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The ESPON 2013 Programme

ReRisk Regions at Risk of Energy Poverty

Applied Research Project 2013/1/5

Inception Report

Please also consult the Annex which contains further information, clarifying and complementing the information given in the Inception Report

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1. RERISK – Regions at Risk of Energy Poverty: The General Approach

The ReRisk project will analyze the European Regions' present and future vulnerability in view of rising energy prices, as well as their capacity to react to this challenge. The research will focus on evaluating the impact of higher energy prices on regional competitiveness and cohesion and formulate policy recommendation on how to improve elasticity of energy demand on regional level.

In order to reach these objectives, the research has been divided in three consecutive phases:

1. In-depth analysis of the regions' present vulnerability in view of rising energy prices: this task, which has already started, consists in checking the availability for data on regional energy consumption and spending, and determining the weight of energy- and transport- intensive sectors for the EU27, Turkey and the Western Balkan. Other relevant data on climate conditions, sociodemographic and transport trends will be compiled with the help of the ESPON database project and through direct contacts with the national institutes of statistics and national or regional energy agencies. The final outcome of this first research step will be the elaboration of a "Risk-of-Energy-Poverty Profile" with the greatest regional break-down possible. For more information on the progress made so far in this task and for the updated list of indicators, please see the section on "data availability".
2. The second step consists of clustering the regions according to their "Risk-of-Energy-Poverty Profile" in order to assess the economic impact of rising prices on the particular types of region and compare these results with other regional typologies defined in earlier ESPON project, as explained below in "Development in Methodology".
3. Finally, possible future developments will be discussed in the form of scenarios, which, according to the modified proposal in "Development in Methodology" will now integrate a Delphi exercise in order to achieve a more direct participation of energy experts and regional stakeholders in the project.

2. Development in Methodology

Clarifications on Methodology: Definition of Regional Typologies

Regional typologies will be used in the ReRisk context in order to assess the economic impact of rising prices. The objectives are to demonstrate that these impacts are geographically differentiated, and that the policies that need to be designed to address them will vary according to particular types of regions. Each typology is based on a different set of criteria serving different policy purposes.

As an starting point, ReRisk will draw on the following spatial typologies available from ESPON on NUTS 2 level:

1. Typology of lagging regions

   We will test to what extent regions characterised as "lagging" are more or less vulnerable to rising energy prices. Relevant factors in this respect can be higher

proportions of low income groups, a less established and more adaptable industrial structure or a higher proportion of agricultural activities in terms of employment or a less well developed energy supply system.

2. Specific territorial context: Coastal, Insular, Mountainous and Border regions

We will test to what extent regions characterised as Coastal, Insular, or Mountainous, as well as outer- and inner European border regions are more or less vulnerable to rising energy prices. Relevant factors in this respect can be dependence on intra-regional transport, access to raw materials, final and intermediate products and quality and reliability of the energy supply system.

These types of areas are defined at NUTS 3 rather than NUTS 2 level, e.g. in the European Commission's Draft Green Paper on Territorial Cohesion. We will therefore need to design methods to incorporate these parameters in our primary scale of analysis, NUTS 2.

3. Pentagon EU 27 plus 2

The Pentagon is primarily a group of highly accessible regions in Europe, with a high concentration of metropolitan regions.

We will test to what extent this type of high European accessibility combined with a predominant metropolitan territorial context can be a factor of increased or decreased vulnerability to increasing energy prices.

These initial typologies do not take into account energy supply or demand or other directly energy related issues. ReRisk will first seek to introduce a broad range of energy-related classification criteria, strengthening their relevance and representativeness for energy policy making. Secondly, the project will assess the relevance of the given set of typologies for the needs of the ReRisk project. In this respect the convergence to or divergence from the existing typologies resulting from the inclusion of energy-related indicators will be identified.

More precisely the approach is that of identifying common features and also differences between regions at high risk of energy poverty and the above-mentioned regional typologies, in order to draw conclusions on how energy poverty may affect earlier analysis on the regions' positioning in Europe.

In a second stage, Rerisk will construct typologies built on indicators that are considered as being of importance for the specific issue of vulnerability of regions to rising energy prices, especially with regards to economic performance and competitiveness. The list of relevant indicators will be finalized at a later stage, but will need to include energy supply and demand aspects, industrial profiles and social structures.

For all these purposes, a set of classification techniques will be proposed and tested presenting results that will be assessed as to their policy making robustness.

Clarifications on Methodology: Scenario Building

The scenario building activity will provide answers mainly on the likely long-term impact of different territorial development trends on energy demand and rising energy prises on regional competitiveness. The scenario-building process is illustrated in the chart entitle "Scenario-building process for task 2.3" presented in section VII of the annex.

Making the scenario bases

Based on the results obtained from tasks 2.1 and 2.2, specifically the regional typologies and quantitative analyses, the goal of this activity is to create the bases for the scenario building process by understanding the past and present trends on energy supply and demand, their short-term impact on regional competitiveness, as well as the impact of the driving forces behind the megatrend referred in the call on energy consumption.

This activity consists of two elements:

I. A literature review, having its focus on ESPON reports but also literature on energy systems combined with a brief and more target oriented analysis of the inputs obtained from tasks 2.1 and 2.2. The goal is to recreate a baseline scenario;
II. One workshop with independent experts in the energy sector, aiming at pinpointing key factors in the energy development process and identifying future development trends on energy supply and demand. The workshop is planned to be one an half day long, consisting of approximately 7-9 independent experts both from public and private energy agencies.

The outputs from the above will in the first place be three preliminary scenarios and two sets of hypotheses for each of the scenarios. The first set of hypotheses will focus on the impact of regional development trends on energy consumption, while the second will be on the possible response of different types of regions, identified during task 2.2, towards rising energy prices.

Building the scenarios

This activity is more regional oriented than the previous one, consisting of two rounds of internet based questionnaires directed towards the regions. The three preliminary scenarios and the corresponding two sets of hypotheses produced during the workshop will be presented in the first questionnaire, which should be answered by representatives from a limited sample of the selected regions. During this activity each representative is supposed to select the most likely hypothesises for each the two sets. In addition the user will have the opportunity to formulate new hypotheses, and to present the critical arguments for their choice. This activity will be analysed and concluded interactively as the research team collects the data.

The results obtained during the first round of questionnaires and the argumentations behind the choices will then be presented in a new internet-based questionnaire that should be answered both by the participants in the previous round and by as many as possible of the remaining regions. This round of questionnaires is aiming at identifying a more precise list of hypotheses, by ensuring a substantial coverage of responses, but especially to focus on regional diversities in their choice of argumentation. The hypotheses and scenarios will be adjusted accordingly.

Validating the scenarios

In order to test the scenarios resulting from the building process, these will be discussed during two workshops. The first workshop aims at bringing in the ESPON community's perspective into the scenarios, and will thus involve the participation of the ESPON community and the project partners who will cross-check and complement the most probable sets of hypotheses, in order to exclude contradictions within each of the scenarios. After the scenarios are adjusted according to the results from this workshop the whole scenario process will be culminated with a final workshop. The aim of the final workshop is to validate the scenarios by presenting them to both energy experts and representatives from selected regions and opening a dialog between these two groups. The final workshop will be carried out during one day including the participation of 20 to 30 participants. In order to complement the scenario-building exercise and cover specific themes that might be otherwise difficult to investigate through this method three to four case studies will be carried out.

3. Analysis of the Relevant Literature

The literature analysis has so far centered on reference works discussing different concepts of regional competitiveness and on identifying studies related to energy consumption and elasticity of demand. Furthermore, the ESPON projects relevant for the ReRisk study have been checked for data input, especially with regard to regional typologies and possible "drivers" for the scenario exercise. It has also been necessary to study various documents on the discussion of the "modifiable areas unit problem" and data management in general, on the Transnational Networking Activity on the Western Balkans, on the statistical treatment of data in Turkey and the Western Balkans and a recent report on energy poverty from the UK. The complete list of reference studies consulted so far has been included in the section of "References". This list will be constantly updated during the project.

4. Data Availability

General remarks

Earlier ESPON projects have used regional indicators that are not available from the Eurostat data base that is publicly accessible. In general, published regional data from Eurostat is rather poor, so we have launched an inquiry to Eurostat of which information can be obtained from the

databases CRONOS and REGIO and from Eurostat's energy expert. We also expect that data accessibility will improve after the official meeting with Eurostat at the beginning of October.

Contacts have been established with the project ESPON DB in order to coordinate data retrieval and treatment from the very beginning of the project. During the first contact it has been agreed that ESPON DB will send the rules for data submission, a 1st set of available data in September and a second set in November. ESPON DB recommends using the NUTS 2003 nomenclature for time series instead of the new NUTS 2006 classification, for the present lack of historical data in the new classification. ESPON DB has indicated the following on general data availability:

⇒ Concerning income and poverty, the only available data is at national level

⇒ Data on ageing is available from Eurostat for the period 2003-2005, according to the 2006 definition of NUTS 2 regions.

⇒ Data on education levels are available for 2005 and 2006 from Eurostat, but Germany and the UK are described at NUTS 1 level (i.e. Bundesländer and England/Wales/Scotland/Northern Ireland). The previous ESPON programme collected complete NUTS 2 data for 2002, but using the 1999 definition of NUTS 2 regions.

Further recommendations obtained from the project ESPON DB regarding specific types of indicators are indicated below.

Regarding the regional dimension, this project will collect data whenever possible on NUTS 2 and 3 level in order to produce input for other ESPON project and the ESPON Database. However, the project also has to take into account the Eurostat rules, which establishes that "the following Member States are considered as one region at this level of detail in NUTS, 2003 version: Denmark, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Malta and Slovenia"[1].

When formulating *policy recommendations*, we suggest using NUTS 1 or NUTS 3 level for those countries, in which the NUTS 2 classification does not correspond to the actual distribution of regional competences. This is based on the consideration that the policy recommendations to be formulated at the end of the project should be addressed to the administrative level, which is able to carry out the necessary measures[2]. This affects the following countries:
Belgium, Germany, United Kingdom.

(http://epp.eurostat.ec.europa.eu/portal/page?_pageid=2293,59872848,2293_68195655&_dad=portal&_schema=PORTAL#REGION)

[2] Referring to the finding of ESPON Project 3.4.3. "THE MODIFIABLE AREAS UNIT PROBLEM http://www.espon.eu/mmp/online/website/content/projects/261/431/file_2243/fr-3.4.3_maup_final_nov2006.pdf

The following countries will be analyzed on NUTS II level whenever possible:
Spain, France, Italy, Netherlands, Austria, Portugal, Finland, Sweden, Czech Republic, Poland, Slovak Republic, Romania, Bulgaria.

The Western Balkan countries will be analyzed on country level, since there is generally no break-down of data to lower administrative levels. Turkey, in turn, has by now defined subregions equivalent to NUTS II level and data coverage may be sufficient to establish the Risk-of-Energy-Poverty Profile on this level.

Data Availability for Turkey

According to the "Mission Report Mission Report on the subject: "Regional Statistics, definition NUTS, coordination with other administrations", by 2002, Turkey has the following territorial breakdown: "Administrative division of Turkey is formed by province, district and villages. There are 81 Provinces. Regional level 3 was defined on the base of provinces. Most of the basic and important statistical data are collected on the base of provinces. Regional level 2 was defined by grouping provinces together (26 Sub-regions, called SRE). Finally, regional level 1 was determined by geographical, economic and social criteria (12 Regions)". According to this document, the Turkish Statistical Office was to submit to Eurostat the "REGIO availability list" with all data contained in REGIO. Some of this data is by now available in the Eurostat database and has been included in the Annex, Section VI.

Turkstat's statistical yearbook contains some more data with regional breakdown:

- Monthly minimum and maximum temperatures by meteorological stations, 2005
- City and village population and annual growth rate of population 1990 – 2000,
- Population, annual growth rate and population density 1990 – 2000
- Number of households and size, 2000
- Mid-year population estimates (city, village), 2005
- Employment and unemployment rate, 2005
- Employment by sector (agriculture, industry, services), 2005
- Nº of poor households and nº of individual poor in urban and rural zones (2004)
- Electricity consumption by SRE, in MWh, 2004, on regional 2-digt level (Total, government offices, commercial, residential, street lighting, Industrial consumption and others)
- Rate of change of consumer prices, 2004 – 2005
- GDP 2001
- Household income distribution
- Distribution of expenditure groups (Gini Index, includes housing and transportation, but not "energy")

However, most of the economic data necessary to measure competitiveness in only available on national level:

- Electricity consumption by source; consumption of electricity by economic activity
- Thermal electricity generation by energy resources, 2004
- Consumption of electricity by economic activity, 2004
- Value-added of industry, 2001 (classification ISIC, Rev.2)

- Industry production index 2001 – 2005 (weighted by value added)
- Consumer price index housing, water, electricity, gas and other fuels, 2003 - 2005

Data Availability in Western Balkans

ECP Slovenia has been contacted in order to integrate into the ReRisk research project the information already supplied as a result of the "ECP Transnational Networking Activity" "Western Balkans". However, the indicative list of territorial indicators proposed does not include data on energy production, consumption or spending, so we have started to check on the availability of these indicators from the national statistical offices.

FYROM (Macedonia): Data accessibility for FYROM is more limited than in the rest of the Western Balkan countries, since the Statistical Yearbook cannot be consulted online and all other publications also have to be purchased. From the accessible data, we have identified the following indicators relevant for the ReRisk project, observing a lack of disclosure of Gross Value Added and lack of data on poverty levels:

Indicator	Source	Year	Available at
Population at midyear	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/glavna_eng.asp?br=01	2003-2006	Country level
Number of unemployed persons according LFS	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/glavna_eng.asp?br=01	2003-2006	Country level
Rate of unemployment	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/glavna_eng.asp?br=01	2003-2006	Country level
GDP and Value added (in million denars)	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/statistiki_eng.asp?ss=09.04&rbs=1	2004-2008	Country level
GDP at current prices (in million denars)	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/glavna_eng.asp?br=01	2002-2005	Country level
GDP real growth rates	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/glavna_eng.asp?br=01	2002-2005	Country level
GDP per capita in US $	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/glavna_eng.asp?br=01	2002-2005	Country level
GDP by NACE sections	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/statistiki_eng.asp?ss=09.01&rbs=1	1999-2005	Country level
Gross value added (total)	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/statistiki_eng.asp?ss=09.01&rbs=1	1999-2005	Country level
Final energy consumption by sector and industry (by fuel type)	State Statistical Office- Republic of Macedonia Energy Balance Sheet	2006	Country level
Total primary production	State Statistical Office- Republic of Macedonia Energy Balance Sheet	2006	Country level
Consumer prices: housing, water, electricity, gas and other fuels	State Statistical Office- Republic of Macedonia http://www.stat.gov.mk/english/statistiki_eng.asp?ss=08.01&rbs=1	2003-2008	Country level

Serbia: National demographic and economic data is available (in English) from the Serbian Statistical Yearbook 2007, which contains most necessary demographic and economic data, but information on poverty levels and transport seems to be insufficient.

- Demographic series until 2002
- Unemployment 2005, 2006
- Value-added by industry 2002 – 2004
- GdP 2002 – 2006 by industry
- Energy production and consumption by sector, 2006
- Electricity and fuel consumption by industry, 2002 – 2006
- Household expenditures on waste collection and, water services and energy products, 2004-2005 (details for electricity, gas firewood and coal and division for urban and rural areas)
- Available budget and individual consumption in 2006, monthly average by member of a household (includes section "Rent, water, electricity, gas and other fuels)"
- Consumption of fuel and electricity by transport, storage and communications enterprises

Croatia: The situation is comparable to Serbia, the statistical data is structured in a very similar way and is generally available for 2005. The energy indicators are, however, slightly different, and poverty indicators have been defined for the country (At-risk-of-poverty rate by age and sex, 2003 – 2005).

Available energy indicators:

- Electricity consumption by consumption sectors and losses (2005)
- Electricity production, import and export, 2006 (only hydro and conventional thermal)
- Total energy consumption, 2006

Federation of Bosnia and Herzegovina: In the Statistical Yearbook 2007, we find very detailed data on "energy and fuel consumption in driving and production purpose" for the year 2006, derived from the "Annual Report on Energy-generating products and raw materials in Industry." Furthermore, the "cost of living indices according to groups and subgroups of products and services" provides very detailed information on the development of energy prices between 1999 and 2006. However, the usefulness of this data has to be confirmed with national experts, since other, much more basic data on energy production and consumption or poverty level is lacking.

Albania: The data that can be accessed free of charge indicates a lack of detail for the economic indicators necessary to evaluate the impact on competitiveness:

- Demographic indicators (1990-2007)
- Employment and unemployment series by activity sector (1995-2006)
- Income by household type (2000)
- GDP at current prices by economic activities (1996-2006)
- Energy statistics:

- National independence of energy (%)(1998-2004)
- Gross inland energy consumption (1998-2004)
- Production and consumption by type of energy (1998-2004)
- Production and consumption of solid combustible minerals (1998-2001)
- Production and consumption of electricity (1995-2004)
- Final consumption of electricity by users (1995-2004)
- Production and distribution of domestic natural gas (1995-2004)

Data Availability for Subsets of Indicators Relevant to the ReRisk Project

Climate Change Indicators:

The definite results of the BBR study on regional impacts of climate change will not be available until 2009, so we are now contacting the International Panel on Climate Change in order to access the data used for their scenarios, which will also form the basis of the ESPON project on climate change. ESPON DB will submit available data for this project through the partner in charge of supporting the Climate Change project (University of Barcelona).

Data on climate characteristics (temperature contrast index) will be supplied by project partner Nordregio, who has recently carried out a related study.

Energy Indicators:

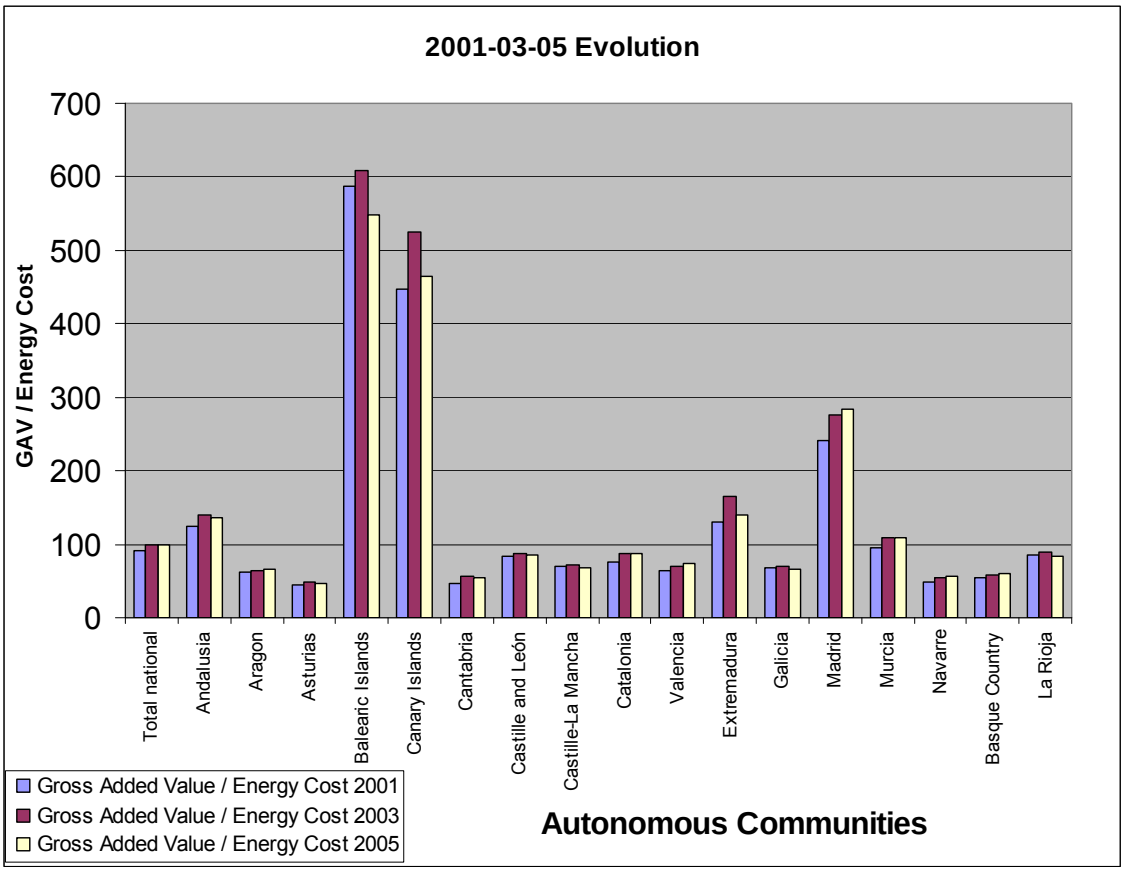
Basic data on energy production (by source) and consumption (by sector) is available con NUTS 2 or 3 level, including for the Candidate countries, according to the ESPON data navigator. However, information on the development of renewable energies on regional level may not be that easily available.

It is quite obvious that the NUTS 2 level is **not** the appropriate scale to analyze dynamics in energy production and supply. European energy policies are primarily designed at the European, Transnational and national levels. Distribution systems are organized at the inter-regional or national scales. Within the Rerisk project, the focus must however remain at the regional level. The dynamics of the energy production and supply sectors will therefore have to be synthesized through some simple scenarios with regards to the access to energy in each region.

One can conclude from this that the analysis of energy production capacities in the regions needs to be clearly dissociated from that of effects of energy poverty. The only exception in this regard is energy production projects that explicitly target local markets (e.g. certain types of small scale bioenergy, wind power or solar energy project). These however generally only account for a marginal proportion of the total energy consumption. Other types of energy are distributed across regional borders, according to market mechanisms and regulatory measures.

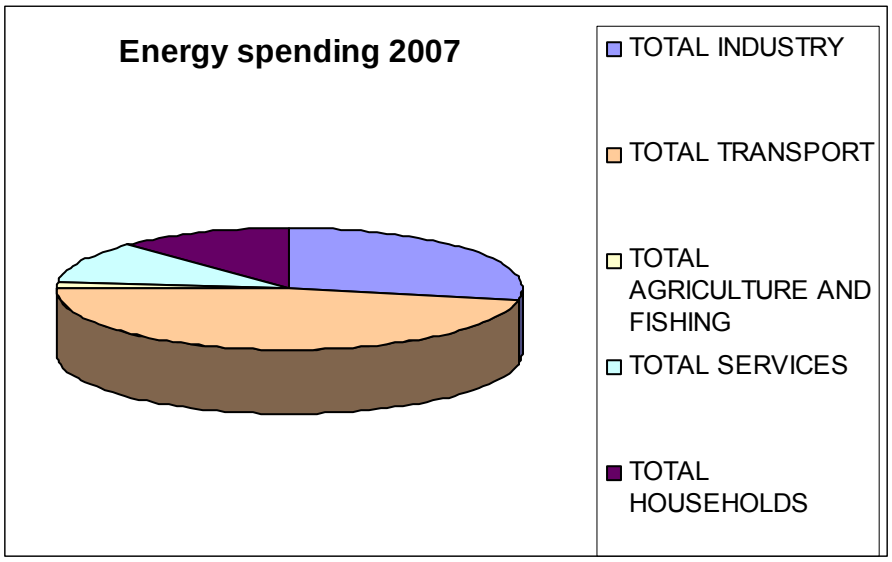
Since detailed information on energy consumption and spending in the regions is a key factor for the success of the ReRisk project, the project team will make a considerable effort to obtain data similar to that available for the Spanish regions, including the Basque Country.

Development of regional energy spending and regional gross added value 2001 – 2005, Spain



Source: INE Data Base, Survey on Structural Business Statistics. Own elaboration.

Distribution of Energy Spending within the Basque Country, 2007



Source: EVE Ente Vasco de Energía. Own elaboration.

In order to complete Eurostat and ESPON data, we have launched inquiries to national and regional statistical offices and other information sources (see list of contacts in Section I of Annex). The information on data availability obtained so far from these contacts and from our own research is summarized in the tables in Section II of the Annex to this document.

Updated List of Indicators

Task	Source	Year	Comments / definition
2.1.1. Climate zone of the region and other specific regional factors that influence energy consumption			
Regional map of climate zones (construction code)			
Average annual minimum temperature			**Nordregio, "The NSPA in Europe"- data on harsh climate**
Average annual maximum temperature			**Nordregio, "The NSPA in Europe" - data on harsh climate**
Average monthly humidity			
Average annual sun hours			
Climate change impacts			
2.1.2. Social indicators			
At risk of poverty rate	Espon		**Lisbon Indicator. Country level**
GDP per capita in pps	Eurostat	2005	**NUTS 2. Regional gross domestic product (PPS per inhabitant)**
Unemployment rate	ESPON / Eurostat	2006 / 2007	**ESPON core indicator. Available from Eurostat on NUTS 3 level in most countries (not Turkey, nor Switzerland)**
2.1.3. Demographic indicators			
% elderly people	Eurostat	2006	**NUTS 2. To be derived from "Average population by sex and age". Some data lacking for New Member States**
Number of one-person households			

Population density	ESPON		**ESPON database ¿including Western Balkans?**
Urban sprawl			
2.1.4. Energy demand indicators			
Electricity consumption by sector (in gigawatt hours)	Eurostat – Datashop: New Cronos: Regio database: tran enr: energy en2 cons		**NUTS 2 (NUTS 3 for Central European and Candidate Countries) according to ESPON Data Navigator**
Electricity consumption / GDP (kWh per 1000 Euro):			**NUTS 2. Can be calculated combining available information on electricity consumption and GDP**
Households' energy use (toe per capita)			
Gross Inland Consumption by fuel	Eurostat	2006	**Country level**
2.1.5. Production capacity indicators*			
Electricity production capacity (in megawatt)	Eurostat - Datashop: New Cronos: Regio database: tran enr: energy en2 celec		Energy sources: nuclear, hydroelectric, thermal, total **NUTS 2 (NUTS 3 for Central European and Candidate Countries) according to ESPON Data Navigator**
Proportion of electricity generated by renewables (%)			
Proportion of electricity generated by liquid fossil fuels (%)	Cronos / Regio above		**Energy sources: thermal** **NUTS 2 (NUTS 3 for Central European and Candidate Countries) according to ESPON Data Navigator**
Proportion of electricity generated by solid fossil fuels (%)	Cronos / Regio above		
Proportion of electricity generated by natural gas (%):	Cronos / Regio above		
Fossil fuel dependency (%)			
Crude oil refined/fossil fuels primary consumption	Eurostat	2005	**Country level**
Transmission capacity (bottlenecks)	UCTE - Union for the co-ordination of transmission of electricity	2007	**"System Adequacy Retrospect 2007". Country level. Includes data on Western Balkan Countries**
Mapping of renewable resources	National / Regional energy agencies		
Past speed of RES deployment (time frame?)	Eurostat	2001 - 2005	**Country level (hydroelectric, wind, PV)**
2.1.6. Transport infrastructure: modal split of passenger and road transport,			

Nº of daily trips by car			
Modal split of passenger transport			
Modal split of freight transport	Eurostat	2006	**Railway infrastructure and transport flows by NUTS II region**
Total number of driven intra-regional trips (trucks / day)	Eurostat	2001	**Available for NUTS 2, but not new Member States**
Total number of km produced by intra-regional trips (1000 Km / day)	Eurostat	2001	**Available for NUTS 2, but not new Member States**
Nº of people working in the region vs nº of persons working in another region	Eurostat	2006	**Available for NUTS 2 – must be related to size of region (area)**
Regional Competitiveness & Elasticity Indicators			
Gross value added at basic prices	Eurostat	2005	**Available for NUTs 2 and NACE 1 digit**
Gross energy consumption / GdP	Eurostat / EFTA		**Lisbon indicator. Country level**
Regional energy costs	Eurostat (country data)/ National		**Council Regulation (EC, Euratom) No 58/97 of 20 December 1996 concerning structural business statistics**
Regional gross value added in energy intensive industries / European gross value added in energy-intensive industries	Eurostat		**NACE 24, 26, 27, 28**
Regional gross value added of transport-intensive sectors / European gross value added in transport-intensive industries	Eurostat		**NACE 14, 17, 19, 20, 21, 26, 29, 31, 34, 45**
Employment in renewable energy sector	National / Regional sources		
Household debt	Eurostat / OECD / ECB		**Country level**
Median disposable income	Eurostat	2004	**Disposable income for NUTS 2, including New Member States**

5. Project Organisation, Expected Deliveries and Dissemination Plan

The project will be developed through three work packages (WP). Work package 1 is focused on coordination activities; work package 2 is dedicated to the research activities that will be carried out to reach the project's objectives, and work package 3, will centre on the dissemination of the project's results.

5.1. Governance Structure, Organisation and Decision Rules

A governance structure has been established for an effective management of the project. Please see figure 1 in the Annex, Section III. In addition, a Partnership Agreement will be signed laying down the division of mutual responsibilities and rights of partners and ensuring smooth working mechanisms.

5.1.2. Role & Responsibilities of Different Bodies

- **Project Lead Partner**

The **Lead Partner** (LP) takes over the responsibility for management, communication, implementation and co-ordination of activities among the involved partners. This partner will be the administrative link between the project and the ESPON programme, namely the project expert in charge at the Coordination Unit as well as the Sounding Board assisting the project. The LP is responsible for reporting progress to the ESPON 2013 Programme and transferring the ERDF contribution to the project partners. The LP will also be the **Communication Manager** of the project. See the figure 1 in the annex Section III.

- **Project Coordinator (PC)**

The coordinator is responsible for the organisation of the project's work. The coordinator is highly qualified in the management of transnational projects as well as in the thematic priority of the project. The coordinator should act as a driving force in the partnership in order to achieve the objectives laid down in the proposal within the foreseen schedule. The coordinator will also provide scientific and technical support to all partners.

- **Financial Manager (FM)**

The financial manager will be responsible for the accounts, financial reporting and internal handling of project financing. The financial manager and the coordinator will work in close cooperation because of they belong to the same organization and they will be closely involved with the partners and the first level controllers in order to enable efficient financial management of the operation. The financial manager is familiar with the accounting rules, international transactions, EU and national legislation for the management of ERDF funds, public procurement and financial control.

Following the ESPON project implementation requirements, the **joint progress report** consists of an **activity part and a financial part**, which also comprises the first level controller's certificate on the validation of expenditure.

The joint progress report will be provided both in digital and paper version to the CU.

The reporting procedure will be as follows (see figure 2 in the Annex, Section III):

1) Project Management Team-PMT- will be responsible of collecting financial documents (invoices, payment slices, salary sheets...) regarding project costs of all partners during each period. This information will be send to Administrative Department –AD- of the Lead Partner's Financial Unit –FU-. The Financial Department will check these documents and send them back to the Financial Manager as a detailed account report.

2) Each partner will send its certified report to the Lead Partner within the deadlines agreed with the Lead Partner and will ensure that its part of the reported activities. FM together with PMT will check these reports and send it back to each partner in order to be independently validated by a first level controller in compliance with the country specific requirements.

3) On the basis of the individual validated report, the Lead Partner compiles the joint progress report for the whole partnership. The compiled report will be checked by the financial department of the LP and signed by the director of accounts. Afterwards it will be sent to the LP´s first level controller.

4) The Lead Partner's first level controller checks Lead Partner's reports.

5) The Lead Partner's first level controller validates the information provided by the partners. This information has previously been controlled and validated by a first level controller according to each country's specific control requirements.

6) The Lead Partner's first level controller verifies the information provided by each partner through the joint progress report.

7) For the audit trail the Lead Partner retains copies of the inputs to the progress report received from the partners, all supporting documents related to the project and give sufficient information to partners to ensure that they also keep their documents until the given deadline. LP also guarantees to distribute any information received from the Programme in relation to final issues and ensure a proper audit trail at project level with close cooperation with the first level controllers.

8) The Lead Partner submits the progress report to the ESPON CU.

The reporting and financial flow will follow the procedure shown in the figure 2 in the Annex, Section III.

- **Project Management Team (PMT)**

The project management team will be composed by the Lead Partner and Communication Manager, Coordinator and Financial and Legal Issues Manager. The role and responsibility of this team will be the overall technical and financial management of the project in the above mentioned topics. The PMT will also coordinate with other ESPON projects; in particular the project financed under *climate change* activity.

Meetings Calendar

Meetings for the different Committees in the project have been planned for the entire project, on the following basis:

• Kick -off meeting for all the partners.

• Project Management Team meetings.

• Transnational Project Groups Meetings (TPGM), according to a established calendar

Kick-off meeting

A one-day kick-off meeting of all of the partners was held within 1 month of the start of the project, concretely on 29th June. The aims of this meeting were:

• Confirm selection of the project management team and tasks responsibilities

• Review and confirm the work plan and time schedule.

• Finalise project administration and financial matters.

Project management team

Half-day meetings of the PMT every month have been planned over the life of the project.

Meeting arrangements

The LP will be responsible for convening the TPG meetings and, jointly with the Project Coordinator, for preparing the agendas and documents for these meetings based on member input. He/she will also be responsible for producing and circulating the minutes of these meetings.

TPG meetings calendar has been established as follows:

- 1st TPG Meeting: 19th September 2008 in Brussels
- 2nd TPG Meeting: 10th- 11th February 2009 in Paris
- 3rd TPG Meeting (including workshop from task 2.3): 29th-30th April 2009 in Athens
- 4th TPG Meeting (including workshop from task 2.3): October 2009 in Sweden (to be defined according to a future ESPON conference)
- 5th TPG meeting: April 2010 in Athens
- 6th TPG meeting (end of the project): December 2010

TPG will also be involved in other events or meetings as Seminars organised by ESPON CU (i.e. 10th-11th December in Lyon/Grenoble) and Climate Change Conference (30th November-11th December 2009 in Copenhagen).

5.2. Expected Deliverables

According to the outputs proposed by the ESPON project specification, as well as the overall project work plan, the time table for deliverables is set according to eh project timetable in the Annex, Section IV.

26 September 2008: Inception report

This report will provide an in-depth vision of the project concept as well as the methodology to be applied. The overall project methodology will be explained and the concrete research hypothesis will be presented. A first outline of detailed data indicators and data availability will be also specified.

31 March 2009: Interim report

This report will include those orientations given in the Inception Report, as well as the results of the discussions with the Sounding Board. The report will include the following elements:

- Preliminary results of developed indicators, regional typologies and maps
- Plan for the applied research towards the draft Final Report as well as the Table of Contents envisaged.

31 October 2009 (updated Interim report)

This report will present the results of the project at the point in order to feed the discussion in the framework of the United Nations Climate Conference that will be held from 30 November to 11 December 2009.

These results will include the Future Scenarios and the regional case studies.

31 March 2010 (draft Final report)

The draft final report will take into account feedback on the Interim report gathered from an ESPON seminar and the Sounding Board. This report will include at least these elements:

- Report on the main results, trends, impacts and policy options for policy development, including indicators, maps, regional typologies, regional profiles, etc…
- An executive summary summarising the main results of the applied research
- Scientific report documenting the scientific work undertaken, including these elements

June 2010 (Final report)
At this time a revision of the Draft Final report on the basis of comments received will be provided.

5.3. Dissemination Plan

The concern for dissemination and policy applications will guide the organization of the research effort throughout the entire process and, as such, will not merely be organized during the last six months of the project. This will be done by involving relevant stakeholders in the process and, as far as possible, by creating a sense of ownership with regard to the purpose, methods and outputs of the study. The main priority here is to ensure that concerned stakeholders actively use the material produced by ReRisk in their daily work thereby undertaking – through their own embedded actions – the dissemination task.

This implies that dissemination activities will be carried out all along the project and it will be important to begin the this process as soon as possible. As such, common partner links with other ESPON 2013 projects will be cultivated to facilitate the exchange of data where permissible. Moreover, all ReRisk activities in this field will be coordinated with the dissemination activities of the ESPON 2013 Programme. A more detailed dissemination plan is included in the Annex, Section V. The first action carried out in the dissemination part has been the design of the project logo por the future Website.

6. New Structure of the Budget

The ReRisk budget has been revised according to the orientations received from the ESPON financial manager and has been resubmitted in the following form(for more detail see annex III of the Partnership Agreement):

N.	Partner	Member/ Partner State	Total budgeted costs	Total financing requested from the Programme/Partner State Budget
1	INNOBASQUE	SPAIN	€ 400.000,00	100%
2	Nordregio - Nordic Centre for Spatial Development	SWEDEN	€ 149.200,00	100%
3	National Technical University of Athens	GREECE	€ 150.050,00	100%

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Other sources:

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- Nordregio et al. (2004) *Mountain areas in Europe: Analysis of mountain areas in EU Member States, acceding and other European countries.* Study for the European Commission, DG REGIO, Nordregio Report 2004:1.
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8. Annexes

Section I: Statistical Sources

- General:
  - Eurostat: http://epp.eurostat.ec.europa.eu/. Survey on Structural Business Statistics: Petra Sneijers, Eurostat Unit G1, Tel. +352.4301.35024)
  - European Commission- Energy fact sheets by country: http://ec.europa.eu/energy/energy_policy/facts_en.htm
  - ESPON Navigator: www.espon.eu
  - International Energy Agency: www.iea.org
  - European Energy Regulators CEER & ERGEG: http://www.energy-regulators.eu/portal/page/portal/EER_HOME
  - International Atomic Energy Agency: http://www.iaea.org/

- Austria:
  - Zentralanstalt fuer Meteorologie und Geodynamik: http://zamg.zc.at
  - Statistics Austria: http://statistik.at
  - Verband der Elektrizitaetsunternehmen Oesterreichs (VEOE): http://www.veoe.at/start.html
  - Federal Ministry of Economics and Labour: http://www.bmwa.gv.at/EN/default.htm

- Belgium:
  - Statistics Belgium: http://www.statbel.fgov.be/
  - Direction géneral Energie du SPF Economie: http://mineco.fgov.be/energy/energy_statistics
  - Portal de l'energie en Region Wallon: http://energie.wallonie.be/
  - Institut wallon de l'evaluation, de la prospective et de la statistique: http://statistiques.wallonie.be/
  - Studiedienst van de Vlaamse Regering: http://aps.vlaanderen.be/
  - ECODATA: http://ecodata.mineco.fgov.be/

- Bulgaria:
  - National Statistical Institute: http://www.nsi.bg/Index_e.htm
  - Energy Efficiency Agency: http://www.seea.government.bg/

- Cyprus:
  - Statistical Service of Republic of Cyprus: http://www.mof.gov.cy/mof/cystat/statistics.nsf/index_en/index_en?OpenDocument
  - Meteorological Service of Cyprus: http://www.moa.gov.cy/moa/MS/MS.nsf/DMLindex_en/DMLindex_en?opendocument
  - CIA-World Factbook: https://www.cia.gov/library/publications/the-world-factbook/
  - Electricity Authority of Cyprus: http://www.eac.com.cy/EN/Pages/Home.aspx

- Czech Republic:
  - Czech Statistical Office: http://www.czso.cz/eng/redakce.nsf/i/home

- Denmark:
  - Statistics Denmark: http://www.dst.dk/
  - Danish Energy Agency: http://www.ens.dk/sw11492.asp

- Estonia:

- Estonian Meteorological and Hydrological Institute: http://www.emhi.ee/?nlan=eng
- Institute of Environmental Physics of the University of Tartu: http://ael.physic.ut.ee/KF.public/default_eng.htm
- Statistics Estonia: http://www.stat.ee/

❖ France:

- Meteo France: http://france.meteofrance.com
- Ministère de l'economie, de l'îndustrie et de l'emploi: http://www.industrie.gouv.fr/energie

❖ Finland:

- Finnish Meteorological Institute: http://www.fmi.fi/en/index.html
- Statistics Finland: http://www.stat.fi/index_en.html

❖ Germany:

- Deutscher Wetterdienst: http://www.dwd.de/
- AG Umwelt-ökonomische Gesamtrechnungen der Länder: http://www.ugrdl.de/
- Federal Ministry of Economics and Technology: http://www.bmwi.de/English/Navigation/root.html
- Statistisches Bundesamt Deutschland EDS Europäischer Datenservice
- Statistical Office of Baden-Württemberg: http://www.statistik.baden-wuerttemberg.de/
- Statistical Office of Bayern: http://www.statistik.bayern.de/
- Statistical Office of Berlin/Brandenburg: http://www.statistik-berlin-brandenburg.de/
- Statistical Office of Bremen: http://www.statistik.bremen.de
- Statistical Office of Hamburg and Schelswig-Holstein: http://www.statistik-nord.de/index.php
- Statistical Office of Hessen: http://www.statistik-hessen.de/
- Statistical Office of Mecklenburg-Vorpommern: http://www.statistik-mv.de/
- Statistical Office of Niedersachsen: http://www.lsk.niedersachsen.de/master/C44771399_L20_D0.html
- Statistical Office of Nordrhein-Westfalen: http://www.lds.nrw.de/
- Statistical Office of Rheinland-Pfalz: http://www.statistik.rlp.de/index.html
- Statistical Office of Saarland: http://www.saarland.de/statistik.htm
- Statistical Office of Sachsen: http://www.statistik.sachsen.de/
- Statistical Office of Sachsen-Anhalt: http://www.statistik.sachsen-anhalt.de/
- Statistical Office of Thüringen: http://www.statistik.thueringen.de/seite.asp

❖ Greece:

- General Secretariat of National Statistical Service: http://www.statistics.gr

❖ Hungary:

- OMSZ: http://www.met.hu/omsz.php

❖ Ireland:

- Central Statistics Office Ireland: http://www.cso.ie/
- Sustainable Energy Ireland: http://www.sei.ie/

❖ Italy:

- Ministerio Della Defensa- Servizio Meteorologico: http://www.meteoam.it/
- Instituto Nazionale di Statistica: http://www.istat.it/
- TERNA: http://www.terna.it/

❖ Latvia:

- Latvijas Statistika: http://www.csb.gov.lv/

❖ Lithuania:

- Lithuanian Hydrometeorological Service: http://www.meteo.lt/english/
- Statistics Lithuania: http://www.stat.gov.lt/en/

❖ Luxemburg:

- STATEC Luxemburg: http://www.statec.public.lu/fr/index.html

❖ Malta:

- National Statistics Office: http://www.nso.gov.mt/
- Enemalta: http://www.enemalta.com.mt/page.asp?p=925&l=1

❖ The Netherlands:

- Statistics Netherlands: http://www.cbs.nl/nl-NL/default.htm
- KNMI: http://www.knmi.nl/

❖ Poland:

- Central Statistical Office Poland: http://www.stat.gov.pl/english/

❖ Portugal:

- Instituto de Meteorologia, IP Portugal: http://www.meteo.pt/en/index.html
- Statistics Portugal: http://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_main

❖ Romania:

- National Institute of Meteorology and Hydrology
- National Institute of Statistics: http://www.insse.ro/cms/rw/pages/index.en.do

❖ Slovenia:

- National Meteorological Service of Slovenia: http://meteo.arso.gov.si/met/en/
- Statistical Office of the Republic of Slovenia: http://www.stat.si/eng/index.asp

❖ Slovak Republic:

- Slovak Hydrometeorological Institute: http://www.shmu.sk/sk/?page=1
- Statistical Office of the Slovak Republic: http://portal.statistics.sk/showdoc.do?docid=359

❖ Spain:

- Instituto Nacional de Estadística: http://www.ine.es/
- Statistical Office of the Basque Country: http://www.eustat.es/
- Basque Energy Agency: http://www.eve.es/

❖ Sweden:

- Swedish Meteorological and Hydrological Institute: http://www.smhi.se/cmp/jsp/polopoly.jsp?d=103&l=en
- Statistics Sweden: http://www.scb.se/default____2154.asp

❖ Turkey

- Turkish Statistical Institute (TURKSTAT): http://www.die.gov.tr/ENGLISH/index.html; Phone: 0312 410 04 10 Fax: 0312 425 33 87 E-mail: info@tuik.gov.tr

❖ United Kingdom:

- Office for National Statistics: http://www.statistics.gov.uk/default.asp
- Planning Portal: http://www.planningportal.gov.uk/
- MET Office: http://www.metoffice.gov.uk/
- BERR: Department for Business Enterprise & Regulatory Reform: http://www.berr.gov.uk/
- Department of Environment, Food and Rural Affairs: http://www.defra.gov.uk/

Western Balkan Countries:

❖ Croatia: Republic of Croatia - Central Bureau Of Statistics http://www.dzs.hr/default_e.htm
❖ FYROM (Macedonia) State Statistical Office: http://www.stat.gov.mk/english/glavna_eng.asp
❖ Albania Institute of Statistics http://www.instat.gov.al/
❖ Bosnia-Herzegovina: Federation of Bosnia and Herzegovina, Federal Office of Statistics http://www.fzs.ba/Eng/index.htm
❖ Serbia and Montenegro: Serbian Statistical Office http://www.statserb.sr.gov.yu/Rzs/erzs.htm

Section II: National Institutions Contacted

Contacted institution	Country	Contacted person	Comments
Statistics Austria	Austria	Unknown	No answer yet
Central Institute for Meteorology and Geodynamics	Austria	Unknown	No answer yet
Statistics Belgium	Belgium	Jean-Luc Stroobant	Forwarded our request to another person (Olivier Pieret)
Institut Royal Météorologique de Belguique	Belgium	Unknown	No answer yet
National Institute of Meteorology and Hydrology	Bulgaria	Tania Marinova	No answer yet
Statistical Office of the Republic of Cyprus	Cyprus	Panagiota Loukaidou	No answer yet
Ministry of Agriculture, Meteorological Services	Cyprus	Unknown	No answer yet
Czech Meteorological Institute, Meteorology and Climatology Division	Czech Republic	Unknown	No answer yet
Danish Meteorological Institute	Denmark	Unknown	No answer yet
Estonian Meteorological and Hydrological Institute	Estonia	Unknown	No answer yet
Statistics Estonia	Estonia	Unknown	No answer yet
Ministry of Economy, Industry and Employment	France	Unknown	No answer yet
Météo France	France	Unknown	No answer yet
Statistics Finland	Finland	Leo Kostiainen	Check web site or send email to energia@stat.fi
Finnish Meteorlogical Institute	Finland	Unknown	No answer yet

Statistiches Bundesamt	Germany	Unkown	No answer yet
Deutcher Wetterdienst	Germany	Patricia Willing	No answer yet
Institute of Environmental Research and Sustainable Development	Greece	Unknown	No answer yet
Hungarian Meteorological Service	Hungary	Unknown	No answer yet
Met Eireann	Ireland	Unknown	No answer yet
TERNA	Italy	Laura De Sanctis	No answer yet
National Institute of Statistics	Italy	Unknown	No answer yet
Centro Nazionale di Meteorologia e Climatologia Aeronautica	Italy	Unknown	No answer yet
Central Statistics Bureau of Latvia	Latvia	Unknown	No answer yet
Latvia's Hydrometeorological Agency	Latvia	Unknown	No answer yet
Statistics Lithuania	Lithuania	Daiva Mikalopiene	Check Eurostat
Ministry of Environment-Lithuanian Hydrometeorological Service	Lithuania	Unknown	No answer yet
STATEC	Luxemburg	Unknown	No answer yet
National Statistics Office	Malta	Shawn S. Borg	Have sent some information. More information ask Enemalta
Malta International Airport MET Office	Malta	Unknown	No answer yet
Statistics Netherlands	The Netherlands	Ferry Lapré	The information required not available at NUTS 2
Royal Netherlands Meteorological Institute	The Netherlands	Unknown	No answer yet
Institute of Meteorology and Water Management	Poland	Unknown	No answer yet
National Statistics	Portugal	Unknown	Check web site

Institute			or send email to energia@dgg.pt
Instituto de Meteorologia	Portugal	Unknown	No answer yet
National Institute of Statistics	Romania	Unknown	No answer yet
National Meteorological Administration	Romania	Unknown	No answer yet
National Meteorological Service of Slovenia	Slovenia	Unknown	No answer yet
Slovenian Ministry of Planning,	Slovenia	Margarita Jančič: margarita.jancic@gov.si	No answer yet
ECP Slovenia,	Slovenia	Tomaz Miklavcic: tomaz.miklavcic1@gov.si	Out of office until Sept 29
Institute for policies of space,	Slovenia	Marko Peterlin: marko.peterlin@ipop.si	No answer yet
Slovak Hydrometeorological Institute	Slovak Republic	Unknown	No answer yet
Statistics Sweden	Sweden	Unknown	No answer yet
Swedish Meteorological and Hydrological Institute	Sweden	Unkown	No answer yet
Department of Business, Enterprise and Regulatory Reform	United Kingdom	Joanna Chan	Have sent some information.
UK Meteorological Office	United Kingdom	Unkown	No answer yet

Section III: Management structure

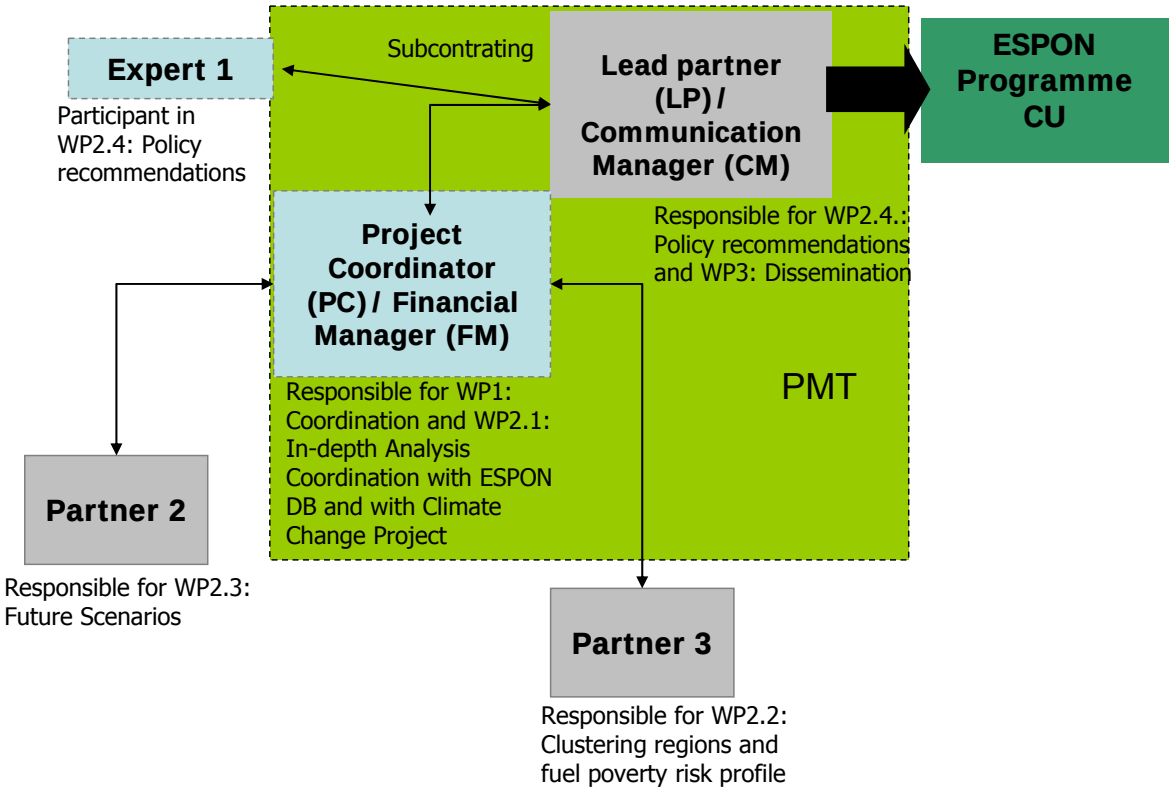


Figure 1. Overview of project management structure

Lead Partner's tasks and responsibilities

The LP's responsibilities in preparing, implementing and closing the project are the following:

- establish a Partnership Agreement setting mutual rights, obligations and duties between project partners;
- ensure the implementation of the entire applied research project being responsible for the division of tasks among the partners involved in the project
- ensure that these tasks are subsequently fulfilled in compliance with the Subsidy Contract
- ensure an efficient internal management and control system agreed between those beneficiaries;
- verify that the expenditures presented by the beneficiaries participating in the project have been validated by the controllers;
- ensure that the tasks regarding the signature of the contract by the other contractors are carried out in a timely and correct manner.
- act as the intermediary between the consortium and the ESPON CU. All information related to the project shall be transmitted timely by the consortium to the Commission through the co-ordinator, with the exceptions foreseen in the contract.
- prepare a conclusions report of the WP's including their relationship and to submit them to the ESPON CU

- introduce appropriate corrections if necessary
- guarantee first level financial control in order to validate the expenditure declared by each beneficiary participating in the project.
- take care of the information flow and methods between the co-ordinator and the WP leaders
- schedule the co-ordination meetings
- submit all the periodic reports , technical and financial
- submit all supplementary reports (outputs)
- establish a meetings calendar
- Oversee the promotion of gender equality in the project
- Approval and monitoring of the information analysis and dissemination process
- Approval of the exploitation and dissemination plan

In order to ensure all these tasks, the Lead Partner has subcontracted a **Project Coordinator** (PC) and a **Financial Manager** (FM) to set up an efficient and reliable management and control system, co-ordination system and audit trail.

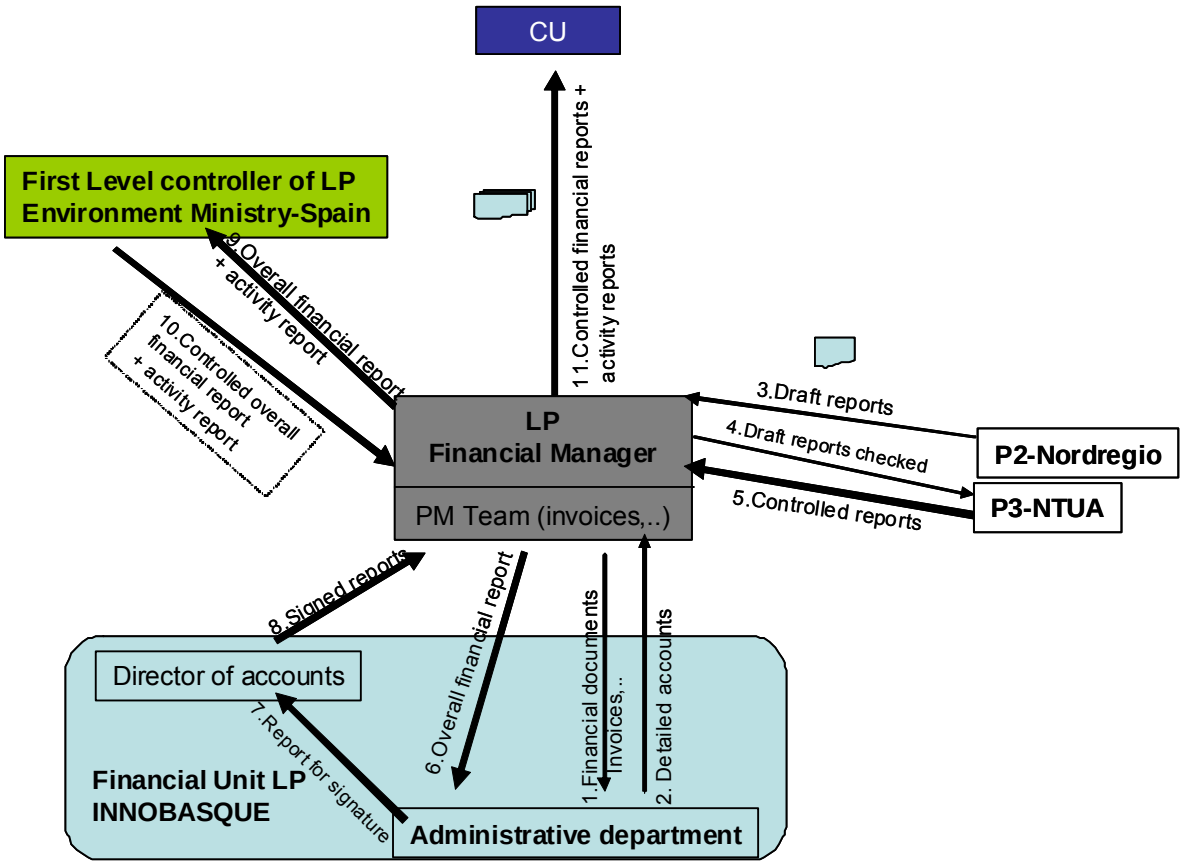


Figure 2. Flow chart of reporting procedure and financial flow

Coordinator's role & responsibilities:

- To review the initial work plan for the different tasks. To suggest changes if appropriated and to agree final work plans
- To follow up the development of every task, according to the milestones established in every work plan.
- To do this job, a six monthly report will be asked by the Co-ordinator to every task leader with the progress of every task, including the man power effort. An advance of these six month report will be asked every three months.
- To review outputs done by task leaders before sending them to the EC
- To assist the task leaders if some difficulties arise
- To prepare meetings: agendas, documentation, etc. in advance, minutes, etc.
- To coordinate with ESPON Database (ESPON DB)
- To coordinate with Climate Change Project

Financial manager's role & responsibilities:

- To keep accounts making it possible to determine at any time what portion of the Community funds has been allocated to each contractor for the purposes of the project and inform the ESPON CU of the distribution of the funds and the date of transfers to the contractors on an annual basis.
- Request and receive payments of project funding;
- Transfer project funding to the partners without delays in compliance with the amounts reported in the progress report
- Make sure that the project expenditures presented by the beneficiaries participating in the project have been incurred in for the purpose of implementing the project and correspond to the activities
- Submit all the periodic financial reports

Role & Responsibilities of the various task leaders

Coordination of a task means:

- • To review the initial work plan of the different participants in each task
- • To prepare a report of the activities carried out for each task for which the partner acts as coordinator
- • To introduce appropriate corrections if necessary
- • To follow up the development of every task, according to the milestones established in the workplan.
- To do this job, a six monthly report will be asked by the task leader to every participant with the progress of every task, including the man power effort. An advance of these six month report will be asked every three months.
- • To assist task participants if some difficulties arise

- • To review with the task participants the activities and budgetary control of the partners before periodic reports and cost statements

Establishing communication flow and methods

The communication flow will be bottom -up and top-down through the typical communication methods such as: meetings, videoconferences, e-mail, phone, fax etc.

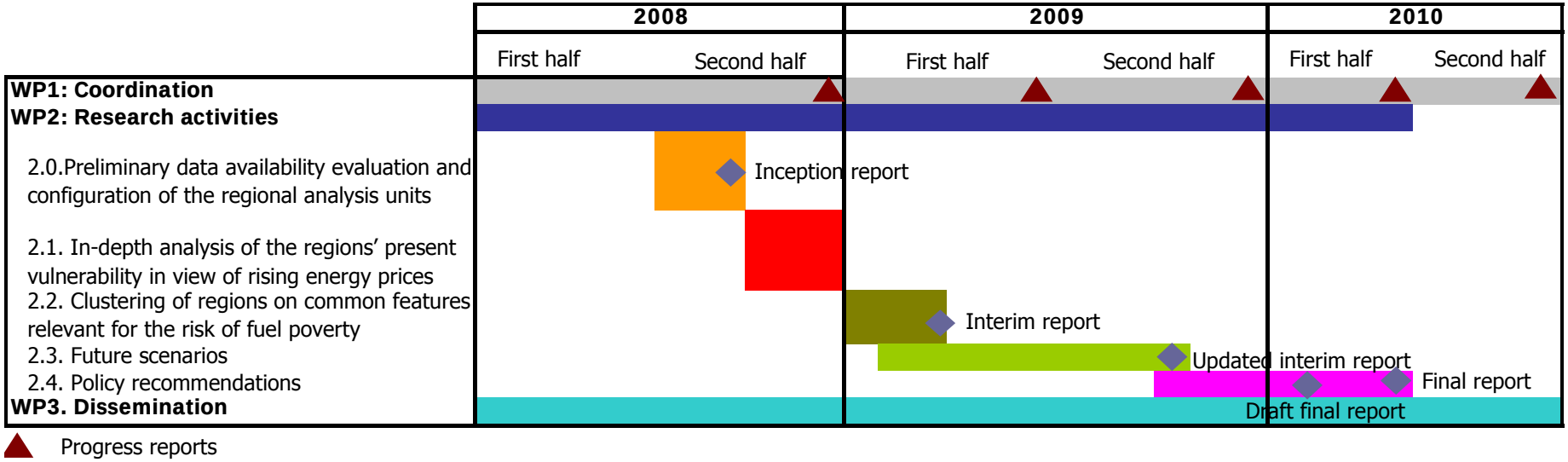
In particular, a co-operative working method using the web site will be established. The system will be organised with a structure in which all participants can deposit and download information on the different work packages and tasks according to their role and responsibilities.

Another section will be created for meetings, events, seminar, etc. Passwords will be facilitated to all partners as well as to the ESPON representative in charge of this project.

Section IV: Timetable

Project Timetable

The project timetable has been designed as follows:



Section V: Dissemination

The dissemination of project results will take place through international conferences and transnational activities of the Efonet Network, workshops, and events organised by the CU, as well as through the website that will be created by ReRisk.

This Website will be interactive to allow regional policymakers to introduce missing data in order to complete their "Risk of Energy Poverty Profile", using as much regional data as possible. Users will have to identify themselves in order to access the data part of the website, so that the submitter of the regional data can be verified before this information is published on the website. Data gathered by the ReRisk project and organized by the NUTS nomenclature, is to be fed into the on-line database to be used as default option, in case regional data is not available. This means that the regional policy maker, when entering the region's NUTS code, will have a clear overview of which data is available and which is missing.

In a later stage, the website will be completed with a section on policy recommendations on how to improve the regional "Risk of Energy Poverty Profile". These policy options must be linked to the type of region, for which they are most relevant, using the regional typology to be developed in the ReRisk project.

Identification of Target Groups

We have identified five target groups that we want to address from ReRisk in order to make sure that the project has relevant impact on related EU research and European and regional policy making:

- ESPON Programme Community, including experts and clients.
- Energy Experts
- Regional Stakeholders
- Strategic Energy planners
- Energy Research Centres

The different tools we envisage to make use of in order to address these different groups are:

Stakeholder	Dissemination tool	Events
ESPON Programme Community, including experts and clients	Presentations, reports	ESPON conferences 2008, 2009, 2010 and when solicited by ESPON CU
Energy Experts	Links with the EFONET European Energy Foresight Network	Common workshop for scenario building 28/04/09 Athens
Regional Stakeholders	Website, interactive "Risk of Energy Poverty Profile"	Website to be on-line after Interim Report. Will be announced through networks such as Innovating Regions in Europe and Assembly of

		European Regions.
	Presentations and digital flyer explaining the ReRisk project's objective	Innobasque leads "Innovation Year-2008" in the Basque Country. Information about ReRisk will be disseminated in various events and conferences organised in this context. Innobasque will also inform about ReRisk in the home page and the weekly newsletter that is sent to a network of 1000 contacts (public administration, main universities, technological centres and enterprises among others)
Strategic Energy Planners	Flyer in digital form, Website	Information to be channelled through SAVE II's Managenergy site to Regional Energy Agencies
	Delphi survey	To be carried out during the scenario building process
Energy Research Centres	Short communications on the progress of ReRisk	Meetings of the European Technology Platforms, of which Tecnalia is a member: • European Hydrogen and Fuel Cell Platform • European Ocean Energy Association • European Renewable Energy Centres Agency • European Solar Thermal Tech Platform • European Wind • Technology Platform for the Electricity Networks of the Future, Working Group 2: Network Operations • Technology Platform for the Electricity Networks of the Future, Working Group 4: Generation and storage

Section VI: Classification of Statistical Regions in Turkey

İstatistiki Bölge Birimleri Sınıflandırması (İBBS)
Classification of Statistical Regions (SRE)

İstatistik Bölge Birimleri Sınıflandırması (İBBS)

	Düzey1 - Level1	Düzey2- Level2	Düzey3 - Level3
TR	Türkiye - Turkey		
TR1	İstanbul		
TR10		İstanbul	
TR100			İstanbul
TR2	Batı Marmara		
	West Marmara		
TR21		Tekirdağ	
TR211			Tekirdağ
TR212			Edirne
TR213			Kırklareli
TR22		Balıkesir	
TR221			Balıkesir
TR222			Çanakkale
TR3	Ege - Aegean		
TR31		İzmir	
TR310			İzmir
TR32		Aydın	
TR321			Aydın
TR322			Denizli
TR323			Muğla
TR33		Manisa	
TR331			Manisa
TR332			Afyon
TR333			Kütahya
TR334			Uşak
TR4	Doğu Marmara		
	East Marmara		
TR41		Bursa	
TR411			Bursa
TR412			Eskişehir
TR413			Bilecik
TR42		Kocaeli	
TR421			Kocaeli
TR422			Sakarya
TR423			Düzce
TR424			Bolu
TR425			Yalova
TR5	Batı Anadolu		
	West Anatolia		
TR51		Ankara	
TR510			Ankara
TR52		Konya	
TR521			Konya
TR522			Karaman
TR6	Akdeniz		
	Mediterranean		
TR61		Antalya	
TR611			Antalya
TR612			Isparta
TR613			Burdur
TR62		Adana	
TR621			Adana
TR622			Mersin
TR63		Hatay	
TR631			Hatay
TR632			Kahramanmaraş
TR633			Osmaniye
TR7	Orta Anadolu		
	Central Anatolia		
TR71		Kırıkkale	
TR711			Kırıkkale
TR712			Aksaray
TR713			Niğde
TR714			Nevşehir
TR715			Kırşehir
TR72		Kayseri	
TR721			Kayseri
TR722			Sivas
TR723			Yozgat

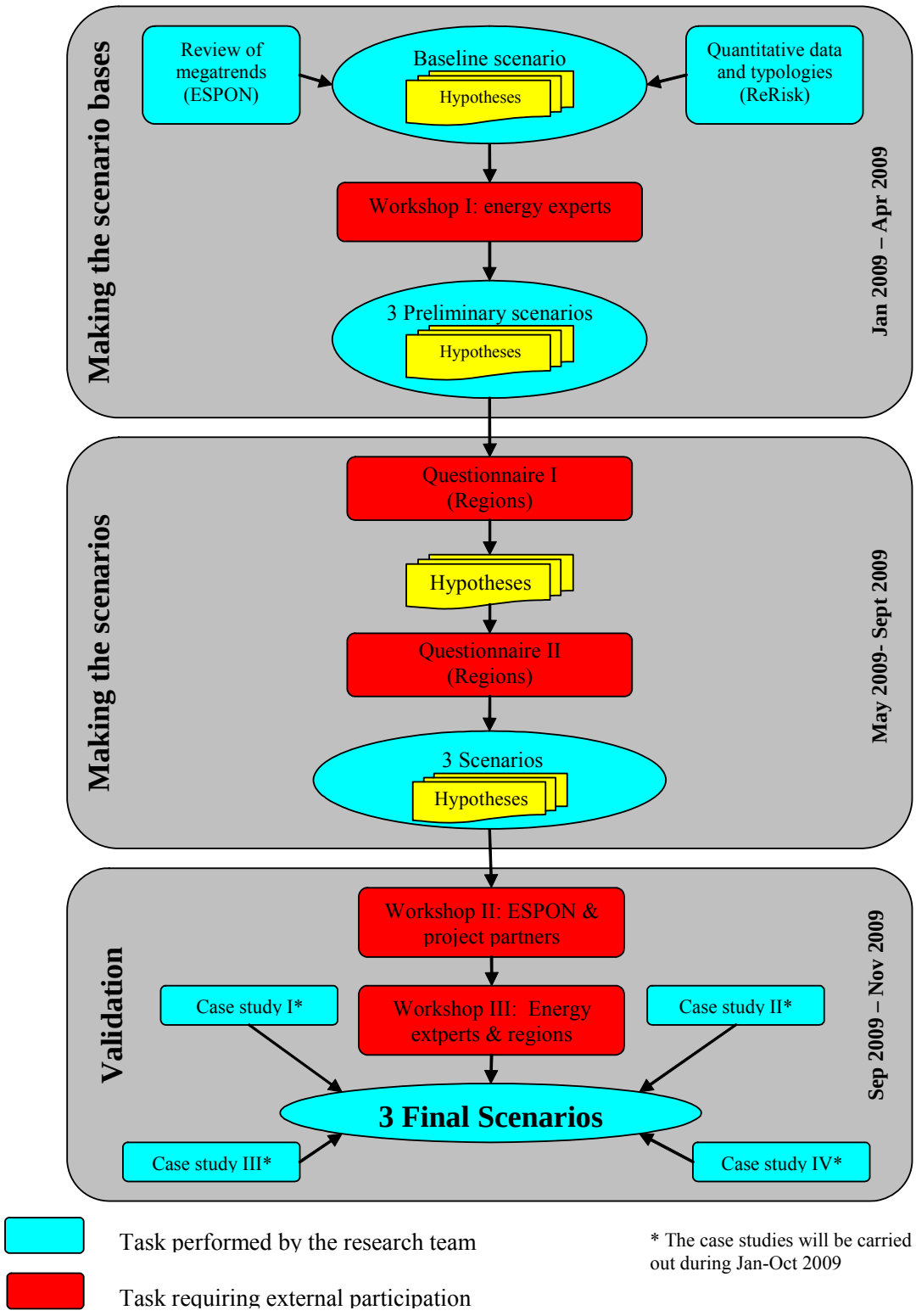
Classification of Statistical Regions (SRE)

	Düzey1 - Level1	Düzey2- Level2	Düzey3- Level3
TR8	Batı Karadeniz		
	West Black Sea		
TR81		Zonguldak	
TR811			Zonguldak
TR812			Karabük
TR813			Bartın
TR82		Kastamonu	
TR821			Kastamonu
TR822			Çankırı
TR823			Sinop
TR83		Samsun	
TR831			Samsun
TR832			Tokat
TR833			Çorum
TR834			Amasya
TR9	Doğu Karadeniz		
	East Black Sea		
TR90		Trabzon	
TR901			Trabzon
TR902			Ordu
TR903			Giresun
TR904			Rize
TR905			Artvin
TR906			Gümüşhane
TRA	Kuzeydoğu Anadolu		
	North East Anatolia		
TRA1		Erzurum	
TRA11			Erzurum
TRA12			Erzincan
TRA13			Bayburt
TRA2		Ağrı	
TRA21			Ağrı
TRA22			Kars
TRA23			Iğdır
TRA24			Ardahan
TRB	Ortadoğu Anadolu		
	Central East Anatolia		
TRB1		Malatya	
TRB11			Malatya
TRB12			Elazığ
TRB13			Bingöl
TRB14			Tunceli
TRB2		Van	
TRB21			Van
TRB22			Muş
TRB23			Bitlis
TRB24			Hakkari
TRC	Güneydoğu Anadolu		
	South East Anatolia		
TRC1		Gaziantep	
TRC11			Gaziantep
TRC12			Adıyaman
TRC13			Kilis
TRC2		Şanlıurfa	
TRC21			Şanlıurfa
TRC22			Diyarbakır
TRC3		Mardin	
TRC31			Mardin
TRC32			Batman
TRC33			Şırnak
TRC34			Siirt

GdP per capita 2001 and Unemployment Rate for Turkish Subregions

Region	GdP per cápita 2001	Unemployment rate by region (% 2004)	Unemployment rate by region (%) 2005	Unemployment rate by region (%) 2006
tr10 **Istanbul**	3395	12.3	11.4	11.2
tr21 **Tekirdag**	3028	6.2	7.8	8
tr22 **Balikesir**	2332	6.6	6.9	6.2
tr31 **Izmir**	3563	14.3	13.1	11.2
tr32 **Aydin**	2689	7.2	7	7.4
tr33 **Manisa**	2096	7.5	7.9	7.2
tr41 **Bursa**	2785	8.8	8.7	7.6
tr42 **Kocaeli**	4554	12	11.2	10.7
tr51 **Ankara**	3049	14.8	14.2	12.1
tr52 **Konya**	1772	8.4	9.5	10.6
tr61 **Antalya**	2249	6.6	6.2	7.3
tr62 **Adana**	2652	13.6	17.2	16.2
tr63 **Hatay**	1761	17.3	15.6	12.1
tr71 **Kirikkale**	2015	10	10.7	10.5
tr72 **Kayseri**	1576	8.9	11.1	11.3
tr81 **Zonguldak**	2576	12	6.9	5.9
tr82 **Kastamonu**	1659	10.6	8.6	5
tr83 **Samsun**	1728	5.6	5.7	6.6
tr90 **Trabzon**	1583	6.8	5.6	5.7
tra1 **Erzurum**	1198	4.1	4.7	5.4
tra2 **Agri**	809	1.7	3.2	5.2
trb1 **Malatya**	1584	17.9	18	13.7
trb2 **Van**	830	11	8.8	8.5
trc1 **Gaziantep**	1549	14.9	13.8	15.1
trc2 **Sanliurfa**	1281	10.8	10.4	12
trc3 **Mardin**	1100	6.1	11.1	15.7

Section VI: Scenario-building process for task 2.3



ReRisk Regions at Risk of Energy Poverty
Applied Research Project 2013/1/5

Annex to Inception Report

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

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Table of contents

1. Barriers and Risk Strategy: Encountered problems and proposed solutions

1.1. Lacking data on climate change

It has been clear from the start of the project, that ReRisk will not receive the needed information from the Climate Change project on time. The analysis of how climate change may affect energy production and consumption will therefore be carried out provisionally, to be updated at a later time. For the time being, ReRisk will use as basic reference document the EEA Report 4/2008 Impacts of Europe's changing climate – 2008 indicator-based assessment[3]. Estimates on the most affected regions will be based on ESPON Project 1.3.1. "Spatial effects of natural and technological hazards". This preliminary analysis will have to be contrasted later on with the findings from the climate change project.
The climate data necessary to ponder regional energy demand (framework data) will be obtained from two main sources:

- The assessment of climate harshness in Europe produced by the Word Conservation Monitoring Centre as part of the DG REGIO Mountain study coordinated by Nordregio
- The data collected by the JRC –IPSC / Agrifish Unit / MARS-STAT Action from 1500 weather stations to establish the best set of weather stations for the interpolation of temperature data at regional level (according to NUTS). The MARS-STAT action is also working on models to estimate the impact of climate change on crop production, which could be a useful input for estimating possible restrictions to biomass production and use[4].

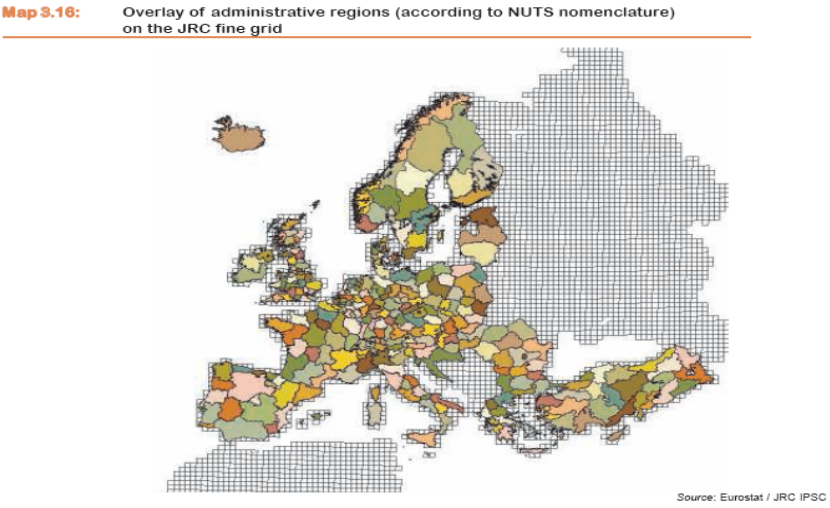


Figure 1. *Source: Eurostat (2007)*[5]

3 European Environmental Agency, JRC European Commission and World Health Organisation (2008): *Impacts of Europe's changing climate- 2008 indicator-based assessment.* Luxemburg: Office for Official Publications of the European Communities. http://reports.eea.europa.eu/eea_report_2008_4/en

4 JRC IPSC (2007)"*Annual Report 2007*" http://ipsc.jrc.ec.europa.eu/showdoc.php?doc=promotional_material/IPSC_AR_2007.pdf

5 Eurostat (2007), "Panorama of Energy 2007. Energy statistics to support EU policies and solutions"

Eurostat has based its correction for energy demand on heating days, but has not yet taken into account cooling demand. An inquiry has therefore been launched to JRC IPSC in order to find out if this data also can be supplied for NUTS 2 and made available to ReRisk. Information on which is the critical temperature / humidity threshold for the use of air-conditioning will be obtained from Spanish utilities Iberdrola and Union Fenosa and / or specialized research centres.

According to the project ESPON database, data can be transferred from the JRC grid to the NUTS classification, and we should try to get access to the entire data set.

1.2. National and Regional Energy Data

In the chart below, please find our research strategy for obtaining national and regional data relevant for the ReRisk Study. Most of our research efforts will be dedicated to tracking down energy-related data, since it is the core contribution of the ReRisk project to the ESPON database. We have chosen to apply a top-down approach in our data search in order to keep the effort within acceptable limits.

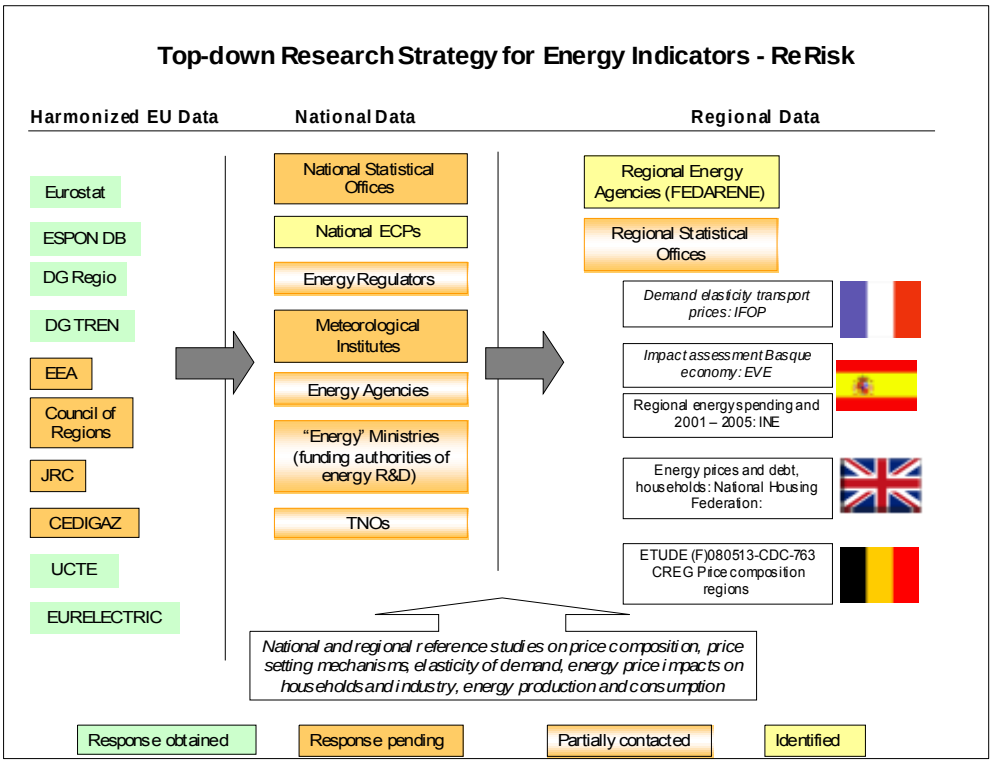


Figure 2

So far, we have received the following input:

Eurostat has already launched a first inquiry on the availability of regional energy data. 75% of the EU regions responded that they collect data on this issue, but when the data was sent, part of it was incomplete or not comparable. So Eurostat has decided to carry out a pilot project on this issue and has asked us for cooperation for defining the right indicators. A coordination meeting has therefore been arranged for Nov 20 in Luxemburg, but we will hardly be able to include the results of this meeting in this annex.

Below, we also explain which type of energy we refer to in each case:

a. Energy infrastructure: national and regional bottlenecks in **electricity** and **gas** transport, relevant for final policy recommendations. The Spanish grid operator REE has already facilitated all necessary data for the energy and gas grid in this country[6], as well as the improvement plans for the UCTE[7] and NORDEL[8] grids, Portugal[9] and Italy[10]. EWEA, the European Wind Energy Association, has furthermore investigated which obstacles exist presently in the Northern and Southern UCTE grid for the further development of wind power[11].

b. Production and consumption of energy: according to the data we have available presently, it is possible to obtain a clear picture both of consumption and on production for all type of fuels on national level (Eurostat / OECD), but on regional level, the information is limited to **electricity** consumption and production (thermal / hydroelectric).

c. Composition of energy prices: Based on case studies, we are presently investigating the actual influence of fossil fuel price increases in the final price of **transport fuels**, as well as **gas** and **electricity** prices for industry and households. The basic data we need for this is the % of prices which corresponds to primary fuel, taxation, and transport / distribution. Furthermore, the price setting mechanisms in the electricity wholesale markets have to be taken into account for each country, since the final daily

[6] Ministerio de Industria, Turismo y Comercio, Secretaría General de Energía, Subdirección General de Planificación Energética (2008): *Planificación de los sectores de electricidad y gas 2008-2016. Desarrollo de redes de transporte*

[7] UCTE Union for the Co-ordination of Transmission of Electricity (2008), UCTE Transmission Development Plan. Brussels: UCTE.

[8] Organisation of the Nordic Transmission System Operators (2008): Nordic Grid Master Plan. Available in http://www.nordel.org/Content/Default.asp?pagename=openfile&DocID=5647

[9] Red Eléctrica Nacional (REN) (2008): Plano de Desenvolvimiento e Investimento da Rede de Transporte 2009-2014 (2019), Consulta Pública (Sumario Executivo). Available at http://www.ren.pt/SiteCollectionDocuments/Homepage/PDIRT%202009-2014%20-%20CP%20-%20S_Executivo.pdf

[10] TERNA, Rette Elettrica Nazionale (2007): Piano di Sviluppo della Rete elettrica di Trasmissione Nazionale 2007. Available at http://www.terna.it/default/Home/SISTEMA_ELETTRICO/programma_triennale_sviluppo/tabid/48/Default.aspx

[11] UCTE, ETSO, NORDEL, ATSOI and UKTSOA (2007): European Wind Integration Study (EWIS) towards a successful integration of wind power into European electricity grids. European Transmission System Operators. Final Report

sales price is not so much determined by the countries' energy mix, but rather by the plants' merit order. Also, special (subsidized) rates may be in place for industry and have to be identified per country. However, the direct link between oil-indexed gas contracts and the decisive influence of gas-fired power plants on daily electricity prices on the wholesale market are thoroughly documented in analysis of market liberalization in the EU[12]. The only additional information ReRisk has to add here is the actual regional differentiation of electricity and gas prices, since some EU countries (e.g. Portugal, France, Italy, Spain, Hungary, Poland) have not completely liberalized the final price of electricity consumption for households in order to protect regional cohesion. For the moment, we do not expect to find major regional differences regarding other types of fuel, but we will back up this hypothesis through reference studies.

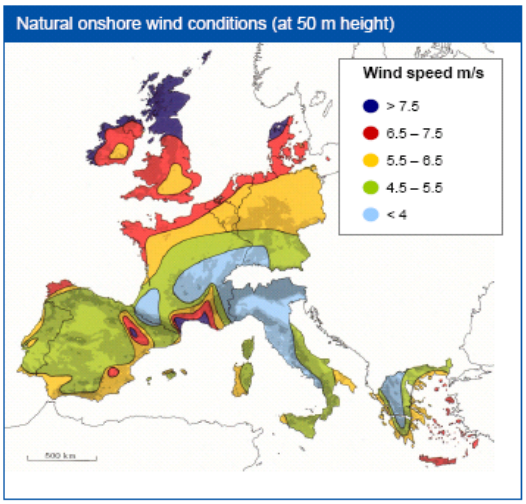
d. Energy spending: this indicator refers to **all types of energy** purchased in a country or a region, as defined by Council Regulation (EC, Euratom) No 58/97 of 20 December 1996 concerning structural business statistics. Eurostat does not dispose of this data on regional level, so we are currently investigating how this directive has been implemented on national level and where regional break-downs such as in Spain are available. Since this is a core indicator for the project, all national statistical offices have been contacted on this. If regional breakdowns are available for several EU countries at least, the Eurostat expert in this question and ESPON DB will be consulted regarding the comparability of the data. The analysis of several EU countries would, however, be sufficient to recognize patterns of high / low energy spending in certain types of regions (industrial, service-oriented) and these conclusions could be extrapolated to all regions in EU 27. However, as suggested in the Annex to the contract, if data availability for this indicator is insufficient, it will have to be complemented with the Lisbon indicator gross energy consumption / GDP, which we are also presently searching for at the national / regional statistical offices.

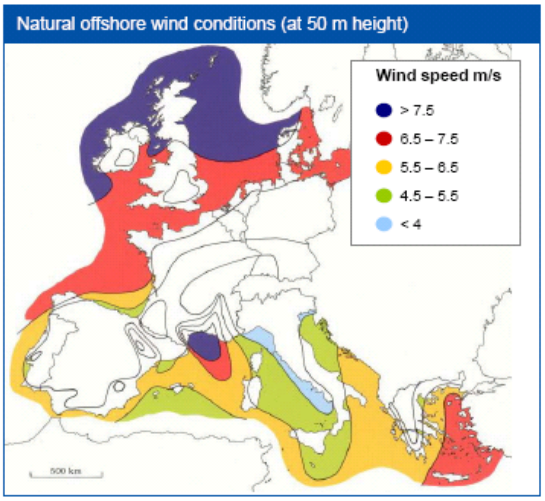
e. Potential of renewables:

    i. Information on solar radiation and PV potential down to city level is available for PV at the JRC's Sunbird database: **http://sunbird.jrc.it/pvgis/apps/pvest.php.**

    ii. On-shore and off-shore wind potential has also been identified for Europe:

[12] DG Competition report on energy sector inquiry, SEC(2006)1724, 10 January 2007 http://ec.europa.eu/comm/competition/sectors/energy/inquiry/





Figures 3 y 4: *Source: RWE*[13]

[13] Source: RWE (2008), "Fact Book Renewable Energy" http://www.rwe.com/generator.aspx/verantwortung/dossier_3A-erneuerbare-energien/property=Data/id=646586/innogy-factbook-en-.pdf

f. Price of renewables: Considering that technology substitution will play a major role in energy price setting in the future, it will be necessary for the scenario exercise to take into account the expected learning curves for renewable energy production. Presently, the remuneration and therefore cost of renewable production varies considerably across Europe, due to different subsidy schemes:

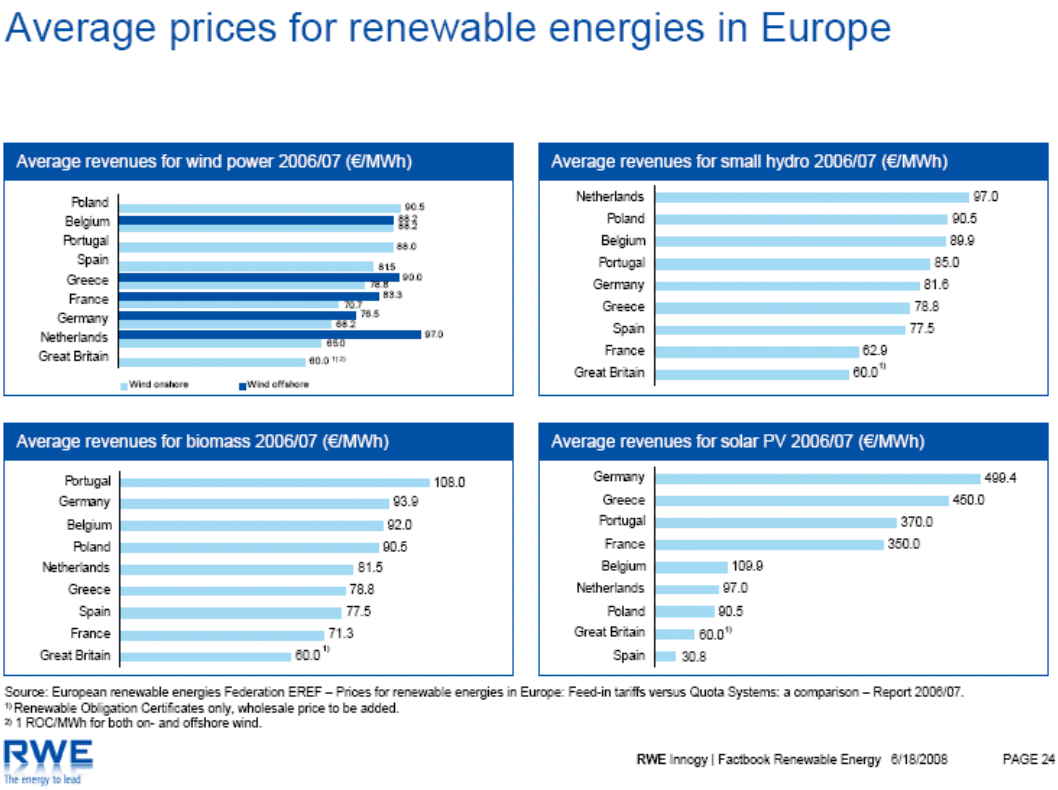


Figure 5

1.3. Social and demographic indicators

In this section, data availability on regional level has already been confirmed for some of the demographic indicators. However, two of the more important social indicators (at-risk-of-poverty rate and household indebtedness) are not available for NUTS 2 or 3 categories, so it may be necessary to combine these two national values with the regional unemployment rate in order to define "hotspots". This is a similar procedure as applied in ESPON project 3.3.

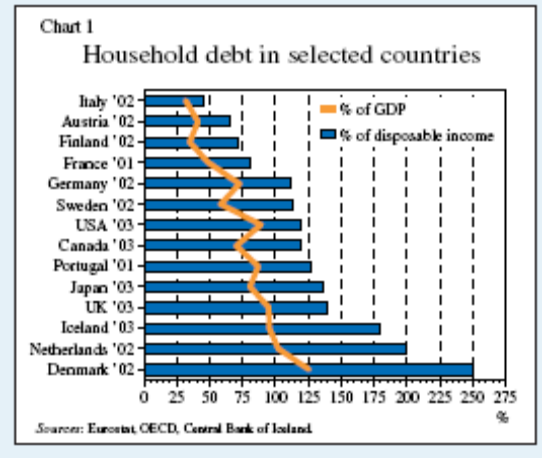


Figure 6

Before turning to this second best solution, however, we will put some effort in trying to identify poverty zones on regional and local level in cooperation with related research projects[14]. We will furthermore consult with the JRC's expert on poverty issues on useful reference studies.

Poverty in urban environments can be analysed using indicators from Eurostat's Urban Audit, which has information on homeless people, inmigrants in shelters, households and individuals depending on social security payments, median income, poor housing conditions and more. Data availability is best for the years 2003 – 2006, but the geographical coverage is quite incomplete. We therefore suggest collecting the data available for all relevant indicators in order to define different poverty features in the Member States and thus point out which part of the population in urban areas may be hardest hit by increasing energy prices and which European cities may face the greatest challenges.

[14] Contacts have been established with the Belgian King Baudouin Foundation, which starts a new project on "Climate Change and Social Justice" in January 2009. This study will analyse social inequity in France, UK, Germany, Italy, Spain, Poland, Belgium, as well as one country each from Eastern Europe, Scandinavia and the Baltic

1.4. Transport

We consider that transport indicators should aim at explaining the modal split and car or air traffic dependency on regional level. *Fuel efficiency of cars* is of lower relevance to the ReRisk study, because progress in this field derives from EU regulation and applies to all new passenger cars sold in Europe[15]. Also, in the past, progress in fuel efficiency has generally produced a rebound effect in the sense that cars are used more frequently and for longer trips.

The *age of the car park* is, however, a relevant indicator and probably related to regional GDP. More precisely, we have found in a pre-estimation that GDP is negatively correlated with the age of the cars (at NUTS 0 level as well as at NUTS 2 level). The coefficient obtained in an OLS estimation gives us the initial assumption that age of the cars within a territory decreases when GDP increases (the coefficient obtained is statistically significant).

Taking into account these advances from the Inception Report an updated list of indicators is provided in Annex 1, including their regional level.

[15] See, for example, the "Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. Setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO2 emissions from light-duty vehicles" from December 2007 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0856:FIN:EN:PDF

2. Clarification of Typologies to be Used

Classification is essentially the identification of groups of similar objects within the set of objects under study. It is necessary so that generalizations concerning within and between group similarities and differences can be made. Such generalizations can be purely descriptive or they can form the basis of a hypothesis which can then be tested by the use of other techniques, such as the analysis of variance.
Two approaches to classification are possible:

- ✓ the identification of groupings –termed classification proper, and
- ✓ the allocation of individuals to existing groups-termed discrimination.

Classification proper can be further subdivided into clustering methods and ordination methods.
Clustering methods provide for the extraction of discreet groups, which may be either hierarchical (so that each group is part of another group at the next level of the hierarchy) or nucleated so that the groups are discreet. Ordination methods involve the display in graphical form the inter-object similarities in a low- dimensional space. Points representing objects are close together if their mutual similarity is high or they are far apart if their mutual similarity is low.

The typologies to be used in the RERISK will have to allow the assessment of risk for of energy poverty as well as the spatial differentials of this risk in order to allow for informed policy making. In order to assess potential energy poverty it is necessary to account for economic development and prosperity of the region, infrastructure and access to the supply of energy, demographic structure of the population and of course climate conditions. An indicative set of types of regions follows:

1. Metropolitan Regions (high accessibility, well developed, above national average household incomes, completion holds energy prices low, economically active households).

2. Evolving Regions (smaller towns with high growth, improvement in income and quality of life)

3. Hidden Risk Regions (areas that seem to do well, but due to the population structure, e.g. high proportion of older people, access to energy, or energy demanding climate conditions may face problems)

4. Lagging Regions (regions with current or eminent energy poverty)

In the RERISK typology context these types will be defined on the basis of their policy relevance for the energy sector

Based on the recent literature, it is apparent that Principal component analysis and fuzzy classification are two well established classification methodologies for this kind of analysis. However, we believe that we should employ one technique that allows a straight forward classification of regions and a more modern approach that allows for advanced visualization of the results and good communication of these to the policy makers. An increasing number of

researchers adopt in this respect an area classification method that is based on the theory and applications of Geodemographics, which we also adopt.

The first approach selected, is the **k-means procedure** which attempts to identify relatively homogeneous groups of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. The procedure tries to form groups that do differ. The reason for a k-means cluster analysis is that it allows the grouping of regions into categories of similar rates for a set of variable. It is a quick algorithm the results of which can be easily mapped (Kalogirou, 2003)[16].
The k-means clustering algorithm is described in detail by Hartigan (1975)[17]. The k-means used here is an efficient version of the algorithm presented in Hartigan and Wong (1979). The aim of the K-means algorithm is to divide M points in N dimensions into K clusters so that the within-cluster sum of squares is minimized. It is not practical to require that the solution has minimal sum of squares against all partitions, except when M, N are small and K=2. We seek instead “local” optima, solutions such that no movement of a point from one cluster to another will reduce the within-cluster sum of squares (Hartigan and Wong, 1979, p. 100)[18].
The second approach is **Geodemographics** that was originally designed to classify areas based on the socio-economic profile and demographic structure of the people living in them. They allow for a straightforward understanding of the average person living in an area. The inclusion of energy and climate related variables in the analysis can produce an extended geodemographic system. Such systems use a two level hierarchical classification that can be top-down or bottom up. The top classes are grouping of the bottom classes that are more detailed. Thus, one can have an initial reading of the regions and their classification. However the system allows for a more detailed classification of the regions that may be useful for specific policy making actions.

[16] Kalogirou, S., 2003, The Statistical Analysis and Modelling of Internal Migration Flows Within England And Wales, PhD Thesis, School of Geography, Politics and Sociology, University of Newcastle upon Tyne, UK
[17] Hartigan, J.A., 1975, Clustering Algorithms New York: Wiley
[18] Hartigan, J.A., and Wong, M.A., 1979, A K-means clustering algorithm, Applied Statistics, 28, pp. 100 – 108

3. Future Scenarios: Impacts of Spatial Megatrends and Emerging Trends on the Risk of Energy poverty

The method behind the scenario building exercise has its bases mainly in General Morphological Analysis (MA) developed originally by Fritz Zwicky, which is a method for structuring and investigating the total set of relationships contained in multi-dimensional, non-quantifiable, problem complexes by using the technique of Cross Consistency Assessment (CCA). In addition the scenario building process is supported by some features derived from the Delphi method which relies on a panel of independent experts who are encouraged to provide and revise their answers in light of the replies of other members through two or more rounds of consultations. These two methodologies have however been modified in order to provide an overview of the topics investigated by task 2.3.

The aim of the exercise is thus to build four different scenarios for 2015 and 2030 by involving both energy experts and region's representatives in the identification and examination of a set of possible relationship or configurations between factors determining energy supply and demand in the future.

3.1. Making the scenario bases

The goal of this activity is to identify the basic parameters of energy systems and regional development and determine a first overview of the interrelations in-between. This presupposes first understanding today's energy system as well as the past and present trends on energy supply and demand. Secondly, to understand the interdependencies between different socio-economic development trends and energy demand. Thirdly, the role of policy measures and interventions in the functioning of energy systems must be considered, for example considering alternative approaches to integrated renewable energy systems.
This process consists of one quantitative and three qualitative activities:

1. An analysis of the inputs obtained from tasks 2.1 and 2.2.
2. A review on national and regional differences in energy policies combined with an analysis of the relationship between national policy measures with current infrastructure endowment
3. A synthetic analysis of energy systems and alternative energy solutions, focussing on the four case studies
4. One workshop with independent experts in the energy sector, aiming at pinpointing key factors in the energy development process and identifying future development trends.

Because the principles used during task 2.2 will determine both the thematic framework and the approach used in the base-line scenario activity, these two elements must be defined before the activity is initiated. At this stage however the scenario building process is not depending on finalization of the outputs of task 2.1 or 2.2. National data on energy supply and demand, supplemented with preliminary analyses are indeed sufficient to provide information to build the base-line scenarios. Two examples of alternative quantitative analyses for the energy sector are:

- European Commission 2007. *Energy, Transport and Environment Indicators*. EUROSTAT pocketbooks.

- European Commission 2008. *European Energy and Transport: Trends to 2030- Update 2007.* Directorate-General for Energy and Transport.

An important remark is that the level of details in the scenario bases would be increased as final results are available from task 2.1 and 2.2.

The synthesis of the activities 1, 2 and 3 will crystallize into two matrixes, each containing different parameters (or dimensions) as illustrated in Figure 7[19]. The first matrix will include the parameters determining the future energy supply while the second will contain the parameters determining the impact of regional development trends on energy demand.

Parameter A	Parameter B	Parameter C	Parameter D	Parameter E
A1	B1	C1	D1	E1
A2	B2	C2	D2	E2
A3	B3	C3		E3
A4		C4		E4
		C5		E5

Figure 7: Example of a 5-parameter morphological field. One configuration (marked in blue) of 600. (Ritchey, 2005-2008)

By using already collected information, a set of configurations in each matrix will be created and examined in order to establish which of them are viable according to the already collected empirical information. This is done through CCA, in which all of the parameters in the morphological field are undergoing pair-wise configurations (hypotheses). As each configuration is examined a judgment will be made as to whether the pair is consistent. The intention is to eliminate logical contradictions in the first place and when possible also empirical contradictions. The goal here is to have a reduced number of hypotheses possible to be examined during the time available for Workshop I.

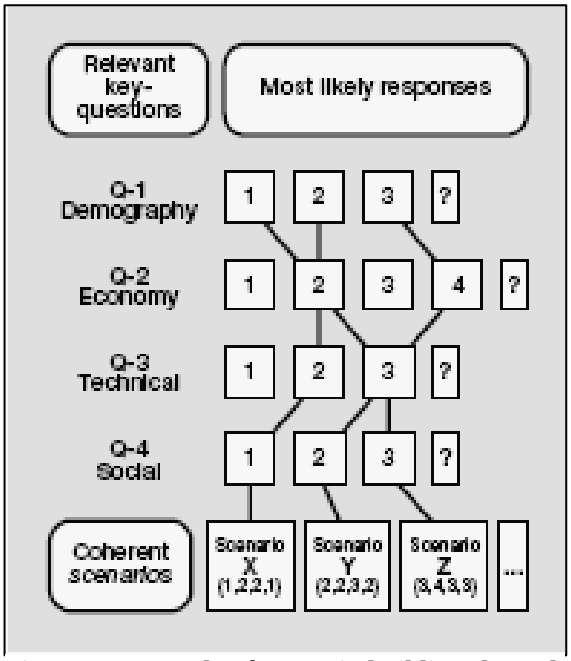


Figure 8: Example of scenario-building through morphological analysis (Godet, 2000)

Through establishing roundtable discussion with experts in the energy sector Workshop I will be a more in depth CCA by examining new possible configurations, and eliminating the contradictory ones. Here most of the empirical contradictions, mainly regarding future energy supply, are expected to be eliminated. Such process can generally be exemplified as in Figure 8[20]. The goal is to further reduce the sets of hypotheses to be used in the first questionnaire. As the two matrixes are reduced four preliminary scenarios will be produced.

[19] Ritchey Tom (2005-2008) *Futures Studies using Morphological Analysis.* Adapted from an Article for the UN University Millennium Project: Futures Research Methodology Series. Swedish Morphological Society, Stockholm.

[20] Godet Michel (2000) Fore front: how to be rigorous with scenario planning. In: Foresight Vol. 2, No. 1, February 2000. Camford Publishing Ltd.

Workshop I is planned to be one and a half day long, consisting of 7 to 9 independent national experts both from public and private energy agencies. In order to secure the quality of the process each expert may have a specific competence within one or several fields whiting the energy sector according to the table below. Accordingly, 5-7 field experts will be grouped into two main sectors namely Renewable Energy Sources (RES) and energy supply. While the RES experts will provide an overview of accessibility, potential and future development of specific energy of sources, the experts on energy supply may tell about solutions and potentials for transforming and supplying energy from renewables to consumers through both electricity and fuels (mainly fuels for the transport sector). Furthermore, the energy supply experts may also provide information about the potential of increasing efficiency on energy supply and use.

Workshop I will also include the participation of one or two key-experts on energy sector regulation. These experts should shed light on:

- Interdependencies between different types of RES
- Policy and measures for the further development of RES
- Interdependencies between different regional development paths and energy demand

Duration: January 2009- April 2009

Table 1. Competencies of participants in workshop

Sector	Field
Whole energy sector	All (Economy and policy)
Energy Supply	Electricity
	District heating
	Transport fuels
Renewable Energy Sources	Wind energy
	Biomass
	Hydropower
	Other alternative sources: fuel cells, geothermal, wave and sun energy

3.2. Building the scenarios

The questionnaire exercise can be seen as a continuation of the CCA process aiming at not only eliminating further contradictive configurations but also shedding light on possible regional differentiation on future energy supply and demand. This activity is therefore significantly more regional oriented than the previous one, consisting of two rounds of internet based questionnaires directed towards a selected number of representative regions. The selection of regions will be made according to the typologies defined during task 2.2 and the availability of civil servants able to provide relevant information on energy supply and demand in their region.

This task will be particularly important for:

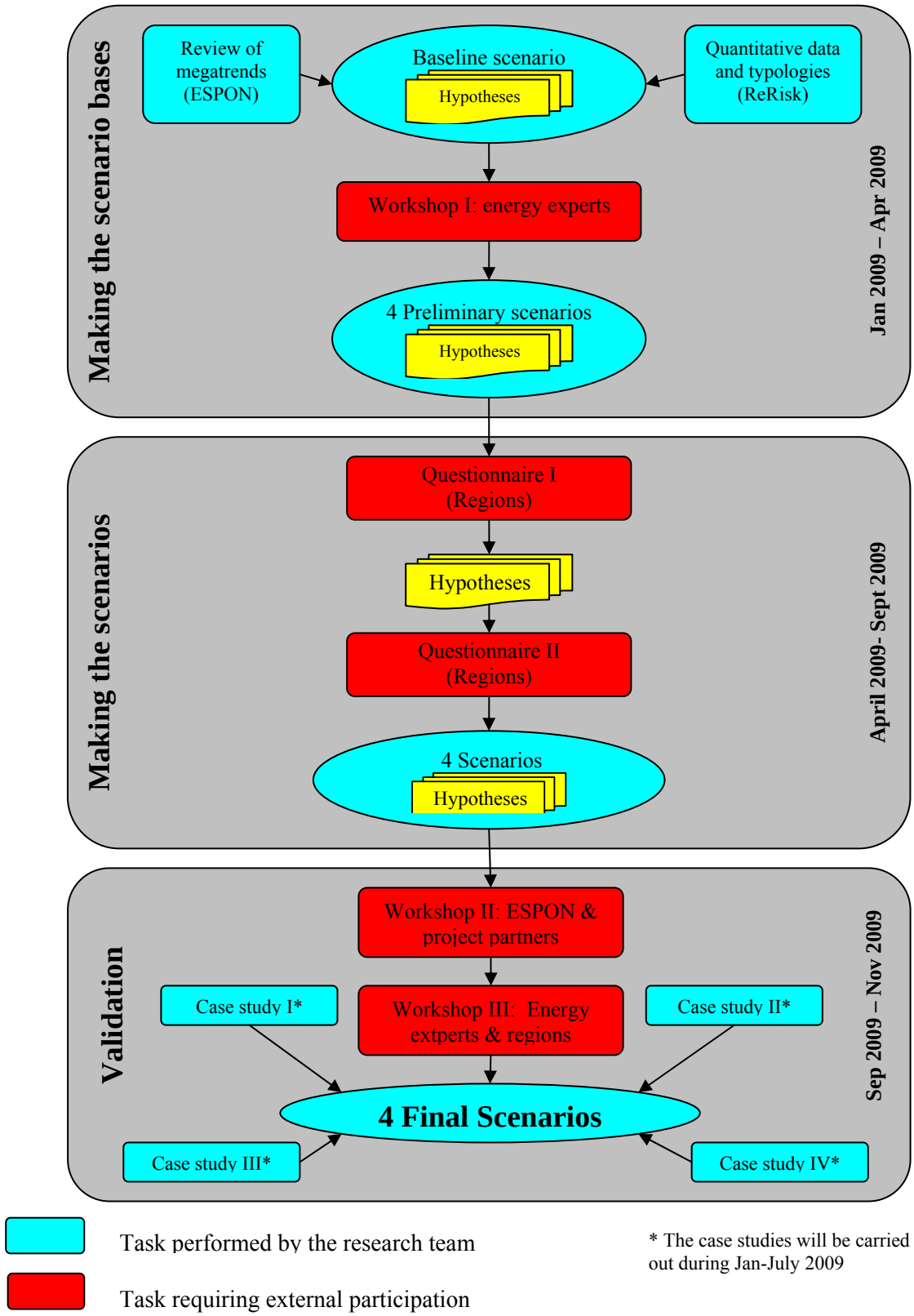
- Fine-tuning of the identified relations between policy approaches and regional energy strategies.
- Current or foreseen responses of the different regions to increasing energy prices
- Identifying regional variations on present and future access to technological development on RES use and energy efficiency
- Identifying regional variations on access to RES in regions

The hypotheses produced during the workshop will be presented in the first questionnaire, which should be answered by representatives from a limited sample of the selected regions. During this activity each representative is supposed to eliminate hypotheses and formulate new hypotheses as well as to present the critical arguments for their choice.
The results obtained during the first round of questionnaires and the argumentations behind the choices will then be presented in a new internet-based questionnaire that should be answered both by the participants in the previous round and by as many as possible of the remaining regions, ensuring a coverage of the typologies identified in tasks 2.1 and 2.2, and the policy approaches identified in the qualitative analysis. This round of questionnaires is aiming at identifying a more precise list of hypotheses, by ensuring a representative coverage of responses, and especially with focus on regional diversities in their choice of argumentation. As the answers are collected, the hypotheses and scenarios will be adjusted accordingly.
At the point of time the answers to the second set of questionnaires are collected and analyzed the output from 2.1 and 2.2 should be available as these will be integrated into the scenarios. Specifically the scenarios may at this stage be used for showing regional differentiations on energy demand and supply when combined with the results from task 2.1 and 2.2.
Duration: April 2009- September 2009

3.3. Validating the scenarios

In order to test the scenarios resulting from the building process, these will be discussed during two workshops. The first workshop (Workshop II) aims at bringing in the ESPON community's perspective into the scenarios, and will thus involve the participation of the ESPON community and the project partners who will cross-check and complement the most probable sets of hypotheses in order to exclude remaining contradictions within each of the scenarios. After the scenarios are adjusted, according to the results from this workshop, the whole scenario process will be culminated with a final workshop (Workshop III). The aim of the final workshop is to validate the scenarios by presenting them to both energy experts and representatives regions and opening a dialog between these two groups. The final workshop will be carried out during one day including the participation of 20 to 30 participants.

Scenario-building process for task 2.3



4. Dissemination Plan

The dissemination of project results will take place through three kinds of actions that will fulfil the ESPON 2013 Operational Programme objectives as well as ReRisk dissemination objectives:

1. Media and Publications: ReRisk website, Lead Partner will be responsible of sending direct mailing, distributing e-mailed newsletters, and elaborating a digital flyer explaining the ReRisk project's objectives that will be disseminated to the target groups.
2. European seminars and workshops:
   - ❖ Two workshops (April and October 2009) organised in the framework of ReRisk.
   - ❖ ESPON Seminars and Conferences during 2008, 2009 and 2010 where important stakeholders will be represented.
   - ❖ An International Event of two-three days organised by the Lead Partner, on the Spring 2009 in Bilbao, where ReRisk project as well as the results of the ESPON projects that have already been finished will be presented, willing to involve policy makers and practitioners working in Public institutions at European, National and Regional levels.
   - ❖ International Climate Change Conference organised by the United Nations in Copenhagen on December 2009.
3. Transnational networking activities: International conferences and transnational activities of the Efonet Network and Fedarene Network.

These activities will contribute to the Priority 4 of ESPON 2013 Operational Programme because they help to the capitalisation and transferability of results by raising awareness on the ReRisk findings involving policy makers and practitioners in participatory international forums, and elaborating written documents that expose the knowledge gained or the results of the project. This output pursues helping policy makers to make decisions to avoid the vulnerability of the regions in view of rising energy prices.

4.1. Website

The website represents an interactive tool which helps to collect relevant data from policy makers. It will not be just a virtual space to share information, but also a key element to get to know the data that it is not accessible and only policy makers from each region can provide.

Moreover, the website will elaborate diagnostics of the vulnerability of each region, and depending on the result there will be available policy recommendations elaborated by an "international core group of experts", that will help to take decisions at the political level to solve the increasing problem of the energy dependency and high prices, according to the particularities of each region. These policy options will be linked to the type of region, for which they are most relevant, using the regional typology that will be developed in the ReRisk project.

There is an important added value on the website because the section on policy recommendations on how to improve the regional "Risk of Energy Poverty Profile" definitely helps and guides on the right decisions to be taken.

This output represents a participatory approach for the elaboration of policy development strategies and a specific action that makes evidence and raises the awareness and involvement of stakeholders in the results of the project and their practical use.

4.2. Policy Target Groups

We have identified two target groups we would like to add to those mentioned on the Inception report:

1. Policy makers from different administrative levels: regional, national and European.
2. Policy makers from energy sector and networks
    - In the EU, energy policy depends on different administrative levels.
    - In some countries energy policy is the sole competence of central government (state-level)
    - Other cases: energy policy decision making and R&D is divided among state, regional and local agents.

The involvement of policy makers is considered as a key aspect in ReRisk, therefore an important specific action will be organized in order to elaborate politic recommendations: an “international core group of experts” will be created. Their involvement in the elaboration of the recommendations will facilitate the practical use of ReRisk results in the policy decision making at different levels.

In addition, their participation is very relevant because they will contribute giving data through the website that it is not accessible and only policy makers from each region can provide.

4.3. ESPON Seminars

ESPON Seminars are considered as a key element among other activities to fulfil dissemination objectives. They represent an excellent opportunity to inform ESPON Community about the progress of the project and to let know experts and stakeholders who attend the seminars what ReRisk is about. As they are several seminars during 2008, 2009 and 2010 we have the opportunity to know and to involve these experts and stakeholders. Moreover we can create synergies inviting them to the workshops and to the International Conference that we will organise in the framework of ReRisk. The workshops will be more focused on concrete aspects of the project, therefore probably people attending ESPON seminars, especially involved in the energy sector, will be very interested in the workshops. On the other hand, the International Conference’s objective will be to present the overall project as well as the ESPON Programme to the Basque Stakeholders and policy makers, even if it will be open to whoever is interest all over Europe, because the speakers and involved participants will be internationally recognized experts.

5. Policy development

ReRisk project will include a bidirectional flow within European Policies: First of all, ReRisk results (regional typologies and policy options) will be an input for European Policies. Secondly, the project will include inputs from European Policies (territorial, energy and transport related, environmental) to design policy options. Thus, ReRisk policy options and recommendations will be aligned with the main European Policies.

The following paragraphs describe the main ReRisk interrelations with some relevant European Policies:

- Lisbon Treaty: ReRisk will contribute to Lisbon objectives and more precisely to Goteborg objectives of being a sustainable territory. Furthermore, ReRisk will contribute to provide better information to regional policy making processes. In the energy field, this project will contribute insight on the countries and regions that may face difficulties due to rising energy costs, a fact that could affect the principle of solidarity included in the Lisbon Treaty. Concretely, ReRisk will add in-depth information to the some of the indicators used for measuring the fulfilment of Lisbon Strategy: at risk of poverty rate, regional energy costs, energy intensity of economies, and more generally, regional competitiveness indicators. The Lisbon Treaty in its article 194 guarantees energy supply and the functioning of the energy market in Europe. For that reason, inputs from Rerisk project will be important for evaluating, possible risks related to longer-term energy demand and production purpose.
- Draft Green Paper on Territorial Cohesion: ReRisk will take into account disparities between regions which are related to energy issues and have an impact in regional competitiveness. Concretely, ReRisk project will consider regions with special geographic features, as it is defined in the Draft Green Paper, which might face development challenges. These are mountainous, islands and coastal regions. This regional typology is considered in the Rerisk project as specific territorial context (see Inception Report p. 3) and, in consequence, these regions will have to implement different policy options regarding energy accessibility, energy production, energy efficiency and some other measures regarding climate change effects, transport accessibility etc…All these measures will be need to be implemented in order to foster competitiveness and sustainability and to reduce regional disparities. Moreover, regional competitiveness indicators considered within the project (i.e., regional gross added value of energy intensive industries) will be an indicative measure of differences between regions and long-term impacts on regional cohesion.
- European Cohesion Policy 2013: According to European Cohesion Policy 2013, regions in Europe can be classified under convergence regions (GDP less than 75% of Community average) or competitive regions (although there are also intermediate regions between both of them- “phasing in” and “phasing out” regions). One of the main results of the ReRisk project will be the elaboration of regional energy poverty profiles, which have an incidence on regional competitiveness. These profiles or regional typologies will contribute to define regions under convergence or competitiveness including phasing in and phasing out regions. Therefore, regions at high risk of energy poverty will have a higher propensity of being convergence regions than competitive ones.

Policy options related to these factors will be included in the project. Thus, convergence and competitive regional typologies will be taking into consideration to formulate best policy options.

- Other policies: ReRisk will also take into account thematic policies as energy and transport policy, as well as initiatives and studies from the Commission and the EU Parliament:
  - Transport:
    - DG TREN Study Trans Vision 2050 (just started, contacted)
    - STOA study on “Alternative Technology Options for Road and Air Transport” (2007)
  - Energy:
    - Second strategic energy review
    - Green paper on use of TEN-E funds
    - Proposal for revision of Energy Performance of Buildings Directive
    - PSE study group on “Energy Poverty in the EU” (brochure just published by Eluned Morgan, MEP)
  - Environment:
    - The Sixth Environment Action Programme of the European Community 2002-2012
    - Environment Thematic Strategies cover the following fields, specially the following ones:
    - Air
    - Waste prevention and recycling
    - Urban Environment

During the entire project there will be a continuous surveillance of European policies, and especially those related to energy, transport, climate change and regional policy. All relevant documents will be considered in order to define the policy framework in scenarios building. At the same time, new policy documents will be an important input for policy recommendations. Policy surveillance will be mainly done by project partners through policies observatories, which are current tools implemented in the different centres. ReRisk partner will also include those documents and inputs provided by ESPON CU or any Sounding Board Member, including other TPGs

Policy options and recommendations will focus on different target groups to be organized in a two-dimensional matrix configuration:

a. Territorial dimension: within this group we will consider administrative boundaries for decision-making on regional level, taking into account policymakers from NUTS 0, NUTS1, NUTS 2 or NUTS 3 level.

b. Energy competencies' dimension: in the EU, energy policy depends on different administrative levels. Thus, in some countries energy policy is the sole competence of central government (state-level) while in are other cases energy policy decision making and R&D is divided between state, regional and local agents (see annex to this document).

The matrix will therefore help to define the adequate level of policy makers to be included for each country in the EU 27. This level will be included as an attribute to regional typologies in order to adapt policy recommendations to regional specificities. Moreover, ReRisk project will have two kinds of results regarding policy options. First of all, it will develop a methodology to allow policy makers implement recommendations and options to their own regions, and secondly, policy options and recommendations which will be joint to each regional typology.

Annex 1: Updated list of indicators

Task	Source	Year	Regional level	Comments / definition
2.1.1. Climate zone of the region and other specific regional factors that influence energy consumption				
Average annual minimum temperature	Nordregio/ Eurostat/ JRC	2007	**NUTS 2**	**Nordregio, "The NSPA in Europe"- data on harsh climate and JRC IPSC "Annual Report 2007" Grid information at EU level**
Average annual maximum temperature	Nordregio/ Eurostat/ JRC	2007	**NUTS 2**	**Nordregio, "The NSPA in Europe" - data on harsh climate JRC IPSC "Annual Report 2007" Grid information at EU level**
Average monthly humidity				
Average annual sun hours	Nordregio/ Eurostat/ JRC	2007	**NUTS 2**	**JRC IPSC "Annual Report 2007" Grid information at EU level**
Heating days per year	Eurostat		**NUTS 2**	
2.1.2. Social indicators				
At risk of poverty rate	Espon		**NUTS 0**	**Lisbon Indicator. Country level**
GDP per capita in pps	Eurostat	2005	**NUTS 2**	**NUTS 2. Regional gross domestic product (PPS per inhabitant)**
Unemployment rate	ESPON / Eurostat	2006 / 2007	**NUTS 3 NUTS 2**	**ESPON core indicator. Available from Eurostat on NUTS 3 level in most countries (not Turkey, nor Switzerland)**
Indicators set of urban poverty	Eursotat	2003-2006	**NUTS 2/ NUTS 3**	**Urban audit**
2.1.3. Demographic indicators				
% elderly people	Eurostat	2006	**NUTS 2**	**NUTS 2. To be derived from "Average population by sex and age". Some data lacking for New Member States**
Number of one-person households				
Population density	ESPON		**NUTS 2**	**ESPON database ¿including Western Balkans?**
Urban sprawl				
2.1.4. Energy demand indicators				
Electricity consumption by sector (in gigawatt hours)	Eurostat – Datashop: New Cronos: Regio database: tran enr: energy en2 cons		**NUTS 2**	**NUTS 2 (NUTS 3 for Central European and Candidate Countries) according to ESPON Data Navigator**
Electricity consumption / GDP (kWh per 1000 Euro):			**NUTS 2**	**NUTS 2. Can be calculated combining available information on electricity consumption and GDP**
Households' energy use (toe per capita)			**NUTS 0**	
Gross Inland Consumption by fuel	Eurostat	2006	**NUTS 0**	**Country level**
2.1.5. Production capacity indicators*				
Electricity production capacity (in megawatt)	Eurostat - Datashop: New Cronos: Regio database: tran enr: energy en2		**NUTS 2**	Energy sources: nuclear, hydroelectric, thermal, total **NUTS 2 (NUTS 3 for Central European and Candidate Countries) according to ESPON Data Navigator**

	celec			
Proportion of electricity generated by renewables (%)	Eurostat/ DG Tren		**NUTS 0**	
Proportion of electricity generated by liquid fossil fuels (%)	Cronos / Regio above		**NUTS 2**	**Energy sources: thermal NUTS 2 (NUTS 3 for Central European and Candidate Countries) according to ESPON Data Navigator**
Proportion of electricity generated by solid fossil fuels (%)	Cronos / Regio above			
Proportion of electricity generated by natural gas (%):	Cronos / Regio above			
Fossil fuel dependency (%)	Eurostat/ OECD		**NUTS 0**	**Country level**
Crude oil refined/fossil fuels primary consumption	Eurostat	2005	**NUTS 0**	**Country level**
Transmission capacity (bottlenecks)	UCTE - Union for the co-ordination of transmission of electricity	2007	**NUTS 0**	**"System Adequacy Retrospect 2007". Country level. Includes data on Western Balkan Countries**
Mapping of renewable resources	National / Regional energy agencies/ Eurostat/ JRC	2007	**NUTS 2**	**Available for solar energy at grid level. JRC IPSC "Annual Report 2007"**
Past speed of RES deployment (time frame?)	Eurostat	2001 - 2005	**NUTS 0**	**Country level (hydroelectric, wind, PV)**
2.1.6. Transport infrastructure: modal split of passenger and road transport				
Nº of daily trips by car	Eurostat	2003-2006	**NUTS 2/ NUTS 3**	**Urban audit**
Modal split of passenger transport				
Modal split of freight transport	Eurostat	2006	**NUTS 2**	**Railway infrastructure and transport flows by NUTS II region**
Total number of driven intra-regional trips (trucks / day)	Eurostat	2001	**NUTS 2**	**Available for NUTS 2, but not new Member States**
Total number of km produced by intra-regional trips (1000 Km / day)	Eurostat	2001	**NUTS 2**	**Available for NUTS 2, but not new Member States**
Nº of people working in the region vs nº of persons working in another region	Eurostat	2006	**NUTS 2**	**Available for NUTS 2 – must be related to size of region (area)**
Age of cars	National statistics		**NUTS 0/ NUTS 1/ NUTS 2**	**NUTS 2 for Eastern Countries. Available on Country level**
2.1.7. Regional Competitiveness & Elasticity Indicators				
Gross value added at basic prices	Eurostat	2005	**NUTS 2**	**Available for NUTs 2 and NACE 1 digit**
Gross energy consumption / GdP	Eurostat / EFTA		**NUTS 0**	**Lisbon indicator. Country level**
Regional energy costs	Eurostat (country data)/		**NUTS 2**	**Council Regulation (EC, Euratom) No 58/97 of 20 December 1996 concerning structural business statistics**

	National			
Regional gross value added in energy intensive industries / European gross value added in energy-intensive industries	Eurostat		**NUTS 2**	**NACE 24, 26, 27, 28**
Regional gross value added of transport-intensive sectors / European gross value added in transport-intensive industries	Eurostat		**NUTS 2**	**NACE 14, 17, 19, 20, 21, 26, 29, 31, 34, 45**
Employment in renewable energy sector	National / Regional sources		**NUTS 0/ NUTS 2**	
Household debt	Eurostat / OECD / ECB		**NUTS 0**	**Country level**
Median disposable income	Eurostat	2004	**NUTS 2**	**Disposable income for NUTS 2, including New Member States**

Annex 2: European and National Institutions Contacted

Contacted institution	Country	Contacted person	Comments
ARPA-Emilia Romagna (RAMEA project)	Italy	Paolo Cagnoli pcagnoli@arpa.emr.it + 39 0512966346 + 39 059433630 + 39 05162238811	Not available at the office. Will contact again.
Burgenland Province	Austria	Ms. Mag. Brigitte Novosel Brigitte.Novosel@bgld.gv.at + 0576002879	Has told us to get in contact with the Energy Agency of the Province.
Burgenland Province Energy Agency	Austria	Dipl.-Ing. Binder/Christian Ecker + 43268290102226	To be contacted
Carinthia Province	Austria	Mr. Dipl.-Ing. Erich Mühlbacher erich.muehlbacher@ktn.gv.at + 43(0)5053630863	Not available. Call on Tuesday 25th November.
Cedigaz	EU	Contacted through gas companies members of Spanish Cedigaz	Have sent national and international data on production and consumption
Central Institute for Meteorology and Geodynamics	Austria	Unknown	No answer yet
Central Statistics Bureau of Latvia	Latvia	Sara Vitola Information, Publishing and Printing Department	Information available paying.
Centro Nazionale di Meteorologia e Climatologia Aeronautica	Italy	Unknown	No answer yet
City of Vienna	Austria	Peter Pokay Peter.pokay@wien.gv.at MA 5-Finanzwirtschaft, Haushaltswesen und Statistik Referat Anita Malik anita.malik@wien.gv.at +43 1 4000 88643	Has information of the City of Vienna. We have requested this information. Have sent city data on consumption and total energy balance in Vienna.

Czech Meteorological Institute, Meteorology and Climatology Division	Czech Republic	Unknown	No answer yet
Czech Statistical Office	Czech Republic	Jan Broum	Has requested specification from us.
Danish Meteorological Institute	Denmark	Unknown	No answer yet
Department of Business, Enterprise and Regulatory Reform	United Kingdom	Joanna Chan joanna.chan@berr.gsi.gov.uk Regional Energy Statistics Energy Markets Unit Tel 020 72152703	Have sent some links where we can find information on energy consumption, electricity production capacity, fossil fuel dependency, etc
Deutscher Wetterdienst	Germany	Patricia Willing	No answer yet
DG REGIO	C1 Conception, forward studies, impact assessment	Wolfgang Münch CSM1 7/038 1049 Brussels phone: 0032 2 29 628 43 fax: 0032 2 29 632 77	Contacted by Erik, has sent contacts in DG Tren
DG TREN	C1 energy policy Energy observatory	Mr. Giordano Rigon +(32) 2 2968196 Head of unit is M.Jean-Arnold VINOIS +(32) 2 2968475 Md. Christine BERG +(32) 2 2991922. (observatory)	Observatory: no regional data. Have facilitated contact for Eurostat data: Peter.Tavoularidis@ec.europa.eu
DIACT- Délégation interministérielle à l'aménagement et à la compétitivité des territoires	France	Pascal Mignerey pascal.mignerey@diact.gouv.fr + 33140651191 + 33140651234	Have talked to his secretary and has told us to contact him next week (→24-28 November 2008)
ECP Slovenia	Slovenia	Tomaz Miklavcic: tomaz.miklavcic1@gov.si	Not ECP any more
ENEMALTA	Malta	Antoinette Mifsuf Zahara Customer Care Coordinator	Has sent some information on households' energy use, average load factor, ratio of energy production to energy consumption, fossil fuel dependency, grid density.
Estonian Meteorological and	Estonia	Unknown	No answer yet

Hydrological Institute			
Eurelectric	Transport bottlenecks	Gunnar Lorenz glorenz@eurelectric.org	EURPROG report (Eurelectric, 450€), UCTE Transmission Development Plan www.ucte.org and ETSO statistics http://www.etso-net.org/
Eurostat Contact Point Sweden	Eurostat-ESDS Sweden + Energy Unit Unit D2 "Regional Indicators and Geographical Information"	Eva Meidner-Andersson, Tel +46 (0)8 506 942 80 Mobil +46 (0)73 6334002 eva.meidner@scb.se	Forwarded info from Eurostat: no regional data except HEATING DEGREE DAYS (HDD) http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&open=/data/envir/nrg/nrg_esdgr&language=en&product=EU_MAIN_TREE&root=EU_MAIN_TREE&scrollto=240
Eurostat Energy Unit	Unit D2 "Regional Indicators and Geographical Information"	Peter Tavoularidis, Head-of-Unit Energy Statistics Tel. (+352) 4301 33023 Peter.Tavoularidis@ec.europa.eu Berthold Feldmann (Berthold.Feldmann@ec.europa.eu)	The person handling regional energy data at Eurostat is Pedro-Jorge MARTINS-FERREIRA [Pedro-Jorge.MARTINS-FERREIRA@ec.europa.eu] Eurostat, D2 - Regional Indicators BECH A3/53, Luxembourg Tel: +352 4301 37851. Meeting scheduled for Nov 20
Finnish Meteorological Institute	Finland	Unknown	No answer yet
Hungarian Meteorological Service	Hungary	Unknown	No answer yet
Institut Royal Météorologique de Belguique	Belgium	Unknown	No answer yet
Institute for policies of space	Slovenia	Marko Peterlin: marko.peterlin@ipop.si	Has confirmed preliminary data on candidate countries. Willing to cooperate with ReRisk
Institute of Environmental Research and Sustainable Development	Greece	Unknown	No answer yet
Institute of Meteorology and Water Management	Poland	Unknown	No answer yet
Institute for Regional Research, University of Kiel (TRANSvisions	Germany	Prof. Dr. Johannes Bröcker broecker@economics.uni-kiel.de	Not available. Will contact again.

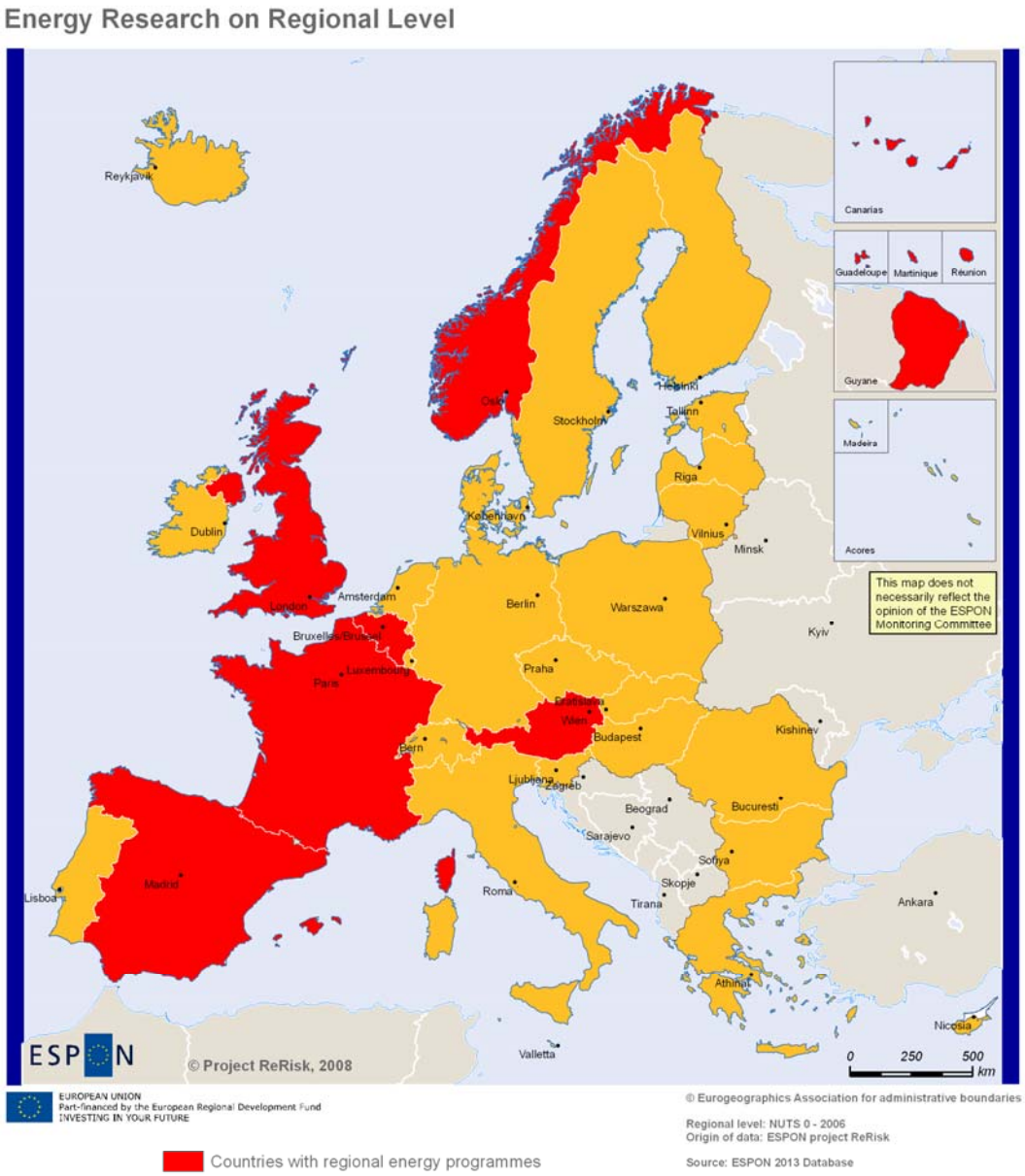
project)		+49 431 880-3276	
Instituto de Meteorologia	Portugal	Unknown	No answer yet
Joint Research Centre	EU	Energy: Harald Scholz 0039-(0)332789877 Poverty: Pia Laurida 0032 2951803	Climate data (heating days) available for JRC grid from JRC – IPSC / Agrifish Unit / MARS-STAT. Solar radiation and potential from PVGIS. Outstanding: transfer of complete data set in these data bases for ESPON DB
Latvia's Hydrometeorological Agency	Latvia	Unknown	No answer yet
Lower Austria Province	Austria	Mr. Ing. Franz Redl f.redl@noel.gv.at + 02742900514786	Will send some info if available. Have to check it previously with Statistics Austria.
Malta International Airport MET Office	Malta	Unknown	No answer yet
Met Eireann	Ireland	Unknown	No answer yet
Météo France	France	Unknown	No answer yet
Ministry of Agriculture, Meteorological Services	Cyprus	Unknown	No answer yet
Ministry of Environment-Lithuanian Hydrometeorological Service	Lithuania	Unknown	No answer yet
National Institute of Meteorology and Hydrology	Bulgaria	Tania Marinova	No answer yet
National Institute of Statistics	Italy	Unknown +390646732243-4	No answer yet
National Institute of Statistics	Romania	Unknown +40213181869	No answer yet
National Meteorological Administration	Romania	Unknown	No answer yet
National Meteorological Service of Slovenia	Slovenia	Unknown	No answer yet
National Statistical Service of Greece-Ministry of Economy and Finance	Greece	Helene Katsorche data.source@statistics.gr +30 210 4852308	Have sent links where we can find information on electric energy consumption, penetration level of RES, solar energy applications. We are requested to mention in our studies that NSSG is the source of the statistical data.
National Statistics Institute	Portugal	Unknown	Check web site or send email to energia@dgg.pt
National Statistics Office	Malta	Shawn S. Borg shawn.borg@gov.mt +356 2599 7211/9	Have sent some links where we can find information on electricity consumption and households' energy use.

			More information ask Enemalta.
Norwegian Meteorological Institute	Norway	Unkown	No answer yet
Office federal de l'environnement OFEV	Switzerland	Mike Weibel mike.weibel@bafu.admin.ch +41 31 322 93 26	Not available climate data at NUTS categories. Has sent some links where we can find about climate change and climate in general.
Red Eléctrica Española	Transport bottlenecks Spain	Javier de Quinto Romero jquinto@ree.es	Presently in Latin America, has sent substitute contact: Patricia Labra plabra@ree.es. Has sent European (Nordel & UCTE) and national info (Spain, Italy and Portugal) on bottlenecks = planned projects 2015 / 2018
Royal Netherlands Meteorological Institute	The Netherlands	Unknown	No answer yet
Salzburg Province	Austria	Mr. Dipl.-Ing. Dr. Gunter Sperka gunter.sperka@salzburg.gv.at +066280424167	No answer yet
Slovak Hydrometeorological Institute	Slovak Republic	Unknown	No answer yet
Slovenian Ministry of Planning	Slovenia	Margarita Jančič: margarita.jancic@gov.si +38614787400	No answer yet
STATEC	Luxemburg	Unknown +35224784219	No answer yet
Statistical Office of the Republic of Cyprus	Cyprus	Michalis Chrysanthou Statistics Officer mchrysanthou@cystat.mof.gov.cy +35722605131	Has sent link to other statistical sources where we can find information on average load factor, grid density, fossil fuel dependency.
Statistics Austria	Austria	Barbara Mayer Barbara.Mayer@statistik.gv.at + 43 (1) 711 28-7624	Has sent a link and will send contacts of the provinces (data NUTS 2)
Statistics Belgium	Belgium	Jean-Luc Stroobant info.eco@economie.fgov.be + 32 (0) 2 277 84 77	Forwarded our request to another person (Olivier Pieret)
Statistics Estonia	Estonia	Margit Kottise Senior consultant of the information and marketing service	Has sent link to their web and to Eurostat with information about electricity consumption and production and energy efficiency indicators.

		Margit.Kottise@stat.ee +372 625 9300	
Statistics Finland	Finland	Leo Kostiainen Kirjasto.tilastokeskus@stat.fi + (09) 1734 2220	Check web site or send email to energia@stat.fi
Statistics Lithuania	Lithuania	Daiva Mikalopiene Daiva.Mikalopiene@stat.gov.lt +370 5 236 4843	Check Eurostat
Statistics Netherlands	The Netherlands	Ferry Lapré infoservice@cbs.nl + 31 (0)885707070	The information required not available at NUTS 2
Statistics Norway	Norway	Unkown- Library and Information Centre biblioteket@ssb.no	Has sent us some links to their web page and has told us that the rest of the information would be a service we would have to pay.
Statistics Sweden	Sweden	Unknown	No answer yet
Statistisches Bundesamt	Germany	Simone Müller Simone.Mueller@destatis.de +49(0)30 18 644 9427	Has sent some links with information on about energy demand and capacity.
Styria Province	Austria	Mr. Dipl.-Ing. Wolfgang Jilek wolfgang.jilek@stmk.gv.at +433168774554	No answer yet
Swedish Meteorological and Hydrological Institute	Sweden	Unkown	No answer yet
Swiss Federal Office of Energy SFOE	Switzerland	Gerold Truniger yetgerold.truniger@bfe.admin.ch +41 (0)31 322 56 09	Has sent us some links where we can find information about Swiss global energy statistics and electricity statistics. It seems that there is only energy information at country level.
TERNA	Italy	Laura De Sanctis info@terna.it +39 06 8313 8111	No answer yet
Tyrol Province	Austria	Mr. Mag. Manfred Kaiser M.Kaiser@Tirol.gv.at +435125083620	No answer yet
UK Meteorological Office	United Kingdom	Unkown	No answer yet
Upper Austria Province	Austria	Mr. Mag. Walter Wöss Walter.Woess@ooe.gv.at +43(0)732772015609	No answer yet
Vienna Province	Austria	Unknown	No answer yet

Vorarlberg Province	Austria	Mr. Mag. Dietmar Buhmann dietmar.buhmann@vorarlberg.at +43(0)557451142010	No answer yet

Annex 3: Energy Research on Regional Level



Source: Information extracted from Wiesenthal, T. et al (2008), "Energy Research Capacities in EU Member States", JRC Scientific and Technical Reports

Countries with regional energy programmes highlighted in red (Austria, Belgium, France, Spain, UK). According to ReRisk partner Nordregio, there are also regional energy R&D programmes in Norway.

Annex 4: Integrations of ESPON projects

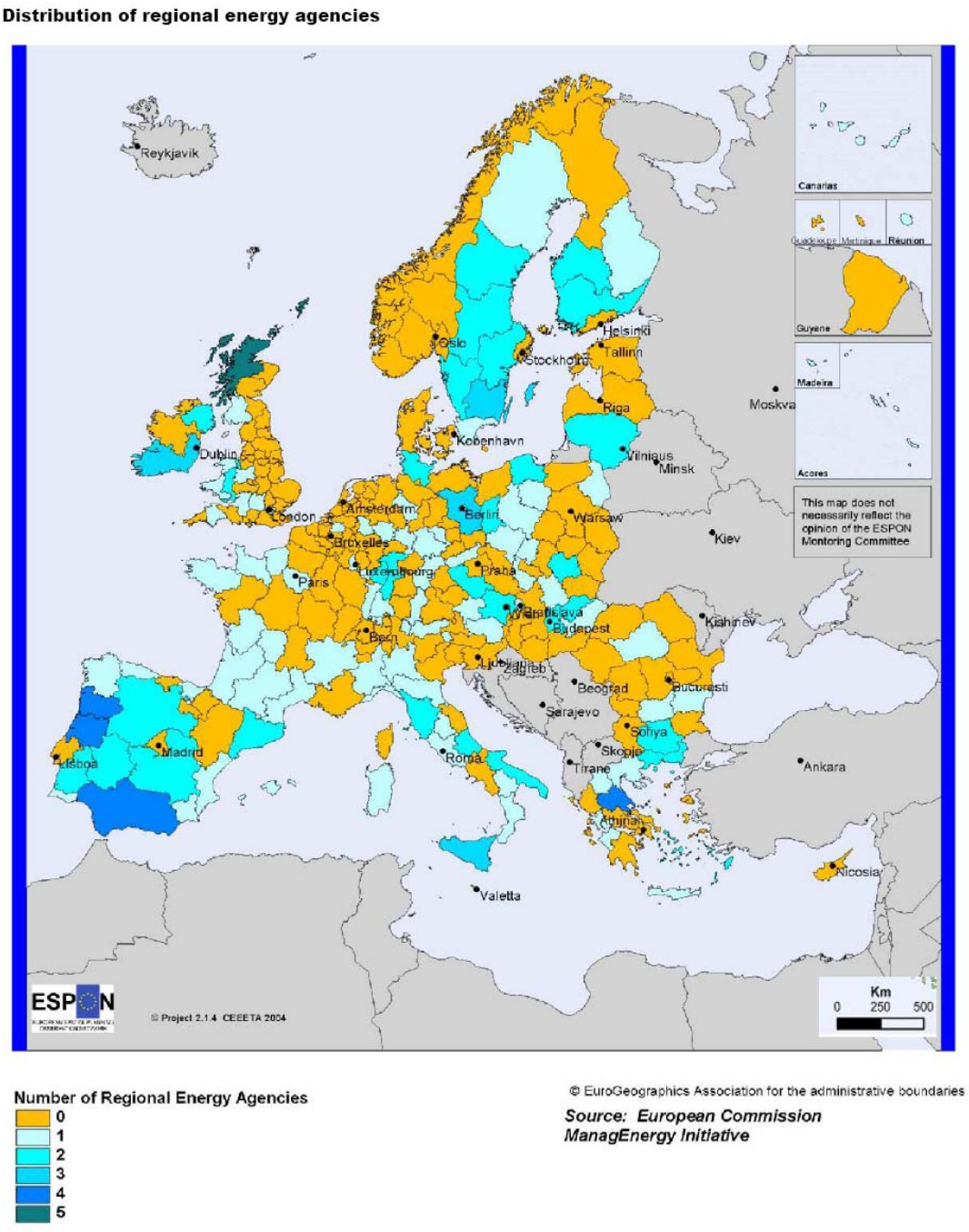
ESPON project	Contributions to energy issues	Regional typologies to be used	Other relevant information
1.1.1. Potential for polycentric development in Europe	ESPON 1.1.1 only touches on energy issues when it seeks to compare levels of polycentricity with energy efficiency (energy consumption by unit of GDP production)	**Typology of regions:** ESPON 1.1.1 has not produced any regional typology. A separate report was produced explaining why typologies of regions regarding urban infrastructure need to take into account cities in the vicinity of each region and not only within them. The typologies resulting from this separate report where however not included in the final ESPON 1.1.1 report.	ESPON 1.1.1 uses data on transport functions (airports, maritime ports). It should however be possible to obtain more updated data from the Commission (see Green Paper on Territorial Cohesion maps on airports, for example).
		Typology of cities ESPON 1.1.1 produced different typologies of cities. A first typology sought to identify the most important cities of Europe, or so-called Metropolitan European Growth Areas (MEGA). These can used as a basis for identifying the urban endowment in each region. It is however recommendable to use the lists and typologies proposed in the ESPON 1.4.1 report rather than those from ESPON 1.1.1. ESPON 1.1.1 also made an analysis of areas within commuting distance of individual cities (so-called PUSH areas – see Annex Report D). These PUSH	

ESPON project	Contributions to energy issues	Regional typologies to be used	Other relevant information
		areas could be used to identify the proportion of the population within commuting distance from a town or city, through an overlay analysis with Eurostat grid population data. This analysis should ideally be extended using the ESPON 1.4.1 FUA list and classification	
1.1.2. Urban-Rural relations in Europe	ESPON 1.1.2 makes frequent references to the relevance of energy in urban-rural relations, but only analyses this dimension in a qualitative and general way.	ESPON 1.1.2 has primarily produced a typology of urban and rural influence in regions at the NUTS 3 level. The Commission has proposed a revised version of this typology in the Green Paper on Territorial Cohesion, which one should probably rather use.	ESPON 1.1.2 has produced some detailed analyses of urban sprawl (sections 5.4-, pp. 222-235) that one may re-use for the purpose of Rerisk.
1.2.3 Identification of Spatially relevant aspects of the Information Society		A pattern identified refers to the increasing discrepancy between core and periphery in which contrasting spatial power relations can clearly be identified among various regional, technological, financial and economic systems all over the world (see e.g. emergence of economic metropolises such as Tokyo, Milano, etc.). The above relations do not only take place in an international core-periphery context but also and with the same intensity in regions within a national economy	At the level of industrial organization there is a framework relevant in which the requirements of advanced technologies induce an increasing trend towards large-scale companies (e.g., telecommunications, aircraft, etc.) due to their highly oligopolistic-competitive framework. This goes together with a contrasting tendency in which the requirements of modern technology induce the emergence of a wide variety of advanced small and medium sized firms (mainly in

ESPON project	Contributions to energy issues	Regional typologies to be used	Other relevant information
			the business service sector), which play the role of the hinterland for large-scale firms and create the seedbed conditions for a flexibility and diversity in local-regional-national industrial structure.
2.1.4. Territorial trends of energy services and networks and territorial impact of EU energy policy	**Data that can be used if updated:** Map 34 Number of Regional Energy Agencies by NUTS 2. Source: European Commission, ManagEnergy Initiative Map 43 Power Station Location by NUTS 2 Map 44 Gas Infrastructures Table 9, Annex III, Data collected for Core Indicator 2 at NUTS 2 1990-2000 (final energy consumption by source and sector) Map 6 Variation of final energy consumption in transport by country (1990-2002) (%) and Figure 11 Final Energy Consumption in Transport by fuel in 2001 (ktoe)	Regions with influence on national energy policy Relevant for possible climate change impacts in electricity-producing regions (drought, flooding) Identification of possible supply bottlenecks: regions with low / high security of gas supply	The collected data, although incomplete, may be helpful to complete newer data sets, but is not included in the study. Long-term trends on country level are helpful to understand consumption dynamics and the structure of energy demand for transport
	Renewable potential: Map 16 Wind potential on NUTS 0 (source EWEA, Meteotest, WASP www.wasp.dk)	Regions with high / low wind potential	Will be contacted for more detailed grid data
	Map 22 Biomass potential at NUTS 3 in 2002 (GJ)	Rural regions with high / low biomass potential	Derived from Corinne Landcover data. Analysis

ESPON project	Contributions to energy issues	Regional typologies to be used	Other relevant information
	Shannon-Weiner measure of diversity Table 7 Summary of main energy features for new Member States		needs to be checked
			Relevant methodology
	Data which has been discarded for use in ReRisk: Response to price **decrease** Analysis of self-sufficiency: must be completed by information on remaining reserves in producer countries	Countries with regional price differentiation for gas and electricity	Could be updated for all Member States with more relevant structural data

Annex 5: Map of distribution of regional energy agencies



Source: ESPON project 2.1.4