BASELINE ASSESSMENT REPORT

THE CLIMATE CONFIDENCE INDEX

ACKNOWLEDGEMENTS

This baseline assessment report is a collaborative effort of the twelve partners participating in the INTERREG IVC co-funded "Regions for Sustainable Change" project (RSC). The RSC partnership aims to promote an EU-wide shift to climate-friendly economies by developing the potential of regions to stimulate mitigation and adaptation to climate change. The baseline assessment and this report represent the first major output of the partnership and will serve as a basis for implementing the rest of the project activities.

The baseline assessment team which prepared the assessment and the report are: Dora Almassy, Venelina Varbova and Ruslan Zhechkov from the Regional Environmental Center for Central and Eastern Europe (REC, the RSC project Lead Partner) and Jennifer McGuinn, Advisor to the RSC Project Team. A working group of four partners – Cornwall Council, Liguria region, the REC, and the University of Debrecen – oversaw the process and designed the baseline questionnaire.

All the RSC partners made outstanding efforts to supply complex data and information to the assessment team on a timely basis. Special credit goes to the contact persons listed below for each region and their team of experts who supplied the invaluable data, information and opinions which provided the basis for this report.

Partner region	Baseline questionnaire contact(s)
Central Hungary	Dora Almassy, Judit Balint and Zsuzsa Ivanyi, The Regional Environmental Center for Central and Eastern Europe
Cornwall, UK	Lindsay Knuckey, Cornwall Development Company
North Great Plain, Hungary	Zoltan Karacsonyi , University of Debrecen
Burgenland, Austria	Johann Binder, Burgenland region
La Rioja, Spain	Susana Gómez and José María Infante, La Rioja Ministry of Tourism, Environment and Territorial Politics
South West Bulgaria	Margarita Atanasova, Bulgarian Ministry of Regional Development and Public Works
Marche, Italy	Cinzia Colangelo, Regione Marche
Liguria, Italy	Matteo Graziani, Regione Liguria
Piedmont, Italy	Valentina Scioneri, Lamoro and Francesco Matera, Piedmont region
Malta	Sergei Golovkin, Malta Environment and Planning Authority
Lower Silesia, Poland	Dorota Wilusz, Municipality of Wroclaw

Finally, the baseline assessment team wishes to express its gratitude to the Interreg IVC programme for financing the RSC Project and making this work possible.

EXECUTIVE SUMMARY

To be prepared

List of Contents

List of Abbreviations

AT – Austria
BG- Bulgaria
CO_2 – Carbon dioxide
EE – Energy Efficiency
EEA – European Environmental Agency
ERDF – European Regional Development Fund
ETS – Emission Trading Scheme
ES –Spain
EU – European Union
Eurostat – Statistical Agency of the European Union
FEC – Final Energy Consumption
GDP – Gross Domestic Product
GHG – Greenhouse gas emissions
GIC – Gross Inland Consumption
GVA – Gross Value Added
HU – Hungary
IT – Italy
LCR – Low carbon region
MS – Member State (of the EU)
MT – Malta
NMS – New Member States (of the EU)
OP – Operational Programme
PL – Poland
PPS – Purchasing Power Standards
RDP – Regional Development Programme
RES – Renewable Energy Sources
ROP – Rergional Operational Programme
RSC – Regions for Sustainable Change
SME – Small and Medium Entreprise
Toe – tonne of oil equivalent
UK – United Kingdom
VAT – Valeu Added Tax

1. INTRODUCTION

This baseline assessment report examines and evaluates the so-called "Climate Confidence" of eleven European regions. The eleven regions are represented by the twelve partners of the INTERREG IVC co-funded "Regions for Sustainable Change" project (RSC)[1]. Through regional networking and cooperation, the RSC partnership aims to develop the potential of regions to stimulate mitigation and adaptation to climate change and to promote sustainable socio-economic development.

To do this, the RSC project will analyse regions' progress, experience and good practices on climate change management; develop a set of criteria and indicators for low-carbon regions; conduct a macro-economic analysis of three partner regions to identify structural changes required to achieve low-carbon status; investigate the use of SEA and sustainability assessment for integrating climate change and low carbon objectives into regional planning; and prepare a methodological handbook on integrating climate change into regional development programmes. In addition, RSC with strengthen the capacity of partners through capacity-building workshops and technical seminars and will carry out pilot actions to transfer the "low carbon region" development model in practice.

The baseline report is the first step of the RSC project, and the basis for the entire project process. The assessment of RSC partner regions' status, strengths and weaknesses, needs, and good practices will be used to carry out the rest of the project activities. The assessment compares the partner regions against each other EU averages, to enable them to learn more about each other and how to critically evaluate their own status for future improvement. The findings and results of this report will enable RSC partners to work towards a set of criteria and indicators which define a climate confident region; and to identify the detailed priority issues and a wide range of corresponding good practices for use in subsequent project events and outputs. In short, this baseline assessment forms the backbone of the RSC project.

A working group of four RSC partners has managed the assessment process. The detailed work has been carried out by a team from the RSC Lead Partner, the Regional Environmental Center for Central and Eastern Europe. The data and information were collected via a questionnaire developed specifically for this purpose by the working group and agreed by all the partners. During the data collection, it became clear that the majority of partners lack easily available, comparable and credible information, especially energy and emissions data. For this reason, some of the questions and issues covered in the questionnaire are not presented in this report, either because there was too limited a response for evaluation or it was not possible to evaluate them clearly.

To best measure and illustrate the regions' positions, strengths and weaknesses, a "Climate Confidence Index" was created, based on seven key issues including energy and emissions data, policy frameworks, institutions, socio-political aspects and financial instruments. These are all critical factors for a region's ability to manage adaptation to and mitigation of climate change within its

[1] Two partners – Cornwall Council and Cornwall Development Company – represent the region of Cornwall and the Isles of Scilly, UK.

territory and economy. The index assigns scores to each partner region based on the information provided in the questionnaire.

The term "Climate Confidence" was coined by the working group to refer to the goal of the RSC partners: to foster regions which are secure in their capability to effectively manage climate change impacts and future risks, and through that management to take advantage of the sizeable economic opportunities of low carbon economy. The partners in the RSC project are seeking to achieve the characteristics of a Low-Carbon Region (LCR), that is a region which has, or is working towards, a minimal output of Greenhouse Gas (GHG) emissions into the biosphere. The ultimate goal of a LCR is to integrate all aspects of its economy from its services, manufacturing, agriculture, transportation and power-generation, and its patterns of consumption etc. around technologies and practices that produce energy and materials with little GHG emission.

1.1. Table: Organization of the Assessment

	Title	Comments
Chapter 1	Introduction	
Chapter 2	The RSC Partner Regions	Provides basic information about the regions: population, area, GDP, economic structure, climate and energy vulnerability
Chapter 3	The Climate Confidence Index	Presents the regions' performance on seven key issues for climate confidence
Chapter 4	Further Analysis on Climate Confidence: Energy and Emissions	Provides further analysis of regions' energy and emissions data and highlights important results and practices
Chapter 5	Further Analysis on Climate Confidence: Policies, Institutions, Socio-Political Aspects and Financial Instruments	Provides further analysis of regions' policies, institutions, social and political awareness and financial instruments and highlights important results and practices
Chapter 6	Conclusions	(to be developed for this draft) Summarizes conclusions and good practices and maps out how results will inform the RSC project process
Annex I	Glossary	Lists and defines specialized terms used in the report
Annex II	References	A list of key references used to compile the assessment and sources of further information
Annex III	Partner Profiles	A profile of each RSC region's main climate related information (under development)

2. THE RSC PARTNER REGIONS

The RSC partnership is a diverse grouping of 12 partners from 11 European regions. This chapter presents basic data and information on these regions: location, size, population, gross domestic product (GDP), economic structure, and climate change and energy vulnerability.

In order to make the partner regions comparable, data was taken from the official database of the Statistical Agency of the European Union (EUROSTAT) and refers to year 2006[2]. This also enables comparison regions' characteristics with EU averages.

2.1. LOCATION

The Regions for Sustainable Change partnership represents eight EU countries: Austria, Bulgaria, Hungary, Italy, Poland, Malta, Spain and the United Kingdom. There are two RSC regions in Hungary and three in Italy.

2.1. Figure: Regions for Sustainable Change partnership

Six regions (Burgenland, Liguria, Piedmont, Marche, Cornwall, La Rioja,) are from the EU-15 group; four regions (Central Hungary, North Great Plain, Malta, Lower Silesia) joined the EU in 2004 and South West Bulgaria in 2007. The ratio between EU-15 to New Member States (NMS) is 6:5. This has considerable impact on climate confidence at the regional level, since the NUTS classification and the regional structure was fully introduced to the NMS only after EU membership.

[2] N.B.: This was the last year where all relevant data was available for partner regions.

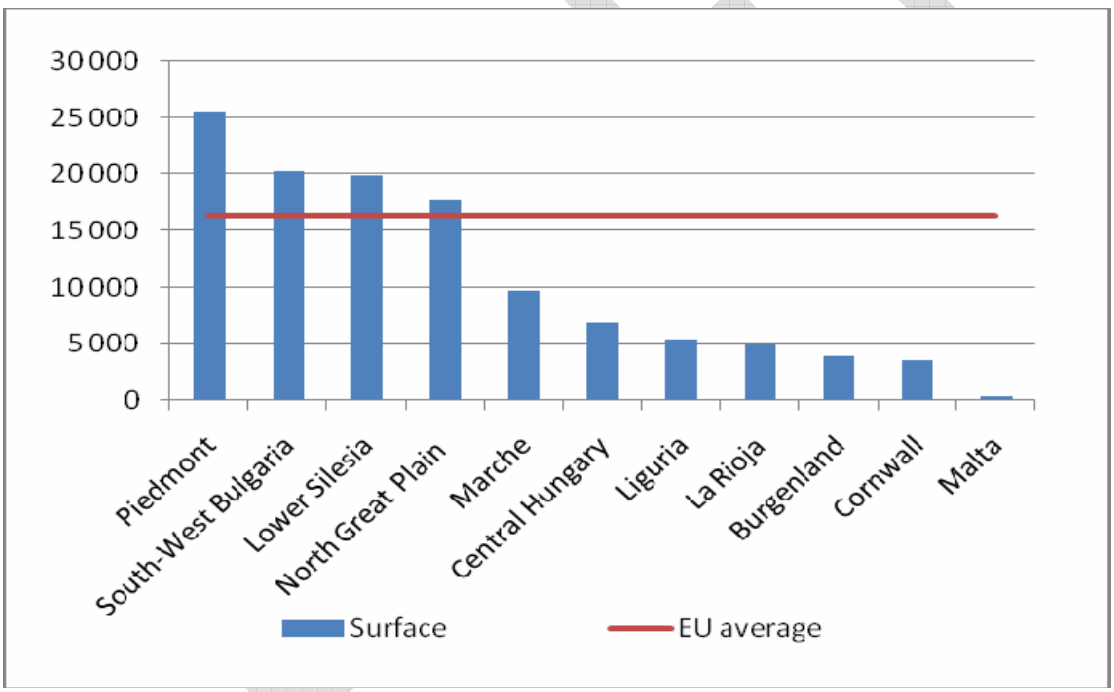
There are two capital regions, Central Hungary and South West Bulgaria, both of them from NMS. Several regions have peripheral locations, either in Europe (Cornwall, Malta) or within their own country (Burgenland, La Rioja and Lower Silesia). Seven regions are inland regions and four are in coastal areas. This geographical diversity results in equally diverse demographic and economic characteristics of the regions.

2.2. AREA[3]

The eleven surveyed regions are diverse in area: four of them (Piedmont, South West Bulgaria, Lower Silesia and Central Hungary) exceed the EU average (16,333 km^2), while the seven others are significantly below this average and four regions (La Rioja, Burgenland, Cornwall and Malta) are among the smallest 25% of European regions in area.

The largest is Piedmont, with 25,402 km^2, but it is just the 48th largest region in Europe. Malta with its 316 km^2 surface is the smallest surveyed territory.

2.2. Figure: Surface of the regions in km^2, 2006



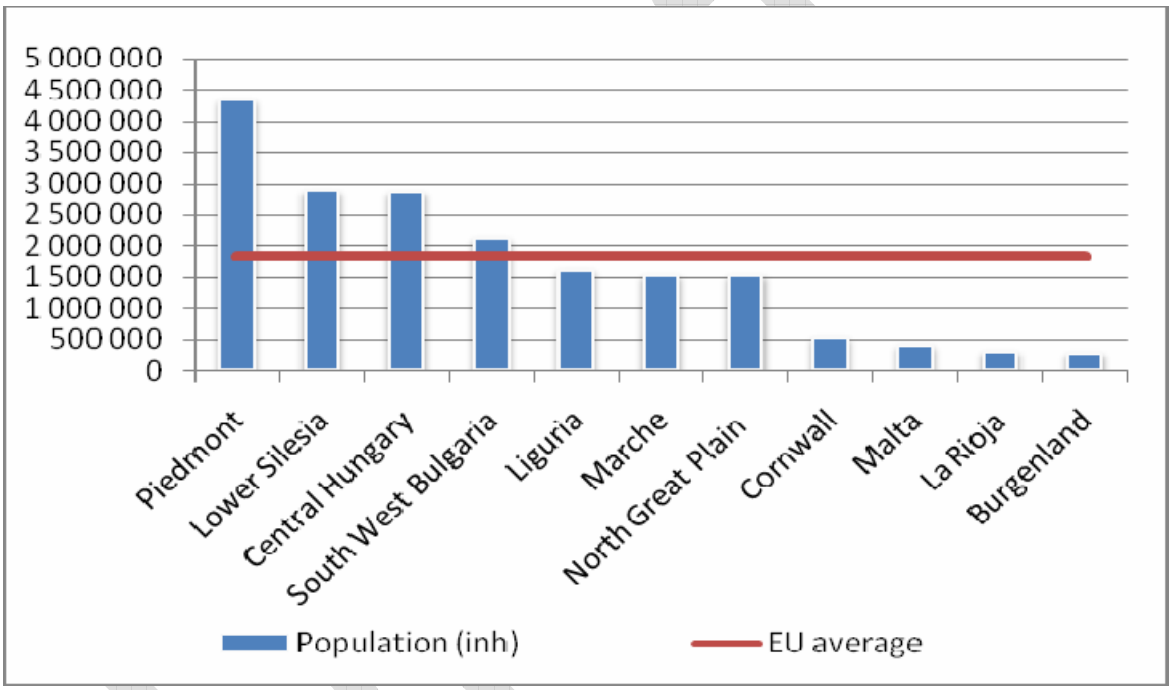
[3] The "total area" concept (which includes the area of lakes and rivers) was used for comparison as several countries only have this type of measurement available.

2.3. POPULATION

The surveyed regions show a diverse picture also in terms of population. Four of them (Piedmont, Lower Silesia, Central Hungary and South West, Bulgaria) are above the EU average (1,823,700 inhabitants); three regions are around the average; and four regions (Cornwall, Malta, La Rioja and Burgenland) rank in the bottom 15% of European regions.

The most populous surveyed region is Piedmont, with 4.35 million inhabitants, which makes it the 18th most populous region in the EU. The smallest, Burgenland, is one of the ten least populous regions in the EU.

2.3. Figure: Population of the surveyed regions, 2006

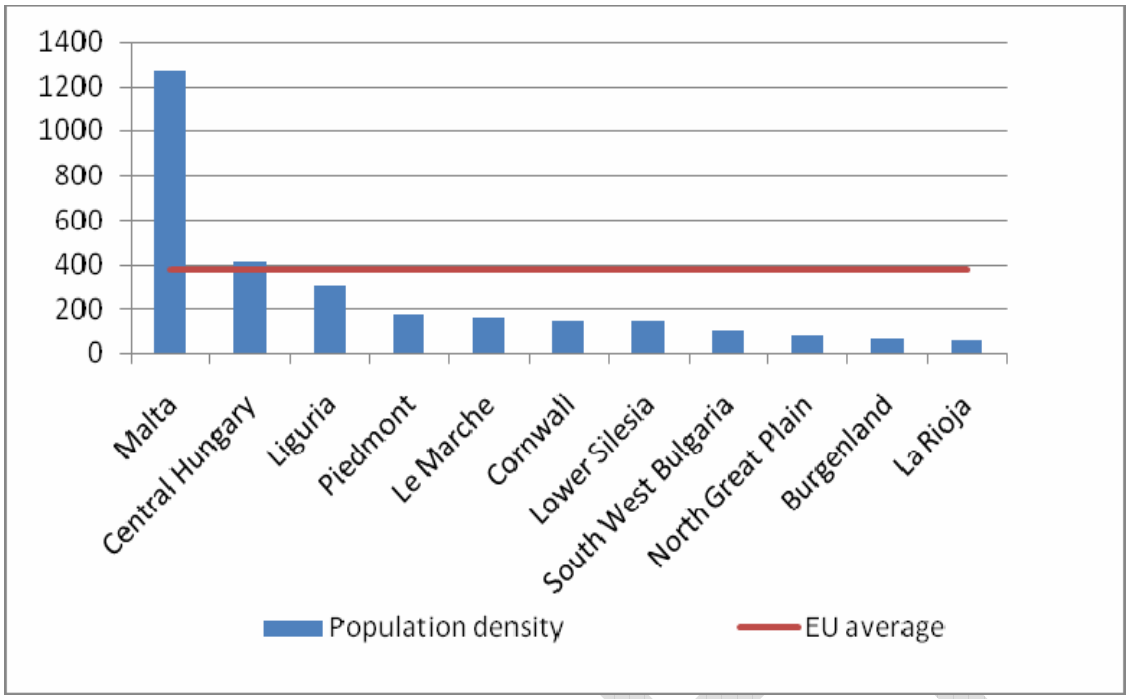


2.4. POPULATION DENSITY[4]

The island nation of Malta is by far the most densely populated region in the partnership. Next is the capital region of Central Hungary. The rest of the RSC regions are below the EU average for population density.

[4] According to Eurostat, for calculation of population density, the land area concept (excluding inland water bodies like lakes or rivers) should be used wherever available. Where data was available (e.g Italian regions) the land area concept was used, but where not availabe the total area (including area of lakes and rivers) figure.

2.4. Figure: Population density in the surveyed regions, 2006



2.5. Gross Domestic Product

Gross Domestic Product (GDP) per capita in Purchasing Power Standards (PPS) [5] ranges from around €9,500 to €27,000 in the partner regions. Nominal GDP – not adjusted for purchasing power – is considerably lower in the regions from the NMS. Both types of GDP will be used in the analysis in this report.

In PPS terms, RSC regions from the EU-15 states have GDP per capita in the range of 78 – 114 percent of the EU average. This drops to 40 – 77 percent for the NMS regions, with the exception of the capital region of Central Hungary, which has GDP at 105% of the EU average once adjusted for purchasing power.

The richest RSC region, Piedmont (where the GDP per capita was 113% of the EU average in 2006) is just the 69th richest region among the 270 EU regions. Burgenland and Cornwall are below this average, but exceed the 75% threshold.

[5] GDP (gross domestic product) is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced less the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS (purchasing power standards) eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size. GDP per inhabitant in PPS is the key variable for determining the eligibility of NUTS 2 regions in the framework of the European Union's structural policy. (Eurostat)

The percent of national GDP generated in the region reveals the region's economic position within its own country. Many of the RSC regions, even those with relatively high GDP per capita, are relatively small in these terms.

2.1. Table: Regional GDP per capita (PPS and Nominal) 2006

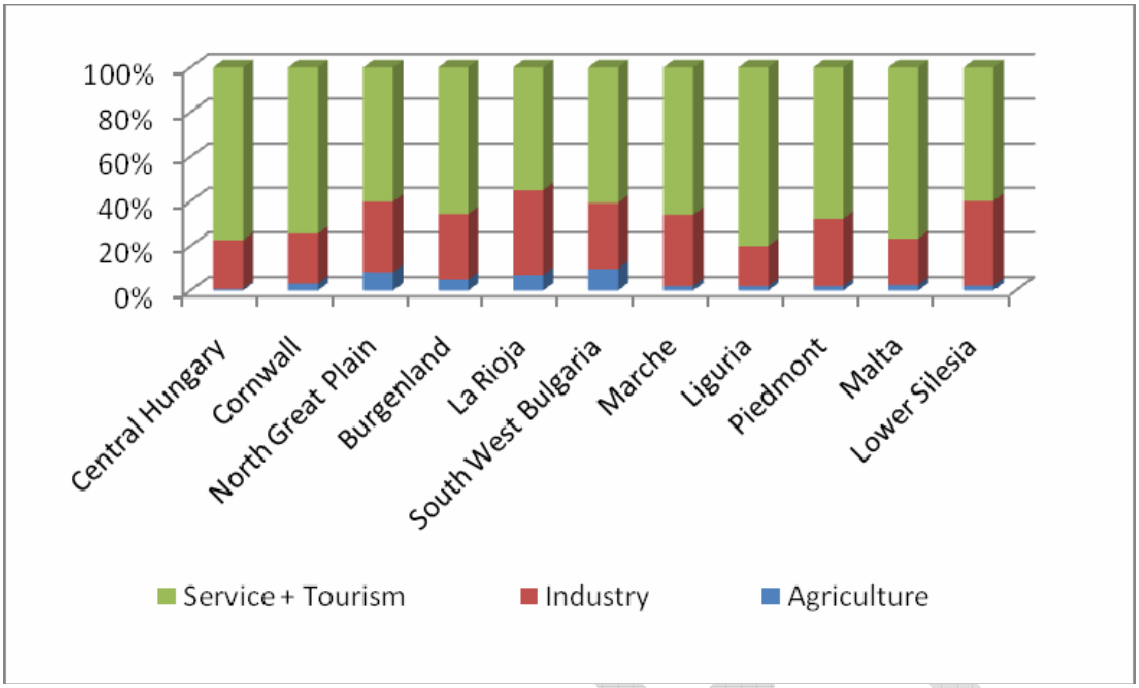
EU rank	Partner Region	Regional GDP per capita ,2006 (PPS)	Regional GDP per capita, 2006 (Euro)	% of the EU average	% of national GDP generated in the region
69	Piedmont	26900	27646	113,98%	8,09%
77	La Rioja	26400	23901	111,86%	0,74%
103	Central Hungary	24900	14830	105,51%	47,21%
104	Liguria	24900	25543	105,51%	2,77%
109	Marche	24600	25300	104,24%	2,61%
185	Burgenland	19400	20512	82,20%	2,23%
196	Cornwall	18300	20637	77,54%	0,56%
200	Malta	18200	12756	77,12%	100%
235	South West Bulgaria	13500	5124	57,20%	43,00%
236	Lower Silesia	13200	7631	55,93%	8,09%
255	North Great Plain	9500	5636	40,25%	9,58%

Further analysis of regions' GDP and development levels can be found in Chapter IV, in the analysis of issues impacting energy and emissions performance.

2.6. STRUCTURE OF THE ECONOMY

Like the gross majority of the European regions, the RSC regions are service-oriented economies. As a general rule in service-oriented regions, the composition of the Gross Value Added (which measures the contribution to the economy of each individual producer, industry or sector in the country or in the region) is 3-5% agriculture, 20-30% industry and 65-75% service sector.

2.5. Figure: Structure of the RSC Regions' Economy (Gross Value Added), 2006



Industry is higher in Wroclaw (37%) and La Rioja (38%). The Services sector is higher in Liguria (80%), and Malta (76%). Agriculture is higher in South West Bulgaria, North Great Plain, and La Rioja. These figures are analysed in detail in Chapter IV in the analysis of energy and emissions data.

2.7. Climate Change and Energy Vulnerability

The European Commission Staff Working Document "REGIONS 2020: an Assessment of Future Challenges for EU Regions[6]," prepared by DG Regional Policy, contains a series of vulnerability indices for European regions, including assessments of climate change vulnerability and energy vulnerability.

The climate change vulnerability index assesses the physical and economic effects of the underlying processes related to climate change:

- change in population affected by river floods;
- population in costal areas below 5m;
- potential drought hazard;
- vulnerability of agriculture, fisheries and tourism, taking into account temperature and precipitation changes.

It found that regions subject to the highest pressure are generally located in the South and East of Europe, due mostly to changes in precipitation and an increase in temperature, and river floods in some areas. Northern and western Europe are expected to see more limited pressures, apart from

[6] "REGIONS 2020: an Assessment of Future Challenges for EU Regions," EU DG Regional Policy, 2008

lowland coastal areas. Regions with low GDP per capita and a lower capacity for adaptation to climate change will also experience greater pressures, according to this assessment.

The energy vulnerability index covers four factors:

- energy import dependency - as %of gross inland (energy) consumption;
- energy consumption of households (toe /capita);
- energy consumption of industries, transport etc. (toe/M€);
- carbon content of gross inland (energy) consumption.

As with climate change, regions located mainly in the South and the East appear particularly vulnerable, for reasons to do mainly with security of supply and energy efficiency. Centrally located regions are in the middle ground owing to higher energy efficiency, but with high household consumption and relatively low environmental sustainability. Again, the least challenged regions are in the North and West, due either to higher own energy resources (United Kingdom, Netherlands) or to energy mixes allowing lower greenhouse gas emissions and lower dependency on fossil energy providers for electricity (Finland, France, Sweden).

Vulnerability in the RSC regions is diverse as the index scores in Table 2.2 demonstrate. Malta, North Great Plain in Hungary, La Rioja, and South West Bulgaria show the highest climate vulnerability. Most of the RSC regions have high energy vulnerability, due mainly to lack of secure supply and energy inefficiency. Energy vulnerability is highest in Malta, Lower Silesia, Poland, and Piedmont in Italy.

2.2. Table: Results of DG Regional Policy climate change and energy vulnerability indexes for RSC regions[7]

Partner Region	Climate index	Energy index
Central Hungary	38	38
Cornwall	19	27
North Great Plain	46	38
Burgenland	32	45
La Rioja	46	45
South West Bulgaria	46	51
Marche	42	52
Liguria	38	48
Piedmont	32	50
Malta	52	56
Lower Silesia	29	55

[7] Scores for all European regions are available at http://ec.europa.eu/regional_policy/sources/docoffic/working/regions2020/index_en.htm

3. The Climate Confidence Index

The Climate Confidence Index gives RSC partner regions the opportunity to evaluate their status and progress on seven key issues which are critical indicators of a region's ability to manage adaptation to and mitigation of climate change within its territory and economy. Based on the information provided by each region in the baseline assessment questionnaires[8], each region received a score from 0 (lowest) to 10 (highest) for each issue. The scores enable regions to compare their progress towards climate confidence against other partner regions and EU averages.

The Climate Confidence Index covers seven issues:

1. Greenhouse Gas (GHG) Emissions: includes GHG emissions per capita and GHG intensity (ratio of GHG emissions to GDP)
2. Energy Consumption: includes Final Energy Consumption (FEC) per capita and energy intensity (ratio of energy consumption to GDP)
3. Renewable Energy: in energy production capacity and in consumption
4. Policy Frameworks: measures the extent to which policy and planning processes for climate change are in place
5. Institutional Capacity: the capacity and effectiveness of the regional authorities to manage climate change issues
6. Socio-Political Aspects: awareness and readiness of the population and key stakeholder groups for climate change related actions
7. Financial Instruments: for financing climate change-related measures

[8] The baseline assessment team carried out additional research to supplement some of the energy and demographic data provided in the baseline questionnaires.

3.1. Table: The Climate Confidence Index

Partner Region	1. GHG Emissions	2. Energy Consumption	3. Renewable Energy	4. Policy Frameworks	5. Institutional Capacity	6. Socio-Political Aspects	7. Financial Instruments	Total
Central Hungary*	5,50	5,41	2,46	1,67	5,00	7,50	5,33	32,87
Cornwall, UK	3,70	4,85	2,66	10,00	2,50	6,67	9,33	39,71
North Great Plain, Hungary*	5,50	5,41	2,46	1,67	5,00	7,50	5,33	32,87
Burgenland, Austria	6,61	1,91	10,00	6,67	6,67	9,17	8,00	49,02
La Rioja, Spain	2,96	4,28	6,69	9,17	6,67	5,83	6,00	41,60
South West, Bulgaria*	3,25	4,80	6,11	0,83	4,17	3,33	2,67	25,16
Marche, Italy	8,31	6,04	1,47	5,00	7,50	5,83	7,33	41,49
Liguria, Italy	3,22	6,42	4,25	5,00	8,33	6,67	6,67	40,55
Piedmont, Italy	6,38	3,25	2,17	8,33	8,33	5,83	6,00	40,31
Malta*	7,33	9,57	0,00	5,83	3,33	5,83	8,00	39,90
Lower Silesia, Poland*	2,71	5,28	5,01	3,33	6,67	6,67	4,00	33,68
Average Score	5,04	5,20	3,94	5,23	5,83	6,44	6,24	37,92

* Scores based wholly or partially on national-level data and information

Note:

- The highest and lowest scores for each issue have been shaded.
- Total is the sum of scores for each individual issue; maximum total is 70 points.
- For regions belonging to the EU New Member States (Central Hungary, North Great Plain Hungary, South West Bulgaria, Malta, and Lower Silesia Poland), national-level data have been used to calculate the scores for issues 1, 2 and 3. This is due to the unavailability of these data at the regional level. In these states regional administrations are generally relatively new structures. Issues 4, 5, 6, and 7 pertain to the regional level wherever possible.
- For Malta, national-level data and information are used throughout the analysis.

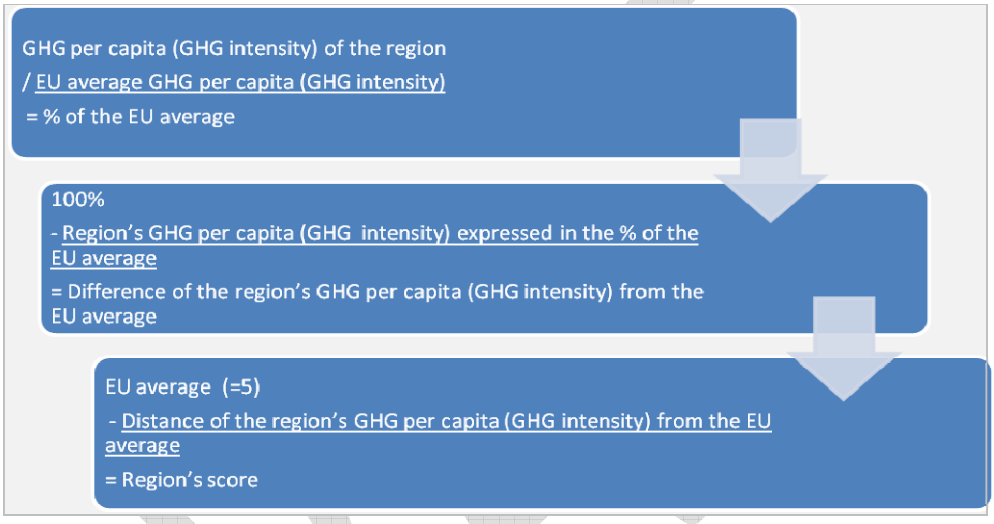
Finally, the assessment team would like to stress that this index should not be viewed as a competition between regions, or as a judgment. It is intended that surveyed regions use the index to assess their own status and progress and determine where they need to make improvements, or target their efforts, based on the other regions' position and experience. Much of the information used to compile the scores is subject to the opinions and standards of the partner region contact persons and the team which prepared the assessment.

Detailed scoring methodologies and results for each issue are presented below.

3.1. GREENHOUSE GAS EMISSIONS – ISSUE 1

Data on overall greenhouse gas emissions (GHG) in tons of CO_2 equivalent was collected from the partner regions. The index assesses regions' GHG emissions per capita and GHG intensity, which is a ratio of GHG emissions to GDP[9]. Scores for both criteria are expressed relative to the EU-27 averages. For each ten percentage points above or below the EU-27 average, partner regions received 1 point or fraction thereof, with the EU-27 average = 5 points.

3.1. Figure: Calculation methodology for GHG emissions



The total GHG emissions score is the average of GHG per capita and GHG intensity.

3.2. Table: RSC partner regions GHG emissions score

Partner Region	Score for GHG emissions per capita		Score for GHG intensity		GHG Totals		Score Total
Marche	8,51		8,11		16,63		8,3
Malta	8,48		6,17		14,65		7,3
Burgenland	8,17		5,04		13,21		6,6
Piedmont	6,06	+	6,71	=	12,77	/2=	6,4
Central Hungary	7,86		3,14		11,00		5,5
North Great Plain	7,86		3,14		11,00		5,5
Cornwall	5,43		1,97		7,40		3,7
South West Bulgaria	6,50		0,00		6,50		3,2
Liguria	3,45		2,99		6,44		3,2
La Rioja	2,63		3,30		5,93		3,0
Lower Silesia	5,43		0,00		5,43		2,7

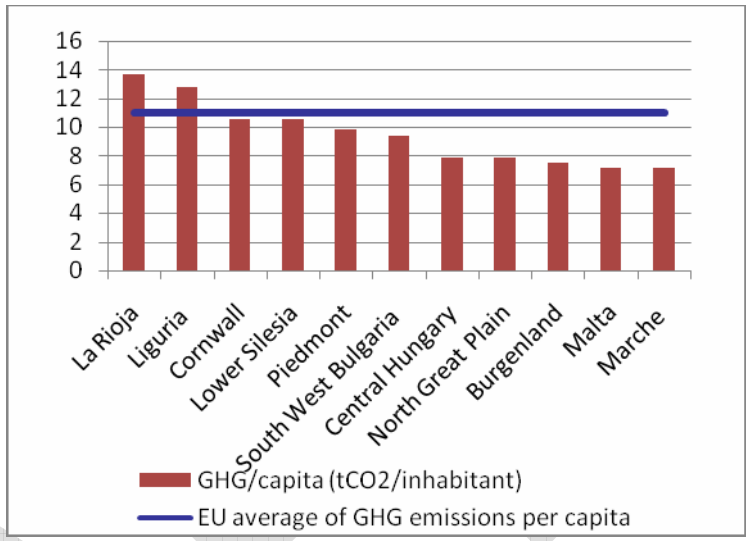
[9] The GDP here is measured in Purchasing Power Standards (PPS) to allow for differences in price levels and currency rates in the different countries.

GHG emissions per capita

Figure 3.2 shows the GHG emissions per capita of the RSC regions, compared to the EU average.

3.2. Figure: GHG emissions per capita in RSC regions[10] (tCO_2/inhabitant)

Partner Region	GHG/capita (t CO2/inh)
La Rioja	13,64
Liguria	12,74
Cornwall	10,56
Lower Silesia	10,56
Piedmont	9,86
South West Bulgaria	9,38
Central Hungary	7,87
North Great Plain	7,87
Burgenland	7,54
Malta	7,19
Marche	7,15
EU 27 average	11,03



GHG intensity

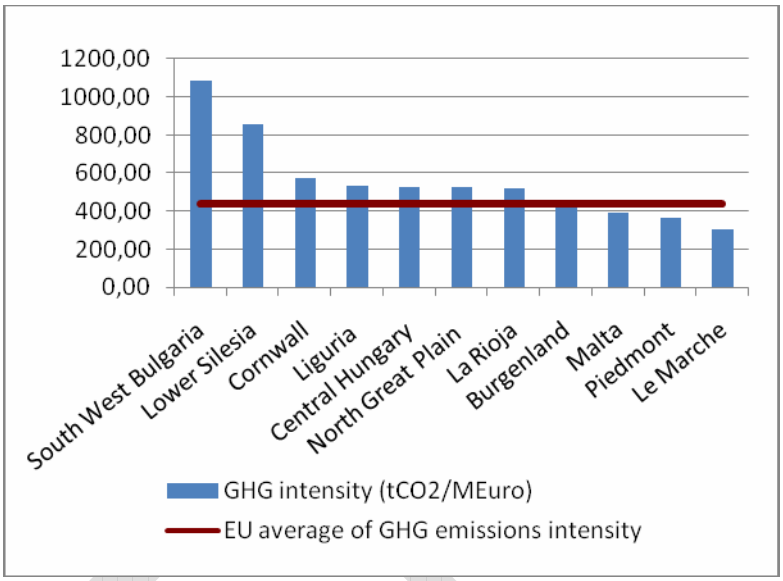
The environmental pressure of economic activity can be measured by emissions intensity, an indicator of the amount of GHG emissions per unit of economic output. This indicator takes account of energy intensity and fuel mix, therefore reflecting a country's level of energy efficiency, its overall economic structure (including the carbon content of goods imported and exported), and the carbon content of the energy consumed in the country[11]. RSC partner regions' GHG intensity, compared to the EU average is presented in Figure 3.3.

[10] GHG emissions figures are from 2006.

[11] *Greenhouse gas emission trends and projections in Europe 2008,* European Environment Agency, 2008, p 24

3.3. Figure: GHG intensity in RSC regions (Tons of CO_2/MEuro)

Partner Region	GHG intensity (tCO_2/MEuro)
South West Bulgaria	1086,58
Lower Silesia	854,11
Cornwall	575,86
Liguria	530,81
Central Hungary	524,42
North Great Plain	524,42
La Rioja	517,30
Burgenland	440,05
Malta	390,19
Piedmont	366,31
Marche	304,48
EU 27 average	442



The data reveal the following:

- The highest overall GHG scores belong to Marche and Malta.
- Regions with higher GDP tend to score higher as their economies generally emit GHGs more efficiently: Burgenland has low emissions per capita, but its emissions intensity is around the EU average. The reverse is true for Piedmont, where low emissions intensity is combined with an emissions per capita close to the EU-27 average.
- NMS regions – except Malta - have higher GHG intensity scores.
- Three of the EU-15 regions - Liguria, La Rioja and Cornwall - have emissions per capita and intensity higher than the EU average.

Chapter 4 will analyse GHG emissions further by examining the relationship between GHG emissions and energy consumption, GDP, economic structure of the regions, the main GHG emitters, sources of energy, renewable energy use, and energy vulnerability.

3.2. Energy Consumption – Issue 2

Energy consumption figures were requested from regions for both Gross Inland Consumption (GIC) and Final Energy Consumption (FEC)[12]. Since many regions did not have GIC figures at the regional level, the index uses FEC. The index assesses regions' FEC per capita and energy intensity, which is a ratio of FEC to GDP (PPS).

Scores for both FEC per capita and energy intensity are expressed relative to the EU-27 averages. For each ten percentage points above or below the EU-27 average, partner regions received one point or fraction thereof, with the EU-27 average = five points. The score is the average of both FEC per capita and energy intensity, equally weighted.

3.3. Table3.4. Figure: RSC regions' scores for energy consumption

Partner Region	FEC per capita (toe/cap)		Energy intensity (toe/Euro)		Total score		Final score
Malta	10,0		9,1		19,1		9,6
Liguria	6,4		6,5		12,8		6,4
Marche	6,2		5,9		12,1		6,0
Central Hungary	7,6		3,2		10,8		5,4
North Great Plain	7,6	+	3,2	=	10,8	/2=	5,4
Lower Silesia	8,3		2,2		10,6		5,3
Cornwall and Isles of Scilly	6,2		3,5		9,7		4,8
South West Bulgaria	9,6		0,0		9,6		4,8
La Rioja	3,7		4,8		8,6		4,3
Piedmont	2,8		3,7		6,5		3,3
Burgenland	3,2		0,6		3,8		1,9

Detailed comparisons of energy consumption figures against EU-27 averages are presented below.

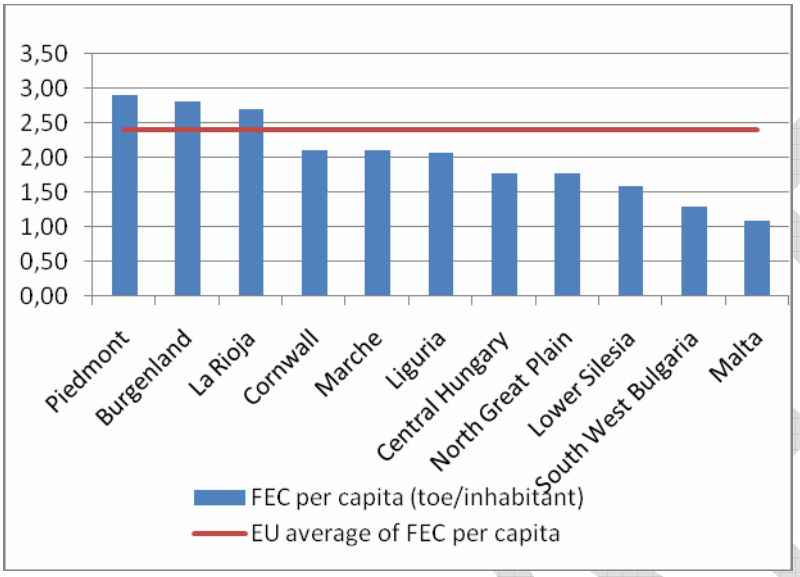
[12] **Gross Inland Consumption (GIC):** Gross inland consumption is the quantity of energy consumed within the borders of a country. It is calculated using the following formula: primary production + recovered products + imports + stock changes– exports – bunkers (i.e. quantities supplied to sea-going ships).

Final Energy Consumption (FEC): Final energy consumption is the energy finally consumed in the transport, industrial, commercial, agricultural, public and household sectors. It excludes deliveries to the energy transformation sector and to the energy industries themselves.

Final energy consumption per capita

In most of the RSC partner regions FEC per capita is considerably below the EU average and the lowest (which belongs to Malta) is less than half of the EU average.

3.5 Figure: Final Energy Consumption per capita in the surveyed regions, 2006

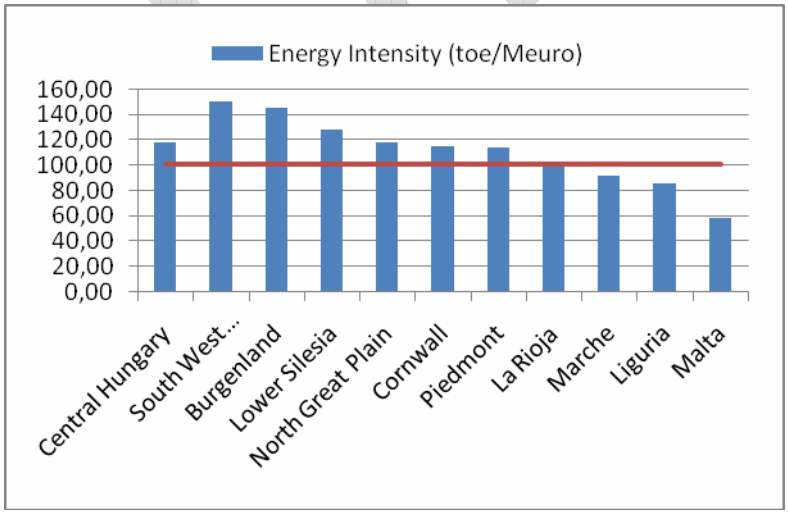


Partner Region	FEC per capita (toe/inh)
Piedmont	2,92
Burgenland	2,82
La Rioja	2,70
Cornwall	2,12
Marche	2,12
Liguria	2,07
Central Hungary	1,78
North Great Plain	1,78
Lower Silesia	1,59
South West Bulgaria	1,30
Malta	1,09
EU 27	2,40

Energy intensity

Energy intensity measures the amount of energy consumed to produce one unit of GDP at current market prices (in PPS). The figures below show the RSC regions' energy intensity figures compared to the EU-27 average.

3.6 Figure: Energy intensity in RSC Partner regions (toe/Meuro)



Partner Region	Energy Intensity (toe/MEuro)
Central Hungary	118,51
South West Bulgaria	150,95
Burgenland	145,40
Lower Silesia	128,95
North Great Plain	118,51
Cornwall	115,60
Piedmont	114,20
La Rioja	102,52
Marche	91,81
Liguria	86,13
Malta	59,01
EU-27 average	100,84

The data reveal the following:

- Malta has the lowest energy consumption figures within the RSC partnership, both per capita and per GDP unit.
- Two Italian regions, Liguria and Marche also have relatively low energy consumption.
- Energy consumption is relatively high in La Rioja, Piedmont and Burgenland.
- Although eight of the RSC regions have energy consumption per capita below the EU average, only three regions' energy intensity figures are below the EU average, many RSC regions have GDP per capita figures below the EU average.

Chapter 4 will analyse energy consumption further by examining the relationship between GHG emissions and energy consumption, GDP, economic structure of the regions, the main GHG emitters, sources of energy, renewable energy use, and energy vulnerability.

3.3. Renewable Energy Use – Issue 3

Partner regions submitted information about production and consumption of energy, broken down by source or fuel share. The index evaluates the renewable energy source (RES) shares of energy production (in most cases electricity generation or installed capacity) and final energy consumption (FEC).

Assigning scores from 0 – 10 was more complicated for this issue, since RES shares vary considerably across the partner regions and countries. For RES in energy production, the score equals the percentage of RES in overall production divided by 10, i.e. 100% = 10 points.

For RES in FEC score is the average of two evaluations, both relative to the EU-27 average for RES share of FEC. First partner regions/countries received 1 point for each 10 percentage points above or below the EU-27 average. To offset the fact that some regions were considerably higher than the EU-27 average and some considerably lower, a second score was assigned proportionally, using the per cent difference from the EU average.

The final composite score for this indicator is a weighted average consisting of 25% RES in production and 75% RES in energy consumption. This was done to offset the variations in energy production within the territory of the region and reliance on imports from outside the region.

3.3 Table: RSC Regions score for RES Share in energy production and consumption

Partner Region	RES share in energy production Score		RES share in FEC Score		Final RES Score
Burgenland	10,0		10,0		10,00
La Rioja	3,8		7,7*		6,69
South West Bulgaria	2,4		7,4		6,11
Lower Silesia	0,8	+ 3*	6,4	/4=	5,01
Liguria	0,0		5,7		4,25
Cornwall	10,0		0,2		2,66
Central Hungary	0,5		3,1		2,46
North Great Plain	0,5		3,1		2,46
Piedmont	3,6		1,7		2,17
Marche	2,8		1,0		1,47
Malta	0,0		0,0		0,00

*RES in GIC

Detailed information on RES use in RSC regions is presented below.

RES in energy production

3.4 Table: RES Share in Energy Production Capacity

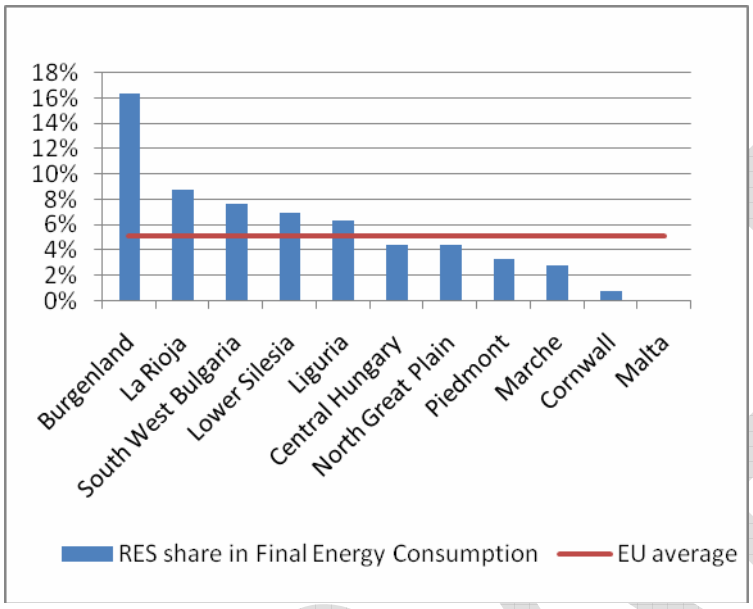
Partner Region	RES share in production (%)
Cornwall	100,00%
Burgenland	100,00%
La Rioja	37,57%
Piedmont	36,17%
Marche	28,41%
South West Bulgaria	23,93%
Lower Silesia	7,73%
Central Hungary	4,78%
North Great Plain	4,78%
Liguria	n.a
Malta	0,00%
EU-27	24,7%

RES shares in production capacity vary considerably across the partnership, and are closely tied to total production capacity of the region. Cornwall produces a very small amount of primary energy within the region, so it is not surprising that it all comes from small-scale RES plants. Burgenland is a notable exception, as it generates a large amount of its own energy from RES. Piedmont also generates a relatively large amount of electric energy per capita, with a relatively high RES percentage. The basis for the energy production figures submitted by the regions varies somewhate; in most cases it is electricity generation or installed capacity, but in some cases the figure represents heat and other types of energy production.

RES in Energy Consumption

The chart below shows the current share of RES in energy consumption in the partner regions against the EU-27 average of 5.07 percent.

3.7 Figure: Renewable Energy Share in energy consumption in RSC partner regions, 2006



Partner Region	RES share in FEC (%)
Burgenland	16,35%
La Rioja	8,70%*
South West Bulgaria	7,68%
Lower Silesia	6,91%
Liguria	6,31%
Central Hungary	4,35%
North Great Plain	4,35%
Piedmont	3,25%
Marche	2,72%
Cornwall	0,71%
Malta	0,00%
EU-27	5,07%

*RES in GIC

The data reveal the following:

- In both production and consumption, about half of RSC regions are above the EU average, and half are below.
- Burgenland has an outstanding RES share in energy production and consumption.
- La Rioja, South West Bulgaria and Lower Silesia have relatively higher RES share in the energy consumed, but not in the energy they produce.
- The low amount of RES in energy consumption in Cornwall indicates that the RES energy it produces is very small in quantity, and most energy is imported from fossil fuel sources.
- Malta has zero RES use in both energy production and consumption.

Chapter 4 will analyse renewable energy use further by looking as RES national targets, RES development potentials in the regions, and barriers to further development of RES. It will also examine the story behind RES success in Burgenland and the potential for further RES development in Malta.

3.4. POLICY FRAMEWORKS – ISSUE 4

Policy frameworks have been evaluated subjectively by the assessment team, based on information about national and regional policies and planning processes. To carry out the assessment the team analyzed the following issues based entirely on the information provided in the questionnaires:

- Issue 4.1.The extent to which climate change vulnerability and adaptation planning are considered in the overall policy framework.
- Issue 4.2. The existence of comprehensive and quantified climate change policy at regional level.
- Issue 4.3. The extent to which climate change factors addressed by the regional sectoral framework.
- Issue 4.4.The scope and ambition of regional-level policy objectives and targets.

3.5 Table: RSC Regions Score for Policy Framework

Partner Region	Criteria				Score
	Adaptation: assessment of vulnerability to CC and incorporation into policies	Regional CC policy exists and is comprehensive and quantified	Regional sectoral framework addresses CC factors	Ambitious regional-level policy objectives and targets	
Central Hungary	1	0	1	0	1.7
Cornwall	3	3	3	3	10
North Great Plain	1	0	1	0	1.7
Burgenland	1	2	2	3	6.7
La Rioja	3	3	3	2	9.2
South West Bulgaria	-	0	1	0	0.8
Marche	-	2	2	2	5.0
Liguria	-	1	3	2	5.0
Piedmont	1	3	3	3	8.3
Malta	1	2	2	2	5.8
Lower Silesia	-	2	1	1	3.3

Scoring: 0 - 3 assigned points per criterion; - indicates no information available in the questionnaire and is counted as zero.

Due to missing information and the subjectivity of the scoring process, these scores must be considered as indicative only. However the questionnaires did show that the top four regions – Cornwall, La Rioja, Piedmont, and Burgenland - have elaborated strategic documents and set policy objectives and targets for tackling climate change at the regional level. The following three regions - Marche, Liguria, and Malta – have also taken steps in the direction of comprehensive climate change planning at the regional level. The bottom four regions – North Great Plain, Central Hungary, South West Bulgaria and Lower Silesia – all hail from the NMS, where regional policies and planning are not yet well developed. Some consideration of this was taken into account in the scoring, and national-level policies were also considered.

Further details on each of the individual issues and partner regions' scores and questionnaire responses is presented below.

Issue 4.1. Climate change vulnerability and adaptation planning

The assessment addressed the following questions for each region:

- Has an assessment of vulnerability to climate change been carried out at the national and/or regional levels?
- How thorough was the assessment, how reliable are the conclusions considered by authorities and experts?
- Have the adaptation vulnerabilities been directly taken into account in national and/or regional policies?

Seven out of eleven regions reported that adaptation issues are integrated into the policy framework (although four regions did not provide feedback on this issue). A comprehensive vulnerability assessment has been carried out in two regions, while in another four regions the process is in an early stage and is not translated into a detailed adaptation strategy. In the two Hungarian regions there is national-level information on vulnerability issues but there is no information on their integration into regional adaptation policy.

Issue 4.2. Existence of comprehensive and quantified regional climate change policy

The assessment addressed the following questions for each region:

- Has the region worked out its own climate change-specific strategy and/or action plan?
- If so, is it comprehensive, i.e. does it address all relevant aspects of climate change?

Are there quantitative targets corresponding to relevant indicators: GHG or CO_2 emissions, renewable energy use in final energy consumption and/or electricity generation, energy efficiency or reduction of energy use, bio fuels and other RES?

Three of the regions reported having thorough regional climate change policies with quantified targets, and four others have made significant efforts in developing the policy framework. There is less progress in the NMS. Four of the regions - La Rioja, Marche, Piedmont and Cornwall – reported that they have quantitative targets concerning GHG or CO_2 emissions and renewable energy use.

Issue 4.3. Climate change factors addressed by the regional sectoral framework

The assessment addressed the following question for each region:

- Are the regional-level sectoral policies comprehensive and do they take into account relative climate change related factors?

The information provided by four of the regions - La Rioja, Marche, Piedmont and Cornwall – indicated that they have a comprehensive regional sectoral policy framework in place, and that it adequately addresses climate change issues. Climate change issues are addressed mainly in energy, agriculture, forestry, transport, and energy-related sectoral policies.

Regions from the new MS have made initial efforts in defining the sectoral framework but they lag behind the other partner regions. In the two Hungarian regions there are no sectoral polices at regional level but only policies at national level, but the Cohesion Policy Operational Programmes do address climate change issues at the regional level. South West Bulgaria has made attempts to develop its energy policy but the process is in the early stage. Lower Silesia has a regional strategy for energy production from biomass.

Issue 4.4. Ambitious regional-level policy objectives and targets

The assessment addressed the following question for each region:

- How ambitious are the regional policy objectives and quantified targets (for GHG emissions reductions, renewable energy use, and energy efficiency), particularly in comparison with national and EU targets?

Cornwall, Burgenland and Piedmont all reported that they have clear and comprehensive quantified targets which are more ambitious than the applicable national and EU targets. Other regions had some specific ambitious targets (i.e. emissions from a particular sector, non-quantified targets, etc.)

Further review and analysis of RSC partners' climate change policies is in Chapter 5, section 5.1.

3.5. INSTITUTIONAL CAPACITY – ISSUE 5

This issue covers the capacity of the regions' institutions to deal with climate change adaptation and mitigation issues. Partners evaluated their own institutions with a score of "low", "average" or "high" for each of the following criteria: dedicated staff, financial means, regulatory mandate and access to research capacity. So the results must be viewed as a self-evaluation, i.e. the regions' own perceptions of their institutional capacity.

The scores presented below are based directly on this self-evaluation. Responses were assigned a score of 0 (non-existing) 1 (low), 2 (average) or 3 (high) and the total score expressed as a percentage of the maximum 12 points.

3.6 Table: Evaluation of institutional capacity

Partner Region	Criteria				Score
	Dedicated Staff	Financial Means	Regulatory Mandate	Access to research capacity	
Central Hungary	1	2	1	2	5,00
Cornwall	1	1	0	1	2,50
North Great Plain	1	1	1	3	5,00
Burgenland	2	3	2	1	6,67
La Rioja	2	1	2	3	6,67
South West Bulgaria	2	1	0	2	4,17
Marche	3	2	3	1	7,50
Liguria	2	2	3	3	8,33
Piedmont	2	3	2	3	8,33
Malta	1	1	1	1	3,33
Lower Silesia	2	2	2	2	6,67

Issue 5.1. Dedicated staff

Regions assessed whether they have sufficient human resources in terms of number and skills/experience with climate change issues. A few issues can be outlined with regards to the assessment:

- Only Marche expressed a high level of satisfaction with the existing human resource capacity; five regions (those which scored “2”) have staff dealing with climate change tasks but consider their number and experience insufficient.
- None of the three regions which scored high on policy frameworks (Cornwall, La Rioja, Piedmont) considers the dedicated human resources sufficient for the achievement of the policy objectives.
- Four of the regions stated that the existing human resource capacity is not enough for achieving climate change policy objectives.

Issue 5.2. Financial means

The following points are to be highlighted based on the assessment of budgetary resources and special programmes supporting climate change related activities:

- Burgenland and Piedmont consider the available funds sufficient for implementing climate change strategies and plans. Since these regions have made also significant progress in developing the policy framework, it is expected that they are well positioned to pursue and achieve their regional climate objectives
- Five of the surveyed regions consider the financial resources for climate change measures unsatisfactory which is a hurdle for achieving regional climate-related objectives.

Issue 5.3. Regulatory mandate

The following issues can be highlighted with regards to devolution of power and authority of the regions to carry out climate change policy:

- Only two regions – Liguria and Marche - consider their regulatory mandate adequate for policy-making and implementing regional climate targets.
- In some cases regions evaluated this criterion strictly on the basis of whether they possess a regulatory mandate; others took a more general perspective on the relative power of the regional authority.

Issue 5.4. Access to research capacity

Access to research capacity is critical for climate change, which depends heavily on information.

- Four regions – North Great Plain, La Rioja, Liguria, and Piedmont - reported that their regional institutions have enough information to manage and implement climate change policies. For the Hungarian regions, access to research capacity may be a factor for boosting the otherwise limited activities of the regional institutions.
- Access to research capacity is considered average in the other three regions from the NMS.
- Cornwall, Burgenland, Marche and Malta consider their access to research capacity relatively low; yet they have much higher scores in other areas of the index.

3.6. Social and political awareness and readiness – Issue 6

Again, the scores are based on regions' self-evaluations as reported in the baseline questionnaires. Partners were asked to evaluate their regions by answering the following questions:

- Issue 6.1 What priority is given to combating climate change on the regional political agenda?
- Issue 6.2 Is there a strong political leadership on climate change and reducing the carbon impact of the economies?
- Issue 6.3 What is the overall awareness of the industry with regard to reducing carbon footprint?
- Issue 6.4 What is the overall awareness of the population with regard to reducing carbon footprint?

Responses were assigned a score of 1 (low/weak), 2 (average) or 3(high/strong) and the total score expresses as percentage of the maximum 12 points.

3.7 Table: Evaluation of social and political awareness and readiness

Partner Region	Criteria				Score
	Priority to cc on regional political agenda	Political leadership on cc	Overall awareness of industry on reducing carbon footprint	Overall awareness of population on reducing carbon footprint	
Central Hungary	2	2	3	2	7,50
Cornwall	2	2	2	2	6,67
North Great Plain	2	2	3	2	7,50
Burgenland	3	3	2	3	9,17
La Rioja	2	2	1	2	5,83
South West Bulgaria	1	1	1	1	3,33
Marche	2	1	2	2	5,83
Liguria	2	2	2	2	6,67
Piedmont	2	2	1	2	5,83
Malta	2	1	2	2	5,83
Lower Silesia	2	2	2	2	6,67

Issue 6.1. Priority given to climate change on the regional political agenda

- Only Burgenland states that high political priority is given to climate change, which corresponds with the region's ambitious targets and objectives especially in the energy sector.
- The majority regions are of the opinion that the climate change is gaining priority on the regional political agenda, but it is not sufficient in view of the urgent need for action.
- South West Bulgaria is the only region which considers climate change low on the political agenda.

Issue 6.2 Political leadership on climate change

- Again, only Burgenland rates its political leadership on climate change and low carbon issues high; this is consistent with its progress in policy and institutional capacity issues.
- Although there are signals of political will and leadership in dealing with climate change issues the majority of surveyed regions consider that it does not entirely correspond to the necessities and more effort is needed.

Issue 6.3 Overall awareness of industry on reducing carbon footprint

- La Rioja, South West Bulgaria, and Piedmont are unsatisfied with the level of awareness of industry with regard to reducing the carbon footprint.
- Although regions report that campaigns have been organized to raise awareness of the industry for reduction of the carbon footprint, the majority of the regions consider that they are not sufficient and further effort should be made.

Issue 6.4 Overall awareness of population on reducing carbon footprint

- Burgenland is the only region which reports high awareness of the population with regard to reducing the carbon footprint; this fits with the region's ambition to become energy autonomous.
- The overall awareness of population on reducing the carbon footprint is considered low only in South West Bulgaria.

3.7. Financial Instruments – Issue 7

Financial instruments have been assessed subjectively by the baseline assessment team according to the information provided in the questionnaires. To carry out the assessment, team members considered the following issues and questions:

- Issue 7.1 The variety of financial instruments available to the region for financing climate change-related measures
- Issue 7.2 The extent of integration of climate change into the planning, programming and implementation of Cohesion Policy funding for 2007-13
- Issue 7.3 The extent of integration of climate change when formulating and selecting projects within regional development investment programmes (RDPs)

Scores were assigned from 0 (very weak) to 5 (very strong) and the total score expressed as a percentage of the maximum 15 points.

3.8 Table: Evaluation of financial instruments

Partner Region	Criteria			Score
	Variety	Integration in cohesion policy planning, programming, implementation	Integration in project form and selection (all RDPs)	
Central Hungary	2	2	1	3.3
Cornwall	5	4	5	9.3
North Great Plain	4	2	2	5.3
Burgenland	4	4	4	8.0
La Rioja	3	3	3	6.0
South West BG		2	2	2.7
Marche	4	4	3	7.3
Liguria	3	4	3	6.7
Piedmont	3	3	3	6.0
Malta	4	4	4	8.0
Lower Silesia	4	1	1	4.0

Issue 7.1 The variety of financial instruments available to the region for financing climate change-related measures

Regions were asked to list and describe the following types of instruments: state and regional subsidies; EU Structural and Cohesion Funds, tax incentives, specialized financial institutions. Regions were scored based on the number of different instruments available to them for financing climate change-related activities and investments. The following points can be highlighted based on the assessment:

- Cornwall has the most extensive variety of financial instruments including subsidies, tax incentives, and specialized funds available for a variety of energy efficiency measures, energy production from RES, and carbon reduction projects.
- Five regions (North Great Plain, Burgenland, Marche, Malta and Lower Silesia) also benefit from a large number and variety of financial instruments supporting climate change related measures.
- EU Cohesion Policy supports climate change measures in all of the surveyed regions. Predominantly, these are measures related to climate change mitigation such as energy projects, and sustainable mobility.
- Adaptation to climate change is mentioned only by Malta and Marche.

Issue 7.2 The extent of integration of climate change issues into the planning, programming and implementation of Cohesion Policy funding for 2007-13

The assessment takes into consideration SEA or environmental assessment of plans and programmes; involvement of environmental authorities and other environmental or climate change partners or stakeholders; allocation of funding for climate change-related criteria and requirements into the project development process. Partners provided this information in the questionnaires in free text format, so the basis for evaluation varies significantly across the regions.

The assessment revealed the following points:

- Five of the regions scored 4 of 5 points, meaning there is a considerable level of integration of climate change issues.
- The concept of sustainability is frequently integrated into the planning process but in many cases climate change specifically is not. Cornwall and Malta have carbon neutrality ambitions for their Cohesion Policy Operational Programmes.
- The focus of most regions' responses in the questionnaires was on so-called vertical integration of climate change into programmes, i.e. specific funding measures dedicated to energy efficiency, renewables, and other climate-friendly objectives, rather than integration of these themes across all funded measures.

Issue 7.3 Integration of climate change when formulating and selecting projects within regional development investment programmes

Scores were assessed based on the regions' reported use of climate change and carbon emission targets, thresholds and other requirements for project promoters; guidance given to project promoters; and criteria and indicators used to evaluate, select and monitor investment projects.

The assessment revealed the following points:

- Cornwall, Burgenland, and Malta report the highest degree of incorporation of climate change issues into the project cycle for regional development programmes
- Other regions which report a lesser degree of integration mention the lack of sufficient practical guidelines and information in place to assist this process.

4. Further Analysis on Climate Confidence: Energy and Emissions

Energy and emissions are critical components of climate confidence. Energy accounts for 80% of all GHG emissions in the EU[13]; it is the basis of climate change in most RSC regions. In Chapter 3, The RSC Climate Confidence Index shows basic energy and emissions figures for RSC regions or countries and evaluates regions based on these numbers. But in order to completely understand those numbers and the index scores, it is necessary to examine the relationship between energy and emissions, along with a series of critical external factors. This chapter will examine and analyse these factors and draw some further conclusions about the RSC regions' current position and climate confidence overall. It will draw heavily from the detailed information provided by RSC partner regions in the baseline questionnaires, and present several interesting case studies from across the partnership.

4.1. Energy and Emissions in the RSC Regions

For review and reference, Table 4.1 presents an overview of the energy and emissions figures for the RSC regions. Figures shaded green indicate performance better than the EU average, and figures shaded red indicate performance worse than the EU average.

4.1. Table: Energy and Emissions figures for RSC regions against EU-27 averages, 2006

Partner Region	GHG/capita (tCO_2/inh)	GHG intensity (tCO_2/MEuro)	FEC per capita (toe/inh)	Energy intensity (toe/ MEuro)	RES in energy prod capacity (%)	RES in FEC (%)
Central Hungary	7,87	524,42	1,78	118,51	4,78	4,35
Cornwall	10,56	575,86	2,12	115,60	100,00	0,71
North Great Plain	7,87	524,42	1,78	118,51	4,78	4,35
Burgenland	7,54	440,05	2,82	145,40	100,00	16,35
La Rioja	13,64	517,30	2,70	102,52	37,57	8,70*
South West Bulgaria	9,38	1086,58	1,30	150,95	23,93	7,68
Marche	7,15	304,48	2,12	91,81	28,41	2,72
Liguria	12,74	530,81	2,07	86,13	0,00	6,31
Piedmont	9,86	366,31	2,92	114,20	36,17	3,25
Malta	7,19	390,19	1,09	59,01	0,00	0,00
Lower Silesia	10,56	854,11	1,59	128,95	7,73	6,91
EU 27 average	11,03	442,00	2,40	100,84	24,70	5,07

*RES in GIC

[13] REGIONS 2020: An Assessement of Future Challenges for EU Regions p17

GHG emissions per capita: In 2006, every EU citizen emitted an average of 11,03 t CO_2 equivalent. Partner regions' GHG emissions per capita range from 7,15 to 13,64 t CO_2/inh., but nine out of the eleven surveyed regions are below the EU average. Only two regions, Liguria and La Rioja exceed the average. Emissions per capita are the lowest in Marche and in Malta.

GHG emissions intensity: In 2006, the EU economy generated 442 g CO_2-equivalent for one unit of GDP (PPS). In the RSC regions, emissions intensity varies from 304 g CO_2 equivalent to 1086 CO_2 equivalent; many of the regions greatly exceed the EU average.

Energy consumption per capita: Most RSC regions consume less energy than the EU average (2.4 toe/capita) with the exception of Piedmont, Burgenland and La Rioja. In general, regions from NMS have lower energy consumption per capita and the lowest (which belongs to Malta) is just half of the EU average.

Energy intensity: Despite low energy consumption rates, seven of the eleven regions exceed the EU average for energy intensity. The most energy intense regions are the NMS regions, plus Burgenland and Cornwall. La Rioja is near the EU average; Malta, Liguria and Marche have relatively lower energy intensity levels.

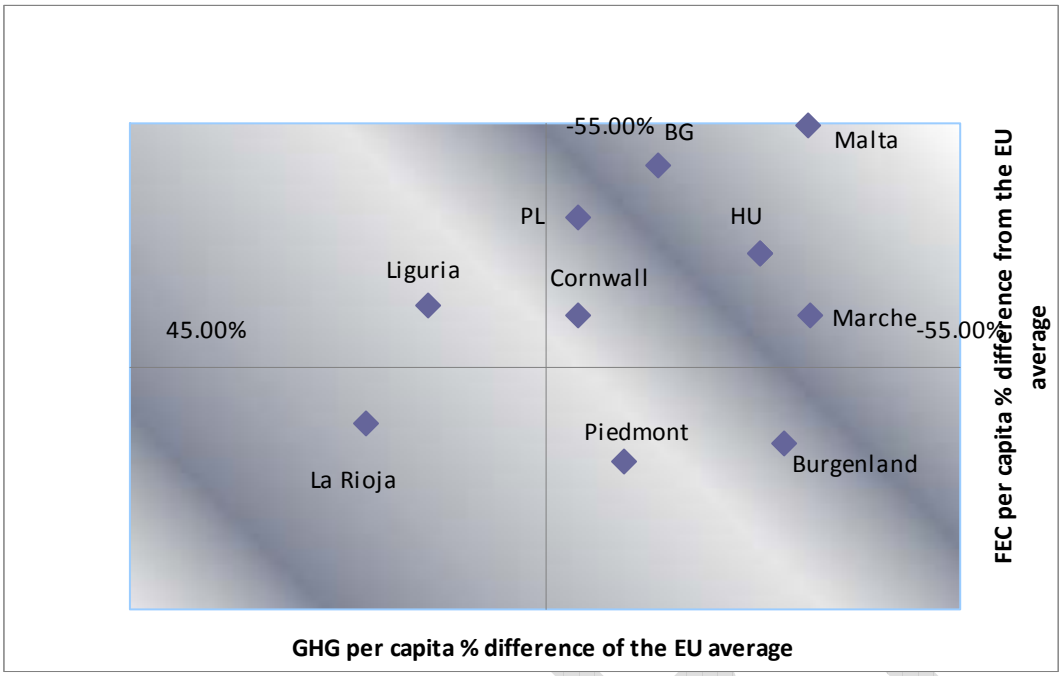
RES share in energy production capacity: The regions' RES production capacities are very diverse, and the percentages are linked closely to actual energy production capacity. Burgenland and Piedmont have higher RES percentages with higher production capacities. The other regions either have very low production capacities, or low RES percentages.

RES share in energy consumption: The current share of RES is relatively low in the RSC regions; the majority of them is below the EU average (5%). Malta, Cornwall, Marche and Piedmont have very low use of RES. RES in energy consumption is relatively high in La Rioja and Burgenland.

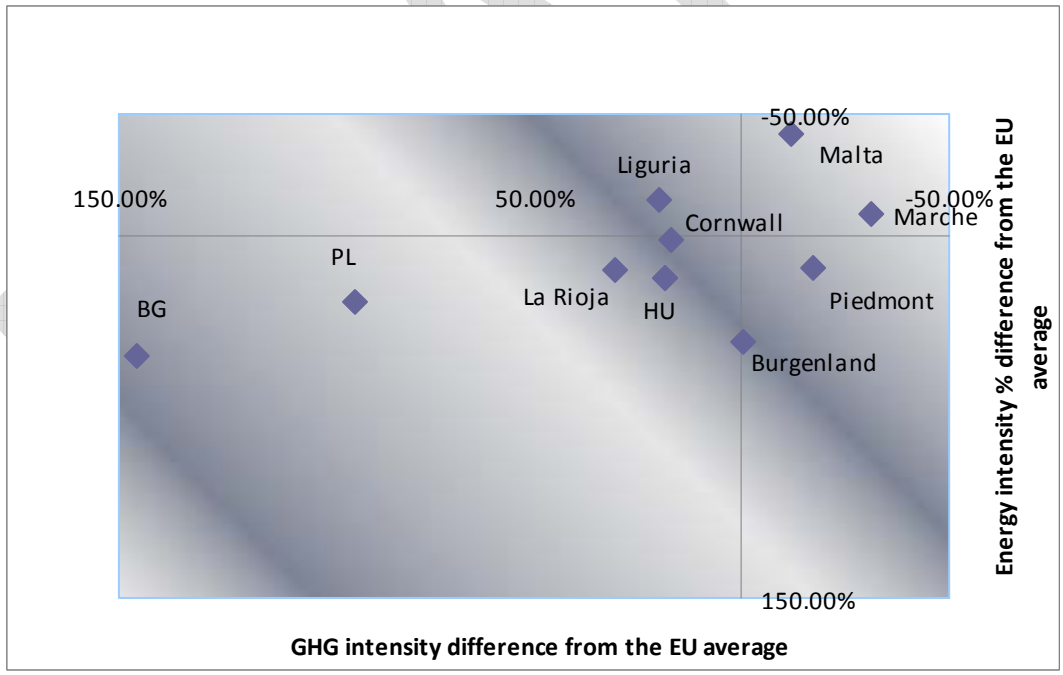
4.1.1. GHG Emissions vs Energy Consumption

Figure 4.1 shows the relationship of GHG emissions to energy consumption per capita for the RSC regions, based on the percentage above or below the EU average. The graph shows that GHG emissions and energy consumption are not always closely correlated. Burgenland and Piedmont have higher energy consumption versus GHG emissions; Liguria and La Rioja have higher GHG emissions and relatively lower energy consumption. Most of the RSC regions fall into the upper right quadrant, indicating both GHG emissions and energy consumption rates below the EU average.

4.1. Figure: GHG vs Energy consumption per capita, % from EU average



4.2. Figure: Energy vs GHG intensity, % from EU average



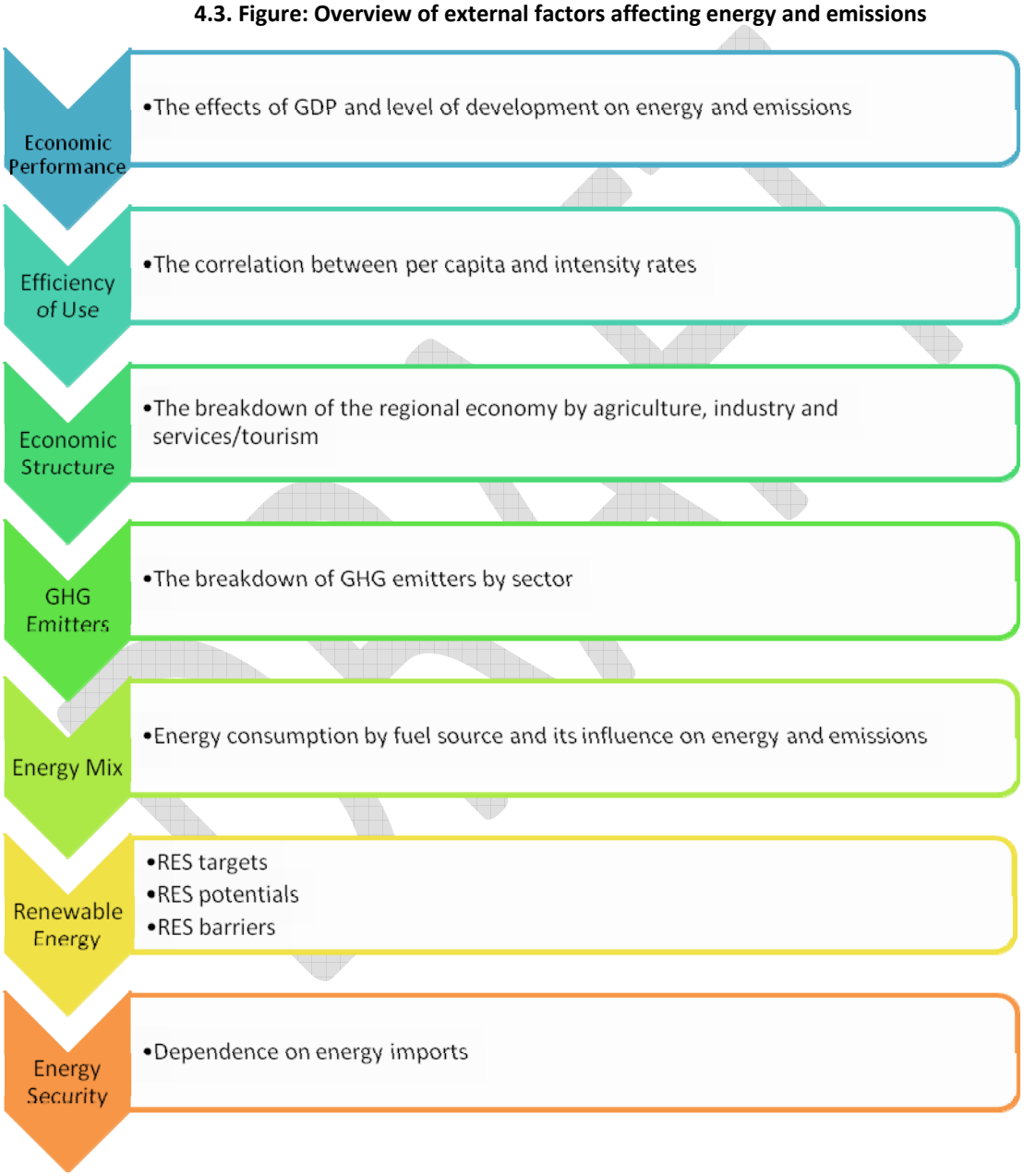
The picture for intensity is somewhat different. Several economies are more emissions and energy intense than the EU average (those in the lower left quadrant.) Only Malta and Marche lie in the upper right quadrant, indicating emissions intensity and energy intensity figures better than the EU average. As mentioned before, this is mainly due to the fact that RSC regions tend to have lower than average GDP per capita rates. Again Burgenland stands out with energy intensity high relative to emissions intensity, while Malta displays opposite characteristics.

4.2. Key factors Affecting Emissions and Energy characteristics

The RSC regions are diverse, and many factors affect their energy and emissions characteristics, as well as their overall efforts to achieve climate confidence. This analysis will examine seven important factors which influence the regions' energy and emissions figures and scores, in order to better understand the regions' performance in these fields.

Figure 4.3 presents the seven factors to be considered in the analysis.

4.3. Figure: Overview of external factors affecting energy and emissions



4.2.1. Economic Performance – the effects of GDP and level of development on climate confidence

RSC regions' GDP rates and development levels

Based on nominal (Euro) GDP per capita rates, the RSC regions can be placed into three groups, as shown in the table below[14]. These groups also divide the regions according to their approximate level of development. Group I are regions well above the EU GDP average, with well developed economies. Group II regions are just below the EU average. In this case they are both developed economies in peripheral areas which are still developing. The group III regions are all from the EU new member states (NMS). These regions have lower GDP and are still developing, i.e. the economies are expected to grow at a relatively fast rate.

4.2. Table: Nominal GDP per capita and development groups for RSC regions

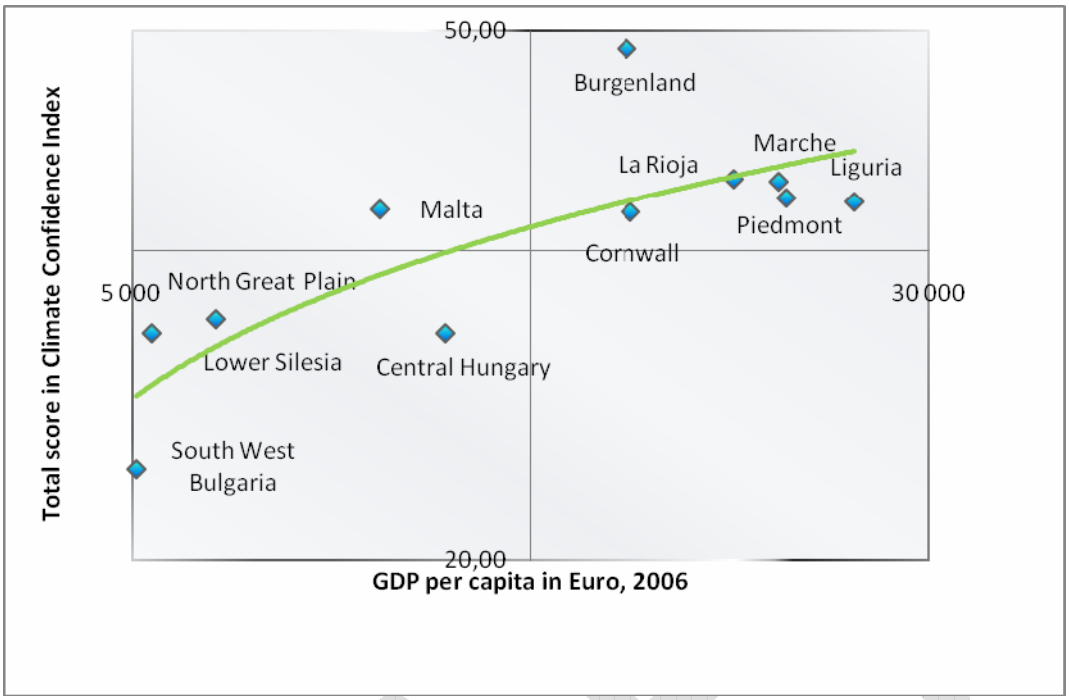
Partner Region	2006 GDP per capita (Euro)	GDP group
Piedmont	27 646	Group I
Liguria	25 543	
Marche	25 300	
La Rioja	23 901	
Cornwall	20 637	Group II
Burgenland	20 512	
Central Hungary	14 830	Group III
Malta	12 756	
Lower Silesia	7 631	
North Great Plain	5 636	
South West Bulgaria	5 124	

GDP and Climate Confidence Index Scores

An examination of regions' final scores in the Climate Confidence Index against GDP per capita rates shows that, in general, regions with higher GDP scored better. Notable exceptions are Burgenland, Malta, and North Great Plain, which had high index scores in relation to GDP.

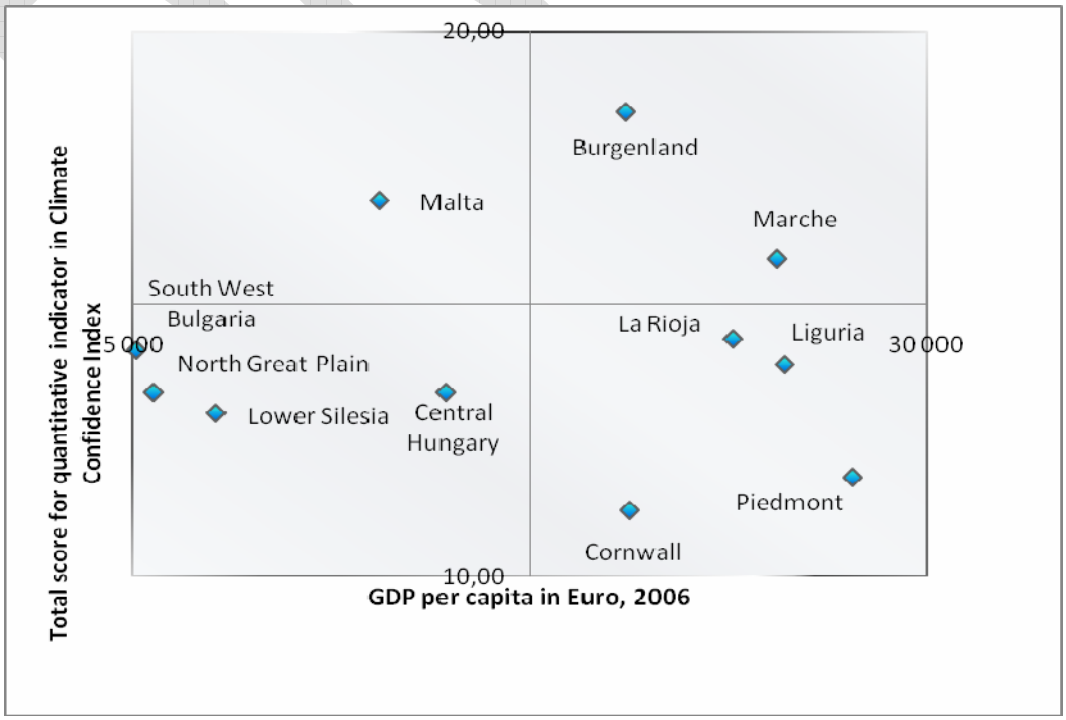
[14] Nominal GDP has been used in this analysis instead of PPS to better reflect the standard of living and economic development stage of each region.

4.4. Figure: Partner Regions' GDP per Capita Versus Climate Confidence Index Total Score

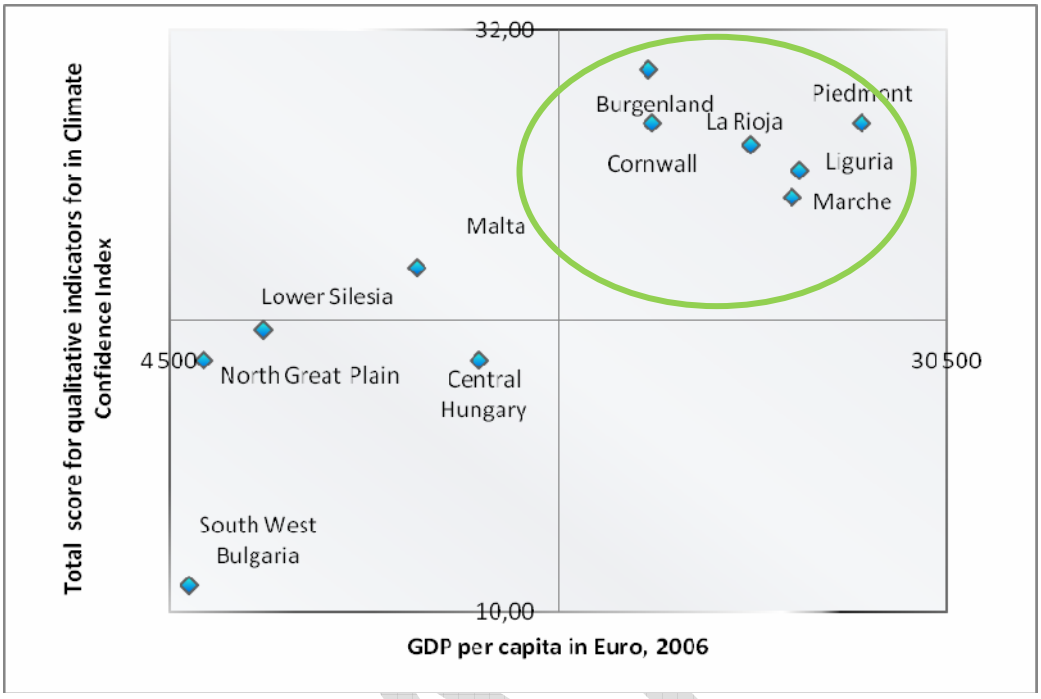


The connection between GDP and index score is much less pronounced for the energy and emissions issues (Figure 4.5) and much more pronounced for the issues pertaining to policies, institutions, socio-economics, and financial instruments (Figure 4.6). For energy and emissions (Issues 1 – 3), the regions are placed all across the four quadrants, indicating that those with high and low GDP have mixed performance. Conversely, for the political, institutional, social, and financial issues, the top six scorers are also the six wealthiest regions. Only Malta stands out with a relatively high score considering its GDP level.

4.5. Figure: GDP per capita v. index scores for energy and emissions (issues 1 – 3)



4.6. Figure: GDP per capita vs. index scores for policy, institutions, socio-political and financing (Issues 4 – 7)



The general expectation for GHG emissions and energy consumption rates is that regions with higher GDP will have higher rates per capita, but lower intensity rates. There are some notable exceptions:

- Burgenland has relatively high energy consumption, especially when compared with its lower GHG emissions and mid-level GDP.
- Conversely, Marche and Liguria have relatively low energy consumption levels considering their high GDP per capita rates.
- GHG and energy intensity in Malta are exceptional as they are below the EU average despite Malta's relatively low GDP and status as a NMS.
- Higher GHG and energy consumption rates in the wealthier EU-15 regions do not appear to be significantly offset by higher efficiency of use. Only in La Rioja is the higher GHG emissions rate accompanied by a lower than average GHG intensity. This issue will be discussed further below.
- Finally, GDP does not seem to have much of an effect on RES use for the RSC regions.

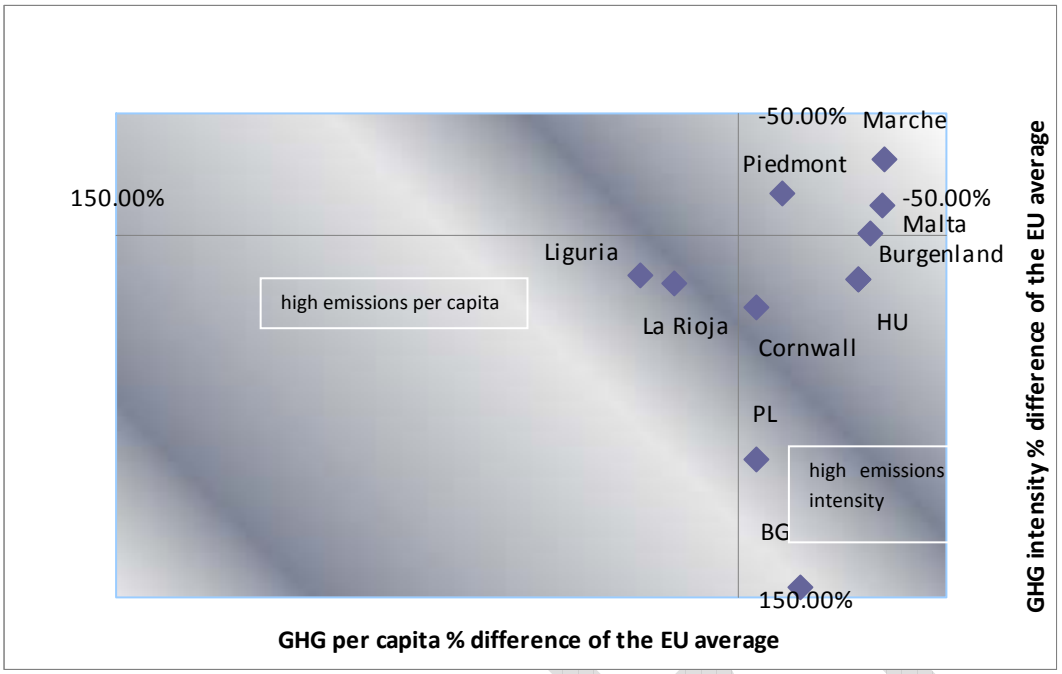
4.3. Table: GDP and energy and emissions in the RSC regions

Partner Region	GHG/capita (t CO_2/inh)	GHG intensity (Tons CO_2/MEuro)	FEC per capita (toe/inh)	Energy intensity (toe/ MEuro)	RES in energy prod capacity (%)	RES in FEC (%)
Central Hungary	7,87	524,42	1,78	118,51	4,78%	4,35%
Cornwall	10,56	575,86	2,12	115,60	100,00%	0,71%
North Great Plain	7,87	524,42	1,78	118,51	4,78%	4,35%
Burgenland	7,54	440,05	2,82	145,40	100,00%	16,35%
La Rioja	13,64	517,30	2,70	102,52	37,57%	8,70%
South West Bulgaria	9,38	1086,58	1,30	150,95	23,93%	7,68%
Marche	7,15	304,48	2,12	91,81	28,41%	2,72%
Liguria	12,74	530,81	2,07	86,13	0,00%	6,31%
Piedmont	9,86	366,31	2,92	114,20	36,17%	3,25%
Malta	7,19	390,19	1,09	59,01	0,00%	0,00%
Lower Silesia	10,56	854,11	1,59	128,95	7,73%	6,91%
EU 27 average	11,03	442,00	2,40	100,84	24,70%	5,07%

4.2.2. Efficiency of use – the correlation between per capita and intensity rates

The Climate Confidence Index assesses per capita emissions and energy consumption rates, and also the rate of emission or consumption per unit of GDP, the so-called “intensity” rate. GHG emissions and energy consumption intensity tell us how much economic output a region gets per unit of GHG emitted or energy consumed. It is a measure of the overall energy efficiency of the economy. In general, wealthier and more developed economies tend to be more energy efficient, i.e. have lower intensity rates. This may be due to more actual energy efficiency in the economy, to the structure of the economy, or to economies of scale owing to higher output. This analysis compares per capita emissions and energy consumption rates against corresponding intensity of use rates, to see if there are regions which demonstrate unique characteristics.

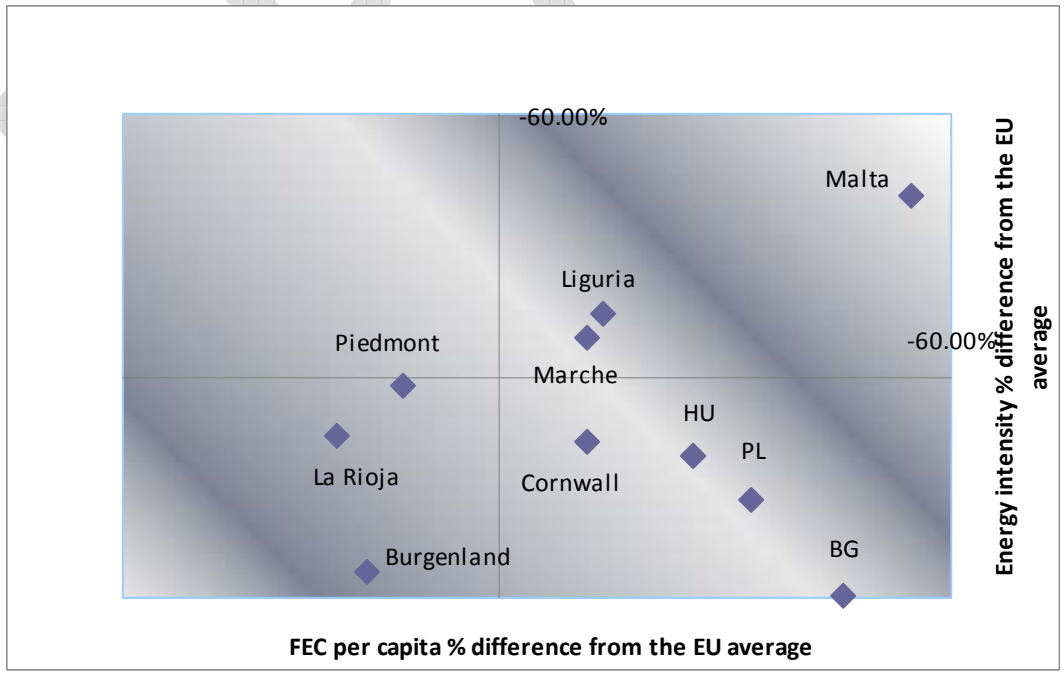
4.7 Figure: Correlation between GHG per capita and GHG intensity



The relationship between GHG emissions per capita and GHG intensity shows the following:

- Malta, Marche, Burgenland and Piedmont have relatively low GHG emissions and GHG intensity
- Liguria and La Rioja have higher emissions which are not offset by higher GDP
- The EU new member states (ex Malta) and Cornwall have lower emissions but higher intensity

4.8 Figure: Correlation between energy consumption per capita and energy intensity



The comparison of energy consumption per capita and energy intensity shows a disparate picture:

- Malta has relatively low energy consumption per capita and low energy intensity

- Liguria and Marche also have lower than average energy consumption and intensity rates
- In Burgenland, Piedmont and La Rioja higher energy consumption is not offset by higher economic output as energy intensity is also high
- In the NMS regions and in Cornwall, the energy consumption per capita is low, but the consumption of the energy used is inefficient and results in high energy intensity.

Malta stands out as the region (country in this case) with very low GHG emissions and energy consumption rates, considering its GDP and level of development. The other NMS exhibit an unsurprising tendency towards lower emissions and energy consumption, but high (in some cases very high) intensity of use. Cornwall also falls into this category, although its GDP is relatively higher. The other regions exhibit mixed results. Only in one case – La Rioja energy consumption – does a high level of GDP actually offset high energy consumption per capita levels. For Piedmont, Liguria, Marche, and Burgenland, high rates of emissions/consumption translate to higher than average intensity levels.

4.2.3. Economic Structure

The structure of an economy – the types of economic activity which predominates in the region – will naturally have an effect on energy and emissions. The RSC regions are mainly service-oriented economies, as shown in the table below. The relatively high level of industrial activity in La Rioja may explain its higher emissions and energy figures.

4.3 Table: Economic structure of RSC regions against energy and emissions data

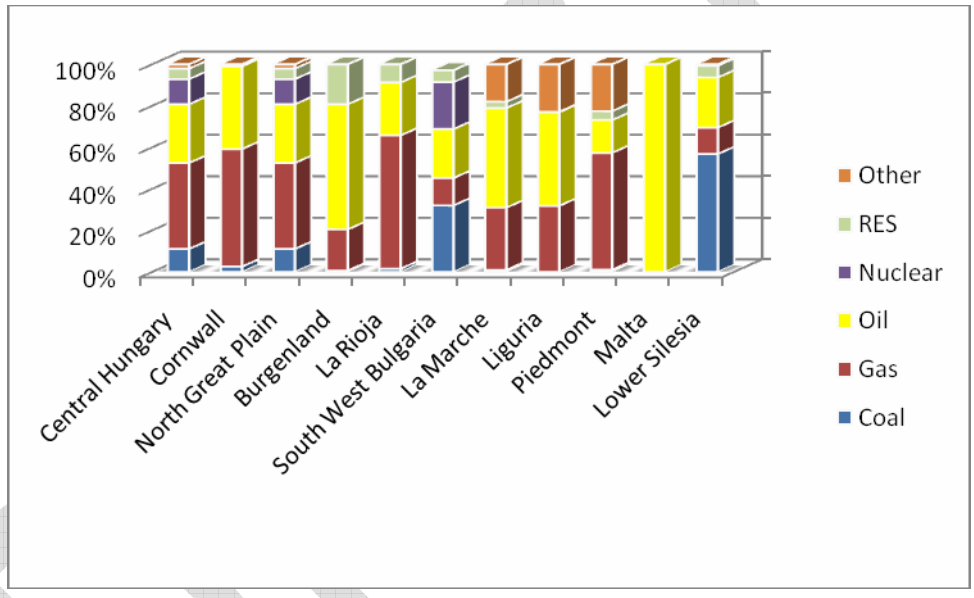
Partner Region	Agriculture	Industry	Service + Tourism	GHG/capita (t CO_2/inh)	GHG intensity (Tons CO_2/MEur)	FEC per capita (toe/inh)	Energy intensity (toe/ Euro)
Central Hungary	0,70%	22,00%	77,30%	7,87	524,42	1,78	118,51
Cornwall	3,20%	22,40%	74,80%	10,56	575,86	2,12	115,60
North Great Plain	8,33%	31,49%	60,18%	7,87	524,42	1,78	118,51
Burgenland	5,01%	29,28%	65,71%	7,54	440,05	2,82	145,40
La Rioja	7,00%	38,00%	55,00%	13,64	517,30	2,70	102,52
South West Bulgaria	9,84%	29,44%	60,72%	9,38	1086,58	1,30	150,95
Marche	2,00%	32,00%	66,00%	7,15	304,48	2,12	91,81
Liguria	2,00%	18,00%	80,00%	12,74	530,81	2,07	86,13
Piedmont	2,05%	30,12%	67,83%	9,86	366,31	2,92	114,20
Malta	2,46%	20,92%	76,62%	7,19	390,19	1,09	59,01
Lower Silesia	2,21%	37,86%	59,92%	10,56	854,11	1,59	128,95
EU 27 average				11,03	442,00	2,40	100,84

4.2.4. GHG Emitters

A review of GHG emissions by sector explains some of the factors behind GHG emissions rates in RSC regions:

- Energy production is the leading source of GHG emissions in all regions except Burgenland and Cornwall, which only produce energy from RES.
- Energy production from RES accounts for relatively low GHG emissions in Burgenland, but not in Cornwall, where only a small amount of energy is produced.
- Emissions from industrial processes are very high in Cornwall on a per capita basis, resulting in high overall emissions despite the lack of energy production.
- The two regions with the highest GHG emissions – La Rioja and Liguria - also have very high emissions from the energy production sector

4.9. Figure: GHG emissions by sector, % share of total*



*national level for NMS

4.4 Table: GHG emissions by sector in tCO_2/per capita Partner Region

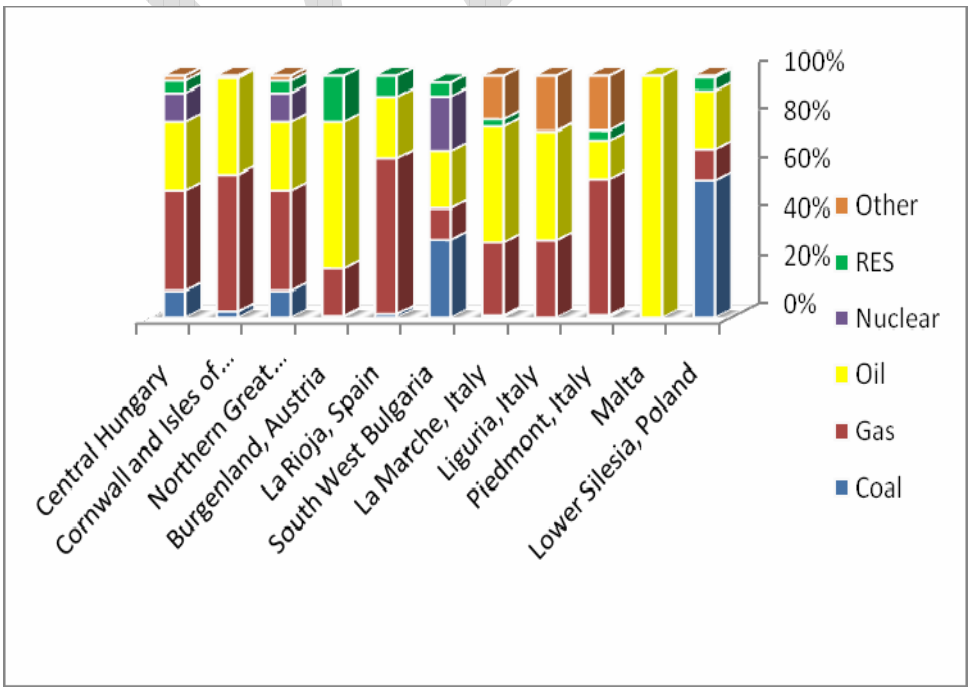
Partner Region	GHG/capita (tCO2/inh)	Energy production	Transport	Industrial processes	Agriculture	Waste	Other	Total
Central Hungary	7,87	4,72	1,27	0,59	0,84	0,41	0,03	7,87
Cornwall	10,56	n/a	2,41	2,68	2,59	n/a	2,88	10,56
North Great Plain	7,87	4,72	1,27	0,59	0,84	0,41	0,03	7,87
Burgenland	7,54	0,10	2,35	0,59	1,37	2,16	0,97	7,54
La Rioja	13,64	8,97	2,66	0,40	1,10	0,42	0,09	13,64
South West Bulgaria	9,38	5,72	1,14	0,89	0,62	0,99	0,01	9,38
Marche	7,15	3,28	2,30	0,66	0,53	0,39	0,00	7,15
Liguria	12,74	9,06	2,10	0,48	0,09	0,84	0,17	12,74
Piedmont	9,86	5,73	2,25	0,79	0,64	0,39	0,06	9,86
Malta	7,19	5,29	1,30	0,15	0,17	0,44	-0,15	7,19
Lower Silesia	10,56	7,68	1,01	0,72	0,91	0,22	0,02	10,56

*National level

4.2.5. Energy Consumption by Energy Source

A review of the type, or source of energy consumed in the RSC regions shows that preference for certain types of energy can be linked to emissions and consumption rates. The figures are not completely comparable as they are based on different energy consumption figures (see note below table), but they nevertheless allow for some interesting generalizations.

4.10. Figure: Energy consumption by fuel source, % share



The energy source data reveal the following:

- In EU-15 regions, the most important energy sources are oil and gas.
- In the EU new member states (ex Malta), coal still plays important role.
- Most regions use nuclear energy; for the Italian regions, it is incorporated in the "other" category.
- RES shares vary considerably across the regions.
- In Malta oil is used exclusively.

In some cases, the data show that regions with higher share of gas tend to have higher energy consumption rates (Cornwall, La Rioja, Piedmont). Regions with a higher share of oil in the energy mix (Liguria, Malta) tend to have lower energy consumption rates and particularly lower energy intensity rates. The results for the two Italian regions Liguria (high GHG emissions/intensity; low energy consumption/intensity) and Piedmont (low GHG; high energy) may be partially explained by the differences in energy mix. Liguria uses more oil and Piedmont more gas. However, the high rate of oil share in Burgenland does not confirm this result; as Burgenland has relatively high energy consumption/intensity. This may be caused by the high RES share in Burgenland.

4.5 Table: Energy consumption by fuel source, % share

Partner Region	Coal	Gas	Oil	Nucl.	RES+	Other	Energy cons. per capita	Energy intensity (toe/ MEuro)	GHG/cap (tCO_2 /inh)	GHG intensity (t CO_2 /MEuro)
Central Hungary*	11	41	28	12	5	2	1,78	118,51	7,87	524,42
Cornwall**	2,6	56,7	39,9		0,8	0,1	2,12	115,60	10,56	575,86
North Great Plain*	11	41	28	12	5	2	1,78	118,51	7,87	524,42
Burgenland **	0,7	19,8	60,3		19,2		2,82	145,40	7,54	440,05
La Rioja*	1,6	64,2	25,5	0	8,7		2,70	102,52	13,64	517,30
South West Bulgaria*	34	14	25	24	6	-3	1,30	150,95	9,38	1086,58
Marche**	1	30	48		3	18	2,12	91,81	7,15	304,48
Liguria**	0	31,9	45,1		0,2	22,8	2,07	86,13	12,74	530,81
Piedmont**	1,1	56,3	15,8		4,3	22,5	2,92	114,20	9,86	366,31
Malta*			100				1,09	59,01	7,19	390,19
Lower Silesia*	58,1	13	24,66		5,8	0,6	1,59	128,95	10,56	854,11

*Based on Final energy consumption; **Based on Gross Inland Consumption

4.2.6. Renewable energy

Renewable energy is without a doubt a key factor on the path to climate confidence. Increasing the use of RES, particularly in small-scale energy consumption, is on the priority list of all RSC partner regions' key planning documents. Moreover, increasing RES in energy consumption to 20% for the EU 27 is one of the key goals of the recently adopted EU climate and energy legislation[15]. There is some

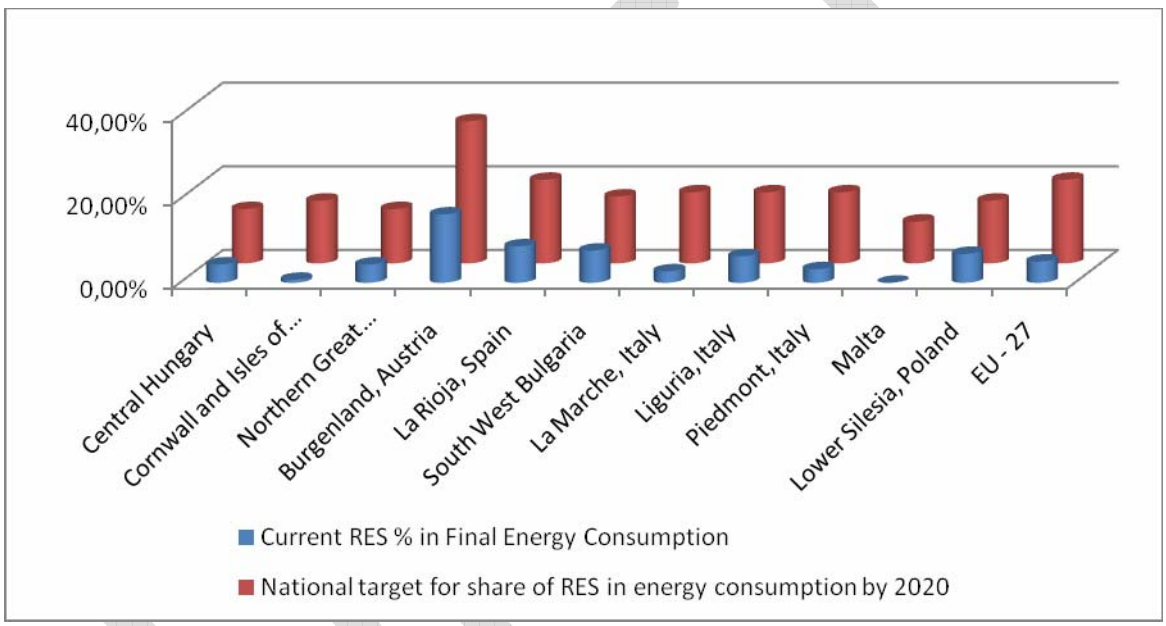
[15] See Chapter 5 for more on the EU climate-energy legislation

debate over whether heavy reliance on increasing the use of renewables and control of their use through targets is the most efficient way to cut GHG emissions and mitigate climate change in Europe. Nevertheless, EU decision-makers have agreed on targets for each member state to achieve by 2020, and regions will have to work towards these targets as well. This section will examine and discuss renewable energy in the RSC regions, based on actual usage rates and national targets, and information about RES potentials and obstacles provided in the baseline questionnaires.

RES Targets and Actual Rates

National targets for RES in energy consumption were set with the passage the EU climate-energy legislation adopted in 2009. Most Member States and regions have a long way to go to achieve the targets, as the chart below shows. Since there was only limited information available on regional targets, the analysis looks at national targets for each RSC region.

4.11. Figure: Comparison of current RES share of FEC and 2020 national targets of the RSC partner regions



- Austria has the most ambitious target (34%); but Burgenland has a relatively high RES share already and ambitious plans to increase this.
- Spain's target is also relatively high (20%), but La Rioja's current RES share is also already relatively high.
- The majority of the countries have a target around 15 %, which means in general a ten to twelve percent increase compared with current RES shares in RSC regions.
- Malta, which so far has zero RES share in energy consumption, will have to reach ten percent by 2020 to meet its target.

Potential for further RES development

The potential for future RES development from solar, wind, biomass and other sources is critical to increasing RES shares, particularly for regions which want to reduce their reliance on energy imports.

Most RSC regions report that they have great solar, biomass and geothermal potential and less wind and hydro potential. Solar has the potential to be an important source of energy in southern regions and geothermal in NMS regions. In both cases, however, financial and market barriers should be reduced to reach higher penetration in the use of these energy sources.

4.6 Table: Potential for increasing RES production, as reported by the regions

High potential / Medium potential / Low potential	Central Hungary	Cornwall and Isles of Scilly, UK	North Great Plain, Hungary	Burgenland, Austria	La Rioja, Spain	South West, Bulgaria	Marche region, Italy	Liguria region, Italy	Piedmont region, Italy	Malta	Lower Silesia, Poland
% RES in Energy Production, 2006	4,78	100,00	4,78	100,00	37,57	23,93	28,41	na	36,17	0,00	7,73
Solar	M	M	H	H	H	H	H	H	M	M	M
Wind	L	H	L	M	M	H	M	M	L	M	M
Small hydro	L	M	L	L	L	M	L	L	M	L	M
Biomass	H	M	H	H	H	H	L	M	Hi/M	L	M
Geothermal	H	H	M	M	H	H	M	L	Hi/M	L	H
Others (Biogas, Wave)		M			M		M				

Barriers for further penetration of RES

RSC partners were asked to evaluate the main barriers for further penetration of RES, and a summary of responses is presented below. Financial and market barriers are the most common ones indicated by the regions.

4.7 Table: Barriers for further penetration of RES, as reported by the regions

Partner Region	Political	Legal	Market	Financial	Awareness	Social acceptance	Combi-nation
Central Hungary							x
Cornwall							x
North Great Plain	x	x		x			
Burgenland			x	x			
La Rioja			x	x		x	
South West Bulgaria							x
Marche	x			x	x	x	
Liguria		x		x		x	
Piedmont			x	x			
Malta							x
Lower Silesia		x	x	x	x		

The following are some of the specific barriers to increasing RES production, as reported by the regions.

Political

- No approved strategy or policy on renewable energy sources (Malta)
- Inadequate ambition for reaching the national RES targets (Bulgaria)
- The RES strategy doesn't contain long term visions to be filled with effective action plans or programmes. (North Great Plain)

Legal

- Inadequate inclusion of RES in the energy efficiency measures in the national action plans, plus need of development of the national electricity network (Bulgaria)
- No legislation at national level that requires any level of RES implementation on given sectors. The absence of planning guidelines is also a barrier for certain technologies such as wind. (Malta)
- Regulations are not adequatly harmonized with sectoral policies. (Liguria)
- Regulations are very complicated and sometimes contradict each other, getting permissions is a long and expensive process; this is unfavourable for investor confidence. (North Great Plain)

Market

- Inadequate market development and lack of available RES technologies (Bulgaria)
- The current level of feed-in tariffs for RES electricity is not at a sufficiently high level to provide an incentive for investment. (Malta)
- Lack of efficient co-operation between stakeholders (North Great Plain)

Financial

- Unfavorable feed-in tariffs; need for significant financial resources and long period for return on investment. (Bulgaria, Piedmont)
- Installations for generating electricity from RES are currently uneconomical and the funding system does not stimulate investments (Burgenland)
- High costs of technology (such as solar photvoltaic and geothermal) which is viable only with tax incentives and other subsidies (Piedmont)

Awareness

- Inadequate practical experience (Bulgaria)
- Awareness on the feasibility and costs of certain technologies and their applicability to the local situation is increasing but is still not sufficient, particularly for micro-wind, building-integrated solar PV, and geothermal heat pumps. (Malta)

Social acceptance

- Inadequate information on the benefits of introducing of RES (Bulgaria)
- Given the limited land use availability, the implementation of certain RES technologies, in particular wind, is constrained by proximity to residential areas (in view of concerns on the noise and visual impact). Visual impact is also a concern in uninhabited areas, in particular areas of recreation and high landscape value. (Malta)

Combination

- Complicated approval procedures, feed-in tariffs considered low, available technologies still expensive, rigid electricity grid system (Central Hungary)
- Barriers constitute a combination of factors, including lack of a national strategy on the use of RES, limited land space for the installation of renewable energy systems as well as the financial costs associated with the required installations. (Liguria)

4.2.7. Energy Security

Energy import dependency is a serious issue across the partnership. According to the regions' self-assessment, their energy dependency from external sources is very high.

4.1. Box: High energy import dependency in Malta and Piedmont

Malta's electricity generating system is a small isolated one, with no connection to the European grid. Malta relies on imports of residual fuel oil (HFO) and gas oil for fuelling its two power plants. Malta is the only EU member state with 100% dependency on energy generated from imported fossil fuels[16].

In Piedmont the share of imported fuel is 89% - mainly from foreign sources, which is higher than the national average for energy dependency. Piedmont consumes more energy than is available locally in terms of primary resources, the major component of electricity is imported and the gross consumption heavily unbalanced towards natural gas[17].

These statements and other concerns of the RSC regions are backed up by the Commission Staff Working Document "REGIONS 2020: an Assessment of Future Challenges for EU Regions," prepared by DG Regional Policy. The report states that Europe is becoming increasingly dependent on imported fossil fuels, and that energy import dependence is expected to increase from 53% of total EU energy consumption in 2005 to 67% in 2030 if no action is taken. Moreover, the document reports that the EU is becoming increasingly exposed to the effects of price volatility and price rises on international energy markets[18].

Based on Eurostat figures, the report shows import dependency as a percentage of GIC in 2006 for each EU Member State. Malta and Italy fall into the most critical category; the UK and Poland are the least energy dependent, due to domestic source of supply and reliance on coal in Poland.

4.8 Table: Energy import dependency of RSC countries[19]

Import dependency, % GIC	Member State (from RSC partnership)
< 0.28	UK, Poland
0.28-0.47	Bulgaria
0.47-0.53	Hungary
0.63-0.78	Spain, Austria
>=0.78	Malta, Italy

[16] Adapted from Malta baseline questionnaire
[17] Adapted from Piedmont/Lamoro baseline questionnaire
[18] *REGIONS 2020: An Assessement of Future Challenges for EU Regions,* p14
[19] *REGIONS 2020: An Assessement of Future Challenges for EU Regions,* p40

While it is not clear what direct effect security of supply has on the energy and emissions data analysed in the climate confidence index, it is nevertheless an important issue for climate confidence.

4.3. CASE STUDIES – ENERGY AND EMISSIONS

Renewable Energy: success and potential

Two case studies from the RSC partner region illustrate dramatic differences in the use of renwable energy. The first case study is about a district of Burgenland, where the current RES share in consumption is around 20% and the region is still very ambitious for further developments. The second case study is from Malta, with a current RES share around 0%.

4.2. Box: Renewable energy: success and potential

Güssing, Burgenland – energy autonomy and economic boost from renewable energy[20]

Güssing is a district in Burgenland region, where significant steps were taken towards achieving a low carbon status. Güssing was once one of the poorest districts in Austria, with a high unemployment rate and severe barriers to economic development. Over the past 20 years it has managed to boost its economy through investments in renewable energy sources and it has become an energy self-sufficient district. Other benefits include the creation of more than 1000 new jobs, start-up of new business and significant net income. It is intended that the successful example of Güssing is replicated in other districts in Burgenland and in other Austrian regions.

Using wood from local forests in its biomass heating plant, the town of Güssing produces more electricity than it consumes and is able to provide power to the entire region. Over 50 companies and 1000 jobs have been created in the renewable energy sector alone and, since 1995, Güssing has reduced its carbon dioxide emissions by 93%.

The so-called "Güssing Model" is the strategy of de-centralised, local energy production using all the available renewable resources in a region. Since every region has certain renewable energy resources in different proportions, the model can serve as an example for many communities.

Malta - looking at ways to increase RES potential in a small island[21]

Malta's RES use is currently negligible. Only 0.003% of electricity consumption in 2006 was produced from RES, and solar thermal applications bring the RES share in total energy up to 0.18% for 2006. Malta has comitted to increase this share to ten percent by 2020 as part of the EU Climate Action and Renewable Energy Package.

Currently, energy in Malta is almost 100% derived from imported fossil fuels (oil). The government's policy on the use of RES is still in draft format, and it is based on a 2005 study commissioned by the government from the consultancy firm Mott MacDonald. The study identified the following potentials and barriers:

[20] Adapted from draft report for ENEA climate change working group prepared by the REC

[21] Based on Malta baseline questionnaire response

Large onshore wind was the most cost-effective technology for electricity from RES, but visual impacts and cumulative effects would make it unlikely that more than one or two large onshore wind farms could be built.

Offshore wind was considered the second most cost-effective technology, but is limited by the bathymetry of Maltese waters. (The 25 meter contour extends to just around 2 to 3 km off the coast and development of wind farms in these areas is constrained by conflicting use of the waters for recreation, tourism other marine activities). A marginal site was identified but using it would require resolving technical issues as well as (existing) conflicting uses of the site.

Micro-wind was not considered to be a feasible option due to planning constraints likely to originate due to visual impacts on the townscape; the planning framework was considered to be more favourable to medium scale wind, but this came at an economic cost (apart from limitations on the electricity that could be produced).

The solar photo-voltaic resource potential was considered to be "enormous" but the cost implications for supporting this technology were very high.

Three Italian regions – very different performance

The three Italian RSC regions; Liguria, Marche and Piedmont have diverse energy and emissions performance, despite similar levels of GDP per capita. This case study looks at some other factors across the three regions:

- Marche has the best emissions and energy performance among the RSC regions, and is below the EU average for GHG emissions and energy consumption per capita and intensity.
- In Liguria GHG emissions are well above the EU average, but energy consumption is low.
- In Piedmont energy consumption and energy intensity are quite high, but GHG emissions are relatively low, below the EU average.

Meanwhile, the other basic characteristics of the regions are similar:

  - GDP levels per capita are very close.
  - All three economies are predominantly service economies, although in Liguria there is considerably less industry.
- Piedmont relies more heavily on gas for energy consumption; the other two regions use more oil than gas.
- Energy production is responsible for a very large percentage of GHG emissions in Liguria.

4.9 Table: Energy, emissions and other basic data for 3 Italian regions

Surveyed regions		Piedmont	Marche	Liguria
GHG intensity (tCO_2/MEuro)		366,31	304,48	530,81
GHG/capita (tCO_2/inh)		9,86	7,15	12,74
Energy intensity (toe/ MEuro)		114,20	91,81	86,13
FEC per capita (toe/inh)		2,92	2,12	2,07
Population density		171,1	158,1	296,8
Regional GDP per capita (PPS)		26900	24600	24900
Structure of the economy	Agriculture	2,05%	2,00%	2,00%
	Industry	30,12%	32,00%	18,00%
	Service + Tourism	67,83%	66,00%	80,00%
Fuel share of final energy consumption, %	Coal	1,1	1	0
	Gas	56,3	30	31,9
	Oil	15,8	48	45,1
	Nuclear			
	RES	4,3	3	0,2
	Other	22,5	18	22,8
GHG emitters by sector, % share	Energy production	58,2	45,87	71,1
	Transport	22,8	32,11	16,5
	Industrial processes	8	9,17	3,8
	Agriculture	6,5	7,34	0,7
	Waste	4	5,5	6,6
	Other	0,6		1,3

- In Liguria, the high share of energy production is likely responsible for high GHG emissions.
- In Liguria the high share of services in the economy and high population density may be the reason for relatively low energy consumption per capita.
- In Piedmont, the favourable, gas-based energy mix may be one of the reasons for low emissions per capita. The high share of industrial production may be a reason for the high level of energy consumption per capita.
- Marche has fairly average characteristics across the board which may account for its relatively low emissions and energy consumption.

5. Further Analysis on Climate Confidence: Policies, Institutions, Socio-Political Aspects and Financial Instruments

To adequately manage climate change and to progress towards low carbon economy, regions must have comprehensive and achievable policies, strong institutions, committed political leadership, popular awareness and support, and it must make effective use of available financial resources and instruments. The Climate Confidence Index evaluated regions on all of these complex factors based on information in the baseline questionnaires, including region's self-evaluations. This chapter will examine the results of this analysis further, contrasting specific issues against each other, and highlighting some of the partners' best practices.

5.1. Policy frameworks for addressing climate change

The reality of climate change and the need to take action has permeated European policy agendas at all levels in recent years. The adoption of the climate-energy legislative package by the European Council in April 2009 has translated climate mitigation objectives into firm obligations on behalf of all Member States, and these obligations have been passed on to European regions. The directives contained in the climate-energy legislative package commit the EU to the so-called "20-20-20 by 2020" targets:

- cutting greenhouse gases by at least 20% of 1990 levels (30% if other developed countries commit to comparable cuts);
- increasing use of renewables to 20% of total energy production (currently ± 8.5%) plus a 10% share of energy from renewable sources in each member state's transport energy consumption;
- cutting energy consumption by 20% of projected 2020 levels[22].

In addition to the requirement to transpose the directives into national legislation, Member States are required to create a number of policies, plans and programmes detailing how they will meet the targets. Each MS will have its own process for devolving targets and actions down to sub-national, levels, depending on administrative set-up, political culture and other factors. As the RSC project concerns regions, the focus of the baseline assessment and questionnaire is on the regional-level policy frameworks for climate change. RSC regions were asked to provide information about the extent of planning for climate change and low carbon-economy related objectives with their region,

[22] Taken from "Citizen's summary: EU climate and energy package", available at http://ec.europa.eu/climateaction/docs/climate-energy_summary_en.pdf and the EC press release "Council adopts climate-energy legislative package" of 6 April 2009 at

http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/misc/107136.pdf

ranging from policies and programmes which directly address climate change to sectoral policies and other plans which incorporate climate change objectives and measures. The results are quite diverse.

Policy Frameworks and the RSC Regions

As summarized in Table 5.1, three of the RSC regions have reported that they are fully on the right track with planning for climate change. They have comprehensive and quantified regional climate change and sectoral policies in place. The second group contains those regions that have made some progress in developing regional-level policies, plans and strategies but some aspects are less detailed or undeveloped. In the third group, regions have either no policy in place or have just begun the process.

5.1. Table: Status of development of climate change policy framework

Partner Region	CC Index Policy Frameworks Score	Status of Policy Framework	Policy dev group	2006 GDP per capita (Euro)
Cornwall	10,00	Comprehensive and quantified regional climate change policy; regional sectoral framework that address climate change factors; ambitious regional level policy objectives and factors	Group 1	20 637
La Rioja	9,17			23 901
Piedmont	8,33			27 646
Burgenland	6,67	Regions with less comprehensive climate change policy framework and sectoral policies which do not fully address climate change issues	Group 2	20 512
Malta	5,83			12 756
Liguria*	5,00			25 543
Marche*	5,00			25 300
Lower Silesia*	3,33	Regional policy related to climate change is in an early phase of development or does not exist	Group 3	7 631
Central Hungary	1,67			14 830
North Great Plain	1,67			5 636
South West Bulgaria*	0,83			5 124

*Regions which received zero score for vulnerability assessment and adaptation planning due to lack of info submitted.

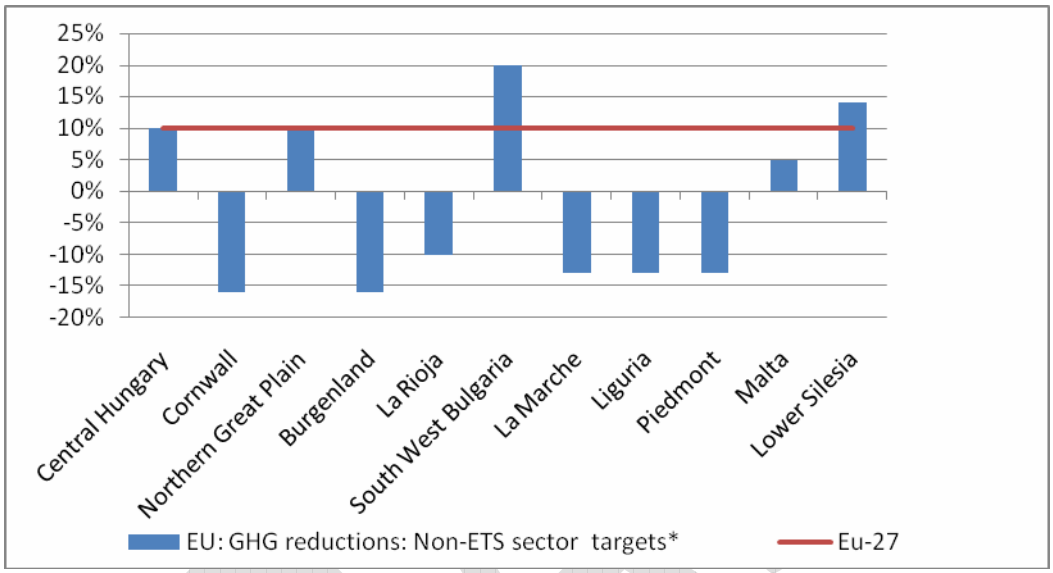
Wealthier regions are more likely to be further advanced in the development of climate change policy frameworks at the regional level. Cornwall is exceptional, as it ranks the highest with mid-level GDP, while some of the wealthier Italian regions have lower scores for this issue. Clearly wealth or economic advancement is not the only driving force in the push towards regional action on climate change planning. Other issues such as institutional capacity, political will and awareness, and readiness of the population and key stakeholders to make changes are critical factors, as will be seen later in this chapter.

All four of the lowest-scoring regions in Group 3 belong to the NMS. As noted elsewhere in this assessment, most NMS have only recently set up administrations at the NUTS 2 level and are still in the process of devolving powers to those institutions. As a result, these regions lack the authority and/or the capacity to develop policies, or have only just begun the process.

Quantifiable policy targets

Well-developed climate change policies will have quantified targets (for emissions reductions, RES use, energy efficiency , etc.) The EU legislation prescribes national targets for GHG emissions from non-ETS sectors and for the share of energy from renewable sources in energy consumption, to be achieved by 2020. These nationally-agreed targets for each of the RSC Member States are shown in Figure 5.1.

5.1. Figure: RSC National targets for GHG emissions targets in non-ETS sectors[23]



EU GHG targets for non-ETS sectors refer to emission cuts required or increases allowed on 2005 emissions for sectors not included in the EU ETS. One main criteria for setting the national targets is GDP levels. The targets range from +20% to - 20% relative to 2005 emission levels. The ETS currently represents some 60% of GHG emissions in the EU and covers transport (cars, trucks), buildings (heating), small industrial installations, services, agriculture and waste. The countries with lower GDP per capita (i.e. the NMS) are allowed to increase emissions; Bulgaria has the highest allowance. The UK and Austria are required to make the highest emission cuts, followed by Italy and Spain.

The negotiation and setting of regional level targets which contribute toward these national obligations is a different process for each MS. Some MS will devolve legally-binding contributions to the regions; others will allow the regions to set their own objectives and targets based on individual circumstances and priorities. Four RSC regions - Cornwall, La Rioja, Marche and Piedmont – provided quantifiable regional-level targets for overall GHG reductions in the questionnaires; in many cases these targets are more ambitious than the EU target. These regional GHG targets are shown in Table 5.2.

[23] Non-ETS sectors are those not included in the EU emissions trading scheme, i.e. transport (cars, trucks), buildings (in particular heating), services, small industrial installations, agriculture and waste; they currently represent some 60% of total GHG emissions in the EU.

5.2. Table: Regional GHG emissions reduction targets for 4 RSC regions

Partner Region	Regional GHG emissions reduction target*
Cornwall	30-35%
La Rioja	37%
Marche	3.5t CO_2 reduction
Piedmont	20%
EU	20%

* From all sectors on 1990 levels by 2020; Marche 2015

For RES, four RSC regions submitted regional policy targets, as shown in Table 5.3. In some cases these are more ambitious than the national commitments.

5.3. Table: Regional RES targets

Partner Region	Regional RES Target	National RES Target 2020
Burgenland	100% RES in electricity by 2013	34%
Cornwall	20%	15%
La Rioja	12% increase by 2010	20%
Piedmont	20%	17%
EU	20%	20%

Finally, many regions define energy savings and/or efficiency improvements as key policy objectives, and Cornwall and Piedmont refer directly to the EU 20% increase. Energy saving is defined as a key objective of the regional policies climate change policies in Malta, La Rioja, Burgenland (energy savings measures in the housing sector), and Marche (energy saving measures in construction and transport sector). Regional targets related to energy efficiency are not defined in the four regions from the NMS but such targets are stipulated in the national policies.

Mitigation vs adaptation in policy-making

Many RSC regions reported that more attention is given to climate change mitigation in policies, particularly the concept of low carbon economy. Adaptation measures generally receive less consideration at the regional level. In some cases this is because comprehensive vulnerability studies are still being worked out at the national level, and regions are waiting for national guidance on this issue. Some of the regions do demonstrate understanding of their specific vulnerability to expected climactic changes and have initiated the preparation of adaptation strategies and plans at the regional level (La Rioja).

Sectoral policies

In order to adequately manage climate change, regions must ensure that climate change objectives and measures are transposed or integrated into key sectoral policies such as energy, agriculture, transport, housing, waste, and others. The extent to which climate change has been integrated into key sectoral policies varies across the partnership, as shown in the table below. Regions from Bulgaria, Hungary and Poland have no or limited regional-level sectoral plans, but they have

developed strategic development plans and programmes aimed at EU Cohesion Policy, and have integrated climate change issues into these documents.

5.4. Table: Level of integration of climate change into key regional sectoral policies

Level of integration: High: XXX Medium: XX Low: X No information or no policy: -	Level of integration of climate change into regional sectoral policies				
Partner Region	**Energy**	**Agriculture and forestry**	**Transport**	**Housing**	**Waste**
Cornwall	XXX	XXX	XX	XXX	XX
La Rioja	XXX	XXX	XX	XXX	XXX
Piedmont	XXX	XXX	X		XXX
Burgenland	XXX	-	-	XXX	-
Malta	XXX	X	XXX		XXX
Liguria	XXX	XXX	XX	X	-
Marche		XX		XX	
Lower Silesia	XX	-	XX	-	-
Central Hungary	XXX	-	XX	-	-
North Great Plain	XXX	XX	XX	XX	
South West Bulgaria	XX	-	X	-	-

Note: Regions from Hungary and Bulgaria do not have any policy frameworks at the regional level and so climate change integration has been evaluated at the national level. Information for Malta is also national-level based.

The analysis shows that integration of climate change issues into sectoral policies has focused mainly on the energy sector, with some progress in agriculture/forestry and housing. In the energy sector, most regions have policies or policy emphasis on renewable energy (wind, solar, biomass, hydroelectric, geothermal) and energy efficiency measures and contributions to climate change targets. Although the transport sector is a major contributor to GHG emissions, only Malta has reported significant integration of climate change issues into the sectoral policies for transport. A sample of climate change-related elements of key sectoral policy documents from across the region is presented in Table 5.5.

5.5. Table: Selected elements of sectoral policy documents integrating climate changes issues

Sector	Selected elements of the sectoral policy and/or action plan
Energy	reduction of the intensive use of traditional energy sources through the increase of energy production from RES and promoting energy efficiency and energy savings GHG emission reduction
Agriculture and forestry	energy production from agricultural biomass sustainable forestry management Improvement of carbon sinks reforestation of non-agricultural areas
Housing	energy efficiency measures in the domestic sector tackling fuel poverty
Waste	decreasing of methane emissions from landfills improvement of systems for energy recovery of biogas in the existing landfills gradual replacement in existing co-incineration plants of use of fossil fuels with fuel derived from waste introduction of waste hierarchy and waste reduction options through reuse, recycling and energy recovery
Transport	promotion of and incentives for sustainable mobility use of methane vehicles and emission control technologies

In addition to specific climate change measures within policies, some regions have used a more comprehensive approach to sectoral integration. Examples of cross-cutting themes integrated into the sectoral policies include:

- **Climate change as an economic driver:** opportunities for employment and economic growth through the transition to a low carbon economy.
- **Climate change and social inclusion:** the linkage between climate change and social issues such as poverty reduction and protection of low-income groups of the population that are more vulnerable to the effects of climate change. Cornwall and Piedmont have envisaged such social benefits in their energy policies.
- **Raising awareness for behavioural change:** raising awareness about energy efficiency, climate change, and what it means for society is part of several regions' sectoral policies.

5.1. Box: Climate change planning in Cornwall

Climate change in the strategic planning context of Cornwall

A key ambition of Cornwall authorities is to transform the county into a stronghold of low carbon economic and social sustainability. In order to achieve this objective an innovative and uniquely holistic approach is applied that affects the energy needs of Cornwall and its communities. It promotes a joint approach of energy conservation and renewable energy generation in all sectors. The newly created Low Carbon Cornwall team, part of the Cornwall Development Company, is a key element of the process.

There are several key national strategies that provide the framework for how the UK (and its regions) can move towards reducing the environmental impact of energy use and become a low carbon economy. Cornwall takes the process further by setting the basis for integrated carbon policy at regional level.

The first step is the South West Climate Change Action Plan which sets out a clear programme of regionally agreed priority actions to address both mitigation and adaptation activity from 2008 to 2010. The main areas of mitigation activity within the SWCCAP include tackling emissions from existing housing, business and public sector operations, transport, new build, energy generation, and land management. Adaptation activity covers: the region's strategic response to climate change; awareness raising; land and marine management; and adapting to flood risk.

The Regional Spatial Strategy includes regional policies and targets that support integrated renewable energy in new building and regional targets for renewable heat. Policies on sustainable construction and traffic demand management are also included. The strategy is further elaborated by incorporating the following aspects:

- apportionment between electricity and heat within various scenarios
- sector splits (industrial and comemrcial, domestic, piublic, transport, agriculture, waste, energy supply
- assessment of potential GHG reductions from key sectors and specific abatement opportunities, etc.

As a next step the policy framework tackles issues related to:

1/ spatial planning such as natural resources planning and infstaructure planning; exploration and justification of low-carbon systems based spatial planning. The findings will be synthesized in Renewable Energy and Energy Infrastructure Supplementary Planning Document.

2/ economic aspects such as economic impact of climate-energy legislation, climate impact assessment, energy security. The analysis will help to identify the economic exposure to climate-energy related issues. The macro-economic analysis for Cornwall which is to be developed within the farmwork of RSC project is integrated into this context and is expected to assist in its further development.

5.2. Institutional Set-up at the Regional Level

Each RSC region has a unique set of institutions with various strengths and weakness, but they fall into three basic groups according to the type of institution which is primarily responsible for climate change policy-making and implementation.

5.6. Table: Institutions responsible for climate change in RSC regions

Group	Type of institution responsible for climate change	Regions
1	Specialized institution(s) in place at the regional level are primarily responsible for climate change policy-making and implementation.	Cornwall, Malta
2	A department within the regional authority is primarily responsible for climate change policy-making and implementation.	Burgenland, Liguria, Marche, Piedmont, Lower Silesia
3	A local/regional branch of environment ministry, inspectorate or other national-level institution has primary responsibility for managing climate change for the region. Regional authorities have a limited role in policy-making and may or may not be responsible for implementation.	Central Hungary, La Rioja, North Great Plain, South West Bulgaria

The table below is a review of the regions' Climate Confidence Index score for institutional capacity and policy frameworks in comparison with the type of institutional set-up.

5.7. Table: RSC partners' institutional group against scores for institutional capacity and policy frameworks

Partner Region	Score Institutional Capacity*	Score Policy Frameworks	Institutional Group
Liguria	8,33	5,00	2
Piedmont	8,33	5,00	2
Marche	7,50	5,00	2
Burgenland	6,67	6,67	2
La Rioja	6,67	9,17	3
Lower Silesia	6,67	3,33	2
Central Hungary	5,00	1,67	3
North Great Plain	5,00	1,67	3
South West Bulgaria	4,17	0,83	3
Malta	3,33	5,83	1
Cornwall	2,50	10,00	1

*Scores for this issue are based on regions' self-evaluations

Most of the regions which reported higher levels of capacity, financing, regulatory mandate, and access to research are those in which the regional authority itself has primary responsibility for climate change (Group 2). In several regions sectoral departments (e.g. Agriculture and Forestry department, Economic development department, etc.) established within the regional authorities are responsible for integration of various aspects of climate change adaptation and mitigation into the respective sectoral activities.

Some regional authorities receive technical assistance from external regional bodies especially in the energy sector. For example, such support is provided to Liguria by Regional Energy Agency, while Regional Economic Development Agency in La Rioja maintains specialized financial body for climate change measures on regional level.

One exception is La Rioja, where a branch of the environment ministry is responsible for climate change. However, La Rioja has one of the most comprehensive regional-level climate change policy

frameworks within the RSC partnership, which implies that the institutional set-up is the appropriate one in this case.

Interestingly, the two partners with specialized institutions for climate change were scored by far the lowest in self-evaluation of institutional capacity. A possible explanation is that the institutions have very ambitious objectives and goals and therefore evaluated themselves on a more difficult scale. In Cornwall responsibilities are further divided: adaptation issues are tackled by South-West Climate Change Impacts Partnership, and mitigation by the Low Carbon Economy Unit within Cornwall Development Company.

Malta is a special case; as a relatively small country, all climate change responsibility is taken at the national level. Malta reports that it is currently in process of establishing a permanent inter-ministerial committee for climate change.

Finally, outside of La Rioja, the regions where a national branch is responsible for climate change for the region reported less satisfaction with institutional capacity. This may be explained by the fact that these regions come from NMS where institutions and progress with climate change policy-making are less mature.

Some of the challenges reported by the regions include:

- absence of a sound national strategy to comprehensively address climate change;
- lack of a clearly delineated institutional responsibility for climate mitigation and adaptation;
- shortage of human resources;
- insufficient financial resources;
- poor access to research capacity for developing scientifically-sound policy models and scenarios.

5.2.1. Box: Examples of unique institutional approaches in RSC regions

Regional Environmental Lawyer in Burgenland

The Regional Environmental Lawyer in Burgenland is in charge of assisting the integration of environmental issues into project cycle. It is not clear from the information what the concrete role of the lawyer regarding climate change is. As Burgenland is a region aiming to achieve energy autonomy an Energy Representative of Burgenland was introduced to assist in development and energy related projects and strategies. Specialized technical support for developing and implementing energy-related projects is also provided to Liguria by the Regional Energy Agency.

Designated delegate of the Government Commission Against Climate Change, La Rioja

A designated delegate of the Government Commission Against Climate Change is responsible for coordination of Government's regional policies related to the impacts caused by climate change. The delegate helps in mainstreaming the activities of the national and regional authorities in respect of climate change.

Environmental Sustainability Advisory Group, Cornwall

With regards to implementation of the OPs in South West England cross programme advisory groups regarding Environmental Sustainability was established. The aim of the group is to set requirements for investments and projects regarding reduction of their environmental intensity including carbon intensity. The group includes

regional key statutory, NGO and Local Authority Environmental partners. Single Environmental Sustainability Manager assists investments and partners in delivering of the strategic environmental sustainability objectives of the OP's.

5.3.2. Box: The role of inter-institutional partnerships in climate change achievements

Partnerships across regional and local-level institutions including various authorities, businesses, and other stakeholders in the planning and implementation processes can be crucial for achieving ambitious GHG emissions reductions and other climate policy objectives and targets. Such partnerships can harness skills, expertise, resources and authority from different sectors and individuals. Some of the RSC regions report positive experience with these partnerships; other have not yet begun to utilize these opportunities. Two successful examples are summarized below.

Cornwall Sustainable Energy Partnership

Cornwall Sustainable Energy Partnership (CSEP) was created in November 2001 to combine the expertise and knowledge of organisations within the public, private, health and community sectors. Over 72 partners have now signed the 2004 Energy Strategy for Cornwall with the aim of ensuring a sustainable future for Cornwall. The activities are carried out by established groups within the partnership. Process groups aim to integrate sustainable energy across all sectors of the Cornish Economy. Delivery groups concentrate on specific projects. This work is supported by CSEP's staff. CSEP has also been actively involved in influencing local, regional, national and European policy, has provided a template for other major initiatives. Source: http://www.csep.co.uk/page79g.html

Agreement between Italian regions to prevent and reduce air pollution in the Po valley

The initiative includes the regions of Piedmont, Lombardy, Emilia Romagna, Veneto, Valle D'Aosta, Friuli Venezia Giulia, the Autonomous Provinces of Trento and Bolzano, the Republic and Canton of Ticino. The focus of the activities is on: harmonization of measures targeting air pollution; a joint inventory for estimating emissions at municipal level; promotion of low-impact vehicles (methane, LPG, hybrids, electric, hydrogen, etc.); support for cleaner public transport through technological upgrade; definition of common mid-long term measures to reduce emissions; lobbying on national and EU level for the creation of specific funding mechanisms.

5.3. Social and Political Awareness and Readiness

The socio-political aspects surveyed in this assessment include political prioritization of climate change; political leadership; and the overall awareness of population and industry on reducing the carbon footprint. These issues are at the core of any region's capacity for climate confidence. Climate change adaptation and mitigation and the move towards a low carbon economy requires sacrifices from many stakeholders, even if only in the short term. And a basic requirement for innovative policy efforts is strong political leadership and prioritization, much of which is dependent upon popular and stakeholder support.

Not surprisingly, Burgenland scored the highest in the self-assessment of these socio-political issues. Burgenland has achieved considerable success in the development of RES and has ambitions to continue this development, which must have clear political and popular support.

5.4.3. Box: Climate change skills-building in Cornwall

Skills for Climate Change Project, Cornwall

The focus of this project is to increase the climate change skills of the local workforce within both the public and private sector; increasing access to learning and skills training for adults and take up of higher skills training by those in employment.

Whilst there is strong strategic support for the movement towards a low carbon economy within the ESF, ERDF and regional economic strategies there is still a significant lack of understanding of what a 'low carbon economy' means in reality, how it can be achieved and in particular how organisations and individual members of the workforce can contribute towards achieving this objective.

The project partners represent key strategic organisations that are integrally involved in defining what a low carbon economy means for Cornwall and identifying the skills and resources required to achieve it. Each organisation is a key stakeholder in the development of the *Cornwall Climate Change Action Plan* (3CAP), which is being led by Cornwall Council. Work so far in developing the 3CAP has already identified that public sector procurement can play a key role in both mitigating and adapting to climate change by including carbon requirements in specifications and tenders. This in turn will encourage 'supply chain' businesses to adopt carbon management standards within their business planning, processing and manufacturing.

5.4. INSTRUMENTS FOR FINANCING CLIMATE CHANGE ACTION

Politicians and experts may argue about the efficiency of subsidizing initiatives aimed at reducing emissions, energy consumption, or improving energy efficiency and renewable use, but it is clear that there are a wide range of options offered by the EU, Member States and even private institutions for funding these efforts.

The Climate Confidence Index has evaluated regions based on three criteria: the number and type of financial instruments available for climate change actions; the extent to which climate change and low carbon issues are integrated into Cohesion Policy; and the extent to which the mechanics of project formulation and selection consider climate change, in all publicly-funded investment programmes. Scores were assigned based on the information provided by the RSC partners in the baseline questionnaires.

5.8. Table: RSC partners index scores for financial instruments, issue 7

Partner region	Variety	Integration in cohesion policy planning, programming, implementation	Integration in project form and selection (all RDPs)	Total score
Cornwall	5	4	5	9.3
Burgenland	4	4	4	8.0
Malta	4	4	4	8.0
Marche	4	4	3	7.3
Liguria	3	4	3	6.7
La Rioja	3	3	3	6.0
Piedmont	3	3	3	6.0
North Great Plain	4	2	2	5.3
Lower Silesia	4	1	1	4.0
Central Hungary	2	2	1	3.3
South West Bulgaria		2	2	2.7

Cornwall scored the highest due to its wide variety of targeted financial instruments, and considerable efforts to integrate climate change and particularly low carbon concerns into all of its funding efforts. Burgenland and Malta reported similar positive experience; the regions from Italy and Spain have mixed results. The regions from the NMS report difficulties with integration of climate change into funding programmes due to lack of experience and specific guidance and tools for this.

EU Cohesion Policy – a wealth of opportunities

The EU Cohesion Policy, a large-scale public funding programme targeted at regions, has earmarked nearly €350 billion for the period 2007 – 2013[24]. A significant amount of this funding - €48 billion – has been earmarked through national and regional strategies and programmes for climate and low carbon-related measures[25]. Funds are targeted at regions which lag behind in development, including many of the RSC regions. For many, Cohesion Policy funds and the strategic planning and programming processes which govern their use, are important overall drivers of regional development. Therefore, the extent to which climate change and low carbon objectives and measures can be integrated into the programmes is critical for making progress on these issues.

Climate change is most commonly addressed "vertically" through priorities and measures specifically focused on climate and/or carbon objectives. These include mainly priorities related to RES, energy efficiency, or sustainable transport. All of the RSC partners have set aside funds for climate and energy-related priorities, allocated across varying programmes, priorities and measures. For example, investments in RES and energy efficiency are a major priority for Italy, which significantly increased funding allocation from €0.8 million in 2000-2006 to €4.4 billion for the current programming period. At the regional level, the three Italian RSC partners have dedicated significant funds to sustainable and efficient energy use: Liguria (11% of Regional OP funding); Marche (13%), and Piedmont (25%).

Integrating climate change as a cross-cutting theme at programme and project level is usually more challenging and the positive experiences are limited. Even if there is a horizontal priority, cases climate change is often just one of the aspects of environmental sustainability which is the main theme.

The so-called "horizontal" integration of climate change and low carbon issues across all of the planning and programming of the funds (as opposed to those measures which specifically fund climate-related measures) is more challenging for regions. Examples of horizontal include successful use of Strategic Environmental Assessment; the introduction of indicators for the reduction of greenhouse gas emissions into the Operational Programmes (OPs); and the development of a carbon evaluation tool to monitor CO_2 emissions produced by projects.

A good example of horizontal integration of climate change issues is the OP for South West UK (covering Cornwall) in which environmental sustainability is the programme's key principle, and the aim is to achieve a low carbon impact. Projects assessed are to address their low-carbon credentials within all stages of investment life-cycle: commissioning, business plan, appraisal endorsement and monitoring. A methodology has been defined by South West Regional Development Agency is to assist in achieving this objective. Another example is Malta, where investments supported by EU funds must at least demonstrate carbon neutrality.

[24] DG Regional Policy Inforegio: http://ec.europa.eu/regional_policy/policy/fonds/index_en.htm

[25] "Cohesion Policy backs 'green economy' for growth and long-term jobs in Europe," EC press release 9 March 2009, http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/369&format=HTML

The political acceleration of the global climate change discourse implies that there may be opportunities for modifying the current programming documents towards further climate resilience and influencing the future ones, to increase the integration of climate change into the next programming period, post 2013.

5.4. Box: Integrating climate change into project formulation and selection

Integrating climate change issues into regional development programmes in Malta

The project proponent is invited to describe how the project will take into account the issues of climate change and environmental sustainability. The Project Selection Committee evaluates and rank projects submitted under each Call against the approved Eligibility and Selection criteria. 15% of the score is dedicated to environmental sustainability and climate change issues, so project proponents have a strong incentive to take them into account. There are two separate selection criteria that are focused on environmental sustainability and climate change. The Environmental Sustainability accounts for 5% of the total score while the Carbon Impact - for 10%.

A three-stage process for evaluating environmental sustainability of projects in the UK South West

In the South West (which includes Cornwall), a three-stage approach was developed in order to meet the objectives of the OP regarding environmental sustainability: pre-commissioning, commissioning and appraisal. At the first stage a project must outline its role in meeting cross cutting themes through an assessment of positive and negative impacts and consideration of alternatives. The second stage provides deeper insight in projects impacts and explores measures for mitigation and exploitation as well as adaptation of relevant monitoring indicators. The third and final assessment includes recommendations and monitoring requirements for each of the cross-cutting themes indicated.

Other public financing instruments

National and regional-level financial instruments that support climate change related measures include subsidies, tax incentives and specialized funds. These financial instruments provide support for measures including energy efficiency in housing, production of energy from RES, sustainable transport and others.

In many RSC regions, specialized national and regional subsidy programmes play a very important role in achieving climate-related goals. Not only do they act as incentives to encourage innovation and behaviour change, but they frequently produce highly visible success stories which enable regions to further promote the benefits of low carbon economy and action on climate change. The following tables present some examples of subsidy programmes, tax incentives, and other specialized instruments used across the partnership to support climate and low carbon initiatives.

5.9. Table: Examples of state and regional subsidies in RSC regions

Sector	Types of support
Energy	Refunds on the purchase of products using solar and wind energy; electric vehicles; and photovoltaic energy generation equipment Aid for replacement of equipment with more energy efficient and less carbon intensive systems
Housing	Increasing energy efficiency in housing sector Micro-generation technologies for housing sector
Sustainable mobility	Subsidies provided to increase energy efficiency and sustainable mobility

5.5. Box: Subsidies in Hungary (examples from Central Hungary and North Great Plain)

"Panel Program" supporting energy efficiency refurbishment of prefabricated multi-apartment panel buildings: Subsidies are provided by the Ministry of Local Government to housing associations for energy efficiency refurbishments of buildings, including thermal insulation and modernization of buildings and the use of RES.

Application of individual control and metering of apartments in district heating systems: The Ministry for National Development and Economy, the Ministry of Local Government and the Hungarian Development Bank provides financial subsidies or favourable loans to households for installing metering devices enabling individual payment and encouraging conservation.

"**Program for Successful Hungary"** The Ministry for National Development and Economy and the Hungarian Development Bank aims to support energy efficiency modernization of traditionally constructed buildings in the form of subsidies and favourable loans. Supported activities include improvement of thermal insulation, modernization of existing heating and water supply systems

Financial instrument (subsidy and/or loan) of the Ministry for National Development and Economy for out-dated appliance exchange: Support is provided for the purchase of household refrigerators, freezers and other household appliances with outstanding energy performance (label 'A').

5.10. Table: Examples of tax incentives

Sectors	Areas of support
Energy	Reduced VAT rate for micro-generation and energy efficiency measures Excise tax deduction for the bio content of diesel
Housing	Deduction of the costs of participation for improving energy efficiency in buildings
Transport	Revision of motor vehicle registration tax and licensing system to encourage the use of vehicles with lower CO_2 emissions

5.6. Box: Examples of specialized financial instruments in RSC regions

Burgenland has a regional instrument to provide subsides for alternative energy solutions as part of its regional objective to achieve energy autonomy. Other regional funds provide loans for building and reconstruction of homes and loans and subsides for SMEs

Cornwall has several institutions set up to support low-carbon initiatives : the Climate Change Capital Ventus Funds with budget of £48 million specifically targeted at the UK RE sector; TRIDOS renewable energy investment fund and similar bank based schemes; and the Salix loan scheme that supports organizational investments to save carbon reduction projects in the health, education, government and local authority sectors.

The Polish "EcoFund" was established in 1992, following Poland's debt relief agreement with the "Paris Club"

of western creditor nations. EcoFund was the first fully-fledged institution established in CEE for the purposes of managing debt-for-environment swap proceeds. Under current agreements, total *contributions to EcoFund* through year 2010 (when most of these agreements expire), will reach approximately USD 474 million.

The EcoFund is obliged by its statute to provide *grant support for projects* in Poland addressing: transboundary air pollution of sulphur and nitrogen oxides; pollution and eutrophication of the Baltic Sea; global climate change gases; biological diversity, and; waste management and the reclamation of contaminated soil. (source Swapping Debt For The Environment: The Polish Ecofund, OECD)

The National Trust EcoFund of Bulgaria was established in October, 1995 through Debt-for-Environment Agreement between Switzerland and Bulgaria. The goal of the Fund is managing funds provided under debt-for-nature and debt-for-environment swaps, as well as funds provided under other types of agreements with international, foreign or Bulgarian sources aimed at environmental protection in the country. By now the Fund has financed 87 projects at the total amount of approximately 13M EUR. The Fund is an independent institution and supports projects in four priority areas: clean up of past pollution, reduction of air pollution, water protection (http://www.ecofund-bg.org/)

6. CONCLUSIONS, NEXT STEPS, THE RSC PROJECT RESPONSE

The conclusions chapter will be prepared in the final version of this assessment, after receiving feedback from RSC partners to this draft, and the results of the partner meeting and discussions in Sofia on 29 September – 1 October.

The current plan for the conclusions chapter is the following:

1. A Summary of the conclusions from the report in two parts:

- *Summary of conclusions on RSC partner regions based on index scores and further analysis, including key best practices which the assessment has identified*
- *Summary of general conclusions about climate confidence – i.e. "what makes a climate confident region?" – these will form the basis for the Criteria and Indicators report*

2. Identification of the initial set of specific topics, issues, needs which may be addressed by some of the subsequent RSC activities and outputs:

- *Three technical seminars*
- *Three capacity-building seminars (to be led by the capacity-building working group)*
- *Methodological Handbook draft content*

GLOSSARY

1. **Business-as-usual -** the scenario for future world patterns or energy consumption and greenhouse gas emissions which assumes that there will be no major changes in attitudes and priorities.
2. **Carbon tax -** A policy that would tax fossil fuels according to the amount of carbon they contained. This would reduce the demand for fossil fuels in general and cause a realignment away from coal to less polluting natural gas, or renewable sources of energy.
3. **Carbon abatement technologies** – innovative technologies applied to reduce carbon dioxide emissions in power generation and carbon intensive process industries (chemical, cement, metal).
4. **Carbon dioxide equivalent** – universal unit of measurement used to determine global warming potential of greenhouse gases, the amount of carbon dioxide by weight in the atmosphere that would cause the same amount of radioactive forcing as a given weight of another greenhouse gas.
5. **Carbon intensity** – the amount of carbon by weight emitted per one unit of consumed energy or the ratio of carbon emission produced to GDP, expressed in terms of grams of carbon dioxide released per megajoule of energy.
6. **Carbon neutrality** – achievement of net zero carbon emission in atmosphere by balancing amounts of carbon dioxide released with an equivalent amount captured and offset.
7. **Clean Development Mechanism** – mechanism under the Kyoto Protocol through which developed countries may finance greenhouse gases emission reduction or removal projects in developing countries, receive credits and use them to meet mandatory limits on their own emissions.
8. **Climate change adaptation** – adjustment of ecological, social and economic systems in response to the current or expected climate change and its effects in order to moderate or offset possible damages and exploit beneficial opportunities.
9. **Climate change mitigation** – human interventions to reduce greenhouse gases emissions and to enhance their sinks aimed at reduction of climate change effects and impacts.
10. **Climate Change Resilience** – the ability of a social, ecological and economic systems to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change. It climate change aspect it refers to the reduction of the energy and climate vulnerability of the regions and their economies.
11. **Climate proof** – decrease of climate vulnerability of the natural and human systems and subsequent enhancement of their climate change resistance.
12. **Climate vulnerability** - is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including extremes of climate variability. Vulnerability is a function of the character, rate and magnitude of climate change and variation to which a system is exposed, its adaptive capacity and sensitivity.
13. **CO_2 (carbon dioxide) emissions** – emissions of carbon dioxide coming from combustion of fossil fuels such as coal, oil, natural gas.
14. **Cohesion Policy (European Union Regional Policy)** – instrument of economic integration introduced by European Union for Member States with GNI per inhabitant less than 90% of the Community average to reduce their social and economic disparities with more affluent regions.
15. **Decarbonisation** – decrease of the carbon dioxide emission intensity of unit of GDP.
16. **Energy consumption** – amount of primary and secondary energy consumed in system, process, by organization or society.
17. **Energy efficiency** – reduction of amount of energy used to provide the same amount of given energy service (heating, cooling, lighting, etc.) or level of activity.
18. **Energy intensity** – ratio of energy consumption to a measure of the demand for energy service or economic or physical output, in case of national economy – total energy consumption per unit of GDP.

19. **Energy production** – production of energy in the form of heat or electricity from primary of secondary sources of energy to provide and fulfil demand in energy services.
20. **European Regional Development Fund (ERDF) -** The ERDF is intended to help reduce imbalances between regions of the Community. The Fund was set up in 1975 and grants financial assistance for development projects in the poorer regions. In terms of financial resources, the ERDF is by far the largest of the EU's Structural Funds.
21. **GHG emissions inventory** – mechanism universally applied by UNFCCC parties to estimate and monitor relative contribution to greenhouse effect and climate change of anthropogenic greenhouse gases emitted by individual sources, regions and nations.
22. **Global warming** – average increase in the temperature of the atmosphere near the Earth surface contributing to changes in global climate patterns and induced by anthropogenic emission of greenhouse gases.
23. **Green industries** – industries applying environmentally friendly, resource and energy efficient, non-polluting and low-carbon technologies to mitigate their negative impact on environment **Green transport** – any means of sustainable transportation with low emissions and impact on the environment; includes vehicles using renewable sources of energy, low carbon fuel and animal or human muscle-powered vehicles.
24. **Greenhouse gases (GHG)** – atmospheric gases contributing to the naturally occurring greenhouse effect through absorption of infrared radiation and responsible for causing climate change and global warming; these gases include carbon dioxide, methane, nitrous oxide, hydrocarbons, per fluorocarbons, sulphur hexafluoride and water vapour.
25. **Gross Domestic Product (GDP)** – the total market value of all the goods and services produced nationwide during a specified period of time.
26. **Gross domestic product at market (current) prices** - the sum of the gross values added of all resident producers at market prices, plus taxes less subsidies on imports.
27. **Gross Primary Production (GPP)** – total energy or nutrients assimilated by ecological unit such organism, population or entire community.
28. **Gross value added** - the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector; gross value added is the source from which the primary incomes of the SNA are generated and is therefore carried forward into the primary distribution of income account.
29. **Joint Implementation** - mechanism under the Kyoto Protocol through which a developed country can receive "emissions reduction units" when it helps to finance projects reducing net greenhouse-gas emissions in another developed country or in a country with an "economy in transition".
30. **Low Carbon Economy (LCE)** is a concept of economy defined as one that is 80% less carbon intensive than our present one and based on low energy consumption, low pollution and low emissions. The fundamental aim is to achieve high energy efficiency, to use clean/renewable energy and to pursue green GDP via technological innovation.
31. **Low-carbon region (LCR)** - a region with minimal GHG emissions as a result of integrating all aspects of the economy around technologies and practices with low emissions. LCRs include communities, buildings, transportation and technologies that use or generate energies and materials efficiently, and that dispose or recycle their wastes to minimize GHG emissions.
32. **National allocation plan** – national plans introduced by European Commission for Member states for allocation of CO_2 emission allowances to energy-intensive industrial plants for the 2008-2012 trading period under European Union Emissions Trading Scheme.
33. **Precautionary principle-**the principle of prevention being better than cure, applied to potential environmental degradation.
34. **Renewable energy -** energy sources which are not depleted by use, for example, hydro-power; PV solar cells, wind power and coppicing.

35. **Purchasing power standard** - the name given by Eurostat to the artificial currency unit in which the PPPs and real final expenditures for the EU 25 are expressed – namely, euros based on the EU 25.
36. **Renewable energy** – energy derived from naturally replenished sources which can not be depleted with time; includes solar energy, wind, tidal and wave power, geothermal heat.
37. **Renewed Lisbon Strategy** – strategy initially launched by EU in 2000 to make it "the most competitive and dynamic knowledge-driven economy by 2010", which was reviewed in 2005 and received new focus on innovation, growth and employment, and promoted strengthening of social cohesion and mobilization of community resources in the Strategy's environmental, economic and social dimensions.
38. **Renewed SDS Strategy** – EU-wide strategy setting policy framework to deliver sustainable development, achieve continuous improvement of quality of life of European Community and ensure environmental protection, prosperity and social cohesion.
39. **SEA** – formal environmental impact assessment applied at the level of programs, plans and policies in order to identify, evaluate, modify, avoid or minimize their adverse environmental effects prior to implementation.
40. **Stern Review –** released in October 2006 on the Economics of Climate Change. The report discusses the effect of climate change and global warming on the world economy, the principal message being that the world must act now on climate change or face devastating economic consequences.
41. **Vulnerability assessment** – is the process of identification, quantification, prioritization and correction of vulnerabilities in social, environmental or economic systems which make them susceptible to climate change and destabilization.
42. **White Paper on CC Adaptation** – document issued by European Commission setting out a framework for reducing EU's vulnerability to climate change and outlining actions needed to strengthen the Union's resilience in coping with a climate change through nationally and regionally applied adaptation measures widely integrated in EU key policy areas such as Cohesion Policy.

LIST OF TABLES

LIST OF BOXES

LIST OF CHARTS

REFERENCES

1. California Climate Change Glossary URL: http://www.climatechange.ca.gov/glossary/letter_g.html [consulted 27 may 2009]
2. CEE Bankwatch Network, Friends of the Earth Europe: EU cash in climate clash - How the EU funding plans are shaping up to fuel climate change Comparative analysis of the 2007-2013 structural funding allocations for energy and transport in the new member states, April 2007
3. Climate Change Glossary, Word Definitions Related to Climate Change and Global Warming. URL: http://climatechangeglossary.com/Glossary_O.html [consulted 27 may 2009]
4. Commission Of The European Communities: REGIONS 2020 - An Assessment Of Future Challenges For Eu Regions (Commission Staff Working Document) Brussels, 2008
5. ENEA CC and CP working group Guidelines
6. EU Commission: White Paper on Climate Change
7. European Commission, Regional Policy Glossary Inforegio http://ec.europa.eu/regional_policy/glossary/glos2_en.htm#d
8. European Environmental Agency: Greenhouse gas emission trends and projections in Europe 2008, EEA Topic Centre on Air and Climate Change, 2009, http://www.eea.europa.eu/publications/eea_report_2008_5
9. Greening Regional Development Programmes, 2006, Greening projects for Growth and Jobs, guidance on integrating the environment within regional development programmes and their projects, October 2006
10. PEER – "Climate Policy Integration, Coherence, and Governance"
11. Stern Review on the Economics of Climate Change,
12. Swapping Debt For The Environment: The Polish Ecofund, OECD
13. The Energy Strategy for Cornwall - Action Today for a Sustainable Tomorrow, 2004

ANNEX – RSC PARTNER PROFILES

To be completed based on the following template:

NAME OF THE REGION

General description of the region

Population	inhabitant	
Surface	km^2	
Nominal GDP	Million euro	
GDP at current market prices	Million euro	
% of the National GDP generated in the region	%	
GDP per capita at current market prices	Meuro/inhabitant	
Region's GDP per capita as of the EU average	%	

Structure of the region's economy	Industry	
	Service	
	Agriculture	
	Tourism	

Key energy figures

Total GHG emissions	Mtons of CO2 eqv.	
GHG per capita	Mtons/inh.	
GHG intensity	tons CO2/Meuro	

Final Energy consumption	TOE	
FEC per capita	TOE/inh	
FEC intensity	TOE/Meuro	

Energy production capacity of the region by energy source in %
Pie graph to be inserted

Energy consumption by fuel source (%)
Pie graph to be inserted

Renewable share in energy production	
Renewable share in energy consumption	
Main RES types in energy production	
Other RES potentials	
Main barriers to higher penetration of RES	

Climate policy of the region

National Climate Change Plan

Regional Climate Change Plan
Other Relevant Policies, Plans and Programmes

Key institutions responsible for climate change

Financial instruments available for financing climate change-related measures
