

Klaus Spiekermann

**How will the spatial structure of Europe change  
through improved transport infrastructure?**

**ESPON YoungStars 2 Seminar**

*VATI, Budapest, 18 May 2006*



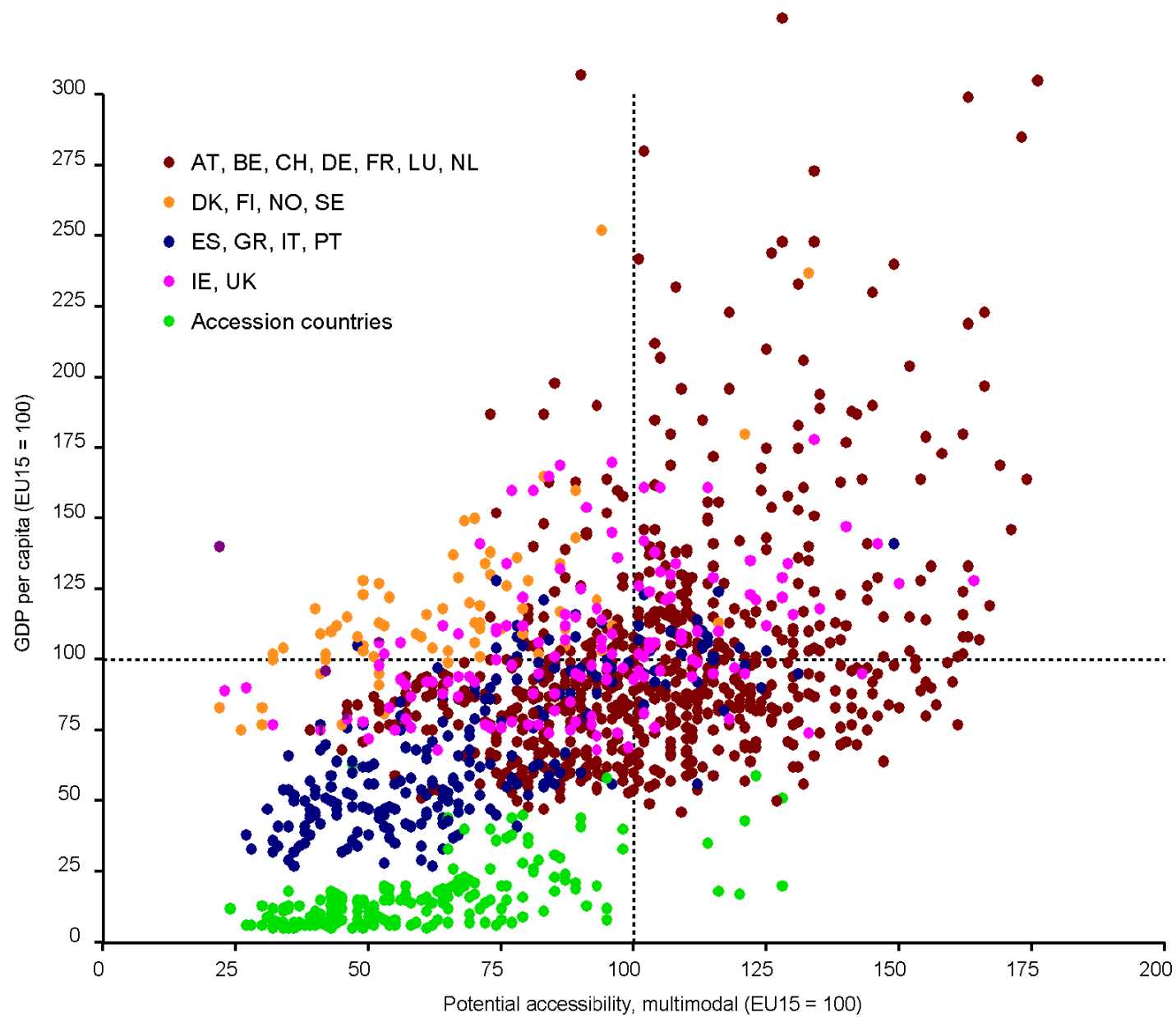
Spiekermann & Wegener  
Urban and Regional Research  
Dortmund, Germany

# Structure of the Presentation

- The SASI Model
- Regional Economic Impacts of Transport Policies
- Regional Economic Impacts of Transport Policies in the context of EU Enlargement
- Impacts on Cohesion
- Impacts on Polycentricity
- Conclusions

# The SASI Model

# Accessibility and GDP



## ***SASI Model***

The SASI model is a ***simulation*** model of the ***socio-economic*** development of the regions in Europe subject to ***transport infrastructure and other transport policies***.

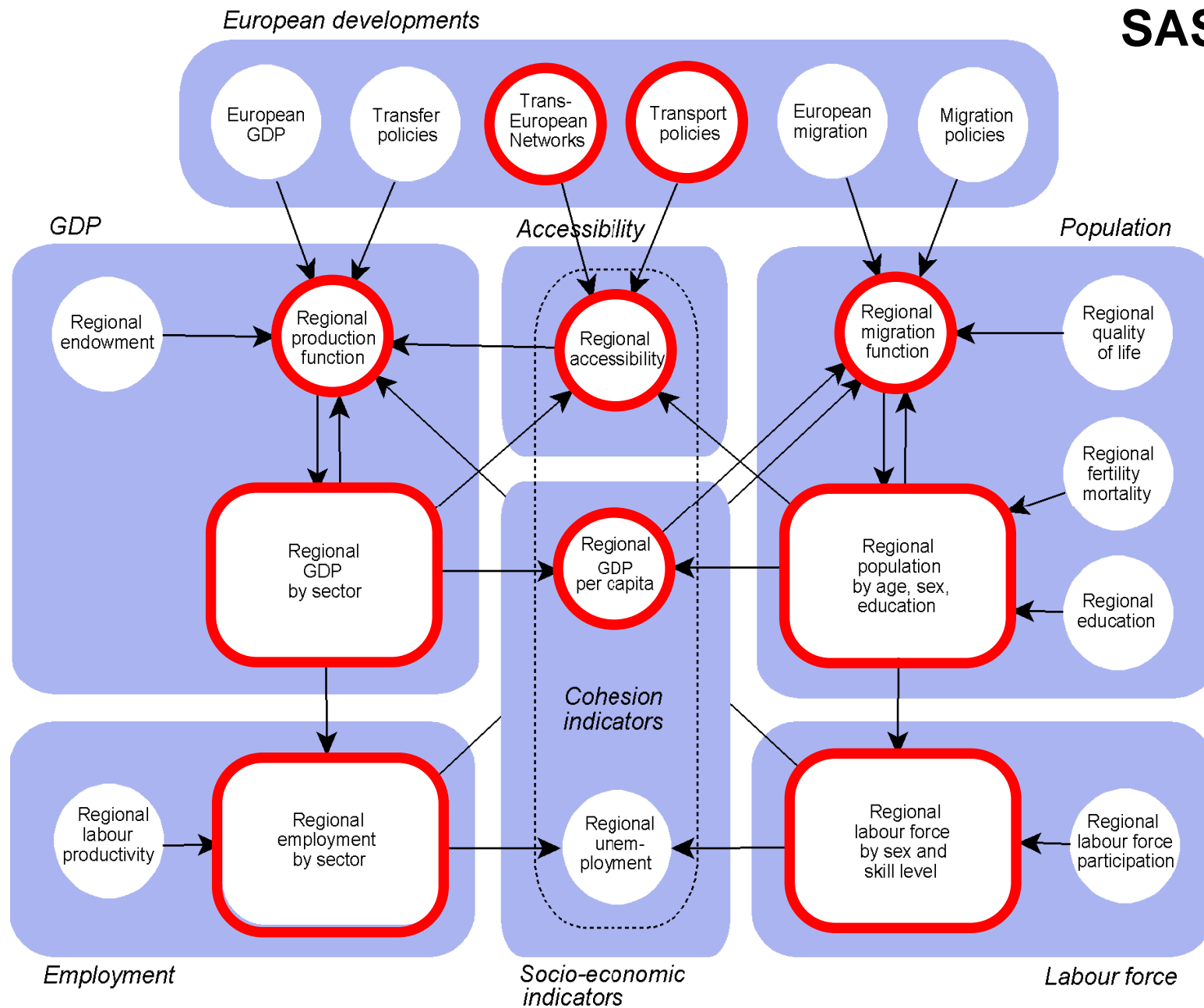
The model forecasts for each ***region***

- ***accessibility***
- ***GDP per capita***

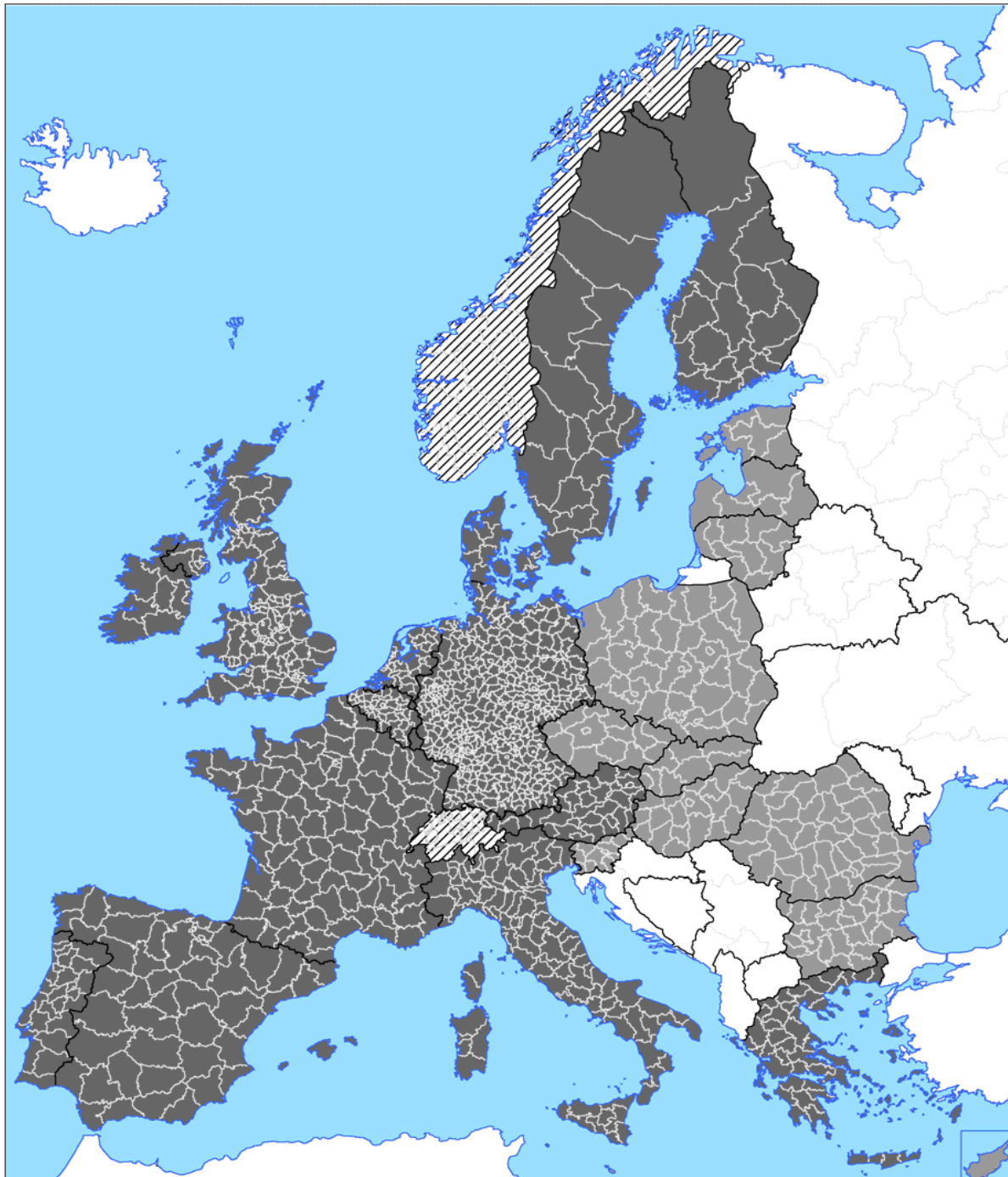
and for each ***country***

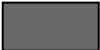


- ***territorial cohesion***
- ***polycentricity***

# SASI Model

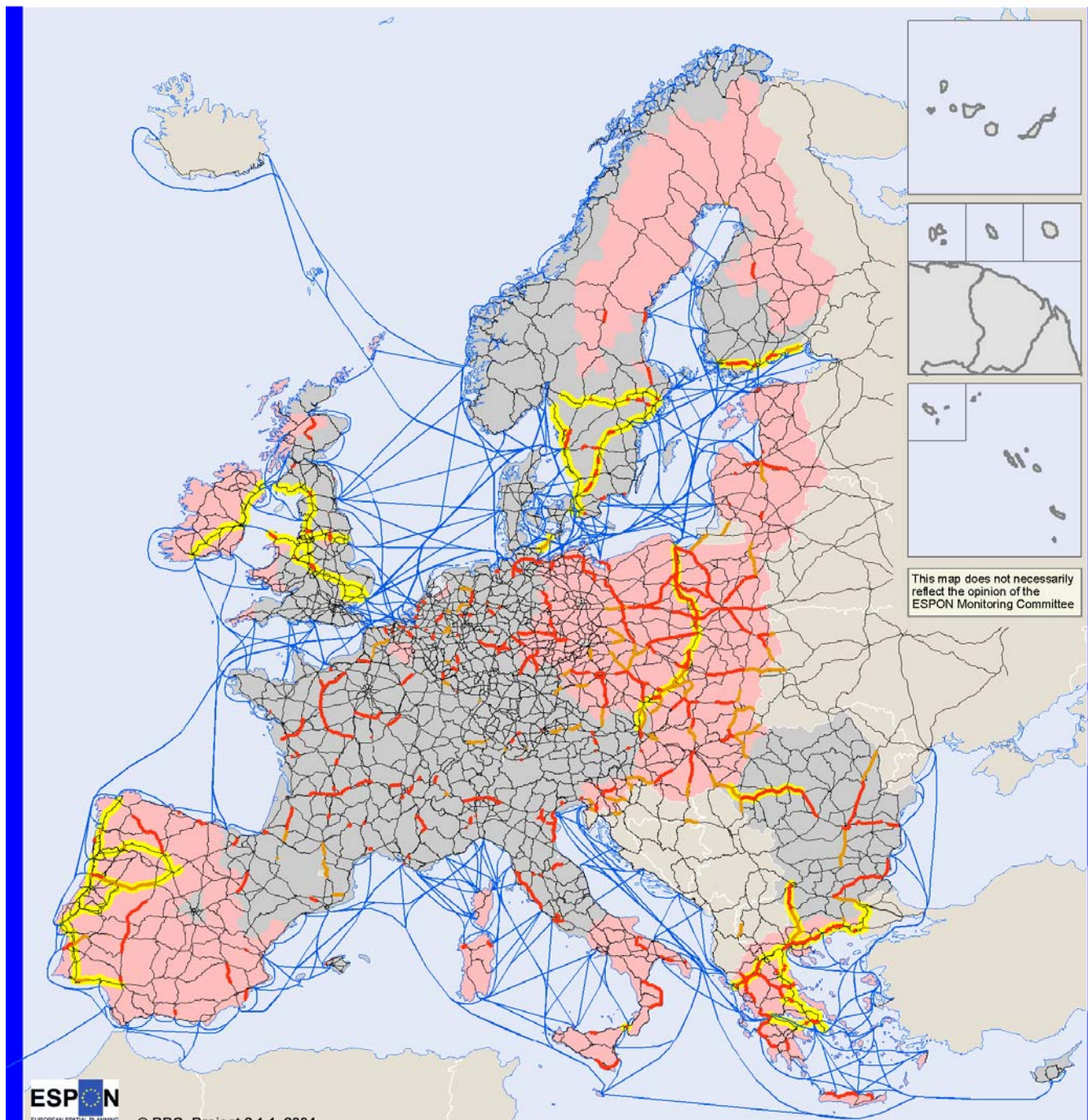


## The SASI system of regions



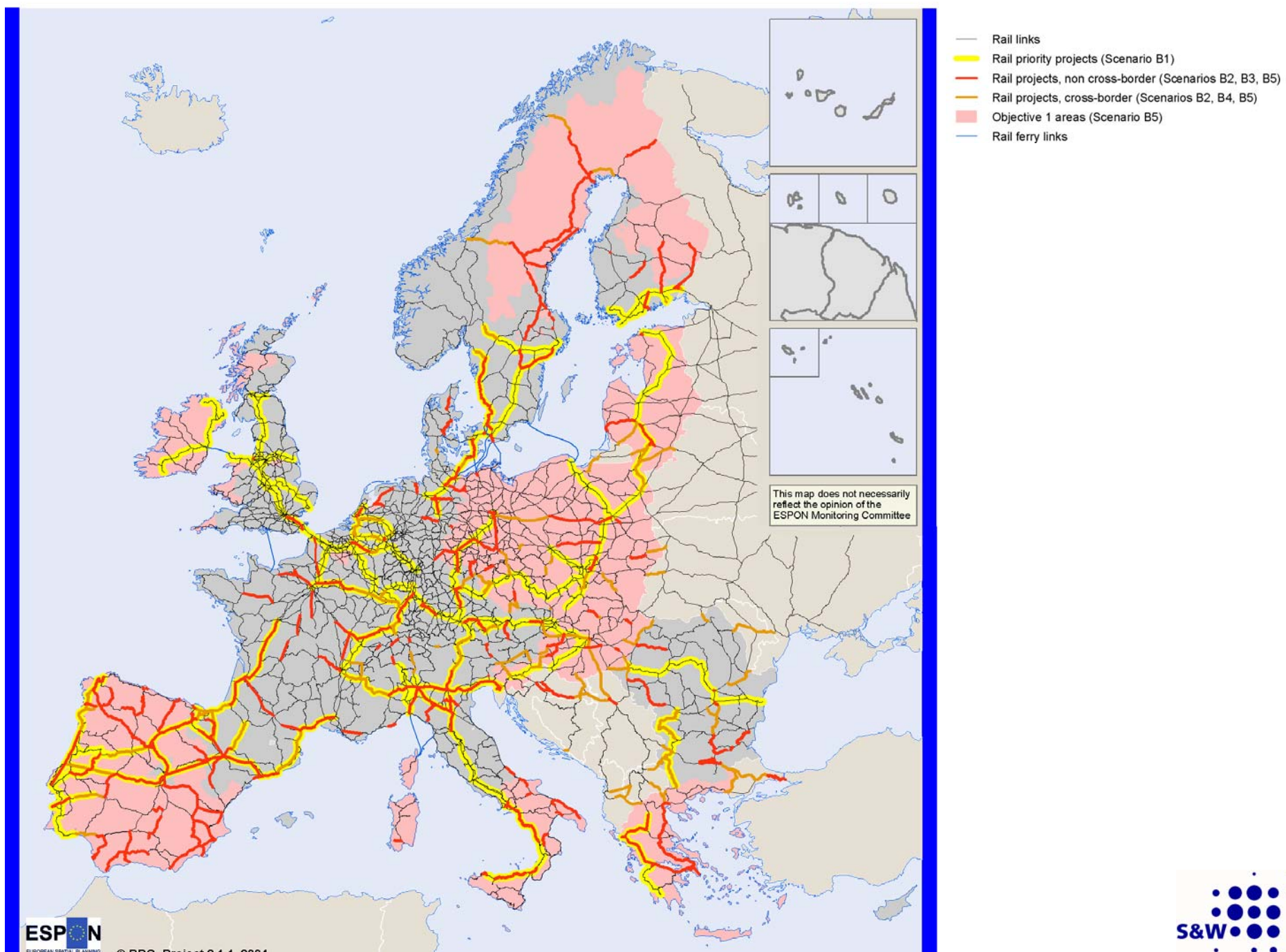
-  EU-15:  
1,085 NUTS-3 regions
-  Candidate countries:  
191 regions
-  Norway and Switzerland:  
45 regions

## Road network



- Road links
- Road priority projects (Scenario B1)
- Road projects, non cross-border (Scenarios B2, B3, B5)
- Road projects, cross-border (Scenarios B2, B4, B5)
- Objective 1 areas (Scenario B5)
- Short sea shipping links

## Rail network



# **Regional Impacts of Transport Policies (ESPON 2.1.1)**

# ESPON 2.1.1 Prospective Scenarios 2001 - 2021

**000** Reference scenario

**B1** Priority projects

**B2** All TEN/TINA projects

**B3** TEN/TINA except cross-border corridors

**B4** TEN/TINA only cross-border corridors

**B5** TEN/TINA only in Objective 1 regions

**C1** Reduction of price of rail transport

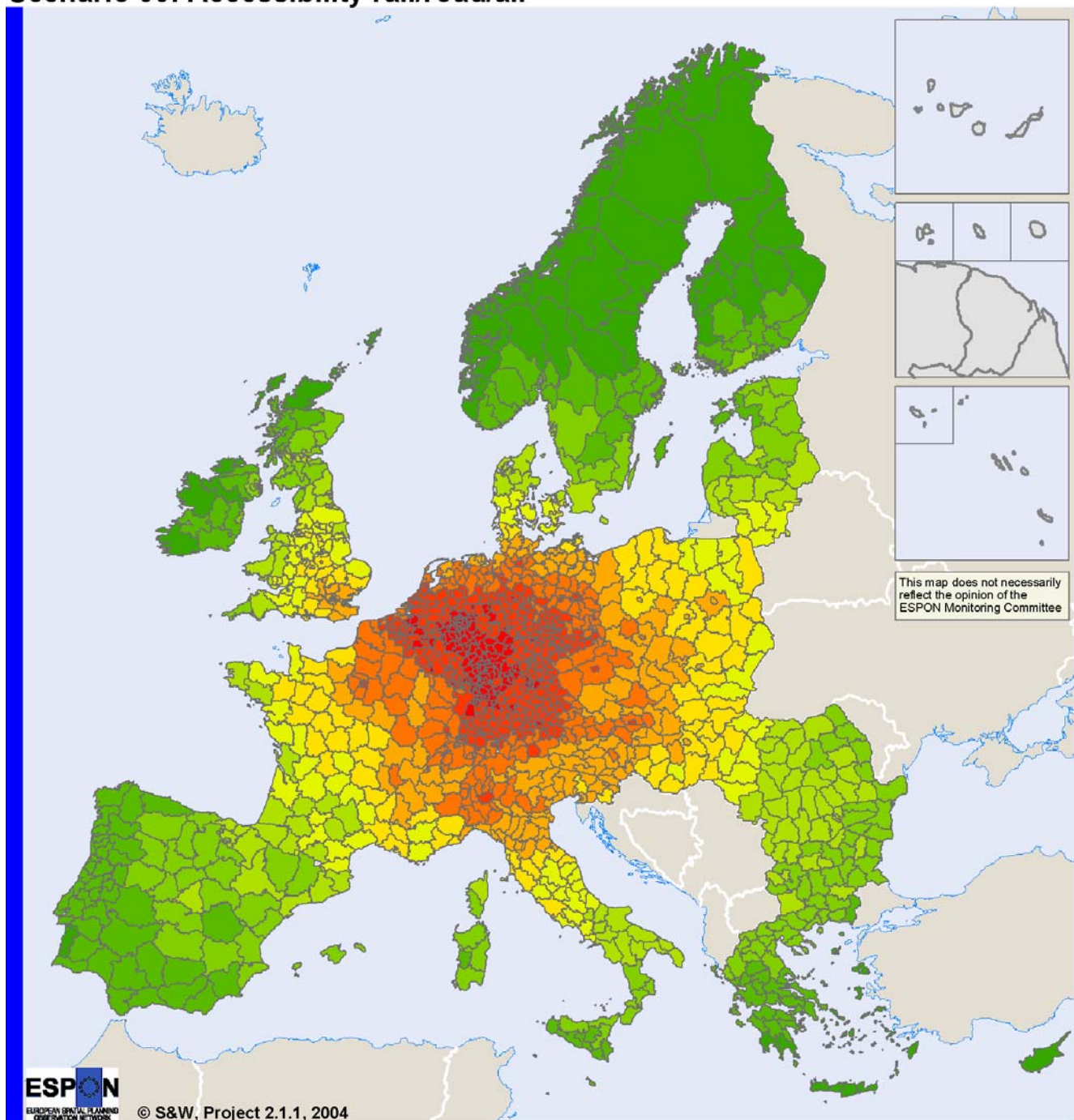
**C2** Increase of price of road transport

**C3** SMC pricing of all modes

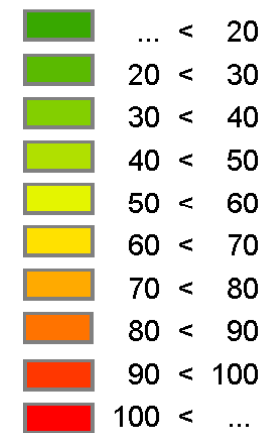
**D1** B1+C3

**D2** B2+C3

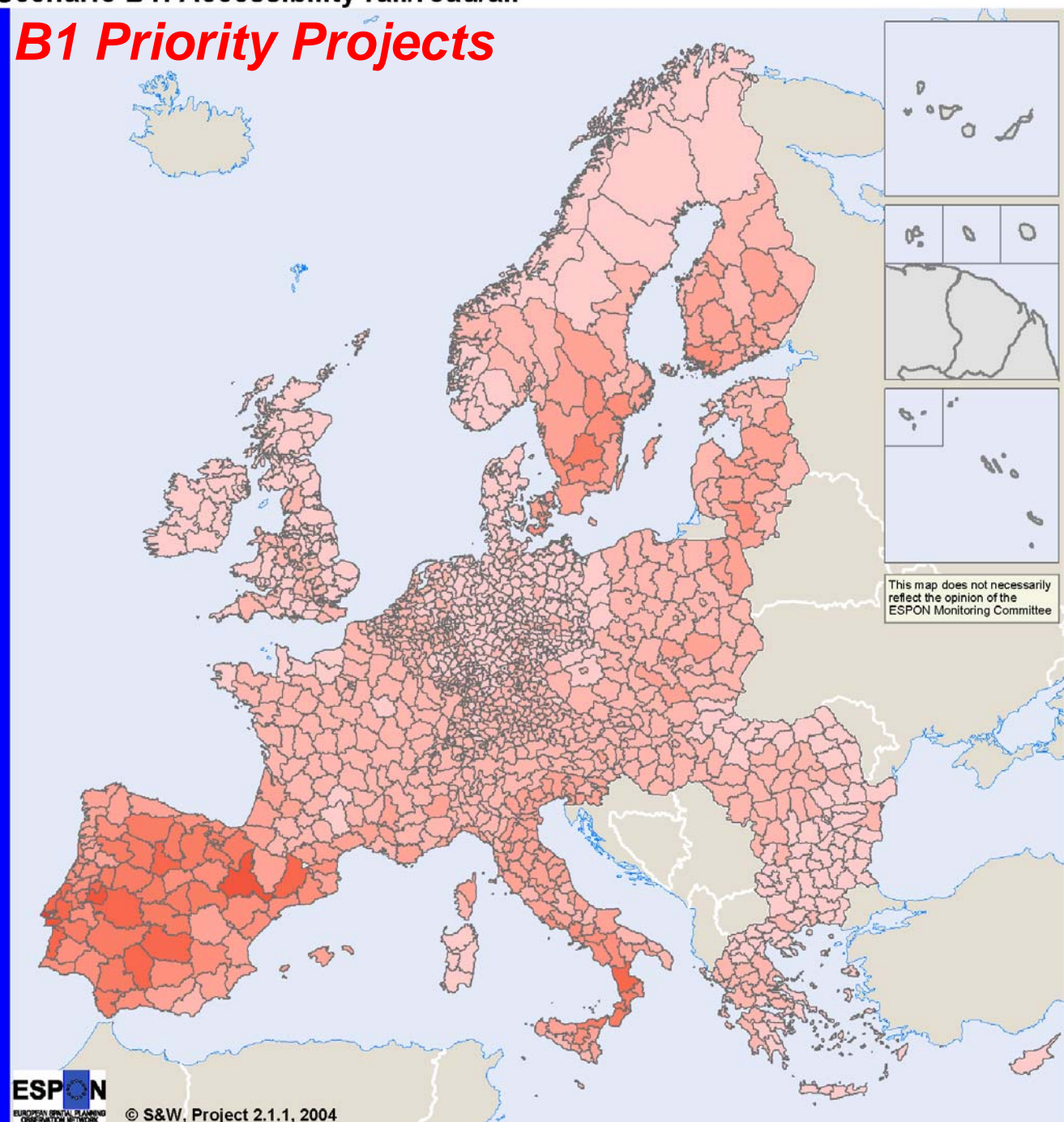
## Scenario 00: Accessibility rail/road/air



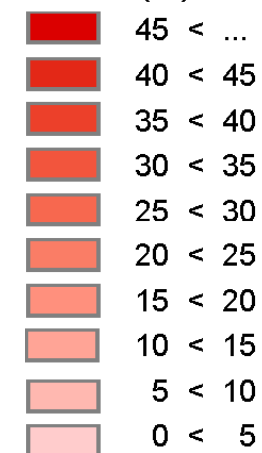
Reference scenario in 2021 (million)



## ***B1 Priority Projects***

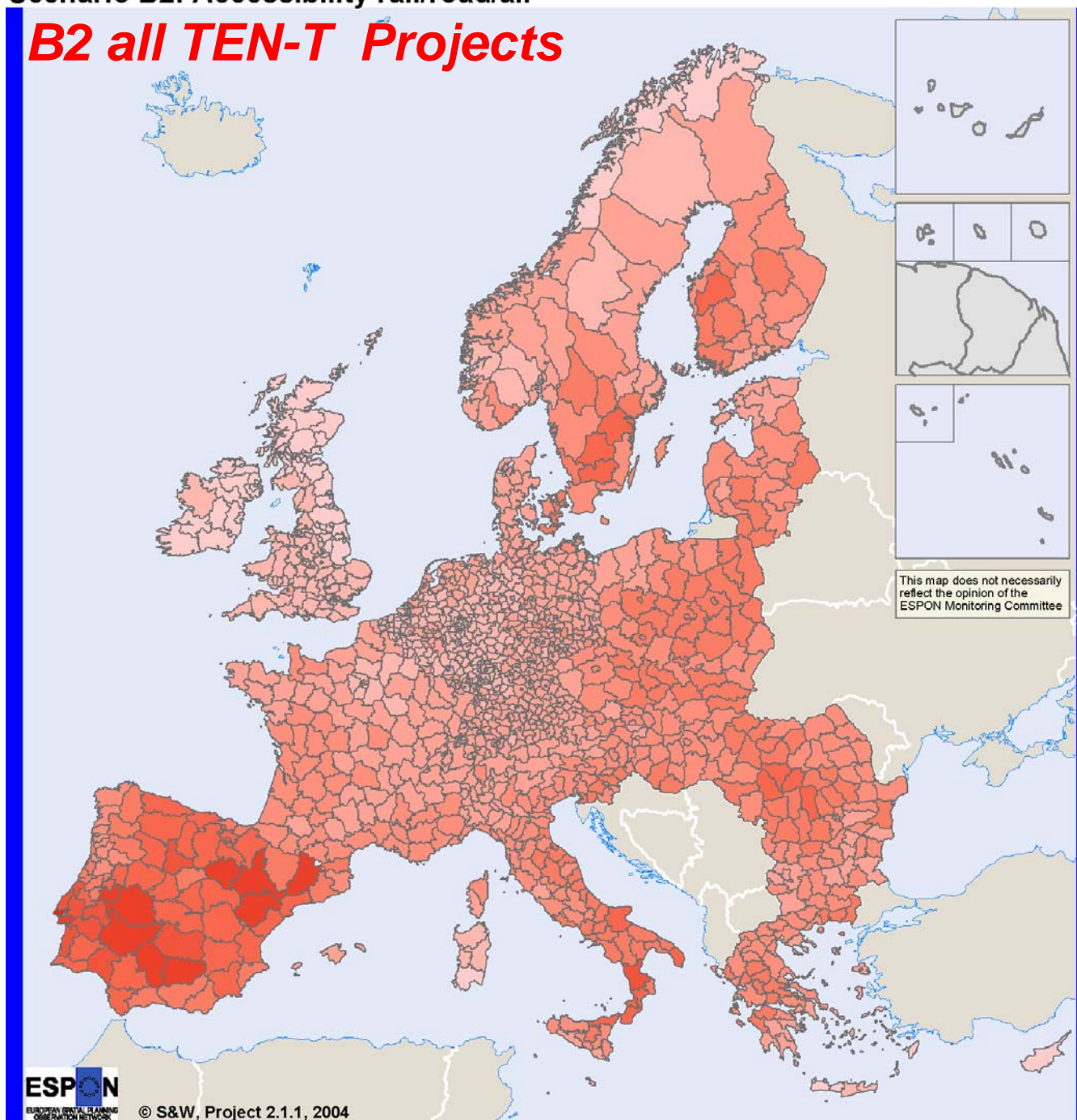


Difference to reference scenario  
in 2021 (%)

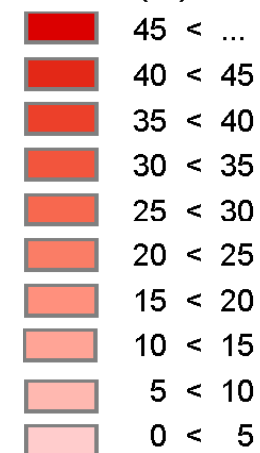


## Scenario B2: Accessibility rail/road/air

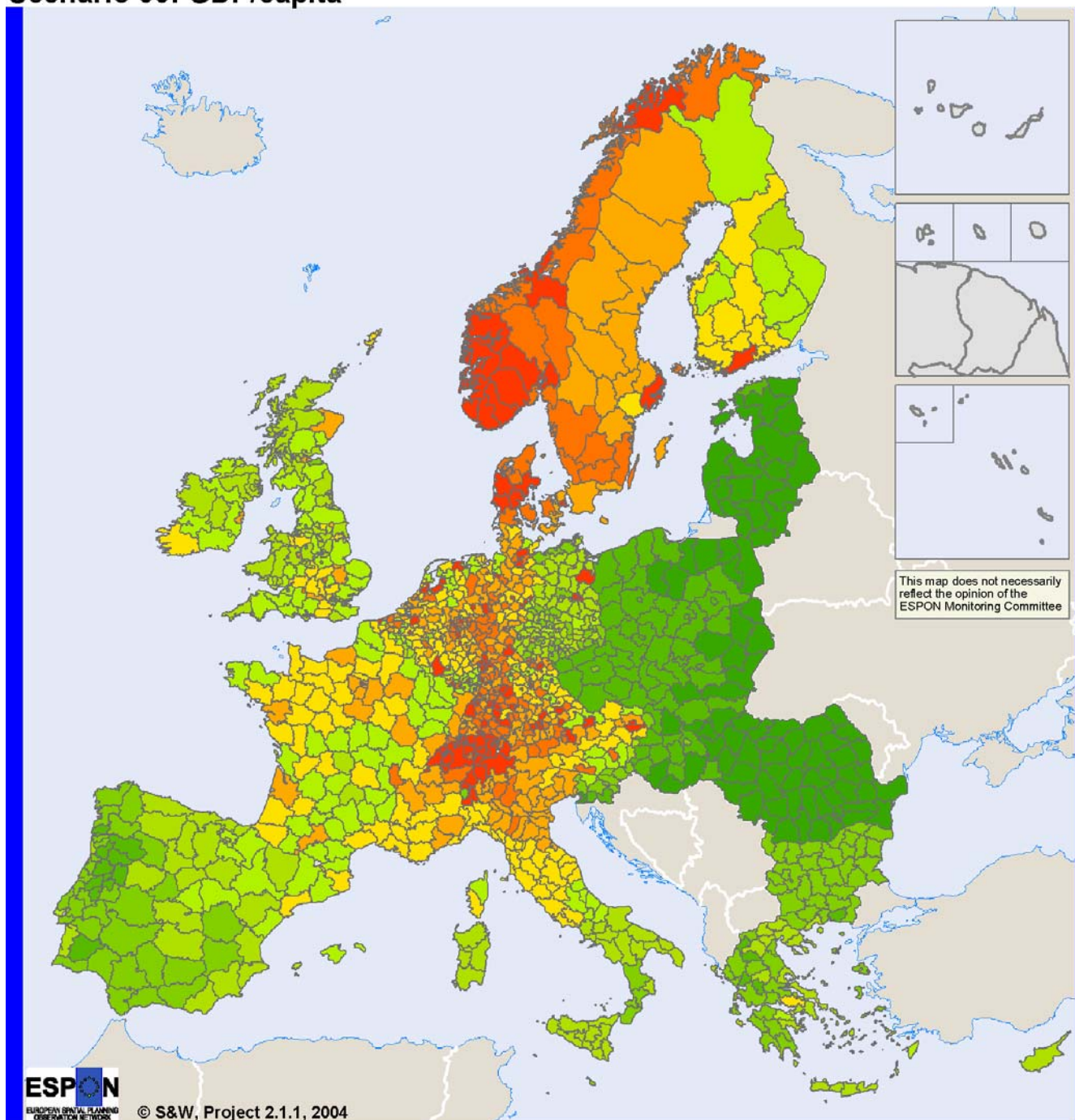
### ***B2 all TEN-T Projects***



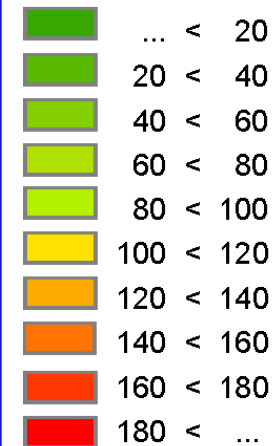
Difference to reference scenario in 2021 (%)



## Scenario 00: GDP/capita

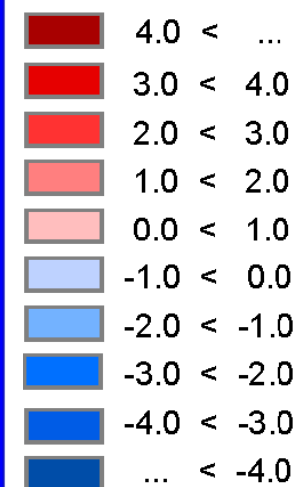


Reference scenario in 2021  
(ESPON Space = 100)



## ***B1 Priority Projects***

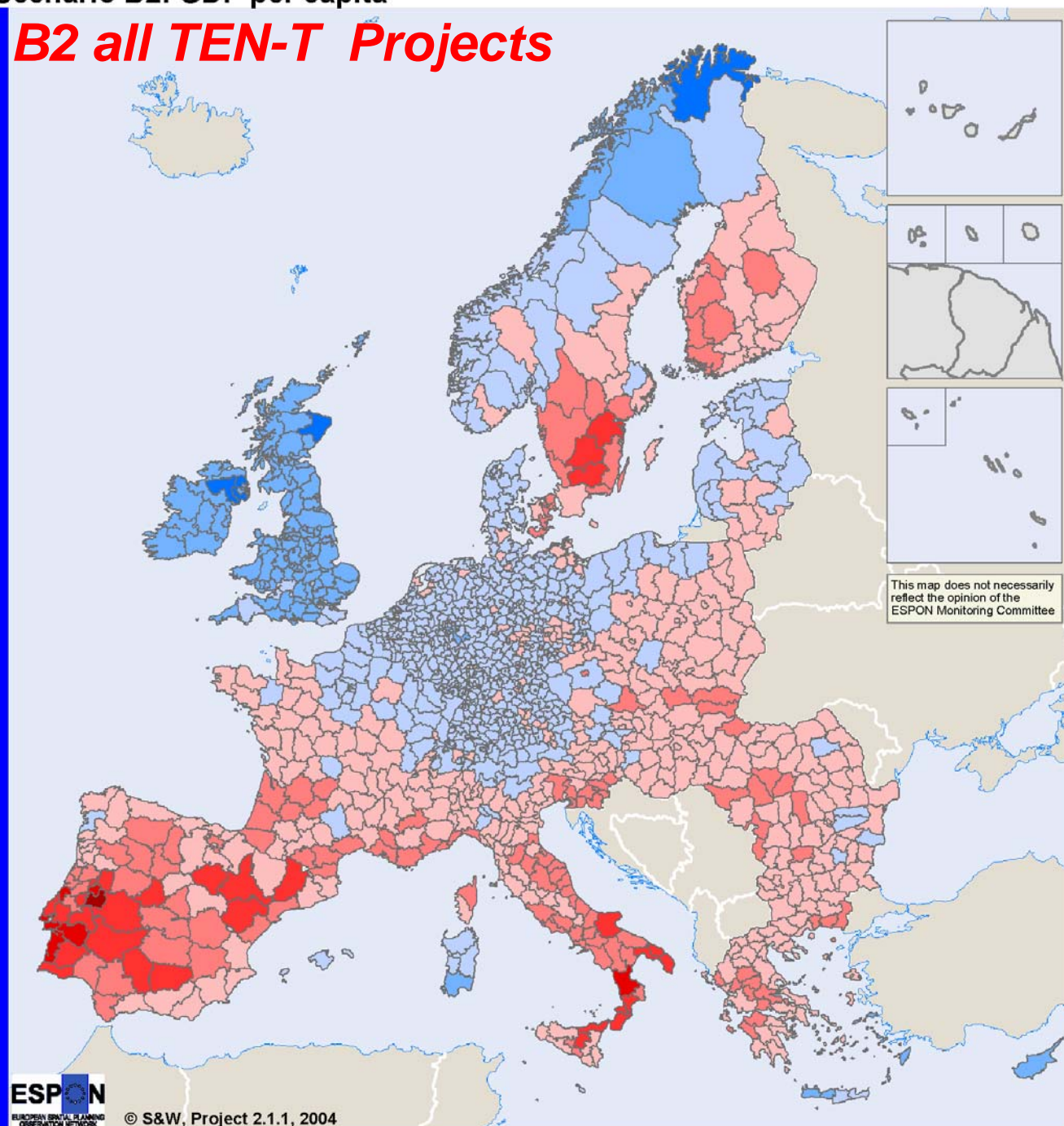
Difference to reference scenario  
in 2021 (%)



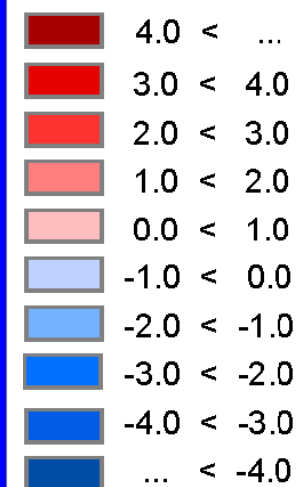
This map does not necessarily  
reflect the opinion of the  
ESPON Monitoring Committee

## Scenario B2: GDP per capita

### ***B2 all TEN-T Projects***

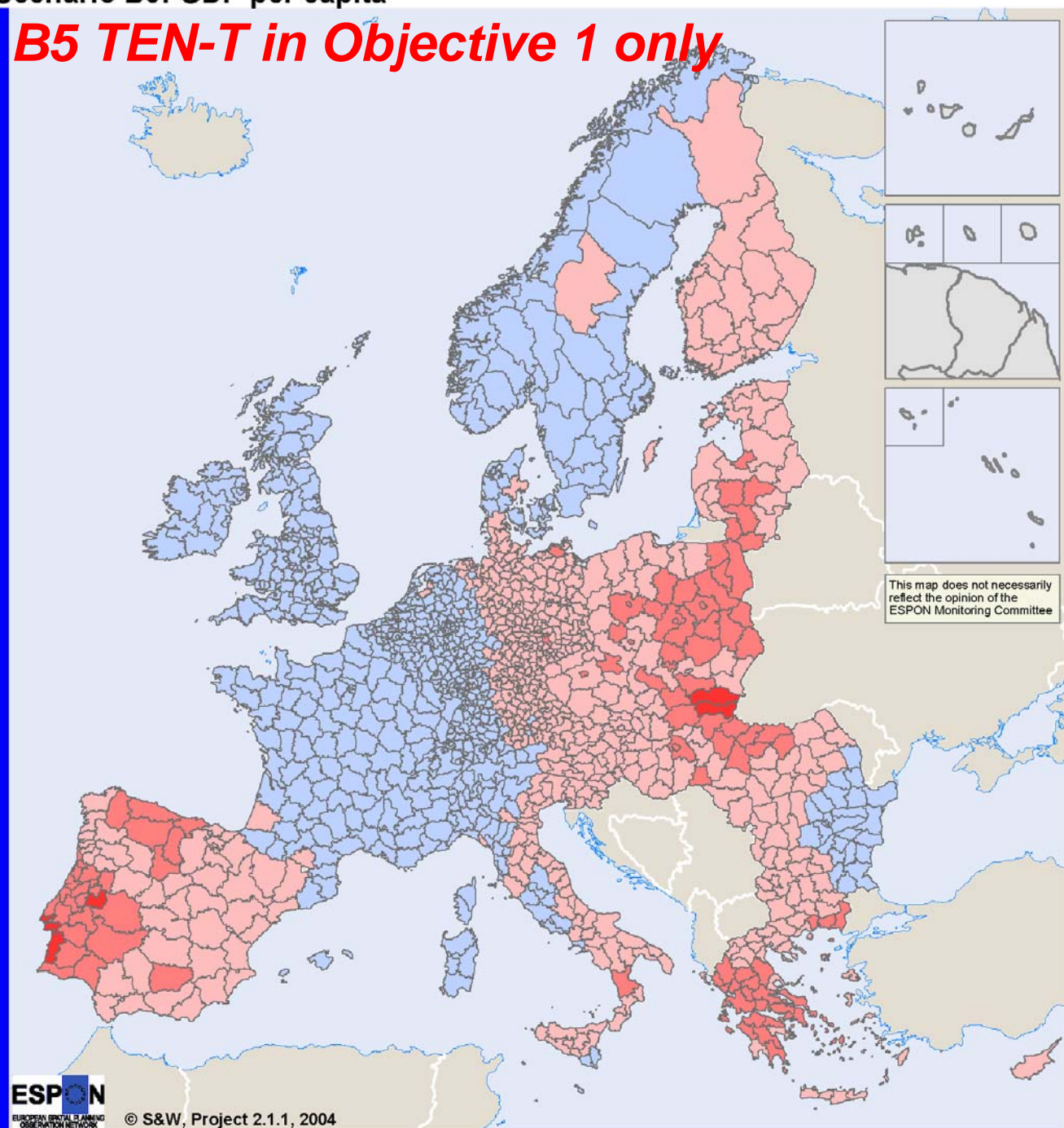


Difference to reference scenario in 2021 (%)

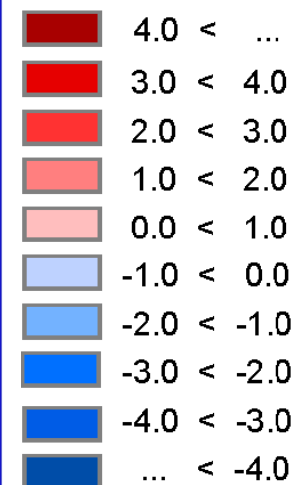


## Scenario B5: GDP per capita

### ***B5 TEN-T in Objective 1 only***



Difference to reference scenario in 2021 (%)



**Regional Impacts of Transport Policies in the  
context of EU Enlargement  
(ESPON 1.1.3)**

# ESPON 1.1.3 Prospective Scenarios 2006 - 2031

**000** Reference scenario

**A1** Enlargement

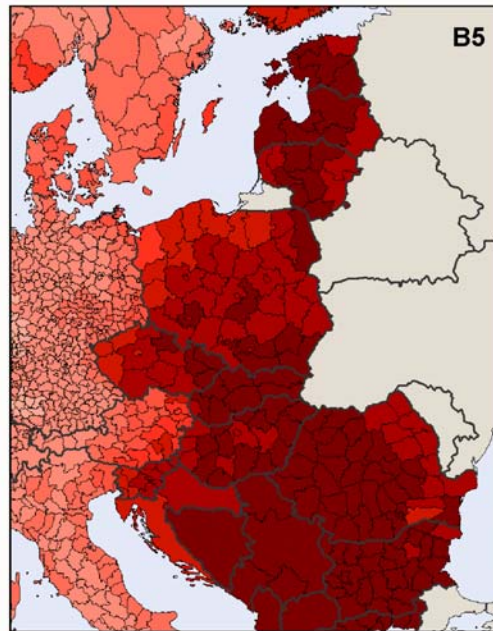
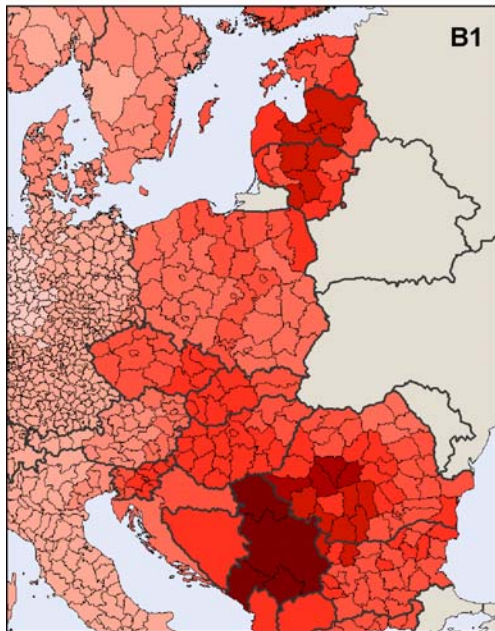
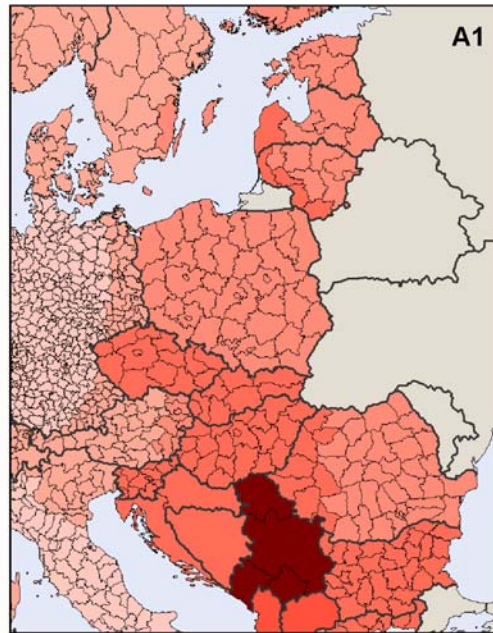
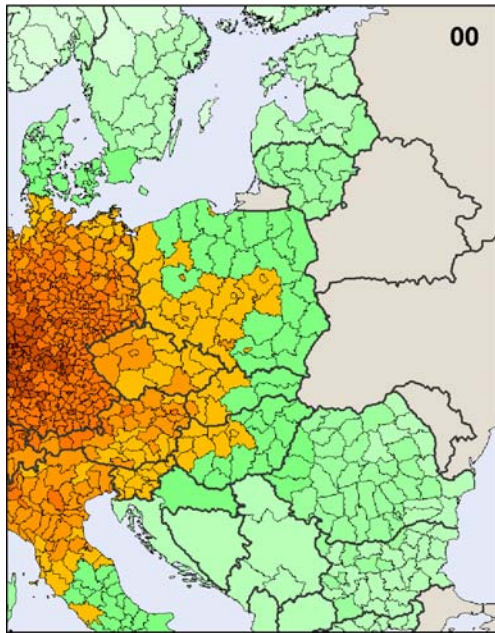
**B1** A1 + all TEN-T priority projects

**B2** A1 + B1 + TEN/TINA projects in NMAC

**B3** A1 + all TEN/TINA projects

**B4** A1 + B3 + additional TINA projects

**B5** A1 + B3 + maximum TINA projects



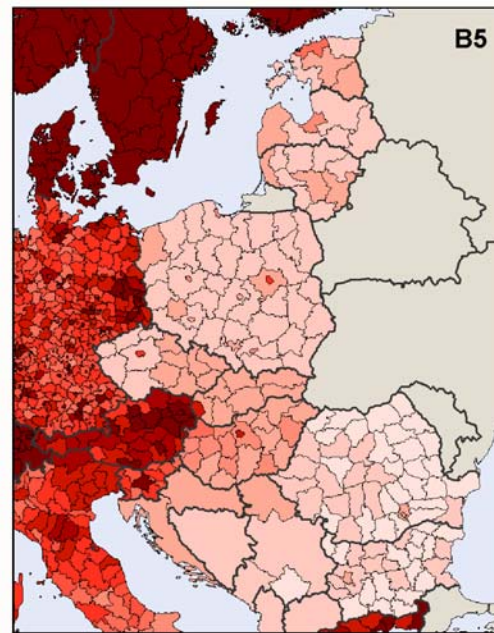
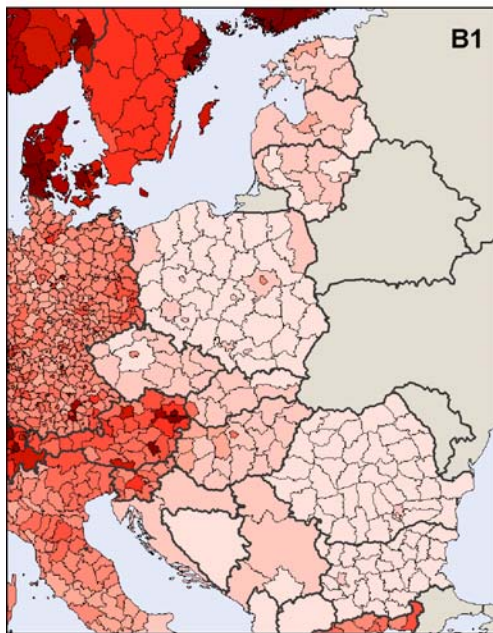
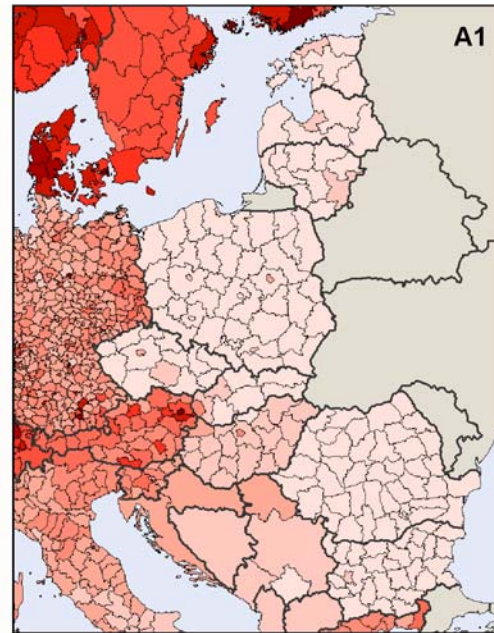
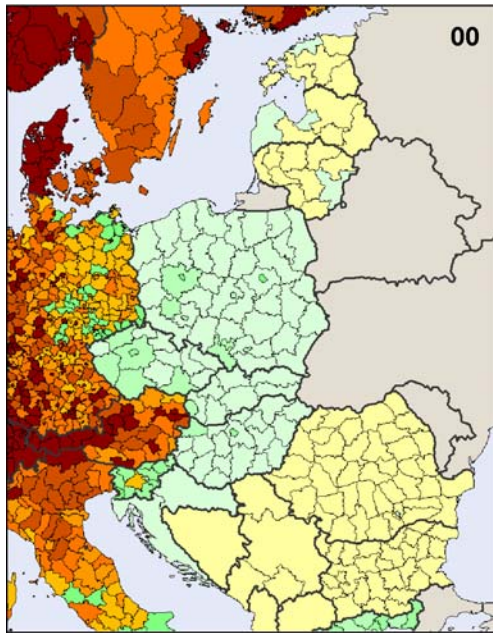
# Relative Change of Accessibility

## Scenarios

A1: Enlargement

B1: A1 + Priority Projects

B5: A1 + TEN/TINA + more



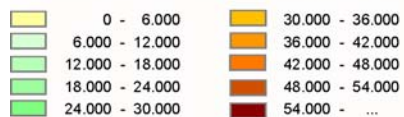
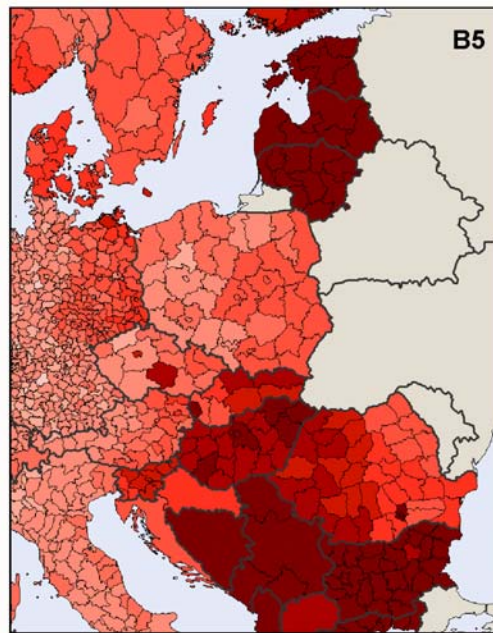
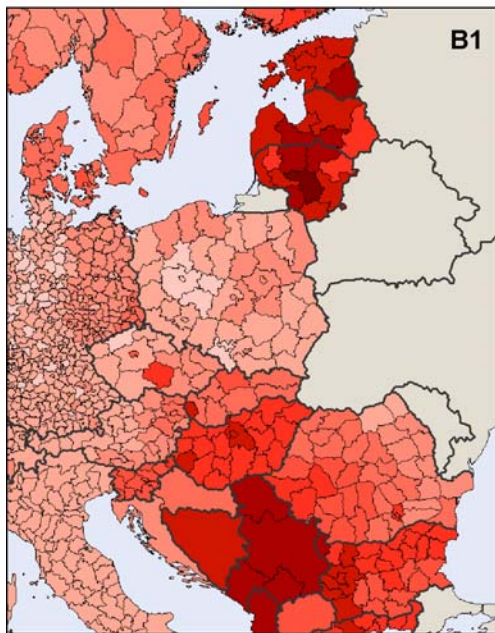
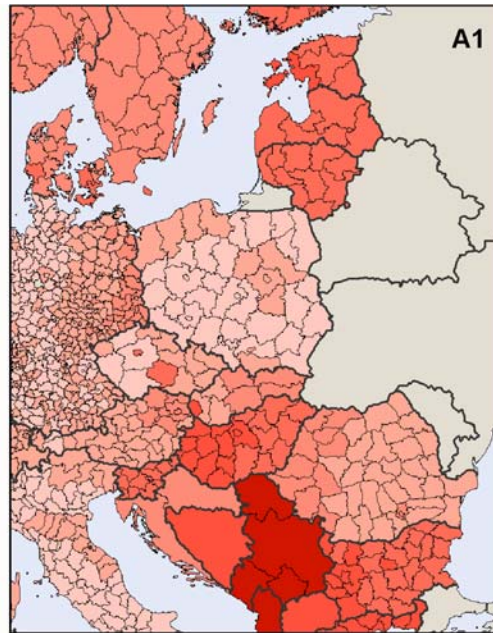
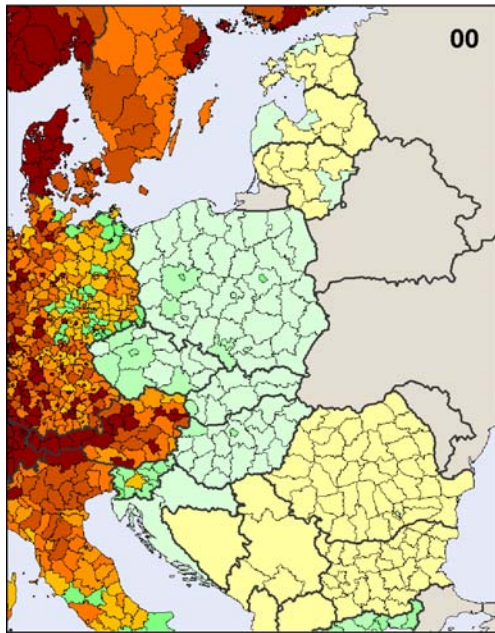
## Absolute Change of GDP

### Scenarios

A1: Enlargement

B1: A1 + Priority Projects

B5: A1 + TEN/TINA + more



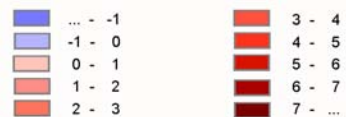
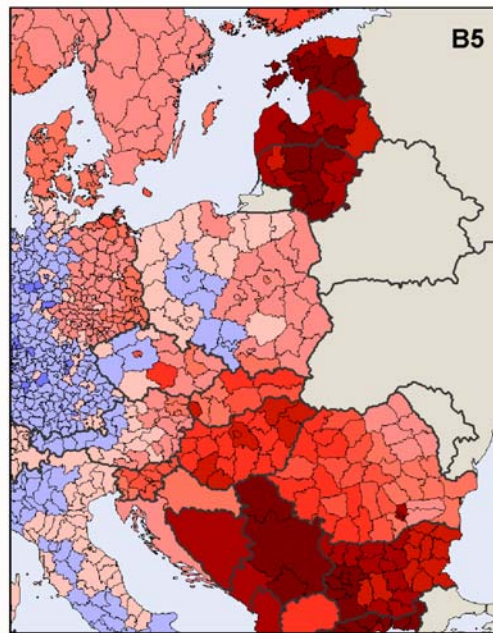
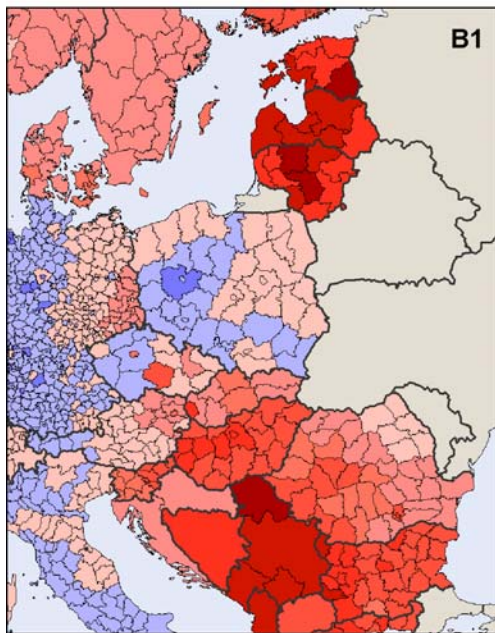
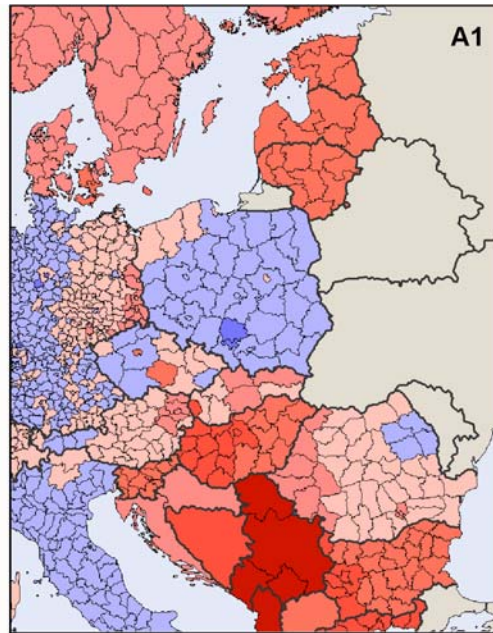
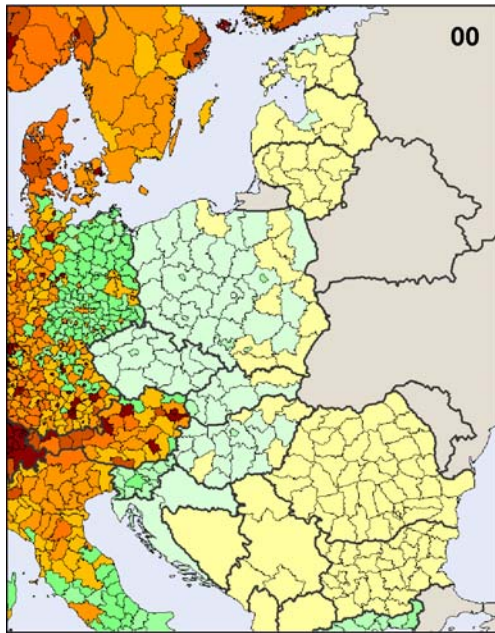
## Relative Change of GDP

### Scenarios

A1: Enlargement

B1: A1 + Priority Projects

B5: A1 + TEN/TINA + more



## Relative Change of GDP (standardised)

### Scenarios

A1: Enlargement

B1: A1 + Priority Projects

B5: A1 + TEN/TINA + more

Scenario		GDP/capita difference between policy and reference scenario			
		EU15	CH+NO	NMAC	EU27+7
<b><i>Unstandardised (Euro of 2005) absolute</i></b>					
A1	Enlargement	+810	+868	+228	+709
B1	A1 + all new priority projects	+1,010	+1,037	+325	+887
B2	A1 + B1 + TEN/TINA projects in NMAC	+1,092	+1,105	+407	+968
B3	A1 + all TEN/TINA projects	+1,358	+1,311	+437	+1,187
B4	A1 + B3 + additional TINA projects	+1,396	+1,356	+465	+1,224
B5	A1 + B3 + maximum TINA projects	+1,416	+1,371	+488	+1,244
<b><i>Unstandardised (Euro of 2005) relative (%)</i></b>					
A1	Enlargement	+2.02	+2.97	+2.88	+2.10
B1	A1 + all new priority projects	+2.51	+3.54	+4.11	+2.63
B2	A1 + B1 + TEN/TINA projects in NMAC	+2.72	+3.77	+5.15	+2.87
B3	A1 + all TEN/TINA projects	+3.38	+4.48	+5.52	+3.52
B4	A1 + B3 + additional TINA projects	+3.47	+4.63	+5.87	+3.63
B5	A1 + B3 + maximum TINA projects	+3.52	+4.68	+6.16	+3.69
<b><i>Standardised (EU27+7=100) relative (%)</i></b>					
A1	Enlargement	-0.09	+0.84	+0.76	0.00
B1	A1 + all new priority projects	-0.12	+0.88	+1.44	0.00
B2	A1 + B1 + TEN/TINA projects in NMAC	-0.15	+0.88	+2.21	0.00
B3	A1 + all TEN/TINA projects	-0.14	+0.92	+1.93	0.00
B4	A1 + B3 + additional TINA projects	-0.16	+0.96	+2.16	0.00
B5	A1 + B3 + maximum TINA projects	-0.16	+0.95	+2.38	0.00

# Impacts on Cohesion

## **TEN-T = Cohesion?**

Critics doubt that the TEN-T will **reduce** disparities between European regions:

- Many of the new connections do **not** link **peripheral** regions to the core but **central** regions with each other.
- The impact of the new connections may be **ambiguous**: A new motorway or high-speed rail link between a peripheral and a central region may make it **easier** for producers in the peripheral region to market their products in large cities, but it may also expose their formerly secure regional monopolies to the **competition** of more advanced producers.

# GDP/capita cohesion effects

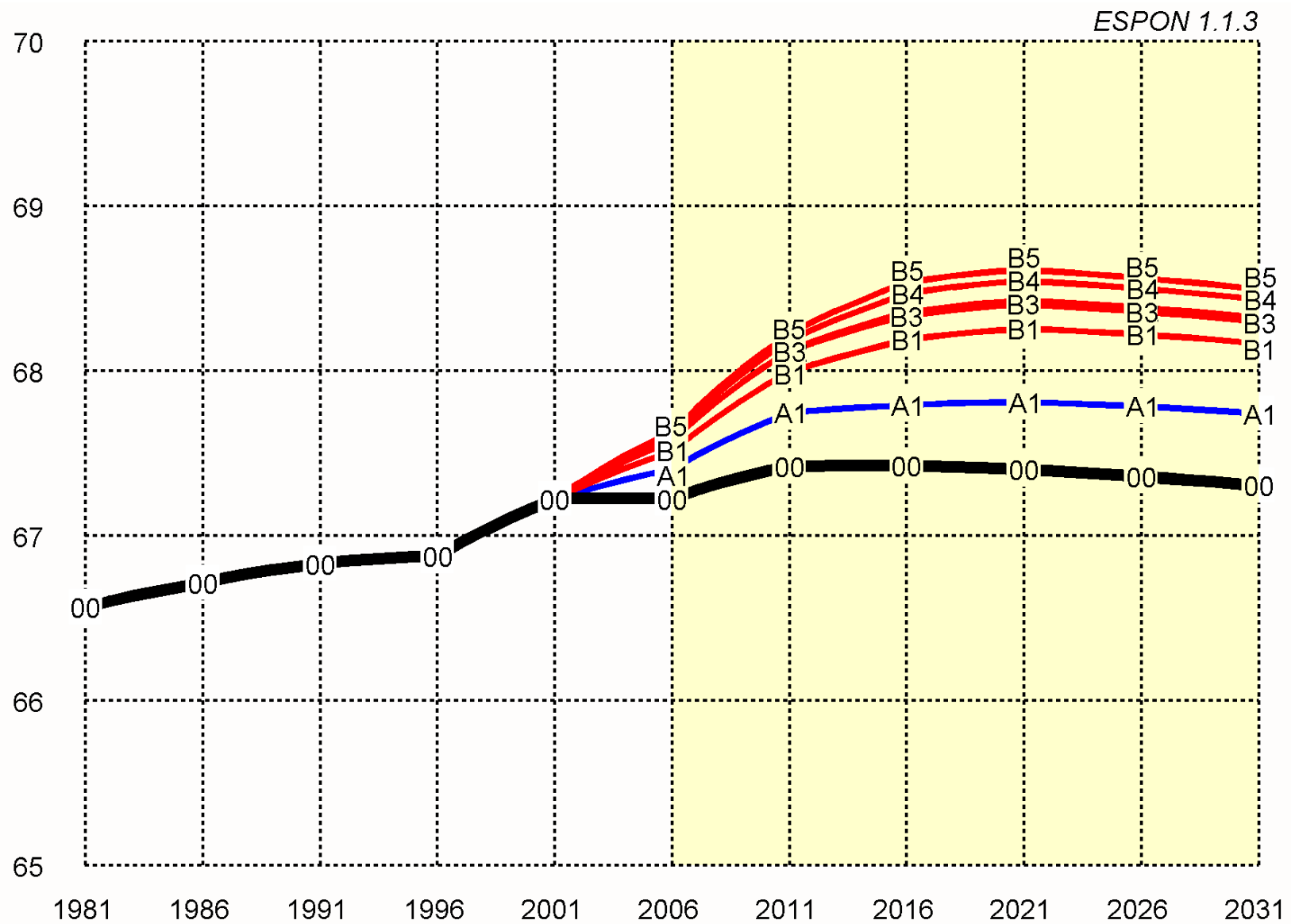
Scenario		GDP/capita cohesion effects (+/–)				
		CoV	Gini	G/A	RC	AC
Total study area (EU27+7)						
A1	Enlargement	+	+	+	+	--
B1	A1 + all new priority projects	+	+	+	+	--
B2	A1 + B1 + TEN/TINA projects in NMAC	+	+	++	+	--
B3	A1 + all TEN/TINA projects	+	+	++	+	--
B4	A1 + B3 + additional TINA projects	+	+	++	+	--
B5	A1 + B3 + maximum TINA projects	+	+	++	+	--
New member states and accession countries						
A1	Enlargement	-	+	·	+	--
B1	A1 + all new priority projects	+	+	+	++	--
B2	A1 + B1 + TEN/TINA projects in NMAC	+	+	+	++	--
B3	A1 + all TEN/TINA projects	+	+	+	++	--
B4	A1 + B3 + additional TINA projects	+	+	+	++	--
B5	A1 + B3 + maximum TINA projects	+	+	++	++	--

+/++ Weak/strong cohesion effect: disparities reduced  
 –/— Weak/strong anti-cohesion effect: disparities increased  
 · Little or no cohesion effect

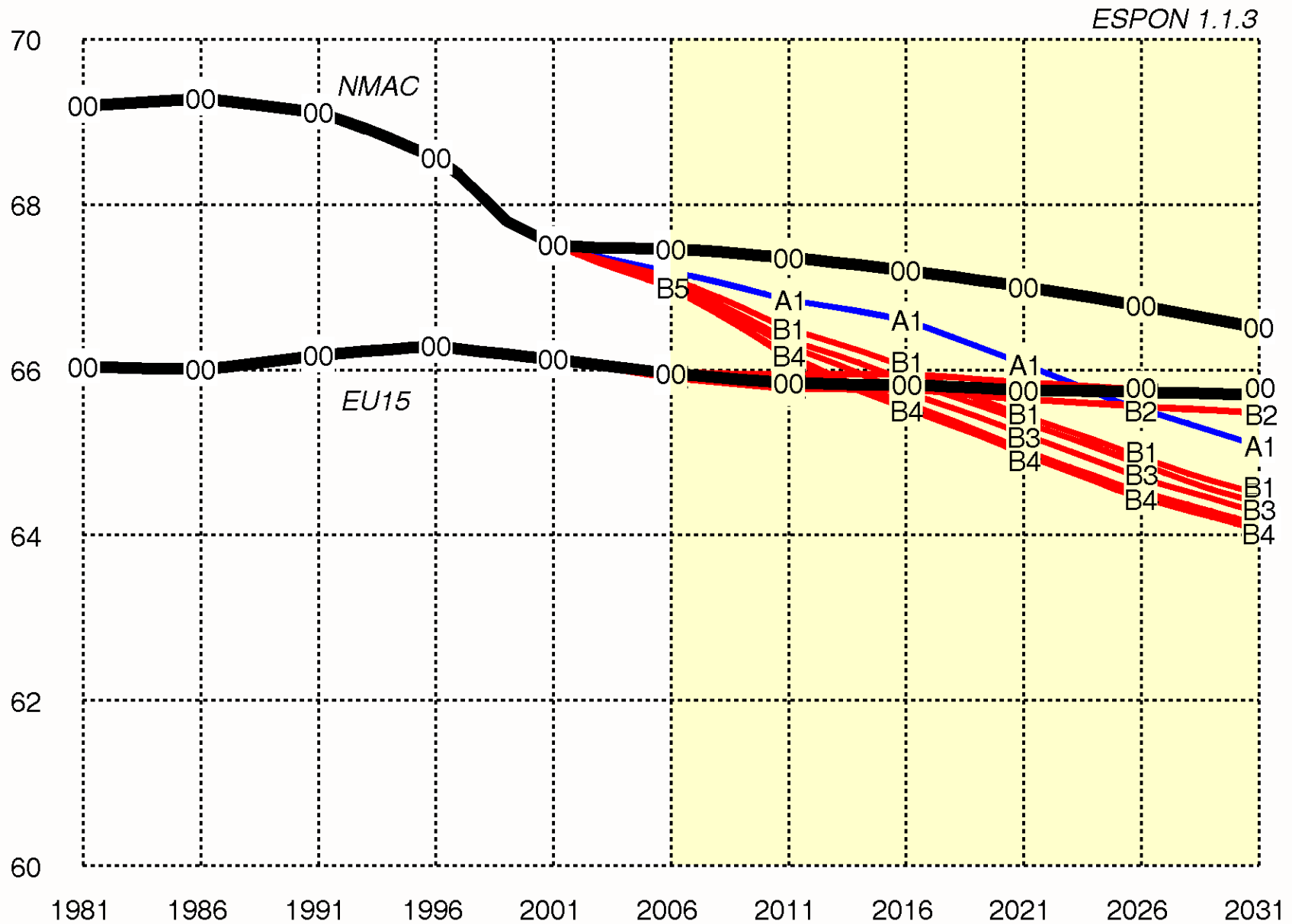
CoV Coefficient of variation (%)  
 Gini Gini coefficient (%)  
 G/A Geometric/arithmetic mean  
 RC Correlation relative change v. level  
 AC Correlation absolute change v. level

## **Impacts on Polycentricity**

## Development of Polycentricity of MEGAs



# Development of Polycentricity of FUAs



# Conclusions

## Conclusions (1): Impacts general

The regional effects of ***transport projects*** and ***transport policies*** are ***small*** compared with those of socio-economic and technical ***macro trends***, such as

- ***globalisation***,
- growing ***competition*** between regions,
- ***ageing*** of the population,
- increasing ***labour force participation***,
- growing ***labour productivity***.

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## **Conclusions (2): Magnitude of Impacts**

Large increases in accessibility translate into only small changes in economic activity.

Largest gains of the new member states are due to the enlargement process itself because it has reduced barriers for travel and goods transport

The infrastructure projects examined contribute to this effect and, not surprisingly, the more infrastructure projects are implemented in the new member states, the better for them.

## Conclusions (3): Impacts on Core-Periphery

For regions in the European **core** with highly developed transport infrastructure additional gains in accessibility bring only **little** additional incentives for economic growth.

For regions at the European **periphery** or in the new member states a gain in accessibility brings **significant** progress in economic development.

## Conclusions (4): Infrastructure policy

Significant positive economic effects for regions in the new member states can only be expected if not only the priority projects but the full list of **TINA** projects or (even more) linking them to the major centres of economic activity are implemented.

## Conclusions (5): Cohesion

All policy scenarios examined, including the enlargement scenario, reduce disparities in accessibility and GDP per capita between the old and new member states in ***relative terms***.

However, in ***absolute terms***, they widen the gap in accessibility and GDP per capita between the old and new member states.

## **Conclusions (6): Polycentricity**

All policy scenarios examined contribute to increasing polycentricity at the European level (MEGAs) by accelerating the economic development of the capital cities and other large cities in the new member states.

However, the price to be paid for this is that the national urban systems of the new member states become more polarised.

