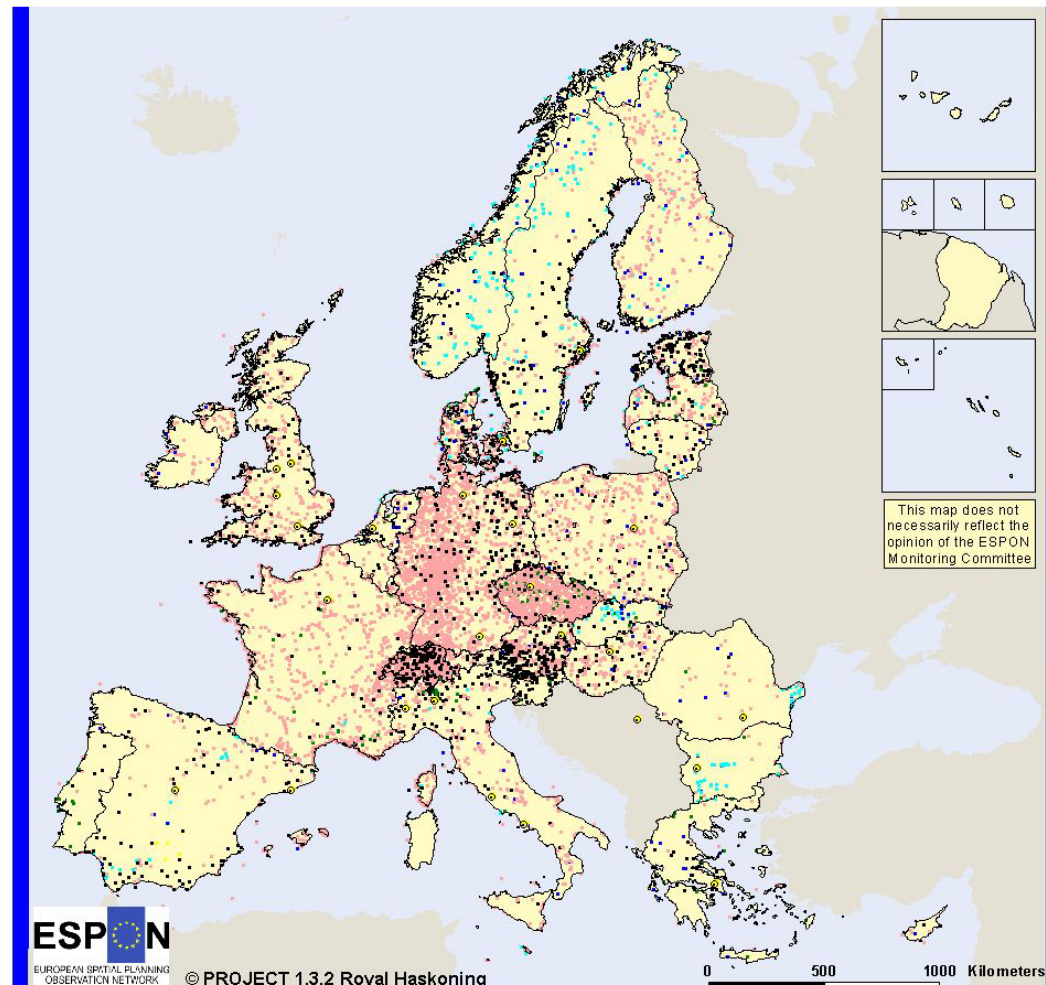


● Main\_cities.shp  
Average size natural area in ha  
0 - 250  
250 - 500  
500 - 1000  
1000 - 2500  
2500  
No data

© EuroGeographics Association for the administrative boundaries  
Sources: IUCN, Eurostat, ESPON Data Base, EEA

# ESPON 1.3.2: Map of physical structure (III)

Distribution of  
designated natural  
areas (IUCN)



- Main cities
- Designated areas with IUCN categories
- I
- Ia
- Ib
- II
- III
- IV
- V

© EuroGeographics Association for the administrative boundaries  
Sources: IUCN, Eurostat, ESPON Data Base, EEA

## ESPON 1.3.2: Enhancing territorial cohesion

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- The protection and enhancement of the natural heritage is well served by territorial cohesion.
- Relevant objectives of the ESDP:
  - polycentric urban development
  - balanced development
  - sustainable development
- ESDP and Natura 2000 aim at enhancing the natural heritage by increasing the natural area and by forming an ecological network.

# **ESPON Contact Point Luxembourg**

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**Christian Muschwitz**

**ESPON 1.1.4:**

**THE SPATIAL EFFECTS OF DEMOGRAPHIC  
TRENDS AND MIGRATION**

**Lead Partner:**

**Swedish Institute for Growth Policy Studies (ITPS)**

## ESPON 1.1.4: State of the art (SIR)

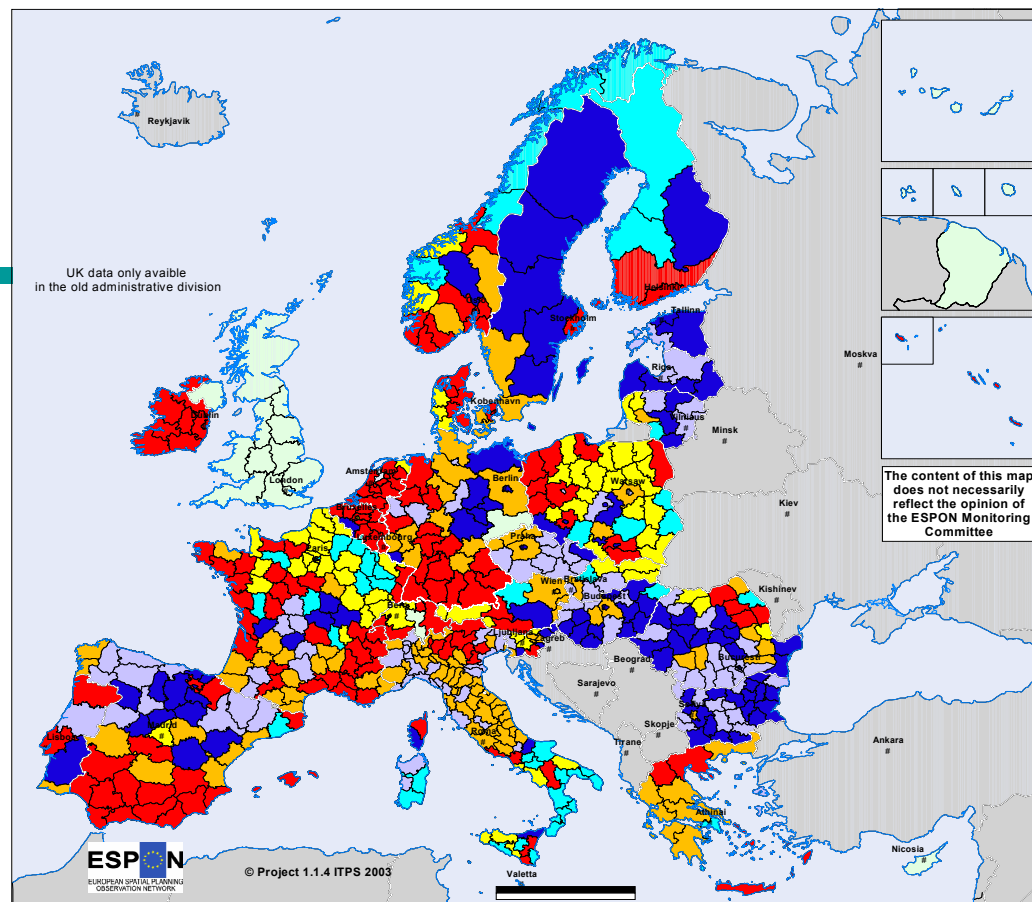
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- Population development - total
- Natural population development
- Fertility development
- Ageing
- Dependency ratios
- Reproduction potentials
- Migratory balances
- Depopulation areas
- The need for replacement migration (intro to some case studies, all of them not yet decided)
  - - ageing
  - - labour shortage
- Typologies



# ESPON 1.1.4: Population change

Population change  
1966-1999,  
six types



## ESPON 1.1.4: Preliminary results

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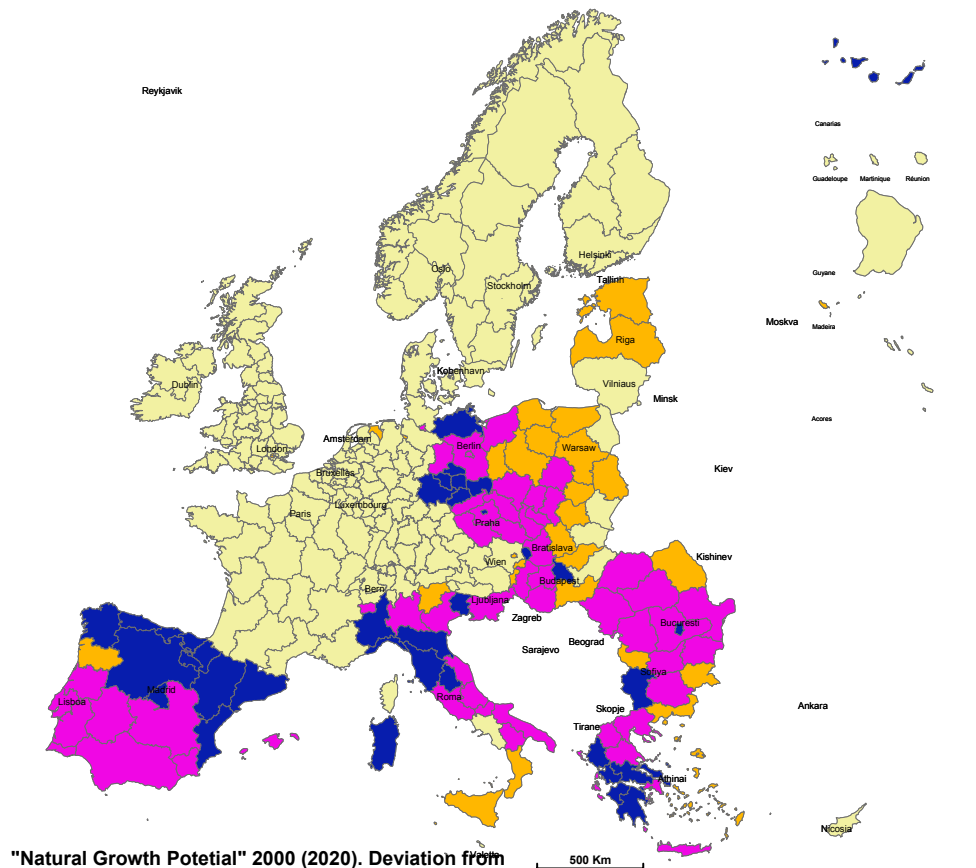
- Natural population development and ageing
  - Population change – more driven by migration than natural population development
  - Half of the regions have a natural population decrease
  - Ageing – more a function of earlier out-migration than low fertility
  - No connection between ageing and total population change
  - No connection between ageing and net-migration today – exception the Nordic countries
  - Connection – ageing and dependency rates
  - In Southern Europe – ageing and low fertility reinforce each other; consequences for the natural population development (reproduction potential)

# ESPON

## 1.1.4: Growth potential

Natural population  
growth potential  
2000/2020

ESPON Space



"Natural Growth Potetial" 2000 (2020). Deviation from "Europe 29" average. Cohort 1991-2000/Cohort 1971-1980 (20-29 in 2020/20-29 in 2000).

Geographical Base: Eurostat GISCO  
Regional Level: NUTS 2 © ITPS 1.1.4

- "Europe 29" average or "better"
- Less than 1/2 STD "negative" deviation
- 1/2 to 1 STD "negative" deviation
- 1 STD deviation or "worse"

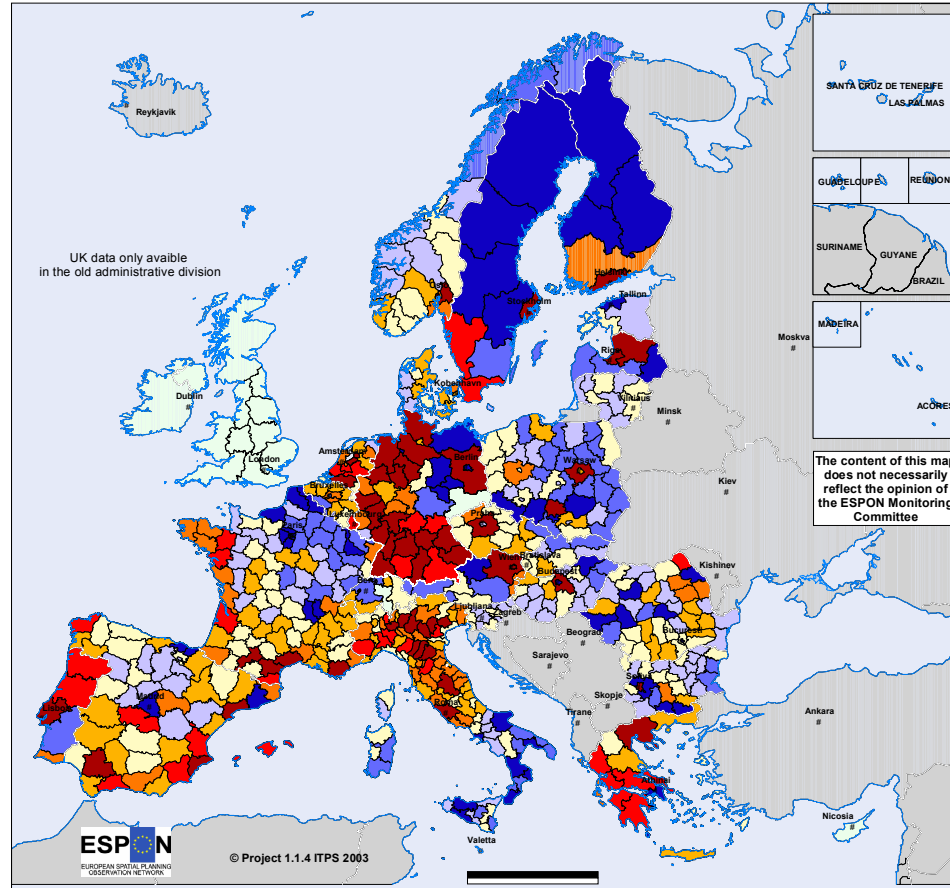
## ESPON 1.1.4: Preliminary results

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- Migration within and between the European countries
  - Borders – a hampering factor
  - European growth zones – in-migration
  - Economic discrepancy – still a driving force but weaker than before
  - Suburbanisation and peri-urbanisation internal migration (redistribution of people from the centre to the surrounding areas)
  - Youngsters to the metro areas (studies, urban life-styles) – middle-aged and elderly people to the “peripheral” areas (environmental factors)
  - Rural exodus still important
  - In the Nordic countries and Eastern Europe – movements from peripheral areas to metropolitan areas are still of great importance
  - “Monocentric” development at the European level – “polycentric” development at the regional level

# ESPON 1.1.4: Migratory balance

Migratory balance  
1996-1999



Origin of data: EU15 and CC's: Eurostat,  
Norway and Switzerland: National Statistics Offices  
Source: ESPON Database



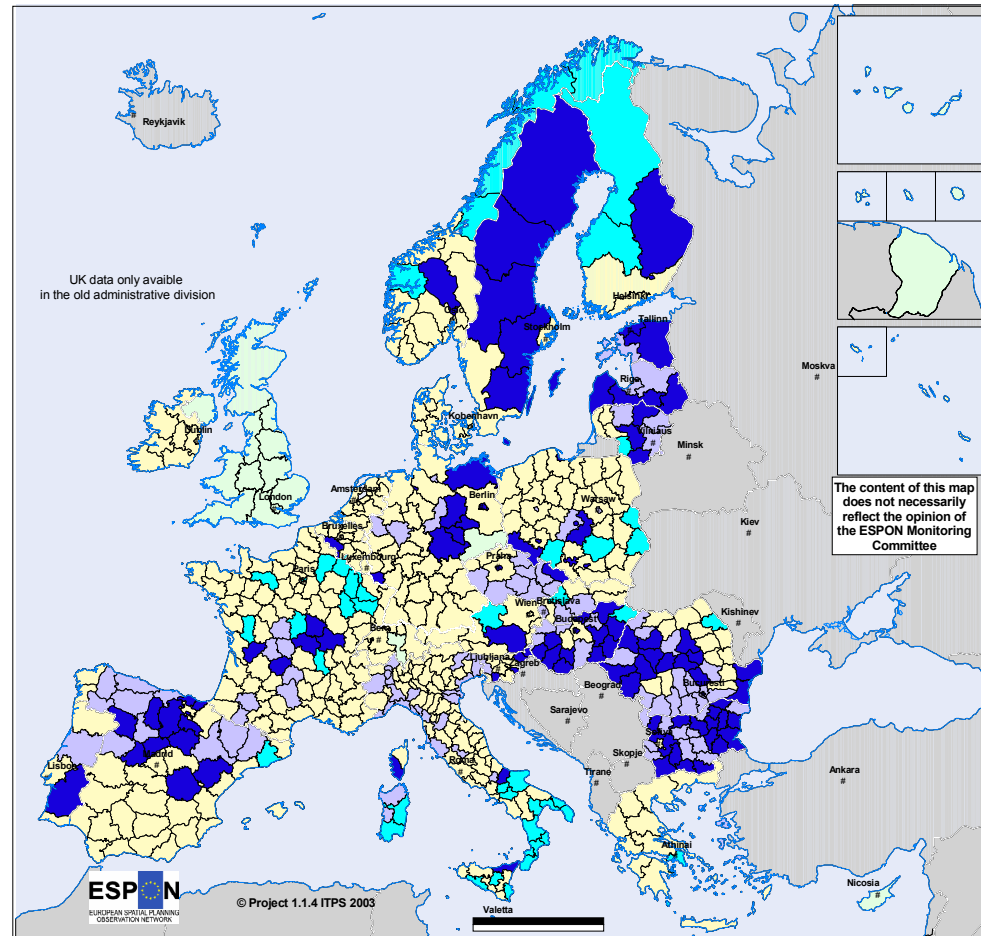
## ESPON 1.1.4: Preliminary results

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- Fertility, migration and depopulation
  - Most negative development:
    - most sparsely populated areas in France, Spain and Portugal
    - northern and southern parts of eastern Europe
    - peripheral regions of Sweden and Finland
  - Very strong depopulation is found in:
    - Territories in countries with very low fertility rates and out-migration
  - Analyses and maps based on both direct and indirect depopulation indicators

# ESPON 1.1.4: Depopulation areas

Depopulation  
areas 1996-1999



Origin of data: EU15 and CC's: Eurostat,  
Norway and Switzerland: National Statistics Offices  
Source: ESPON Database



## ESPON 1.1.4: Preliminary results

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### ■ Ageing, labour shortage and “replacement migration”

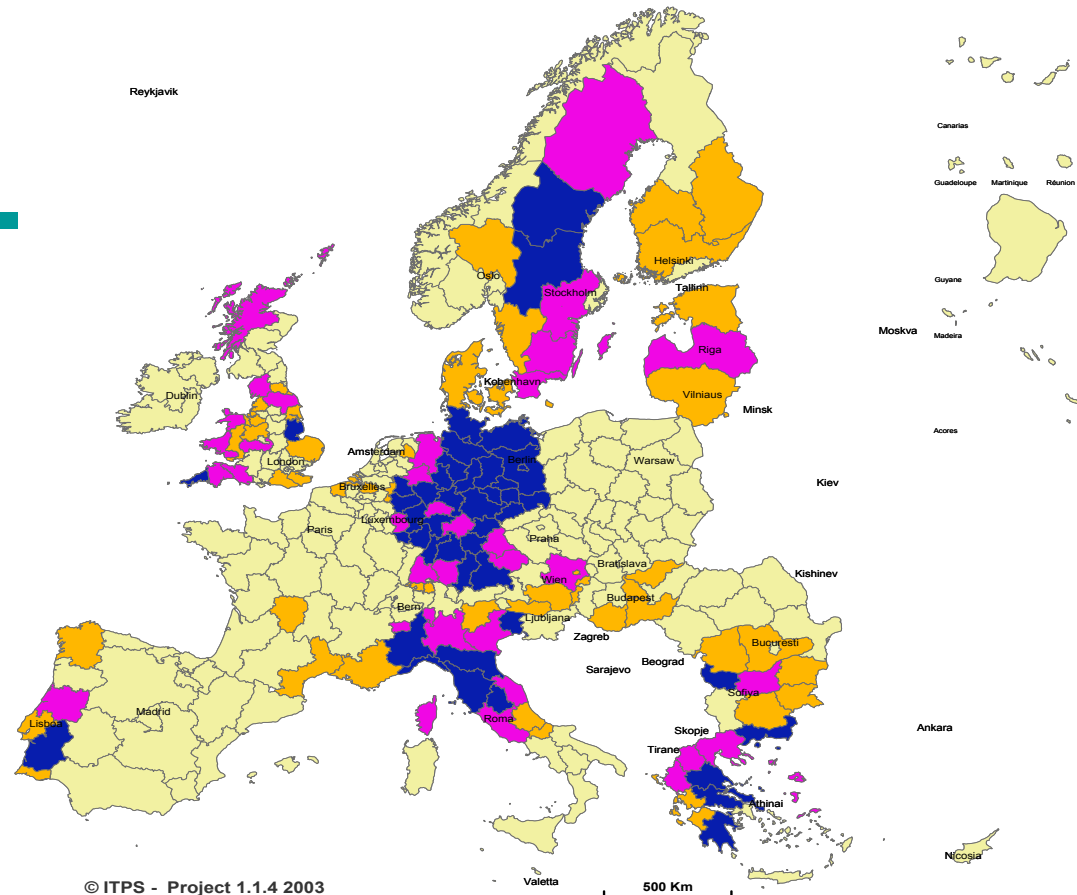
#### In an initial phase

- Two types of problems:
  - Ageing
  - Labour shortage
- Case studies with regard to e.g. labour shortage (not decided yet)
  - Regions dominated by labour-intensive production
  - Regions dominated by labour-intensive service production (e.g. elderly care)
  - Metropolitan areas (specialists, low-skilled, different segments)
- Political controversial topic!



# ESPON 1.1.4: Ageing labour force

Ageing labour  
force 2000



© ITPS - Project 1.1.4 2003

**Ageing Labour force 2000. Deviation from "Europe 29" average.  
55-64/20-64 years.**

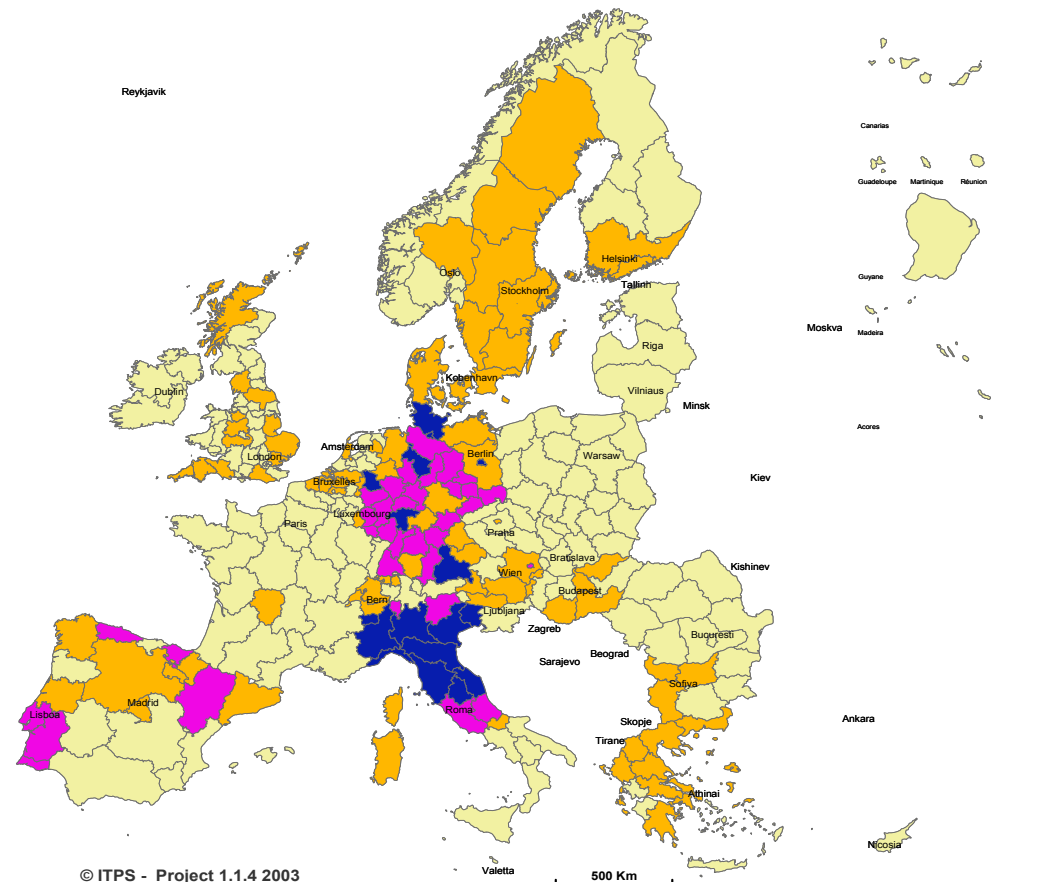
Geographical Base: Eurostat GISCO  
Regional Level: NUTS 2

- "Europe 29" average or "better"
- Less than 1/2 STD "negative" deviation
- 1/2 to 1 STD "negative" deviation
- 1 STD deviation or "worse"

# ESPON 1.1.4: Labour force replacement

Labour force  
replacement ratio  
2000

ESPON Space



© ITPS - Project 1.1.4 2003

"Labour Force" Replacement Ratio 2000. Deviation from "Europe 29" average. 10-19/55-64 years

Geographical Base: Eurostat GISCO  
Regional Level: NUTS 2

- "Europe 29" average or "better"
- Less than 1/2 STD "negative" deviation
- 1/2 to 1 STD "negative" deviation
- 1 STD deviation or "worse"

## ESPON 1.1.4: Work to do

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- Complete the data set
- Add data - new data, better data
- Refine the indicators
- More sophisticated analyses
- Develop and refine the typologies
- The temporal dimension will be more pronounced
- A dynamic approach – processes more explicitly analysed
- Replacement migration (ageing, labour shortage) - more explicitly analysed
- More explicit policy implications and recommendations

# **ESPON Contact Point Luxembourg**

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**Christian Muschwitz**

**ESPON 2.1.4:**

**TERRITORIAL TRENDS OF ENERGY SERVICES AND  
NETWORKS AND TERRITORIAL IMPACT EU ENERGY  
POLICY**

**Lead Partner:**

**Centro de Estudos em Economia da Energia, dos  
Transportes e do Ambiente (CEEETA), Portugal**

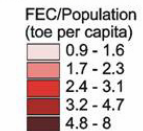
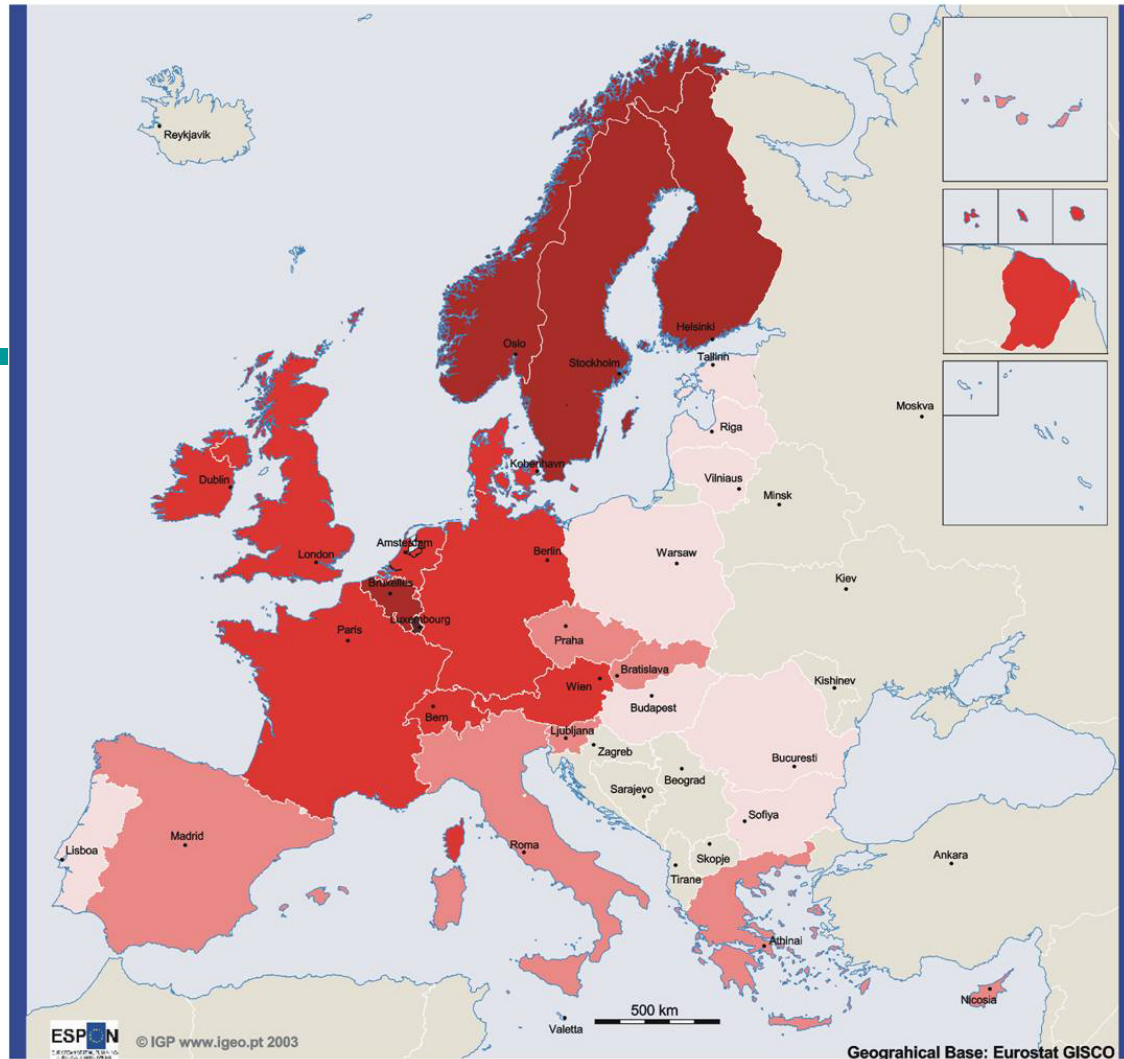
## ESPON 2.1.4: Preliminary results

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- Energy indicators
  - A. Economy, society and energy  
e.g. TPES/population (toe per capita)
  - B. Reliable supplies of energy  
e.g. Proportion of electricity generated by renewables (%)
  - C. Competitive energy markets  
e.g. Fuel price indices for the industrial sector –  
heavy fuel oil, gas, electricity, coal
  - D. Environmental objectives  
e.g. Greenhouse gas emissions – global impacts  
(emissions, Kyoto targets)

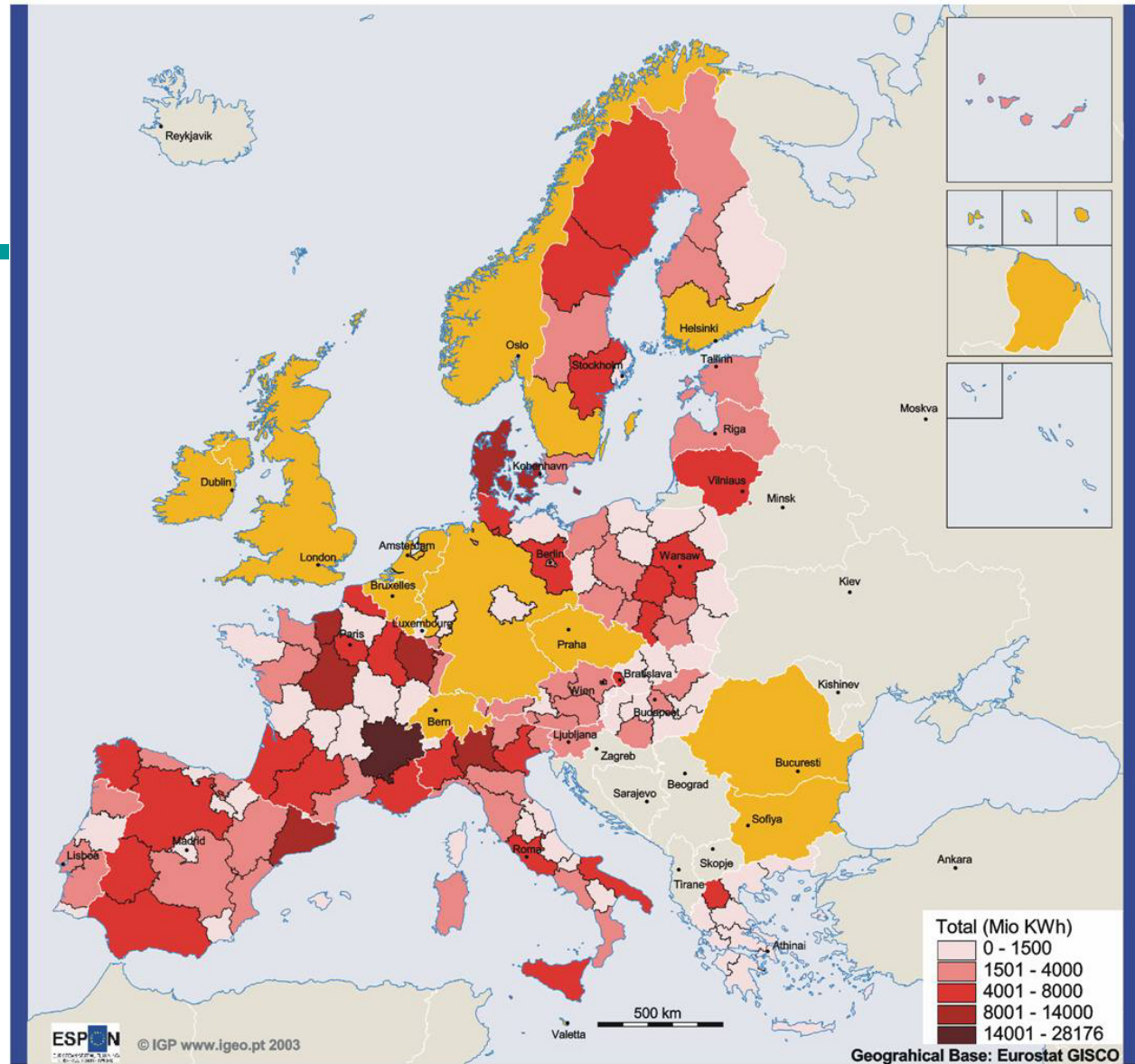
# ESPON 2.1.4: Final energy consumption

Final Energy  
Consumption/  
GDP (2000)



# ESPON 2.1.4: Total electricity production


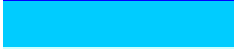
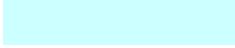
Total Electricity  
production by  
NUTS 2 (1997)



# ESPON 2.1.4: Towards policy recommendations (I)

The impact assessment of energy main policies is now being carried out. Case studies can be of great help.

Policy headlines	Impact carriers		
	Investment	Prices	Income transfer
Security of energy supply	Relevant impacts expected	Some impacts expected	Difuse impacts expected
Internal market in energy	Difuse impacts expected	Relevant impacts expected	Difuse impacts expected
Energy and sustainable development	Some impacts expected	Relevant impacts expected	Relevant impacts expected
Energy efficiency	Difuse impacts expected	Difuse impacts expected	Difuse impacts expected
Renewable energy development	Relevant impacts expected	Difuse impacts expected	Relevant impacts expected
Taxation of energy products	Difuse impacts expected	Relevant impacts expected	Relevant impacts expected
Trans-european networks	Relevant impacts expected	Some impacts expected	Some impacts expected

-  - relevant impacts expected
-  - some impacts expected
-  - difuse impacts expected



## ESPON 2.1.4: Towards policy recommendations (II)

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- Energy intensity shows a clear decreasing trend. Transport shows the most significant growth of energy consumption between 1995 and 2000
  - Policy recommendation
- Most countries have reduced their dependence on fossil fuels since 1995. Oil is the most significant energy source in EU 15, while in the Candidate Countries the energy consumption is more differentiated among sources.
  - Impact on local development ? Policy recommendation
- .....

# **ESPON Contact Point Luxembourg**

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**Simone Reinhart / Christian Muschwitz**

**Thank you for your attention....**