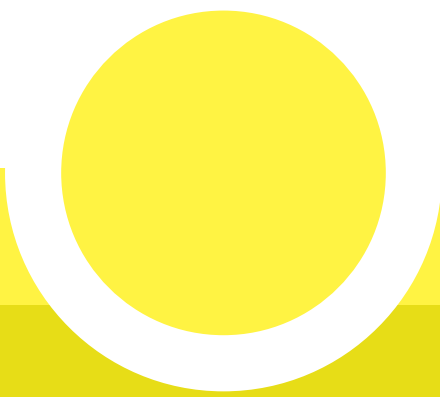


ANALYSIS ON NEW ENERGY



Low Carbon Economy Regions Project
LoCaRe

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Low Carbon Economy Regions Project LoCaRe

This report was prepared by the Sustainability,
Climate Change and Participation Office of
Principality of Asturias Government

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INTRODUCTION

The **LoCaRe project** (Low Carbon Economy Regions project) is a common initiative of six European regions aiming to cooperate on a cross-border climate effort. The objective is to develop low carbon solutions at regional and local level and contribute to economic growth at the same time, by means of this project. The regions are: **Syddanmark** (Denmark), **Västra Götalandsregionen** (Sweden), **Principado de Asturias** (Spain), **Regione Emilia-Romagna** (Italy), **Gorenjska** (Slovenia) and **Province of Zeeland** (the Netherlands).

The Principality of Asturias is the leading region of the LoCaRe INTERREG IVC project for the elaboration of the *Analysis on New Energy*, following the Terms of Reference (TOR) adopted by the Steering Committee.

The Analysis should at least contain the following elements:

- Short description of the subject

- Short description of the EU-policy in the field of Energy

- Description of the policies and practices in the fields of Energy within the LoCaRe Regions

- A SWOT analysis of the energy policy and implementation practices in the LoCaRe Regions

- Identification of differences between the Regions and with the EU-policy

- Suggestions to the Regions and Municipalities in formulating and carrying out policies in the field of energy.

- Some best practices of other Regions to compare with experiences in LoCaRe Regions

- Suggestions for discussions during the conference for which the report is input material

On approaching this subject, it should be taken into account that the production and consumption of energy is the most important contributor to the emission of Green House Gases (GHG) and consequently, **acting on the energy patterns is of paramount importance for achieving the objectives aimed for the LoCaRe project.**

The Analysis made by the LoCaRe regions shall be coherent with the Energy-Climate policy of the European Union (EU). In December 2008, the Heads of State and Government of the EU adopted the Energy/Climate strategy and set up legally binding quantitative targets for the year 2020: this is the famous 20/20/20 strategy, that involves cutting greenhouse gases by 20% (30% if an international agreement is reached), reducing energy consumption by 20% through increased energy efficiency and meeting 20% of our energy needs from renewable sources.

The EU has developed from 2009 until today very important legislation and has implemented legal, financial and cooperative instruments for its implementation. The Analysis that has been made by LoCaRe should be found on this instruments and more particularly on the [national renewable energy action plans \(NREAP\)](#) that have been notified by the Member States (MS), according with the provisions of the new Directive on renewable energy.

On 10 November 2010, and after an extensive public consultation, the European Commission adopted the [Communication “Energy 2020 - A strategy for competitive, sustainable and secure energy”](#), that defines the energy priorities for the next ten years and sets the actions to be taken in order to tackle the challenges of saving energy, achieving a market with competitive prizes and secure supplies, boosting technological leadership, and effectively negotiating with our international partners.

Most of the policies and actions included on the **NREAP** shall be adopted at national level. Nevertheless, they should be implemented at the **regional and municipal** level. **The**

implementation of the NREAP will give new opportunities for the regions to encourage economic growth through innovation and a sustainable competitive energy policy. For example, production of energy from renewable sources often depends on local or regional small and medium-sized enterprises (SMEs). The opportunities for growth and employment that investments in regional and local production of energy from renewable sources and energy efficiency bring about in the Member States and their regions are important.

Moreover, the **Regions and Municipalities** have their own tools and regulatory capacity for making the difference on the energy/climate debate. The *“Analysis on New Energy ”* shall focus also on “where and how” the **regions** could take the maximum benefit from the measures adopted at **national level** and at the same time on “where and how” they could make the difference by adopting policies and measures that could be decided at **local level**.

The **interaction** among the community/national/regional and local energy/climate initiatives has been discussed during the “LoCaRe Conference on Climate change/Sustainable energy” held in Gijon (Asturias) on 26th January 2011.

This **interaction** is particularly important because the regions are the places where the stakeholders dialogue should perform. The stakeholders dialogue is fundamental for creating process, as these are the cases presented by Vastra Götaland and South Denmark on the Gijon LoCaRe Conference.

The cornerstone recommendation of the LoCaRe *“Analysis on New Energy”* is the regions to develop their own **“Regional Sustainable Energy Strategy”**, that take into account its particular conditions. The adoption by the Member State of an energy/climate strategy until the 2020 horizon, including action plans on renewable energy (NREAP), on Energy Efficiency and in Carbon Capture and Sequestration, is a unique opportunity for the definition by the regions of their own strategy and for the regional stakeholders to identify opportunities for new economic activities, growth and job creation.

The *“Analysis on New Energy”* has undertaken an in-deep analysis of the **Community** policies, measures and instruments, of the **action plans** on renewable notified by the **NREAPs** of the 6 LoCaRe countries ,on the **information supplied by the LoCaRe members** following the methodology and the questionnaires that are detailed on annexes 1 to 4 and of the lectures and discussions of the **LoCaRe Conference** on Climate change/Sustainable energy held in Gijon (Asturias) on 26th January 2011.

The result of the *“Analysis on New Energy”* is a document in which the local authorities and stakeholders of the LoCaRe regions could find information on the **opportunities** offered to the regions by the implementation of the policies and measures adopted at national level (ultimately translated on action plans) ,as well as the **“why and how”** of the policies and measures adopted by other LoCaRe regions ,a **catalogue** of “good practices” implemented abroad and finally a set of **conclusions and recommendations** that could be useful for the definition by the LoCaRe regions of their own energy/climate strategy.

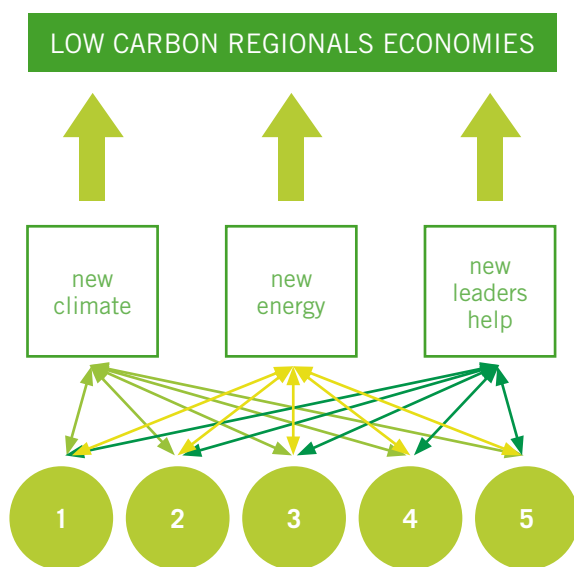
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SHORT BACKGROUND DESCRIPTION



The **LoCaRe project** (Low Carbon Economy Regions project) is a common initiative of six European regions aiming to cooperate on a cross-border climate effort. The objective is to develop low carbon solutions at regional and local level and contribute to economic growth at the same time, by means of this project. The regions are: **Syddanmark** (Denmark), **Västra Götalandsregionen** (Sweden), **Principado de Asturias** (Spain), **Regione Emilia-Romagna** (Italy), **Gorenjska** (Slovenia) and **Province of Zeeland** (the Netherlands).

The regions will work on the following three strategic themes: **New Climate, New Energy and New Leadership**. Local authorities will work together in sub-projects, dealing with use of renewable energy in local energy systems, carbon capture and carbon storage, procurement practices, low carbon territorial planning and citizens' empowerment.



OBJETIVE

THEMES

ANALISIS/CONFERENCES

SUB-THEMES - PROJECTS/STUDY VISITS

1. Renewables in local energy systems
2. Carbon Capture and Carbon Sinks
3. Sustainable Procurement Practices
4. Low Carbon Territorial Planning
5. Empowerment - Public as a driver

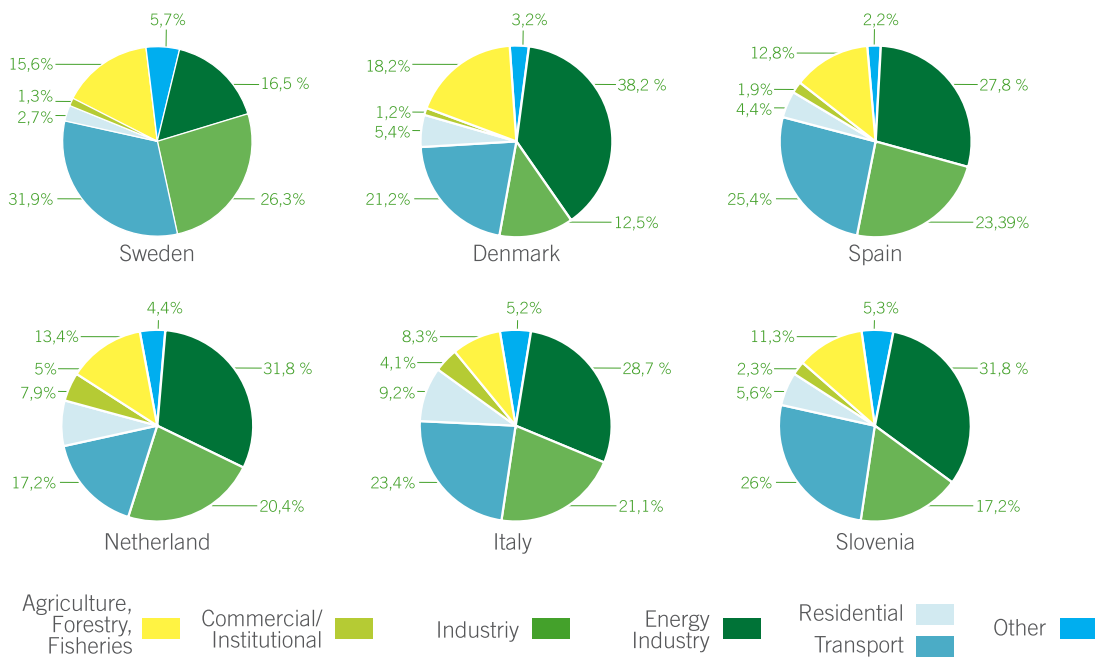
The solutions will be developed through a number of collaborating activities between municipalities and regions across Europe. The project will contribute to develop regional planning for regional development to be as harmless to the climate as possible. At the same time new competitive products and new processes in the energy field will be developed.

The activities in the LoCaRe project include networking and experiences exchange, such as joint annual conferences, workshops and site-visits. The outcome of the project will include best practice inventories, thematic analyses, new methodologies and guidelines, pilot actions, action catalogues, policy recommendations etc.

The energy subject is particularly relevant for LoCaRe objectives, as the EU27 production, conversion and consumption of energy is responsible of 79,6% of the Green House Gases (GHG) that contribute to climate change. On absolute terms, from the 5.111 million tons emitted each year by the EU27 (the reference year is 2005) 4.066 million ton CO₂ equivalent came from energy activities.

The following diagrams give indication of the GHG emissions by sectors (in Mton CO₂ equivalent) for each of the 6 LoCaRe countries (the information supporting these diagrams could be found on annexes 5 to 10):

Greenhouse Gas Emissions (GHG)* by Sector of Total Emissions: 2007
 DG TREN, 2010



The disaggregated GHG emissions of the six LoCaRe countries is included on Annex 11 and can be compared with the total emissions of this 6 countries and with the EU27 (with the reference year being 2005).

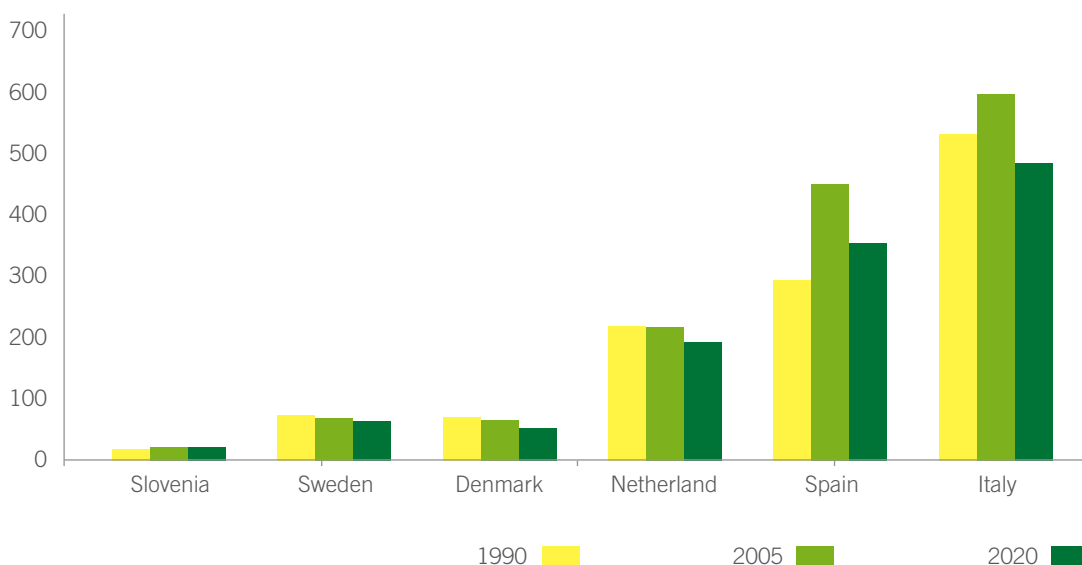
There are not information on GHG emissions at regional level but the comparative analysis of the figures at national and community level can give an appraisal of the sectors in which the LoCaRe regions should concentrate their efforts.

Effort sharing GHG reduction 2020-2005

Sweden	-17%	Netherland	-14%	Italy	-13%
Denmark	-20%	Spain	-10%	Slovenia	4%

European Emissions Trading System reduction 2020-2005 **-21%**

LoCaRe Countries GHG emissions (1990-2005-2020)



The analysis made for the LoCaRe regions could be useful to other regions. In that case, the non-LoCaRe regions could get information on their country on the following European Commission web site: http://ec.europa.eu/energy/publications/statistics/statistics_en.htm

The GHG emissions of the LoCaRe countries are distributed by sectors as follows (taking 2005 as reference year):

Energy industries (Public electricity and Heat production).....	28,6%
Industry (manufacturing and construction and industrial processes).....	21,9%
Transport.....	22,3%
Residential.....	7,7%
Comercial/Institutional.....	3,5%
Agriculture/Forestry/Fisheries.....	11,2%
Other.....	4,8%

It can be assumed that the distribution by sectors of the GHGs coming from the energy consumed on the LoCaRe region should be similar to the national one.

As it has been mentioned before, the European Union has set up very stringent objectives on GHG reductions for the year 2020, which involve cutting greenhouse gases by 20% (30% if an international agreement is reached) with respect to the emissions level of 1990. In order to achieve this objective, the European institutions have established two main instruments:

1. For those installations in which the emissions are identifiable and measurable, in particular energy industry and industry sector installations, the revision and strengthening of the **Emissions Trading System** (EU ETS) have been decided. The EU ETS system is the EU's key tool for cutting emissions cost-effectively.

A single EU-wide cap on emission allowances will apply from 2013 and will be cut annually, reducing the number of allowances available to businesses to 21% below the 2005 level in 2020. The free allocation of allowances will be progressively replaced by auctioning, and the sectors and gases covered by the system will be somewhat expanded. From 2013 onwards, the EU ETS will be strongly reinforced by the introduction of an auctioning process for credits, compared to the system used so far that consisted on free allocation.

2. For sectors not covered by the EU ETS, such as transport, housing, agriculture and waste, an 'Effort **Sharing Decision**' has been ruled. Under the Decision each Member State has agreed to a binding national emissions limitation target for 2020 that reflects its relative wealth. The targets range from an emissions reduction of 20% by the richest Member States to an increase in emissions of 20% by the poorest. These national targets will cut the EU's overall emissions from the non-ETS sectors by 10% by 2020 compared with 2005 levels.

The following tables (See Annexes 12 and 13) includes an estimation of the GHG reductions that have to be made by the 6 LoCaRe countries

Country	Kyoto Protocol		Directive on the promotion of energy from renewable sources					
	Base year 1990 Mton CO ₂	Target 2008/2012 Mton CO ₂	Reference year 2005			Target year 2020		
			Total GHG Mton CO ₂	Non-ETS Mton CO ₂	ETS Mton CO ₂	Total GHG emissions Year 2020 Mton CO ₂	Reduction (%) 2020/1990	Reduction 2020/2005 (MtonCO ₂)
Sweden	72,3	75,2	67	47,57	19,43	94,63	-17,14	7,09
Denmark	69,3	54,7	63,9	37,7	26,2	80,9	-26,44	12,92
Netherland	213,2	200,4	212,1	131,5	80,6	281	-12,1	24,7
Spain	288,4	331,7	440,6	255,6	185	516,7	21,13	91,24
Italy	519,5	485,7	582,2	355,2	227	712,7	-9,2	110,48
Slovenia	20,2	18,6	20,3	11,57	8,73	27,33	-5,97	1,31
Total LoCaRe	1182,9	1166,3	1386,1	839,14	546,96	1713,26	-3,77	247,75
Total EU 27	5818,5	n.a.	5177			4141,6	-28,82	1035,4

as well as a theoretical calculation of the GHG emissions reductions that have to be made by the 6 LoCaRe regions in case of a share effort based on the regional participation on the national Gross Domestic Product (GDP).

Gross Domestic Product M€

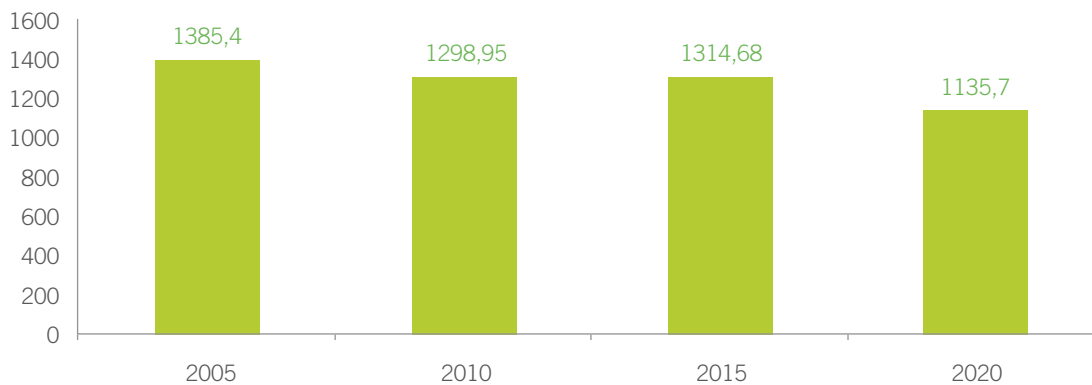
Countries/ Regions	GDP, in M€		Average 2005/2007	%region over country	GHG emission 2005 Mton CO ₂	GHG emission 2020 Mton CO ₂	Country GHG reduction MtonCO ₂	Region GHG reduction Mton CO ₂
	2005	2007						
Sweden	300.852	328.716	314.784		67	59,9	7,1	
Vastra Gotaland	36.442	35.150	35.796	11,4				0,81
Denmark	201.889	222.450	212.169		63,9	50,97	12,93	
Sydenmark	39.792	44.202	41.997	19,8				2,56
Netherland	501.236	559.735	530.485		212,1	187,4	24,7	
Zeeland	10.683	12.151	11.417	2,15				0,53
Spain	871.440	1.019.465	945.452		440,6	349,36	91,24	
Asturias	19.581	22.921	21.251	2,25	27,04			2,05
Italy	1.400.657	1.507.394	1.454.025		582,2	471,71	110,49	
Emilia-Romagna	123.975	136.770	130.372	8,97				9,91
Slovenia	28.355	33.167	30.761		20,3	18,99	1,31	
Gorenjska	1.709	1.447	1.578	5,13				0,07
Total LoCaRe Regions	232.183	252.641	242.412	6,95				15,92
Total LoCaRe Countries	3.304.428	3.670.926	3.487.677		1386,1	1138,33	247,77	
Total EU 27	10.825.126	12.048.113	11.436.620		5177	4141,6	1035,4	
%LoCaRe regions/ EU27	2,14	2,10	2,12	2,12				1,54
%LoCaRe countries/ EU27	30,53	30,47	30,50	30,50	26,774	27,485	23,930	23,93
%LoCaRe regions/ Countries				6,95				6,43

The conclusion is that the 6 LoCaRe countries have to reduce their GHG emissions from 2005 to 2020 on 248 Mton CO₂ equivalent, that is near 24% of the EU27 committed reductions.

The theoretical sharing effort of the LoCaRe regions, based on the contribution to the national GDP, shall be of 16 Mton CO₂ equivalent, that is 6,4 % of the 6 LoCaRe countries, and the 1,5% of the EU27.

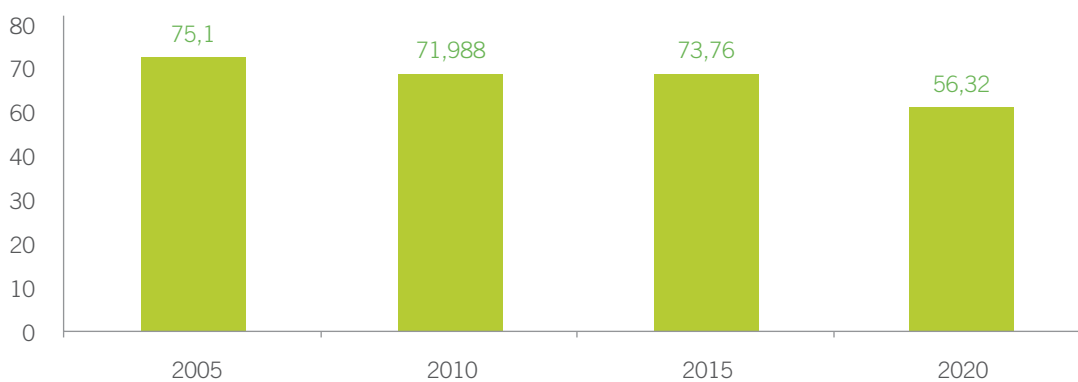
The following diagrams represent the trajectories of the GHG emissions on the 6 LoCaRe countries and regions (assuming the hypotheses that the share of regional emissions on the national one is similar than the share on the GDP):

Countries GHG emissions (Mton CO₂ equivalent)



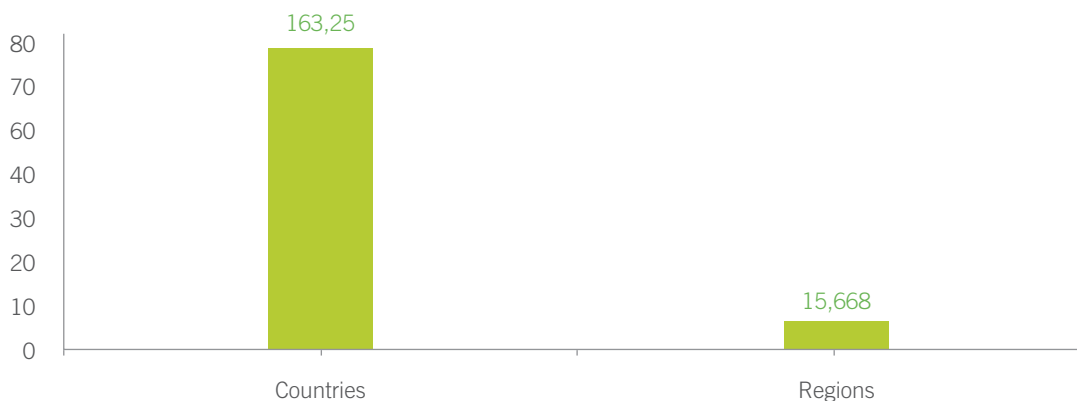
(GHG reduction 2020/1990 of LoCaRe countries: 18,2%)

Regions GHG emissions (Mton CO₂ equivalent)



The remaining reduction effort of GHG from 2010 to 2020 is:

Graphic 4b. Decrease in GHG emissions 2020-2010 (million tonnes CO₂ equivalent)



Although the 6 LoCaRe regions efforts could seem limited on the context of the EU27, it could be relevant on absolute terms and could have an important multiplicative effect on the context of the regions of Europe. The results and the methodology applied to the LoCaRe regions for the “New energy analysis” could be displayed through a big number of regions of Europe through a series of initiatives. In particular, the LoCaRe methodology could be useful for the “Survey on sustainable energy policy by EU regions and cities: Good practices and challenges” and the “Europe 2020 Monitoring platform” launched by the Committee of the Regions (CoR) of the European Union (<http://cor.europa.eu/europe2020>).

The European Union has adopted a strategy for GHG reduction on the context of Climate Action that is based on:

- The promotion of renewable sources of energy (RES)
- The promotion of rational use of energy and energy efficiency (RUE)
- The promotion of carbon capture and sequestration (CCS)

At the same time, the European Union has adopted decisions aiming at the introduction of market oriented economic instruments that facilitate the penetration of new climate-friendly technologies.

Technology and innovation will be one of the most relevant strategies for fighting climate change in the energy sector. The European Union has developed Strategic European Technology Plan (SET Plan) and has proposed efficient economic instruments for its implementation. Europe is moving from political declarations to actions, and a good example of this is the decision to allocate an important part of the revenues from the auctioning of the CO₂ credits to the implementation of new sustainable energy projects (The NER 300 programme).

The “New energy” process could be an opportunity for the **creation of new economic activities** on the LoCaRe regions and for fostering interregional cooperation. The opportunities offered by the “New energy activities” justify that the objectives of the LoCaRe project should focus, not only on the decisions that could be adopted at local and regional level, but on the opportunities

that the decisions adopted at the national level could offer to the regions themselves. The European Commission expect that the investment on energy infrastructures on the period 2010/2020 will be 1 trillion euros, out of which 50% on the electricity sector. Further analysis undertaken for the Commission suggests that whilst annual **capital investment in renewable energy today averages €35bn**, this would need to rapidly double to €70bn to ensure we achieve the EU goals .

Beyond the technological and regulatory aspects, Member States, regions and cities need to step up their efforts to strengthen skills, knowledge and capacities, in particular within the relevant administrations and agencies (such as through the EU Covenant of Mayors), to ensure adequate governance for the efficient delivery of renewable energy.

The “Analysis on new energy” is proposing the regions to develop **Regional Sustainable Energy Strategies** that aims to implement on its territory the Community and National Energy Policies and more in particular the National Renewable Energy Action Plans (NREAP).

2

SHORT DESCRIPTION OF THE EU-POLICY IN THE FIELD OF ENERGY



2.1 THE ULTIMATE OBJECTIVE OF THE EU ENERGY POLICY

A European Energy Policy will firmly commit the European Union (EU) to a low consumption economy based on **more secure, more competitive and more sustainable energy**. Priority energy objectives involve ensuring the smooth functioning of the internal energy market, strategic supply security, concrete reductions in greenhouse gas emissions caused by the production or consumption of energy and the EU's ability to speak with a single voice on the international stage.

Today, climate change is one of the biggest challenges the EU faces. This was the moving force for the adoption of an **integrated energy and climate change policy** in December 2008, including ambitious targets for 2020. It hopes to set Europe on the right track - towards a sustainable future with a low-carbon, energy-efficient economy - by:

Cutting greenhouse gases by 20% (30% if international agreement is reached)

Reducing energy consumption by 20% through increased energy efficiency

Having 20% of our energy needs from renewable sources

The European Union has been particularly active on the field of energy, with a number of public consultations and legislative decisions. At the same time, the European Union is the worldwide leader in fighting against climate change.

The European Commission presented on 10th November 2010, after a large consultation to the public, the **Communication “[Energy 2020 - A strategy for competitive, sustainable and secure energy](#)”**. The Commission defines the energy priorities for the next ten years and sets the actions to be taken in order to tackle the challenges of saving energy, achieving a market with competitive prizes and secure supplies, boosting technological leadership, and effectively negotiate with our international partners.

The Commission identifies on the Communication Energy 2020 five top priorities, among which, two are particularly important for LoCaRe objectives:

-Energy savings

The Commission proposes to focus its initiatives on the two sectors with the biggest energy saving potential: **transport and buildings**. To help house owners and local entities to finance renovation and energy saving measures, the Commission will propose investment incentives and innovative financial instruments by mid 2011.

-Europe's leadership in energy technology and innovation

Four major projects in key areas for Europe's competitiveness will be launched, such as new technologies for intelligent networks and electricity storage, research on second-generation biofuels and the 'smart cities' partnership to promote energy savings in urban areas.

For more information on Energy strategy 2020 please see: http://ec.europa.eu/energy/strategies/2010/2020_en.htm

The EU energy/climate strategy will provide new opportunities to its regions and cities, because the new systems of production, distribution and consumption of energy will be much more decentralized and because the “New sustainable energy” requires the deployment of a number of innovative technological solutions, most of which can be developed locally.

2.2 THE LEGISLATIVE FRAMEWORK

As a result of the “integrated energy and climate change policy” adopted by the European Council in December 2008, the EU has moved forward very ambitious objectives on energy efficiency, promotion of energy from renewable sources and CO₂ reductions, including CO₂ capture and sequestration. It is very important to highlight that for the first time the most important objectives, such as the share of energy from renewable sources, are legally binding for the Member states (not only indicative or voluntary, as before) and that the EU has adopted important financial decisions, such as the €4 billion budget allocated in 2009 for the [“European Energy Programme for Recovery” \(EEPR\)](#).

The most important EU legislative decisions are the following:

- The [new Directive on renewable energy](#) sets ambitious [targets](#) for all Member States, such that the EU will reach a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy specifically in the transport sector. It also improves the legal framework for promoting renewable electricity, requires national action plans that establish pathways for the development of renewable energy sources including [bioenergy](#), creates cooperation mechanisms to help achieve the targets cost effectively and establishes the sustainability criteria for [biofuels](#). Member States should implement the new Directive by December 2010. Related documents can be found [here](#) and the first steps in implementation are indicated on the [transparency platform](#), including the [national renewable energy action plans](#).
- The so-called “energy services” “Directive [2006/32/EC](#) of the European Parliament and the Council of 5 April 2006 on energy end-use efficiency and energy services” applies to supply and distribution of electricity, gas, heating and fuels to households, transport and industrial consumers. The European Commission has launched an “Action Plan for Energy Efficiency: Realizing the Potential” [[COM\(2006\) 545](#)] aiming to mobilize the general public, policy-makers and market actors, and to transform the internal energy market in a way that provides EU citizens with the most energy-efficient infrastructure (including buildings), products (including appliances and cars), and energy systems in the world. The European Commission has announced a new proposal to the European Parliament and to the Council on the first half of 2011.
- The Regulation (EC) No [663/2009](#) of the European Parliament and the Council of 13 July 2009 established a programme to aid economic recovery by granting Community financial assistance to projects in the field of energy.

This Regulation is aimed at setting up an European Energy Programme for Recovery (EEPR) that will fund projects in three main areas of the energy sector:

- gas and electricity infrastructures*;
- offshore wind energy*;
- carbon capture and storage*

• The regulation (EU) N° 1233/2010 ([Regulation \(EU\) No 1233/2010](#)) of 15 December 2010 amending Regulation (EC) No 663/2009, that provides for the creation of a financial facility (the “**facility**”) to support **energy efficiency and renewable energy** initiatives and shall facilitate the financing of investments in those areas by **local, regional** and, in duly justified cases, national public authorities.

• The Directive 2003/87/EC of the European Parliament and the Council of 13 October

2003 established a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (see [Consolidated version of Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community](#)). This directive, as amended last time on 2009, is a very important tool for the future competitiveness of the new low-carbon energy plants and for the availability of financial resources for investing on new and sustainable technologies. Effectively, after 2013 the CO₂ emission credits shall be auctioned and Member States will have to reimburse more than 50% of the income from such a credits to “New energy” projects, either on the EU territory or in developing countries.

- On 13th July 2009, the European Union adopted the “Third package on the internal energy market”, including:
 - The Regulation (EC) No [713/2009](#) of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators (text with EEA relevance).
 - The Directive [2009/73/EC](#) of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC
 - The Directive [2009/72/EC](#) of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC

These directives are very relevant for the promotion of “New energies” because they provide conditions for the access of electricity and gas from renewable sources to the electricity and gas networks, as well as the fostering by the Transmission System Operators (TSO) of the “Smart grids”, that shall facilitate the easy integration of the electricity and gas decentralized generation on the network.

2.3 THE STRATEGIC ROLE OF TECHNOLOGY

“**Technology**” will play an important role on the development of new and sustainable energy systems. This is very important for the LoCaRe regions, as new technologies could be an opportunity for industrial innovation and job-creation locally.

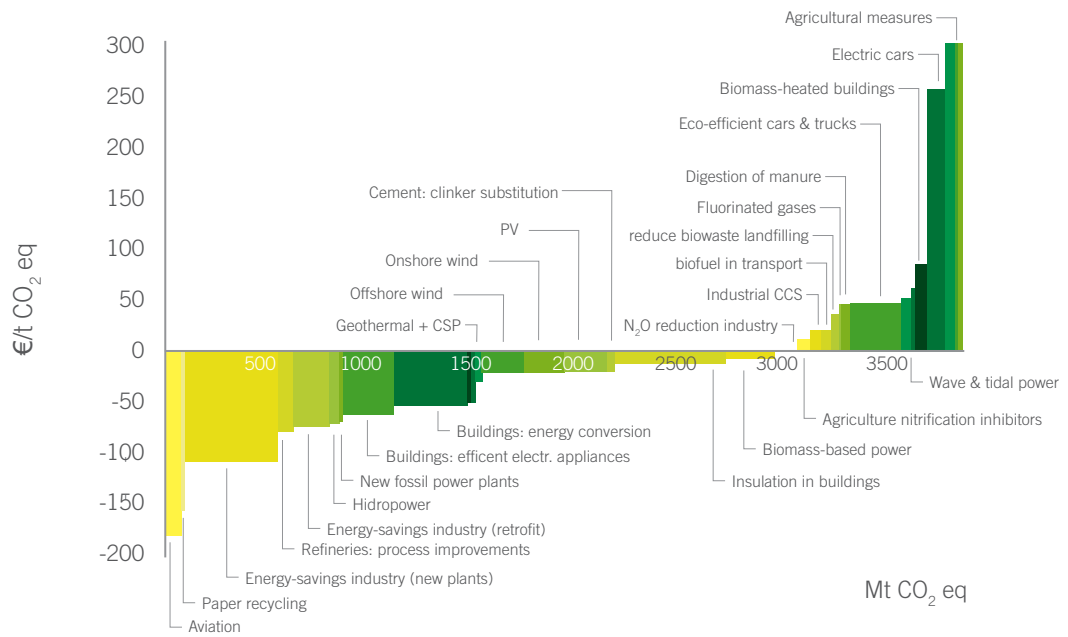
The European Commission is launching a number of proposals, flanked with financial instruments, among which the following are the most relevant:

- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Investing in the Development of Low Carbon Technologies (SET-Plan) [COM(2009) 519 final], that proposes methods of funding for these initiatives.
- Communication - A European strategic energy technology plan (SET-Plan) - Towards a low carbon future, sets up the kind of initiatives that the European Union (EU) should put in place in order to steer the current energy system towards a low carbon model. Especially relevant are the “Road Maps” for the development of the different technologies that are going to orient the future “Work programmes” of the Framework Programme on RTD.

- The Commission Communication of 10 January 2007 “Sustainable power generation from fossil fuels: aiming for near-zero emissions from coal after 2020” [[COM\(2006\) 843 final](#)] – In this Communication the Commission assesses how and at what cost power can be generated from fossil fuels in future while reducing the associated greenhouse gas emissions.
- The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 23 January 2008 entitled: “Supporting early demonstration of sustainable power generation from fossil fuels” [COM(2008) 13 final – Official Journal C 118 of 15.5.2008]. The use of technologies for capture and storage of CO₂ (CCS) is an essential instrument to achieve significant cuts in greenhouse gas emissions, and especially those from power plants fired by fossil fuels, such as coal or gas. The development and commercial use of these technologies nevertheless represent a very high cost, in the order of several billion euro in total and several hundred million euros per power plant. However, according to the estimates of the European Technology Platform for Zero Emission Fossil Fuel Power Plants (ETP-ZEP), the cost of CCS can be brought down by 50% between now and 2020 if efforts are focused on research & development and demonstration. Furthermore, the planned increase in the cost of acquiring CO₂.
- The Research activity is a component of a knowledge triangle (the other two being education and innovation) meant to boost growth and employment in the European Union (EU) in the context of a global economy. Decision No [1982/2006/EC](#) of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-13), includes the possibility of co-financing projects on the energy and environment (including climate change) sectors under the [Cooperation](#) Programme, that aims to stimulate cooperation and improve links between industry and research within a transnational framework.

The **technologies** for “New energy” are on a different stage of development and present different costs and deploying potential. Politicians and decision makers should take into account criteria of Cost and Benefit (CBA) on the selection of technologies to be promoted on a particular region and country. The following graphics, that have been presented on the Gijón Conference by the Spanish Office for Climate Change, gives an illustrative idea of the costs and potential of different measures and technologies.

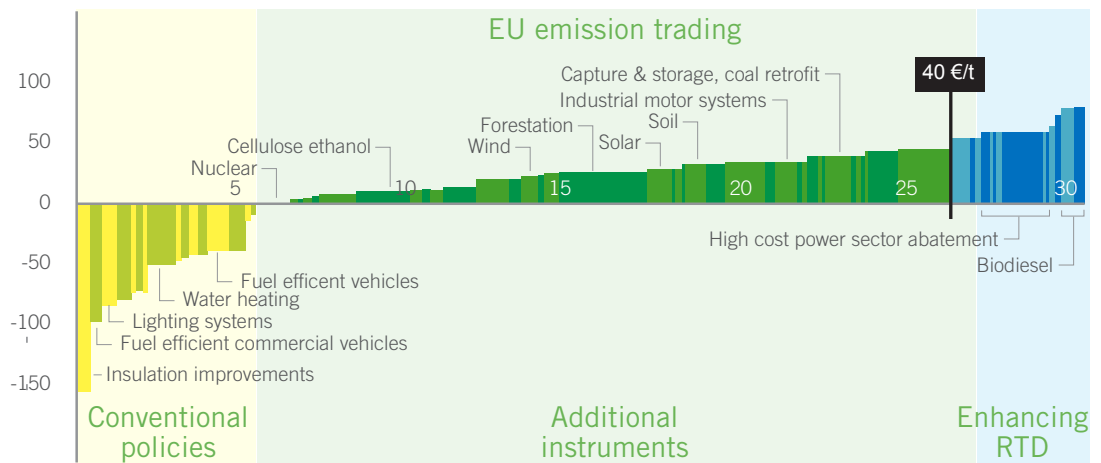
Cost-curve scenario for the EU27 in 2030. Cumulative abatement is relative to the FTRL reference emission in 2030. Technologies aggregated into clusters for clarity



Source: Ecofys

Based on the abatement cost of the different technologies, it is possible to draw strategies and least cost measures for GHG emission reduction, as it is indicated on the following example:

Marginal Cost of abatement - examples
€/t CO₂



Abatement potential Gt CO₂ year in 2030

Negative abatement marginal cost Abatement marginal cost below €40/t Abatement marginal cost above €40/t

2.4 COMMUNITY FINANCIAL INSTRUMENTS SUPPORTING “NEW ENERGY”

“New energies” request public support that should take into account their social and environmental advantages, as well as the need to overtake technological uncertainties and to make progress on the “learning curves”. “New energies” also provides support, as the environmental policy objective is to effectively internalize environmental external cost to the price of energy.

The main Community financial instruments are the following:

- The “funds” of the **Cohesion policy, meaning:**
 - **The European Regional Development Fund (ERDF)**, that can provide financial support to projects stimulating energy efficiency and renewable energy production as well as the development of efficient energy management systems, in all kind of regions (convergence objective and competitiveness objective regions)
 - The **cohesion fund (CF)** that supports projects related to sustainable development which clearly present environmental benefits, namely energy efficiency and renewable energy.
- **The Framework Programme on Research and Development:** The objective of [energy research under FP7](#) is to aid the creation and establishment of those technologies necessary to adapt the current energy system into a more sustainable, competitive and secure one. It should also depend less on imported fuels and use a diverse mix of energy sources, in particular renewable, energy carriers and non-polluting sources. The following link gives an [Overview of topics that are open in current calls for proposals](#).
- The [European Energy Programme for Recovery \(EEPR\)](#): 43 major energy projects that will significantly contribute to the economic recovery in the EU, while increasing our energy supply security by creating cross-border infrastructure. On 15 december 2010, the EEPR allocate € 144 million for to **facilitate** the financing of investments on energy efficiency and renewable energy initiatives by **local, regional** and in some cases, national authorities.
- The **Intelligent Energy - Europe programme** is the EU’s tool for funding action to improve the conditions for untapped opportunities to save energy and encourage the use of renewable energy sources in Europe, for which market conditions do not always help. Intelligent Energy – Europe is a part of the EU’s **Competitiveness and Innovation Framework Programme (CIP)**.
- The loans of the European Investment Bank (EIB): The EIB finances projects promoting sustainable, competitive and secure [energy](#) sources. To facilitate the mobilization of funds for investments in sustainable energy at local level, the European Commission and the European Investment Bank have established the **ELENA technical assistance facility (European Local ENergy Assistance)**, financed through the [Intelligent Energy-Europe](#) programme. ELENA support covers a share of the cost for technical support that is necessary to prepare, implement and finance the investment programme, such as feasibility and market studies, structuring of programmes, business plans, energy audits, preparation for tendering procedures - in short, everything necessary to make cities’ and regions’ sustainable energy projects ready for EIB funding. For more details, go to the [ELENA](#) website.

Moreover, Community legislation is the base for the implementation by the Member states of economic instruments that are the origin of funds aiming to support sustainable energies, in particular:

- Feed in tariffs, as stated on the Directive [2009/72/EC](#), is the most market based effective instrument for the integration of electricity from renewable sources in the internal market of energy.
- The revenues generated from the **auction of allowances** of the EU ETS. At least 50% of the revenue should be used for the following purposes:
 - To reduce greenhouse gases;
 - To develop renewable energies, and other technologies contributing to the transition to a low-carbon economy;
 - Measures to avoid deforestation and increase afforestation and reforestation;
 - Forestry sequestration;
 - Capture and geological storage;
 - A shift to low-emission and public forms of transport;
 - Research in energy efficiency and clean technologies;
 - Improvements in energy efficiency and insulation;
 - To cover administrative expenses of the management of the Community scheme

The Commission has launched the first Call for Proposals for innovative renewable energy and carbon capture and storage projects under the NER300 competition (formally launched the 09/11/2011 in the Official Journal). The NER300 competition is established under Article 10a(8) of the EU ETS [Directive 2003/87/EC](#), and is detailed in the [Decision C\(2010\) 7499](#).

The European Commission is also promoting a number of programs aiming at the dissemination of “best practices” for the promotion of RES and EE solutions, to the cooperation among local and regional actors (acting together) and also to facilitate the local authorities with tools for programming their own strategies and actions plans.

The LoCaRe regions could find a number of imaginative solutions and commitments for the promotion of “New energy” on the following Community programmes:

- **BUILT UP:** Launched in 2009, **BUILD UP** is a new environment for building professionals, local authorities and building occupants willing to share their experience on how to cut energy consumption in buildings.
- **COVENANT of MAYORS:** The **Covenant of Mayors** is a commitment by signatory towns and cities to go beyond the objectives of EU energy policy in terms of reduction in CO₂ emissions through enhanced energy efficiency as well as cleaner energy production and use.
- **SUSTAINABLE ENERGY EUROPA:** Launched in 2005 and now extended until 2011, the **Sustainable Energy Europe Campaign** aims to spread best practices and to build alliances among sustainable energy stakeholders serving as a platform for new ideas and actions.


- **CONCERTO:** The programme **CONCERTO** supports local communities, as clearly defined geographical areas or zones, in developing and demonstrating concrete strategies and actions that are both sustainable and highly energy efficient.
- **MANAGENERGY:** Launched in 2002, the **ManagEnergy** initiative supports the work of actors working on energy efficiency and renewable energies at the local and regional level. ManagEnergy provides training, workshops and online events targeting energy professionals and managers of energy agencies.
- **INTELLIGENT ENERGY-EUROPA:** The **Intelligent Energy – Europe (IEE)** programme helps deliver on the ambitious targets that the EU has set for itself to sustain the competitiveness of its economy while fighting climate change. It does so by supporting concrete projects and real people doing real things.
- **ECO-INNOVATION:** Through the **Eco-innovation** funding scheme, the EU wants to support innovative products, services and technologies that can make a better use of our natural resources and reduce Europe’s ecological footprint.
- **THE EUROPEAN 2020 MONITORING PLATFORM:** The EUROPE2020MP supports the diffusion of multilevel policymaking for growth and jobs by facilitating the exchange of information and good practices between local and regional policy makers. The programme has been launched by the Committee of the Regions.

More detailed information on these programmes will be given on the chapter 7 and on the Annex 19 of the “Analysis”.The study [Financing Renewable Energy in the European Energy Market](#) commended by the European Commission is an important reference document for gathering information on costs and support measures for the promotion of renewable energy.

3



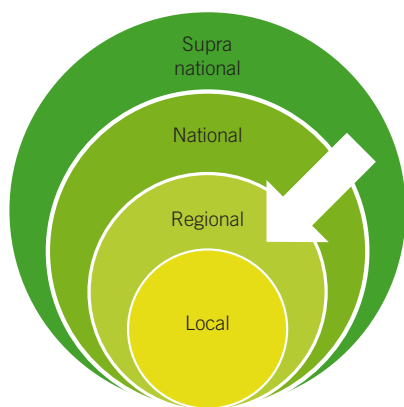
DESCRIPTION OF THE POLICIES AND IMPLEMENTATION PRACTICES IN THE FIELDS OF ENERGY WITHIN THE LOCARE REGIONS



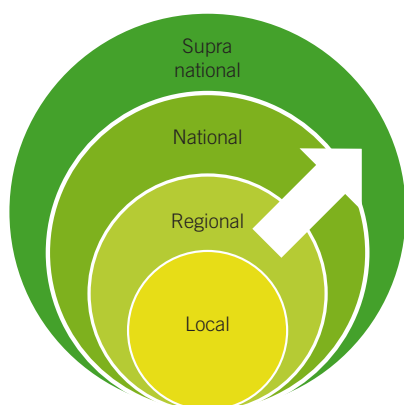
The policies and implementation practices in the fields of energy within the LoCaRe regions are double fold:

- From one side, the LoCaRe regions should cooperate on the implementation of the **national** policies and action plans, from which they could gather important benefits and opportunities, including jobs creation and economic growth.
- Moreover, the **regions and local municipalities** should develop their own strategies and action plans on the activities for which they have delegated powers and tray to expand its results to the national and supranational levels.

At the end, the regions and municipalities are the physical space in which the policies and actions shall be implemented. An intelligent approach for local and regional entities should be to cooperate with national entities on the global objectives from which they could take the maximum benefit and at the same time promote the measures that they could decide locally. The graphic representation proposed by South Denmark on the Gijon Conference ,that reflect also the proposals of other panelists, defines clearly this idea:



- EU directives
- NREAPs
- Regional plans
- Local plans



- Wild ideas
- Local pilot project
- “Yes we can” effect
- Showcases
- Public engagement leads to
- National and Supranational acceptance
- And change of policy

The municipalities and regions of Europe have a unique opportunity for developing Regional Sustainable Energy Strategies, which should be guided by the National Action Plans and based on the particularities of the respective regions. Taking the wordings of the NREAP of Sweden, it is worth to highlight the following:

“The municipalities, county councils and regions are of vital importance as engines in this change work. They are political arenas with responsibility for local and regional development working as a team together with trade and industry and other players. They are also community planners, major operators and procurers and not least an important platform for civil dialogue and civil involvement. The municipalities, county councils and regions have important roles to play and make important contributions to the energy and climate work. Key priority areas are contributing to extending the environmentally-sound energy supply, working towards energy efficiency and cost savings, increased investment in public transport and infrastructure, green planning and environmentally-friendly procurements. The involvement of trade and industry is vital for successful energy and climate work. Trade and industry is able to offer experience and there is potential for energy efficiency and energy conversion. The environmentally-driven commercial development is a prerequisite for sustainable growth”.

The “Analysis of new energy” has proceeded with an in-deep analysis of the NREAP of the six LoCaRe countries and of the additional information given by the six LoCaRe regions on its respective policies and implementing measures. Such information concerns the national and regional targets on final energy consumption 2010-2020, the share of renewable and trajectories on the sectors of electricity generation, heating&cooling and transport sectors. The information has been provided by the Member states following the template published by the Commission in conformity with the [renewable energy Directive \(2009/28/EC\)](#) and will be facilitated on the “Analysis” on a series of graphics (Annex 16 will follow).

The “Analysis of new energy” includes also the “Overview of all policies and measures to promote the use of energy from renewable sources” that have been notified on the NREAP of the 6 Member States of LoCaRe. A summary of such “Overviews “is included on Annex 14. Several of this “policies and measures “are addressed either to the regional or to the municipal administrations. The “Analysis of new energy” is going to summarize, on the following chapters, the most relevant conclusions but it is recommended to the LoCaRe members and other interested people to read the chapter 4 “Measures for achieving the targets” of the respective country NREAP.

Coming back to the summary of the policies and implementation practices in the fields of energy within the LoCaRe regions, the “Analysis” is structured as follows:

- Summary of the LoCaRe National and Regional energy/climate policy
- The LoCaRe National and regional targets and trajectories for achieving the objective 20/20/20 in 2020(Graphic presentation)
- Specific measures for achieving the targets, that includes measures on:
 - Administrative procedures and spatial planning
 - Buildings
 - Information provisions on the promotion of RES and RUE
 - Electricity infrastructure and grid operation
 - Biogas integration into the natural gas network
 - District heating and cooling infrastructure development
 - Biofuels and bioliquids
- Support schemes to promote the use of energy from renewable sources in electricity, heat and transport sectors.

3.1- SUMMARY OF THE LOCARE NATIONAL AND REGIONAL ENERGY/CLIMATE POLICY

The National energy/climate policies of the EU Member States are strongly dependent on the energy/climate strategies defined by the European Union. Similarly, the Regional energy/climate policies are dependent on the National policies. The Municipal policy could be more independent, because of the delegated powers on Local Spatial Planning and on Spatial Management. In any case, the final objectives of the Municipalities on sustainable energy/climate are exactly the same than the regions and than the Country.

The six LoCaRe countries have defined energy/climate objectives at the horizon of 2020 and some of them, as it is the case of Sweden, Denmark and Netherland, a “Vision” to 2030 and also 2050. During the Gijon Conference, it has been also presented the shared vision of the “Green Valley of Europe”.

The six LoCaRe Countries agree unanimously that energy/climate policy aims to reconcile sustainability, competitiveness and security of supply. The energy policy should create the conditions for an efficient and sustainable energy usage and a cost-effective energy supply with a low negative effect on health, the environment and the climate.

Moreover, the “Vision” of the Northern countries such as Sweden and Denmark is to become independent of fossil fuels with no net emissions of greenhouse gases into the atmosphere by 2030/2050.

Most of the ongoing energy programmes of the LoCaRe regions expire in 2010-2012. For example, Emilia-Romagna implement a Regional Energy Plan (REP) that is carry out through triennial Action Plans. The regions have now a unique opportunity to develop regional energy/climate Strategies to the 2020 horizon, based on the objectives and measures of the National Plans. A good example is the regional strategy “ The Vastra Götaland climate strategy” or the “ Denmark Climata Strategy” resulting on the “Smart Energy Climate dialog 2007-2009 “ and on the study *“Towards an economy less dependent on carbon – can Västra Götaland be a leader”* that is included on Annex 15. It is worthy to highlight the following statement taken from this study: *“Sweden accounts for just above 0.2% of all carbon dioxide emissions, Västra Götaland for 0.04%. If the ambitious measures described above are achieved, Västra Götaland can contribute to meeting national goals, but the region has in practice no impact on global emissions or on prices or price development. The main prospects for exerting influence reside in setting a good example and taking the lead to the extent that resources allow while intensifying development of new technology and new system solutions. As stated earlier, the latter is highly feasible”*

That means that the strategy of Västra Götaland has an environmental objective, but without forgetting that it should be economically sound.

The region of Southern Denmark has presented the “Master plan for ZEROcarbon Sonderborg” that follows similar “vision” than the Västra Götaland region but at the local level. This Master Plan is based on the Denmark Climate strategy.

The six LoCaRe countries are already implementing National Action Plans for the promotion of energy from renewable and the promotion of energy efficiency, in three sectors: **electricity generation, heating and cooling and transport**. The six LoCaRe Countries have clearly defined the cost-effective renewable technologies that they have the intention to promote and they have set up quantified trajectories for implementation. The selected technologies for the generation of electricity from renewable are wind, onshore and offshore, solar, either photovoltaic (PV) or concentrated solar power (CSP), and biomass, in particular the co-combustion of solid

biomass with coal and biogas from agriculture residues. Other technologies, such as hydro and geothermal, are dependent on local conditions. In the case of hydro, the potential for increasing is reduced because most of the capacity is already on operation. Finally, other technologies such as energy from waves or from tide are on an early stage of development and the growing potential until 2020 is very reduced. The efforts on promoting these technologies will be concentrated on RTD.

The central governments of the LoCaRe countries have the capacity for ruling the **legislative framework** and also for the setting up of the support measures for the promotion of electricity from renewable. Assuming that there are differences among them, the regions and the municipalities have the capacity for the authorization, certification, licensing procedures and, in the case of municipalities, for spatial planning. The regions have also important capacity for the implementation of the environment legislation, in particular the Environmental Impact Assessment of the individual projects (EIA). The conclusion is that the cooperation among the central, the regional and the municipal administration is very important. Some LoCaRe countries have set up cooperation mechanisms, and it is worthy to mention the **“Government coordination scheme”**, the **“Climate and Energy Agreement between the Government and the Provinces”** and the **“Climate Agreement between the Municipal Authorities and the Government”** existing in Netherland. Important Agreements and Covenants exist also in other LoCaRe countries, regions and municipalities.

The six LoCaRe countries are also implementing “Action Plans for Energy Efficiency”, that concerns mainly heating and cooling production and consumption, as well as local production and consumption of biomass and biofuels. Most of these measures are included in the NREAP, which request from the countries specific information on the following:

- **Buildings**, and more in particular:
 - Increasing the share of renewable energy for heating and cooling,
 - Reducing energy consumption for heating and cooling by increasing the energy efficiency
 - Increasing the local use of renewable energy on district heat.
 - Plans for ensuring the exemplary role of public buildings at national, regional and local level by using renewable energy installations or becoming low-energy buildings from 2012 onwards
 - New initiatives intended to reduce energy consumption in new and existing buildings
- **District heating and cooling infrastructure** development, and more in particular:
 - The need for new district heating and cooling infrastructure using renewable energy sources and contributing to the 2020 target.
 - The expected contributions of large biomass, solar and geothermal facilities in the district heating and cooling systems

The building sector, the district heating services and the promotion of biofuels, (in particular biogas) are the sectors on which the LoCaRe regions and municipalities have relevant capacity for intervention.

As a result of the enquire launched by the *“Analysis on new energy”* for proceeding of a SWOT analysis, the LoCaRe members answer unanimously that the regions have high capacity for **substantial increases of energy efficiency in buildings**. This conclusion has demonstrated, in some way, the coherence of the analysis made by the LoCaRe members with the European

Commission, that on the Communication of 10 December 2010 [“Energy 2020 - A strategy for competitive, sustainable and secure energy”](#) proposes to focus its initiatives on the two sectors with the biggest energy saving potential: **transport** and **buildings**.

The six LoCaRe countries are also setting up national targets and trajectories for increasing the share of renewable energy in the **transport** sector. The main renewable sources for transport are Bio-ethanol/ Bio-ETBE, Biodiesel, Renewable electricity and others, among which hydrogen and biogas.

The six LoCaRe countries have endorsed the target of the 10% of bioenergy on the final energy consumption of transport. The origin of the biofuels can be either domestic or imported. The LoCaRe countries have implemented support regulatory and financial mechanisms. The **“Sustainable procurement”** on the buying of public vehicles has been identified as a powerful instrument for the promotion of clean vehicles. In the case of Netherland, the government has set up guidelines on sustainable procurement and the governmental organizations are building consensus on ambitious targets by 2010 and 2015.

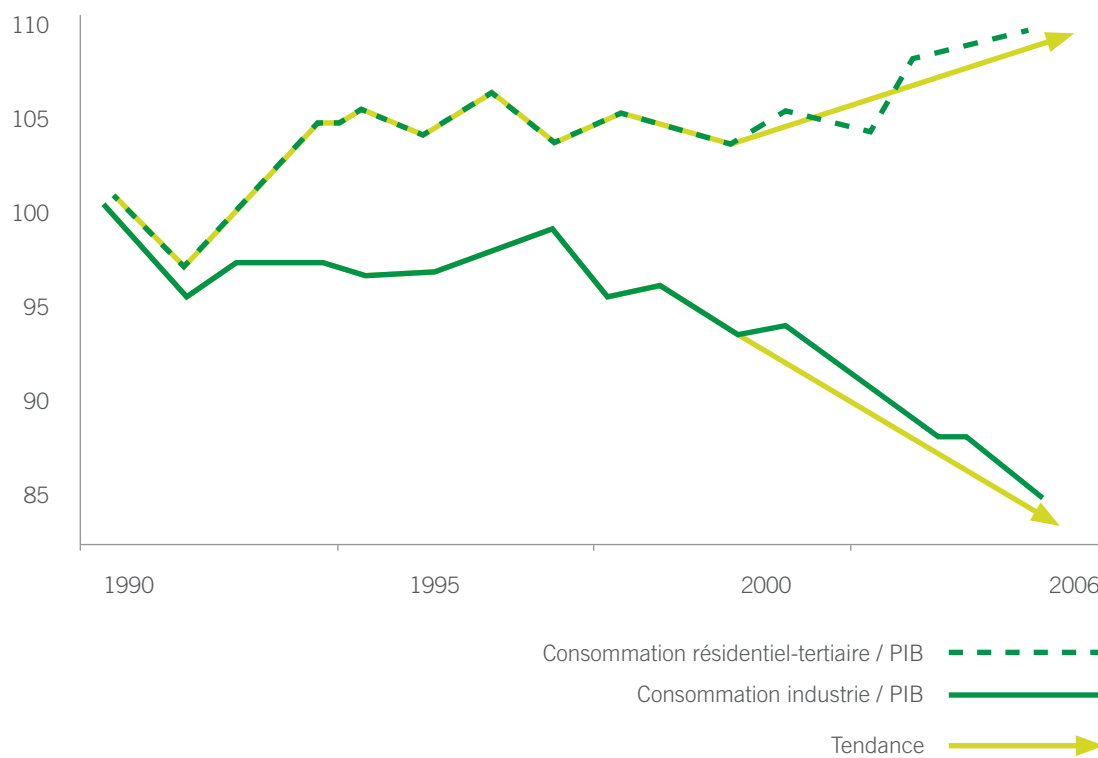
Besides the promotion of the consumption of energy from renewable sources and the promotion of the energy efficiency, the European Union is also promoting the **capture and the geological sequestration of CO₂ (CCS)** produced on large industrial plants. Such a technology is strongly supported by the European Union, that has given priority on the RTD programmes and that has devoted approximately €1 billion from the EEPR and on the open call for NER 300, with an indicative contribution of €2 billion. The target of the EU is to have in operation 12 zero emissions coal firing power plants by 2015.

The LoCaRe regions of Zeeland, Asturias and Emilia-Romagna have expressed big interest in the CCS technology. Sweden and Denmark, in coherence with the objective to become independent from fossil fuels in 2030, have not expressed similar interest. There is also a potential scope for regional cluster on this field, because a number of studies such as “Geocapacity” and the recently published by the DG Energy of the European Commission [“Europe-Wide CO₂ Infrastructures”](#), that set up guidelines for the transport infrastructure and safe storage of CO₂.

The development and deployment of the CCS technology request the decision of the industry, in particular the electricity, iron, chemical and cement industry. The European Union and the Member States, as it has been mentioned before, are paving the way by supporting the “demonstration” costs of the high investments of these technologies. Most of the LoCaRe regions are very industrialized and energy intensive regions, relying on fossil fuels (coal and gas) for electricity generation and have now the opportunity to set up strategies for industrial cooperation, that can take benefit from the community and national supporting schemes for “low carbon” technologies. There are also potential “synergies” for LoCaRe cooperation among research and industrial organisations.

Finally, the “Analysis” would like to highlight the important of the behavior of the **individual consumers** on achieving the energy/climate targets on energy efficiency and rational use of the energy. This subject has been raised during the Gijon conference by several participants and in particular by the representing of the Spanish State Secretariat of Energy and former Director on the European Commission and also by the representing of the DG Energy of the European Commission.

The panelist highlighted that 80% of the European citizens live on cities and consequently, acting at regional and local level is of paramount importance for changing the energy/climate patterns. The industry has made important progress on improving energy efficiency, the individual consumer have a long way to pay. The following graphic is very illustrative:



Source: Centre français de recherche pour l'étude et l'observation des conditions de vie (Credoc), avril 2008

3.2-THE LOCARE NATIONAL AND REGIONAL TARGETS AND TRAJECTORIES FOR ACHIEVING THE OBJECTIVE 20/20/20 IN 2020 (GRAPHIC PRESENTATION)

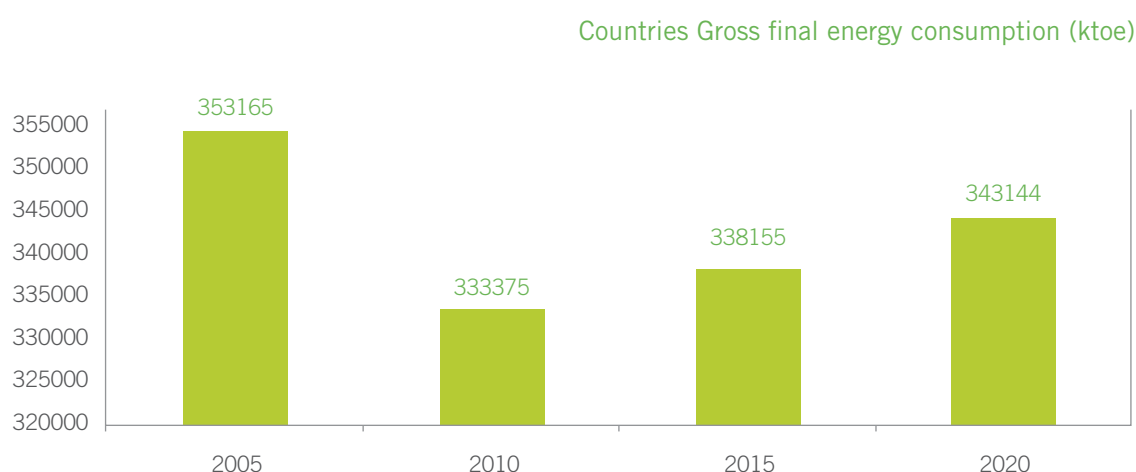
The “*Analysis of new energy*” has made an exhaustive analysis of the information notified by the LoCaRe countries on the NREAP. This information deals with the expected final energy consumption 2010-2020, with the renewable energy targets and trajectories and with the sector targets (electricity, heating and cooling and transport) and its trajectories. The information gathered from the NREAP has been completed with the expected GHG reductions and the estimated national allocation made by the “Analysis”. The 2010- 2020 trajectory is based on a scenario of additional energy efficiency.

Based on the national objectives and information of the NREAPs, the “Analysis of new energy” request to the LoCaRe members similar information on the regions. This information was not available in all the cases and the “Analysis” proceeds on to make estimations on the regional trajectories of the relevant energy parameters based on indicators, mainly the share of the regional GDP on the National GDP.

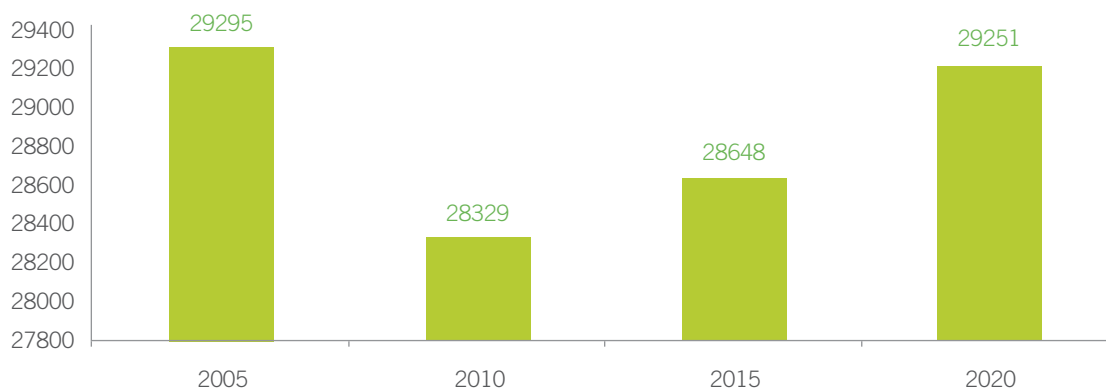
The purpose of this exercise is that the public authorities and stakeholders realize the “**magnitude**” of the **effort** that shall be made on the regions in order to achieve the National objectives, irrespectively that the decisions were made either by the National or by the Regional /Local authorities. It is important to emphasize that the magnitude of the effort is enormous, because the 20/20/20 by 2020 objective is the most ambitious legally binding energy target ever adopted in Europe.

The results of the national and regional targets and trajectories are presented in a series of graphics in the Annex 16. The Annex includes also the aggregated results for the six LoCaRe countries and regions (it is important to recall that the several figures for the LoCaRe regions have been estimated through simulations based on regional GDP compared with national GDP. Consequently, the regional figures cannot be used for official purposes ,but the aggregate figures can give good indication for LoCaRe policy-action).

The following graphics represent the main results of the graphic analysis in the LoCaRe Countries and Regions ,between 2005 and 2020:

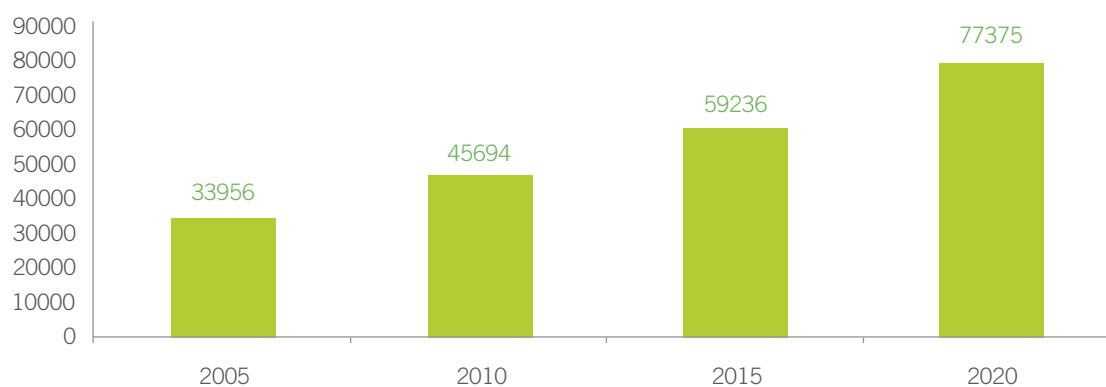


Regions Gross final energy consumption (ktoe)

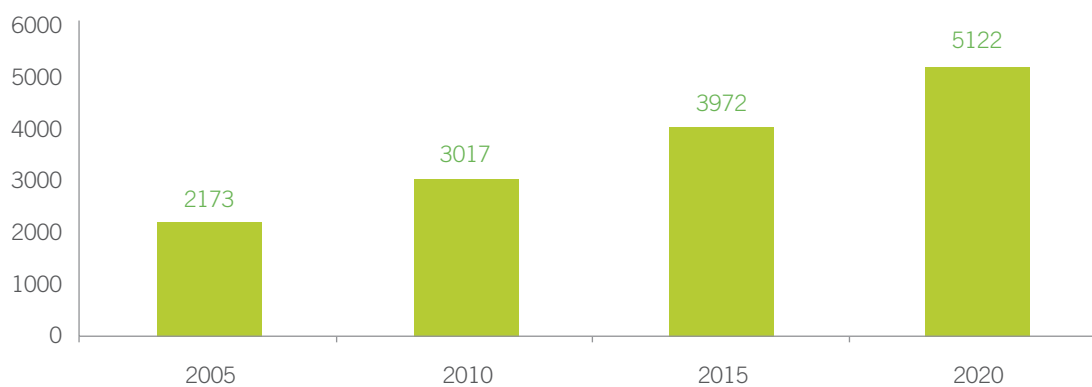


The gross final energy consumption from renewable sources in the LoCaRe Countries and Regions should be as follows:

Countries Expected total RES consumption (ktoe)

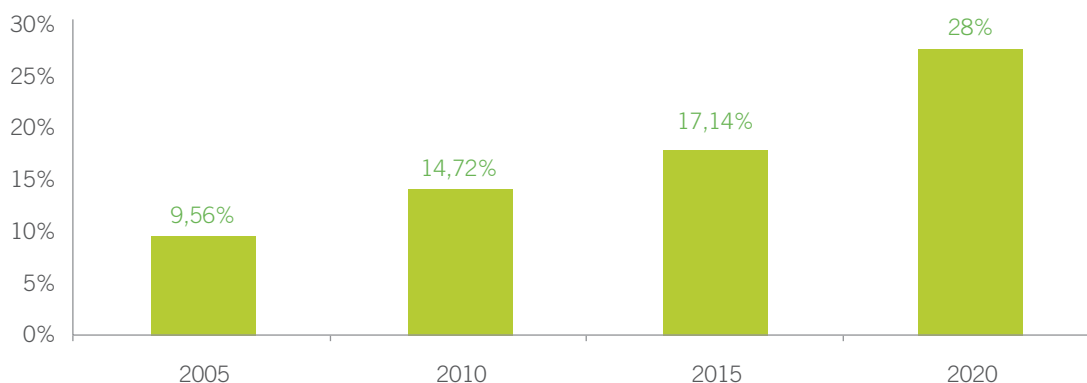


Regions Expected total RES consumption (ktoe)

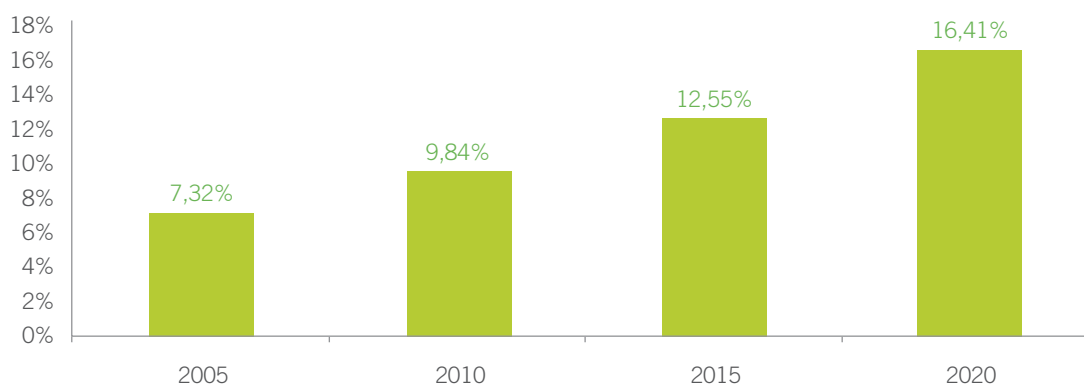


And the share of energy from renewable on the gross final energy consumption:

Countries Energy from renewable sources in gross final energy consumption (%)

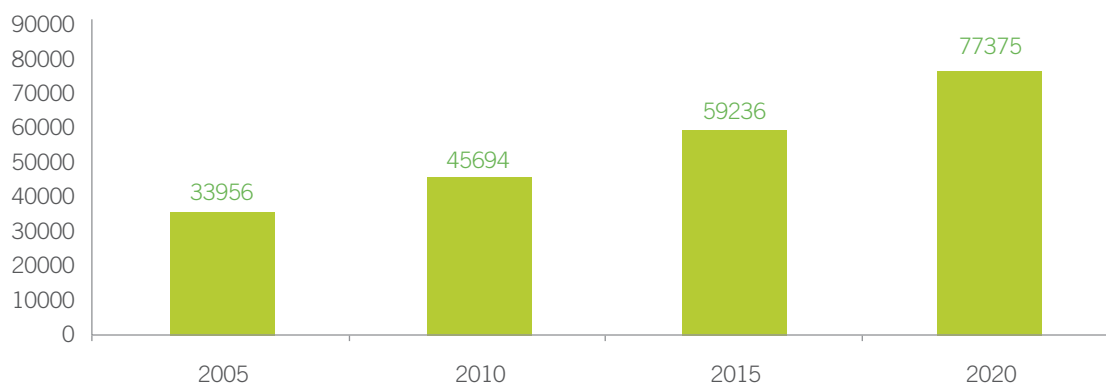


Regions Energy from renewable sources in gross final energy consumption (%)

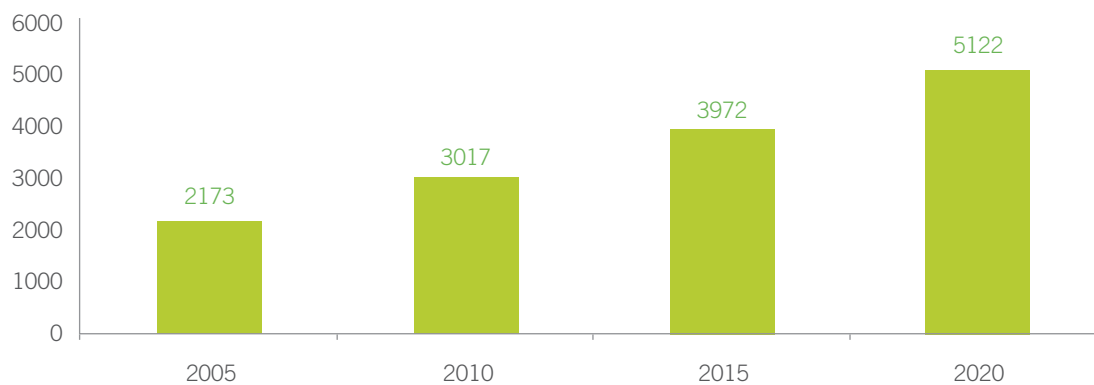


The result is that the aggregated gross final energy consumption from renewable will increase as follows:

Countries Expected total RES consumption (ktoe)

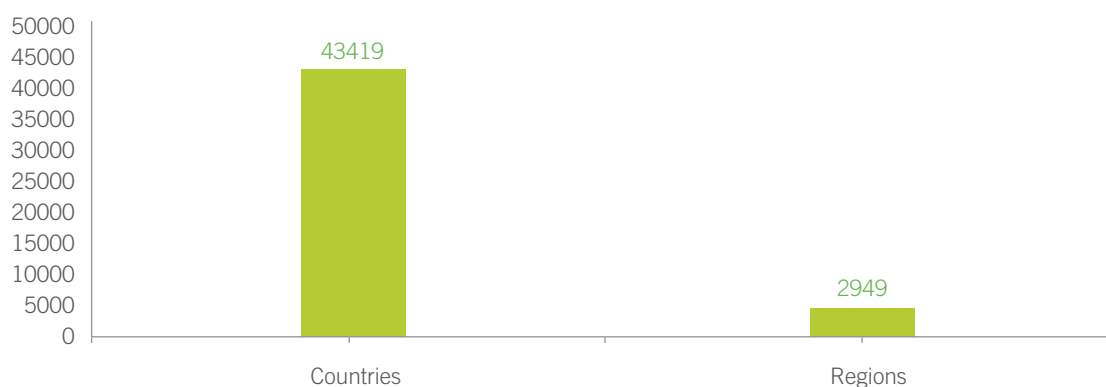


Regions Expected total RES consumption (ktoe)

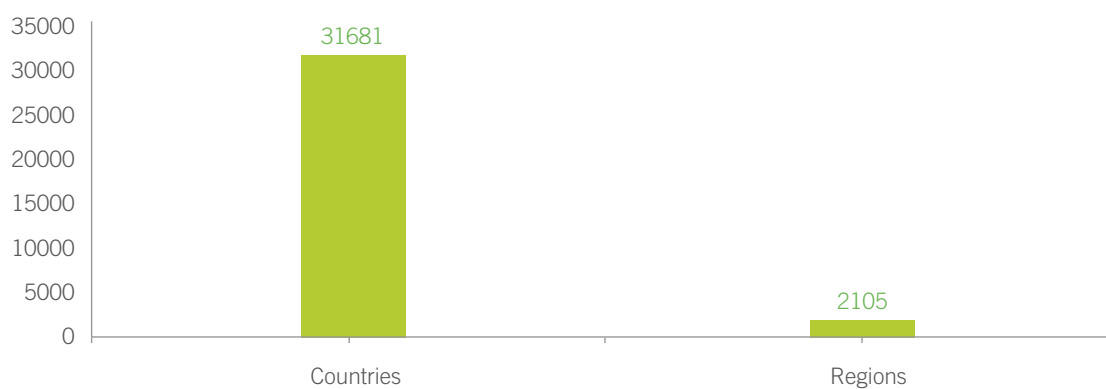


And the increase on the period 2005/2020 and 2010/2020 of gross final energy consumption from renewable:

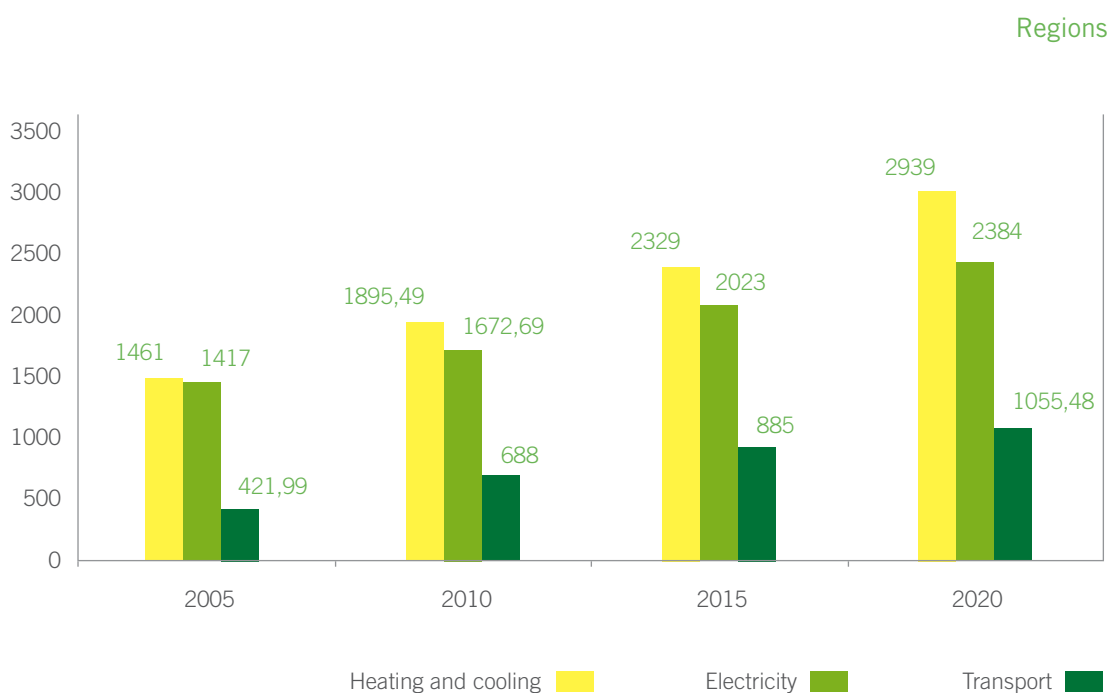
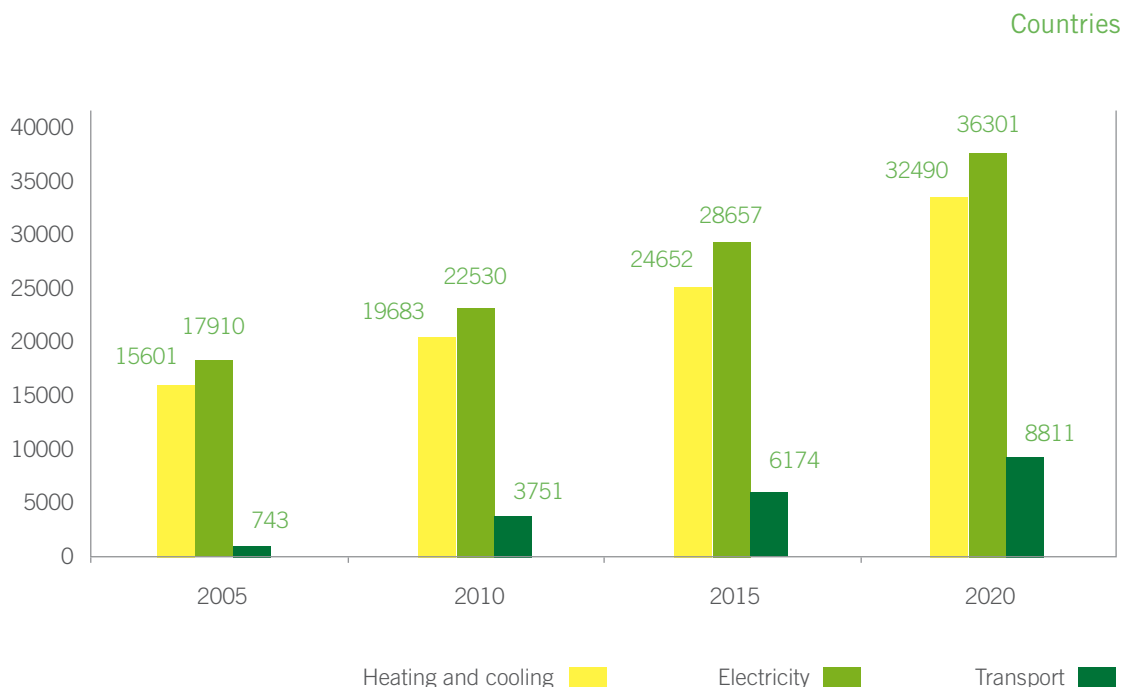
Graphic 10. Increase on gross final energy consumption from RES 2020-2005 (ktoe)



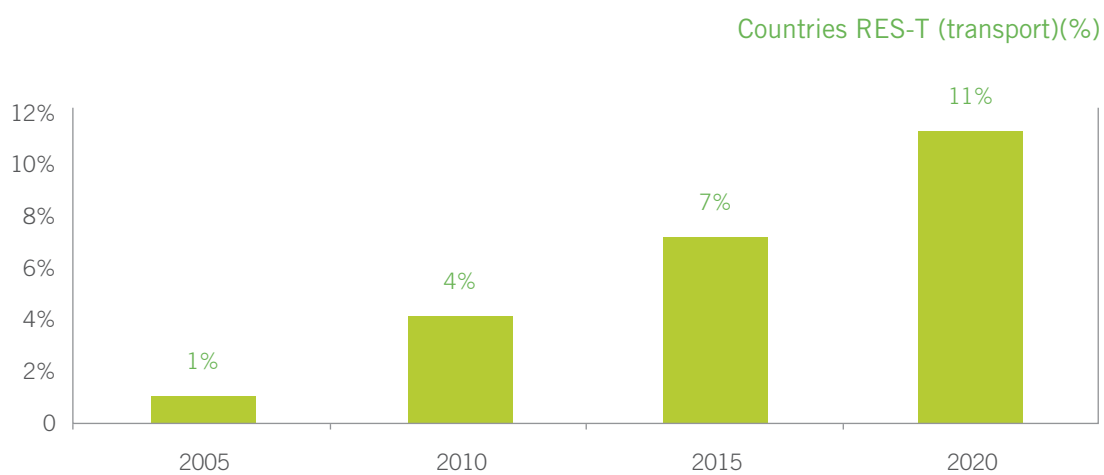
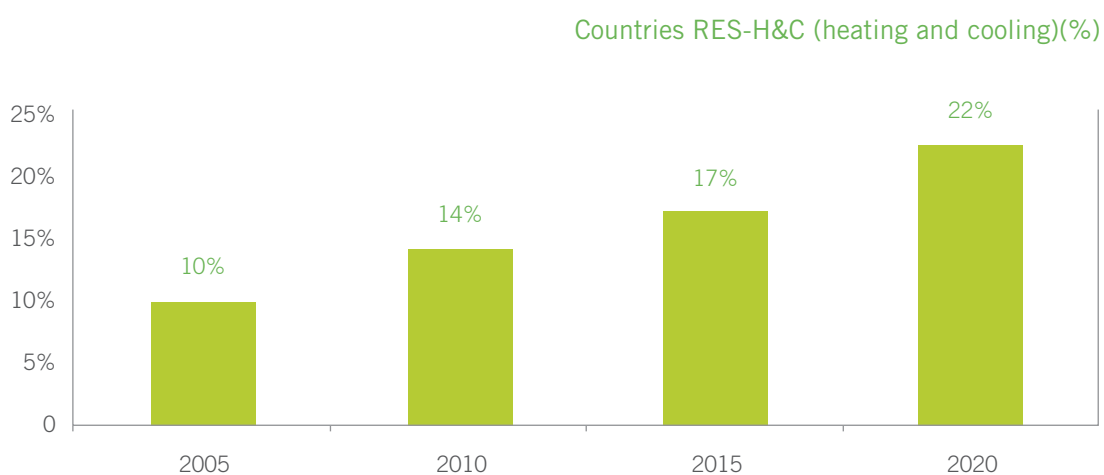
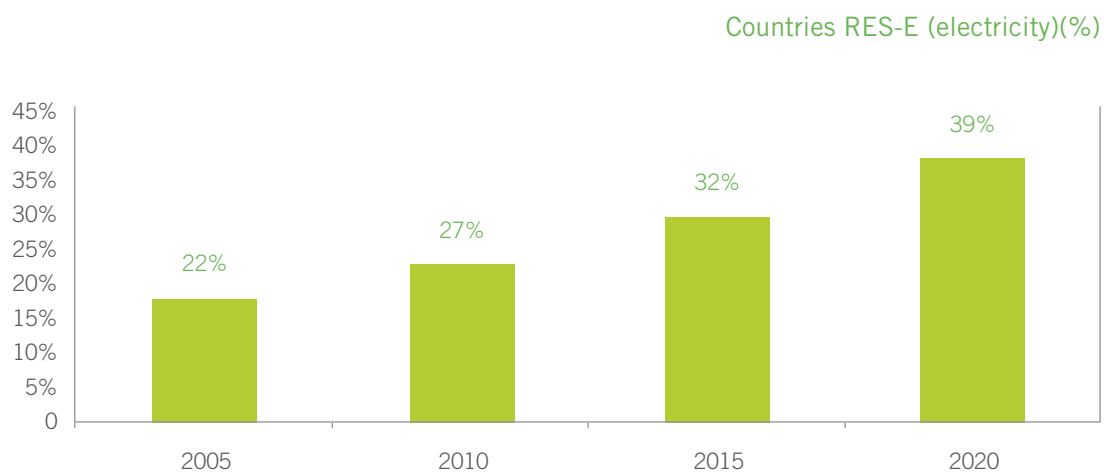
Graphic 10 bis. Increase on gross final energy consumption from RES 2020-2010 (ktoe)



The “Analysis” has made an appraisal of the estimated gross final consumption of energy from renewable on the three sectors: electricity, heating&cooling and transport. The result for the LoCaRe Countries and regions is as follows:

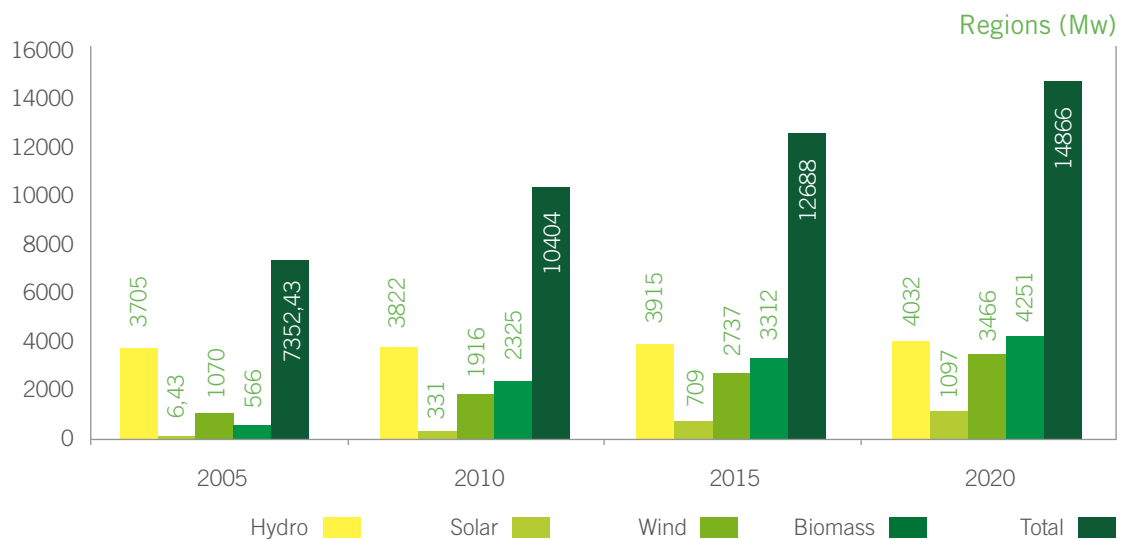
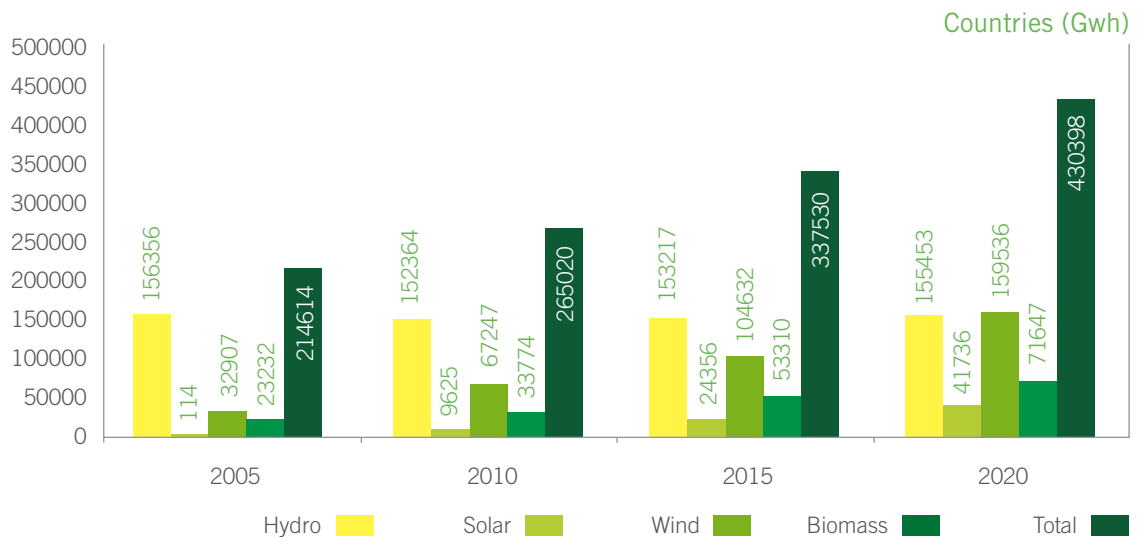
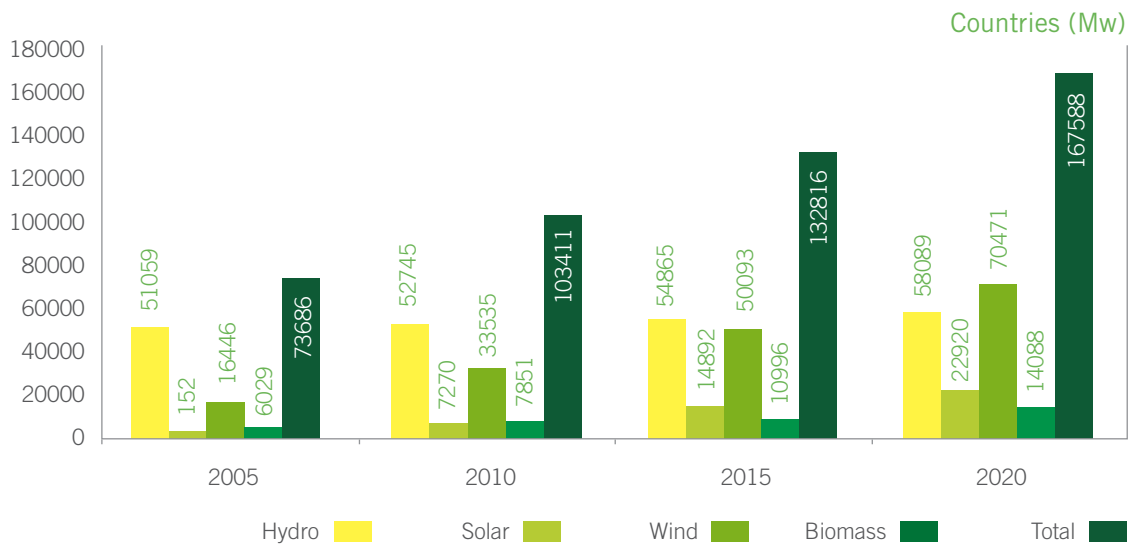


The trajectories of the share of energy from renewable on the LoCaRe countries by sectors are:

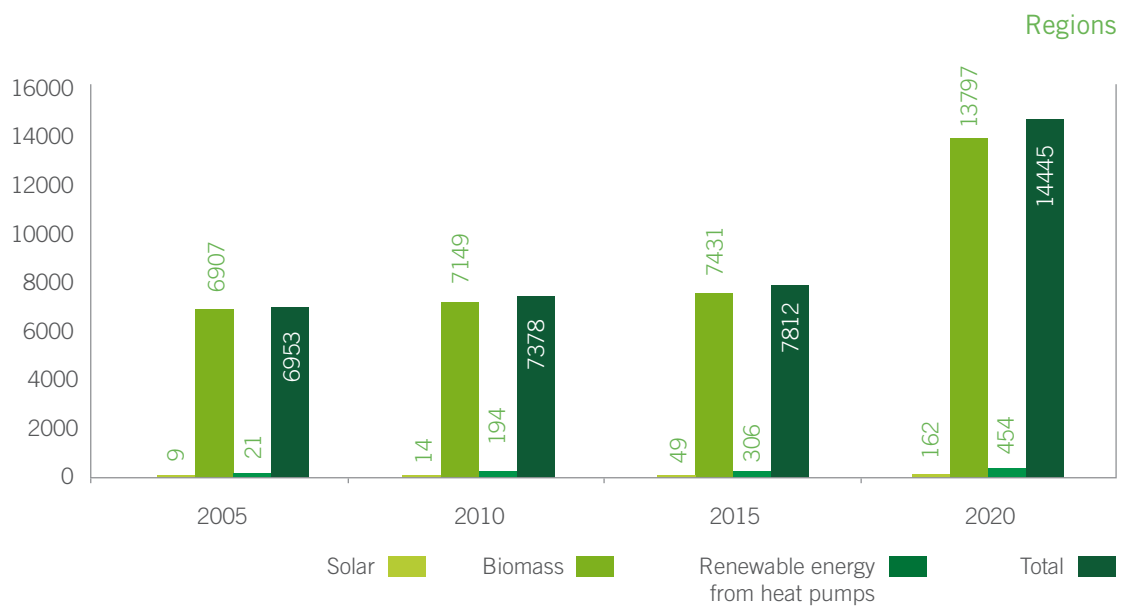
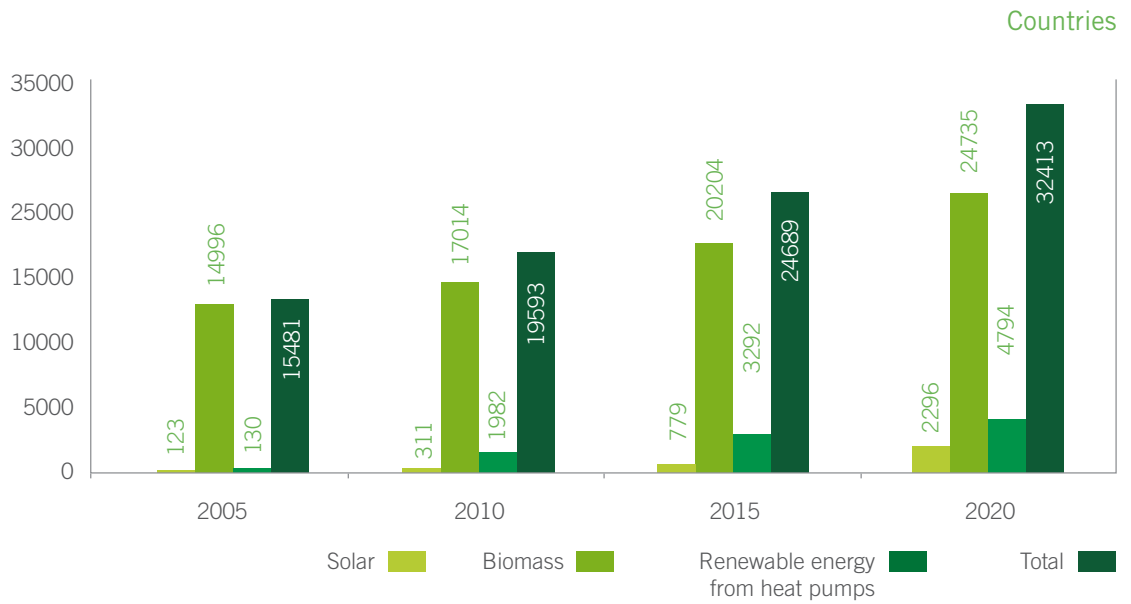


The development of energy from renewable is technology driven. Consequently It is important to have one idea of the trajectories of the diferent technologies, on the three sectors:

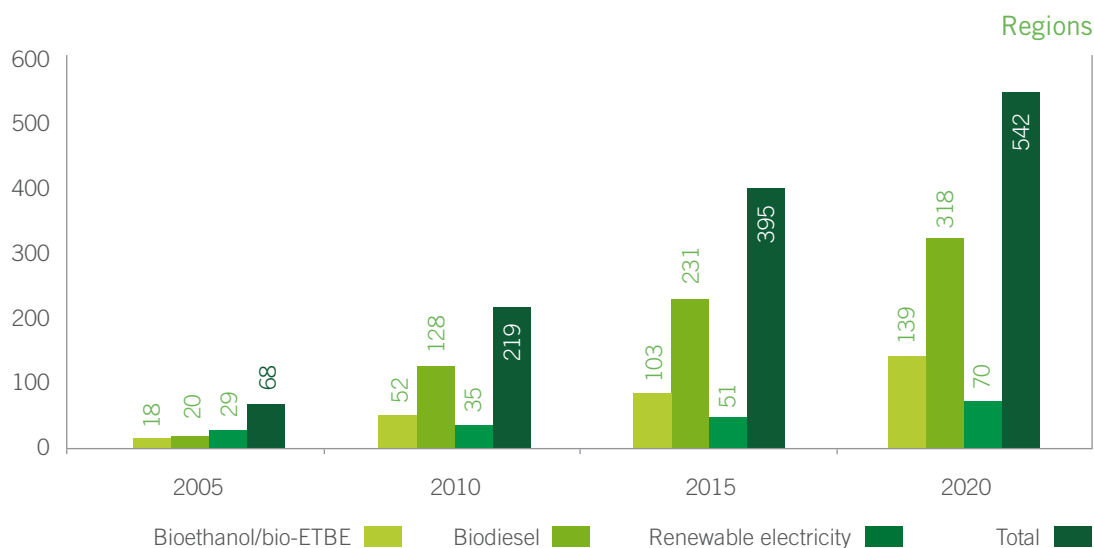
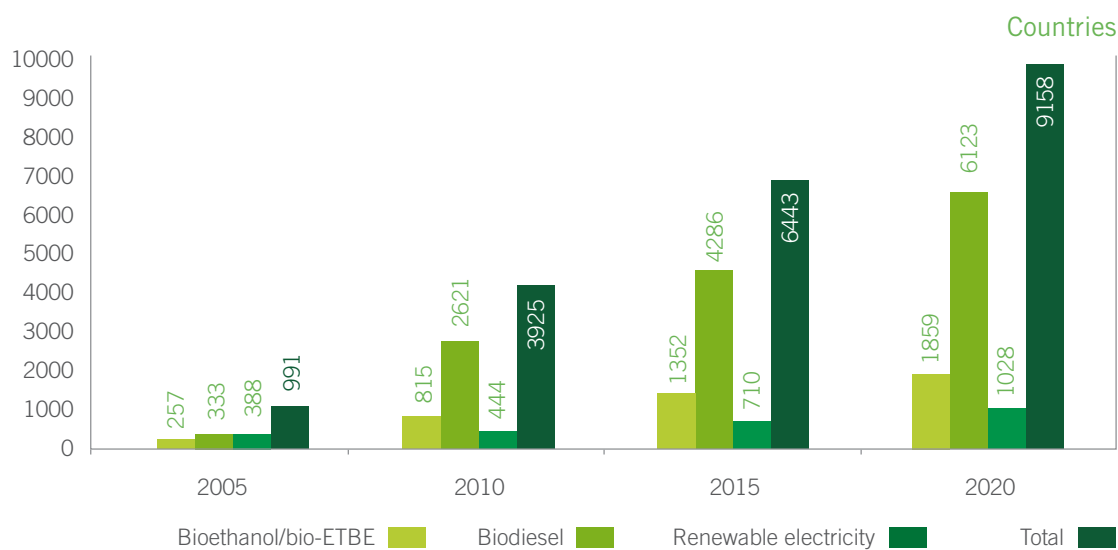
Electricity technologies:



Heating and Cooling technologies:



Transport technologies:



The main conclusions on the energy trajectories for the LoCaRe regions on the period from 2010 to 2020, are the following:

- The Gross final energy consumption is expected to increase on the period 2020/2010 by 886 ktoe, that means 3,13%.
- But the expected energy consumption from renewable sources is expected to increase on the period 2020/2010 by 2105 ktoe, that means by 70% .
- The expected increase on the period 2020/2010 of energy from renewable is near 2,4 times the increase of Gross final energy consumption; that means that energy from renewable is expected to cover the increase on final energy consumption and besides to replace aprox. 1219 ktoe of conventional energy.
- The share of energy from renewable on Gross final energy consumption on the LoCaRe regions is expected to increase from 7,3% in 2010 to 16,4 % in 2020.

•The share of electricity and energy for heating&cooling from renewable sources is expected to be multiplied by two on the period 2020/2010.On the transport sector, the multiplying factor is expected to be near three.

•The GHG emissions are expected to decrease by 15,67 Mt CO₂ equivalent, that means by 21,76%.

The **market for the renewable technologies** on the LoCaRe countries on the period from 2010 to 2020, as it can be deducted from tables 10 to 12 of the NREAPs notifications, is the following:

Technology	Electricity Capacity (Mw)	Heating&Cooling (ktoe)	Transport (ktoe)
Hydro	5.344		
Geothermal	166	302	
Solar	15.650	1.985	
Tide,wave,ocean	103		
Wind	36.936		
biomass	6.237	7.721	
Renewable from heat pumps		2.812	
Bio-ethanol			1.044
Biodiesel			3.502
Electricity from renewable			584
TOTAL	64.436	12.820	5.233

3.3-SPECIFIC MEASURES FOR ACHIEVING THE TARGET

The following chapter means mainly, but not exclusively, with measures that could be implemented at regional and municipal level. Some indications are also given on the measures that are applied at national level in order to reflect the context in which many of the regional and municipal measures should be implemented

3.3.1. Administrative procedures and spatial planning

In the LoCaRe countries, the State has legislative power whilst the regions have administrative power. The regions are responsible for the administrative duties relating to energy - including renewable sources - that were not reserved for the State or assigned to local authorities.

National legislation concerning the authorization, certification, licensing procedures and spatial planning applied to energy plants and associated transmission and distribution network infrastructure is typically:

- Environmental Management Act
- Spatial Planning Act
- Flora and Fauna Act

- Nature Conservancy Act
- Housing Act
- Public Works Management Act
- Government Coordination Scheme

In the regions, there are regional government authorities and administrative boards that have the task of coordinating and implementing the targets and mandates stipulated by the national authorities. The administrative boards are also, in this context, involved in supervision and issuing licenses, primarily in the area of the environment such as environmentally harmful activities. They also have promotional duties and advise the municipalities of the region as well as administer funding for areas such as energy efficiency and energy conversion.

At the local level, the municipalities make decisions with a high level of autonomy within their geographic area, including taking charge of the spatial planning, with the support of the municipal planning monopoly. They also have licensing and supervisory duties for smaller plants and they control much of the physical sitting through their planning activities. These competences are very important for local action on energy efficiency and renewable in buildings, district heating infrastructure development, use of renewable for heating and cooling, small technologies and biofuels, among others.

Concerning the environmental impact assessment (EIA), the responsibilities either at national or at regional level, rely on the size of the project. The administrative procedures for licensing and authorization of plants can differ from one region to other, but a typical example could be Denmark: in this country *“ the appropriate approvals and permissions in accordance with the Planning Act are issued by local authorities for wind turbines up to a height of 150 meters, cf. below. Permission for wind turbines higher than 150 meters will be approved by the Regional Environmental Centers, in accordance with EIA rules in the Planning Act, following an EIA. The Climate and Energy Minister approves authorisations for geothermal energy. Local authorities are responsible for the EIA of renewable energy installations, including wind turbines under 150 meters. The Environmental Centers are responsible for coordinating and carrying out EIAs for wind turbines over 150 meters. The local authorities have an important role to play in connection with approval of projects for combined heating supplies. The local authorities can also carry out heat planning in for the area in cooperation with the supply companies and other related organisations. The Consolidation Act on the approval of projects for combined heating supply installations states that the District council, which is the body that approves heating projects, must ensure that heating planning is included in the spatial planning .At the same time, local authorities are able to stipulate requirements in their local plans that new buildings in a given area should be low-energy buildings”*

In the case of Asturias, the National Government has competence to enact basic legislation in connection with energy and environment. However, the National Government is not allowed to regulate the authorization procedure for plants where authority for concession has been transferred to the Autonomous Communities. With regard to urban planning, the Spanish Constitution provides that the self-governing Autonomous Communities “may assume competences over town and country planning and housing”. Asturias has higher delegated powers than other LoCaRe regions.

In most of the LoCaRe countries, the **spatial planning** is a concern of the municipalities (the so-called ‘municipal planning monopoly’). Currently, the Spatial Planning Acts could regulate:

- The spatial integration of renewable energy installations and the associated network structure;
- The preparation of structural visions at municipal, provincial and national level, such as a regional or provincial environmental plan;
- Land use designation at municipal level. Specifically in the case of renewable energy projects in rural areas, it is important to ascertain whether these tie in with the activities of existing agricultural businesses.

Nevertheless, the capacity of the LoCaRe regions for spatial planning and spatial management is reduced, with the exception of the Autonomy of Asturias, which *“may assume competences over town and country planning and housing”*. In other LoCaRe regions the central government has developed “Coordination Schemes” that are incorporated in the Spatial Planning Act. Regional spatial planning applies more in the case of renewable energy projects and the Government Coordination Schemes applies normally depending on the capacity of the installation. The region of Emilia-Romagna has launched on the Gijon Conference an interesting idea consisting on “promoting self-regulating actions such as production-chain agreements, as opposed to territorial planning tools concerning energy”

Spatial planning is important for sustainable urban development. In Sweden the Planning and Construction Act is targeted at the part of the municipalities’ work on planning that concerns the utilization of land, water and the built environment. The Act regulates urban development through planning examination of licensing applications and supervision. The spatial planning is a concern to the municipalities.

The infrastructure for energy systems, transportation, waste management, etc. is to be integrated into the town planning and designed in order to reduce the consumption of resources and energy and impact on the climate. The physical and spatial planning must be based on programmes and strategies for how to achieve increases in efficiency in energy consumption in order to decrease this consumption in the long-term, how to protect renewable energy resources and how to promote the development of production facilities for district heating, solar energy, biofuels and wind power.

Spatial planning has also a European dimension on the definition of an integrated and coordinated approach for offshore wind energy deployment. The LoCaRe regions could support the proposal of the European wind association EWEA for the maritime spatial planning (MSP) between the Member States and regions.

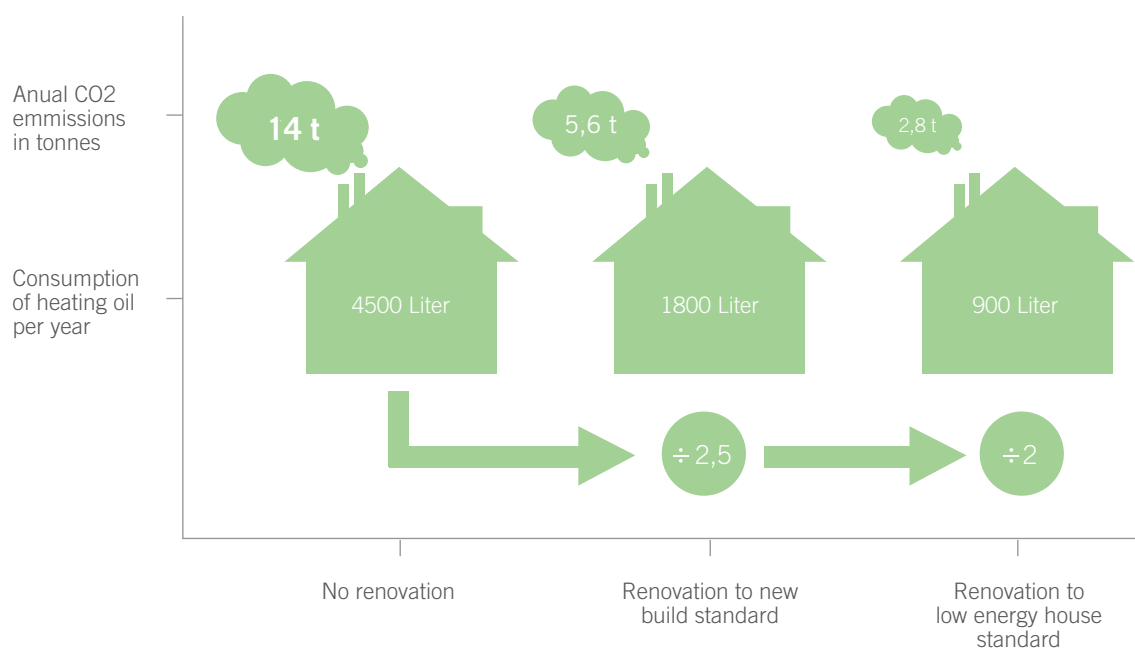
The conclusion for the LoCaRe regions on the procedures for authorization, certification, licensing and spatial planning applied to plants and associated transmission and distribution network infrastructure, is that coordination among the national/regional and municipal authorities is of paramount importance. Several LoCaRe countries has initiated a process to reach a regional consensus regarding the energy and climate issues in broad collaboration with the municipalities, real estate companies, municipal energy companies, transportation companies, commercial enterprises, government agencies, nonprofit organizations, colleges and cooperative and autonomous bodies, etc. Now for the first time many regional administrative boards have been able to gain an overview of the challenges and opportunities facing the counties in relation to energy and climate. The LoCaRe countries are fostering coordination among different administrative levels, through schemes such as the “County administrative boards” in Sweden, the “Government coordination scheme” in Netherland or the “Service Conference” in Italy.

3.3.2. Buildings

Buildings are likely the most important sector for energy /climate policy implementation at local (municipal) level. The LoCaRe countries have notified on the NREAPs the measures that they have the intention to carry out on the period 2010-2020 for improving the energy efficiency and for increasing the share of renewable in buildings.

Households is one of the main sectors for intervention, as it can be noted on the following graphic:

What improving energy efficiency means for a single family house of the 70s (150 m² in D)



There are various national **legislative regulations** regarding energy efficiency and the use of renewable energies, some of which involve local authorities. There are limited **regional** provisions regarding renewable energy in the building sector. At a regional level there are plans and targets for the phasing-out of fossil fuel for heating by means of the regional climate and energy strategies. One example of regional provisions is Emilia-Romagna Region that since 2008 has specific rules on energy efficiency buildings in compliance with the Directives 2002/91/EC and 2006/32/EC which also support the measures of the Regional Energy Plan on reduction of CO₂ emission in atmosphere. In 2009 the Region also adopted its own energy certification system.

The current use of renewable energy sources for heating and cooling in buildings is comprised partly of the local use of renewable energy in the form of biomass, solar heating (etc.,) and partly of renewable energy sources in the district heating supply system. The latter is extremely important in several LoCaRe countries and regions, where substantial share (i.e. in Denmark around 40%) of the gross final energy consumption for domestic heating comes from district heat (about 25 % for single unit and 82 % for multiple units in Denmark) and high part (about 65 % in Denmark) of consumption for heating of commercial premises (incl. the public sector)

comes from district heating. Almost half of Danish district heat is produced from biomass and organic waste. A considerable contribution to the expansion with renewable energy is expected to come from district heat and cogenerated heat based on biomass.

Nevertheless in other regions, such as Asturias, heating networks using any fuel are scant and their role in supplying buildings and industry is negligible. There is a serious handicap for the development of renewable for heating and cooling in Spain.

The LoCaRe regional and municipal authorities have capacity to enforce obligation for publicly-owned buildings or buildings for public use to meet their energy needs by favoring the use of renewable energy sources, unless there are technical or financial obstacles to this. In the case of Denmark, the government decided that the state must reduce its energy consumption by 10% in 2011 in relation to 2006. Local Government Denmark (the association of local government authorities) entered into an agreement with the Minister of Transport and Energy in regard to energy saving in local authorities. In this agreement, local authorities must meet the same requirements as were applicable to the state at that time. This meant that local authorities must introduce energy management and implement the energy savings required by the energy marks, which have a reimbursement time of up to five years.

In Spain, the central government has introduced limitations of a maximum temperature in winter and a minimum temperature in summer in the ministerial buildings, with the objective to save energy and reduce the energy bill by 10%. Moreover, the central government has launched a public procurement on the management of energy in public buildings by energy services private companies.

Concerning new buildings, local authorities are able via their local plans, to require that all new buildings in a given area must meet the low-energy criteria stated in the Building Regulations that could go further than the binding requirements. This will help promote the use of renewable energy and increase the relative share of renewable energy via reduced consumption. A number of local authorities have taken this up.

In conformity with the Directive on the Energy Performance of Buildings (2002/91/EC and 2006/32/EC), some LoCare countries are considering the introduction in the new buildings alternative systems that are technically, environmentally and economically viable. Alternative systems refers, for example, to decentralized energy supply systems that are based on renewable energy, combined heat and electricity generation, district heating/small-scale district heating or district cooling/small-scale district cooling, if available, heat pumps, under certain conditions, and this must be considered before building commences.

Several LoCaRe countries, such as Sweden, Denmark and Netherland are regarding the so-called "virtually zero energy buildings". The national plans be drawn up to increase the number of buildings for which both CO₂ emissions and the consumption of primary energy are low or equal to zero.

Finally, the renewable directive stipulates that Member States shall ensure that new public buildings and existing public buildings that are subject to major renovation, at national, regional and local level fulfill an exemplary role in the context of this Directive from 1 January 2012 onwards.

The Member States have introduced a number of support measures aiming to improve energy efficiency and increase the share of renewable in building. Asturias is implementing the plan RENOVE for the refurbishment of building blocks. Denmark and Spain have introduces support schemes for the scrappage of oil-fired boilers combined with a subsidy for the purchase and installation of an energy efficient heating system. Sweden is promoting the phasing-out of fossil-fuelled heating and funding for certain renewable heating and electricity for converting from direct-acting electricity in favor of renewable energy.

3.3.3. Information provisions on the promotion of RES and RUE

The LoCaRe countries are engaged in information and awareness raising campaigns and programmes. Most of the countries have a long tradition of informing and involving the public on questions regarding the promotion of renewable and energy efficiency.

Typically, the information regarding renewable energy and subsidy schemes is available on the websites of the various ministries. Links are also provided to energy/climate agencies and organizations and stakeholders that can provide information on renewable energy.

The information on subsidy schemes should be found on the website of the Agencies.. The website should comprises a large number of sub sites geared towards the use of renewable energy by specific target groups (cities, buildings, vehicles) or the use and generation of renewable energy (heat, electricity, biofuels). The National Agencies (Swedish Energy Agency, Agentschap in Netherland, IDAE in Spain, ENEA in Italy, etc) should also have a helpdesk where information on subsidy schemes and other relevant information can be obtained.

At local level, it is primarily the municipal and regional authorities that inform citizens and companies on the generation and use of renewable energy, in some cases with the help of regional Energy Agencies, as it is the case of FAEN in Asturias. There exist a number of agreements and covenants between the National, Regional and Municipal organizations that focus on the intensification of local and regional climate policy and on the collaboration with market players with climate ambitions.

The European Union is implementing a number of programs, aiming to:

- Find energy solutions for better buildings (BUILD UP),
- To spread best practices and to build alliances among sustainable energy stakeholders serving as a platform for new ideas and actions (Sustainable Energy Europe),
- Support local communities in developing and demonstrating concrete strategies and actions that are both sustainable and highly energy efficient (CONCERTO)
- Provide training, workshops and online events targeting energy professionals and managers of energy agencies by supporting the work of actors working on energy efficiency and renewable energies at the local and regional level (ManagEnergy)
- Commit local sustainable energy in cities (Covenant of Mayors)
- Deliver on the ambitious targets that the EU has set for itself to sustain the competitiveness of its economy while fighting climate change, by supporting a number of projects under the heading “sustainable energy communities “through the Intelligent Energy Europe (IEE).

Members of LoCaRe and other interested bodies could find best practices and tailored made solutions by surfing on the web site of these programmes (see Annex 18).

3.3.4. Electricity infrastructure and grid operation

In the LoCaRe countries, the electricity generation from decentralized co-generation plants and electricity generation installations that produce electricity from renewable energy or use waste products as fuel, have priority access to the grid. The transmission and network companies have a commitment to ensure the sufficient and efficient transport of electricity and associate services. Distribution and transmission of electricity from renewable energy sources is guaranteed via the requirements for the network and transmission companies to ensure sufficient and efficient transport of electricity and connection.

The principle of the priority or guaranteed access to the grid and that the transmission system operators, when dispatching electricity generating installations, give priority to those using renewable energy sources is fundamental for the promotion of electricity from renewable and for the proper integration on the internal market of electricity. Such a principle has been enforced by the national legislation of all Member States.

In order to maintain the balance and supply stability of the network that enable the integration of variable resources, it is important that the market and grid design could cover measures such as trading closer to real time (changing from day-ahead to intra-day forecasting and rescheduling of generators), aggregation of market areas, ensuring sufficient cross border interconnection capacity and trade, improved cooperation of adjacent system operators, the use of improved communication and control tools, demand-side management and active demand-side participation in markets (through two-way communication systems — smart metering), increased distributed generation and domestic storage (e.g. electric cars) with active management of distribution networks (smart grids).

Strong connections with neighboring countries and regions are of vital importance for the inclusion of electricity from renewable sources. This will also be the case in the future. The increased input of electricity from renewable energy sources will be facilitated both by expanding connections to neighboring countries and by national initiatives, further levels of integration and interconnection. Several LoCaRe countries and regions are facing problems for the construction of new transport and transmission lines and this opposition jeopardizes the development of electricity from renewable. A case is the region of Asturias that has serious problems for the interconnection with neighboring regions because of the existing of some protected areas.

The LoCaRe countries have notified on the NREAP a number of projects for the interconnection with neighboring countries. The success histories are the grids of Sweden and Denmark that are integrated on the Nordel Regional network (now replaced by ENTSO-E). The following new interconnections are included in Denmark's planning:

- The Great Belt connection (600 MW) connecting East and West Denmark. The connection will be operational in the second half of 2010
- Skagerrak 4 to Norway (700 MW). Authorisation has been applied for with expected operation in 2014
- The Cobra cable to Holland has also been included in planning, but not yet applied for
- Combined grid solution at Kriegers Flak (600 MW) to Germany (the project also requires a decision on the erection of offshore wind turbines)
- Sweden is planning several new lines in order to reinforce the interconnection with Norway and Finland (this are the case of A new 400 kV Nea–Järpströmmen transmission line between Norway and Sweden, that will increase the transmission

capacity by approx. 500MW, the new Fenno-Skan 2 DC current connection with 800MW transmission capacity between Sweden and Finland, the new VSC-HVDC multi-terminal connection, SydVästlänken (the South-West Link), in southern Sweden and between Sweden and Norway. It will enhance the transmission grid by 1200MW both in southern Sweden and between Sweden and Norway. In addition to these, a new DC current connection VSC-HVDC between Sweden and the Baltic States (NordBalt) is planned, with a capacity of 700 MW)

It is very important for Spain to establish international connections with France because, in addition to increasing security of supply, this would allow for the integration of a greater volume of renewable and increase electricity trade with the rest of Europe. Current planning envisages two new connections with France, one through the Eastern Pyrenees and another through the Central Pyrenees. The first of the two is the Santa Llogaia-Baixas line, whose definitive technical solution involves a double direct-current circuit with 2,000MW of capacity that is expected to come into operation in 2014.

The European Union is very active on promoting transeuropean electricity networks, which objective among others is contributing to sustainable development and protection of the environment, inter alia by involving renewable energies and reducing the environmental risks associated with the transportation and transmission of energy.

On 17 November 2010, the European Commission has adopted the [Communication “Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network”](#). The European Commission proposes in its Communication to ensure timely integration of renewable generation capacities in Northern and Southern Europe and further market integration, the European Commission proposes to focus attention on the following priority corridors, which will make Europe’s electricity grids fit for 2020:

- 1. Offshore grid in the Northern Seas and connection to Northern as well as Central Europe** – to integrate and connect energy production capacities in the Northern Seas with consumption centers in Northern and Central Europe and hydro storage facilities in the Alpine region and in Nordic countries.
- 2. Interconnections in South Western Europe** to accommodate wind, hydro and solar, in particular between the Iberian Peninsula and France, and further connecting with Central Europe, to make best use of Northern African renewable energy sources and the existing infrastructure between North Africa and Europe.
- 3. Connections in Central Eastern and South Eastern Europe** – strengthening of the regional network in North-South and East-West power flow directions, in order to assist market and renewable integration, including connections to storage capacities and integration of energy islands.
- 4. Completion of the BEMIP** (Baltic Energy Market Interconnection Plan) – integration of the Baltic States into the European market through reinforcement of their internal networks and strengthening of interconnections with Finland, Sweden and Poland and through reinforcement of the Polish internal grid and interconnections east and westward.

The presentation of South Denmark during the Gijon conference highlighted the importance of regional integration for the development of regional markets development. South Denmark made reference to the European Wind Integration Study (EWIS) and the Scenarios for the Baltic Sea Region, that are important pillars of the shared vision “A green Valley of Europe”

- Exploit wind diversity
- Share reserves & storage
- Maximize CO₂ benefits

- Co-ordinated needed cross-borders impacts already experienced



3.3.5. Biogas integration into the natural gas network

Biogas is a local energy carrier that can be produced out of many different kinds of organic materials and its options for utilization can be equally versatile. Biogas can be used to generate electricity, heat and biofuels. Also the fermentation residues, called digestate, can be used, for example as a fertiliser.

Consequently, biogas is the most suitable renewable energy for local and regional action, even for rural action.

Taking into account these characteristics, it is worth to analyze on this chapter the feedstock for biogas production and the versatility of the main uses.

Today many different feedstock are used for biogas production .A general distinction can be made between **biomass from agriculture** like manure or dedicated crops for biogas and **various waste streams** (see table below).

Biogas feedstocks	
Agriculture	Waste streams
Manure	Landfill
Energy crops, catch crops	Sewage sludge
Landscape management	Municipal solid waste
Grass	Food waste
Other by-products	Other waste

The use of manure for biogas production offers several benefits:

- It reduces CH₄ emissions during the storage of the manure
- It reduces CO₂ emissions by replacing fossil fuels
- It offers an additional energy carrier that does not compete with other uses
- The substrate as final product is a valuable fertilizer

The mix of maize and manure is the most commonly used feedstock for decentralized agricultural biogas plants. Energy crops maximize the yield (dry matter per hectare) and offer high conversion efficiencies.

Biogas covers a variety of markets, including electricity, heat and vehicle fuels.

To get a good combustible gas, the “raw” biogas (typically methane content, CH₄: 50-75% and carbon dioxide, CO₂: 25-45%) is cooled, drained, dried and cleaned from H₂S because of its corrosive effect. The obtained gas can be either applied directly or upgraded to natural gas standard – biomethane (98 % methane).

The typical applications of raw biogas are:

- Production of electricity and heat (cogeneration)
- Production of electricity alone
- Production of heat alone

And the applications of upgraded biogas (biomethane): options as above for biogas and in addition:

- Injection in the gas grid
- Transportation fuel
- High tech process energy
- Raw material for the chemical industry

In the last year different concepts for the organization of biogas plant emerged:

- Decentralized plants on farms etc.: production of electricity and use of heat (but using the heat is often not obvious)
- Decentralized plants in combination with biogas pipelines, transporting the biogas to a cogeneration unit situated in proximity to a district heating system. Therefore the cogeneration can make full use of the heat
- Decentralized plants delivering the raw gas in biogas pipelines to a upgrading station and injecting the biomethane in a gas grid. The biomethane can be used for cogeneration, transportation fuel or high tech process energy.
- Centralized plants in areas with high feedstock availability

Biogas upgrading and injection into the gas grid

Introducing biomethane into the natural gas grids widens up the opportunity to utilize biogas in several ways depending on society needs. An efficient way of integrating the biogas into the entire European energy sectors are by upgrading the biogas to natural gas quality and injecting it into the natural gas grid. This option will be increased due to liberalization of the energy markets in all European countries, but it requires reaching natural gas quality by advanced treatment technologies. It offers a wide range of gas consumers, from house units for heating or fuel cells to decentralized CHP plants, to industrial customers and to larger energy consumers as power plants.

The current bottleneck in this area is the cost of biogas upgrading (e.g. via pressure swing adsorption; amine or water scrubber or cryogenic separation treatment of the biogas). It is obvious that the treatment price will be reduced in coming years due to the increasing numbers of upgrading facilities installed and also by the economically downscaling of the upgrading facilities fitting to the modular biogas plants existing in Sweden and Denmark. The coming decade will boost this development, when the installed capacities are increasing rapidly in numbers exemplified by the Sweden and Denmark biogas growth rate in this decade.

Sweden is a good case for biogas. Due to its relatively low prices for electricity, Sweden has traditionally used biogas for heat production (today around 50 % of biogas) and focused less on electricity (8 %). About 25 % of the produced biogas is upgraded and used as vehicle fuel (the rest is flared or used for other applications). The upgraded biogas is injected into the existing natural gas grid in 7 sites with an injection capacity of 220GWh (replacing 2 % of the natural gas in the system). The injection capacity is planned to increase to 1.6TWh (10-15 % renewable in the natural gas system) within 5 years.

The market for biogas as vehicle fuels has been growing rapidly in recent years. In Sweden there were in 2008 17.000 vehicles driving on upgraded biogas/natural gas. There are currently 38 upgrading plants and in 2008 about 25% of Sweden's biogas production was used as vehicle fuel and 60 % of the total gas volume sold as vehicle fuel was biogas and only 40 % consisted of natural gas.

The awareness of the advantages of biogas is increasing, such that the demand for biogas as a vehicle fuel is greater than the supply in some regions, such as the Stockholm area. New technologies for the purification and transport of biogas have been developed and the number of filling stations for biogas in Sweden amounts to more than 120 and the number are continuously increasing.

The realistic biogas potential in the EU27 until 2020 is 39,5Mtoe, out of which 31,3Mtoe from agriculture, including the 6Mtoe from manure, and 8,2Mtoe from waste. This potential should be compared with the production of 5,9Mtoe in 2007 and correspond to a yearly growth of 20%. The indicative benchmark of the biomass production by 2020 is of 1Twh (86ktoe) primary energy from biomass per 1 Million people. That means that an objective for the LoCaRe regions for 2020 is:

-Vastra Gotaland.....	132ktoe
-Southern Denmark.....	102ktoe
-Zeeland.....	33ktoe
-Asturias.....	91ktoe
-Emilia-Romagna.....	358ktoe
-Gorenjska.....	17ktoe
Total LoCaRe regions.....	733ktoe

The LoCaRe Analysis recommended that until 2020 at least 35% of the manure, 40% of the available organic waste suited for biogas production and the sludge of water treatment is used to produce biogas. If this raw material is supplemented by energy crops, cultivated on 5% of arable land, biogas could contribute in average 2 to 3 % of the electricity production, 1 – 2 % of the transportation fuels and 1 % to the heat supply. Each member of LoCaRe shall elaborate a biogas concept within the regional action plans that defines in detail the contribution of energy from biogas to the heat, electricity and fuel market.

In a second step the measures will have to be defined in cooperation with national authorities that will be taken to reach these targets. Important measures in this context are:

- The integration of the waste policy of the communities in the energy concept
- The financial support for the needed infrastructure such as biogas pipelines, upgrading stations, biogas plants, heat networks to use the heat from cogeneration plants
- Various incentives to increase the number of gas driven vehicles
- Feed in tariffs especially conceived to use manure and green cuttings or catch crops for biogas production
- Green certificate schemes in favor of biogas (for countries without feed-in tariffs)
- Fair grid access for biomethane without fees for using the grid

Finally, it is illustrative to report on how a country as Netherland, that is very rich on natural gas ,is dealing with the promotion of biogas. The government of Netherland and a number of market players on a regional scale has carried out studies aiming to assess the need to expand the gas grid infrastructure for promoting the integration of gas from renewable sources.

A wider study into the potential for biogas for a specific regional area where a problem area has currently been identified is being carried out on behalf of the government of Netherland in order to determine the possible future plans of undertakings.

This study is collaboration between the relevant regional system operator, the national system operator, the national government and the provincial authority. As well as providing a specific network integration solution for the area concerned, the study also offers instructive ideas and suggestions for a further inventory of the required gas grid infrastructure at national level. The aforementioned studies will serve as examples for other regions.

In various regions, market players are focusing attention on the development of (green) gas hubs as a means of achieving network integration of gas from renewable energy. Various fermenters are working together to clean, process and feed green gas into the gas grid and are aiming to achieve economies of scale in this way. These economies of scale also make it economically viable at an earlier stage to feed the green gas into the high-pressure network.

The national system operator is now carrying out a scenario study into network integration of gas from renewable sources on its own initiative.

The conclusion is that the integration of biogas into the natural gas network is a complex issue that request cooperation among local, regional and national authorities, as well as the Transmission System Operators and the natural gas industry. The national authorities shall guaranty, in any case, that transmission and distribution tariffs do not discriminate against gas from renewable sources.

3.3.6. District heating and cooling infrastructure development

District heating is widespread in Sweden and Denmark in comparison to the rest of the LoCaRe countries. District heating is produced mostly by central co-generation plants, decentralized cogeneration plants and district heating plants. It is also produced by a number of peak and reserve load installations as well as some private companies. In the case of Italy, the development of district heating and cooling, above all if these systems are combined with cogeneration, is considered useful for several purposes: energy saving and efficiency, reduction of urban pollution, economic development and employment. In Emilia-Romagna district heating systems have been in use since several years, most of them coming from cogeneration centrals. A special mention deserves the first medium enthalpy (100 °C) geothermal district heating system based in Ferrara which has been working for 20 years. Currently it provides the needs of 14.000 families plus the energy requirements of all public buildings in the city.

In Slovenia, the main objective of the subprogramme in the area of **local energy** is to formulate, adopt, and implement intensive development strategies for local energy, relying on high-efficiency cogeneration of heat and power, RES and district heating and cooling systems.

The case of Netherland (Zeeland) and Spain (Asturias) is different. The Netherlands has a long history of using natural gas and as a result, the gas grid provides very extensive coverage. Spain has small tradition on district heating and a large-scale transition from a natural gas supply to a heat network is not envisaged.

There is great potential for conversion to an increasing use of various forms of renewable energy sources in district heating and this will form part of the expansion with **renewable energy** up to the 2020 target. A new boost to the development of district heating and cooling could be brought about by:

- Utilization of biomass from agriculture / forestry in mountain areas;
- Utilization for energy purposes of waste downstream of the reduction, reuse and sorting process, in accordance with the hierarchy sanctioned by European Directive 2008/98/EC;
- Utilization of waste biomass in agricultural and industrial areas;
- Provision for geothermal heat transport networks, as early as the design and construction stages for infrastructure serving manufacturing and residential areas.

To put these ideas into practice, it will be necessary, in one respect, to clarify the legal framework for district heating (Italy put the question whether or not it falls under local public services).

New forms of direct and indirect support must be added to the existing measures. Instruments are being established which use the white certificates mechanism to promote cogeneration, including in combination with district heating. District heating /district cooling from renewable sources could take advantage of this mechanism, since under the current legislation it is possible to add these incentives for the use of cogenerated heat to those provided for electricity from renewable sources.

Additional measures, for which the involvement of local bodies will be crucial, could relate on the one hand to the introduction of a minimum quota for renewable energy use as early as the design and construction stages for infrastructure serving new manufacturing and residential areas, to be achieved, for example, by building heat transport networks using geothermal heat.

On the other hand, the regions and local bodies will be involved in a process of examining the local pollution levels and/or the local availability of biomass, factors which suggest that more use should be made of district heating and cooling.

Consequently operations will be planned which bring together the national support schemes (usually based on the energy produced and useful heat) with those established by local authorities, which could relate to the creation of networks, for example through long-term loans and guarantee funds.

Additionally, since district heating typically requires a high level of investment and has a long pay-back period, it could be worthwhile setting up guarantee funds allowing access to long-term credit lines to satisfy the increase in investment necessary for developing these networks.

3.3.7. Biofuels and bioliquids

“Biomass means the biodegradable fraction of products, wastes and residues from biological origin from agriculture (including vegetable and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste”.

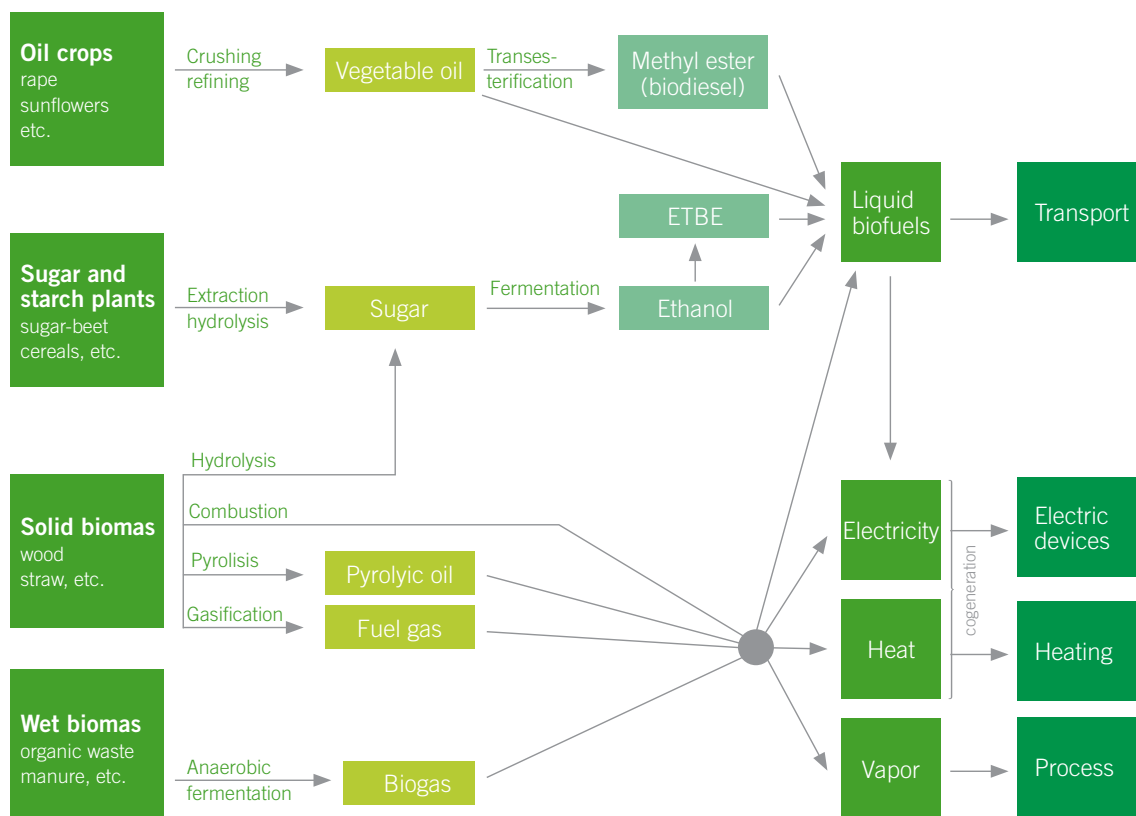
Biomass is the fourth largest technically and economically available energy source in the world after coal, oil and natural gas – and is the largest and most important renewable energy option at present and can be used to produce different forms of energy, thus providing all the energy services required by the society.

Wood is the oldest form of biomass known to mankind. For centuries wood was used for heating, cooking and industrial purposes. Nowadays there is a growing interest in bioenergy that can be used in an efficient way using modern technologies for the production of heat, electricity and transportation fuels. Biomass, used in a sustainable manner, is a regenerative source of energy.

Biomass originates from forest, agricultural and waste streams.

1. Forest and wood-based industries produce wood that is the largest resource of solid biomass. Biomass procurement logistics from forest to bioenergy plants are subject to major improvements. The sector covers a wide range of different biofuels with different characteristics – wood logs, bark, wood chips, sawdust and more recently pellets. Pellets, due to their high energy density and standardized characteristics, offer great opportunities for developing the bioenergy market worldwide.
2. Agriculture can provide dedicated energy crops as well as by-products in the form of animal manure and straw. Available land can be used for growing conventional crops such as rape, wheat, maize etc. for energy purposes or for cultivating new types of crops such as poplar, willow, miscanthus and others.
3. Biodegradable waste is the biomass that can cover several forms of waste such as organic fraction of municipal solid waste, wood waste, refuse-derived fuels, sewage sludge, etc.

Each biomass resource has different characteristics in terms of calorific value, moisture and ash content, etc. that requires appropriate conversion technologies for bioenergy production. These conversion routes use chemical, thermal and/or biological processes. Finally biomass/bioenergy can be classified according to its end use as follows:



The LoCaRe regions can implement policies and actions for Biomass production and consumption, in conformity with the national policy and support measures. A fundamental question on the promotion of bioenergy is to assuring that the sustainability criteria for biofuels and bioliquids are implemented at national level. The LoCaRe countries have notified on the NREAP the national provisions for the compliance with the sustainability criteria as well as the national authority or body nominated to monitor the fulfillment of the criteria.

The NREAP of the LoCaRe countries include a chapter on the specific measures for the promotion of the use of energy from biomass. The chapter includes information on the use of biomass in 2006: both domestic and traded, and forecast for 2015 and 2020. The chapter includes also extensive information on biomass availability classified by the three sectors of origin: A) Biomass from forestry, B) Biomass from agriculture and fisheries and C) Biomass from waste.

It is not possible in this “Analysis” to summarize the information that has been given by the LoCaRe countries, but the members of the LoCaRe project and other interested people can get such information on the [national renewable energy action plans](#) (NREAP) that have been published by the European Commission on “transparency platform”.

3.4- SUPPORT SCHEMES TO PROMOTE THE USE OF ENERGY FROM RENEWABLE SOURCES IN ELECTRICITY, HEAT AND TRANSPORT SECTORS

The LoCaRe countries have set up regulatory, financial and soft support schemes to promote the use of energy from renewable resources in electricity, heating and cooling, and transport.

The financial support schemes contribute to that energy prices reflect external costs of energy production and consumption, including, as appropriate, environmental, social and healthcare costs.

Moreover, when favoring the development of the market for renewable energy sources, it is necessary to take into account the positive impact on regional and local development opportunities, export prospects, social cohesion and employment opportunities, in particular as concerns SMEs and independent energy producers. That is one of the reasons why the “Analysis” encourages local and regional authorities to set targets in excess of national targets and to involve local and regional authorities in drawing up national renewable energy action plans and in raising awareness of the benefits of energy from renewable sources.

The regulatory and financial **support schemes** promoting the use of energy from renewable resources in electricity, heating and cooling, and transport in the LoCaRe countries have been notified on the NREAPs of the LoCaRe countries and are summarized in the following tables:

	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU
Electricity	FIT	x	x	x	x	x		x	x		x	x	x
	Premium				x		x	x	x				
	Quota obligation		x										
	Investment grants		x		x	x				x		x	x
	Tax exemptions		x						x	x		x	
	Fiscal incentives			x			x		x				
Heating	Investment grants	x	x	x	x	x		x		x	x	x	x
	Tax exemptions	x	x				x				x	x	
	Financial incentives			x			x				x		
Transport	Quota obligation	x		x	x	x	x		x	x	x		
	Tax exemptions	x	x		x	x	x	x	x		x	x	x

	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
Electricity	FIT	x	x	x	x	x			x			x	x	x
	Premium						x					x	x	
	Quota obligation		x					x		x	x			x
	Investment grants			x	x	x	x							
	Tax exemptions					x		x	x		x		x	x
	Fiscal incentives						x	x	x			x		
Heating	Investment grants	x		x	x	x	x	x	x		x	x	x	x
	Tax exemptions		x	x				x			x			x
	Financial incentives								x					
Transport	Quota obligation	x		x	x	x		x	x	x	x		x	x
	Tax exemptions	x	x	x	x	x		x	x	x	x	x	x	x

In what concern the LoCaRe countries, the following comments can be made on the three sectors: Electricity, Heating&Cooling and Transport:

Electricity						
	Sweden	Denmark	Netherland	Spain	Italy	Slovenia
Feed in tariffs (FIT)				x	x	x
Premium		x	x	x		x
Quota obligation	x				x	
Investment grant						
Tax exemptions	x		x	x		
Fiscal incentives			x			x

The LoCaRe countries have set up regulatory and economic support mechanisms for the promotion of **electricity** from renewable and for the access to the electricity network. The economic mechanisms range on a variety of schemes, among which:

- “Feed in tariffs” in Spain and for solar electricity in Italy.
- “Green certificates” in Italy and Slovenia
- Operating subsidies, such as the long term financial fund SDE that covers the unprofitable component of sustainable energy projects in Netherland
- Investment support, such as the Environmental investment deduction scheme (MIA and Vamil), the Energy investment deduction (EIA) or the Green investment schemes in the Netherland. Spain and Slovenia have implemented investment support schemes for innovative and pilot projects .In Sweden for biogas installations and in other cases for solar.
- Marketing of wind power. Financial contribution to the development and demonstration of wind pilot projects (Sweden, Netherland)
- Energy tax and carbon tax, as well as tax exemptions (Sweden, Denmark)
- Electricity certificates (Sweden, Slovenia)
- Scrapage schemes for wind turbines (Denmark)
- Promotion of additional burning and combined burning of biomass in coal-fired power stations and the MEP scheme, that is a 10-year subsidy started in 2003 for environmental quality of the electricity produced (Netherland)
- Non-reimbursable grants for investments and incentives for RDT and deployment of the less developed technologies.

The LoCaRe regions can benefit from all this support schemes for the promotion of the generation of electricity from renewable on its territory.

The promotion of **offshore wind energy** and the development of the interconnected electricity network on the region of the Baltic and the North Sea are of particular importance for the regions of Västra Götaland, Southern Denmark, Zeeland and Asturias. The European Wind Energy Association (EWEA) foresees to reach a wind offshore capacity on the Baltic and North Sea region of 40Gw in 2020 and 150Gw in 2030. The market for wind turbines would grow steadily from 1,5Gw in 2011 to 6,9Gw in 2020, with an annual investment that is expected to increase from €3,3 billion in 2011 to €8,81 billion in 2020. The EWEA prospect for 2020 has been

confirmed by the NREAP's, that foresees similar installed capacity. The EU is contributing to these developments through the European Energy Recovery Programme (EERP) and through the NER 300, that has been made available for the financing of low carbon innovative technologies up to 300 million of CO₂ tradable credits (the current value is approx. €4.500 million).

The importance of the development of the offshore capacity for some LoCaRe regions is self-explaining, because most of the foundations, substructures, turbines, as well as the innovative installations vessels, port facilities and others have to be developed near the seaports. This development is also an opportunity for LoCaRe neighbors of the Atlantic, Nord Sea and Baltic Sea for the organization of a "Regional cluster" on oceanic energies. It should be mentioned that in Denmark there is a National Test Centre for larger wind turbines at Østerild and that are planning areas for testing wind turbines up to 20 Mw, that in Zeeland province there is a test facility for small wind turbines and that the Energy cluster of the Asturias University is launching the "Offshore experimental Station" in Avilés.

Heating and Cooling

	Sweden	Denmark	Netherland	Spain	Italy	Slovenia
Investment grant	x		x	x		x
Tax exemptions	x	x	x		x	
Fiscal incentives						

The six LoCaRe countries have also implemented a number of regulatory and economic support schemes for the promotion of renewable and for increasing the energy efficiency on the heating and cooling sector. The support mechanisms range on a variety of schemes, among which:

- Operating subsidies, such as the long term financial fund SDE for bio-CHP heat , sustainable heat scheme, EIA and green projects scheme in Netherland. As well, generating heat from renewable in Slovenia.
- Obligation, for share of renewable in district heating in Slovenia.
- Financial support, for planning process and conversion from direct-acting electricity to district heating, bioenergy and heat pumps, for sustainable urban development, including district heating in Sweden. Spain is implementing the programme RENOVE, for buildings refurbishment and cogeneration and Denmark is promoting the scrappage of oil-fired boilers.
- Risk cover, for geothermal energy projects in Netherland.
- Tax on energy aiming at more efficient energy consumption in Sweden and tax on environment in Slovenia.
- Tax relief for renewable in heating and cooling in Denmark and for building refurbishment in Italy.
- Tax credit, for investments in renewable in Sweden, district heating using biomass and buildings refurbishment in Italy.
- Soft loans (interest rebate) and Third Party Finance (TPF) in Spain
- Public procurement practices for renewable promotion in Slovenia and Netherland.
- Demand management and promotion of energy service in public sector in Spain and Slovenia.

Transport

	Sweden	Denmark	Netherland	Spain	Italy	Slovenia
Quota obligation		x	x	x		x
Tax exemptions	x	x		x	x	x

The support economic schemes for the promotion of renewable in transport include financial mechanisms such as tax exemptions and specific fiscal regimes (Spain) charges in vehicle taxation and exemption for CO₂ tax on biofuels (Denmark), energy tax on petrol, on the majority of other liquefied petroleum products and carbon fuels, on LPG and on natural gas, grants to fuel retail outlets for investment in pumps other than ethanol, aiming to promote the distribution of renewable fuels, investment support for biogas and other renewable gases ,energy tax and carbon tax (Sweden), filling stations for alternative fuels (TAB), innovative Biofuels (IBB) and action plan for electric driving (Netherland), among others. Spain is very committed with the promotion of electric cars, and the central government has launched the programme VIVE (Vehículo Innovador/ Vehículo Eléctrico), that aims to put into circulation by 2014 one million hybrid-electric vehicles. In Italy, it is expected that Biofuels contribute from 21ktoe in 2005 to 850ktoe in 2020 and the electricity from RES in transport, from 139ktoe in 2005 to 271ktoe in 2020.

Besides the regulatory and financial measures, the national, regional and municipal actors shall encourage the so-called “**Soft measures**”, that aims at the public acceptance and the integration of the energy/climate objectives in all policies. The **NREAP** includes an important chapter on “Information provisions”. The six LoCaRe countries have notified current and future information and awareness raising campaigns and programmes. They have also informed whether the regional/local authorities have a substantial role.

Several LoCaRe countries have delegated its information obligations to Energy Agencies. The Swedish Energy Agency has complete responsibility for information under the Renewable Directive, as well as the Centre for Energy Savings and the Agency for Spatial and Environmental Planning in Denmark. In Spain, the national agency is IDAE and Asturias has set up the Local Agency FAEN, co financed by the subprogram SAVE of the Intelligent Energy Europe.

The LoCaRe regions and its municipalities are implementing a number of initiatives aiming to become “Sustainable energy communities” .A number of municipalities have signed the “Covenant of Majors” and have adopted local programmes on sustainable mobility, sustainable urban development, smart cities and others, as well as implemented programs aiming to promote the use of biofuels (for instance, by deploying biofuels filling station or charging points for electric cars).

Generally speaking, the political and public sensibility on sustainable energy is displaying, in the LoCaRe regions, from the North of Europe to the South. The good notice is that on the Northern countries, moving through a sustainable energy/climate strategy is appreciated progressively as a welfare and economic opportunity. Northern countries are conscious for applying the principle of the “First Mover Advantage”.

The European Commission, in the Communication of 10 December 2010 “Energy 2020 - A strategy for competitive, sustainable and secure energy”, proposes among the actions for keeping Europe’s leadership in energy technology and innovation, to launch a project on ‘smart cities’ to promote energy saving in urban areas. This proposal from the Commission will be, surely, a new opportunity in a key area for Europe’s competitiveness.

The LoCaRe project on “New energy” will contribute to spread sound information and to build consensus for political and public acceptance. The LoCaRe project shall identify regional and local industrial opportunities for economic growth and job creation, coming from the transit from the current system to the “New energy” economy.

4

A SWOT ANALYSIS OF THE ENERGY POLICY AND IMPLEMENTATION PRACTICES IN THE LOCARE COUNTRIES AND REGIONS

The SWOT analysis has been developed on the context of the whole policies and measures that are been adopted at Community, National and Regional level and that could affect the Regions and Municipalities.

A short introduction to a SWOT analysis

The “SWOT” (strengths, weaknesses, opportunities and threats) analysis is an extremely useful tool for understanding and for decision-making for all kind of situations in business and organizations. The aim of any SWOT analysis is to identify the key **internal and external** factors that are important to achieve the objectives of a organization.

A SWOT analysis groups key pieces of information into two main categories:

- **Internal factors** – The strengths and weaknesses internal to the organization.
- **External factors** – The opportunities and threats presented by the external environment to the organization.

The SWOT analysis headings provide a good framework for reviewing strategy, positioning and direction of proposals. Completing a SWOT analysis is a good exercise for workshop sessions and brainstorming meetings.

SWOT for LoCaRe New Energy analysis

The purpose of the SWOT analysis of the energy policy and implementation practices in the LoCaRe regions is to be able to analyze the strategies to move to sustainable energy production and/or consumption in such a regions.

The **internal** factors for the LoCaRe regions are strongly related with the capacity to develop low carbon and energy efficient technologies (including manufacturing capabilities), but also, among others, factors such as political support, public acceptance, environmental sensibility and support schemes (either regulatory or financial).

The **external** factors for LoCaRe regions are strongly dependent on the European Union’s policy on energy and climate, which has been translated into legally-binding directives that have to be implemented by the Member States. This could be a unique opportunity for the social and economic development of the regions, as new technologies have to be manufactured and/or implemented in their territory.

Questionnaire to be fulfilled by LoCaRe regions

As the purpose of a SWOT analysis is to conceptualize information and summarize it, a comprehensive questionnaire, made up of short questions and simple answers to be ticked, has been prepared. The members of the LoCaRe project have given answer to the questioner for the SWOT analysis. The template of the questioner is included in Annex 17 and the summary of the SWOT analysis, as well as the individual answers of the LoCaRe members on Annex 18

The conclusions of the SWOT analysis

The main conclusions are resumed on the following SWOT table:

	HELPFUL to achieving the objectives	HARMFUL to achieving the objectives
INTERNAL ORIGIN (attributes of the Organization)	<p>Strengths</p> <p>National Sustainable Energy Strategy 2011/2020 (NREAPs, Energy efficiency action plans, Bio energy action plans, others)</p> <p>Regional and Municipal Sustainable Energy Strategy 2011/2020: existing or announced</p> <p>Capability for spatial planning at national and/or municipal level</p> <p>Capability for authorisation, certification and licensing procedures of projects</p> <p>Positive political commitment and leadership</p> <p>Growing public acceptance</p> <p>Positive attitude of the industry and stakeholders, provided that measures are cost-effective</p> <p>The capability for GHG reduction on some energy intensive industrial regions is high</p> <p>The potential for development of renewable energy is high or medium, depending on technologies</p> <p>Existence of national regulatory and/or financial support schemes for renewable energy</p> <p>High potential in all LoCaRe regions for improving energy efficiency in buildings</p> <p>Positive appraisal of the potential for job creation (growing in the future) and regional industrial development</p>	<p>Weaknesses</p> <p>Limited capability for legislation and spatial planning at regional level. Regional strategies are strongly dependent on national ones.</p> <p>Gap on the regulatory and financial capability at regional level. Reduced capability to set up regional support schemes</p> <p>Regional barriers towards a transition to a sustainable energy</p> <p>Social opposition to some renewable energy, in particular wind onshore.</p> <p>The potential for renewable in transport is considered medium</p> <p>Negative appraisal of renewable sources in case of increase of the price of the energy</p> <p>Lack of support schemes for some renewable energy with potential on the region (e.g., bioenergy)</p>
	<p>Opportunities</p> <p>The integrated energy and climate change policy adopted by the European Union, including ambitious targets for 2020 is a high or medium opportunity for the region and have implications on ongoing policies.</p> <p>The notification of a National Renewable Energy Action Plans is a high or medium opportunity for the region</p> <p>The EU programmes on RTD (7 FP RTD) , on Innovation (Intelligent energy Europe) and the European strategic energy technology plan (Set-plan) offers high or medium opportunities to the regions</p> <p>The EU Directive on ETS and the allocation of credits to innovative projects is a high to medium opportunity for the regions, but State support is necessary</p> <p>Exporting of technology to third countries through Clean Development Mechanisms is a high or medium opportunity for the industries of the region.</p> <p>Regional clusters have been instrumental in reaching agreement on regional priorities and their implementation. Dedicated regional platforms in the context of LoCaRe would be useful to facilitate the planning, implementation and monitoring of the identified priorities and the drawing up of investment plans and concrete projects.</p> <p>The national support schemes contribute to the promotion of electricity from RES.</p>	<p>Threats</p> <p>The promotion of sustainable energy on the regions is highly dependent on the national support schemes(both, regulatory and financial). The national support schemes should be flexible and take into account the regional conditions.</p> <p>The prices of the sustainable energy will be higher than those of the conventional energy whilst they do not internalise the environmental cost.</p> <p>Similar commitments on CO₂ reductions than the EU, shall be adopted by non EU developed countries .</p> <p>Risk of delocalization of energy intensive industry to non-signatory countries of the Kyoto Protocol</p> <p>Strong regional environmental policies could jeopardise new projects of energy</p> <p>Skilled personnel to cope with the requirements of renewable energy sector</p> <p>Better access to financial resources for facing new energy projects</p> <p>The economic crisis could jeopardise investments on sustainable energy</p> <p>No consistency of long term regulatory framework for investors</p>
EXTERNAL ORIGIN (attributes of the environment)		

5

IDENTIFICATION OF DIFFERENCES BETWEEN THE REGIONS AND WITH THE EU-POLICY



The 6 LoCaRe countries have notified the NREAPs, which are now under the scrutiny of the European Commission. The central governments are already preparing the measures necessary for the implementation of the action plans. That means that the policies and measures that will be implemented by the LoCaRe countries and regions in the context of the NREAPs will be in conformity with the EU-Policy.

From some years ago, the most “**Knowledge-intensive**” regions and metropolitan areas of the LoCaRe countries have been very proactive on adopting and implementing **sustainable energy strategies** in the context of the integrated approach for “**sustainable cities**”. This is the case of several cities and metropolitan areas of the regions of the North of Europe that are detailed on this “Analysis”.

The driving force for the strategy of the **Knowledge-intensive** regions is the capability of their economies for innovation, creativity and entrepreneurship. Most of the strategies have been drawn up more by the municipalities than by the regions itself, which is coherent with the higher capacity of decision at the local level. The administrations of the regions are playing, nevertheless, the important role of the coordination and the implementation of the national policies on its territory. **The strategy adopted by the so-called “Knowledge-intensive” regions is fully in conformity with the EU-Policy and in many cases is on the forefront of this policy.**

In the more “**conventional wisdom**” regions and metropolitan areas of the LoCaRe countries, the main role of the local and regional administrations has been the implementation of policies and measures adopted at national level. The national government defines the regulatory and financial support schemes and it is up to the commercial companies to take the decisions on which regions they prefer to invest. The main role of the regions is drawing up “plans” based on the national schemes and to facilitate the administrative procedures. On the more “**conventional wisdom**” LoCaRe regions, the declarations of “sustainable energy communities” are not frequent and the municipalities do not adopt normally sustainable energy action plans. **The strategy follows on the so-called conventional wisdom regions is coherent with EU-policy, but they are less proactive than the Knowledge-intensive regions ones.**

Looking to the future, it is expected that the LoCaRe regions and most of its cities and metropolitan areas are going to develop **sustainable energy action plans**, that should be in conformity with the NREAPs and hence, with the EC-policy. The **action plans** should take into account the particular conditions and capabilities of the different regions. Consequently, the action plans could present important differences among them and could follow different paths to achieve the common objective of “**produce more with less**”.

As a matter of example of differences between regions on the LoCaRe environment, the “Analysis of New energy” could make a comparison between Västra Götaland (SE) and Asturias (ES). Västra Götaland is an industrialized region with significant capacity within autos, petro-chemi-cals, plastics, pharmaceuticals and IT, that means a strong link to the energy sector. The region is characterized by businesses that are making major investments in R&D and employing large numbers of scientists and technicians. From many years the region is making efforts to reduce the dependence from fossil fuels and to reduce the carbon intensity. Moreover, Västra Götaland consumes near zero-carbon electricity generated from hydro and nuclear.

Asturias is a traditional industrial region based on coal and steel. The region holds high carbon intensive industries as coal firing power plants and cement industries, as well as energy intensive activities, such as metallurgical (steel and aluminum) and glass plants. Current regional policy is in favor of cleaner and innovative industry.

The starting situation on energy /carbon- related of the two regions is very different. The energy intensity (toe/M € '00) of the two regions is 437 (Asturias) and 96 (Västra Götaland). The CO₂ per capita (kg CO₂/cap), 25.552 and 7.871 respectively and the energy consumption per capita 8.083 and 3.145 respectively.

The consequence is that the least cost strategy for Asturias (and hence for Spain) could be to abate CO₂ through the introduction of Carbon Capture and Sequestration technologies and the optimal strategy for Västra Götaland could be to promote sustainable energy communities based on renewable and high tech innovative energy solutions. Both strategies could contribute to the EU-energy/climate objectives, as well as regional development and growth. The conclusion is that each regional strategy should take into account its particular conditions.

The LoCaRe regions should cooperate from their diversity and particular situations on the identification of strengths, weaknesses, opportunities and threats that allow developing the least cost and more efficient energy/climate strategy.

6

SUGGESTIONS TO THE REGIONS AND MUNICIPALITIES IN FORMULATING AND CARRYING OUT POLICIES IN THE FIELD OF ENERGY

According with the analysis that has been made on the **policies and measures** proposed by the LoCaRe regions, the “Analysis of New energy” formulates the following suggestions **that could be implemented at regional and municipal level** and that should be complementary of those that affect also the regions but that shall be decided either at **national level** or by the big **industry** .The first 6 recommendations have a cross cutting nature and the last 5 are more sector oriented:

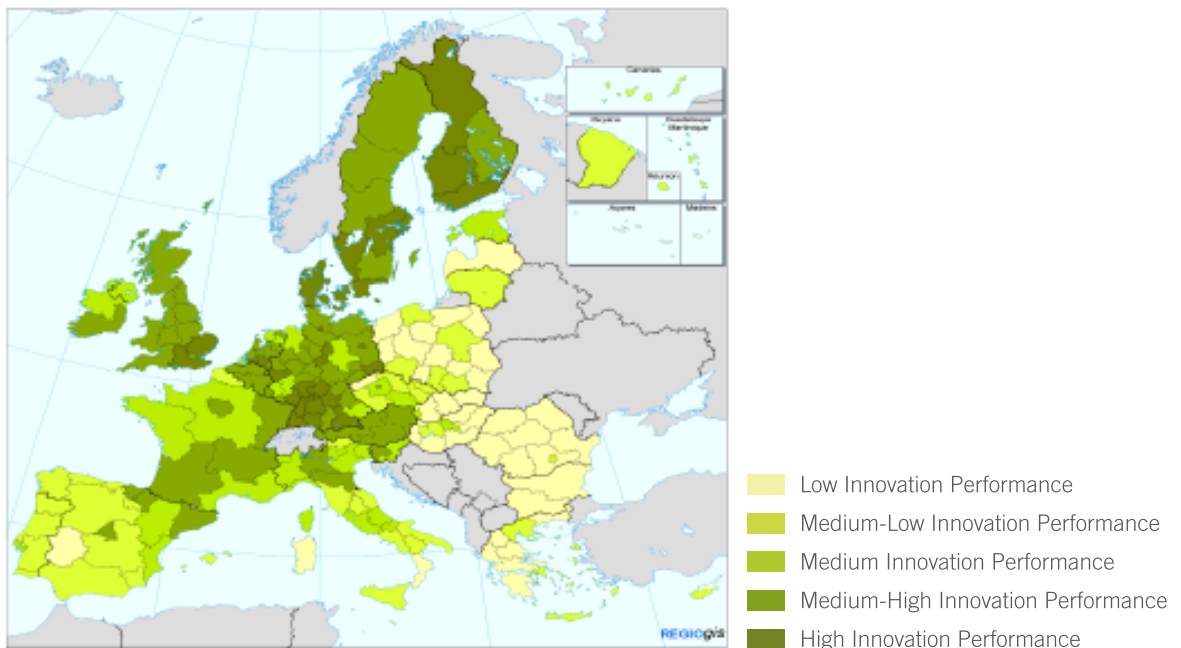
- The LoCaRe regions to create framework conditions to promote business investment in R&D, entrepreneurship and innovation

The European regions that are more actives in promoting research and innovation as a key policy instrument to enhance competitiveness and job creation, address major societal challenges and improve quality of life, are those that at the same time become more active on boosting policies for tackling the major climate change & energy challenge. This is the case, in general, of the innovative policies of the Northern regions of Europe.

It is recognized that climate change will make substantial changes to the corporate and production sector and our lives and livelihood in the next few years. Low carbon technologies are of paramount importance for achieving such a fundamental changes and, consequently, R&D and innovation in energy is a substantial component of the EU 2020 strategy for smart sustainable and inclusive growth.

The following map gives the Regional Innovation Performance Index of the regions of Europe in the year 2006, where the LoCaRe regions could recognize themselves and, whether necessary, look for best-cases references.

Regional Innovation Performance Index, 2006



The LoCaRe regions should boost their efforts for creating favorable conditions for innovation, education and research, so encouraging R&D and knowledge-intensive investment, and moves towards higher value added activities. Under this context, they should encourage R&D and innovation on energy related activities aiming to tackle with climate-oriented solutions.

- Striving towards an economy less dependent on carbon can improve competitiveness and lead to more jobs.

The region of Västra Götaland has contributed to the “Analysis of New Energy” with the document “Towards an economy less dependent on carbon – can Västra Götaland be a leader?” According to the “Vision” contained on the document, the transformation to an economy less dependent on carbon is a key issue for the future of the region. The analysis made by the regional authorities concludes that “the region has in practice no impact on global emissions or on prices or price development, but that the main prospects for exerting influence reside in setting a good example and **taking the lead to the extent that resources allow while intensifying development of new technology and new system solutions**”.

Such a conclusion could be a motivating factor for other LoCaRe regions in order to build public acceptance and to foster political action based on a shared vision. Likely, making costly efforts for the worldwide reduction of GHG emissions is not enough justification in many regions for political action. Nevertheless, good reasoning that justifies the potential for sustainable development would be much more convincing for public acceptance.

The LoCaRe regions should analyse on what extend striving towards an economy less dependent on carbon can give the region new opportunities for economically sound activities and job creation.

- Regional Sustainable Energy Strategies

The [new Directive on renewable energy](#) that request the Member States to elaborate [national renewable energy action plans](#) (NREAP), states also that “Member States may encourage local and regional authorities to set targets in excess of national targets and to involve local and regional authorities in drawing up national renewable energy action plans and in raising awareness of the benefits of energy from renewable sources”.

The [national renewable energy action plans](#) (NREAP) contains a number of references on the level of administration (local, regional and national) that is responsible for legislation, for the authorization, certification and licensing procedures, on spatial planning, on existing and planned measures for buildings, on information provisions and electricity infrastructure development and others. Such a provisions of the NREAP demonstrate that whilst action at EU and national levels is vital part of realizing the energy/climate objectives, without action at regional and local level there is not chance that they can be achieved.

The implementation of the NREAPs has an important regional impact because is a new opportunity for investment, growth and job creation. Production of energy from renewable sources often depends on local or regional small and medium-sized enterprises (SMEs). The opportunities for growth and employment that investment in regional and local production of energy from renewable sources brings about in the Member States and their regions are important.

The move towards decentralised energy production has many benefits, including the utilisation of local energy sources, increased local security of energy supply, shorter transport distances and reduced energy transmission losses. Such decentralization also fosters community development and cohesion by providing income sources and creating jobs locally. As a matter of example, the NREAP of Spain includes an “Assessment of the impacts” that states the following:

“it is estimated that renewable energies in Spain in 2010 will be responsible for the creation of 70,152 direct jobs and a further 45,570 indirect jobs, bringing the total employment figure in the renewable energies sector to 115,722 job posts in 2010.

The breakdown of direct employment by renewable area shows that 43.7% correspond to the wind sector, 27.9% to solar photovoltaic and 9.6% to solar thermal. The rest of the areas considered jointly account for 18.8% of the remaining direct employment.

The activities creating the most jobs are equipment manufacturing (35%), implementation of service projects (17%) and plant construction (16%). R&D Innovation activities contribute to employment at a rate of 4.5%, indicating that as far as employment is concerned renewable energy companies contribute more to GDP than the rest of the economy.

On the basis of the evolution forecast by the 2011-2020 Renewable Energy Plan and the socio-economic forecasts, direct employment associated with renewable energy sources in 2015 and 2020 is expected to reach 82,589 and 128,373 jobs respectively”

The LoCaRe regions should develop their own Regional Sustainable Energy Strategy Plan, based on the NREAP and other national strategies, such as Action Plans on Energy Efficiency and on Carbon Capture and Sequestration. Such a Regional Sustainable Energy Strategy will be also very important for giving guidance for projects promoters and investors.

- The cities-A key energy player

The cities and metropolitan areas of Europe have important powers on the implementation of energy/climate related strategies. The cities have powers on spatial planning, that could be based on programmes and strategies for how to achieve increases in efficiency in energy consumption (in order to decrease this consumption in the long-term), how to promote renewable energy resources and how to encourage the development of production facilities for district heating using biomass, solar energy, biofuels and wind power. The cities and metropolitan areas could play also a key role in driving energy clusters and, with the combination of knowledge, capital and leading companies, to become a vital global player with renewable energy and environmental technology.

The municipalities of Europe are cooperating among themselves through a number of organizations aiming to develop sustainable policies. EUROCITIES is the network of major European cities and brings together the local governments of more than 130 large cities in over 30 European countries. METREX is a network of practitioners, i.e. politicians, officials and their advisers with a common interest on spatial planning and development at metropolitan level.

A number of cities are cooperating either around regional organizations, as it is the case of the “Union of Baltic Cities”, or National organizations, as it is the “Swedish Association of Local Authorities and Regions”(SALAR). The European Union is also promoting cooperation among cities committed to local sustainable energy, as it is the **Covenant of Mayors**, that commit the signatory towns and cities to go beyond the objectives of EU energy policy in terms of reduction in CO₂ emissions through enhanced energy efficiency as well as cleaner energy production and use.

Either individually or through their associations, a number of cities in the North of Europe have made the climate challenge a priority by setting themselves the ambitious political goal of CO₂ neutrality by 2030. In many cases, the municipalities have developed holistic “Vision” that combine growth with sustainable development and include the ambitious target of becoming independent of fossil fuels by a precise horizon.

Common strategies to tackle the major climate change & energy challenge coming from cities (which consume around 80% of the overall EU energy and are responsible for about the same share of greenhouse gases) could be created by a representative platform of key stakeholders and boost the use of ICT to accelerate the deployment of smart grids, new systems for using energy from renewable source, smarter & cleaner urban mobility and increased energy efficiency of buildings.

The cities and metropolitan areas of the LoCaRe regions should participate on regional and/ European organizations that share common objectives, combine growth with environment, develop long-term vision and set intermediate targets on CO₂ reductions. The cities and metropolitan areas should implement strategies and action plans based on their local capabilities.

The cities and metropolitan areas of the LoCaRe regions should actively participate on the initiative “the ‘smart cities’ partnership to promote energy savings in urban areas”, that has been proposed by the European Commission on the Communication “Energy 2020 strategy”.

- Cross border networking of Clusters

The cluster can be defined as “geographic concentrations of interconnected companies specialized suppliers, service providers, firms in related industries, and associated institutions (for example: universities, standards agencies, and trade associations) in particular fields that compete and also cooperate”.

In policy and practice, the cluster approach is often employed to develop so-called triple helix relations between universities, industry and government.

In the European context, the Commission plays a central role in disseminating best practice and promoting policy-learning across borders. As for cluster policy, the Commission focuses on mapping, the identification and dissemination of best practice, the provision of platforms for know-how exchange between policy makers and practitioners, as well as on cross-border networking of clusters.

Concerning Energy Savings, the European Commission prone for promoting networking among Member States and regions to ensure financing of the best practices in energy efficiency.

Several LoCaRe regions have set up regional clusters on energy and environment. The “Analysis” proposes the LoCaRe regions to enhance the diffusion channels for cluster know-how through a LoCaRe cross-border networking of clusters.

- Sustainable procurement

The EC directives on public procurements make it possible, but not obligatory, to stipulate environmental requirements in procurement procedures. They contain provisions regarding how contracting authorities and units can contribute in their procurements to protect the

environment and promote sustainable development. According to the procurement rules, it is therefore possible to observe environmental requirements in public procurement. Environmentally-sound public procurement involves setting a good example and influencing the market.

In the Netherlands, for example, the government is aiming to implement 100 per cent sustainable procurement by 2010. The municipal authorities are aiming for 75 per cent by 2010 and 100 per cent by 2015. The provinces and Water Boards have set a target of 100 per cent by 2015.

The cities and metropolitan areas are important contractors of goods and services, such as public buildings, vehicles and recently, energy services. In some cases, joint procurement from a number of municipalities could contribute to achieve the critical mass for new developments. As a matter of example, the European Investment Bank (EIB) has granted a loan for buying near 2000 clean vehicles to a Spanish private company responsible for the cleaning of a number of cities.

LoCaRe cities and metropolitan areas should introduce environmental requirements (for instance energy/climate requirements) in procurement procedures.

- Buildings

Existing and new buildings, either public or private, are the most important sector for local energy action. Residential housing currently accounts for 40% of the energy consumption in the EU and the potential for improving energy efficiency and increase the share of renewable energy is high.

Cooperation among national, regional and local entities is very important on this field. Many regions have initiated a process to reach a regional consensus regarding the energy and climate issues in broad collaboration with the municipalities, real estate companies, municipal energy companies, transportation companies, commercial enterprises, government agencies, nonprofit organizations, colleges and cooperative and autonomous bodies, etc.

Concerning public buildings, Article 13(5) of the renewable directive stipulates that Member States shall ensure that new public buildings and existing public buildings that are subject to major renovation, at national, regional and local level fulfill an exemplary role from 1 January 2012 onwards. Several LoCaRe countries have set up quantified targets for reductions on energy consumption and CO₂ emissions on public buildings. New private buildings must meet the low-energy criteria stated in the Building Regulations, to promote the use of renewable energy.

Nevertheless, the most important field for energy saving is the most difficult to intervene, that means the private old housing blocks. The solution of renovating old heating and energy systems in large buildings can bring big environmental and financial benefits. However, in blocks with many owners, the finances, administration and logistics can get complex. The most cost-effective short-term solution for old blocks could be to change the behavior of the inhabitants by the introduction of heat metering systems and introducing the “consumers paying principle”.

The LoCaRe regions should share experiences on local policies and practices for energy saving in buildings.

- District heating

District heating is directly linked with heat supply in buildings. The contribution to the reduction of CO₂ emissions is due to the possibility to be fueled with bioenergy, geothermal or passive solar energy. District heating is an important sector for local energy action, but only in the case that the district heating network exists or could be easily developed.

There are big differences among the LoCaRe regions on the potential for district heating development. In the Northern LoCaRe regions, district heating is already well developed and the main strategies consist on develops cogeneration plants fueled with biomass.

The solution for regions on which heating networks using any fuel are scant and their role in supplying buildings and industry is negligible could be to develop innovative systems on housing blocks, such as the replacement of oil firing by wood pellets boilers, heat pumps or when commercially available, micro-cogeneration based on fuel cells. The central heat installation should be complemented with smart distribution and heat metering systems.

The LoCaRe regions should cooperate on sharing experiences and best practices on the management of heat systems on existing buildings, particularly on old blocks.

- Local and regional promotion of Renewable energy

The local and regional administrations and stakeholders have an important role to play on the promotion of small renewable energy systems and also on the cooperation with energy utilities on the development of large producing energy systems.

The regions of Vastra Götaland and South Danmark have highlighted on the Gijon Conference the importance of the regions on the interaction between different stakeholder- levels in “New Energy”, as follows:

- **“The regions can have important roles:**

- Facilitator of interaction between stakeholders
- Coordinators and supporters for local actions
- Push National and Supra national initiatives in the right direction
- Regional job creation

- **Regional and transregional action plans in coherence with national plans would be one of the means “**

The LoCaRe municipalities could develop programmes and strategies based on its physical and spatial planning capabilities on for how to achieve increases in efficiency in energy consumption in order to decrease this consumption in the long-term, how to protect renewable energy resources and how to promote the development of production facilities for district heating, solar energy, biofuels and wind power.

The government and municipal authorities could promote substantial increases in the generation and use of renewable energy. By way of land-use plans, municipal authorities designate sites for the generation of renewable energy. They have licensing and supervisory duties for smaller plants and control much of the physical sitting through their planning activities. The focus is primarily on regulation and local acceptance.

The LoCaRe regions and municipalities should back the national and European climate policy initiatives and should work together with other authorities and private partners to achieve the targets. The agreements made among the central governments and the regions that relate specifically to renewable energy could include the following:

- In spatial planning: the regions promote the framework for spatial integration of energy projects; the regions support and facilitate municipal authorities.
- In spatial planning: new opportunities should be created for the production and use of biomass.
- Authorisation: the regions facilitate investment by granting licenses quickly and resolving issues and eliminating obstacles.
- Role model: the regions act as a role model and invest in energy saving and generation or use of sustainable energy in their own provincial organization.
- Stakeholder: the regions that are stakeholders in energy - production and/or network companies can use this role to support objectives.
- The regions and the government should offer incentives for the production of biofuels that meet sustainability criteria.
 - The regions should facilitate large-scale production installations for biofuels adjacent to energy infrastructure.
 - The government and regions should work together to devise an effective licensing process for ground energy systems.
 - Through licensing arrangements, the regions should promote the use of residual heat in operational processes. They are mapping out where heat is released and where potential consumers are located.
 - The regions should promote and facilitate regional collaboration in the use of residual heat.
 - The regions should facilitate large-scale solar power projects.

The agreements made among central/regional governments and the municipalities that relate specifically promoting the generation and use of renewable energy could include the following:

- Municipal authorities will provide scope in land-use plans for sustainable energy, inter alia by designating sites for sustainable energy generation;
- By way of land-use plans, municipal authorities designate sites for the generation of renewable energy, for instance, for wind power.
- The infrastructure for energy systems, transportation, waste management, etc. is to be integrated into the town planning and designed in order to reduce the consumption of resources and energy and impact on the climate.
- Municipal authorities will exert their influence as stakeholders of energy and waste companies to exploit the opportunities for the use of sustainable energy and residual heat;
- Municipal authorities will support the development of 'green gas' by supporting and collaborating in trial projects.

Generally speaking, in the LoCaRe countries there exists no national, regional or local legislation that specifically regulates an increased share of renewable energy within the building sector. It does exist indirectly in the form of targets and plans for the phasing-out of fossil-fuelled heating and funding for certain renewable heating systems. There are also financial support schemes for the promotion of the integration of renewable energy in buildings.

In the building sector, a considerable contribution to the expansion with renewable energy is expected to come from district heat and cogenerated heat based on biomass.

The LoCaRe regions should share local experiences on how to integrate renewable energy on its planning activities and on how to implement measures for its promotion.

- Urban mobility

The promotion of renewable energy on the transport sector is one of the objectives of the [national renewable energy action plans](#). Such an objective could be made either by the use of liquid or gas biofuels, or by the use of electricity generated from renewable energy.

In the LoCaRe regions of Västra Götaland and Southdanmark there are good cases of local systems fueled with biogas produced from agriculture activities.

The regions and municipalities have an important role to play in order to promote “sustainable mobility” in the context of broader concept of “Smart cities. The awareness of the advantages of biogas is increasing, such that the demand for biogas as a vehicle fuel is greater than the supply in some regions and new technologies for the purification and transport of biogas have been developed .

Sustainable urban mobility is a complex issue that has to be pursued by the combination of policies and measures, among which to develop Zero Carbon Growth areas.

The LoCaRe regions should share experiences and best practices on how biofuels, and particularly biogas, can support the area’s farmers and exploit the potential and interest in delivering future green energy from agriculture.

- Smart grids

Smart grid are considered to have an important role to play in the issue of increasing the generation of renewable energy, reducing the demand for power and increasing the flexibility of electricity consumption.

A larger spread of distributed generation (a large number of small generating units in closer proximity to the consumers, in contrast to the principally central generation of today) will also place other demands on the controllability of the grid.

Smart grid is a subject for extensive and continual research and development that is targeted at electrical power transmission and distribution systems, including smart grid and IT and storage. The European Union is co-financing, in cooperation with several Transmission System Operators (TSO) an extensive study aiming to find solutions for a better integration of renewable electricity on the grid.

Moreover, the ETSO-E organization, that has been created under “Regulation (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity” shall draw up a non-binding Community-wide ten-year network development plan, (Community-wide network development plan), including a European generation adequacy outlook, every two years; this development plans are of the interest of the LoCaRe regions that are facing problems for the integration of RES-electricity on the network.

The LoCaRe regions should cooperate on technical solutions for the development of smart grids aiming the access of the electricity generated from renewable energy, particularly from wind, on the electricity network.

7

**SOME BEST PRACTICES ON
THE LOCARE REGIONS.
EXPERIENCES OF OTHER REGIONS
TO COMPARE WITH THOSE
IN LOCARE REGIONS**

The “Analysis on New energy” presents the “best practices” on two chapters:

- First, the Best practices on the LoCaRe regions
- Second, the Best practices on other regions and that have been collected from projects supported by Community programmes

7.1 BEST PRACTICES FROM LOCARE REGIONS

- “Vision” on long term carbon neutral strategies

The Vastra Götaland climate strategy



Celebration as first 63 stakeholders adopt Västra Götaland Climate Strategy, October 2009

The regional authorities organized a Smart energy “Climate dialogue 2007-2009” that identifies 6 **strategic areas**:

1. Efficient energy use in housing and property sector
2. Efficient transport of goods–“green logistics”
3. Efficient transport of people–“green mobility”
4. Alternative fuels and more efficient vehicles and shipping

5. Increased use of energy from renewable sources
6. Lifestyle, consumer power and producer responsibility

The **target** of the strategy is:

”By 2030, the economy of western Sweden is no longer dependent on fossil energy.

Citizens and businesses have a secure and long term sustainable energy provision.

Housing, transport and production & consumption of goods and services are resource saving, energy efficient and based on renewable energy.

In all, this has contributed to a strong economy and an innovative and competitive business sector.”

And the “**tools**” for implementation:

- Public tender
- Regional and municipal planning
- Owner directives to public companies and administrations
- Public and private investments
- Education creates knowledge among key stakeholders
- Influence national and international decision makers

6x Agreements

- Increase number of energy efficient buildings
- ”Climate smart” procurement
- Solar Energy
- CSR West Sweden, the Climate Initiative
- Inland waterway transports, ”Freight Shuttle on the River”
- ”Young Energy”
- More agreements on their way...

3x Best practices

- Energy efficient buildings
- Biogas
- Solar Energy

The South Denmark climate strategy

The strategies of South Denmark rely on the interaction among supranational, national, regional and local strategies. This best practice relies on the activities of the Danish Climate Commission

Recommendations from the stakeholder dialogue

- shared vision “A Green Valley of Europe”
- energy stakeholder forum
- regional projects
- common interconnector strategy
- action plan for efficient and sustainable heating
- common regional training programme

Results of the Commission on Climate Change policy

- Denmark can become independent of fossil fuels by 2050
- Even if the Danish energy demand doubles
- The technology is available today, but more will become available
- Small additional cost as continued dependence on fossil fuels will become an expensive habit

The strategy with two elements

- We need to use the energy more effectively. Technological solutions and investments have a large potential
- The energy of the future will come from renewable sources

The Commission's 40 recommendations: Examples

- Tax on fossil fuels
- Funding for research and development
- Measures for energy efficiency
- Electric cars and biogas for heavy load transport
- A complete plan for an intelligent electrical grid in Denmark
- Extension of offshore wind turbine capacity with 200 MW/y from 2015 to 2025

The road to independence must start now

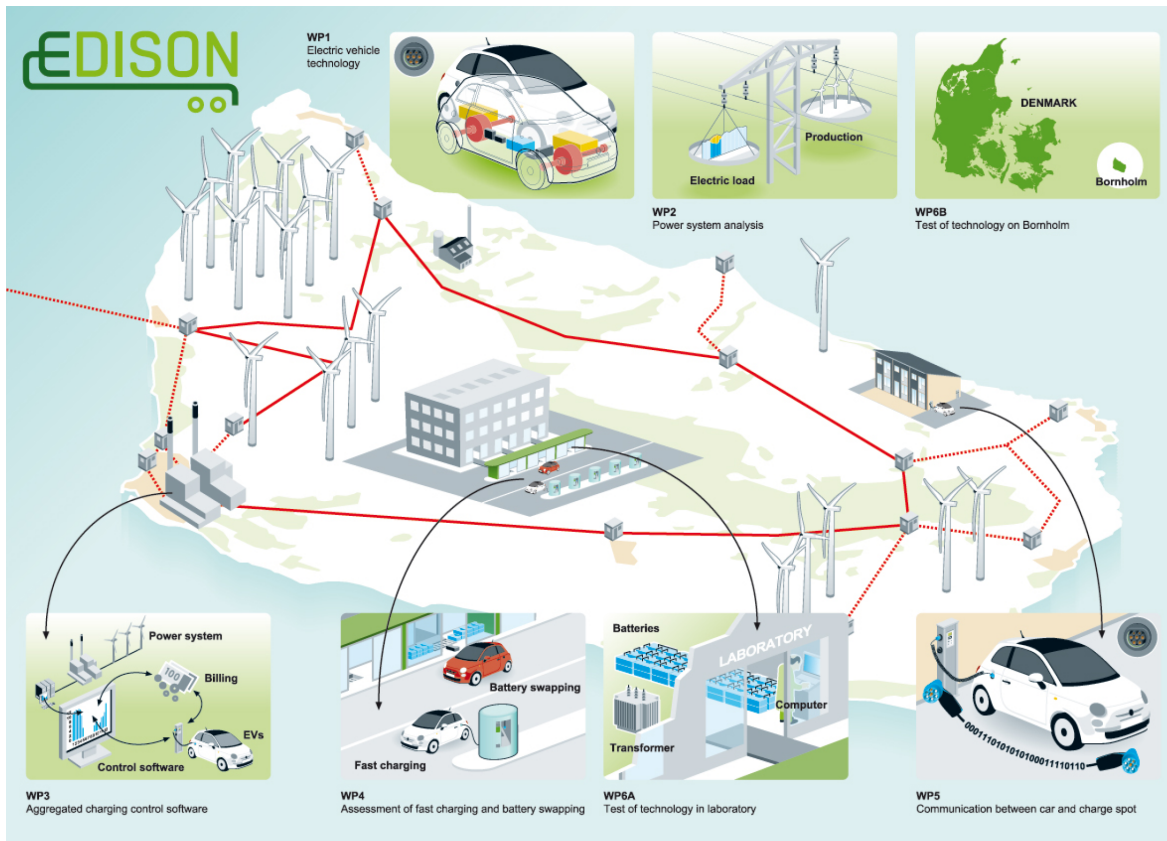
- Sustainable energy communities

Regional communities: Bornholm

Bornholm is an island on the Baltic sea that is a demonstration place for an integrated energy system powered by renewable sources .

The **activities** are:

- Wind power
 - Wind power plants –not only wind turbines
- Electric cars
 - EDISON
- PV
 - PV Island Bornholm
 - SmartPV Bornholm
- The Electricity System
 - EU More Microgrid
- Electricity consumption
 - Consumption to regulate the frequency
 - FlexPower –price signals in real time
 - EcoGrid EU –full scale demonstration
- Bornholm as a laboratory
 - PowerLabDK –eksperimentel platform for electricity and energy



- Local communities: Samsø

http://www.energiakademiet.dk/flashmap_uk.asp

Samsø's renewable energy

Here is a graphic presentation of the largest renewable energy systems on the island. Click on a district heating plant or a group of wind turbines to zoom in and learn more: factual texts, pictures, and links to even more information.

If you'd like to read the texts without the graphics, you can go to 'Flashmap texts only' in the menu on the left.

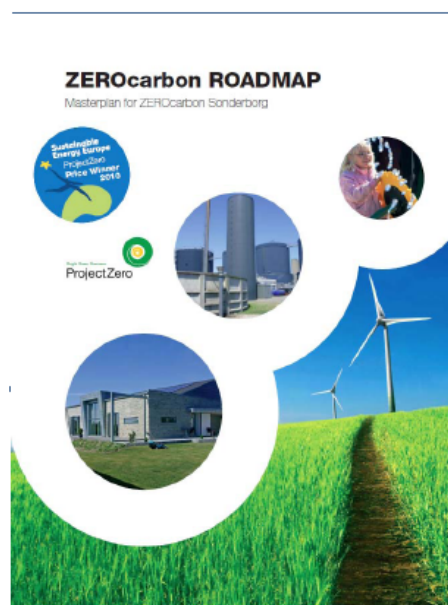
- The island is 100% self-sufficient with wind-generated electricity. About 70% of island heating needs are met with renewable energy, and the transportation energy consumption is 100% compensated by the electricity production from the offshore wind turbines.
- Quite a number of people are working with plans to establish a cooperatively run farm-based biogas plant to extract biogas from the major pig farms' slurry. This biogas will be used to produce electricity and the excess heat will be used for heating purposes. The remaining 30% of the island households will be approached in information campaigns to promote new neighbourhood heating systems and individual solutions. Heat pump systems are now attractive solutions because the island generates a surplus of electricity.
- The transport sector can in part be supplied with canola oil for diesel vehicles and the island's gasoline cars can use bioethanol or can be converted to hydrogen and electricity. We're ready when technological innovation and lower prices make large scale conversion feasible.
- The Energy Academy offers courses and workshops on these future perspectives and it will continue to accommodate the many interested visitors to Samsø, Denmark's energy island.

- Local communities: Sønderborg

Sønderborg

The ZEROcarbon goal

The goal of ProjectZero is to make the entire Sønderborg-area ZEROcarbon by 2029 in relation to all energy-related purposes, including road transportation. Energy imported from outside the municipality should also be ZEROcarbon and therefore come from wind turbines or other renewable energy sources. Imports and direct emissions of greenhouse gases from agriculture and waste sites are not included in the energy balance calculation.



- Biobase Zeeland

The province of Zeeland, in the south-west part of the Netherlands is working on the changeover to a biobased economy: an economy in which fossil fuels are gradually replaced by green materials. Zeeland entails a large agricultural and chemical sector and is, in combination with the two harbours, pre-eminently the experimental garden for biobased activities.

The “Best practice “ of the Biobase Zeeland includes ,among others, an experimental farm with several cultivations ,demonstration of fish cultivation on land and in Biopark Terneuzen the chemical industry is helping vegetable & fruit cultivators to obtain environment-friendly heat and pure CO₂.

Experimental farm Rusthoeve

The experimental farm Rusthoeve is located on the island of Noord-Beveland. The arable farming is situated at the foot of the Zeelandbrug. Rusthoeve facilitates research and demonstrations in arable and vegetable crops in the field of variety, fertilization and disease control. The testing and demonstration of new innovative techniques are an important part of their activities.

Zeeuwse Tong

The small soles are cultivated on the land basins. The traditional agricultural company is becoming less important for the economy of Zeeland. Therefore, the foundation ‘Zeeuwse Tong’ innovates in the combination fishery/fish cultivation and the agricultural sector. The Foundation conducts research into the cultivation of sole in inland basins. This form of fish cultivation on the land in an almost closed cycle can become a new, promising economic sector and stimulate the agricultural sector. Moreover, sole from the sea is becoming scarce. So, enough reason to look into the possibilities to cultivate fish on land in a profitable and in the most sustainable way.



Biopark Terneuzen

Companies cooperating in Biopark Terneuzen, use each others' residual products and waste streams which in former days got lost as waste or emission. Like the project WarmCO₂: at which residual heat and CO₂ of artificial fertilizer plant Yara are used for environment-friendly and sustainable greenhouse farming. With WarmCO₂ the vegetable & fruit cultivators have access to cheap, environmentfriendly heat and pure CO₂. The heat is always available and practically independent of energy market prices.

- Renewable energy across the alpine land (REAAL)/swiss mechanism

The Gorenjska region participates on this project: Focus areas si rehabilitation and modernization of basic infrastructure and improvement of the environment. Priority area of this Project is Environment and Infrastructure. In this project 6 investments were predicted: 5 RES (renewable energy system) investments in Primary Schools across the Region and 1 investment in 1 Public Swimming Pool. REAAL will improve energy efficiency and introduce renewable energy systems (e.g. biomass, solar, geothermal). Also will make for Improvement of energy efficiency in public infrastructure.

- Project ALP energy/alpine space

The Gorenjska region participates on this project: Rich endogenous renewable energy sources (RES), like hidropower, solar and wind energy, wood and other biomass exist throughout the Alpine Space, but equal access to their use is even more restricted because the need to balance electricity production and use requires a strong electric grid and its-often unacceptable-extension of strengthening if the rate of RES is to be increased. Virtual Power Systems (VPS) offer an alternative by using ICT-technology for intelligent combinations of RES, load management and storage. A prerequisite are innovative ways of cooperation among utilities, independent power producers and consumers. VPS have a high potential to trigger new knowledge-based and competitive economic activities. AlpEnergy will explore this potential and sensitive political and business decision makers. This includes a comprehensive communication concept.

7.2 Best practices from regions different than LoCaRe

As it has been mentioned before, the Commission plays a central role in disseminating best practice and promoting policy-learning across borders. The Commission focuses on the identification and dissemination of best practice, the provision of platforms for know-how exchange between policy makers and practitioners. The Commission manages a number of programmes that contribute to raise awareness and public acceptance, to foster cooperation among public entities and stakeholders and to promote pilot projects many of them are disseminated as best practices. The Commission grants financial aid for the support of these activities.

On the Annex 19, the LoCaRe members and other interested people can access to the website of the programmes managed by the European Commission. The “Analysis of new energy” has selected a number of best practices gathered from this information and from other sources notified by the LoCaRe members:

“Vision” on long term carbon neutral strategies

The cities of Aarhus (DK) want to be CO₂ neutral by 2030. Other cities as Hamburg (DE), Rotterdam (NL), Oslo (NO), Helsinki (FI), Stockholm (SE), Genova (IT) aims to have halved its CO₂ emissions by the year 2025 compared with 1990 levels and near carbon neutral by 2050. The City Council’s holistic vision of Stockholm combines growth with sustainable development and includes the ambitious target of becoming independent of fossil fuels by 2050. The cities and its metropolitan areas enjoy a strong position within sustainable energy and to promote on the region a market leading companies within the field. The strategies to achieve the goal are energy efficiency, clean tech, technical knowledge, education, a change of CO₂ habits and citizen involvement.

A number of European metropolitan regions that are members of METREX are aiming to devise strategies to achieve an 80% reduction of greenhouse gas emissions by the year 2050. These are the task of the project EUCO₂80/50.

Sustainable energy communities

Sustainable Energy Communities are communities that implement a set of sustainable energy policy measures in the field of renewable energy, rational use of energy and sustainable mobility with the strong involvement of the local population in the planning and implementation process.

Sustainable Energy Communities (SEC) support the development of energy fora – involving strong participation by all local stakeholders, and the creation of local energy action plans and concrete measures in the field of energy efficiency, renewable energy and sustainable mobility.

All the SEC projects clearly contribute to sustainable development by:

- mobilising civil society to endorse energy-related measures
- developing planning or management tools
- launching processes towards a low-carbon community at local level
- encouraging knowledge transfer between local actors

The following projects dealing with Sustainable energy communities have been selected as “Best practices” on other regions different than LoCaRe:

• **Sustainable Energy Communities in Urban Areas in Europe (SECURE)**

[Link](#)

The main objective of the SECURE project was to create long-term sustainable action plans for the cities of Malmö, Dublin, Hillerød and Tallinn and to remove the barriers of mainstreaming results from successful demonstration projects. The project implemented a structured benchmarking to identify success factors that were then used to create the sustainable energy action plans. The concepts of passive houses and carbon neutral city were analysed and several activities were implemented in this field.

• **ENGAGE - local authorities communicating to engage stakeholders and citizens (ENGAGE)**

[Link](#)

The ENGAGE project aims to directly support the EU's Energy & Climate Package targets by involving local authorities having signed the Covenant of Mayors (not exclusively) and encouraging them to share the EU “3x20” objectives at local level and to mobilise all actors to reach them. Therefore, the objective is to provide an efficient participative PR campaign strategy and an innovative, ready to use online tool in order to render the participation of the civil society not only feasible but also desirable. This will be done via a bottom up process involving a core group of 12 pioneer cities from 12 different countries. Furthermore, the project will support collaborative work among local administrations, stakeholders and citizens facing similar challenges in different European countries. Through participatory approaches involving as many stakeholders and citizens as possible in municipal energy policy-making, the ENGAGE project promotes sustainable energy solutions and facilitates local communication. Finally, the European ENGAGE Campaign aims to spread the participatory approach in at least 150 European local authorities.

• **Co-operation between communities for Energy Action Plans (WISE-PLANS)**

[Link](#)

Four communities from Wales, Italy, Sweden and Spain worked co-operatively towards the objectives of the Europe's Sustainable Development Strategy and its policies for sustainable energy. The aim was to identify requirements to mitigate the impacts of the production and supply of energy, to reduce emissions of CO₂ from fossil fuels and reduce dependence on external resources. WISEPLANS' objective was to create Sustainable Energy Action Plans in each community, taking advantage of cross-referral between all partners in order to derive relevant, common methodologies; this led to the production of high-grade, community-scale plans for a more effective use and management of local energy resources. Guidelines for best practices to plan Sustainable Energy Communities were defined and disseminated to a wide community, at both national and European levels, so that further replications may be implemented more easily and at lower levels of cost.

• **3-fold initiative for Energy planning and sustainable development at local level (3-NITY)**

[Link](#)

The 3-fold initiative developed, tested and demonstrated a comprehensive set of tools, quality systems and sustainable best practices for local energy planning and implementation. Local stakeholders were encouraged to apply this methodology for continuous improvement that covers 3 main areas:

- Sustainable Planning: development of a modern planning and investment decision tool for local energy planning at several levels in the local community,
- Sustainable Measures and Activities: stimulation of politicians, planners, energy actors and citizens to actively participate in local sustainable energy planning and implementation through a series of events, initiatives and methodologies,
- Sustainable Excellence: application of the EFQM-excellence model - a tool to measure the qualitative achievements of an organization - to local governments and municipalities.

• **Promoting reproducible actions in the communities to improve sustainable energy (PRACTISE)**

[Link](#)

The PRACTISE project helps implementing EU energy policies in local communities and enables them to address energy efficiency and renewable energy with greater success, mainly by involving a wide range of important groups and actors in the analyses, networking and training. The project involves 5 organizations from 5 European countries committed to the cause of sustainable energy. The project will start with market analyses and territorial studies to define the state of play; and to develop an area-based sustainable energy strategy and action plan for each partner. Regular consultation, training and networking of local actors will support a process of continuous improvement. Lighthouse actions and targeted communication should ensure co-operation between actors and increased awareness of the local population.

• **European Sustainable Energy Communities – effective Integrated Local Energy Action today (SUSTAINABLE NOW)**

[Link](#)

This 3-year project, starting in September 2008, focuses on strengthening the role of local and provincial governments, as political and administrative bodies acting in an exemplary manner and guiding communities in the sustainable energy transition period. It addresses non-technical aspects, capacity building, peer exchange and reviews in order to create an environment of tangible results with an extensive audience of local and regional actors. Measures imply an in-depth strategy and involvement of strong local and regional partners as well as EU-wide networks to implement ambitious climate and energy targets. Learning communities mainly benefit, through improved capacity and use of instruments that address development, implementation and evaluation of sustainable energy community concepts that have a longer-term sustainable impact. The use of local resources, involvement of diverse stakeholder and improve community resilience from a climate protection and energy security perspective are underlying aspects.

Regional clusters

The following has been selected as best practice:

- **Regional Energy Profit Clusters - Economic growth, competitive advantages and employment incentives in regions through regional energy profit clusters (REGIO ENERGY PROFIT)**

[Link](#)

The projects' aim is to gain best regional economic benefits from sustainable energy systems. The underlying assumption is that sustainable energy concepts will find broader and more powerful support if they can be justified by proven regional economic benefits. Therefore a strong cooperation between the whole energy-based regional value chain, the regional authorities and energy agencies is needed. As result of REGIO ENERGY PROFIT optimized cluster management structures fostering both, the implementation of sustainable energy systems and regional economic growth, employment and innovation are expected. To achieve these goals the project assesses the impact of sustainable energy policies and programmes on regional economic growth, employment and innovation. Best practice of management structures, policy instruments and joint actions are identified in the partner regions and actions are implemented by the regional cluster management.

- **Energy planning tools**

The following has been selected as best practice:

- **Balance globally, evaluate locally (BALANCE)**

[Link](#)

The project is based on a successful certification and quality management system for energy efficient municipalities, the European Energy Award (eea). Within the action, the existing eea tools are further developed to achieve a harmonized methodology and a tool for energy/CO₂ balances at municipal level in general as well as individual hard and soft measures in particular. The tools were worked out in close collaboration with the municipalities, the eea energy advisors and experts and were supported by a comprehensive evaluation of existing software tools and methodologies. The new elaborated tools are easy to apply and also appropriate for the application in smaller municipalities. They are tested in 30 municipalities and after some revision widely implemented within the eea network. Finally, based on this work, a system of voluntary agreements between local and regional bodies as well as CO₂ town twinning projects were further developed based on existing good practice examples in business.

- **Partnership Energy Planning as a tool for realizing European Sustainable Energy Communities (PEPESEC)**

[Link](#)

The PEPESEC project supported the emergence of European sustainable energy communities through the use of local community planning for the efficient supply, distribution and use of renewable energy sources and improved management of conventional energy. The project aimed to learn from and widen the use of existing best practice energy planning methodologies (from Sweden and wider EU) and further develop these through the addition of innovative

techniques to facilitate the involvement of all stakeholders whose buy-in and actions are required for effective energy plan delivery. Through partner/stakeholder engagement, community needs and aspirations were recognized and incorporated into energy plans that promote the significant economic, social and environmental benefits of developing a low-carbon economy. Innovative uses of technologies, especially ICT, to support stakeholder engagement and sustainable energy awareness was also a feature of the project.

• **Sustainable Energy Communities - Benchmarking of energy and climate performance indicators on the web (SEC-BENCH)**

[Link](#)

Local communities have a significant potential in terms of saving energy and converting to more sustainable energy sources, especially in their own buildings and technical installations. SEC-BENCH will develop a web-based benchmark solution to help local communities to identify, plan and realize this potential. The main objective of the SEC-BENCH project has been to develop a web-based tool that will help municipalities to realize their potential in terms of energy savings and conversion to renewable energy sources in their own buildings and technical installations.

Rural areas and agriculture communities

The following has been selected as best practice:

RES and RUE Stimulation in Mountainous - Agricultural communities onwards sustainable development (MOUNTAIN-RES/RUE)

[Link](#)

The main objective of the project was to stimulate renewable energy sources and the rational use of energy in four local agricultural communities located in mountainous regions.

The needs and prospects of these communities were analyzed and ideas for the launch of new technologies and land use planning identified. Viable and socially matured RES and RUE project opportunities and a guide for self-sufficient energy communities were prepared during project's lifetime

Energy self supply in rural communities (ENSRC)

[Link](#)

The Energy Self-Supply in Rural Communities (ENSRC) project established rural self-supply energy co-operatives or networks in each of the four countries participating in the project (Ireland, Wales, Portugal and Bulgaria). The project partners identified the barriers and incentives that exist for the development of rural self supply energy cooperatives as well as undertook a feasibility study and a development plan for each cooperative. Technical and administrative support was also given to the new cooperatives through manual, development manager and studies. Through its activities, ENSRC contributed to increasing the use of locally available sustainable energy in rural areas and ensured a long-term dissemination of its actions via the production of a well-made manual. Renewable energy facilities were also promoted and if not installed yet everywhere, at least planned.

Buildings

The following has been selected as best practice:

Energy Efficiency Communities - establishing pilot communities for the building sector (EFFCOBUILD)

[Link](#)

The project aimed to overcome existing barriers for capitalizing on energy saving potentials in the target communities' building sectors. Joint economic and environmental interests were brought together by involving and connecting the different stakeholders such as building owners, public authorities, financial institutions, private companies and politicians. A 'virtual saving power plant' for each community was developed based on energy demand analysis which helped citizens to realise the potentials of the energy saving measures. The project demonstrated that environmental protection can positively affect economic benefits for the region, as energy saving measures enabled the economic added value to remain mostly in the local area and region. To support promotion and dissemination activities for the project a brochure with the 10 "best of" examples of energy efficiency measures in buildings from each community has been produced and is available for download.

Applying the EPBD to improve the ENergy PErformance Requirements to EXISTing buildings (ENPER EXIST)

[Link](#)

Better energy efficiency in buildings means looking at both existing buildings and future constructions. By improving our knowledge of existing buildings we can put together a roadmap for better energy performance. This was the goal of ENPER-EXIST, which established a snap-shot of current building stock and assessed which building standards might be applied, what alternative solutions are available, and what would be the impact of the new certification schemes on the market, human capital and national administrations.

Building and Energy Systems and Technologies in Renewable Energy Sources Update and Linked Training (BEST RESULT)

[Link](#)

The BEST RESULT project was developed by actors already involved in training and dissemination activities related to renewable energy sources technologies. It aimed to raise awareness and to enhance skills among key actors in the building and energy sector on the supply side like installers, technicians, professionals, architects, planners, retailers etc.) with regard to renewable energies. This was achieved through a range of training and information measures (specialization courses, info-desks, workshops, website, etc.). At the same time, the project contributed to boost also the demand side (i.e. end consumers) for small-scale renewable applications (e.g. by means of guidelines, seminars, publications, website, etc.). The project activities were based on a thorough analysis of barriers to the deployment of small-scale renewables appliances (e.g. surveys and studies). The project partners are sharing a common methodology, which however is adapted to the specific regional/local needs and conditions.

Sustainable Energy systems in New buildings- market inTROduction of feasibility studies under the Directive on the Energy Performance of Buildings (SENTRO)

[Link](#)

The project starts with making an inventory on how EU Member States are complying with the requirements of conducting a feasibility study for alternative energy systems for new buildings and which policy they pursue to actively introduce this requirement. Subsequently, in the seven SENTRO countries (Denmark, France, Lithuania, Poland, Slovenia, Sweden and The Netherlands), an inventory is also made of the building practices as a possible barrier of the implementation of alternative energy systems. After this inventory phase, an approach is developed to ensure that assessment of alternative energy systems will become an integral part in the common planning process of new buildings. Supporting tools of the approach (checklist and a handbook) include technical, financial as well as organizational aspects. Core of the project is a field trial in which the developed approach (including the checklist and handbook) is tested in the seven SENTRO countries. Finally, experiences are disseminated through courses and conferences towards the different target groups (e.g. national and international policy makers and key actors in the national building process).

Development and marketing of integrated concepts for energy efficient and sustainable retrofitting of social Housing (ROSH)

[Link](#)

This project looked at energy efficiency and sustainable retrofitting in social housing in specific regions in six EU countries. It was based on integrated programmes combining information, training and communication. Guidelines on financing schemes were also being drafted, while demonstration projects serve to evaluate practices. The wider aim was to stimulate the market for these solutions, and increase comfort levels and quality of life for tenants.

Energy Savings from Intelligent Metering and Behavioral Change (INTELLIGENT METERING)

[Link](#)

Backed by estimates suggesting that energy savings of up to 30% could be achieved by combining intelligent metering with behavioral change among occupants, the INTELLIGENT METERING partners in the United Kingdom, Austria, Denmark and Germany set themselves the task of improving the energy consumption of some of their public buildings. The consumption of almost 70 buildings was made available on-line in graphic form in order to give occupants an idea of consumption trends. Via training sessions, the building users were shown the impact of their behavior that was immediately and visibly demonstrated on their computer screens by the intelligent metering system.

Energy-toolset for improving the energy performance of existing buildings (E-TOOL)

[Link](#)

The goal of E-TOOL was to collect energy consumption data and develop a simple and practical toolset that could assist in the improvement of the energy performance of existing buildings. The toolset is based on the actual energy consumption of a building, the so called 'operational' rating, as well as benchmarks covering different building categories. The energy savings from recommended measures are calculated and the improvement in energy performance of the building demonstrated by the tool, which has been tested in different climates around Europe.

Establishment of a co-operation network of passive house promoters (PASS-NET)

[Link](#)

The project aims at the promotion and diffusion of the passive and very low energy houses and technologies in Europe, including a focus on new member states. Given the huge energy and CO₂-saving potential and the low recognition of the passive house standard, the project will offer independent information on financing, construction, and planning matters. In some countries there has been a positive uptake of this standard and these experiences need to be transferred to other countries. This will strengthen co-operation and the exchange of know-how between the participating countries (Austria, Belgium, Croatia, Czech Republic, Germany, Romania, Slovakia, Slovenia, Sweden and the U.K.) and will encourage new initiatives Europe-wide. The project activities include promotion and awareness raising as well as training activities for specialists and the dialogue with public authorities. The most important benefit should be a European wide passive house database promoting best practice objects.

Covenant of Mayor

The following has been selected as best practice:

A network of sustainable ENERGY supporting structures FOR the Covenant of MAYORS (ENERGY FOR MAYORS)

[Link](#)

ENERGYforMAYORS starts from the consideration that Supporting Structure (SuS) are necessary for a successful implementation of the Covenant but they need guidance in order to achieve their role and be an effective support, in particular, for small towns. The present action aims at creating a network of SuS through capacity building. 11 partner SuS will also assist small and medium sized municipalities in the implementation of Sustainable Energy Action Plans (SEAPs). The consortium will enlarge its networking activities to at least one SuS in each EU country and creating networks of SuS in each project country.

Sharing urban sustainable energy strategies - promoting the Covenant of Mayors (COME2COM)

[Link](#)

come2CoM aims to promote the Covenant of Mayors within Europe by empowering cities and municipalities to prepare a baseline emissions inventory and a Sustainable Energy Action Plan. come2CoM intends to positively exploit the regional and local networks of the partners to get in touch with the decision-makers of the cities and to assist them to curb their CO₂ emissions by at least 20 % by 2020. Support will be given through individual consultations with the relevant cities' decision-makers and through seminars. come2CoM partner consortium will provide guidance to cities in choosing a suitable methodology and tool in setting up an energy plan as well as a baseline emissions inventory. This venture will help define targets and key actions for energy efficiency and CO₂ reduction. Furthermore, they will give advice on how to integrate relevant stakeholders in the development and implementation of the action plan and how to finance the projects that feature in the plan. The CoM will thus benefit from close relationships of the consortium's partners to small cities that usually feel less attracted by European initiatives.

On-line catalogue of SEAPs – an innovative platform to showcase your actions!

The on-line catalogue is the innovative web based system that gives high-visibility for actions by Covenant signatories, forming their Sustainable Energy Action Plans (SEAPs). It demonstrates with figures and graphs the key aspects of the SEAPs and enables the transparent sharing of key data underlying the Covenant commitments.

[Link](#)

First SEAPs online

The Sustainable Energy Action Plan (SEAP) of Genova is the first SEAP published on the Covenant of Mayors website. It is an exemplary SEAP tackling all the key areas identified within the Covenant of Mayors initiative. “The SEAP of Genova is an ambitious and comprehensive plan that is intended to lead to a 23% reduction of CO₂ emissions in 2020 compared to 2005. A large number of ambitious measures are planned in all recommended key sectors of activity. Plans and programmes in other relevant areas have been integrated into the SEAP.”

[Link](#)

Bioenergy

The following has been selected as best practice:

Regional Networks for the development of a Sustainable Market for Bioenergy in Europe (BIOREGIONS)

[Link](#)

The “bioenergy regions” enjoy various benefits including increased employment especially for the younger people, and a green image that can boost tourism and business activities. BioRegions will bring the development of bioenergy regions on a European level building based on the work of the most advanced areas and documenting their experiences in a way that can be easily replicated. This will be achieved with the following plan: (i) create a comprehensive knowledge platform that will collect and evaluate all positive and negative experiences of the “best practice regions”, (ii) develop guidelines for using quality and sustainability criteria that ensure the technological maturity of bioenergy ventures and their positive development effects for the region, (iii) formulate successful financing strategies comprising private funding from the specific region, institutional investment and money from public sources iv. define and implement Action Plans for establishing five new bioenergy regions v. encourage and support other regions to replicate the project activities

Implementation plan for BioEnergy Farm (BIOENERGY FARM)

[Link](#)

The objective of this project is an increase in the use and production of bioenergy and biofuels by farmers. To achieve this, it is necessary that farmers are given information on the possibilities and feasibility of the available options. This will be done by the European Bioenergy Platform. Individual farmers will be able to do an online Bioenergy Quick Scan to assess the profitability of bioenergy or biofuels for their farm. If the online scan predicts a positive profitability, the next step is a bioenergy scan by an expert of the farmers’ association. The expert scan comprises a more detailed calculation to determine the profitability and feasibility of bioenergy for the

individual farm. The expert will visit the farmer to perform the scan using the bioenergy profit calculator. A training programme will be developed and operated to train experts in performing the bioenergy scans. If the profitability and feasibility look good, support for the implementation will be given, including the drafting of a business plan. This plan will help the farmer to obtain funds and to make an investment decision.

Leveraging the development of national biomass strategies & action plans, based on a balanced assessment approach for policy makers (BAP DRIVER)

[Link](#)

The promotion of bioenergy is a top priority on the political agenda of the EU and most member states. However, the progress in terms of actual market deployment is still dissatisfactory. Many of the existing market barriers have their origin in insufficient policy frameworks on the national level. Recent policy initiatives aim at overcoming these barriers, including the European Biomass Action Plan (BAP). The process of developing country-specific BAPs is the starting point for this project. Its aim is to foster an integrated view of policy makers on biomass promotion and to leverage the formulation and implementation of consistent national biomass strategies and action plans in EU member states, thus, help fulfilling the European BAP.

Promotion of Biomethanisation in Agricultural Environment as a Decentralised Renewable Energy Ressource for Europe (BIOPROFARM)

[Link](#)

The idea of the project is to increase the valuing of the agricultural biomass to generate energy. Addressed to relevant stakeholders like farmers, entrepreneurs, investors and public decision makers, BIOPROFARM will try to eliminate the existing barriers in regional context and promote the technology to create an added value for the region. By organizing seminars, participation on exhibitions and organising awareness campaigns we will achieve the main goal of the project which is evaluation and support pre-feasibility studies of a number of realistic development projects and the establishment of technical, financial and administrative recommendations adapted region by region.

Heat

The following has been selected as best practice:

Supporting the organization of spot markets supply for wood chips and firewood (BIOMASSTRADECENTRES)

[Link](#)

The project aims to improve the professionalism of firewood and chips supply chain at regional scale, enabling the offer/demand meeting. It will mainly address the barriers lack of -promotion and training of wood fuels suppliers, -professionally large-scale spot markets customer-oriented for producing and trading wood fuels of guaranteed quality, -confidence and awareness of customers in wood fuels availability of fitted quality at local level, -technical and economical knowledge of farmers in cultivating fast-growing wood energy crops.

Expanding biomass and solar heating in public and private buildings via the energy services approach (BIO-SOL-ESCO)

[Link](#)

Energy service companies (ESCOs) can help the uptake of biomass and solar heat projects in larger buildings. At present this type of renewable ESCo is rare but the project will seek to change this by analysing and demonstrating solutions to non-technical difficulties faced by developers. Successful existing examples will be studied to enable detailed understanding of their approaches and operation. An up-to-date, comprehensive review of the current status of ESCOs will provide new knowledge on these approaches including the similarities, success or lack of and numbers. Detailed data will be collected and analysed on ESCo investment models, financial performance, organisation structure and contracts. Eight Member States participate - Austria, Bulgaria, Croatia, Germany, Greece, Finland, Italy and UK. These are wide-ranging and representative for Europe so results will have widespread applicability. Results will be widely useful throughout EU25. Finally work will be undertaken to establish exemplar ESCo schemes within the eight Member States.

GIS-based decision support system aimed at a sustainable energetic exploitation of biomass at regional level (BIOENERGIS)

[Link](#)

BioEnerGIS aims to improve the sustainable energetic exploitation of biomass at regional level developing a GIS-based decision support system, which allows both public decision makers and private operators to identify the most suitable sites for biomass plant installations, in terms of energetic, environmental and economic sustainability. The GIS-based DSS "BIOPOLE" combines supply and demand-side data, regional legislation, technological options and business plans to produce maps for capability localization. The end-use technology focus will be on district heating systems and cogeneration plants. BioEnerGIS will also explore the public and private interest in realizing the plants, the different stakeholders' needs and the possible finance or laws instruments in order to encourage a shared action programme. The overall approach and system will be tested in four regional case study areas, representing different environmental and economic conditions (Lombardy, Wallonia, Slovenia and Northern Ireland).

Model cities promote green CHP - Pacemakers for renewable energies (CHP GOES GREEN)

[Link](#)

The goal of the CHP goes Green project is to increase the use of RES in cogeneration which applies to district heating and cooling as well as to decentralised cogeneration units and integration of RES-based CHP-applications in buildings. The project proposes to develop model cities/regions by means of promotional activities in Berlin, Paris, Prague, Riga, Frankfurt/Main, Hannover, Graz, Grenoble. Further to this it is proposed that this successful model will be introduced to other European regions through know-how-transfer. Three main activities are planned on a regional level: consultation for the development and implementation of policies for the use of RES in cogeneration (legal issues, standards and certification); promotion of best practices for heat supply with biomass CHP for decision makers (building owners, planners and installers); and training of above mentioned decision makers in technical, ecological and economical issues to support the practical implementation of these issues. The project will also include the analysis of the legal and economical framework; best practices regarding RES based CHP strategies and the transfer of know-how through workshops.

Promotion of efficient heat pumps for heating (PROHEATPUMP)

[Link](#)

The overall goal of the project was to contribute to the reduction in the use of fossil fuels for heating purposes. The key objective of the project was to promote energy efficient heat pumps for heating. The project focused on the systems for the residential sector and SMEs, i.e. small to medium size heat pumps and in particular in the refurbishment stage where the needs for promotion is higher than for the new buildings. Promotion of heat pumps has been done by the means of improved and steady information for the target groups, end users and installers as well as policy makers. Another important project topic was the investigation and evaluation of the possibilities to combine heat pumps and renewables.

UP-RES Urban Planners with Renewable Energy Skills (UP-RES)

[Link](#)

There is a serious need to reduce energy consumption and emissions in urban areas and support sustainable development. Currently there is lack of both knowledge and usable tools that would combine both elements, energy and urban and regional planning. Relevant training is also missing throughout the Europe. UP-RES project will contribute to bringing awareness and comprehensive understanding on renewable energy systems among urban and regional planning professionals. The project will design and deliver training on energy issues for urban and regional planners in five partner countries. There will be both short workshops and long professional development programs. The trainings will take place 2011 and 2012. The project aims at having nearly 800 participants in the trainings.

District heating

The following has been selected as best practice:

ECOHEAT4EU (ECOHEAT4EU)

[Link](#)

District heating and cooling (DHC) have the potential to significantly contribute towards attaining the ambitious EU energy policy targets for 2020. Following up on the recommendations from Ecoheatcool and as part of the strategy to realise this important potential in the period 2015-2020, 'ECOHEAT4EU' aims to survey and analyse support legislation for DHC in a wide range of European countries and to present policy-makers with tools to improve the legislative environment for DHC. 14 countries are directly targeted by the project (Germany, UK, France, Spain, Czech Republic, Lithuania, Italy, Ireland, Romania, Croatia, Norway, Denmark, Finland and Sweden). Among other issues it will address: Overview of existing national laws and regulations and an assessment of their effectiveness Best practice support schemes and analysis of the possibilities to transpose them into different legal orders In-depth assessment of the barriers and opportunities for DHC Recommendations for policy-makers in each target country Comprehensive 'road maps' for DHC expansion in 4 countries: France, Germany, UK and Spain DH Barometer to measure the development of district heating in national markets

Solar District Heating in Europe (SDHTAKE-OFF)

[Link](#)

Solar district heating (SDH) plants are a large-scale solar thermal technology supplying renewable, zero-emission heat from large collector fields via district heating networks to residential and industrial areas. Long-term research programmes in Sweden, Denmark, Germany and Austria led to SDH demonstration plants, operating today at feasible heat cost. Twenty years of operational experience, plant technology and know-how are available from these programmes. Since the mid of this decade there is an increased interest in the commercial operation of SDH, mainly by utilities but also from local authorities and the housing sector. SDH presently makes the step into the market. In this project the partners analyze the market conditions and barriers leading to recommendations to policy and support scheme decision makers. District heating experts and industries together at one table with experts and industries of the solar thermal sector elaborate industry standards and guidelines for SDH, necessary for commercial activities on this sector. Capacity on the supply side is built up by training and support structures. Targeted dissemination activities will disseminate the project results

8

**SUGGESTIONS FOR DISCUSSIONS
DURING THE CONFERENCE
FOR WHICH THE REPORT
IS INPUT MATERIAL**



Previous to the conference on “Climate change and sustainable energy” that took place in Gijon (Asturias) the 26th January 2011, the region of Asturias sent to the members of LoCaRe a draft of the “Analysis on New energy”. Based on the first results of this Analysis, the Steering Committee of LoCaRa decided to organise two roundtables during the Conference , on **“Opportunities in the transition towards a Low Carbon Economy Regions”** and on **“Regional best practices in sustainable energy development to tackle climate change”**, on which relevant experts were invited .The presentations of the experts and the proceedings of the Conference have been published on <http://www.locareproject.eu>

The following questions were raised by the “Analysis on New Energy” to the panellist before the conference and they continue to be open for futures discussions:

Opportunities for the regions:

- Does the LoCaRe region believe that the transformation to an economy less dependent on carbon is a key issue for the social and economic future of the region? Does the region believe that solving the conflict and paying for environmental damage will increase local activity, more jobs and a better environment?
- Does the LoCaRe region believe that moving to a sustainable energy community request as a previous condition an extensive research capacity, busi-nesses activity in the relevant areas, wide-ranging international contacts and a public sector pro-active and already taking the lead in several areas? Or to the contrary, does the LoCaRe region believe that embarking on a sustainable energy community is an effective way to go through a Knowledge-intensive region?
- Should the LoCaRe region analyse whether it fulfill the conditions for taking the lead on a particular sector or geographical area? Does the region consider that the adoption and implementation of a sustainable energy action plan is the best way to achieve the energy/climate objectives? What about a regional debate on a long term vision?
- Which is the level of public administration, national, regional or municipal, that should take the lead for implementing energy/climate strategies? How the national authorities could encourage the regions and municipalities on to introduce sustainable energy objectives on its political agenda? How to involve stakeholders and to get public acceptance? How to succeed on becoming sustainable community?

Regional best practices in sustainable energy

- Could the LoCaRe region summarise a good reference of regional/local sustainable energy action plan?
- Could the LoCaRe region summarise good references on?
 - Local electricity from renewable
 - Co-combustion of biomass with coal on power plants
 - Biogas produced from agriculture feedstock
 - Heat and cooling generated from renewable

- Buildings: either public or private, individual or housing blocks, old or new buildings
- Buildings: integrated actions on renewable and energy efficiency
- District heating: increasing the share of renewable energy
- Marketing biogas on local transport
- Integration of electricity from renewable on the grid
- Low carbon technologies, in particular CCS
- Could the LoCaRe region summarise good references on?
 - Spatial planning
 - Sustainable public procurement
 - Integrated actions for sustainable mobility

The final report on the *“Analysis of New Energy”* has incorporated the main contributions of the experts ,as well as the main conclusions of the Conference on “Climate change and sustainable energy”

ANEXES

- Annex 1 to 4: TOR, NREAP and IRREAP instructions
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- Annex 6:Denmark ext_greenhouse_gas_emissions_by_sector
- Annex 7: Netherland ext_greenhouse_gas_emissions_by_sector
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ABBREVIATIONS

BEMIC	Baltic Energy Market Interconnectio Study
CBA	Cost&Benefit Analysis
CCS	Carbon Capture and Sequestration
CF	Cohesion Fund
CHP	Combined Heat and Power
CIP	Competitively and Innovation Framework Programme
CoR	Committee of the Regions
CPV	Concentrated Photovoltaic
CSP	Concentrated Solar Power
EEPR	European Energy Programme for Recovery
EIA	Environmental Impact Assessment
EIA	Energy investment deduction (Energie investeringsaftrek (NL))
EIB	European Investment Bank
ELENA	European Local Energy Assistance
ENTSO-E	European Network of Transmission System Operators for Electricity
ERDF	European Regional Development Fund
ETP-ZEP	European Technology Platform Zero Emission Fossil Fuel Power Plant
EU	European Union
EU ETS	European Union Emission Trading System
EWEA	European Wind Energy Association
FAEN	Fundación Asturiana de la Energía
FP RTD	Framework Programme on Research and Technological Development
FP7 RTD	Seventh Framework Programme on Research and Technological Development
GDP	Gross Domestic Product
GHG	Green House Gases
GW	Giga watt (10 ⁹ watt)
IBB	Innovatieve biobrandstoffen Innovative Biofuels (NL)
ICT	Information and Communication Technologies
IDAE	Instituto para la Diversificación y Ahorro Energético(Spain)
IEE	Intelligent Energy-Europe Programme
Ktoe	Kilo ton oil equivalent
KW	Kilowatt (10 ³ watt)
LoCaRe	Low carbon Economy Regions
LPG	LiquidPetroleum Gas

MEP	Milieukwaliteit Elektriciteitsproductie (Environmental quality of electricity production)(NL)
MIA &VAMIL	Environmental investment deduction scheme (Milieu Investeringsaftrek - MIA) & Random write-off of environmental investments (Willekeurige Afschrijvingen Milieuinvesteringen - Vamil)(NL)
MSP	Maritime Spatial Planning
MW	Megawatt (10^6 watt)
NER 300	New Entrants Reserve (300 allowances)
NREAP	National Renewable Energy Action Plan
OVMEP	subsidy scheme for fermentation installations (NL)
PV	Photovoltaic
RES	Renewable Energy Sources
RUE	Rational Use of Energy
SALAR	Swedish Association of Local Authorities and Regions
SDE	Sustainable Energy Production (NL)
SEC	Sustainable Energy Communities
SET Plan	Strategic Energy Technology Plan
SME	Small and Medium Size Enterprises
SWOT	Strengths Weakness Opportunities Threats
TAB	Filling stations for alternative fuels(Tankstations Alternatieve Brandstoffen (NL)
Toe	Ton oil equivalent
TOR	Terms of Reference
TPF	Third Party Finance
TW	Terawatt (10^{12} watt)
VIVE	Vehiculo Innovador/Vehículo Eléctrico

