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USING SUSTAINABLE AND RENEWABLE ENERGIES IN THE CONTEXT OF THE STRUCTURAL POLICY 2007–2013

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Content:

This study analyses the role of sustainable and renewable energies in the 2000-2006 Structural Funds programming period, by focusing on the different Member States' Operational Programmes and on examples of good practice. It also reports the main measures relating to sustainable and renewable energies presented in the National Strategic Reference Frameworks and describes a series of proposals intended to increase the use of Structural Funds to promote sustainable and renewable energies in the context of the 2007-2013 period.

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Summary

Study context and objectives

The new environment, as regards the level of energy costs, global warming and the profound change of objectives and areas eligible for 2007-2013, prompted the European Parliament's Committee on Regional Development to request an account of the use of sustainable and renewable energies during the implementation period of the 2000-2006 Structural Funds (SFs), which will end at the end of 2008, and of its inclusion in the framework of the next programming period in 2007-2013, on which negotiations between Member States, Regions and the European Commission began a few months ago.

This study aims to provide a brief description of the role of sustainable and renewable energies in the context of the SFs, to analyse the sustainable and renewable energy measures presented in the Member States' national strategic programmes for the 2000-2006 period, and to provide examples of best practice for this period. It also aims to analyse the sustainable and renewable energy measures included in the National Strategic Reference Frameworks (NSRFs) for the 2007-2013 period. Finally, this document proposes a series of recommendations intended to increase the use of the SFs to promote sustainable and renewable energies.

Political orientations and legislative framework

The two energy crises that followed one another in the 1970s revealed the weaknesses of the European energy system, which was heavily dependent on external factors. In the years that followed, people gradually became aware of the problems linked to the limitation of energy resources and became increasingly aware of environmental issues. Finally, more recently, various reports on climate change led to increasingly specific positions and commitments, aiming to make energy policy one of the main features of current European priorities.

In this context, the resources available in specific programmes appeared to be inadequate with regard to the significance of necessary changes to the EU's energy model.

European energy policy has developed around a few pivotal themes: the creation of a single, liberalised energy market (electricity and gas) at EU level that was both transparent and efficient; the diversification of sources for greater security of supply; the reduction of energy consumption and the intense development of new forms of renewable energy.

For several years, the Commission has, with foresight, developed programmes in the energy sector intended for local authorities. It has also supported the creation and strengthening of new structures (regional and local energy agencies to support local administrations, companies and citizens), the exchange of experience, the establishment of associations of local bodies, and the dissemination of technologies and results. However, the effort to be made is still significant, in particular in reducing the disparities between different regions.

Finally, the concentration in recent years of energy-themed European directives has almost completely absorbed Member States' legislative activity in the sector. In future, the Member States must administer an increasingly homogeneous body of legal texts and centralised technical standards and ensure the continuous approximation of the various standards.

Quantitative and qualitative analysis

Data was gathered in the 15 Member States affected by the 2000-2006 ⁽¹⁾ programming period, on the basis of the overall framework of the context and energy policies.

The results vary from one country to another. Nevertheless, the analysis shows the modest proportion of real expenditure dedicated to renewable and sustainable energies – around 1.16% of the total expenditure made in the 2000-2006 Operational Programmes (OPs). According to analyses carried out by other authors ⁽²⁾ on certain countries with a strong awareness of energy issues, it must be pointed out that the initial estimates were at least three times greater than the expenditure actually made.

Analysis of quantitative data has made it possible to underscore the predominance of measures and projects concerning renewable energies in comparison with those relating to energy efficiency. This finding can be explained in particular by the greater visibility of renewable energies, which are a more attractive element for policy makers.

The energy certification system, used for several years for household electrical appliances, has demonstrated its effectiveness. The expectations are many, particularly in the context of the energy certifications recently adopted for buildings.

The development of services in the energy-saving sphere, emanating from private actors, may free resources which until now have been frozen by legal limits set by public expenditure.

Quantitative analysis has also made it possible to highlight the considerable ‘energy’ expenditure allocated to SMEs. A few years ago, energy expenditure was focused on improving infrastructure, and resources were mainly intended for the public sector or large production and distribution companies. The financial resources dedicated to sustainable and renewable energies are now predominantly allocated to SMEs, which have developed new technologies, services and products.

Qualitative analysis has shown that, in certain countries, it has been possible to perfectly integrate energy objectives with economic development objectives. Energy and technological innovation, energy and rural development, and energy and the construction sector are just some examples of how this sector can still develop considerably and thus improve the quality of programming.

The various documents analysed show an increased responsiveness in the regions to the development of new agro-energy procedures and models. The European agriculture crisis, which materialised in the reform of the Common Agricultural Policy (CAP), forces farmers to choose the type of production on the basis of market criteria. In this context, agro-energy presents enormous potential. It is a unique opportunity to turn farmers’ resources into a strategic product, enabling energy imports from abroad to be avoided. The transport sector for its part represents a third of total energy consumption, which is mainly of fossil origin. Operators in the sector currently still pay little attention to the energy impacts caused by their various choices.

The study of new programming documents reveals strong disparities between countries. Some are innovative, while others have difficulty escaping traditional models. The financial data available show a rise in total energy expenditure, but this nevertheless still remains limited. The objective of 5% of the total of the SFs intended for sustainable and renewable energies appears increasingly unattainable and a more modest objective of 3% is more realistic.

⁽¹⁾ Only partial studies or studies intended for the development of projects or programmes have been carried out. No work involving the gathering of quantitative and qualitative data on all of the countries affected by the SFs is currently available.

⁽²⁾ See, for example, the Project ‘BACCHUS, Best Actions for Collaboration in Countries for a High Efficient Use of Energy in Structural Funds’, SAVE Contract No 4.1031/P/00-016/2000.

The situation of the new Member States arouses particular interest given the share of the SFs they are granted and the lack of experience of their managing authorities. However, the situation varies from one country to another: the Baltic states allocate more than 5% of financial resources to energy, while the percentages for the other countries remain much lower. Analysis of the various documents shows a growing interest in the theme of energy efficiency. This theme is in fact consistent with local needs for the structural conversion of the fabric of production and of the construction sector as regards energy saving, but also for the use of agricultural and forest biomass.

Analysis of the 2000-2006 programming period and the financial perspective for the next period in the 'old' Member States has made it possible to identify homogeneous groupings. The Central European countries (Austria, Germany) appear to be the most dynamic in the spheres of energy and the environment. The United Kingdom has focused its efforts mainly on companies, while the Scandinavian countries appear to have been more attentive to rural areas. France and the Benelux countries have taken approaches which are more limited but are aimed at specific themes (public buildings). Finally, in the Mediterranean countries, apart from a few exceptions, there are problems in integrating ambitious and consistent sustainable and renewable energy objectives into programming.

Fifteen examples of good practice have been identified in projects that have developed a strong consistency between energy objectives and social and economic development, through the involvement of SMEs and local actors and the integration of elements of technological innovation and new planning concepts.

Conclusions

The financial allocations for sustainable and renewable energies during this period are estimated at around 1.16%. This means that the real expenditure intended for specific projects using sustainable and renewable energies is probably less than 1%. This rather modest result can be explained by several factors:

- the lack of clear priorities,
- the absence of a specific and well-defined connection with the economic development of regions (companies and employment),
- the lack of objectives relating to improving the quality of the environment (tackling global warming),
- the lack of measures intended to support renewable energies and those aimed at increasing energy efficiency,
- the watering down of energy measures in other areas (waste use, networks, clean technologies, etc.), and in the area of support for SMEs and large companies.

However, analysis of projects in the National Strategic Reference Frameworks (NSRFs) for the 2007-2013 period reveals positive changes. First of all, the total amount of financial resources allocated to sustainable and renewable energies appears to be on the increase, strategic approaches appear to be more evident and, finally, a greater number of regions identify sustainable and renewable energies as a priority or a specific measure. The question is whether this improvement will have an impact on national and regional operational programmes, as well as on the financial resources that are programmed and consumed.

Finally, the identifying and analysing of good practices has made it possible to highlight the strategic role of sustainable and renewable energies in the development of a region and its companies. For the latter, sustainable and renewable energies may become a significant

technological advantage in terms of reducing costs and improving competitiveness, but also in terms of the development of new commercial opportunities.

Recommendations

Setting an achievable objective

On the basis of existing data for the 2007-2013 period, the financial resources allocated to sustainable and renewable energies in the context of the SFs are increasing, as is the threshold of investments in sustainable and renewable energies, taking all the SFs together. As a result, an increase in the share of sustainable and renewable energies from 1.16% to 3.5%, or indeed 5%, as is proposed in the information document *Channelling EU funds into efficient and renewable energy* ⁽³⁾, appears attainable.

It should be noted that the increase in expenditure to 5% of the total budget means a total final expenditure of EUR 17 370 billion (EU 27), an increase of EUR 15 billion compared with the previous period. For this reason it is advisable to consider 3.5% as a minimum objective while making an earnest effort to achieve 5%.

Furthermore, this sum must be dedicated entirely to actions linked to sustainable and renewable energies, without the inclusion of other technologies or themes.

A more strategic approach to sustainable energy

Sustainable and renewable energy must be an integral part of programming documents. It must be consistent with national and regional strategies and take into account European directives and policies on energy, by linking them to the priorities established by strategic Community directives.

Energy quality issues to be managed in all sectoral interventions

Energy is generally a key element in the economic development of a region. It is an integral part of transport, industry, housing and buildings, technological development and innovation, and companies and infrastructure. Several NSRFs have adopted an approach in which sustainable energy is included in all sectoral priorities and contributes to the achievement of overall objectives.

It is necessary to carefully consider the energy issues linked to interventions in all sectoral measures by assessing the energy impact of national measures.

There are several directives that define the characteristics of the approach to sustainable and renewable energies in different sectors (presented in the chapter on the policy framework). Better use should be made of the directives and policy documents as a reference, both during programming and during the implementation phase.

Finally, it should be remembered that Directive 91/2002/EC mentions that it is the responsibility of the public sector to stand as a positive example to the private sector. Since the SFs constitute public funding, they must help to ensure, in accordance with the European Community's approach to the issue, that energy is used in the most sustainable way possible.

⁽³⁾ CEE Bankwatch Network and Friends of the Earth Europe: *Channelling EU funds into efficient and renewable energy*, supported by Énergie-Cités, the European Renewable Energy Council (EREC) and the European Alliance of Companies for Energy Efficiency in Buildings (EuroACE).

Recommendations directly linked to the management of the SFs

The effort of the European Commission, which establishes, in the Community Strategic Guidelines ⁽⁴⁾, clear priorities for energy efficiency and sustainable and renewable energies for the three objectives of the 2007-2013 SFs, must be recognised.

It is now necessary for the European Commission to carefully monitor the programming process, by verifying the existence of a strategic approach on sustainable and renewable energies.

The introduction of a strategic monitoring system should strongly support the process and facilitate its management in the years to come.

The development of specific directives on the main energy issues should be undertaken throughout the programming process, and should make reference to objectives and priorities as well as energy policy documents.

Finally, it would be advisable to carry out a thematic assessment of sustainable and renewable energies for the last programming period and studies to support the integration of sustainable and renewable energies in the SFs.

Recommendations for energy and transport programmes

The Intelligent Energy – Europe II (IEE II) programme will be part of the new Competitiveness and Innovation 2007-2013 programme, with a significant share of the total sum (22.3%, or EUR 727 million). Emphasis will now be placed on the interaction of sustainable and renewable energies with competitiveness and innovation in companies, in particular SMEs. This aspect is in fact one of the recurring ideas in this study: European energy policy demands a change in the attitude of companies towards different, more sustainable and renewable energy systems, and towards more economical and more efficient methods. The new energy technologies must be converted into state-of-the-art expertise in order to make European societies more competitive at the international level.

There must be sustained effort and an emphasis must be placed on the role of local energy agencies in order to encourage the creation of projects at local level, in the context of the SFs.

Recommendations for actions aimed at companies

The role of companies in the development of sustainable and renewable energies was, however, underestimated in the 2000-2006 programming period. Most of the measures for SMEs and large companies were very general (ecological technologies), which left the choice of investing in new energy solutions to autonomous initiatives.

Companies must be strongly supported in the area of new models for energy supply and use, to prepare themselves for a period in which energy will become increasingly strategic (and expensive). Business combinations should be promoted in the context of their energy consumption, insofar as many solutions are financially viable only on a large scale.

Recommendation for research and development

The projects supported by the Seventh Framework Programme for Research and Development in the sphere of sustainable and renewable energies will have a significant influence on DG TREN's activity. A new concept was introduced in IEE II ⁽⁵⁾, which consisted in supporting the

⁽⁴⁾ Council Decision 2006/702/EC of 6 October 2006 on Community strategic guidelines on cohesion [Official Journal L 291 of 21.10.2006].

⁽⁵⁾ Decision No 1230/2003/EC of the European Parliament and of the Council of 26 June 2003 adopting a multiannual programme for action in the field of energy: 'Intelligent Energy – Europe' (2003-2006).

replication of new products and processes to facilitate the introduction of new technologies on the market.

Interaction at different levels of local development of the R&D chain, with the introduction on the market of new products and processes, may produce very positive results and make it possible to successfully achieve the ambitious objectives of European policy on sustainable and renewable energies.

Recommendation for cross-border collaboration

The EU 27's neighbour countries, in particular those on the eastern and southern borders, could benefit greatly from sustainable and renewable energy-related technologies developed by European companies. Programmes aimed at regional collaboration could become a means of disseminating available and proven technologies developed and implemented by European companies. Like Interreg, which proved successful in funding projects using sustainable and renewable energies, the new European Neighbourhood and Partnership Instrument (ENPI) and the Instrument for Pre-Accession Assistance (IPA) could be tools to help disseminate European energy technologies in neighbouring countries, bearing in mind that they are partly funded by the SFs.

For Member States

The development of the NSRFs and the operational programmes is at a very advanced stage and negotiations with the European Commission are ongoing for most of them (most of the NSRFs and OPs have not been approved so far). In this context, it is useful to provide some information which it still appears possible to include in the NSRFs and the OPs, and which may improve their quality.

On the basis of consideration of the most innovative NSRFs, they should all:

- include strong reference to technologies that use sustainable and renewable energies in the priorities for innovation and technology transfer. Increasing the know-how of European companies in this sector may open up significant commercial opportunities on a global level and contribute to the technological leap demanded by the ambitious objectives of the European energy action plan;
- include a reference to energy efficiency and sustainable and renewable energies in the priorities for the competitiveness of companies;
- plan the development of new agricultural or forest energy interventions, taking into account the whole process, from production through to final use, by emphasising the inclusion of raw material producers in the processing chain, with the aim of securing a reasonable profit for farmers;
- introduce sustainable and renewable energy considerations into transport, as a condition of the creation of new infrastructure, to avoid European funding being used to guide transport systems towards a model that would further squander energy;
- set the most advanced energy performance standards in interventions concerning all types of buildings (public, residential, industrial and commercial), in the regeneration of towns and cities, in new industrial areas and in rural areas;
- include water-saving considerations (another form of energy saving) in all interventions concerning water infrastructure;
- verify, using monitoring committees, the rationalisation of EU energy policy directives in operational programmes.

For regions

The active role of regional authorities is particularly important for innovation and technology transfer. Sustainable and renewable energies warrant a specific effort to bring together the research, development, human and physical resources available.

Planning authorities must coordinate regional energy plans with regional OPs, of which there are now many in several Member States. While regional energy plans must focus more directly on the funding of installations for renewable energy sources and energy efficiency programmes, the OPs must tackle strategic aspects linked to economic development, such as innovation and the competitiveness of SMEs operating in the sustainable and renewable energy sector, the creation of energy products based on agricultural and forest products, and the inclusion of sustainable and renewable energies in spatial planning.

Finally, the responsibilities of managing authorities could be extended to checking that projects conform to energy quality criteria, according to regional regulations on energy sustainability.

For local authorities

The global change of attitude towards energy issues, climate change and the agriculture crisis should encourage local authorities to progressively incorporate sustainable and renewable energy priorities into their projects. Initiatives should be managed at local level:

- to promote participative approaches, in particular in the themes of agricultural energy, energy from forest products and the exploitation of biomass. Innovative approaches are needed for farmers, processors, industry and local authorities – in particular final users – who must agree with local strategies;
- to develop projects promoting new and old generation plants and the supply of energy to villages, using sustainable and renewable energy sources;
- to establish concerted actions with a view to vastly improving energy efficiency in industry and commerce, in public buildings, public lighting and other public property, and in residential buildings and social housing.

For the Committee on Regional Development

- To call on the European Commission to carry out studies to support the integration of sustainable and renewable energies in the SFs;
- To call on the European Commission to identify good practices as regards sustainable and renewable energies during the 2000-2006 period, and to disseminate them to the whole chain of SF managers and beneficiaries;
- To call on the European Commission to carry out ad hoc thematic assessments on sustainable and renewable energies for the 2000-2006 programming period and for 2007-2013.

Abbreviations and acronyms

CIP	Community Initiative Programme.
CNASEA	Centre national pour l'aménagement des structures des exploitations agricoles (National centre for the development of the structures of agricultural holdings).
CO₂	Carbon dioxide.
DG	Directorate-General of the European Commission.
DG REGIO	European Commission's Directorate-General for Regional Policy.
DG TREN	European Commission's Directorate-General for and Energy Transport.
DG XVII	Former Directorate-General for Energy.
EAGGF	European Agricultural Guidance and Guarantee Fund.
EFF	European Fisheries Fund.
ENPI	European Neighbourhood and Partnership Instrument.
ERDF	European Regional Development Fund.
ESF	European Social Fund.
ESPON	European Spatial Planning Observation Network.
EU	European Union.
EU 15	European Union of 15 Member States, prior to the integration of 10 candidate countries, on 1 May 2004.
EU 25	European Union of 25 Member States 2004-2007.
EU 27	European Union of 27 Member States, following the integration of Romania and Bulgaria on 1 January 2007.
FIFG	Financial Instrument for Fisheries Guidance.
IEE II	Intelligent Energy – Europe II.
IPA	Instrument for Pre-Accession Assistance.
NSRF	National Strategic Reference Frameworks.
NUTS	Nomenclature of Territorial Units for Statistics.
OP	Operational Programme.
R&D	Research and development.
SF	Structural Fund.
SME	Small and medium-sized enterprises.
SPD	Single Programming Document.
TOE	Tonne of oil equivalent.

Glossary of specific terminology

ALTENER	ALTENER is a programme that aims to assist the creation of the legal, socio-economic and administrative conditions required for the implementation of an action plan for renewable energies and to encourage private and public investment in the production and use of energy from renewable energy sources.
Biofuels	Biofuels are a liquid or gaseous source of energy produced from biomass. Biofuels can be divided into two types: <ul style="list-style-type: none"> • - alcohols, obtained from cultures rich in sugar or starch (sorghum, beet) • - oils, obtained from oil seeds (rapeseed, soya, sunflower).
Biomass energy	In the energy sphere, the term 'biomass' groups together all of the organic matter that can become a source of energy. It can be used either directly (wood energy) or following methanisation (biogas) or new chemical transformations (biofuel).
Geothermal energy	Geothermics, from the Greek γῆ (earth) and θερμός (heat), is the science that studies the earth's internal thermal phenomena and the technology aiming to exploit it. Geothermics, by misnomer, also includes geothermal energy from the earth, which is converted to heat and/or electricity. Geothermal energy can be divided into three types: <ul style="list-style-type: none"> • high-energy geothermal power (electricity production), • low-energy geothermal power (heat production), • very low-energy geothermal power (geothermal heat pump drawing out heat contained in the ground).
Hydraulic energy	Hydraulic energy comes from energy potential linked to the exploitation of a falling body of water or a dam to convert it into electric energy using hydraulic turbines.
IEE II – Intelligent Energy – Europe II	IEE II is a multiannual programme (2003-2006 period) for actions in the sphere of energy.
JOULE-THERMIE	Implemented under the Fourth Framework Programme for Research and Development (1994-1998), the JOULE-THERMIE programme aims to promote energy security, sustainable development, clean and efficient energy technologies, industrial competitiveness and social cohesion.
Photovoltaic solar energy	Photovoltaic solar energy is the production of electricity from light, in particular using solar panels.
Renewable energy	Renewable energy is a source of energy that renews itself quickly enough to be considered inexhaustible on a human scale.
SAVE	Adopted by Decision No 647/2000/EC of the European Parliament and of the Council of 28 February 2000, this programme concerns the improvement of energy efficiency and the rational use of energy, in particular in the construction and industry sectors (apart from actions under STEER), including the development of legislative measures and their implementation.
Thermal sea power	Thermal sea energy is the thermal energy built up in the seas through solar radiation.
Tidal energy	Tidal energy originates from the movement of water created by the tides.
Wave energy	Wave energy is a potential source of energy linked to the movement of the surface of the sea through wave action.

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1. Introduction

1.1. Background

The new environment prompted the European Parliament's Committee on Regional Development to request an account of the use of sustainable and renewable energies during the implementation period of the 2000-2006 Structural Funds (SFs), which will end at the end of 2008, and of its inclusion in the framework of the next programming period in 2007-2013, for which negotiations between Member States, Regions and the European Commission began a few months ago.

Between 2000 and 2005 the price of crude oil on the international market rose from an average of USD 12 a barrel to an average of USD 60. The arrival of new consumer countries, such as China and India, has brought forward the end of energy from fossil fuels, and global warming and the influence of greenhouse gases on climate have become a reality shared by a majority of States and citizens (Kyoto Protocol). Finally, the technologies underpinning the production of sustainable and renewable energies have evolved considerably. All of these elements have of course profoundly changed the standing of energy in the economy and in ecology.

Europe's energy future is characterised by a dependence on external energy resources, which will climb to 70% – a figure that is due to a deficiency of internal alternative energy resources – and by a collective responsibility in the face of climate change. These new elements have led the European Council to take a strong position on energy issues, with the adoption of the Action Plan for a New Energy Policy for Europe in March 2007. Furthermore, the scenario in 2007, at the beginning of the 2007-2013 programming period, is completely different from that which emerged in 2000, at the beginning of the previous period.

The study takes into account this change in situation and will reflect its effects when drawing conclusions and making recommendations. Firstly, despite the fact that energy does not feature among the strategic objectives of cohesion policy, it is now integrated in many priorities linked to the various objectives⁽⁶⁾. Secondly, the experiences of recent years and some recent studies have shown that sustainable and renewable energies have a potential objective for development. Finally, support for a better quality of public expenditure, as far as the environment is concerned, has grown continuously.

All the above elements have been taken into account, to varying degrees, in the public policies of the Member States, introducing, in particular, new public energy policies:

- in the new Member States, for example, the theme of restructuring residential buildings built according to the Soviet model and which are of poor quality in terms of building and energy efficiency standards has been included in the Structural Funds;
- certain Member States disseminate decentralised models of sustainable energy communities, which are characterised by medium-term objectives to abandon the use of energy from fossil fuels;
- in the context of the reduction of farming subsidies, the largest farms have implemented a significant structural conversion to agro-energy and the small and medium-sized farms should follow the same path in future.

'Local energy actors', in particular the regional and local energy agencies, have sprung up (in large part through the contribution of the SAVE programme, now Intelligent Energy – Europe)

⁽⁶⁾ See for example 'Inforegio Panorama' magazine No 20 of September 2006, dedicated to 'Energy and regional development'.

and today represent a highly anticipated link between major Community and national policies and their application on the ground at local level.

1.2. Definitions

Within this new scenario it is becoming necessary to introduce new definitions for sustainable and renewable energies.

Sustainable energy is the energy obtained from sources the exhaustion of which is not expected within a time frame that is significant for the human race and that, therefore, contributes to the durability of all species. This concept is called ‘sustainability’. Another criterion for ‘sustainability’ which is useful for short and medium-term decisions is the social and political sustainability of an energy technology.

Renewable energy is the energy obtained from essentially inexhaustible sources, in contrast to, for example, fossil fuels, of which there is a limited supply. Renewable energy sources include wood, waste, geothermal energy, wind, photovoltaic energy and solar thermal energy. The traditional uses of wind, water and solar energy by man are very widespread in developed and developing countries. The mass production of electricity from renewable energy sources has become commonplace in recent years and reflects the main threats from climate change due to pollution, the exhaustion of fossil fuels and the ecological, social and political risks of fossil fuels and nuclear energy.

As a general rule, sustainable energy sources include all renewable sources, such as solar energy, wind energy, wave energy, geothermal energy, tidal energy and others. Fission energy and fusion energy meet the definition of sustainability, although, for social and political reasons, there is controversy surrounding their sustainability.

1.3. Aims and objectives

The purpose of this study is to provide a description of the role of sustainable and renewable energies in the European legislative framework, to analyse the sustainable and renewable energy measures present in the 2000-2006 operational programmes (OPs) and in the Member States’ National Strategic Reference Frameworks (NSRF) for the 2007-2013 period and to provide examples of good practice from projects carried out between 2000 and 2006. Finally, this document proposes a series of recommendations intended to increase the use of the SFs to promote sustainable and renewable energies.

1.4. The role of sustainable and renewable energies in the Structural Funds

The arrival of 12 new countries, the new SF map and the new objectives have considerably changed the geographical context of the areas and populations that are eligible. The extent of the changes is considerable: 16 Member States benefit from ‘Convergence’ objectives and 34 new regions from ‘Competitiveness’ objectives. For 2007-2013, 468 million inhabitants are eligible for SFs, that is 310% more than for the previous period. There are also 252 regions, that is 148% of the previous period. These new beneficiaries must learn to master the programming mechanisms, with energy interventions having become a priority, indeed a cross-cutting one, over all possible interventions in the framework of the SFs. At budgetary level, even if the sums allocated to the SFs in the EU budget are considerable, the fact remains that the sums per year and per inhabitant are decreasing. Given the principle of the concentration of interventions, sustainable and renewable energies are competing with other interventions.

Three new objectives for the 2007-2013 period have replaced the former structure of the Structural Funds:

- **the ‘Convergence’ objective** aims to stimulate growth and employment in the least-developed regions;
- **the ‘Regional competitiveness and employment’ objective** covers all areas of the European Union that cannot benefit from the convergence objective;
- **the ‘European territorial cooperation’ objective** aims to strengthen collaboration at cross-border, trans-national and inter-regional level.

Regulation (EC) No 1080/2006 of the European Parliament and of the Council of 5 July 2006 on the European Regional Development Fund (ERDF) establishes the following priorities for sustainable and renewable energies in each of the objectives:

‘Convergence’ (Article 4)

‘Under the Convergence objective, the ERDF shall focus its assistance on supporting sustainable integrated regional and local economic development and employment [...]. This shall be achieved primarily through the following priorities: [...]

9. energy investments, including in improvement to trans-European networks which contribute to improving security of supply, the integration of environmental considerations, the improvement of energy efficiency and the development of renewable energies’.

‘Competitiveness’ (Article 5)

‘[...] the ERDF shall focus its assistance in the context of sustainable development strategies, while promoting employment, primarily on the following [...] priorities:

[...] 2. environment and risk prevention, and in particular:

[...] c. stimulating energy efficiency and renewable energy production and the development of efficient energy management systems’.

‘European territorial cooperation’ (Article 6)

‘Under the European territorial cooperation objective, the ERDF shall focus its assistance on the following priorities:

1. the development of cross-border economic, social and environmental activities through joint strategies for sustainable territorial development, and primarily: [...] (d) by reducing isolation through improved access to transport, information and communication networks and services, and cross-border water, waste and energy systems and facilities;

2. the establishment and development of transnational cooperation [...] concentrating primarily on the following priority areas: [...] (b) environment: water management, energy efficiency [...].’

Finally, the eligibility of expenditure linked to housing in the ‘Convergence’ objective will enable sustainable and renewable energies to be included in the funding of the reconstruction of large building complexes in the new Member States which were built during the Soviet era and are very significant consumers of fossil fuels.

2. Identifying the EU's energy needs and policy responses

2.1. Level of energy self-sufficiency in the EU

In order to better understand the EU's complex energy scenario, it is useful to analyse 'spatially' the situation in the various Member States, using a few significant parameters such as energy self-sufficiency, the share of renewable energy, the potential for the use of biomass and the regional share of employment in the energy sector.

Energy self-sufficiency is a strategic parameter. It permits the measurement of the period of time available to each country during which it is shielded from a shortage of energy in an international context of limited oil resources and fluctuations in fossil fuel prices.

Considering, furthermore, that predictions of the future availability of fossil fuels are not reassuring and even envisage alarming energy crises, the level of energy self-sufficiency is becoming a vitally important parameter for every Member State.

It is possible, from Map 1, to gather a lot of useful information on the level of energy self-sufficiency attained by the EU in 2002. Firstly, it is clear that only a few countries have achieved a good level of energy self-sufficiency in terms of locally available energy resources, in particular Norway (hydroelectricity) and, to a lesser extent, the United Kingdom (North Sea oil) and Denmark (wind energy).

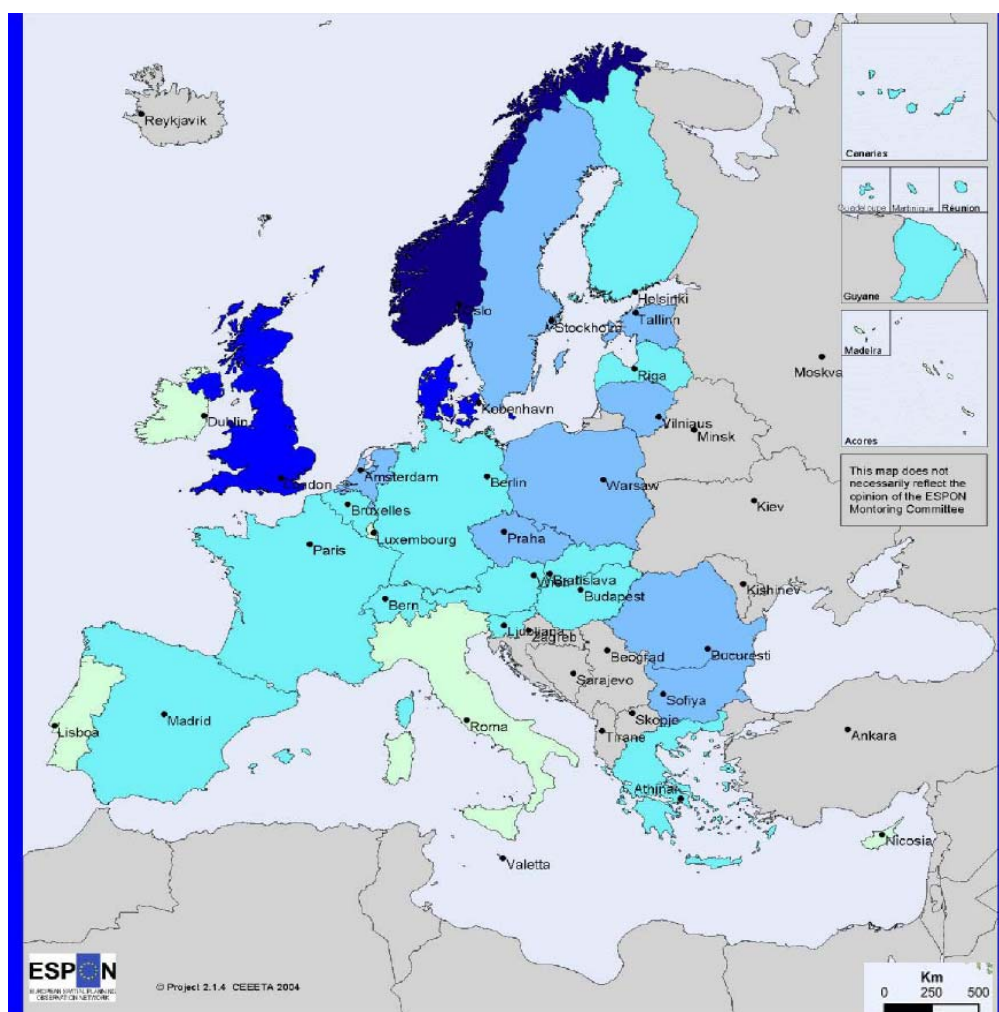
It appears, moreover, that a few Eastern European countries, such as Estonia, Poland, the Czech Republic and Romania are able to enjoy a good level of self-sufficiency – greater than 50% – with sufficient energy resources available to satisfy their own needs at national level to a great extent.

On the other hand, the countries that have a level of self-sufficiency lower than 50%, that is, with low availability of indigenous resources, forcing them to import oil, gas, coal or electrical energy products, are more exposed to crises and are those in which research in the exploitation of other local forms of energy should be most intense. The most significant cases in this category concern countries that are not concentrated in a single European geographical area, such as Ireland, Germany, Slovakia, Italy, Portugal, Spain, Greece, Cyprus and Malta.

While, on the one hand, intervention at European level is useful, particularly for strengthening energy networks and interconnections, it is also true that the greatest effort must be sustained at national level by every Member State in order to access renewable energy (wind, biomass and solar energy) according to their own climatic and territorial conditions ⁽⁷⁾.

⁽⁷⁾ Source: ESPON Project 2.1.4 'Territorial Trends of Energy Services and Networks and Territorial Impact of EU Energy Policy', Final Report 2005.

Map 1. European energy self-sufficiency in 2002 (%)



Energy self sufficiency in 2002

0 - 15
15 - 50
50 - 89
89 - 143
143 - 866

Source: ESPON Project 2.1.4

© EuroGeographics Association for the administrative boundaries

Source: DGET, Eurostat

In 2002 the share of electricity generated by renewable energies was very significant for countries such as Norway, Switzerland, Sweden and Austria, for which hydroelectric energy and forest biomass is available. Production covers almost the entire electricity demand and contributes substantially to energy independence by limiting imports.

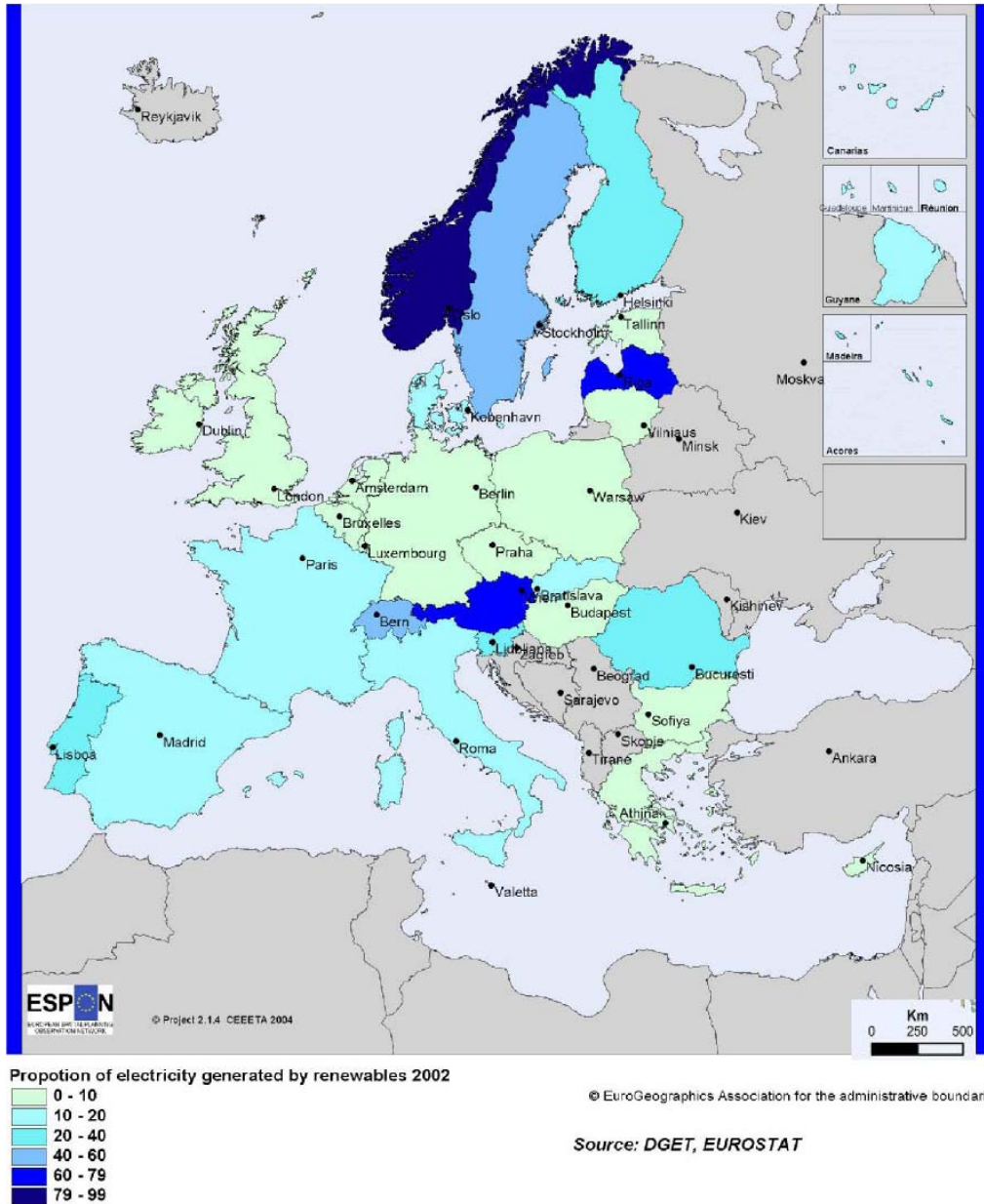
For the majority of European countries, such as Italy, Spain, Portugal, Denmark, Finland and Ukraine, the share of electricity generated by renewable energies is between 10% and 40% and comes predominantly from biomass, hydroelectric and wind energy.

Member States such as Ireland, the United Kingdom, Belgium, the Netherlands, Germany, Poland, Hungary, the Czech Republic and Greece generate less than 10% of electricity using renewable energy.

There is therefore still a significant margin for growth in production from renewable energy in general.

Taking into account the necessary investment, wind energy and biomass offer the best results and permit substantial economies of scale. On the other hand, the photovoltaic, solar thermal and geothermal markets are not yet sufficiently operational to be subject to wide dissemination. Recent studies and projections for the growth of natural resources have made it possible to identify future potential for the exploitation of wind and biomass resources. The map below illustrates the distribution of these resources throughout the European territory ⁽⁸⁾.

Map 2. Share of electricity generated by renewable energies in 2002 (%)



Source: ESPON Project 2.1.4

Map 3 analyses biomass and wind potential, compared to total final electricity consumption.

It can be seen that there is still strong development potential for wind throughout the northern/north-western part of Europe, on the Atlantic and North Sea coasts, for Denmark, Norway, Latvia and Ireland, continuing in the west with Spain and Portugal, with the notable

⁽⁸⁾ Ibid.

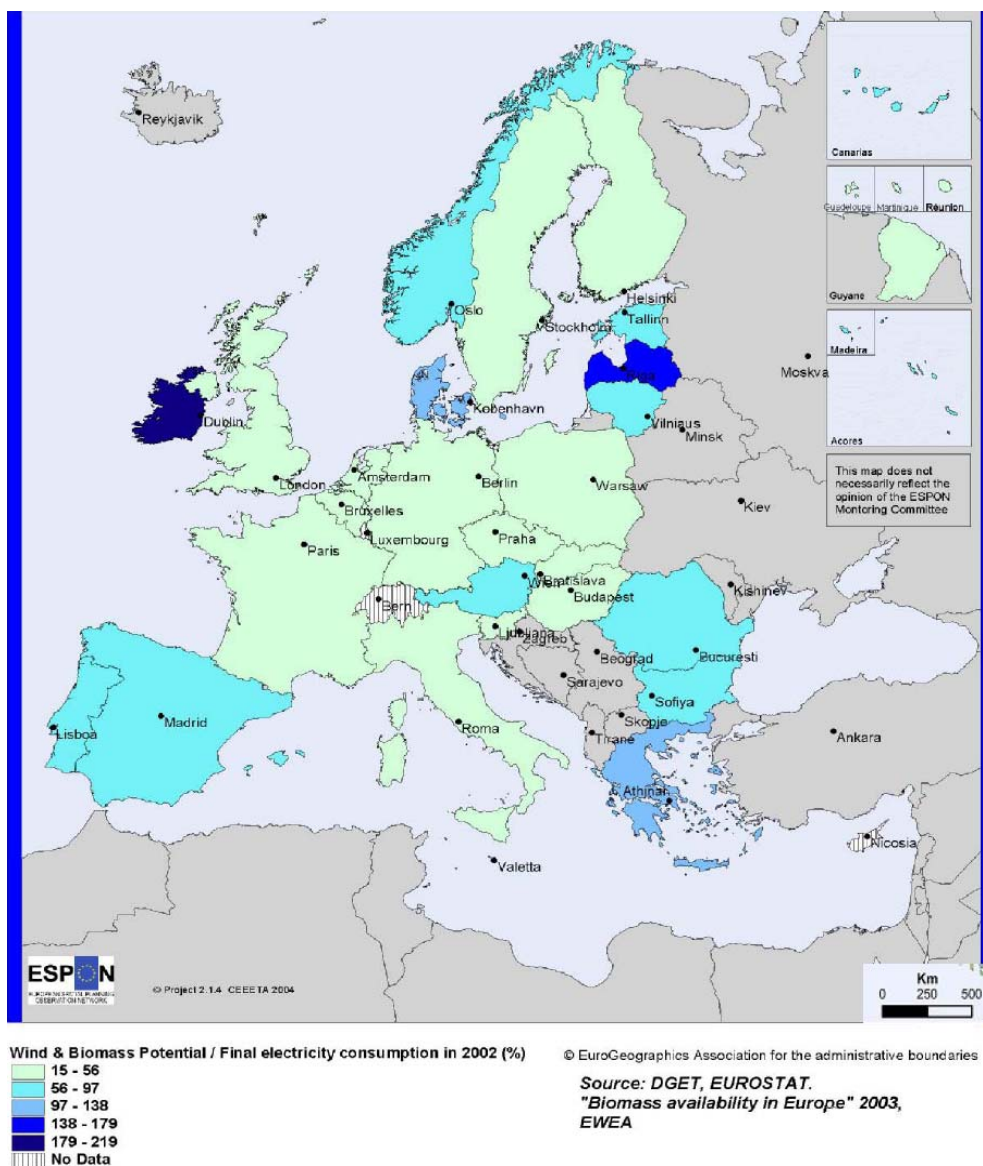
exception of Greece. These countries have been investing a great deal in these technologies for decades now and still have good exploitation margins for the coming years.

Conversely, the exploitation of biomass is concentrated in the eastern/north-eastern part of Europe in countries such as Norway, Latvia, Austria, Bulgaria and Romania, in areas where there is a considerable availability of forest biomass.

The band of countries located in the centre of Europe, such as France, Germany, the Netherlands, Poland, the United Kingdom and Italy, however, remain marginally involved in this process, owing to climate-related factors or policies that today are still insufficiently oriented towards the intensive use of renewable energies.

Conversely, Ireland and Latvia remain cases to be highlighted for their potential, which is much higher than average.

Map 3. Wind and biomass potential, at NUTS level 0, for the electricity consumption of final users in 2002 (%)



Source: ESPON Project 2.1.4

2.2. Taking energy sources into account in EU policies

Tackling climate change is one of the greatest challenges that the EU must face. Noteworthy steps have been taken, from the setting of the Kyoto objectives on greenhouse gas emissions to the maximum ceiling for the gases responsible for acid rain set by the Gothenburg Agreement.

These signals clearly indicate that further actions will be implemented in the areas of rational energy use, the development of renewable energies and the change in energy mix, to guide them towards a gradual reduction of fossil fuels in favour of renewable energies and natural gas.

Furthermore, the economy's dependence on fossil fuels (more than 50% of energy needs in the majority of European countries) requires the urgent adoption of policies aimed at reducing this handicap.

Renewable energies can play a key role in meeting many EU energy policy objectives.

The ALTENER, SAVE and JOULE-THERMIE projects have, in this respect, made a significant contribution to the promotion of technologies, good practice and institutional reforms in the areas of energy, as well as the creation of numerous energy agencies and cooperation projects between Member States. The 2000 Green Paper presents itself as an instrument that is even more incisive than the previous ones. It proposes a strategy to diversify imports and reduce energy consumption through the improvement of energy efficiency and the more intensive use of renewable energies.

The Kyoto Protocol clearly anticipates that sustainable and renewable energies constitute the most promising sector in terms of investment, with very considerable results for local economic development. The exploitation of renewable energies is well-placed in particular to create employment, increase exports, increase research and development, and promote economic and social cohesion, particularly in the most remote areas.

The development of a strong sustainable and renewable energy sector could thus make a contribution, in the long term, to the diversification of energy sources and to the security and self-sufficiency of external energy supplies, at both local and national level.

Energy is not a factor that can be defined unequivocally, because it horizontally affects numerous sectors of human activity. Considering its wide use, it is possible to note its presence in all economic activities and in both public and private production services (transport, lighting, office buildings, residential buildings, etc.).

The choice of energy type may have various territorial impacts: employment, competitiveness and localisation factors, income creation, virtuous behaviours in the domestic context, air quality and the environment.

Territorial and energy development policies must view these components as strategic factors to be optimised concomitantly in the various spheres of energy use. However, this vision of unity is necessary in the various production sectors (primary, secondary and tertiary) in providing for actions to promote energy savings or a progressive abandonment of electricity generation from non-renewable sources and fossil fuels.

2.3. The evolution of energy policies

These policies are beginning to acquire a more sharply defined profile, both in the objectives to be achieved and in the intermediate objectives that Member States must pursue, through the integration of the approaches defined by European directives in their own national energy policies.

The EU's energy policies promoting renewable energies have, in recent years, experienced a specific evolutionary process, through various phases of development:

- the 1970s were characterised by the first guidelines on renewable energies and energy efficiency;
- during the course of the 1980s, the first documents and detailed programmes were developed to guide renewable energy development, break down barriers and promote technologies;
- the 1990s were characterised by the significant production of more incisive directives to make electrical appliances more energy efficient and carry out the complete liberalisation of the energy market;
- in the 2000s legislation was consolidated and was largely inspired by Green and White Papers, until the approval of the Commission's proposal for a new European energy policy at the European Council of 8-9 March 2007.

Fact sheets on the EU's main legislative acts are presented in detail in an annex to this study (A 1.).

2.4. The role of local energy agencies

Local and regional energy agencies are assigned a key role in guiding energy policies on the one hand, and policy makers on the other, towards the sustainable use and planning of local energy resources.

The European Commission's DG for Energy and Transport supports the creation of local and regional energy agencies through the SAVE programme. The agencies have the key responsibility of advising policy makers on local energy policy choices and providing support in the transition to systems that are more sustainable in energy terms.

There are currently more than 380 local energy agencies that provide support for the dissemination of good practice in energy management, provide informative guides and offer a full range of services geared towards local needs.

The agencies are working on the most important issues, both with regard to energy demand and supply, in bringing together local and regional institutions, consumers and energy producers, the public and wholesale and retail technology suppliers.

The availability of such expertise provides major assistance for the development of energy policies in that it has an impact on the actual well-being of the population and on the use of local energy resources.

2.5. Observations of the European Presidency

The European Council meeting held in March 2007 under the German Presidency was, as regards European energy policies, fully dedicated to tackling climate change and the main issues related to renewable energy.

The Presidency conclusions clearly highlight the most urgent issues that Europe must address, one of these being the development of a 'sustainable integrated European climate and energy

policy'. The European Council adopted an Action Plan (2007-2009) entitled 'An Energy Policy for Europe'. The Presidency conclusions state:

The EU Member States must continue to have a leading role in meeting the commitment to collectively reduce their own emissions of greenhouse gases in the order of 30% by 2020, compared to 1990. Efforts will later have to be increased to achieve a reduction in emissions of 60% to 80%, by 2050, compared with those of 1990.

The European Council of 9 March 2007 supported the Commission's proposal regarding energy and climate change and reached agreement on an action plan to establish a European energy policy in 2009. The most significant progress has been made in the following sectors:

Reduction of greenhouse gases:

- a binding target to reduce EU emissions by 20% by 2020, not detracting in any way from the progress achieved in the international negotiations on a post-Kyoto agreement;
- a binding target of 30% should also involve the other industrialised countries in the pursuit of a similar course, including the United States.

Renewable energy:

- a binding target to produce 20% of total European energy consumption from renewable energy by 2020;
- the setting of a minimum binding target for every Member State to achieve at least 10% of their fuel consumption for transport from biofuel. However, the binding nature of this target lies in the general provision that fuel production must be sustainable and that second generation biofuels are made commercially available on the market.

Energy efficiency:

- achieving the Commission's target of an EU energy consumption saving of 20% by 2020 according to projections.

These observations open up a new era in energy policy choices. They provide a long-term objective, punctuated by stages of intermediate objectives. National energy policies must therefore no longer provide only for occasional and generic interventions. They will have to implement changes to the national energy structure, in particular in the production and electrical appliance sectors, as well as regarding people's behaviour in terms of energy consumption.

It is important to call for the necessary involvement of the SFs for an economic and social transformation of this scale.

The Action Plan 'An Energy Policy for Europe' is, for the SFs, an opportunity to be grasped in order to involve entire economic sectors, as in the case of the European energy sector, since these funds are institutionally responsible for assisting such radical changes.

3. Qualitative and quantitative analyses

3.1. Methodological approach

The objective of the analysis was to identify the role reserved for sustainable and renewable energies in the 2000-2006 SF programming period, in relation to Objectives 1 and 2 for the 15 'old' EU Member States, and the Community Initiative Programmes.

The new Member States that began using the funds only in 2004 have not been included in the analysis of the 2000-2006 programming period, since the documentation available was not sufficient to contribute significantly to the outcome.

The information sources used were:

- the geographical and thematic units in DG REGIO;
- the national and regional managing authorities in the Member States;
- European organisations in the sphere of energy (five were contacted in order to obtain supplementary information for the qualitative and quantitative analysis; only one of them replied and its contribution was included in the study);
- the Internet.

The analysis was carried out on the basis of OPs and implementation reports available at national and regional level.

With regard to the quantitative analysis, it must be noted that the implementation reports for the OPs are incomplete and the latest ones available date back to 2005. Information on funding is therefore limited, insofar as the funds will not be fully spent until 2008, and that the data available is often contradictory and not always usable.

In order to gather more precise information, the 'Barnier' codes ⁽⁹⁾ were used, which identify the activities in Community programming through the selection of several appropriate areas of activity. The codes selected correspond to renewable energies, energy efficiency, assistance to large companies for clean technologies, and to the same assistance for SMEs.

However, these codes group together different technologies (environmental protection, waste management, water cycle, etc.), among which energy technologies also feature. In this respect, DG REGIO has not provided data by project, which would have enabled the accurate identification of energy projects in the context of the codes for assistance to large companies for clean technologies and assistance to SMEs for clean technologies, and thus to distinguish projects linked purely to ecology. In fact, DG REGIO does not have precise data or summaries by country, objective or area of activity.

Searching for data by project at Member State level was the only way to obtain accurate figures. In this context and given the time available, only the French national management authority, the national centre for the development of the structures of agricultural holdings provided all of the projects funded by the ERDF in the context of Objective 1 and Objective 2 OPs, the URBAN programme and the cooperation programmes. This step therefore made it possible to obtain exhaustive information for France, in comparison with the other countries analysed.

⁽⁹⁾ *Commission Regulation (EC) No 438/2001 of 2 March 2001 laying down detailed rules for the implementation of Council Regulation (EC) No 1260/1999 as regards the management and control systems for assistance granted under the Structural Funds* mentions the division by category of the areas of activity of the SFs in accordance with Article 36 of Regulation (EC) No 1260/1999. In addition to its use in the annual reports on the SFs and its contribution to the clear communication of the different Community policies, this information by category enables the Commission to reply to requests for information from Community institutions, Member States and the public.

The quantitative analysis is therefore based, except for France, on two different series of tables, provided by DG REGIO:

- summary table of the areas of activity provided by the management authorities;
- summary table of the different measures envisaged in the Member States, for the four areas of activity linked to sustainable and renewable energy.

The elements extracted from DG REGIO's Infoview database were organised into different Excel files, which provide values by country, by funding source, by objective and by measure. Summary tables were produced from the results, showing the distribution of sums allocated and the percentages in comparison with the total expenditure.

So as not to end up with data that was too maximised in comparison with the actual situation, the areas of activity that did not explicitly mentioning energy were not included, even if they might contain sustainable and renewable energy-related projects, such as:

- Improvement and maintenance of ecological stability in protected wooded areas;
- Preservation of the environment in terms of soil, forest and landscape conservation, and the improvement of the well-being of fauna;
- Intelligent transport systems;
- Environmental infrastructure (including water);
- Protection, improvement and regeneration of the natural environment.

3.2. Qualitative analysis of the 2000-2006 programming period

The analysis was carried out through the study of programming documents available at national and regional level in the 15 Member States. The aim of the research was to identify information relating to sustainable and renewable energies, included in the programming for priority Objectives 1 and 2 and in the Community Initiative Programmes.

Analysis of the arrangements by which sustainable and renewable energies were integrated in the programming documents was carried out by placing the countries together in regional groupings, according to an approach previously developed in other studies.

The choice of regional groups is an adaptation of EU classifications used in the European Interreg regional programme. The Member States each belong to a single group and each group presents homogenous trends. In particular, countries that have adopted similar criteria in the collection of energy terms within SF programming have been grouped together, with particular attention being paid to strategic choices that may have high potential for successful replication in the next programming period.

3.2.1. Central Europe

Austria

Austria represents a particularly interesting example of the use of the Structural Funds for sustainable and renewable energies, which are presented in programming documents in a more meaningful way than in any other country. The SPDs for Styria and Upper Austria point to a general strategy oriented towards meeting the Kyoto objectives and following the guidelines of the European Commission's White Paper ⁽¹⁰⁾, from which the specific measures in the different

⁽¹⁰⁾ Energy for the future: renewable sources of energy – White Paper for a Community Strategy and action plan

sectors are taken. Among other things, the agricultural sector, research and development, and the creation of pilot and demonstration projects have been taken into account; in other words, measures that contribute to the growth of the regional economy in the energy and environment sector.

More specifically, it involves the creation of facilities and installations that enable the reduction of greenhouse gases, the performance of feasibility studies, the acquisition of resources and materials, and the recruitment of specialist staff. By way of example in the case of Styria, mention may be made of the creation of biomass power plants and boilers, the use of waste for energy purposes in the Goss brewery, the Gemini-Haus demonstration house, the solar cooling system for wine ageing cellars, and the construction of the Dollrath biogas installation. At the same time, the projects envisaged in the Upper Austria programme, provide for initiatives involving wind, solar, mini-hydraulic and geothermal energy installations.

The Lower Austria region has oriented itself towards the use of wind energy. Its SPD mentions the possibility of biomass heating stations and recommends having access to regional energy, using, for example, wood and straw from agricultural operations.

In the case of the programmes for regions such as Salzburg, Tyrol, Burgenland (Objective 1) and Carinthia, specific measures on sustainable and renewable energy are not mentioned, but they are described in measures concerning the environment, energies, and nature conservation. Furthermore, emphasis is placed chiefly on the responsible use of energy on energy saving and efficiency in companies, and the proper use of sustainable and renewable energies. These measures involve a wide range of actions such as electric power plants using and capturing the industrial heat and energy produced from biomass.

Finally, certain regions such as Vienna and Vorarlberg also envisage progressively phasing out diesel oil and replacing it with hydroelectric and thermal energy, and biomass from forest and waste origins, although no energy projects have been mentioned.

Integrating general strategic objectives linked to European energy policies into regional programmes is a fundamental point in terms of the objectives of this study. The example of these Austrian regions shows that this is a winning approach, insofar as it combines energy/ecological objectives with innovation, competitiveness and cohesion objectives. Unfortunately, little has been done to follow this approach in the majority of the other Member States' and regions' programming documents 2000-2006.

Germany

In Germany, renewable energy is rarely dealt with as a specific measure of OPs and in SPDs. It is most often considered to be an element pertaining to other measures, such as, for example, the environment, technological research and development, regional competitiveness, energy efficiency and rural development. Sustainable and renewable energies are generally considered to be a possible branch of economic activity which is capable of asserting technological and production excellence.

Numerous interventions place emphasis on the biomass branch, by setting their sights in particular on the construction and expansion of thermal and electric power plants, often linked to the wood cellulose pulp industry. It is particularly interesting to combine the most common technologies (solar thermal, photovoltaic and wind energy) with other less frequently adopted systems, such as the capture of energy using heat pumps, the use of vegetable-based bio-oil, the use of low-temperature geothermal potential, fuel cells and the environmentally friendly construction of buildings.

Furthermore, in Germany, particular attention is paid to information and communication aspects and the transfer of know-how. Interest is less evident in the urban metropolitan areas, such as Berlin and Hamburg.

The regions presenting the most ambitious plans regarding sustainable and renewable energy are North Rhine-Westphalia, Rhineland-Palatinate and Bremen. The SPD for North Rhine-Westphalia, in particular, considers renewable energies to be one of the most important challenges in its programme, especially in light of the liberalisation of the energy market, which represents an opportunity to be grasped to strengthen the position of renewable energies by means of concrete actions and standards. With this in mind, the SPD provides for the development of plans to transform the Ruhr into a 'centre of excellence' for renewable energies, which must be combined with the different objectives linked to technology, infrastructure, industry, employment and the environment.

A project that is worthy of mention is the Centre for Fuel Cell Technology, affiliated to the University of Duisburg. This Centre develops and integrates various types of fuel cells in different field of application; it in particular coordinates their integration in supplying gas, electricity and heat. The Centre can carry out research that directly meets the needs of companies or the research sector in the Ruhr, by creating a link between the world of research and the practical applications of new technologies.

In the case of the Rhineland-Palatinate region, the SPD of which contains a specific measure dedicated to renewable energy, aimed at developing sustainable and renewable energy production technologies and strengthening supply, the implementation reports up to 2005 show that the number of projects implemented (energy generation from wood, pilot projects, demonstration projects and biogas installations, putting hydro-electric power plants into operation,) is well above expectations.

Finally, it is interesting to mention three initiatives funded by the Bremen region SPD, which have been very successful: the establishment of a competence and information centre in the sphere of the ecology of construction, wind energy and the management of social organisations; a trans-regional centre for competence and know-how in off-shore wind energy; and, a centre for the environment and entrepreneurship.

3.2.2. Western Mediterranean

Spain

The Spanish situation is completely different from that of the countries considered earlier. Nine regions do not propose any measures specific to renewable energy. They nevertheless provide for measures relating to energy saving and the improvement of energy efficiency.

In line with guidance in the Green Paper, most Spanish regions had the objective, during the 2000-2006 period, of expanding their internal gas and electricity market to create growth and employment. Many regions have taken advantage of the ERDF to perform energy audits, which represent a key part of the energy management system because this allows the energy saving potential to be quantified. Furthermore, Spain has made a start on opening up its national electricity and gas market to all energy producers and has promoted electricity generated from renewable energies, in the context of the OPs.

In total, the percentage of the SFs for sustainable and renewable energies is 0.23%. The Basque Country is an interesting example. It has not provided for any action on renewable energy, but has undertaken to produce biogas from urban domestic waste in Bilbao. Similarly, the Navarre region has started a campaign with a view to reducing energy consumption in municipal buildings in the city of Pamplona. In addition the autonomous city of Melilla is aiming for an annual production of 9.5 GWh from renewable energy. In the region of Murcia, medical centres have been built following bioclimatic rules, making it possible to save energy while promoting environmentally friendly architecture. This project saw the light of day thanks to the financial assistance provided by the DG XVII's THERMIE programme.

Madrid is the only case involving a programme based on general energy objectives: a 1% limit on the rise in energy consumption and the achievement of a minimum share of 2% from renewable energy. This result was achieved through a series of measures ranging from awareness-raising campaigns in schools to the optimisation of the public transport system.

In Spain, the level of use of the SFs for sustainable and renewable energies is particularly low in all regions (widely lower than 1%), except Madrid where it is 2%. This figure is at odds with Spain's emerging position in renewable energy sectors such as wind energy, for which Spain is placed second among Member States in terms of installed power (8 264 MW in 2004). Spain is the European leader as regards bioethanol and ranks third for other energy sources such as photovoltaic, mini-hydraulic and biogas.

The Objective 1 regions have an average percentage of 0.14%, compared with 0.42% for Objective 2 regions. The less-favoured regions, occupied by other urgent economic and infrastructure matters, encounter more difficulties in adopting strategic policy objectives, despite the presence of a particularly advanced national industry in the sector, which uses incentives (attractive rates for the production of green electricity, for example). Action to support regional through, in particular by improving the competence of the regional energy agencies regarding the opportunities offered by the SFs and the related programming arrangements (regional energy agencies with consolidated experience already operate in regions such as Andalusia, Catalonia and Castile-Leon), would be useful.

Portugal

In Portugal, 3 POs in 7 contain elements relating to renewable energy and energies efficiency. These measures are most often diluted in other more global measures. It is noted that measures relating to improving energy efficiency are rare, indeed almost absent, in the majority of the POs studied. Only the programming complements for the Azores and Lisbon expressly mention types of projects that are likely to be funded in the context of renewable energy and/or energy efficiency. The OPs for Vale do Tejo and Alentejo limit themselves to mentioning actions aimed at increasing the development of renewable energies without giving examples of specific projects.

The 'Energy' measure in the Objective 1 OP for the Azores provides for increasing the capacity of power plants and electricity networks with the stated objectives of: increasing renewable and indigenous energy using geothermal energy in particular; reducing the environmental impact of electricity systems for the clean and efficient use of electric energy; increasing the level of reliability and efficiency of transport and electric energy distribution systems; and increasing the levels of energy efficiency and effectiveness. The OP for the Azores provides, in particular, for the funding of projects to build thermal, hydro-electric, geothermal and wind power plants. The 'Energy' measure represents 6% of the total amount of the OP for the Azores. The projects that have actually been funded involve, in particular, the building of a geothermal power plant and a wind energy development plan.

The Objective 1 OP for Alentejo provides, in a measure concerning environmental and territorial development, for actions aimed at improving and developing renewable energies. A significant number of projects that have actually been funded in the context of this measure in reality concern either waste management, the building of waste-water treatment plants or interventions regarding urban solid waste reduction systems.

The Objective 1 OP for Lisbon and Vale do Tejo provides, in a measure concerning environmental and heritage development, for water supply systems, waste-water drainage and treatment systems, systems for the collection, recycling and disposal of urban solid waste, and also the exploitation of renewable energies and the development of alternative energies.

The building and modernisation of thermal, hydro-electric, geothermal and wind power plants (Azores), actions to improve or develop renewable energies (Alentejo), and the supply of renewable energies (Lisbon and Vale do Tejo) are among the most significant types of measures. The situation described for Spain is duplicated and aggravated in numerous regions of Portugal. In fact, there is clear difficulty in addressing the subject of sustainable and renewable energies, as is attested to by overly generic themes and the lack of objectives. The positive example of the Azores is significant, both from a quantitative point of view (it has one of the highest percentages in Europe) and because of the measures provided for, which cover different technologies that can be implemented in island energy systems.

3.2.3. BENELUX

Belgium

The situation in Belgium is very varied, given the considerable regionalisation of the country

With regard to the SPDs for the Flemish provinces, renewable energies are not represented in an obvious way, with the focus being placed instead on the responsible use of energy. Consequently, the percentage of renewable energy projects implemented and funded is rather insignificant.

The SPD for the province of Antwerp contains a measure dedicated to renewable energy entitled ‘Sustainable Energy’, which aims to fund innovative microprojects to promote the use of renewable energies and to promote efficient energy use in companies in urban and rural areas. This measure has enabled the funding of the ‘Kamp C’ project, which dedicates an area of 10 hectares for the establishment of various initiatives centred around environmental and sustainable construction and housing. The area also includes a documentation centre and a library.

The SPD for the province of West Flanders and the coastal area of Westhoek contains no specific measures relating to renewable energies. Nevertheless, in a measure concerning sustainable development and the improvement of the SME environment, elements can be found which fund projects focused on the aim of improving energy efficiency and the supply of sustainable energy. However, the list of funded projects does not contain examples of this type.

The SPDs for the provinces of East Flanders and Limburg contain no measures relating to renewable energies. However, the SPD for Limburg provides, in a measure on nature and the environment, for the possibility of funding actions in the renewable energy sector, even if in concrete terms no example of this type has been found in the project database.

With regard to the Walloon Region, only the OP for Hainaut contains a measure relating to renewable energies and energy efficiency. This measure, concerning the development of indigenous energy potential, encompasses renewable energies such as wind, solar, hydro-electric and biomass energy and energy efficiency, cogeneration and energy management. It aims to fund: awareness-raising and information actions on the potential offered by alternative energy, directed at companies (industries, SMEs, farmers, forestry workers) and also local authorities (districts, hospitals, social housing associations, schools, museums, etc.); feasibility studies and the performance of energy potential audits for the different audiences targeted (companies and authorities); the setting up of renewable energy trading networks between different companies and between companies and local authorities; and actions to promote and demonstrate the first projects with a view to disseminating and developing these new activities.

The ‘Tournai - Gazenbois’ project can be singled out for mention from among the projects funded in the context of the Objective 1 OP for Hainaut. This project involved setting up a cogeneration unit using wood gasification to generate electricity and heat for the swimming pool in Orient, Tournai (Gazenbois). Its objectives were: to reuse wood waste from the maintenance

of the wooded estate by installing a cogeneration plant using wood gasification; to meet the electricity and heating needs of the Orient swimming pool; to play a pilot demonstration role for other authorities; to raise public awareness about renewable energies; and to support the rural community and improve the environment and quality of life.

Overall, the actions funded through the OP for Hainaut are mainly centred around increasing energy awareness in companies and among the general public, understanding the potential of sustainable and renewable energies, developing feasibility studies, and preparing the ground for further concrete actions in the future.

The Netherlands

The effort dedicated in the Netherlands to sustainable and renewable energies during the 2000-2006 period is not very clear: there is an absence of specific measures and the subject is merely skimmed over.

In the SPD for East Netherlands, some attention has been paid to the theme of the sustainability of nature, water and the environment, but not specifically in relation to the production of renewable energy. With regard to renewable energies, emphasis has been placed on the responsible management of energy sources in industrial areas and on the regeneration of these areas.

The SPD for South Netherlands is similar to that for East Netherlands.

In the province of Flevoland, increasing the use of sustainable energy was part of measure 1 concerning the strengthening of the economy. A general sustainability objective has been added to the OP and several projects have been implemented in the context of a sub-measure on increasing the use of alternative energy sources. The Annual Report mentions an annual increase in the production of wind energy and this even tripled between 1999 and 2002. The 2005 Annual Report reveals that, so far, no sum has been committed to the measure on increasing the use of alternative energy sources.

Furthermore, a measure concerning the structuring and development of urban areas includes projects linked to the building of clean energy housing estates. No further reference to this measure has been found in the mid-term assessments or the final reports.

The energy efficiency theme takes on a certain importance in the OP for North Netherlands. This OP funds, among other things, a centre to steer technology towards solutions offered by renewable energies (Kenniscluster Technologie Centrum Noord-Nederland – TCNN).

In the 'Energy Valley' project, the public and private sectors work together on energy activities, with the aim of achieving growth in the regional economy on the basis of employment. Activities are linked to oil and natural gas, the two resources present in the area. In the sphere of sustainable energy, the 'Energy Valley' project has dedicated itself to the following subjects: natural gas-powered transport, biomass/bio-gas, clean fossil fuel, production chain management and the use of biomass, and hydrogen energy. North Netherlands has been set up as a test bed for sustainable energy and decentralised energy production. The project is ongoing.

Although it is averagely placed, renewable energy has not received a great deal of attention in the 2000-2006 SPD. North Netherlands and the province of Flevoland are exceptions and have made interesting contributions to the promotion of renewable energy. In Flevoland, renewable energy was integrated in a sub-measure and some results were achieved. North Netherlands did not include the subject in SPD objectives and measures, but it nevertheless implemented a significant project.

In the rest of the Netherlands, sustainability and the reuse of resources were taken into consideration, but less than in the sphere of energy production.

The improvement of sustainable quality in SMEs and industrial areas is frequently mentioned. The tools for addressing the problem of CO₂ emissions are most often linked to energy saving and energy efficiency rather than significant production of renewable energy. Consequently, it is difficult to sketch out a general policy line for renewable energies on the basis of the Dutch programmes in the SPD. The fact that renewable energy was not a priority in the 2000-2006 SPDs does not mean that there was no interest in renewable energy in the Netherlands during this period and that nothing has been done in this respect. Moreover, a report on energy in the Netherlands (www.energie.nl) presents several sustainable energy initiatives which took place between 2000 and 2006.

Luxembourg

The programming complement and the 2005 Annual Report on the Objective 2 OP for Luxembourg provide interesting information. A measure concerning infrastructure facilities for basic economic use, which consists of interventions contributing to the reduction or removal of certain obstacles to regional economic development, focuses on four main aspects, including energy. As far as energy is concerned, the infrastructure supported must make it possible to respond to the needs of regional economic development. The measures apply both to installations guaranteeing improved security and to quality of distribution; some of these concern energy efficiency, cogeneration and energy management.

A measure concerning the development or adaptation of infrastructure with respect to environmental constraints aims to support planned interventions which respect environmental constraints, benefit the specificities of the regional economy, and apply the principles of proximity and economic efficiency.

The measure does not concern conventional infrastructure; as a priority, the actions envisaged concern the development of new infrastructure and/or the adaptation of existing infrastructure in three main areas, including energy. It involves the development of new or modernised capacity guaranteeing respect for environmental constraints, and improved security and quality of distribution according to the type of production (heat networks linked by a connection to a cogeneration plant, renewable energies, autonomous energy production).

With regard to the energy sphere, the programming complement mentions the same elements described previously in the measure concerning the development or adaptation of infrastructure with respect to environmental constraints.

In the context of measures relating to renewable energies and energy efficiency, Luxembourg's Objective 2 OP provides for the funding of projects giving greater importance to renewable energy and conventional facilities projects, but which contribute to the implementation of the national sustainable development plan, and projects guaranteeing maximum energy efficiency and a substantial reduction in energy consumption.

Among the projects that have actually been funded are: the establishment of a large field of photovoltaic modules using different technologies (total electric power of 56 kWp) on the roof surface of a hospital; the construction of a wooden school building on three levels (low energy consumption); the establishment of a solar-powered sewage sludge drying installation of eight units made up of covered greenhouses with a surface area of 5 000 m²; and, the creation of an electricity/heat cogeneration installation set up in the basement of the new storage facility for the local technical services.

3.2.4. Scandinavian countries

Sweden

The SPDs for the various Swedish regions do not contain any measures specifically dedicated to sustainable and renewable energies. However, sustainable and renewable energies and, in particular, biofuels, are dealt with in a general way and are linked to other themes, such as R&D, infrastructure development, the environment and business development. Specifically, they are a priority in the northern part of Sweden, particularly in the least populated areas, which are rich in forest and water resources.

Two examples of the organisation of R&D activities, with the achievement of common objectives in the north of Sweden, are the establishment of a region for biofuels and a technical centre for energy. The aim of research in these regions is to access raw materials and it focuses on renewable energy production technologies, in particular within the forest industry. These two achievements have not been cofunded by the Structural Funds, but consist of sub-projects and the creation of new industries, a part of which has been funded by the ERDF.

The Objective 2 SPD for South Sweden emphasises the importance of renewable energy sources and considers energy infrastructure projects to be a priority. The Objective 2 SPD for West Sweden mentions sustainable and renewable energies as a specific sub-objective, linked to employment and business development. However, the identification of funded projects and therefore the total expenditure on sustainable and renewable energies remains very vague, both in the SPDs and in the intermediate report, which confirms the very weak presence of sustainable and renewable energies in Swedish programming.

Finally, it should be noted that, in the European Union, Sweden is a country that is leading the way in the geothermal sector and most of the investment has been made without turning to the ERDF. In any case, since renewable energies and alternative sources are mentioned in the Swedish SPDs, it can be said that geothermal energy development is part of the funded interventions.

Denmark

In Denmark, the SPD (Objective 2) does not contain any measures specifically dedicated to sustainable and renewable energies. In fact, the SPD focuses on development in the most deprived and underdeveloped areas by placing an emphasis on employment in SMEs, with projects shared between the private and public sectors, and covers the following four priority themes:

- development of products that can have a positive impact on the environment;
- development and/or transfer of new technologies with an energy or ecological impact;
- investment in the tourism sector and projects with a low impact on the environment and nature;
- guidance for SMEs, including on the development of new products and export potential.

Projects centred around the development of sustainable and renewable energies have been funded within the context of these themes. In South Fyn and the Danish small islands, projects have been developed on fuel cells, solar thermal installations and export opportunities. Lolland-Falster and Møn have run thermal insulation and micro-generation projects, and the development of new products. The counties of Viborg, Ringkøbing, South Jutland and Århus have run projects on buildings and infrastructure.

A very significant example from the latter county is the island of Samsø, where the concept of using only renewable energy was applied for the first time. This was an example for numerous projects subsequently implemented in other European regions (sustainable energy communities). In fact, in 1997 the Government launched a competition aimed at Danish communities, in which

they had to produce 100% of local energy from sustainable and renewable energy sources. This objective, which was programmed for 2008, was achieved in 2003, through the cooperation of the 4 200 citizens living on the island.

Samsø is completely self-sufficient with regard to electricity, which is produced entirely by 11 one-megawatt turbines installed on the island in 2000, while 70% of heating comes from solar panels, straw, heat pumps and biomass.

Moreover, in 2003 Samsø installed 10 off-shore wind turbines each capable of generating 2.3 megawatts and making it possible to offset 140% of emissions from transport on the island, while offering electricity to the rest of Denmark. In addition, it has managed to stop producing CO₂.

Thus, an energy academy will be established in Samsø, in which all the expertise acquired in the island through the implementation of projects in the sphere of renewable energies will be concentrated.

Finland

The development of renewable energies is a very important priority in the Finnish SPDs. Of all the Scandinavian countries considered, Finland is the one that possesses the most developed and systematic approach in this sphere.

The objectives linked to renewable energies are well-defined in the four geographical areas concerned: southern Finland and western Finland – Objective 2, and northern Finland and eastern Finland – Objective 1.

The SPDs mention objectives for the development of SMEs and the renewal of the industrial structure, the setting up and development of new companies, the development of skills, innovation networks and new technologies, putting emphasis on the areas of technology, engineering, and sustainable and renewable energy research and development, and in particular energy saving in the production sector.

A noteworthy example of a project developed in Finland is the BENET cooperation network. BENET Bioenergy provides a wide range of services to the rapidly expanding bioenergy market. Founded in 1997 and comprising nine independent specialist organisations in central Finland, as well as individual members, BENET offers expertise in agriculture, forestry, biomass processing, energy production technologies, installation design, energy markets, business development and training. Funded principally by the Intelligent Energy – Europe Programme, the projects implemented by BENET (5 EURES, Propellets and BioHousing) promote the use of bioenergy for heat and electricity production, the export of technologies and the spirit of enterprise within the sector. The network cooperates with international partners for the development of bioenergy markets. BENET has valuable assets at its disposal, including one of the most important R&D laboratories in Europe and a training and development unit, the Bioenergy Centre.

It is worth mentioning that 66% of Finland is covered by forests and that it is the leading European country in the production of biofuels from forests. The majority of municipalities in the centre of the country (around 30 local authorities) use biofuel for heating. Central Finland's energy is produced entirely from biofuel, which meets 35-45% of this region's energy needs.

These figures show that Finland is developing its energy plan with particular emphasis on renewable energy sources.

3.2.5. British Isles

United Kingdom

All of the British programmes include renewable energy as a cross-cutting theme in the context of sustainable energy.

Energy comes within the scope of other themes, such as buildings, SMEs, forestation, feasibility studies and pilot projects. Certain projects incorporate technologies in order to improve the energy efficiency of buildings, including industrial buildings, centres for sustainable energy, laboratories and testing centres, demonstration installations and wind parks.

Several regions of the United Kingdom (Cornwall, the North-West, Yorkshire and Humberside) aim to develop SMEs in the sphere of renewable energy, recognising a considerable potential for the development of production activities in this innovative sector. The measures implemented range from assistance for companies to training activities (Objective 3).

Analysis of reports makes it possible to select some case studies, such as, for example, UK Biofuels Ltd, a family business that started using waste oils to produce biodiesel in the garage of the family home and which produces around 1 million litres a year, and has a plant in Knowsley. Other case studies include: the Merseyside intersectoral cooperation project, which provides for the supply of services to companies for innovation in renewable energy; Blackpool's Solaris Centre (North-West), which aims to promote renewable energies with a firm message – the transformation of the former Harrowside art déco solarium on the South Promenade into a zero-energy building – which is a model for the local community and an example to encourage people to change their behaviour and become more environmentally friendly.

The Sherwood Energy Village (East Midlands), in which industrial units were constructed using best practice in sustainable construction, is another convincing example.

In the Highlands and Islands of Scotland, there are many projects involving very advanced energy technologies (from wind energy to biomass, via tidal and hydrogen energy).

The cross-cutting theme of sustainable development is made up of two priorities. One of its objectives is to promote economic development through the use of renewable energies, local waste management strategies and good environmental practice in all sectors.

The first priority is to reduce energy consumption and to use renewable resources where possible. The second involves supporting companies in the procurement of supplies from flexible energy and achieving an increase in procurement from renewable sources.

In the east of Scotland, the strategic sector for forest products mentions energy production (biofuel), although energy efficiency is mentioned among other actions. For example, the 2004 annual implementation report mentions a pilot project approved in March 2005, called the Hydrogen Office, involving a new office building. The project is based on the effective use of energy, provided by hydrogen. Finally, in the mid-term assessments, there is mention of projects promoting the use of renewable energies, in particular biomass.

In Wales, renewable energies are comprehensively considered in two objectives under the cross-cutting theme of environmental sustainability. Wales has specifically integrated measures to support biomass and wind energy projects in the Objective 1 OP, and rural development and SME measures based on renewable energy in the Objective 2 OP.

The OP for Northern Ireland includes renewable energies under an objective on economic growth and competitiveness, but also in the 'Building Sustainable Prosperity' programme, with a predominance of wind installations. Renewable energies are covered in a marginal way in the PEACE II programme and no significant mention is made of activities on this theme.

Ireland

The National Development Plan includes the promotion and use of sustainable and renewable energy among its objectives. Specific measures on renewable energy are defined and implemented by the Economic and Social Infrastructure Programme and are presented under a theme concerning energy conservation and alternative energy/sustainable and renewable energy.

In fact, in the case of Ireland, infrastructure interventions are integrated in interventions relating to renewable energies, which indicates a horizontal approach to measures dedicated to sustainable and renewable energy. In the Operational Programme mentioned above, it has been admitted that in the past mistakes were made in the development of the market, which have led to important opportunities being missed to improve energy efficiency, research in this sector being neglected and energy being wasted in housing stock with low energy standards.

As regards renewable energies, there is considerable consistency between the improvement of the distribution network and the growth of the product distributed: for example, the growth of wind energy between 2004 and 2005 is equal to 495 electric megawatts, with an increase of 46%. A more robust distribution network could accept a higher capacity of uncontrolled energy (such as wind and solar energy).

In the case of energy efficiency, there is an initiative intended to improve the performance of public buildings and social housing built prior to 1980 in which energy management is very low, thereby anticipating the European Directive on the energy performance of buildings (2002/91/EC).

An important aspect of the Irish national plan for energy is the role of the National Energy Authority (now called 'Sustainable Energy Ireland'), which provides technical and organisational support for national energy policy and which has developed national strategies for tidal energy, sea energy and bioenergy in the context of the 2000-2006 SFs.

The innovative aspect that should be considered in the approach adopted by the British Isles, but above all the United Kingdom, is the introduction of energy not as a measure in itself, but as a horizontal component within the main programmes. This approach shakes up traditional organisation and opens up important perspectives. All future public expenditure will have to ensure that rigorous criteria are met as regards the quantity and quality of the energy to be used, regardless of its destination – for public infrastructure rather than for industrial or tertiary companies.

3.2.6. Central-West Mediterranean

Italy

In Italy, 20 of the 21 regional programmes include renewable energies and in 14 regions there are specific measures, which are, however, linked to other energies (energy from waste, electricity and gas networks, upgrading of power plants to environmental standards, energy saving).

In the case of Objective 1, the energy theme is included within the scope of a theme on natural resources and, for three regions (Calabria, Apulia and Sardinia), projects on energy are expressly mentioned. While the Campania region provides for measures on renewable energies, no trace of them is found among the projects implemented.

On the other hand, for Objective 2, sustainable and renewable energies are not a specific objective but feature in priorities in the context of the environment. In certain regions (Liguria, Lazio, Tuscany, Province of Trento) there are specific measures, but these are always integrated into the waste theme.

In Calabria, an action concerning the production of energy from renewable sources and energy efficiency, interventions relating to photovoltaic installations and to solar panels for domestic hot water, high-performance heat pumps for the air conditioning of rooms and other energy-saving interventions are at an advanced stage of implementation. Interesting projects are programmed as regards types of intervention relating to wind energy production and the production of energy from biomass, the most significant of which is that of the energy-producing urban waste incinerator in Gioia Tauro.

In Molise, measures on the distribution of photovoltaic technology installations and installations for the thermal exploitation of solar energy, for the reuse of biomass and for the exploitation of hydro-electric energy are combined with a measure relating to process innovations in waste management systems, by encouraging the reduction of the quantity and danger of waste produced and by promoting energy recovery, in particular from biodegradable waste, which is a source of renewable energy under Directive 2001/77/EC.

In Sicily, wind energy is favoured, with installations of a minimum overall power of 1 MW built with aerogenerators of a minimum power equal to 500 kW. In the case of biomass, interventions aimed at producing electric and/or thermal energy using agricultural, forest and industrial waste are provided for, as are the establishment of installations producing energy from photovoltaic solar, thermal solar and geothermal sources.

The 2005 annual report on the implementation of Objective 2 in the Lazio Region mentions the establishment of 41 new renewable energy sources and rational energy use installations, with a rise of 0.53% in energy produced from renewable and assimilated sources, thanks to the new installations, compared with the initial figure of around 2% (of total energy consumption in 1995). The intermediate assessment report of December 2005 mentions 63 projects funded, 43 started, 31 completed, and 2 abandoned as part of a measure concerning the upgrading of the environment and basic infrastructure.

Liguria (Objective 2) provides for interventions concerning: the establishment of wind, thermal solar and photovoltaic solar installations that are autonomous and connected to the electricity network; the return to use of hydroelectric plants or the building of new ones; installations for cogeneration and heat distribution by distance heating, the power of which is not greater than 5 thermal MW, using biomass of agricultural and forest origin; installations for cogeneration and heat distribution by distance using biogas; and installations using agricultural and forest biomass, only if they are connected to heat distribution networks using distance heating. In taking forward these actions, connections to the existing electricity network will receive cofunding.

In Emilia-Romagna, although the region provides for the establishment of renewable energy installations in the context of its SPD, in practice no projects are funded in this sector. The frequent divergence between the objectives established in programmes and the actual implementation of projects indicates a lack of desire on the part of the local authorities to undertake energy projects, even though they are mentioned in the programmes. The reason can be attributed to the higher priority being given to other themes (in the case of Objective 2, for example, the theme of funding aqueducts and water purifiers has prevailed among the provincial and local authorities). If the local authority does not feel that energy is a significant theme at local level, regional programming is pointless. The growing significance that has developed in recent years offers hope for a change of strategy in the next programming period.

Greece

Sustainable and renewable energy measures are very important in Greece's OP.

A first measure concerns the promotion of cogeneration, renewable energy sources and energy saving, through the implementation of information, promotion and dissemination projects, and

support studies for these technologies. Public investment is also envisaged, both in renewable energies and in gas cogeneration, as are energy-saving interventions in public buildings. The same is true for private initiatives on innovative energy systems. The projects anticipated concern wind generation, mini hydroelectric installations on watercourses and aqueducts, cogeneration using biomass, low- and medium-temperature geothermal applications and solar electricity applications.

A second measure aims to improve the quality and reliability of the electricity supply to the islands, including the promotion of investment in renewable energy where the potential is greatest. In this context, infrastructure projects for the transmission and distribution of electricity are anticipated, including better distribution to the small islands, in order to promote the use of discontinuous sources such as renewable sources or cogeneration surplus and finally support for the infrastructure of transmission systems in order to promote projects based on renewable sources.

A third measure concerns security of supply and the reduction of dependence on supply from abroad through the differentiation of sources, in particular as regards increasing the share of renewable energies and cogeneration. In this context, the projects will be combined with wind energy, small-scale hydroelectricity, the use of biomass (particularly in cogeneration), geothermal applications, the development of solar applications and support for investments in electricity networks and systems linked to projects for the production of electricity using renewable sources. For this country, which is particularly vulnerable to dependence on energy from abroad, these actions reveal a very targeted strategic choice in favour of renewable sources through very specific measures that address, on the one hand, the lack of infrastructure (networks) and, on the other, public and private interventions for production.

France

The information on France has been separated from the regional grouping of which it is part and dealt with at the end of the chapter, because the analysis does not use the same perspective of interpretation as for the other countries. It has in fact been possible, in the case of France, to analyse expenditure on sustainable and renewable energies by region thanks to the systematic use of the 'Barnier' codes in the documents provided by the National Management Authority, which gather together all the projects funded in the context of the OPs of all the French regions and Community initiatives concerning renewable energy. There are, however, disparities between Objective 1 and Objective 2 regions. The regions that have dedicated the most significant financial resources to renewable energy projects are:

- Objective 1 regions: Réunion and Martinique,
- Objective 2 regions: Provence-Alpes-Côte d'Azur, Rhône-Alpes, Upper Normandy and Brittany.

In the French OPs, infrastructure in the sphere of renewable energies, both in production and in distribution (wind, solar, hydroelectric, biomass), assembles the largest number of projects and the most significant financial resources. According to the figures drawn up in January 2007, a total of EUR 414 309 has been programmed and EUR 217 754 authorised for this project category.

The percentage of investment programmed varies considerably from one region to another and ranges from 0 to 5%. This shows that it is possible to aim for an objective of 5% for all regions for the next programming period and that it is necessary to assist the regions that are least conscious of the problem to catch up with the others, so as to achieve the European objectives on reducing greenhouse gas emissions.

The percentage of expenditure on sustainable and renewable energies drops considerably for the funding that has actually been committed. This reduction reflects the difficulties encountered at

local level in implementing energy measures, even if they are part of programmes, compared with other more traditional measures. The reasons may be many: a lack of specific skills in local authorities; a lack of support structures (energy agency, centre of competence); and competition with other more urgent priorities. This point will be considered in the conclusions and solutions put forward for closing this gap.

In all regions combined, projects linked to the installation of a wood boiler and those linked to the installation of solar heating represent the vast majority of projects funded in the context of the SPDs. There are also a number of projects related to photovoltaic solar installations.

Several regions have also funded studies for the implementation of a wood energy policy network in the context of their OPs.

Furthermore, the financial resources provided for in the OPs have made it possible to fund studies intended to manage the energy costs of public and company buildings in various French regions.

Several regions have also funded high energy quality practices in the context of the SPDs, for example the creation of high energy quality buildings in Brittany, Upper Normandy, Lower Normandy and Auvergne.

On the other hand, few of the OPs have funded projects for the installation of one or more wind installations, with the exception of Réunion, which has funded many. Several regions have funded studies related to wind energy in the context of their SPDs, such as Picardy, Midi-Pyrénées, Poitou-Charentes and Provence-Alpes-Côte d'Azur. Lower Normandy has funded the organisation of regional wind energy conferences.

There are few projects relating to transport and there are hardly any projects linked to the development of biofuels or biogas for transport.

There is particular interest in energy interventions among French citizens.

3.2.7. Community Initiative Programmes

Analysis of the role given to sustainable and renewable energies in the Community Initiative Programmes (CIP) is particularly important insofar as these programmes draw their justification from a higher level of innovation than is expected from national and regional OPs.

The URBAN Programme often contains initiatives that are interesting from the point of view of energy. The European Commission, moreover, suggests that designers address these themes, often getting involved in the design and negotiation process in a very direct way. There are examples in the sphere of: energy production at urban level (cogeneration and regeneration instead of traditional boilers); the use of more developed means of public transport (electric, methane and biogas buses); and energy audits on public buildings intended for interventions to improve energy efficiency. Although it is not binding in character, the attention paid to the method of use of expenditure in relation to the type and quality of the energy is an example of the control that the central authorities can exert on the Member States.

The Interreg Programme contains numerous projects that offer to exchange experiences between the most developed regions and those in a learning phase in the sphere of sustainable and renewable energy. Although it does not represent very significant expenditure items (investment is practically impossible), the exemplary value of these projects is significant. In fact, in many OPs, investment is linked to the development of initiatives that are intended to produce changes of behaviour among users, both public and private.

Finally, a very important aspect is represented by the LEADER Programme, which, through the concept of rural development, has enabled farmers to become aware of the opportunities offered by the local use of their agricultural or forest resources. The LEADER database of rules for

good practice contains a lot of information on this subject, even though, with the changes currently taking place in relation to the CAP, the problem of restructuring agriculture has become urgent to the point of requiring very significant financial budget assistance and the challenge of agro-energy would demand very different instruments to assist regional and local authorities, which unfortunately are not yet ready to take it up.

3.2.8. Energy and transport

It has been difficult to assess the influence of measures concerning the impact of energy in the public and private transport sector, which nevertheless represents a third of total energy consumption. The reason for this is that the problem of transport and traffic is usually addressed as a theme in itself. The objectives pursued concern cost reduction, traffic reduction, the improvement of air quality and the development of the necessary infrastructure, but they neglect the impact of energy.

A change of strategy took place within the European Commission with the merger of the Directorate-General for Energy with the Directorate-General for Transport, and then with the mission assigned to the regional energy agencies to take charge of transport. As far as the Operational Programmes are concerned, projects linking energy and transport have remained limited (with the sole exception of the development of biofuels).

A large number of measures relating to the improvement of transport have a significant impact on energy consumption, such as more efficient or renewable energy powered means of transport, alternative modes of transport (car pooling), the use of collective transport in preference to individual transport, bicycle use in the city, and so on.

On the other hand, many strategic choices in the sphere of transport can have serious negative consequences for energy, such as: the development of road infrastructure in comparison with rail infrastructure; the uncontrolled expansion of cities according to models that are increasingly less compact, which is not followed by equivalent public transport planning; the planning of buildings for services without consideration for the impact on travel, etc.

Therefore, the attention paid, in Structural Funds expenditure, to the quantity and quality of energy used will also have to extend to choices to be made in the transport sphere.

3.3. Quantitative analysis of the 2000-2006 programming period

3.3.1. Introduction

Analysis was carried out using data provided by DG REGIO on the basis of the OPs, SPDs, programming complements and annual implementation reports and assessments provided by the managing authorities. The absolute values and the percentages for the use of the SFs in relation to sustainable and renewable energies have been considered and categorised by area of intervention, fund type, programme type and by Member State ⁽¹¹⁾.

⁽¹¹⁾ The data mentioned must be used very carefully, because it is based on intentions for expenditure (commitments) and not on actual payments. Furthermore, it is dependent on the quality of information supplied by the Member States.

3.3.2. Overall impact of sustainable and renewable energies on the 2000-2006 SFs

The overall percentage of expenditure commitments relating to sustainable and renewable energies compared with the total expenditure is 1.16%, as shown in Table 1. This is an overestimation because of the fact that:

- the valuation was established mainly on the basis of expenditure commitments and not on the basis of the total expenditure actually made;
- the areas of intervention providing the total sum committed to supporting companies in environmentally sustainable technologies and clean energy technologies ⁽¹²⁾ consist not only of energy interventions but also of interventions generally more oriented towards the environment. It has not been possible to separate the two elements.

Table 1. Impact of areas of activity on sustainable and renewable energies in relation to the SF total (€K)

	Total funds committed to sustainable and renewable energies (€)	SF total (€)	Percentage of the total
Clean energy technologies for large companies	435 694	-	0.19%
Clean energy technologies for SMEs	1 240 285	-	0.55%
Renewable energies	606 180	-	0.27%
Energy efficiency	332 720	-	0.15%
TOTAL:	2 614 880	225 084 078	-
%	-	100%	1.16%

Source: the authors, using DG REGIO data

A reading of Table 1 provides other interesting information. The area of intervention with the greatest burden (0.55%) is that of clean energy technologies for SMEs. This observation also indicates that the energy/environment sector is already an advanced technological frontier, offering prospects of new activities for European SMEs, concomitantly with the development of company competitiveness. Less than half of the funds allocated to this area are intended for large companies, although energy has long been considered one of the most productive areas for action. The market is in a process of change and the most dynamic SMEs that are ready to take advantage of the technological and economic opportunities play a leading role in it.

Comparison between the areas of intervention relating to renewable sources and energy efficiency shows a clear predominance of renewable energies (ratio of approximately 2 to 1). This situation appears to confirm an idea put forward by operators in the sector ⁽¹³⁾, according to which, in the context of energy efficiency, there is lower visibility, whereas with renewable energy sources there is a greater return at political level.

The percentage obtained for all sustainable and renewable energies (1.16%) is slightly above that generally taken into account by DG REGIO (around 1%) ⁽¹⁴⁾. It is, however, consistent owing to the fact that the percentage obtained is most likely overestimated.

¹² The two areas of activity are defined as follows: 152: Assistance to large commercial organisations: ecological technologies, clean and economical energy technologies; and 162: Assistance to SMEs and the craft sector: ecological technologies, clean and economical energy technologies.

⁽¹³⁾ Written contribution supplied by the Association of European local authorities promoting local sustainable energy policy, Énergie-Cités, Besançon, France, prepared by Jana Cicmanova, Énergie-Cités, 14 March 2007.

⁽¹⁴⁾ Peter Ungar, personal communication.

An earlier study ⁽¹⁵⁾ had provided a higher suggestion (between 2 and 3%), but the estimate was then limited to a single sample, consisting of only three Member States (Italy, France, United Kingdom).

3.3.3. Analysis by fund type

The four main SFs:

- ERDF (European Regional Development Fund);
- ESF (European Social Fund);
- EAGGF (European Agricultural Guidance and Guarantee Fund);
- FIG (Financial Instrument for Fisheries Guidance)

participate in measures other than expenditure for sustainable and renewable energy. The burden of expenditure is met almost entirely by the ERDF (see Table 2), with a minimal contribution from the EAGGF. The table also shows that use of the agriculture fund is essentially reserved for renewable sources (this is foreseeable due to the fact that the agriculture fund is in this case chiefly applied to agro-energy cultures intended to provide energy from biomass) but also in large part for the area of activity reserved for assistance to SMEs, and to a lesser degree the area of assistance to large companies. The opportunities for significant expenditure on sustainable and renewable energy are to a large extent linked to policy on companies.

Table 2. Allocation of expenditure commitment in the four areas of activity relating to sustainable and renewable energy, by type of Structural Fund (€K)

	Renewable energies (wind energy, solar and hydroelectric energy, biomass)	Energy efficiency, cogeneration, energy management	Assistance to large companies - environmental technologies, clean and economical energy technologies	Assistance to SMEs and craft businesses - environmental technologies, clean and economical energy technologies
ERDF (€K)	602 337	332 721	433 356	1 235 528
EAGGF (€K)	3 844	0	2 338	4 758
ESF (€K)	-	-	-	-
FIG (€K)	-	-	-	-
SF (€K)	606 180	332 721	435 694	1 240 286

Source: the authors, using DG REGIO data

3.3.4. Analysis by objective and programme

The objective of this part of the study is to analyse in a more detailed manner the spread of funds dedicated to sustainable and renewable energies in all the Member States according to the objectives and programmes. It also aims to develop the spread of the four areas of activity relating to sustainable and renewable energies by Member State.

⁽¹⁵⁾ 'BACCHUS, Best Actions for Collaboration in Countries for a High Efficient Use of Energy in Structural Funds' Project, SAVE Contract No 4.1031/P/00-016/2000, coordinated by ECUBA srl.

The use of the ERDF in Objective 1 suggests a more or less even distribution between the four areas of activity, with a slight predominance of the area relating to assistance to SMEs, followed by renewable sources. The not insignificant presence (20%) of assistance to large companies, very likely public services, is interesting, while it is much weaker in Objective 2 (only 6%). The situation is reversed for SMEs, which go from 43% in Objective 1 to 63% in Objective 2. The energy programmes of Objective 2 appear to be more attentive to SMEs compared with those of Objective 1, which pay more attention to the activities of large companies.

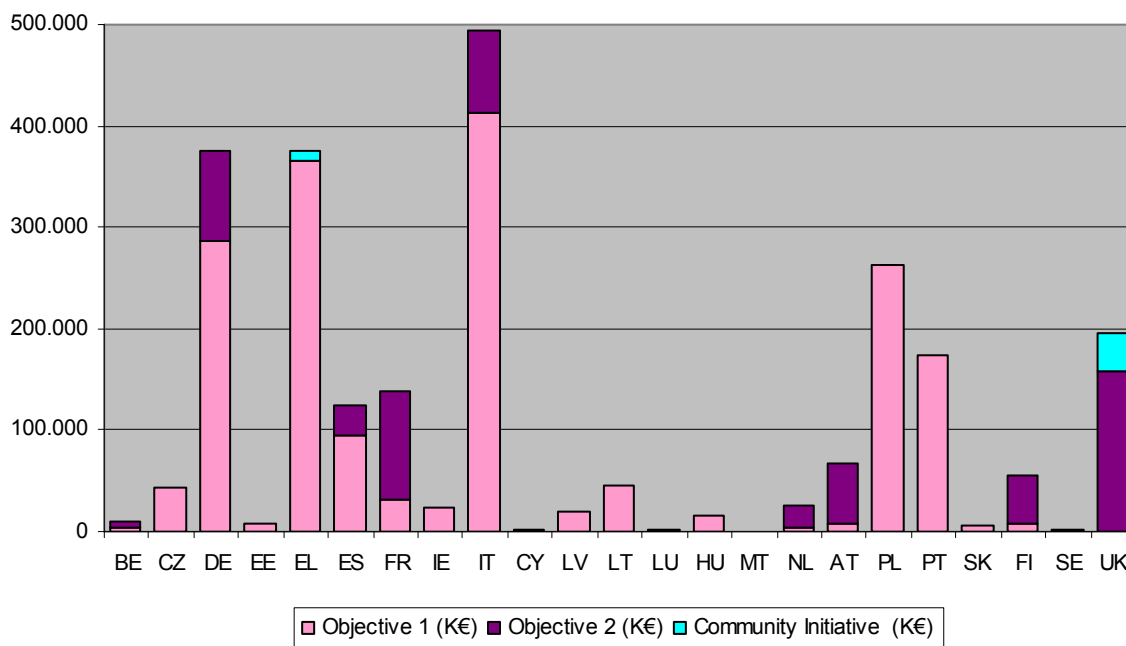
In contrast to Objective 1, the EAGGF has not been used in Objective 2, although it is often represented by peripheral and sparsely populated areas. This situation is not easy to interpret: it is likely that the richest regions have decided not to focus on agricultural activities in order to turn to other sectors that are more promising for development, while neglecting the opportunities for restructuring food and non-food agriculture. In less-favoured regions, the EAGGF has been intended almost entirely for initiatives on renewable sources (in all likelihood agricultural or forest biomass). The ERDF is, on the other hand, quite evenly divided between the four areas of activity, but always with a predominance of renewable energies.

The percentage of renewable sources is always predominant in the case of the Community Initiative Programmes, even though the share of clean energy technologies for SMEs remains significant. The share of energy efficiency and of large companies is much lower. This phenomenon can be explained by the greater attention paid by public authorities to renewable energies (because they provide higher visibility and a greater social impact) and by the increased scope for initiative by SMEs in calls for tender that are more innovative in nature. EAGGF's low share has also been divided between renewable energies (very likely biomass or other energies applied in agricultural and rural tourism and much used by the LEADER Programme) and assistance to SMEs.

The predominance of the use of sustainable and renewable energies in Objective 1 in countries such as Italy, Portugal and Greece, as well as in all the new Member States and unified Germany, can be easily predicted given the considerable proportion of Objective 1 regions. The predominance of the use of sustainable and renewable energies in Objective 2 in France, Austria and the Netherlands is equally predictable for the reason given previously. On the other hand, it is surprising to note the complete absence of energy in Objective 1 in the United Kingdom and the almost complete absence of the use of the SFs for energy purposes in Sweden (apart from the limited allocation of SFs in Sweden, the data is also confirmed in percentages).

The United Kingdom and Greece are the only countries with an appreciable use of energy in the Community Initiative Programmes.

Graph 1. Distribution of the total sum intended for sustainable and renewable energies by objective and by Member State (€K)



Source: the authors, from DG REGIO data

In absolute values, the ranking for the use of energy in the Member States has Italy in first place (EUR 494 million), followed by Germany (375), Greece (374) and Poland (262). There are significant differences between the smaller countries: the Baltic Countries and Ireland are much more committed to this theme than Hungary and Belgium.

For a comparative evaluation in relative terms rather than absolute terms, one should analyse the percentages for the use of sustainable and renewable energies compared with the total programmed for each nation, by considering the funds and programmes separately.

In the case of Objective 1, Lithuania is, in relative terms, in first place with 5.06%, followed by Poland (3.17%), Latvia (3.15%), the Czech Republic (2.97%) and finally, the United Kingdom, which is top of the EU 15, with 2.49%. The countries in the lead in absolute values rank low in percentage terms (Italy: 1.73%, Greece: 1.61%).

Sweden, Slovenia, Spain and Malta have the lowest percentages (less than 0.5%).

As far as Objective 2 is concerned, Finland, with an excellent 9.11%, Austria, with 8.21% and Cyprus, with 7.67%, lead the rankings. On the other hand, Denmark, Slovakia, Sweden and the Czech Republic have a percentage of less than 0.5%. The low percentage of the new Member States is of course due to the reduced presence of Objective 2.

In the context of the Community Initiatives, the country that has dedicated the most resources in percentages is Greece, with 2.67%, while for all the other countries the percentages are less than 0.33%.

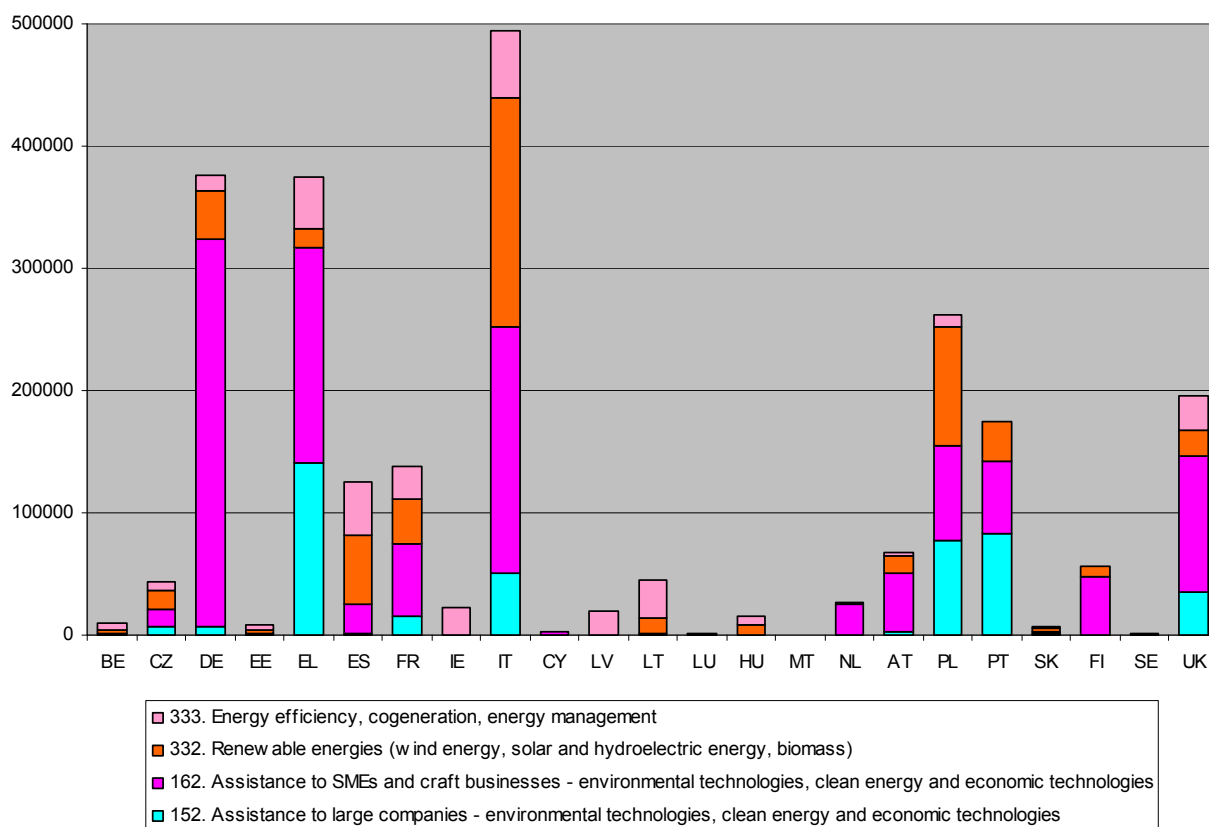
Analysis of the share of energy in the different OPs suggests that overall it is impossible to foresee an alignment of all the Member States along the values of the most virtuous countries in this area. For Objective 1 it seems reasonable to seek to reach a value of between 4 and 5% for 2007-2013, considering the significant number that have already achieved 2-3% in the 2000-2006 period.

It is more difficult to estimate a value to be reached for Objective 2, owing to the fact that only three countries have passed the threshold of 3% and have now reached between 7 and 9%. Is this performance exceptional in character or can it represent an objective for all? Apart from Cyprus, the allocation of which is very modest and may represent an unusual case linked to

individual initiatives which dominate others, Austria and Finland are at an intermediate position in terms of absolute commitment, and may therefore represent a model that can reasonably be applied in a general way.

3.3.5. Analysis by area of activity in the different Member States

Graph 2. Distribution by Member State of the four areas of activity



Source: the authors, from DG REGIO data

Graph 2 makes it possible to verify if the situation of the Member States so far considered to be possible models to follow is characterised by areas of activity that are unusual compared with the average. The case of Austria and Finland shows that the predominant area of activity (Assistance to SMEs) is therefore not out of reach of the other countries. In the context of Objective 1, the countries with the highest percentages fall into two clearly diversified groups: the new Member States have a predominance of energy coming from renewable sources, whereas the United Kingdom, Austria and the Netherlands have a predominance of assistance to SMEs.

These observations confirm the general point, already mentioned, about the importance of clean energy technologies in policy for the development of SMEs. This fact is particularly evident in 'old' Member States with stronger technological and productive growth. In conclusion, to achieve positive results in terms of an increased application of new energy, an energy policy cannot ignore a policy of support for SMEs.

The new objective of the 2007-2013 SFs on innovation and competition between companies therefore represents an enormous challenge for the energy sector.

In the Cohesion objective, bringing the less-favoured regions up to speed may be given considerable impetus thanks to the adoption of more rigorous energy standards in the construction of buildings, infrastructure, facilities and installations, which promote the growth

of skills in local companies and among local operators, and which contribute to achieving the ambitious objectives of the EU's energy policy. The opportunities offered to the least prosperous part of European agriculture, through a conversion, albeit only partial, to agro-energy, must not be neglected either.

On the other hand, the traditional approach based on the development of specific measures within areas linked to the environment and infrastructure does not appear to guarantee a success of this importance.

Finally, it is useful to mention the constant underestimation of energy efficiency compared with renewable sources, which goes against the equal importance of these two objectives in the European Council's vision for 2020 in the Resolution of March 2007: 20% for both results. All the initiatives that are also focused on the most attractive applications for renewable sources, which include the obligation to reduce consumption with unvarying levels of comfort and quality levels, may prove to be useful.

3.4. Preliminary indications for the 2007-2013 programming period

3.4.1. Methodological approach

The aim of the analysis is to identify new trends in sustainable and renewable energies for the 2007-2013 programming period.

At the time of the study, the majority of National Strategic Reference Frameworks (NSRFs) and OPs for 2007-2013 were the subject of discussions between the Member States and the Commission. The study was therefore based on the NSRF projects in order to maintain a homogenous approach. It has been possible to identify the type and spread of the measures provided for sustainable and renewable energy, and to carry out comparative analyses.

The analysis took into account the whole of the EU 25, with the exception of Finland and Greece, for which the NSRFs for 2007-2013 were not available when the study was carried out.

3.4.2. Preliminary indications regarding the EU 15

The reading of the NSRFs made available by the Member States provides a unique opportunity to confirm the trends of change among the 2000-2006 SF projects and those that are emerging for 2007-2013 in the sphere of sustainable and renewable energy.

The strategic Community directives have highlighted and placed an emphasis on the role of energy, by suggesting two 'energy' priorities within the 'Convergence' objective: energy efficiency and renewable energies, and three priorities in the 'Competitiveness' objective: encouraging energy efficiency, increasing production from renewable sources and developing an efficient energy management system.

The Community directives have led to a noticeable change in behaviour in the majority of the NSRFs. A large number of regions have placed energy among their key priorities and mention it as a specific measure when drawing up their programming documents. The themes chosen to support energy are more consistent and strategic. They make reference to innovation and the competitiveness of the economy, tackling climate change and the use of local energy resources as a contribution to more competitive, steady and rational growth. In general, national programming in 2007 reflects a greater responsiveness to energy themes than could be identified in 2000.

The majority of Member States are beginning to deal with the two themes of 'energy efficiency' and 'renewable energies' simultaneously in order to resolve problems linked to security of supply and tackling climate change.

The Member States can be grouped into geographically homogeneous areas, according to an approach already used in similar studies (¹⁶).

It is worth mentioning an area consisting of countries in the central and north-west region in which the attention focused on energy themes, as well as on approaches that move towards the integration of energy objectives in regional and local economic development has increased significantly. In an area comprising countries in the central region (France, Belgium and the Netherlands), responsiveness to these themes is lower and a more specific focus in the direction of innovation themes emerges. The Scandinavian countries continue to focus particular attention on renewable energies, particularly in the less populated rural areas, whereas the Mediterranean countries (essentially Spain and Portugal, rather than Italy) are beginning to take energy policy objectives into account and to combine it with development objectives. Finally, an important group of countries in the central-eastern region (the most significant part of the new Members States) display a considerable internal heterogeneity but appear to have accepted the challenges of integrating energy into the programming for their development.

(i) Germany, Austria, Ireland and the United Kingdom

In Austria, six provinces out of nine have placed energy among the priorities of the new NSRF, whereas, in the previous programming period, only four provinces mentioned energy among their measures, of which only one had a specific measure. The top priority in the Austrian document is innovation and knowledge, which comprises a chapter on innovation in ecological and energy technologies

In the second priority concerning developing regions that attract investment and competitive sites in which to locate companies, investment in renewable energies is considered to be one of a total of five strategic measures. The objective is to increase energies efficiency in all areas of society and to increase the use of renewable energies in companies and in the public sector. Furthermore, energy efficiency is considered to be key to the general improvement of competitiveness and to contribute to meeting the Kyoto objectives. The main elements of this strategy are biomass and wind energy, provided that, from the planning phase, careful consideration is given to the landscape aspect and the impact on the environment.

This emphasis placed on renewable energy as a tool for improving the innovation and competitiveness of companies and regions is not an isolated one: it is also found in the documents of Germany, Ireland and the United Kingdom.

Finally, Ireland provides for the strengthening of electricity networks to enable a maximum contribution from green electricity in the national and local network. A preliminary study has been completed and the plan now foresees its concrete implementation, in order to increase the production of wind energy and biomass in the island's network. The Irish NSRF provides information from the 2007-2013 National Development Plan, which awards energy a significant percentage of 8% of the plan's total allocations.

⁽¹⁶⁾ European Parliament, Directorate-General for Internal Policies of the Union, Structural and Cohesion Policy Unit: 'The possibilities for success of the sustainable communities approach and its implementation'.

(ii) France, Belgium, the Netherlands and Luxembourg

Two new sectors not found in the other NSRFs make an appearance in France: the energy quality of buildings and clean energy in urban transport, accompanied by multimodal transport solutions. These two themes help to clearly explain the importance of a horizontal approach to energy. In these two examples, sustainable energy represents a quality characteristic, which features in two policies that are not normally linked to energy, such as buildings and transport. The recent Directive on the energy performance of buildings ⁽¹⁷⁾ clearly expresses the obligation to create high energy quality buildings and entrusts public authorities with the task of providing an example to citizens and companies by increasing the energy efficiency of public buildings or those funded by public money. In the same way, European transport policies suggest a rational use of energy, with regard to both fuels and modes of transport. The importance of public authorities turning towards ‘green’ purchases in the use of the SFs, including in structural investment programmes, is therefore understandable.

Useful statistical data can be found in the document of the French Community of Belgium (Walloon Region), which indicates a sustainable and renewable energy share of 2.6% and 2.2% of the ERDF total in the Convergence and Competitiveness objectives respectively. The spread between energy efficiency and renewable energies represents a ratio of 1 to 2, which once again confirms the predominance of the second over the first.

In the Netherlands, the total for sustainable energy in the context of infrastructure reaches 3.2%, but other fund allocations are included in this for assistance to companies and SME investment, without the amounts being specified. This figure nevertheless shows a percentage growth compared with the average value reached in 2000-2006 (less than 1.16%).

Among the priorities relating to the Competitiveness and Employment objective presented in Luxembourg’s NSRF, theme 1 concerning contributions to making Luxembourg sites more attractive for investment and employment presents three measures, one of which consists of promoting ecotechnologies, energy efficiency and renewable energy sources. In the context of this measure, the NSRF provides for the encouragement of ecotechnologies and renewable energy sources by: promoting R&D, innovation and the production of ecotechnologies, products and services; promoting new technologies using the full potential offered by renewable energies; and encouraging SMEs to take steps to introduce environmentally friendly energy management systems. This measure also provides for the encouragement of rational use of energy by: promoting this in production activity, transport and the residential and non-residential sector; promoting voluntary agreements to reduce consumption in the main sectors of economic activity; pursuing information efforts aimed at making consumers more responsible as regards sustainable and ecological consumption; and promoting a competitive energy policy.

(iii) Sweden and Denmark

Denmark aims to meet the Kyoto objectives by including the elements of energy efficiency and renewable sources in a strategy to improve the environmental profile and standards of SMEs. It is interesting to note that the number of new jobs is used as an indicator. Therefore, employment policies place an emphasis on providing SMEs with advice on environmental matters such as renewable and sustainable sources, emphasising wind energy and agro-energy in particular.

Sweden, which showed little interest in renewable energies in the previous programming period, now pays greater attention to the sparsely populated areas in the north of the country, for which it proposes the ambitious objective of doubling the share of renewable energies in order to increase jobs in activities related to the environment by 30%.

⁽¹⁷⁾ Directive 2002/91/EC on the energy performance of buildings.

(iv) Italy, Spain and Portugal

In the Portuguese NSRF, particular attention is paid to describing the cities and the territory, and several references are made to renewable sources.

However, it is in Spain that the most interesting approach to the theme of sustainable energy can be found. Here, 4 out of 9 priorities included in the NSRF revolve around the theme of sustainability (transport, energy, economic growth and urban planning). Added to this is innovation, which focuses on private investment in new technologies, among which renewable energy occupies fourth place. The energy priority establishes three objectives: a 20% rise in efficiency, in line with the European Action Plan ⁽¹⁸⁾; technological development, in particular in wind energy, biomass and biofuels; and focusing resources intended for traditional energy on improving the electricity network, with clear advantages in the area of trans-European energy trading and the possibility of accepting higher percentages of non-programmed energies, such as renewable energies.

Italy's policies on renewable energies are contained in:

- Priority 3 concerning the sustainable and efficient use of environmental resources for growth,
- General objective 3.1, which concerns guaranteeing conditions for the environmental sustainability of growth and adequate levels of environmental services for the population and companies, and specific objective 3.1.1 concerning the promotion of opportunities for local growth through the implementation of production chains linked to an increase in the share of renewable energies and energy savings.

This information makes it possible to note a first move towards a sustainable energy policy that is tied more closely to growth in production, although this is within a project that is still very traditional, with energy being considered as serving growth and not as a driver of it. Diffuse cogeneration, distance heating/cooling and the applications of renewable energies can be found among the actions.

3.4.3. The situation in the new Member States

The new Member States are starting off with limited experience as regards SFs, but many have demonstrated programming that is particularly determined with regard to new energies, at least compared to that demonstrated in the previous paragraphs.

Hungary, Lithuania and Slovakia have dedicated well-defined measures to sustainable energy, whereas Poland, Estonia and Latvia have no specific measures. The Czech Republic has two such measures.

A quantitative analysis of the projects of the 2007-2013 Operational Programmes ⁽¹⁹⁾ has highlighted considerable disparities between countries (see Graph 3.3). The share of the total SF allocation intended for energies is 5.4% in the case of Lithuania, and Slovakia comes second, with a 3.8% share. Poland and Hungary dedicate a share of less than 2%, which is comparable to the average released for the 2000-2006 period.

The allocation for sustainable energy in the 2007-2013 period is estimated at EUR 3.1-3.2 billion, or 2% of the total SF package for the 10 Member States of Central and Eastern

⁽¹⁸⁾ Action Plan for Energy Efficiency: Realising the Potential, COM(2006)545 final.

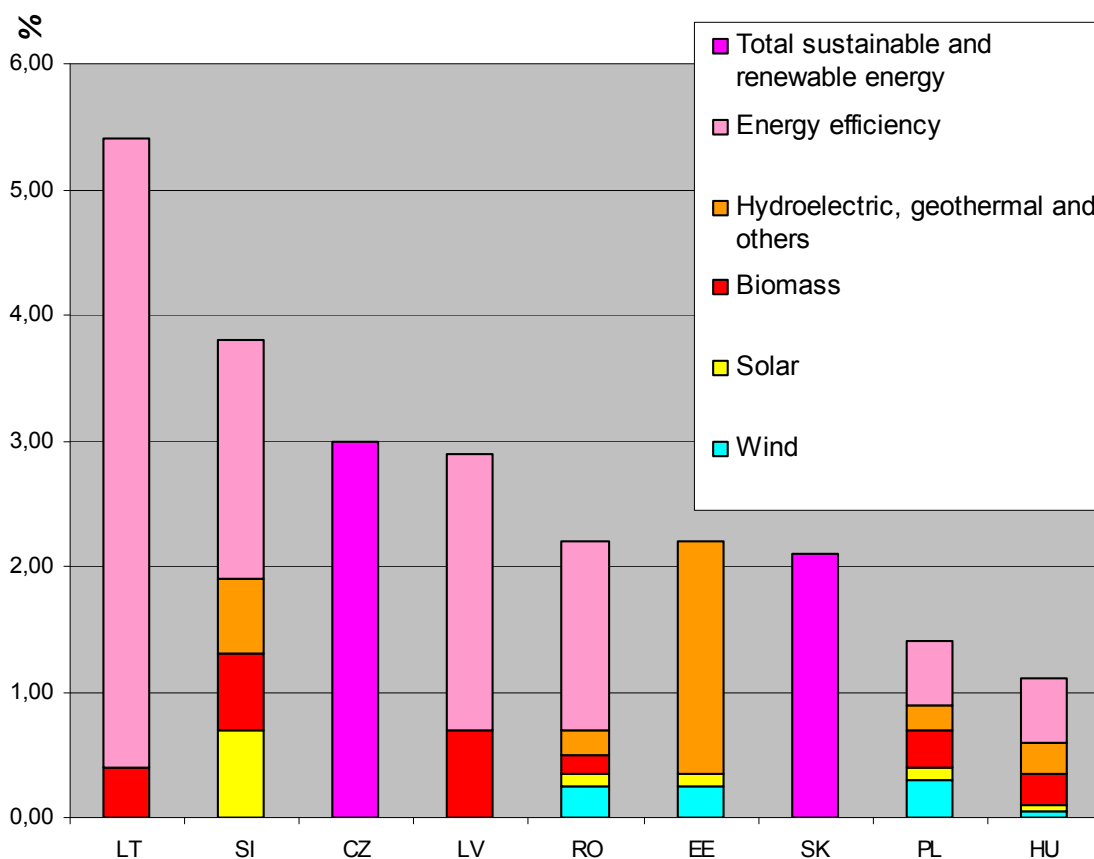
⁽¹⁹⁾ CEE Bankwatch Network, Friends of the Earth Europe: *Channelling EU funds into efficient and renewable energy*, information document.

Europe. Although it is double the 2000-2006 percentage for the EU 15, this is an unsatisfactory result and is clearly below expectations.

Several critical voices have already been raised with regard to these first observations ⁽²⁰⁾, calling for a revision of the programming documents by the Commission, with input from the Member States.

Sustainable and renewable energy must be considered more as an integrated horizontal priority, as far as is possible, in all other measures and activities funded by the SFs. This is the case, for example, in measures that consist of activities linked to buildings. It is now required that new projects integrate energy performance through a new certification system. A positive example is that of the modernisation of new university buildings in Slovakia, in the context of the research and development theme of the Operational Programme, which explicitly provides for improvements in the area of energy efficiency.

Graph 3. Percentage of the total 2007-2013 SF allocation intended for renewable and sustainable energies in the Central and Eastern European countries (situation on 26 February 2007)



Source: CEE Bankwatch Network, Friends of the Earth Europe: *Channelling EU funds into efficient and renewable energy.*

⁽²⁰⁾ Written contribution supplied by the Association of European local authorities promoting local sustainable energy policy, Énergie-Cités, Besançon, France, prepared by Jana Cicmanova, Énergie-Cités, 14 March 2007.

3.4.4. The quality of measures

Inspection of the characteristics of the measures in the different countries shows, according to graph 3, a distinct predominance of the energy efficiency theme, in particular in Lithuania, Latvia, Estonia and Romania. Renewable sources (solar, wind, biomass and hydroelectric/geothermal) represent a significant share in Slovenia, Poland and Hungary.

The distribution for Slovakia and the Czech Republic is unavailable. Slovenia appears to have the most balanced distribution between the different sources (wind energy is absent owing to its low potential), with a parity finally being reached between energy efficiency and renewable energy.

Table 3 provides an even more precise outline of the typologies of measures presented in the projects of the Operational Programmes. It can be noted, for example, that measures aimed at companies are presented in 6 programmes in 10, compared with a presence of only 3 in 10 in the buildings sector. The measures concerning distance heating are more pronounced (they are presented in 5 programmes).

In the renewable energy sector, biomass achieves a maximum score (all 10 programmes), followed by solar and geothermal energy (6 programmes out of 10), and hydroelectric energy (5 programmes out of 10).

Table 3. Outline of the presence of sustainable and renewable energy measures in the OP projects of the Central and Eastern European countries

	Energy efficiency		Renewable energy				Measures	% ²¹	Mark				
	Industry/ companies	Energy sector	Housing	Public buildings	Central heating	Wind				Solar	Biomass	Geothermal	Hydro electric
Lithuania	X	√	X	√	√	X	X	√	X	X	Cohesion OP (2) Infrastructure OP (1)	5.4	😊
Slovenia	√	X	√	±	X	X	√	√	√	X	Environment and Infrastructure OP (4)	3.8	😊
Czech Republic	√	X	X	√	X	√	√	√	√	√	Environment OP (3) Companies OP (1)	3.0	😊
Latvia	X	X	√	±	√	X	X	√	X	X	Infrastructure and Services OP (2)	2.9	😊
Romania	√	√	X	X	√	√	√	√	√	√	Competitiveness OP (2) Environment OP (1)	2.2	😊
Estonia	X	X	√	X	√	√	X	√	X	X	Environment OP (3)	2.2	😊
Slovakia	√	√	X	X	±	X	√	√	√	√	R&D OP (1) Environment OP (1)	2.1	😊
Poland	X	√	X	±	±	√	√	√	√	√	Environment and Infrastructure OP (5)	1.4	😊
Hungary	√	X	X	√	√	±	√	√	√	√	Environment OP (2)	1.1	😊
Bulgaria	√	X	X	X	X	±	±	±	±	±	Competitiveness OP (1)	?	😊

√ included

± partially included

X not included

Source: CEE Bankwatch Network, Friends of the Earth Europe: *Channelling EU funds into efficient and renewable energy*

²¹ Percentage of the total Community allocation intended for renewable energy/energy efficiency.

4. Good practice

4.1. Methodological approach

The theme of sustainable and renewable energies is horizontal and affects various EU policies. During the 2000-2006 period, numerous projects were funded in the context of programmes launched by different Directorates-General of the European Commission, such as DG REGIO, DG TREN and the Research and Agriculture DGs.

Several ‘good practice’ databases in the sphere of sustainable and renewable energies are accessible on the Internet and have been analysed with the aim of selecting 15 model projects. These good practices have been selected according to the following criteria:

- consistency of the projects with the programming objectives of the 2007-2013 SFs;
- development of close collaboration between local actors, in particular with regional and local energy agencies;
- representation of a wide variety of technologies and economic and financial approaches;
- the widest possible geographical coverage, without claiming to represent all Member States, and a variety of different regional development contexts (intervention in rural and urban areas).

These good practices have been selected in order to demonstrate how the SFs or other regional development funds were able to contribute towards supporting the launch of sustainable and renewable energy projects at local level. All the good practices selected are funded by the SFs or fulfil all the conditions for receiving SFs.

The good practices collected are grouped into four themes, which are presented in the table below:

Themes	Good practices
Contribution of energy projects to the development of rural areas	‘Energy Academy’ – Samsø Island, Denmark; ‘Energy crops’ – Podlaskie Region, Poland; ‘The seeds of renewable energy in Ireland’ – Wexford, Ireland; ‘Biogas use’ – Šilutė, Lithuania.
Management of sustainable energy by local authorities	‘Lydney Local Power’ – Lydney, England; ‘Assessment of energy saving potential in residential buildings’ – Kaunas, Lithuania; ‘Specialist biomass company’ – Šal’a, Slovakia; ‘Biodiesel production using waste oil’ – La Ribera, Spain.
Creation of regional plans integrating energy into local economic growth	‘Solar roof initiative’ – Berlin, Germany; – ‘Energy certification initiative for small and medium-sized enterprises (SMEs)’ – Saxony, Germany; ‘Ecoprofit Vienna-Győr’ – Vienna, Austria and Győr, Hungary.
Energy and spatial planning	‘Ecodyfi’ – Dyfi Valley, United Kingdom; ‘Energievision Murau’ – Styria, Austria; ‘Exploitation of geothermal potential’ – Central Macedonia, Greece; ‘Sustainable energy in the sphere of production’ – Emilia-Romagna Region, Italy.

4.1.1. Contribution of energy projects to the development of rural areas

Two main strategic objectives can be pursued in rural areas to implement long-term development: the maximum use of local resources and self-sufficiency in energy. The exploitation of all local resources, including sustainable and renewable energies, is a significant advantage for the future.

The use of renewable energy sources can guarantee almost total energy independence. Most of the time, the success of these projects depends on favourable local political will, the active participation of local actors, the management skills of operators and the judicious investment of local and regional funds. In mountainous regions, the main sustainable and renewable energy source is woody biomass.

In short, the path towards real and affordable rural development is determined by the combination of all the factors mentioned above, by maintaining a horizontal approach: the improvement of sustainable and renewable energies as a basic principle of investment in projects for economic growth.

4.1.2. Management of sustainable energy by local authorities

Energy management has been addressed in projects funded by the SAVE Programme, which have led to the accumulation of wide-ranging and in-depth experience in several non-technical areas of energy saving, and which have provided several interesting examples related to local authority management of clean energy.

The development of innovative legislative, financial and contractual tools for the management of economically sustainable energies in public buildings, urban lighting and hospitals, at both regional and national level and in large urban areas as well as in small towns, is an essential element.

The most significant energy supply options in these case studies are energy-saving measures in residential housing and buildings, and the use of ecological electricity and biomass for the production of heat and sustainable and renewable electricity.

Furthermore, owing to several years of insufficient budgets, local authorities are attempting to identify new paths towards the financially viable management of municipal buildings, geared towards users and involving private sector companies in these projects, for example, in the context of franchise agreements, different forms of contractual energy management and other energy service projects, to improve the cost situation in energy management, without these improvements having to be funded from the town's budget.

The decision to carry out an energy audit of the municipal estate, so as to identify potential improvements, has very often acted as a trigger for setting other initiatives in motion, for example, for deciding to initiate actions intended to modernise and optimise the energy efficiency of all municipal public buildings. The grants are primarily used for investing in final energy efficiency, the maintenance of regulating energy sources, measures in the buildings sector, sustainable and renewable energy sources and, to a lesser extent, action planning for climate protection and expert studies on optimised local development using energy and spatial planning.

4.1.3. Creation of regional plans integrating energy into local economic development

Local development experts, who are to a large extent responsible for innovative actions undertaken at local level, generally ignore the potential of clean energy technologies for the creation of new companies and jobs, and for the development of sound initiatives using local resources. In reality, the good practices gathered show that specific approaches are positive when accompanied by instruments linked to legislative innovations, technology and new financial and contractual projects. Furthermore, two success factors in particular have been acknowledged as being social and political prerequisites: the political boldness to aim to achieve ambitious objectives, for example, the 100% use of sustainable and renewable energy and the potential for access to the SFs.

4.1.4. Energy and spatial planning

Owing to the demand for new residential and production areas, local authorities in all countries plan new urban development areas, but are at the same time responsible for regulating the growth of urban agglomerations and preserving the country's 'green heart'.

The rules for good practice describe the progress made by different municipalities and officials who have decided to become proactive in the preservation of local energy, through a series of actions in very varied sectors: public transport, local heating networks, eco-energy public buildings, biogas, waste-energy projects, cogeneration, etc., as steps along the path towards the use of renewable energy by communities.

The selection of projects shows that, in many cases, the local level can serve as an example for duplication on a wider scale, thereby ensuring the leverage necessary for an effective impact on development policy. It furthermore enables the creation of important future advantages at EU level. Support for a local energy agency has often been decisive in taking technical and directional risks and in strengthening other local actors.

4.2. Selected examples of good practice

4.2.1. 'The Energy Academy' – Samsø Island, Denmark

Context: The Danish Island of Samsø constitutes a European model for renewable energies. Numerous projects have been implemented in this sphere, from wind turbines and urban heating systems using straw to rapeseed oil and solar thermal collectors. The Danish Government designated Samsø a 'sustainable energy island' in 1997.

Objectives: The primary goal of the 'Energy Academy' project is to capitalise on the experience and know-how acquired on the island during the course of the projects implemented in the sphere of renewable energy, by offering Danish and foreign researchers an opportunity to study renewable energies without having to look far for inspiration.

Process: The project was launched in 2004. The Academy's management committee is made up of representatives of universities, district and municipal authorities, and local NGOs. The building housing the Academy was built respecting the following principles: fresh air provided by a natural ventilation system in open-plan offices and by open, large-volume rooms; low water consumption thanks to recovery facilities; heat saving thanks to the building's efficient insulation and a solar heating system connected to the local urban heating plant, which uses straw etc. The solar collectors supplying the Academy with hot water will serve to demonstrate this heating process to visitors. Some 100 m² of solar photovoltaic cells on the roof and local wind turbines supply the building with electricity. Low-energy lighting and appliances are used in all areas. The windows are devised to optimise the lighting conditions.

Financial resources: The Energy Academy is a local project cofunded by Samsø municipality, Real Dania (private funds) and the Structural Funds (Objective 2 SPD). The total cost, including interior fittings, stands at EUR 2 000 000. The ERDF has contributed up to EUR 25 000 for the feasibility study and EUR 400 000 for the construction. The profits made from energy savings and the production of clean energy are reinvested in the Academy.

Results: The Academy was opened in May 2007. A conference centre will receive researchers, contractors and political representatives, in particular to discuss the themes of local development based on renewable energies, energy saving, new energy technologies, new operational structures and property models. The Samsø Energy Office and the Energy Academy plan to move into the site to pursue their energy consulting activities there, for both companies and

private individuals. They also intend to promote energy-related tourism as well as workshops and seminars organised on this theme. The Academy will thus be the new headquarters of the Samsø energy organisations. Throughout the summer, the Academy will open up exhibition and experimentation spaces to tourists, students and other energy enthusiasts. Already, each year, more than a thousand visitors of all kinds discover the 'renewable energy island'. Samsø will also be an excursion destination for children, so as to raise their awareness of renewable energies at summer camps or during the school period.

Contact: Samsø Energiakademi; Address: Strandengen 1, 8305 Samsø, Denmark; Tel.: +45 8792 1011; E-mail: info@energiakademiet.dk; Website: www.energiakademiet.dk.

4.2.2. 'Energy crops' – Podlaskie Region, Poland

Context: Energy crops provide a double opportunity for sustainable development in rural communities. They help to reduce CO₂ emissions and dependence on fossil energy imports. Furthermore, they offer an additional source of agricultural income in areas where agriculture is in decline. However, farmers do not always have the knowledge needed to exploit energy crops. It is in this context that the Podlaska Agency developed its project in the north-east of Poland.

Objectives: The project's objectives have been: to provide farmers with the necessary knowledge of methods for cultivating energy plants and of biomass use in the energy sector; provide information about Poland's energy policy and the European dimension; to provide information about the possible sources of funding for the development of energy crops; to raise public awareness of energy themes and the protection of the environment and air quality; and to teach farmers and entrepreneurs about the functioning of the energy market in Poland and in other countries.

Process: The project, launched in 2004, has been developed by the Energy Agency for the Podlaskie region. It involved the organisation of training sessions aimed at farmers and entrepreneurs in the region, in collaboration with local authorities.

Financial resources: The project has been supported by Agency resources. The cost of hiring sites booked for seminars was met by the local authorities. The budget for the project therefore took into account only the travel costs for participation in the seminars – a total sum of EUR 600.

Results: During the 4-month duration of the project, 125 farmers and energy sector professionals participated in 9 seminars. Furthermore, 200 hectares have been planted with energy crops and 5 farms have started using biomass energy.

Contact: Podlaska Agency for Energy; Address: ul. Starobojarska 15, 15-073 Białystok, Poland; Tel.: +48 85 740 86 83; E-mail: paze@pfr.bialystok.pl; Website: www.paze.pl.

4.2.3. 'The seeds of renewable energy in Ireland' – Wexford, Ireland

Context: County Wexford is rich in rapeseed crops. In 2002 a group of Irish farmers, assisted by an engineer who had worked for many years in the renewable energy sector, took an interest in the production of biofuel from oil plants and, in particular, in the technique that involves crushing rapeseed to obtain a 100% oil fuel for adapted diesel engines.

Objectives: The farmers of Wexford decided to exploit the rapeseed crops present in the region to: produce biofuel; increase their agricultural income; and contribute to rural development, to supplying a local energy source and to County Wexford's competitiveness.

Process: The project was launched in 2003. The farmers first of all requested funding within the framework of the Leader+ Programme under the Cooperation strand. They bought an oil press

with which to crush the rapeseed, conducted research and then adapted three diesel cars to enable them to run on biodiesel. The exchange of experiences with the partner of a German project (a group of oil plant growers) was also carried out in the context of the programme. The plant responsible for conversion, Biogreen Energy Products Ltd, buys rapeseed from local farmers and sells the waste as animal feed.

Financial resources: The farmers have obtained two Leader+ grants (50%): the first with a budget of EUR 75 424, and the second with a budget of EUR 40 000.

Results: The first harvest in 2002 produced 60 tonnes of rapeseed oil; the figure rose to 2 000 tonnes in 2004 and 11 000 in the 2005-2006 season. Up to 10 tonnes of oil can be produced each day. With 100 adapted cars, the amount of CO₂ produced has been reduced by 1 000 tonnes. The creation of a new industry and new jobs and an increase in know-how are among the results worth mentioning.

Contact: Wexford Organisation for Rural Development Ltd (WORD); Address: Johnstown Castle, Co. Wexford, Ireland; Tel.: +353 5391 46453; Website: www.wexfordleader.ie; www.rapoleum.com.

4.2.4. 'Biogas use' – Šilutė, Lithuania

Context: The proportion of livestock in Lithuanian farms is constantly increasing due to the fact that Lithuania has the largest quota for meat and milk production. Farms have expanded and modernised and are considerable consumers of energy. Furthermore, abattoirs have been modernised and their number has increased considerably. They produce around 60 000 tonnes of animal waste, which can be treated in biogas plants. Only two animal waste treatment companies are currently operating in Lithuania and they do not have the capacity to treat all of the waste produced. On the other hand, it is not economically viable to transport the organic waste produced by all the country's butcher's shops. In fact, it appears to be more economical to increase the production of biogas for the butcher's shops and to use the energy produced for the companies' own needs. The national authorities are willing to develop biogas as an alternative to traditional energies.

Objective The project aims to treat animal waste in order to produce biogas for use by companies in the agro-food industry.

Process: A study was carried out in 2006 by an external consulting firm, to assess the biogas potential, the technologies available and the cost-benefit relationship on the basis of three case studies. Finally, a national plan for the exploitation and production of biogas was then drawn up by the Lithuanian authorities in the context of the 2007-2013 OP.

Funding: The total programme of investment is estimated at EUR 175 000 000.

Results: This project will enable the Šilutė region to save 137 840 tonnes of oil equivalent and to reduce CO₂ emissions by 393 600 tonnes.

Contact: LEI Lithuanian Energy Institute; Address: Breslaujos g. 3, 44403 Kaunas, Lithuania; Tel.: +370 37 351403; Fax: +370 37 351271; E-mail: klevas@lei.lt; Website: www.lei.lt.

4.2.5. 'Lydney Local Power' – Lydney, England

Context: The 'Lydney Local Power' project is part of a wider scheme that aims to regenerate an area that has suffered enormously as a result of mine closures and the decline of industry.

Objectives: The project was developed with the aim of establishing a 'Community Energy Club' enabling citizens to take an active part in the planning and development of sustainable

projects in the region, such as, in particular, the creation of a small-scale hydraulic energy system and a community wind turbine. The Club has also made it possible to organise awareness-raising campaigns aimed at a wide audience and to encourage the implementation of measures to improve domestic energy efficiency.

Process: The project was developed between 2004 and 2006 by the Severn Wye Energy Agency (SWEA), the Forest of Dean District Council, Gloucestershire County Council and Lydney Town Council. A study was first of all carried out to measure the level of local support for the initiative. Next, the Club was created and a steering group was set up for the initiative as a whole, as were steering groups responsible for decisions concerning individual projects.

Financial resources: EUR 20 000 were invested for the feasibility study and the project development plan; the implementation of the project (2 years) cost EUR 70 000. The steering committee invested EUR 7 350 in the form of voluntary work and EUR 66 000 were spent on putting in place energy efficiency measurement facilities.

Results: Today the Club has 115 members. It has become a partner in the town regeneration plan. The creation of the hydraulic energy system enables the emission of 592 tonnes of CO₂ to be avoided during its life cycle (25 years). Furthermore, 500 energy efficiency improvement measures have been taken, saving 562 986 kWh and 136 025 kg of CO₂ a year.

Contacts: Severn Wye Energy Agency Ltd; Address: The Mews, Brook Street, Mitcheldean, Gloucestershire GL17 0SL, England; Tel.: +44 (0)1594 545360; Website: www.swea.co.uk.

4.2.6. 'Assessment of energy saving potential in residential buildings' – Kaunas, Lithuania

Context: In Lithuania more than 60% of the population lives in buildings constructed between 1961 and 1990 that do not comply with current efficiency standards in a number of areas, in particular thermal insulation. In this context, the Lithuanian Government drew up a housing sector strategy for the renovation and modernisation of existing buildings and for efficient energy use. Energy consumption for heating in Lithuania is in fact 1.8 times greater than in other EU countries.

Objectives: The project was developed in Kaunas in the context of the strategy mentioned above and its goal was to undertake an assessment of the energy saving potential in residential buildings in Kaunas. This assessment was carried out in 2006 and should also enable the development of future energy efficiency programmes.

Process: The project covered all five- and nine-storey buildings in Kaunas. It began in 2004 and was rolled out in the following stages: the selection of buildings for assessment; the auditing of energy consumption in these buildings; analysis of potential energy savings based on the application of different building renovation measures; the calculation of the investment needed for the renovations; and the presentation of conclusions and recommendations in the 'Plan of Rational Energy Use in Kaunas City', prepared by Kaunas City Municipality in collaboration with SC 'Kaunas Energy', the largest heating supplier in Kaunas.

Financial resources: The project was implemented with resources provided by the Regional Energy Agency (subsidised by the Intelligent Energy – Europe programme). The project cost EUR 10 000, EUR 5 000 of which came from Community cofunding. The next investment programme (around EUR 22 million over 5 years) has been put forward for 2007-2013 ERDF funding for Lithuania.

Results: The calculations were made taking into account the fact that by 2009 3% of all five- and nine-storey residential buildings would be renovated. Heat consumption following renovation is reduced by 50% for five-storey buildings and by 40% for nine-story buildings. This means that in 2010, following the renovation of 113 five-storey buildings and 55 nine-

storey buildings, the total energy consumption for heating will be reduced by 29 115 MWh, or by 7.7% compared with 2004. CO₂ emissions would potentially be reduced by 83 950 tonnes a year.

Contact: KREA – Kaunas Regional Energy Agency; Address: Breslaujos 3B-202, 44403 Kaunas, Lithuania; Tel.: +370 37 491043.

4.2.7. 'Specialist biomass company' – Šal'a, Slovakia

Context: Two thirds of the town's inhabitants live in housing that is heated and supplied with hot water by the municipality through heat plants, using an urban heating system.

Objectives: The aim of the project is to construct biomass boilers in order to promote renewable energies and make substantial energy savings.

Process: In 2005 Šal'a municipality approved the company Menerttherm's plans for the construction of biomass boiler rooms. Since the autumn of 2006, two biomass boilers have started operating: one is fed by wood chips and the other by straw.

Funding: The project was funded with assistance from the SFs (41% of the total cost), in the context of the OP for basic infrastructure. The Slovak Republic's Ministry of the Environment allocated EUR 141 232.98 for the construction of the wood boiler and EUR 149 423.07 for the conversion of the second boiler (straw).

Results: The project enabled: the reduction of CO₂ emissions by 2 100 tonnes a year in Kukučínova and 2 100 tonnes a year in Pázmána; the achievement of a saving of 4 200 tonnes a year compared with natural gas heating; a reduction in fuel imports; and the creation of job opportunities in the wood chain and in the collection, distribution and supply of straw for operation of the biomass boiler.

Contact: Energetické centrum Bratislava/Energy Centre Bratislava; Address: Ambrova 35, 831 01 Bratislava, Slovakia; Tel.: +421 2 593 000 91; Fax: +421 2 593 000 97; E-mail: menerttherm@menerttherm.sk; Websites: www.ecb.sk or www.menerttherm.sk.

4.2.8. 'Biodiesel production using waste oil' – La Ribera, Spain

Context: The Agència Energètica de La Ribera (the Energy Agency of La Ribera) wishes to introduce a culture of energy saving in the region of La Ribera using the waste from certain products.

Objective: The project aims to collect and recycle waste oil from local companies and convert it into biodiesel.

Process: In July 2003 an agreement was signed between the Agència Energètica de La Ribera (AER) and the company CENRESA for the collection of waste vegetable oil in agro-food industries and from restaurants in the region. The AER also signed an agreement with 30 towns to supply them with biodiesel intended for municipal vehicles and public transport. The collection of industrial waste oil began in 2004.

When collection began, each mayor received a progress report setting out the number of organisations involved in the project and the volume of oil collected. During the first year, 260 698 litres of oil were collected from 418 different locations. Two other towns joined the operation during the year, taking the number of participants in the project to 32. Once collected, the waste vegetable oil was taken to Bionet Europe, which had implemented a chemical process to convert the oil into biodiesel. A local fuel distributor was then used to deliver the biodiesel to the 32 municipalities and to distribute it among their vehicles. A new biofuel pump was installed in a petrol station in the town of l'Alcúdia. This biofuel could be used in vehicles belonging to

both the municipalities and private individuals. Biofuel pumps were then installed in every district participating in the project.

Results: In total, 32 municipalities participated in the project. The number of restaurants and agro-food industries collaborating increased by 58% during the first year and their total number was 418. This project made an impact in terms of reducing CO₂ emissions through the use of biofuels in local authority vehicles. It helped raise awareness of recycling and the use of biofuels among the public. A total of 810 biofuel pumps have been installed at petrol stations throughout the region. The project has made it possible to extend collection to waste vegetable oil from domestic use.

Funding: The cost of the administrative management of the project was EUR 2 000. Containers for collecting oil cost EUR 10 000 and biodiesel storage tanks for the various districts EUR 70 000.

Contact: Agència Energètica de la Ribera (AER); Address: Plaza de Argentina 1, 46680 Algemesí, Valencia, Spain; Tel.: +34 96 24 24 641; Fax: +34 96 242 12 56; E-mail: aer@aer-ribera.com; Website: www.aer-ribera.com.

4.2.9. 'Solar roof initiative' - Berlin, Germany

Context: Today, reducing greenhouse gases is vital. The city of Berlin is not able to produce energy through the exploitation of wind or water. Nevertheless, it has a significant surface area available for the production of solar energy: the roofs of municipal buildings (around 6 000 buildings). In 2002 the coalition government concluded an agreement to offer the roofs of municipal buildings for the installation of solar panels. The 'Solar roof initiative' was developed in order to implement this agreement.

Objectives: The initiative was launched in 2002 with the aim of encouraging the private sector to invest in the construction of solar energy facilities on the roofs of municipal buildings. The ultimate objective is a reduction in emissions produced by the city of Berlin and the establishment of a solar power friendly community.

Process: On the basis of a list of usable buildings produced by each district, the Climate Protection Unit of the Senatsverwaltung für Stadtentwicklung (Senate Department for Urban Development) created 17 networks of 86 buildings with over 144 000 m² of exploitable surface area for solar facilities. One person was given the task of carrying out feasibility inspections on all the buildings. The buildings were subsequently photographed so as to be placed in an online catalogue published on a dedicated website, in order to disseminate information and thereby attract the interest of potential investors.

Financial resources: The cost of the feasibility inspections on the buildings for the facilities and of developing the website was EUR 4 500. This cost was met by the Senatsverwaltung für Stadtentwicklung.

Results: In 2005 some 25 investors showed an interest and the related agreements are still ongoing. The first facilities have been set up and the website continues to receive a significant number of visitors, as well as requests for information, in particular on the completed facilities. Furthermore, the initiative has significantly raised awareness of the advantages offered by solar energy use among employees in public buildings and citizens.

Contact: Senatsverwaltung für Stadtentwicklung Berlin/Referat Klimaschutz; Address: Brückenstr. 6, 10173 Berlin, Germany; Tel.: +49(30) 9025 2145; E-mail: klaus.mueschen@senstadt.verwalt-berlin.de; Website: <http://www.stadtentwicklung.berlin.de>.

4.2.10. 'Energy certification for SMEs' – Saxony, Germany

Context: The project can be seen in the context of the necessary restructuring of industry in the Saxony region. The region wishes to enable SMEs to be competitive at international level.

Objective: The aim of the project is to encourage SMEs in the industrial sector to achieve excellent results in terms of energy, by implementing an energy performance certificate, by improving their competitiveness at international level and by enhancing the economic attractiveness of Saxony.

Process: First of all, the various policy priorities (OP, Regional Development Plan, the Saxon Energy Agency, etc.) and the incentive systems for companies in the energy/environment sphere were listed and evaluated. The results of the evaluations then made it possible to establish some guidelines, which fed into the OP. Secondly, the basic principles for energy performance certification in the industrial sector (indicator models, company categorisation model, catalogue of measures to improve energy efficiency in companies, energy saving, effects inherent in the reduction of CO₂ emissions) were drawn up and tested. Thirdly, a support plan was implemented through guidelines, selection and assessment criteria, administrative procedures, efficiency indicators and the development of a budget. Fourthly, an incentive system was created combining energy certification with other tools stemming from regional economic development. Finally, a qualification relating to energy efficiency management was established for staff in SMEs and Chambers/associations in order to support the decision-making process in energy investment and to assist them in using the various support programmes available.

Financial resources: The project study was funded in 2006 by the IEE programme's SEIPLED project and its implementation (EUR 500 000) will be funded by the ERDF in the context of the Saxon 2007-2013 OP.

Results: This project will make it possible to increase the region's attractiveness to companies, to facilitate companies' access to the various support programmes, to increase companies' motivation to specifically invest in energy, to enhance the economic competitiveness of the SMEs in the region and to increase the number of energy projects included in the framework of the OP.

Contact: B&SU Beratungs- und Service-Gesellschaft Umwelt mbH; Saarbrücker Str. 38 A, 10405 Berlin, Germany; Tel.: +49.30.39042-92; Fax: +49.30.39042-31; E-mail: KDinges@bsu-berlin.de.

4.2.11. 'Ecoprofit Vienna-Győr' – Vienna, Austria and Győr, Hungary

Context: In regions with an industrial tradition, such as Vienna in Austria and Győr in Hungary, economic activity has long been synonymous with deterioration of the natural environment. The growing demand for environmental protection is, however, now being met in a certain number of firms, where more environmentally friendly practices are adding value to their image and ensuring more sustainable conditions for development.

Objectives: Companies from all sectors of the economy are increasingly becoming aware that the introduction of practices that are more environmentally friendly can add value to their image and ensure more sustainable conditions for their future development. However, helping companies to adopt ecological practices is a complex task that requires an integrated approach, including cooperation between governmental bodies, companies and consulting firms. It was to facilitate this process that the cross-border 'Ecoprofit Vienna-Győr' project was implemented in 2001, in the context of the European Union's Interreg II programme.

Process: 'Ecoprofit' is a consulting module created by the 'Viennese Initiative for Entrepreneurial Protection of the Environment'. Specially designed for small and medium-sized enterprises in the production sector, its aim is to make entrepreneurs aware of the basic

principles of the management of materials and energy by encouraging them to participate in working groups and individual consulting sessions. The purpose is to convince them that it is possible not only to maintain the status quo, but also to become more competitive by respecting the environment if they are able to meet the challenge of innovation and manage costs effectively. With support under the Interreg III programme, 'Ecoprofit Vienna-Győr' is now being expanded to a bigger project, 'EcoBusinessPlan Vienna-Győr'. This project includes all the modules from the previous programme (Ecoprofit; climate protection; tourist ventures; EMAS (EU Eco-Management and Audit Scheme); and ISO 14001) and provides for the development of an additional module aimed at reducing the amount of waste produced by small businesses.

Financial resources: Ecoprofit Vienna-Győr Project (Interreg II A Austria/Hungary): total eligible cost of EUR 460 000; Community contribution of EUR 230 000. EcoBusinessPlan Vienna-Győr Project (Interreg III A Austria/Hungary): total eligible cost of EUR 1 416 000; Community contribution of EUR 674 000.

Results: 'Ecoprofit Vienna-Győr' has primarily developed in Vienna, where the number of firms participating increased from 15 in the first year to 40 the following year. In parallel to this, Viennese specialists have established contacts with city government officials in Győr with a view to setting up a similar initiative on the Hungarian side, and information material has been drafted in Hungarian. In the longer term the project has contributed to the introduction of energy and environmental management, in accordance with European regulations, in the economic area situated between the two cities (which in particular requires the adaptation of Hungarian standards in this area).

Contact: Vienna-Győr Cooperation; Address: Municipality of Vienna, Environmental Protection Department, Ebendorferstraße 4, 1082 Vienna, Austria; E-mail: dic@m22.magwien.gv.at; Website: <http://www.oekobusinessplan.wien.at>.

4.2.12. 'Ecodyfi' – Dyfi Valley, United Kingdom

Context: The Dyfi Valley is a community of 12 000 inhabitants on the coast of Wales. Its economy is based on tourism, services and agriculture, even though there has recently been a serious decline in income from the latter. On the other hand, the Valley can count on other assets: the environment (landscape and habitat), culture, tradition and a local sustainable technology business cluster. The use of water power was widespread until the 1950s and the community no longer depended on imported energy. Today, wind farms produce electricity for local consumption but most of the energy needed for heating is still imported.

Objectives: The project aims to: encourage the Valley's inhabitants to engage directly with energy issues, establish a community based on renewable energy installations and improve understanding of and support for renewable energy by maximising the benefit for the local community and adopting an approach based on local support.

Process: The project employs hydro, solar thermal, solar electric, wood heat and ground source heat pump technology. The project was launched in 1998 and its funding was extended until 2002. The project was promoted through visits to various local groups, including the local authorities, as well as through public meetings, leaflets and press articles. The scheme adopted involved the launch of appeals for project ideas, to be converted, following a feasibility study, into real project proposals for funding. The winning projects received funding of up to 30% of their costs. The project sponsors/developers included schools, farms, companies, householders and groups such as, for example, one that formed an industrial company which erected a 75 kW wind turbine as its first project. A 'Solar Club' was also created within the scope of the project. It promotes solar water heating to householders and encourages them to install their own

system. In the future, the goal of the project is to transform the Dyfi Valley into a 100% renewable energy community.

Financial resources: The European Commission funded 34% of the project from the ERDF. The Welsh Development Agency, Powys County Council, Dulas Ltd and the Shell Better Britain Campaign made other financial contributions. The private sector – project sponsors/developers – provided the remaining investment. Ceredigion County Council funded the feasibility studies.

Results: The 65 initial scheme registrations were carried through to 28 grant offers, 16 of which were completed and grant-aided. Altogether, EUR 541 000 were invested, including EUR 155 000 of ERDF grant aid. In addition, solar water heating was installed in 10 houses at a total cost of EUR 24 000. The total capacity of the renewable energy schemes completed is: 205 kW of electrical capacity (hydraulic, solar and wind); 150 kW of heating capacity (solar, wood, heat pump).

Contact: Ecodyfi; Address: Tŷ Bro Ddyfi; 52 Heol Maengwyn; Machynlleth, Powys SY20 8DT, Wales; Tel.: +44 01654 703965; E-mail: info@ecodyfi.org.uk; Website: www.ecodyfi.org.uk.

4.2.13. 'Energievision Murau' – Styria, Austria

Context: Under the coordination of the local energy agency Energieagentur Judenburg-Knittelfeld-Murau (EAJ), three local districts in Austria developed the 'Energievision Murau' project. The aim was to produce 100% of energy for heating and electricity using renewable energies. The region is in fact rich in natural resources that can produce renewable energy (biomass and hydroelectric, solar, wind and geothermal energy). The initiative was considered in the context of a cooperation project known as 'SEIPLED', funded by the Intelligent Energy – Europe programme.

Objectives: The aim of the project is to replace fossil energy in the region with sustainable energy by turning to the different energy sources available.

Process: The project, developed between 2004 and 2006, involved carrying out a study to identify existing technologies in the region able to provide heating using renewable energy, and the most important actors operating in the energy sector so as to involve them in a common regional strategy. The study was developed in the following stages: analysis of the current energy supply situation (total consumption and sources); analysis of the different renewable energy sources present in the region; the organisation of meetings with the various actors concerned; the carrying out of feasibility studies for demonstration projects; the design and development of pilot projects; analysis of success factors and barriers; and the creation of a guide for the transfer of a similar strategy to other regions.

Financial resources: A total of EUR 23 200 000 has been invested in the project, which is eligible for 2007-2013 ERDF funding.

Expected results: Total thermal energy saved: 86 500 000 kWh; electric energy saved: 15 900 000 kWh; tonnes of oil equivalent (toe) saved throughout the region: 10 739; CO₂ emissions avoided: 296 490 tonnes by 2011; overall annual turnover: EUR 7 785 000.

Contact: Energieagentur Judenburg-Knittelfeld-Murau; Address: Kaserngasse 22A, 8750 Judenburg, Austria; Tel.: 0043.03572.44.670; E-mail: energieagentur@ainet.at; Website: <http://energieagentur.ainet.at/>.

4.2.14. 'Exploitation of geothermal potential' – Central Macedonia, Greece

Context: The area to the east of the city of Thessaloniki is renowned for its rich geothermal potential. Moreover, this type of energy gave its name to the town of Thermi, which is known for the hot springs that feed its thermal baths. The National Institute for Geothermal Research has carried out several studies on the temperature and the subterranean composition of the water, which clearly prove the existence of geothermal deposits. However, these studies have not highlighted the different possible economic opportunities. Only a limited number of farmers use the subterranean waters, with limited technical know-how. In addition to this, national legislation has left numerous areas of uncertainty regarding the promotion of activities using the geothermal potential of the region.

Objective: The aim of the project is to develop the geothermal potential of the Bay of Thessaloniki by implementing concrete applications.

Process: A study was initiated in a first phase. It aimed to establish concrete proposals for the use of the geothermal energy by specific groups such as farmers and tourism establishments, and to attract the attention of local politicians and entrepreneurs in order to encourage them to invest using the funding possibilities and existing technological advances. In a second phase, a Consultative Committee was created to gather together geothermal experts and consider the diverse range of uses for this type of energy. Finally, two policies were implemented through the Competitiveness OP and the National Development Plan in order to offer incentive funding to potential users.

Funding: The total investment was around EUR 1 million.

Results: The use of geothermal energy will be developed by means of three concrete applications: ground heating for the outdoor and greenhouse cultivation of agricultural products such as tomatoes and asparagus; heating for an Olympic swimming pool; and the construction of a recreational spa using the potential of geothermal deposits. This project enables a saving of 600 toe and an annual reduction in CO₂ emissions of 1 500 kg.

Contact: Anatoliki S.A./Regional Energy Agency of Central Macedonia (REACM); Address: K. Rafailidou-Papadaki 3-5, PO Box 60497, 57001 Thermi, Greece; Tel.: +302310 463930; Fax: +302310 486203; E-mail: kostas@anatoliki.gr; Website: www.anatoliki.gr.

4.2.15. 'Sustainable energy in the sphere of production' – Emilia-Romagna Region, Italy

Context: Ministry Decree 112/98 introduced to Italy the concept of an 'ecologically equipped industrial area' (APEA – Area Produttiva Ecologicamente Attrezzata). These are industrial or craft industry areas that regions can govern autonomously and which are equipped with systems and infrastructure ensuring that safety, health and the environment are respected. Regional Law 20/2000 enacted by Emilia-Romagna aims to combine sustainable economic development with protection of the environment and natural resources. The 'energy' aspects have quickly become a priority and in this context three provinces have decided to set up pilot projects to promote renewable energy.

Objectives: The goal of the project is to develop urban heating networks supplied by combined heat and power plants (CHP), which include biomass conversion units, and to develop energy management in SMEs in each APEA.

Process: The approach consisted of various stages: the involvement of local actors; the setting of criteria and targets; the development of guidelines; and implementation and testing in the three cases. Each stage was supported and evaluated by a representative group of local actors.

Funding: The initial financial investment was EUR 123 000, 50% of which was provided by the IEE programme (Intelligent Energy – Europe).

Results: Numerous local initiatives were implemented based on the APEA concept (projects were implemented in the framework of Interreg IIIC, IEE and local programmes). The specifications of the APEA, including a broad chapter on energy, were approved by the Province of Bologna. A consultative group was established in order to facilitate consistency between the different initiatives and a strategic environmental agreement was also produced. The regional programme is in the process of being implemented.

Contact: ECUBA srl, Via del Cestello 4, 40124 Bologna, Italy; Tel.: +39 051 228048; Fax: +39 051 656512.

5. Conclusions and recommendations

5.1. Conclusions

To sum up, this study shows clear evidence of a new phase in the relationship between energy and the SFs.

Analysis of the legislative framework has confirmed the assertion, already touched on in the introduction, that the Union's energy situation has undergone a profound transformation between 2000 (the year in which the previous Structural Funds programming period got underway) and 2007, which sees the start of the new 2007-2013 period.

Community legislative initiatives of great importance have been formulated during these seven years, which could profoundly change the way we view our future energy in terms of both long-term strategies and immediate policies. While there has been a continuity of substance through all the legislative initiatives on energy in the last 10 years, prominence has been given to themes that are at the centre of legislative and normative processes in the Member States, in particular the recent directives on renewable energies, biofuels, buildings, cogeneration and energy end-use efficiency. Emphasis has rightly been placed on the new phase opened up by the recent Action Plan 'An Energy Policy for Europe', which directs the Union along the path of energy efficiency and renewable sources, this being the only strategy capable of truly countering the risk of a dangerous dependence on energy, the rise in fossil fuel prices and the supply monopolies of external countries. The worrying reality of climate change is identified as the other driver of this energy conversion, which will have a tremendous impact on industry, public authorities and end-users.

5.1.1. Quality and quantity of expenditure

The successive stages of development of the study have involved analysis, through detailed examination of the documents from the managing authorities of the various Member States, of the achievements in sustainable and renewable energy themes, both in the context of programmes (development plans, OPs and SPDs) and the main projects funded. This research has produced a wealth of information, subdivided by Member State and grouped into homogeneous geographical areas, revealing considerable differences in perception of the theme in the various countries. While, on the one hand, there are progressive cases in which it has been possible to effectively combine economic development with sustainable energy objectives, on the other hand, there are still numerous cases involving a very simplistic interpretation of the potential that energy projects could offer for development. As regards the latter, cases of straightforward under-valuation of the theme or of an approach based on separate themes or on a theme being consigned to modest or isolated measures have been noted. These factors produce little real interest on the part of potential beneficiaries. In the most positive examples, on the other hand, an attempt has been noted – albeit a modest one – to integrate energy with innovation in SMEs, agriculture with agro-energy, and energy with rural development, leading the way to greater development of these themes in the next programming period.

Qualitative analysis was followed by quantitative analysis, which has revealed the shape of the areas of interest concerning sustainable and renewable energies, in absolute and relative terms, by means of tables and graphs. Besides the low sum of total values (EUR 2.6 billion out of 225, or 1.16%), the considerable divergence between Member States and between programming objectives has once again been confirmed, with percentages ranging from 9% to less than 0.1%.

This rather modest result can be explained by several factors:

- the lack of clear priorities,

- the absence of a specific and well-defined connection between sustainable and renewable energies and economic development (companies and employment),
- the lack of objectives relating to improving the quality of the environment (tackling global warming),
- the lack of measures intended to support renewable energies and those aimed at increasing energy efficiency,
- the watering down of 'Energy' measures in other areas (waste use, networks, clean technologies, etc.), and in the area of support for SMEs and large companies.

A first, preliminary reading of the Member States' 2007-2013 programming documents was carried out, including of those of the new countries that have joined the Union.

Analysis of the NSRF projects for this period reveals many positive changes. First of all, the total amount of financial resources allocated to sustainable and renewable energies is on the increase, strategic approaches appear to be more evident and, finally, a greater number of regions identify sustainable and renewable energies as a priority or a specific measure. This scenario, while certainly an improvement on the previous situation, nevertheless remains extremely insufficient, in both quantitative (around 2% of the total expenditure) and qualitative terms (there are still many generic and non-integrated programmes).

The question is whether this improvement will have an impact on the final national and regional OPs and be reflected in the financial resources that are programmed and consumed.

Guidelines for the future are bringing about a change in approach to guarantee strong consistency between energy/environmental objectives laid down in the directives and the Energy Action Plan and the objectives of Convergence, Regional Competitiveness and Employment, and Territorial Cooperation. In this context, an overall quantitative objective (between 3 and 5% of the total expenditure) and the need for better exchange of experiences between countries have been identified. In this respect, the grouping of the countries analysed into homogenous spatial areas (according to the level of appropriation of methods to integrate energy into programming) clearly indicates which countries are now on the way to a new model (the central European area and Scandinavian countries) and which areas evidently have yet to begin reflecting on this (the Mediterranean countries and some of the new Member States).

5.1.2. Rules for good practice

In order to illustrate the possibility of combining energy and economic and social development, 15 examples of good practice were chosen.

Experiences were grouped by thematic or procedural characteristics – from the theme of energy development in the rural environment to local authority initiatives and from integrated local programmes to spatial planning on a regional scale – with a special focus on sustainable energy themes.

At local level, the possibility has been explored of guiding local communities towards models for the self-generation of energy, by making use of wind, solar, biogas and biomass resources, as well as limiting energy consumption. These models make reference to systems based on integrated cycles of production and use, either in the context of agricultural exploitation, or in the context of systems in which local authorities play a driving role, by modifying their own buildings in order to power them with renewable sources created by local cooperatives.

On the theme of energy management at local authority level, approaches were identified which placed great importance on the participation of local actors, the modernising of public property, and the reuse of waste (waste oil, for example) for energy production.

On the theme of the integration of economic development and energy, there were innovative projects to steer SMEs towards greater energy sustainability, using solutions already tested in other countries, as well as interesting partnerships between the public and private sectors.

Finally, on the theme of territorial planning and energy, it was possible to note how local authorities were in a position to launch large-scale projects involving industrial installations, tourist and agricultural areas, and small communities in mountainous areas, for which sustainable and renewable energies represent not only a planning obligation, but also an opportunity for growth.

In conclusion, the identification and analysis of good practices has made it possible to highlight the strategic role of sustainable and renewable energies in the development of a region and its companies. For the latter, sustainable and renewable energies may become a significant technological advantage in terms of reducing costs and improving competitiveness, but also in terms of developing new commercial opportunities in the EU and beyond.

5.2. Recommendations

The recommendations and advice presented below are addressed to the different actors operating in the environment of the Structural Funds, with the aim of improving the use of the resources available, for more sustainable and renewable energy.

A first sub-section outlines objectives that can reasonably be set. A second sub-section proposes various recommendations for each relevant level of the decision-making hierarchy, considering that the successful implementation of the Structural Funds depends on the principle of partnership.

5.2.1. Objectives to be met

On the basis of existing data, it would appear that, for the 2007-2013 period, the financial resources allocated to sustainable and renewable energies in the context of the SFs are increasing, as is the threshold of investments in sustainable and renewable energies, taking all the SFs together. As a result, an increase in the share of sustainable and renewable energies from 1.16% to 3.5%, indeed 5%, as is proposed in the information document *Channelling EU funds into efficient and renewable energy* ⁽²²⁾, can be envisaged.

The increase in expenditure on sustainable and renewable energies to 5% of the total budget represents a total final expenditure of EUR 17 370 billion (EU 27), an increase of EUR 15 billion compared with the 2000-2006 period. Furthermore, it is advisable to consider 3.5% as a minimum objective, while making an earnest effort to achieve 5%.

Furthermore, this sum must be dedicated entirely to actions linked to sustainable and renewable energies, without the inclusion of other technologies or themes ⁽²³⁾.

⁽²²⁾ CEE Bankwatch Network and Friends of the Earth Europe: *Channelling EU funds into efficient and renewable energy*, supported by Énergie-Cités, the European Renewable Energy Council (EREC) and the European Alliance of Companies for Energy Efficiency in Buildings (EuroACE).

⁽²³⁾ The allocation and use of funds for sustainable and renewable energies will be easier to evaluate in future. In fact, Regulation (EC) No 1828/2006 on the 2007-2013 Structural Funds establishes separate codes for each type of energy technology (for example: 39 wind, 40 solar, 41 biomass, 42 hydroelectric, geothermal and other, 43 energy efficiency, co-generation, energy management). Furthermore, the same regulation requires that managing authorities publish a list of project beneficiaries as well as project titles and the sums allocated (Article 7 of Regulation EC 1828/2006). This will make it possible to access information which was not accessible for the 2000-2006 programming period.

5.2.2. Recommendations for all European regional policy actors

A more strategic approach to sustainable energy

Analysis of the documents concerning the 2000-2006 programming period reveals that in quantitative terms sustainable and renewable energy is of marginal importance in the Operational Programmes (1.16% of the total expenditure). Furthermore, it is included only in a sporadic and inconsistent way compared with the main priorities and is only very rarely integrated in other measures. Thus, when it is present as a specific measure, energy tends to be isolated from the local development context. Its relationship to the competitiveness of companies or regions is not taken into account.

Sustainable and renewable energy must be an integral part of programming documents. It must be consistent with national and regional strategies and take into account European directives and policies on energy, by linking them to the priorities established by strategic Community directives.

For example, in the context of the Competitiveness objective, sustainable and renewable energy can be a key element for the promotion of: a new technology including a sustainable and renewable input; innovation projects; technology transfer to local companies; assistance for investment in SMEs; demonstration units installed by local authorities in public buildings; training for installers; and assistance for marketing actions. A 30% reduction in total energy consumption in public buildings and tourist resorts is an objective that could reasonably be set at the end of the current programming period.

The Convergence objective could focus one of its strategies on the development of biogas systems, by integrating an environmental protection objective into it (for example, the reduction of the impact of pig manure), and facilitate conversion to agricultural energy cultures and participation by farmers in an industrial initiative on sustainable and renewable energies. The participation of different actors could lead to the creation of networks between farmers and tertiary industries in order to supply gas, electricity and heat to rural districts. Producing 3% of electricity from renewable energy sources could be a reasonable regional objective.

Energy quality issues to be managed in all sectoral interventions

Energy is today a key element in the economic development of a region. It is an integral part of transport, industry, housing and public and private buildings, technological development, innovation and infrastructure. Several NSRFs have adopted an approach in which sustainable and renewable energy is included in all sectoral priorities and contributes to the achievement of overall objectives.

It is therefore necessary to carefully consider the energy issues linked to interventions in all sectoral measures. For example, when interventions are being undertaken on buildings, infrastructure or transport systems, if the impact on energy consumption and energy supply is neglected, the result may produce negative effects in relation to European policies on sustainable and renewable energy.

Several directives define the characteristics of the approach to sustainable and renewable energies in different sectors, and better use should be made of them as a reference throughout the programming phase.

Furthermore, this approach corresponds to the general principle mentioned in Directive 91/2002/EC, according to which it is the responsibility of the public sector to stand as an example to the private sector. As public funding, the SFs must make it possible to ensure that energy is used in the most sustainable way possible.

5.3. Recommendations for the European Commission

5.3.1. Recommendations directly linked to the management of the SFs

Through the Community Strategic Guidelines, the Commission establishes clear priorities for energy efficiency and sustainable and renewable energies for the three objectives of the 2007-2013 SFs.

In numerous public statements during the previous programming period, Commission representatives had nevertheless explained that energy was not a cohesion policy objective and that the adoption of sustainable and renewable energy priorities was the responsibility of the Member States. Today this message must change and the Commission must clearly shoulder its responsibility as regards guidance on energy.

During the 2007-2013 period the Commission will have to carefully monitor the programming process by checking for the existence of a strategic approach to sustainable and renewable energy (rather than isolated measures) and verify the use of and conformity with European policy documents concerning energy issues in all sectors.

The introduction of a strategic monitoring system should support and facilitate the management of the process in the years to come.

The application of specific directives on key energy issues must be subject to step-by-step monitoring during the programming process, so that reference is made to the objectives and priorities as well as the energy policy documents. This process should be particularly useful for sustainable and renewable energies.

Since the application of these directives cannot be verified at this stage of programming, it would be very helpful if this could be done during the mid-term assessment of the programmes.

It would be advisable to carry out a thematic assessment of sustainable and renewable energies for the 2000-2006 programming period and studies to support the integration of sustainable and renewable energies in the SFs.

5.3.2. Recommendations for energy and transport programmes

The Intelligent Energy – Europe II (IEE II) programme will be part of the new Competitiveness and Innovation 2007-2013 programme, with a significant share of the total sum (22.3%, or EUR 727 million).

Emphasis will now be placed on the interaction of sustainable and renewable energies with competitiveness and innovation in companies, in particular SMEs. This aspect is in fact one of the recurring ideas in this study: European energy policy demands a change in the attitude of companies to take them towards different, more sustainable and renewable energy systems, and towards more economical and more efficient methods of using energy. The new energy technologies must become state-of-the-art expertise for European societies in order to make them competitive at international level and to improve their export potential on the world market.

Furthermore, the IEE II programme must interact with the SFs (their programming periods coincide). One of the objectives of IEE is the elimination of non-technical barriers, but IEE II does not provide for investment support. The SFs do for their part support investment and there is therefore real complementarity there.

Thus, IEE projects should open the way for SF projects. The selection of projects funded in the context of the SFs should be linked to the results of projects funded in the context of the IEE programme.

There must be sustained effort and an emphasis on the role that regional and local energy agencies must play in order to encourage local initiatives funded in the context of the SFs.

5.3.3. Recommendations for actions aimed at companies

The role of companies in the development of sustainable and renewable energies was underestimated in the 2000-2006 programming period. Most of the measures for SMEs and large companies were very general (ecological technologies), which left the choice of investing in new energy solutions to autonomous initiatives.

Companies must be strongly supported in the area of new models for energy supply and use, to prepare themselves for a period in which energy will become increasingly strategic (and expensive).

Business combinations should be promoted, owing to the fact that many solutions are financially viable only on a large scale. By way of example, the outsourcing of the supply of energy services (Directive 2006/32/EC of 5 April 2006) may be a winning solution, because new information and communication technologies offer exceptional opportunities for efficient and financially viable energy management systems that are better adapted to a district than to a single company.

The Commission should take action, in particular regarding communication on the SFs to make companies aware of these problems and encourage them to participate in all the programmes and initiatives funded under the SFs in the area of energy technologies.

5.3.4. Recommendations for research and development (R&D)

The projects supported by the Seventh Framework Programme for Research and Development in the sphere of sustainable and renewable energies will have a significant influence on DG TREN's activity. A new concept was introduced in IEE II, which consisted in supporting the replication of new products and processes – an additional stage, following the demonstration projects, to facilitate the introduction of new technologies on the market.

Interaction at different levels of local development of the R&D chain, with the introduction on the market of new products and processes, may produce very positive results and make it possible to successfully achieve the ambitious objectives of European policy on sustainable and renewable energies.

5.3.5. Recommendations for cross-border collaboration

The competitiveness of European companies must be supported, not only in the context of the internal market of the EU, but also in that of new markets. The EU 27's neighbour countries, in particular those on the eastern and southern borders, could benefit greatly from sustainable and renewable energy-related technologies developed by European companies. Programmes aimed at regional collaboration could become a means of disseminating available and proven technologies developed and implemented by European companies. Like Interreg, which proved successful in funding projects using sustainable and renewable energies, the new ENPI (European Neighbourhood and Partnership Instrument) ⁽²⁴⁾ and IPA (Instrument for Pre-Accession Assistance) ⁽²⁵⁾ instruments could be interesting tools to help disseminate European

⁽²⁴⁾ The European Neighbourhood and Partnership Instrument (ENPI) is a policy instrument that fits into the framework of existing bilateral agreements between the Community and neighbour countries. It aims in particular to support the implementation of action plans under the European Neighbourhood Policy.

⁽²⁵⁾ The Instrument for Pre-Accession Assistance (IPA) is the new financial instrument for all the European Commission's pre-accession activities, starting from 1 January 2007.

energy technologies in neighbouring countries, bearing in mind that they are partly funded by the SFs (ERDF).

5.4. Recommendations for Member States

Although the development of the NSRFs and the OPs is already at a very advanced stage, it is nevertheless useful to provide some information which it still appears possible to include in the NSRFs and the OPs, and which may improve their quality.

On the basis of consideration of the most innovative NSRFs, they should all:

- include strong reference to technologies that use sustainable and renewable energies in the priorities for innovation and technology transfer. Increasing the know-how of European companies in this sector may open up significant commercial opportunities on a global level and contribute to the technological leap demanded by the ambitious objectives of the European Energy Action Plan;
- include a reference to energy efficiency and sustainable and renewable energy in the priorities for the competitiveness of companies, since the availability of reliable, clean and economical energy will very probably become a vital factor in competitiveness on the world scene in the next 10 years;
- plan the development of new agricultural or forest energy interventions, taking into account the whole process, from production through to final use, by emphasising the inclusion of raw material producers in the processing chain, with the aim of securing a reasonable profit for farmers;
- introduce sustainable and renewable energy considerations into transport, as a condition of the creation of new infrastructure, to avoid European funding being used to guide transport systems towards a model that would further squander energy;
- set the most advanced energy performance standards (which may be assessed by the recently adopted energy certification for buildings) in all interventions concerning all types of buildings (public, residential, industrial and commercial), in the regeneration of towns and cities, in new industrial or production areas and in rural areas;
- include water-saving considerations (another form of energy saving) in all interventions concerning water infrastructure;
- verify, using monitoring committees, the rationalisation of EU energy policy directives in the OPs.

5.5. Recommendations for regions

The active role of regional authorities is particularly important for innovation and technology transfer. Sustainable and renewable energies warrant a specific effort to bring together the research, development, human and physical resources available (positive examples were noted in several NSRFs, and others came out of the previous SF programming period).

Planning authorities must coordinate regional energy plans, of which there are now many in several Member States, with regional OPs. While regional energy plans must focus more directly on the funding of installations for renewable energy sources and energy efficiency programmes, the OPs must tackle strategic aspects linked to economic development, such as innovation and the competitiveness of SMEs operating in the sustainable and renewable energy sector, the creation of energy products based on agricultural and forest products, and the inclusion of sustainable and renewable energies in spatial planning (cities, towns, production areas, renovation of less-favoured districts and housing, etc).

Finally, the responsibilities of regional authorities could be extended to checking that projects conform to energy quality criteria, according to regional regulations on energy sustainability.

5.6. Recommendations for local authorities

Local authorities, the main beneficiaries of projects funded by the SFs, are often considered to be responsible for the lack of sustainable and renewable energy proposals. The global change of attitude towards energy issues, climate change and the agriculture crisis should encourage local authorities to progressively incorporate sustainable and renewable energy priorities into their projects.

Initiatives should be efficiently managed at local level:

- to promote participative approaches, in particular in the themes of agricultural energy, energy from forest products and the exploitation of biomass. Innovative approaches are needed for farmers, processors, industry and local authorities – in particular final users – who must agree with local strategies;
- to develop projects for the local renovation of old energy production plants to supply villages and public buildings with sustainable and renewable energy;
- to establish concerted actions with a view to improving energy efficiency in industry and commerce, in public buildings, public lighting and other public property, and in residential buildings and social housing.

5.7. Recommendations for the Committee on Regional Development

- call on the European Commission to carry out studies to support the integration of sustainable and renewable energies in the SFs;
- call on the European Commission to identify good practices as regards sustainable and renewable energies during the 2000-2006 period, and to disseminate them to the whole chain of SF managers and beneficiaries;
- call on the European Commission to carry out ad hoc thematic assessments on sustainable and renewable energies for the 2000-2006 programming period and for 2007-2013.

Annexes

A 1. DESCRIPTION PAR FICHE THÉMATIQUE DES PRINCIPALES DIRECTIVES ET COMMUNICATIONS EUROPÉENNES EN MATIÈRE D'ÉNERGIE

A 1.1. Fiabilité des fournitures énergétiques

DOCUMENTS

1. "Livre vert" (2000) ⁽²⁶⁾ ;
2. Réserve minimale de pétrole et produits pétrolifères ⁽²⁷⁾ ;
3. Mesures de sauvegarde de la sécurité des fournitures de gaz naturel ⁽²⁸⁾ ;
4. Proposition pour une directive du Parlement européen sur les infrastructures électriques et la sécurité des fournitures ⁽²⁹⁾.

OBJECTIFS

1. Maintenir une vision d'ensemble des principales problématiques et risques connexes à la croissante dépendance énergétique des pays européens ;
2. Assurer l'existence de réserves minimales de pétrole et de produits pétroliers dans chaque Etat membre pour accroître la sécurité de l'approvisionnement énergétique ;
3. Établir un cadre général commun dans chaque État membre afin de définir des politiques pour la sécurité de l'approvisionnement qui soient transparentes, solidaires, non discriminatoires et cohérentes avec les exigences d'un marché commun du gaz ;
4. Mesures spécifiques pour garantir l'équilibre entre l'offre et la demande dans le marché de l'électricité.

FACTEURS POTENTIELS D'IMPACT TERRITORIAL

1. Équilibrer les politiques liées à la fourniture à travers des actions claires en faveur d'une politique de la demande ;
2. Mettre en place un mécanisme qui permette la création de réserves stratégiques et de prévoir de nouvelles voies de liaison pour augmenter les importations de gaz et de pétrole ;
3. Assurer un niveau adéquat d'interconnexion.

⁽²⁶⁾ Livre vert du 29 novembre 2000 "Vers une stratégie européenne de sécurité d'approvisionnement énergétique" COM/2000/0769.

⁽²⁷⁾ Directive 68/414/CEE du Conseil, du 20 décembre 1968, faisant obligation aux Etats membres de la C.E.E. de maintenir un niveau minimum de stocks de pétrole brut et/ou de produit pétroliers.

⁽²⁸⁾ Directive 2004/67/CE du 26 avril 2004 concernant des mesures visant à garantir la sécurité de l'approvisionnement en gaz naturel.

⁽²⁹⁾ Proposition de directive du Parlement européen et du Conseil concernant des mesures visant à garantir la sécurité de l'approvisionnement en électricité et les investissements dans les infrastructures COM/2003/0740 final SEC(2003) 1368.

A 1.2. Le marché interne de l'énergie

DOCUMENTS

1. Transparence du prix de l'électricité et du gaz ⁽³⁰⁾ ;
2. Secteur hydraulique, énergétique, des transports et des télécommunications ⁽³¹⁾ ;
3. Le marché interne de l'énergie : règles communes pour le marché électrique interne ⁽³²⁾ ;
4. Le marché interne de l'énergie : règles communes pour le marché du gaz interne ⁽³³⁾ ;
5. Le marché interne de l'énergie : fourniture de gaz et d'électricité ⁽³⁴⁾ ;
6. Achèvement du marché intérieur de l'énergie ⁽³⁵⁾.

OBJECTIFS

1. Augmenter la transparence des prix de l'électricité et du gaz appliqués aux utilisateurs finaux industriels pour favoriser la liberté de choix des consommateurs ;
2. Coordonner les procédures nationales d'approvisionnement d'eau, énergie, transports et télécommunications pour assurer une libre concurrence entre les opérateurs européens de ces secteurs ;
3. Réaliser un marché de l'électricité compétitif, sûr et écologiquement durable ;
4. Ouvrir graduellement les marchés du gaz nationaux à la libre concurrence, améliorer la sécurité des fournitures et la compétitivité industrielle.
5. Éviter une double taxation, ou, au contraire, aucune taxation, sur la production, le transport et la distribution d'électricité et de gaz, en harmonisant les règles relatives aux services de transmission et de transport qui existent dans les lieux de production ;
6. Stimuler les échanges transfrontaliers d'électricité en établissant un mécanisme de compensation pour les flux de transit de l'électricité, en introduisant des principes harmonisés pour la taxation des transmissions transfrontalières et en distribuant les capacités d'interconnexion disponibles entre les divers systèmes de transmission nationaux.

FACTEURS POTENTIELS D'IMPACT TERRITORIAL

7. Chaque État membre doit communiquer officiellement à l'Office Statistique de la Communauté européenne le détail des prix et des tarifs appliqués et la Commission est tenue de présenter périodiquement un rapport récapitulatif sur l'état d'application de la Directive ;
8. Soutien aux procédures d'approvisionnement en eau, énergie, transport et télécommunications pour les établissements publics et privés ;
9. Obligation de service public et défense du consommateur. Déterminer les futurs marchés publics pour augmenter la capacité électrique disponible ;
10. Établissement de règles communes pour le stockage, la transmission, la fourniture et la distribution du gaz naturel ;
11. Obligation de service public et protection des consommateurs ;
12. Simplification du système de taxation et de la TVA.

⁽³⁰⁾ Directive du Conseil 90/377/CEE du 29 juin 1990 instaurant une procédure communautaire assurant la transparence des prix au consommateur final industriel de gaz et d'électricité.

⁽³¹⁾ Directive 93/38/CEE du Conseil, du 14 juin 1993, portant coordination des procédures de passation des marchés dans les secteurs de l'eau, de l'énergie, des transports et des télécommunications, Journal Officiel L 199 du 09.08.1993.

⁽³²⁾ Directive 2003/54/CE du Parlement européen et du Conseil du 26 juin 2003 concernant des règles communes pour le marché intérieur de l'électricité et abrogeant la directive 96/92/CE.

⁽³³⁾ Directive 2003/55/CE du Parlement européen et du Conseil du 26 juin 2003 concernant des règles communes pour le marché intérieur du gaz naturel et abrogeant la directive 98/30/CE, Journal officiel L 176 du 15.07.2003.

⁽³⁴⁾ Directive 2003/92/CE du Conseil du 7 octobre 2003 modifiant la directive 77/388/CEE en ce qui concerne les règles relatives au lieu de livraison du gaz et de l'électricité.

⁽³⁵⁾ Règlement (CE) n° 1228/2003 du Parlement européen et du Conseil du 26 juin 2003 sur les conditions d'accès au réseau pour les échanges transfrontaliers d'électricité.

A 1.3. Énergie et développement durable

DOCUMENTS

1. Stratégies pour le développement durable ⁽³⁶⁾ ;
2. Intégration de l'environnement dans les politiques énergétiques de la Communauté européenne ⁽³⁷⁾ ;
3. Dimension énergétique du changement climatique ⁽³⁸⁾.

OBJECTIFS

1. Définir une stratégie à long terme pour donner une empreinte durable au développement économique et social des actuelles et futures générations ;
2. Etablir un ensemble de mesures pour faciliter l'intégration des considérations environnementales dans les politiques énergétiques ;
3. Identifier les politiques à mettre en œuvre et les mesures à prendre pour atteindre les objectifs de réduction des émissions de gaz à effet de serre.

FACTEURS POTENTIELS D'IMPACT TERRITORIAL

1. Coordonner et mettre simultanément en place les trois piliers de la stratégie, économique, social et environnemental, pour garantir un développement de type durable;
2. Développer une politique énergétique qui soit en mesure d'affronter les changements climatiques et d'atteindre les objectifs fixés par le Protocole de Kyoto; identifier les indicateurs qui peuvent enregistrer les progrès obtenus par le processus d'intégration environnementale et créer un système de suivi ;
3. Sélectionner et proposer les mesures avec le meilleur rapport coût-bénéfice obtenu.

⁽³⁶⁾ Communication de la Commission du 15 mai 2001 « Une Europe soutenable pour un monde meilleur : une stratégie de l'UE en faveur du développement durable, Proposition de la Commission COM/2001/0264).

⁽³⁷⁾ Communication de la Commission du 14 octobre 1998 : Renforcer l'intégration de la dimension environnementale dans la politique énergétique européenne COM(98) 571 final.

⁽³⁸⁾ Communication de la Commission du 14 mai 1997 sur la dimension énergétique du changement climatique COM(97) 196 final.

A 1.4. Efficacité énergétique

DOCUMENTS

1. Le "Livre vert" sur l'efficacité énergétique ⁽³⁹⁾ ;
2. Le programme "SAVE II" (1998-2002) pour l'efficacité énergétique ⁽⁴⁰⁾ ;
3. Le programme " Énergie intelligente - Europe " (2003-2006) ⁽⁴¹⁾ ;
4. Le programme-cadre pour l'innovation et la compétitivité (2007-2013) ⁽⁴²⁾ ;
5. Efficacité énergétique : le parcours vers une stratégie d'utilisation rationnelle de l'énergie ⁽⁴³⁾ ;
6. Efficacité énergétique : plan d'action ⁽⁴⁴⁾.

OBJECTIFS

1. Réduction de la consommation énergétique de 20% à l'horizon 2020, ce qui permettrait de dégager un montant total de 60 billions d'€ pour d'autres investissements. Renforcer la compétitivité industrielle européenne par la création d'emplois dans les secteurs de la gestion des transports, des technologies à haute efficacité, etc.;
2. Encourager l'utilisation rationnelle et efficace des ressources pour atteindre les objectifs de réduction de CO² prévus par le Protocole de Kyoto ;
3. Soutien aux objectifs de l'UE en termes de développement durable et sécurité des fournitures énergétiques ;
4. Atteindre les objectifs de la stratégie de Lisbonne, c'est-à-dire stimuler la croissance et l'emploi en Europe. Encourager l'utilisation des technologies informatiques, des technologies environnementales et des énergies renouvelables ;
5. Promouvoir les économies d'énergie ;
6. Réduire la consommation énergétique, augmenter l'efficacité énergétique dans le secteur des transports pour protéger l'environnement, augmenter la sécurité de l'approvisionnement énergétique et établir des politiques énergétiques plus durables.

⁽³⁹⁾ Commission Livre vert, 22 juin 2005, "Efficacité énergétique – ou comment consommer mieux avec moins" COM(2005) 265 final – non publié au Journal officiel.

⁽⁴⁰⁾ Décision N° 647/2000/CE du Parlement européen et du Conseil du 28 février 2000 adoptant un programme pluriannuel pour la promotion des énergies efficaces (SAVE) (1998 à 2002) Journal officiel L 79, 30.03.2001.

⁽⁴¹⁾ Décision n° 1230/2003/CE du Parlement européen et du Conseil du 26 juin 2003 arrêtant un programme pluriannuel pour des actions dans le domaine de l'énergie: "Énergie intelligente — Europe" (2003-2006) (Texte présentant de l'intérêt pour l'EEE).

⁽⁴²⁾ Proposition de Décision du 6 avril 2005 du Parlement européen et du Conseil établissant un programme-cadre pour l'innovation et la compétitivité (2007-2013) COM(2005) 121 final.

⁽⁴³⁾ Communication de la Commission - L'efficacité énergétique dans la Communauté européenne - Vers une stratégie d'utilisation rationnelle de l'énergie COM (1998) 246 final.

⁽⁴⁴⁾ Communication de la Commission au Conseil, au Parlement européen, au Comité économique et social et au Comité des Régions. Plan d'action visant à renforcer l'efficacité énergétique dans la Communauté européenne Brussels, 19.10.2006 COM(2006) 545 final.

FACTEURS POTENTIELS D'IMPACT TERRITORIAL

1. Favoriser la diffusion de véhicules moins polluants ; généraliser les constructions à basse consommation énergétique ; utiliser des appareils électriques à haute efficacité ; rationaliser les consommations énergétiques de l'industrie pour produire plus avec moins d'énergie ;
2. Financer les actions suivantes : études sur l'efficacité énergétique ; projets pilotes pour accélérer les investissements dans le secteur ; suivi et évaluation des actions entreprises ; management de l'énergie au niveau régional et urbain; échanges d'expériences et développement de la cohésion entre États membres ;
3. Financement de projets au niveau local, régional et national, dans les secteurs des énergies renouvelables, de l'efficacité énergétique et de la rationalisation énergétique dans les transports. Il s'agit de promouvoir des schémas efficaces, intelligents et durables pour la production et la consommation d'énergie, de créer une plus grande sensibilisation environnementale à l'énergie soutenable basée sur une formation appropriée;
4. Promotion de la compétitivité et de l'innovation dans les entreprises et dans l'industrie ;
5. Promotion de stratégies pour l'utilisation rationnelle de l'énergie ; dans les bâtiments, dans les appareils électriques, par le financement à travers des tiers ⁽⁴⁵⁾, la gestion énergétique et l'approvisionnement de technologies vertes pour les organismes publics et les coopératives.

⁽⁴⁵⁾ Le Financement à Travers les Tiers (en anglais Third Party Financing) est défini par la Directive 2006/32/CE du Parlement européen et du Conseil relative à l'efficacité énergétique dans les utilisations finales et aux services énergétiques. Il s'agit d'un contrat de services énergétiques où le risque technique et éventuellement financier relatif à l'investissement est pris en charge par une société des services énergétiques (ESCO) qui représente un tiers par rapport à l'utilisateur final et au fournisseur d'électricité, et où la rémunération du capital est liée aux résultats économiques provenant de l'économie d'énergie ou de la production énergétique renouvelable.

A 1.5. Législation en matière d'efficacité énergétique

DOCUMENTS

1. Efficacité énergétique pour les utilisateurs finaux et services énergétiques ⁽⁴⁶⁾ ;
2. Cogénération ⁽⁴⁷⁾ ;
3. Construction à basse consommation ⁽⁴⁸⁾ ;
4. Projet éco soutenable pour les appareils électriques ⁽⁴⁹⁾ ;
5. Appareils électroménagers : étiquetage de consommation énergétique ⁽⁵⁰⁾ ;
6. Efficacité énergétique : le programme "Energy Star", les qualités requises d'efficacité énergétique des transformateurs, des lampes fluorescentes compactes, des réfrigérateurs domestiques ⁽⁵¹⁾ ;
7. Chauffe-eau pour l'eau chaude sanitaire ⁽⁵²⁾.

OBJECTIFS

1. Établir des objectifs, des incitations, des structures financières et légales pour éliminer les barrières d'un marché qui empêchent une utilisation efficace de l'énergie. Développer un marché des services énergétiques et un marché pour la fourniture de programmes d'efficacité énergétique ;
2. Faciliter l'installation et le fonctionnement d'implantations de cogénération (technologie qui permet la production combinée d'électricité et de chauffage) pour économiser l'énergie et combattre le changement climatique ;
3. Créer une plateforme commune pour la promotion et le développement d'un marché de la construction à basse consommation énergétique ;
4. Réduction des consommations d'énergie des appareils électriques grâce à une adaptation éco soutenable des mêmes produits ;
5. Harmoniser les mesures nationales relatives à la publication des informations sur la consommation énergétique et autres spécifications techniques pour les appareils électroménagers afin de permettre aux consommateurs de choisir ces produits sur la base de leur consommation d'énergie ;

⁽⁴⁶⁾ Directive 2006/32/CE du Parlement européen et du Conseil relative à l'efficacité énergétique dans les utilisations finales et aux services énergétiques.

⁽⁴⁷⁾ Directive 2004/8/EC du Parlement européen et du Conseil du 11 février 2004 concernant la promotion de la cogénération sur la base de la demande de chaleur utile dans le marché intérieur et modifiant la directive 92/42/CEE.

⁽⁴⁸⁾ Directive 2002/91/CE du Parlement européen et du Conseil du 16 décembre 2002 sur la performance énergétique des bâtiments [Journal officiel L 001 du 04.01.2003].

⁽⁴⁹⁾ Directive 2005/32/EC du Parlement européen et du Conseil du 6 juillet 2005 établissant un cadre pour la fixation d'exigences en matière d'éco conception applicables aux produits consommateurs d'énergie et modifiant la directive 92/42/CE du Conseil et les directives 96/57/CE et 2000/55/CE du Parlement européen et du Conseil.

⁽⁵⁰⁾ Directive du Conseil 92/75/CEE, du 22 septembre 1992, concernant l'indication de la consommation des appareils domestiques en énergie et en autres ressources par voie d'étiquetage et d'informations uniformes relatives aux produits [Journal officiel L 297 du 13.10.1992].

⁽⁵¹⁾ Directive 96/57/EC du Parlement européen et du Conseil du 3 septembre 1996 concernant les exigences en matière de rendement énergétique des réfrigérateurs, congélateurs et appareils combinés électriques à usage ménager (voir amendements).

⁽⁵²⁾ Directive 92/42/CEE du Conseil, du 21 mai 1992 concernant les exigences de rendement pour les nouvelles chaudières à eau chaude alimentées en combustibles liquides ou gazeux.

6. Coordonner l'étiquetage des équipements électriques de bureau avec le logo ENERGY STAR;
7. Rénover le secteur des lampes à incandescence avec des lampes fluorescentes compactes et le secteur des transformateurs avec transformateurs à haute efficacité énergétique ;
8. Les réfrigérateurs domestiques doivent avoir une marque de conformité "EC" pour garantir que l'appareil répond aux standards énergétiques préfixés ;
9. Tous les chauffe-eau pour eau chaude sanitaire, d'une puissance comprise entre 4 kW et 400 kW, alimentés au gaz ou par combustibles liquides, doivent répondre aux requis énergétiques minimum fixés par l'UE et obtenir la marque de conformité "EC".

FACTEURS POTENTIELS D'IMPACT TERRITORIAL

1. Augmenter l'efficacité énergétique et contrôler la demande énergétique pour la grande distribution et la vente au détail d'électricité et de gaz ;
2. Encourager le perfectionnement de la technologie cogénérative, simplifier les procédures administratives pour son installation, augmenter sa diffusion pour réduire, dans le futur, les coûts et créer une demande consistante d'implantations de cogénération;
3. Réduction des consommations dans la construction pour le secteur résidentiel et tertiaire (bureaux, édifices publics...). Définition d'une méthodologie commune pour calculer la performance énergétique intégrée du bâtiment ; de standards minimum d'efficacité énergétique ; de systèmes de certification énergétique ; d'un système d'inspection et de contrôle ;
4. Définition d'un système de certification européenne des appareils électriques éco soutenable afin de pouvoir graduellement et définitivement remplacer les produits à consommation plus élevée ;
5. Les appareils électroménagers devront être vendus avec une étiquette fournissant des informations détaillées sur leurs performances énergétiques respectives. Les fournisseurs devront mettre à disposition une documentation technique suffisamment complète pour permettre l'identification des performances énergétiques. La Directive s'applique aux appareils électroménagers suivants : réfrigérateurs, congélateurs et leur combinaison, lave-linge, sèche-linge et leur combinaison ; lave-vaisselle ; fours ; air conditionné ; ampoules ; chauffe-eau et accumulateurs d'eau chaude ;
6. Économie d'énergie dérivant de l'utilisation d'appareils électriques de bureau à haute efficacité énergétique ;
7. Réaliser des économies considérables énergétiques et économiques par l'utilisation d'ampoules fluorescentes compactes et de transformateurs à haute efficacité énergétique;
8. Réaliser des économies notables d'énergie par le remplacement du parc de réfrigérateurs et congélateurs domestiques de vieille génération par des appareils garantis par la conformité et la marque "EC" et classés, sur la base des standards de consommation énergétique, avec un certain nombre d'étoiles ;
9. Garantir la sécurité et de hautes prestations énergétiques pour tous les chauffe-eau pour eau chaude sanitaire, d'une puissance comprise entre 4 kW et 400 kW, alimentés au gaz ou par un combustible liquide.

A 1.6. Énergie renouvelable

DOCUMENTS

1. Plan d'action pour la biomasse ⁽⁵³⁾ ;
2. Soutien à la production électrique par des énergies renouvelables ⁽⁵⁴⁾ ;
3. Stratégie de l'UE pour les biocarburants ⁽⁵⁵⁾ ;
4. Énergies renouvelables : le projet Altener (1999-2002) ⁽⁵⁶⁾ ;
5. "Le Livre vert" (1996) ⁽⁵⁷⁾ ;
6. "Le Livre blanc": une stratégie et un plan d'action pour l'UE ⁽⁵⁸⁾ ;
7. Énergies renouvelables : promouvoir l'électricité provenant des énergies renouvelables ⁽⁵⁹⁾ ;
8. Énergies renouvelables : la répartition des énergies renouvelables dans l'UE ⁽⁶⁰⁾.

OBJECTIFS

1. La communication préconise une série d'actions pour accroître la demande de biomasse. Elle entend, en particulier, améliorer les fournitures, dépasser les barrières techniques et économiques et développer la recherche ;
2. Harmoniser, avec un objectif à long terme, les normes du secteur des énergies renouvelables;
3. Faire appliquer les sept axes stratégiques de l'UE pour le développement et l'utilisation du biocarburant dans les États membres et dans les pays en voie de développement ;
4. Altener entend mettre en place les requis légaux, socio économiques et administratifs, pour la promotion des énergies renouvelables ;
5. Ouvrir le débat sur les mesures les plus urgentes et importantes en faveur des énergies renouvelables, identifiant ainsi les obstacles, les objectifs et les moyens à utiliser pour les atteindre ;

⁽⁵³⁾ Communication de la Commission du 7 décembre 2005 – Plan d'action dans le domaine de la biomasse, COM(2005) 628 final – Journal officiel C 49 du 28.02.2005.

⁽⁵⁴⁾ Communication de la Commission - Aide en faveur de l'électricité produite à partir de sources d'énergie renouvelables, SEC(2005) 1571].

⁽⁵⁵⁾ Communication de la Commission du 8 février 2006 – Stratégie de l'UE en faveur des biocarburants, COM(2006) 34 final – Journal officiel C 67 du 18 mars 2006.

⁽⁵⁶⁾ Décision n° 646/2000/CE du Parlement européen et du Conseil, du 28 février 2000, arrêtant un programme pluriannuel pour la promotion des sources d'énergie renouvelables dans la Communauté Altener 1998-2002.

⁽⁵⁷⁾ Livre vert de la Commission du 20 novembre 1996 sur les sources d'énergie renouvelables.

⁽⁵⁸⁾ Communication de la Commission - Energie pour l'avenir : les sources d'énergie renouvelables – Livre blanc établissant une stratégie et un plan d'action communautaires pour le futur.

⁽⁵⁹⁾ Directive 2001/77/EC du Parlement européen et du Conseil du 27 septembre 2001 relative à la promotion de l'électricité produite à partir de sources d'énergie renouvelables sur le marché intérieur de l'électricité [Journal officiel L 283 du 27.10.2001].

⁽⁶⁰⁾ Communication de la Commission au Conseil et au Parlement européen – La part des sources d'énergie renouvelables dans l'UE – Rapport de la Commission conformément à l'article 3 de la directive 2001/77/EC. Evaluation des incidences des instruments législatifs et des autres politiques communautaires visant à augmenter la part des sources d'énergie renouvelables dans l'UE et propositions d'actions concrètes. [COM(2004) 366 final].

6. Obtenir, pour 2010, une pénétration minimale des énergies renouvelables dans le marché de l'UE ;
7. Créer un cadre communautaire qui facilite une augmentation significative, à moyen terme, de l'électricité produite par des énergies renouvelables ;
8. Atteindre l'objectif de 12% d'énergie électrique produite par des sources renouvelables, dans l'UE 15, à l'horizon 2010.

FACTEURS POTENTIELS D'IMPACT TERRITORIAL

1. Augmenter la diffusion de la biomasse pour : chauffage, génération électrique, carburant pour le transport, reforestation, production de bioéthanol, méthanol et biodiesel;
2. Faciliter la pénétration du marché de l'électricité produite par des énergies renouvelables par: un système de certification d'énergie "verte"; l'introduction de règles de tarifs de rachat, certificats verts, systèmes d'adjudication et incitations fiscales;
3. Réduction des émissions de dioxyde de carbone (CO₂°), création d'emploi et développement économique, dérivant de la diffusion des biocarburants ;
4. Encourager les investissements publics et privés dans le développement des énergies renouvelables ;
5. Dupliquer la contribution des énergies renouvelables pour 2012, en générant un effet positif pour la création de plus de 500.000 nouveaux emplois ;
6. Le plan d'action du Livre blanc prévoit une série de mesures prioritaires : biocarburant pour le transport, le chauffage et l'électricité ; promouvoir l'utilisation du biogaz et développer le marché de la biomasse ; promouvoir l'utilisation des énergies renouvelables dans l'industrie de la construction, allègements fiscaux et financiers ;
7. La Directive introduit un système de garantie d'origine de l'électricité produite par des énergies renouvelables pour faciliter les échanges d'énergie et augmenter la transparence en faveur de choix en connaissance de cause des consommateurs ;
8. Mise en place de propositions et d'actions pour atteindre l'objectif de 12% d'énergie électrique produite par des sources renouvelables, dans l'UE 25, à l'horizon 2010.

A 1.7. Tableau : Résumé des principaux objectifs énergétiques atteints par l'UE-15

Les résultats obtenus à ce jour par les politiques énergétiques des États membres de l'UE 15, par rapport aux objectifs de Kyoto, sont résumés dans les tableaux suivants :

Pays	Principaux investissements énergétiques prévus	Engagement de Kyoto 2008-2012	Observations
Autriche	Installations de stockage de gaz ; Energie renouvelable (ER)	- 13%	L'Autriche est un lieu stratégique pour le commerce international d'énergie
Belgique	ER & production combinée de chaleur et d'énergie (CHP : Combined Heat and Power)	- 8%	Le Belgique s'est engagée à abandonner progressivement l'énergie nucléaire. Importance du commerce de l'électricité et de gaz.
Danemark	ER : géothermique, éolienne & biomasse ; efficacité énergétique	- 21%	Introduction d'un système de « certificats verts ».
Finlande	Production d'énergie nucléaire supplémentaire. Accroître les connexions et les réseaux électriques transfrontaliers.	0	Il existe de nombreux échanges commerciaux d'électricité entre les autres pays nordiques et les pays de l'Est .
France	ER	0	Utilisation plus importante de l'énergie nucléaire pour la production de l'électricité. Réduction de l'utilisation du charbon
Allemagne	ER, CHP & efficacité.	- 21%	Abandonner progressivement le nucléaire à partir de 2005. Le plus grand marché d'électricité en Europe. Réduction des subventions pour le charbon.
Grèce	Utilisation du gaz naturel pour la production électrique : économie d'énergie & efficacité & ER.	25%	Expansion de l'utilisation de gaz naturel : production d'énergie et autre.
Irlande	Renforcer les réseaux de transmission : nouveaux pipe-lines sous-marins de gaz naturel vers le R-U ; renouvelables, remplacement des centrales électriques de combustible à charbon	13%	Petit marché. Le charbon et la tourbe jouent un rôle important sur l'approvisionnement en énergie mais ils sont d'importants émetteurs de CO2. Supprimer des centrales électriques de combustible à charbon.
Italie	Substitution de fioul et de charbon par le gaz naturel . ER	- 7%	Fortes différences entre le nord et le sud du pays.
Luxembourg	ER & CHP	- 28%	Forte importance de l'industrie du fer et de l'acier. Consommation élevée d'énergie par habitant. Très petit marché.
Hollandes	Renforcement des réseaux électriques. ER	- 6%	Prévision d'abandon du nucléaire.
Portugal	Expansion du réseau de gaz naturel et de ses terminaux (GNL); renforcement de l'électricité ; efficacité énergétique ER et CHP	27%	Création d'un marché ibérique de l'électricité: en cours.
Espagne	Expansion des réseaux de gaz naturel et d'électricité vers l'UE. ER et CHP, efficacité énergétique.	15%	Un des marchés européens les plus importants de l'énergie éolienne.
Suède	Gaz naturel , ER & CHP.	4%	En phase d'étude : une expansion du marché de l'électricité vers les pays baltiques. Élimination de toutes les centrales nucléaires.
R-U	Nouveaux pipe-lines de gaz; ER, efficacité énergétique et CHP.	-13%	Un des plus grands marchés de l'énergie en Europe.

Source: Projet 2.1.4 ESPON "Territorial Trends of Energy Services and Networks and Territorial Impact of EU Energy Policy".

A 1.8. Tableau : Résumé des principaux objectifs énergétiques atteints par les nouveaux États membres de l'UE

Pays	Ouverture de marché de l'énergie (l'électricité +gaz)	Investissement énergétique principal prévu	Engagement de Kyoto d'ici 2008-2012	Directive renouvelable 2010 de cible	Obs.
Chypre	Acquis Communautaire	Renouvelables	- 13%	6,0%	Les importations d'énergie ont représenté 70% des exportations.
République Tchèque	Fort effort vers la libéralisation	Nouvelles centrales nucléaires. Projeter l'amélioration des raffineries et d'investir dans la production de pétrole.	- 8%	8,0%	Forte dépendance du charbon (50% de TPES en 1998). Exportateur net d'électricité.
Estonie	Libéralisation en cours	Système de gaz naturel.	- 8%	5,1%	Forte dépendance de l'huile de schiste (près de 75% de TPES).
Hongrie	Fort effort vers la libéralisation	Turbines à gaz à cycle combiné.	- 6%	3,6%	Ressources de combustible fossile.
Lettonie	Fort effort vers la libéralisation	-	- 8%	49,3%	Aucune capacité de raffinage ; importateur net d'électricité.
Lituanie	Certains secteurs de l'énergie sont été privatisés	Nouvelle capacité de production électrique pour la substitution de 3000 MWe provenant du nucléaire.	- 8%	7,0%	L'énergie nucléaire est la source principale pour la production de l'électricité, exportateur net d'électricité.
Malte	-	-	-	5%	Substitution de charbon par le pétrole.
Pologne	La libéralisation est dans le programme politique	Systèmes de raffinage et de production électrique.	- 6%	7,5%	Lourde dépendance du charbon ; exportateur de charbon et exportateur net d'électricité.
Slovaquie	Marché libéralisé	Réseaux d'électricité.	- 8%	31,0%	Forte dépendance aux importations de combustibles fossiles; exportateur net d'électricité.
Slovénie	100%	Centrales électriques à gaz naturel et centrales électriques hydrauliques (augmentation de la puissance et remise à neuf).	- 8%	33,6%	Exportateur net d'électricité. Manque de capacité de stockage d'huile.
UE-25				21,0%	

Source: Projet 2.1.4 ESPON "Territorial Trends of Energy Services and Networks and Territorial Impact of EU Energy Policy

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Reader's Notes

