

**DRAFT THEMATIC GUIDANCE FICHE FOR DESK OFFICERS
RENEWABLE ENERGY AND SMART GRIDS INVESTMENTS¹**

VERSION 2 - 06/02/2014

RELEVANT PROVISIONS IN THE LEGISLATION

<i>Regulation</i>	<i>Articles</i>
<p><u>Common Provisions Regulation</u> (CPR) (N° 1303/2013)</p>	<p>Article 8 "Sustainable development" Article 9 – Thematic objective 4 "Supporting the shift towards a low-carbon economy in all sectors"</p> <p>Article 9 – Thematic objectives 1 "Strengthening research, technological development and innovation", 2 "Enhancing access to, and use and quality of ICT", 3 "Enhancing the competitiveness of SMEs", and 10 "Investing in education, training and vocational training for skills and lifelong learning".</p> <p>ANNEX I, Sections 4.3 "Horizon 2020 and other centrally managed EU programmes in the areas of research and innovation", 4.8 "Connecting Europe Facility (CEF)", and 5.2 "Sustainable development".</p> <p>ANNEX XI, Ex-ante conditionality 4.1 "Actions have been carried out to promote cost-effective improvements of energy end use efficiency and cost-effective investment in energy efficiency when constructing or renovating buildings", 4.2 "Actions have been carried out to promote high-efficiency co-generation of heat and power", and 4.3 "Actions have been carried out to promote the production and distribution of renewable energy sources".</p>
<p><u>European Regional Development Fund Regulation</u> (ERDF Regulation) (N° 1301/2013)</p>	<p>Article 5 "Investment priorities" – (4) "Supporting the shift towards a low-carbon economy in all sectors by:"</p> <p>4 (a) "promoting the production and distribution of energy derived from renewable sources";</p> <p>4 (b) "promoting energy efficiency and renewable energy use in enterprises";</p> <p>4 (c) "supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector";</p> <p>4 (d) "developing and implementing smart distribution systems at low and medium voltage levels";</p>

¹ This fiche should be read together with the one on energy efficiency investments.

	<p>4 (e) "promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures";</p> <p>4 (f) "promoting research in, innovation in and adoption of low-carbon technologies";</p> <p>4 (g) "promoting the use of high-efficiency co-generation of heat and power based on useful heat demand".</p> <p>Article 3 – "Scope of support from the ERDF"</p> <p>1. The ERDF shall (...) support:</p> <p>(b) productive investment, irrespective of the size of the enterprise concerned, which contributes to the investment priorities set out in points (1) and (4) of Article 5 (...);</p> <p>(c) investment in infrastructure providing basic services to citizens in the areas of energy, environment, transport and ICT;</p> <p>(e) investment in the development of endogenous potential through fixed investment in equipment and small-scale infrastructure, including small-scale cultural and sustainable tourism infrastructure, services to enterprises, support to research and innovation bodies and investment in technology and applied research in enterprises.</p> <p>2. The ERDF shall not support (b) investment to achieve the reduction of greenhouse gas emissions from activities listed in Annex I to Directive 2003/87/EC.</p>
<p><u>Cohesion Fund Regulation</u> (CF Regulation) (N° 1300/2013)</p>	<p>Article 3 "Investment Priorities" – (a) "Supporting the shift towards a low-carbon economy in all sectors by:"</p> <p>(i) "promoting the production and distribution of energy derived from renewable sources";</p> <p>(ii) "promoting energy efficiency and renewable energy use in enterprises";</p> <p>(iii) "supporting energy efficiency, smart energy management and renewable energy use in public infrastructures, including in public buildings, and in the housing sector";</p> <p>(iv) "developing and implementing smart distribution systems at low and medium voltage levels".</p> <p>(v) "promoting the production and distribution of energy derived from renewable sources"promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures"promoting the production</p>

	<p>and distribution of energy derived from renewable sources";</p> <p>(vi) "promoting the production and distribution of energy derived from renewable sources"promoting the use of high-efficiency co-generation of heat and power based on useful heat demand"promoting the production and distribution of energy derived from renewable sources".</p> <p>Article 2 – "Scope of support from the Cohesion Fund"</p> <p>1. The Cohesion Fund shall (...) support:</p> <p>(a) investment in the environment, including areas related to sustainable development and energy which present environmental benefits.</p> <p>2. The Cohesion Fund shall not support (b) investment to achieve the reduction of greenhouse gas emissions from activities listed in Annex I to Directive 2003/87/EC.</p>
<p><u>European Territorial Cooperation Regulation</u> (ETC Regulation) (N° 1299/2013)</p>	<p>Article 6 – "Thematic concentration"</p> <p>Article 7 – "Investment priorities"</p>

This is a draft document based on the new ESIF Regulations published in OJ 347 of 20 December 2013 and on the most recent version of the relevant Commission's draft implementing and delegated acts. It may still require review to reflect the content of these draft legal acts once they are adopted.

1. INTRODUCTION

This guidance explains issues related to thematic objective 4 “*supporting the shift towards a low-carbon economy in all sectors*” and the related investment priorities for renewable energy and smart grids investments under the European Regional Development Fund (ERDF) and the Cohesion Fund (CF). The main focus in this fiche is on investments priorities “*promoting the production and distribution of energy derived from renewable sources*”, “*promoting the use of high-efficiency co-generation of heat and power based on useful heat demand*”, “*promoting research in, innovation in and adoption of low-carbon technologies*” and “*developing and implementing smart distribution systems at low and medium voltage levels*”, while the other investment priorities under thematic objective 4 also containing renewable energy aspects (listed in the table above) are further developed in the guidance fiche on energy efficiency investments.

2. STRATEGIC FRAMEWORK

2.1 Point of departure: The National Renewable Energy Action Plan

Cohesion Policy funds are a crucial tool for helping Member States (MS) achieve their Europe 2020 objectives, including the headline target on renewable energy (RES). National priorities in terms of increasing the share of RES are indicated through MS’ National Renewable Energy Action Plans (NREAPs). This should be the basis for determining the nature of support, complemented by the Commission's progress reports, tracking the progress of RES development in the MS and, inter alia, identifying the weaknesses in MS' efforts to implement their plans and thus areas needing further support. Strong coherence is required between the main strategic documents related to RES in the given MS and region on the one hand and the Partnership Agreements (PAs) and Operational Programmes (OPs) on the other.

2.2 Renewable energy as a driver for regional development

RES enable us to diversify our energy supply. This increases security of supply and improves overall competitiveness, creating new industries and Small and Medium-sized Enterprises (SMEs), jobs, economic growth and export opportunities, whilst also reducing our greenhouse gas emissions.

In many MS, given the national support framework already in place for RES, the focus of Cohesion Policy support in this area would mainly be on decentralised RES electricity production and RES use in heating and cooling, strengthening the energy independence and contributing to the growth of the regions, and on innovative RES technologies, in particular technologies mentioned in the Strategic Energy Technology Plan (SET-Plan)² and in the Energy Roadmap 2050.

² The SET-Plan Technology Map 2011 describes the status of 18 technologies/sectors, mainly RES (such as wind, solar, hydro, marine, geothermal, bioenergy), energy efficiency, grids and storage, but also others (nuclear, carbon capture and storage (CCS)). The May 2013 Commission Communication “Energy Technologies and Innovation” suggested that the rapidly evolving energy landscape requires a system approach and responsiveness to new developments. The SET-Plan needs increased focus on energy system integration, integration of activities along the innovation chain and increased coordination of key actors to support this. An Integrated Roadmap is

Some MS and regions are expected to conclude in the process to develop their research and innovation smart specialisation strategies ('RIS3') that they have the potential to invest a large share of their ERDF funding in state-of-the-art Research, Technological Development and Innovation (RTDI) for sustainable energy, but every MS and region should aim to capitalise on the funding opportunities in a smart way and invest in advancing its local RTDI capabilities under Thematic Objective 4 and also make sure that they are aware of and can capitalise on the results of RTDI activities carried out elsewhere.

In the framework of the focus on decentralised RES, an option that should be considered is the integration of RES in Community Led Local Development (CLLD). Decentralised RES that are supported by local economic players and groups involving a broad range of stakeholders, including civil society, can represent a real opportunity for renewed socio-economic activity, especially in remote places like rural areas, islands or mountainous zones.

2.3 Smart grids as a crucial enabler for integration of RES, active participation of consumers in the retail market and improved energy efficiency

Smart grids will be the backbone of the future decarbonised power system. They will enable improved energy efficiency and the integration of vast amounts of RES and electric vehicles, provide an opportunity to boost the future competitiveness and worldwide technological leadership of EU technology providers, and a platform for traditional energy companies or new market entrants such as ICT companies, including SMEs, to develop new, innovative energy services. That dynamic should enhance competition in the retail market, facilitate consumer activation and engagement in the management of energy consumption and production, incentivise reductions in greenhouse gas emissions and provide an opportunity for economic growth.

Public investments in local/regional smart grid pilot projects will substantially help to remove existing technical and non-technical uncertainties associated with the full deployment at national/EU level. Investments in smart grids will also have substantial cross-cutting impacts at local/regional level. Projects and investments in the area of smart grids must now aim for 'real life' demonstration and validation, solving system integration issues and demonstrating the business cases. They must also demonstrate how consumers can benefit most from the introduction of these systems.

2.4 Ensuring an integrated approach and coordination with other instruments, as well as triggering a maximum of private investment with a minimum of public support

The development of urban sustainable energy action plans and mobility action plans should be encouraged and supported as part of broader low-carbon and urban development strategies in order to facilitate optimisation and coordination of investments, i.e. an integrated approach.

It is important to ensure coordination with already existing instruments, including both funding and non-funding instruments. Support from Cohesion Policy funds should not duplicate support from revenue obtained from auctioning allowances under the European Emission Trading System (ETS) and should complement national support schemes for RES.

currently under development, incorporating the key principles and measures identified in the Communication, which will consolidate the (updated) technology roadmaps of the SET-Plan.

Support should therefore focus on areas where current initiatives are insufficient. The bulk of investment should be made by the private sector, in particular in relation to mature RES technologies.

Furthermore, the Common Strategic Framework (Annex I to the CPR) sets out the obligation for MS and, where appropriate, regions to "*ensure that the interventions supported through the ESI Funds are complementary and are implemented in a coordinated manner with a view to creating synergies*". In addition, MS shall "*take appropriate steps to ensure consistency, at programming and implementation stages, between interventions supported by the ESI Funds and the objectives of other Union policies*".

3. REGULATORY SCOPE OF SUPPORT

In line with the results orientation of the new legislative framework for Cohesion Policy, the ERDF and the CF regulations distinguish clearly between the scope of support for the ERDF/CF (the activities it may support) and the investment priorities for each thematic objective (objectives to which the ERDF/CF shall contribute)³. For an operation to be eligible for ERDF/CF support it must contribute to a specific objective defined for an investment priority and fall within the scope of the fund's activities.

3.1 Scope of support

ERDF

There are two main fields of intervention of the ERDF on renewable energy and smart grids: productive investments contributing to the investment priorities set out below, including those carried out by large enterprises, and investments in the development of endogenous potential, through fixed investment and small-scale infrastructure.

Cohesion Fund

The Cohesion Fund, while ensuring an appropriate balance and according to the investment and infrastructure needs specific to each MS, shall support investments in the environment, including areas related to sustainable development and energy which present environmental benefits, in compliance with article 177 of the Treaty.

³ Investment priorities "should set out detailed objectives, which are not mutually exclusive, to which the ERDF is to contribute. Such investment priorities should form the basis for the definition of specific objectives within programmes that take into account the needs and characteristics of the programme area" (ERDF Regulation recital number 7; identical text for the CF in recital 12 of the CF Regulation).

3.2 Investment priorities

Investments under the thematic objective 4 "Supporting the shift towards a low-carbon economy in all sectors" shall contribute to the following investment priorities related to renewable energy and smart grids⁴:

ERDF

- (a) promoting the production and distribution of energy derived from renewable sources;
- (b) promoting energy efficiency and renewable energy use in enterprises;
- (c) supporting energy efficiency, smart energy management and renewable energy use in public infrastructures, including in public buildings, and in the housing sector;
- (d) developing and implementing smart distribution systems at low and medium voltage levels;
- (f) promoting research and innovation in, and adoption of low-carbon technologies;
- (g) promoting the use of high-efficiency co-generation of heat and power based on useful heat demand.

There may also be scope for investment in renewable energy under:

- (e) promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multi-modal urban mobility and mitigation relevant adaptation measures.

Cohesion Fund

- (i) promoting the production and distribution of energy derived from renewable sources;
- (ii) promoting energy efficiency and renewable energy use in enterprises;
- (iii) supporting energy efficiency, smart energy management and renewable energy use in public infrastructures, including in public buildings, and in the housing sector;
- (iv) developing and implementing smart distribution systems at low and medium voltage levels;
- (vi) promoting the use of high-efficiency co-generation of heat and power based on useful heat demand.

There may also be scope for investment in renewable energy under:

- (v) promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multi-modal urban mobility and mitigation relevant adaptation measures.

⁴ The ERDF Regulation also includes an investment priority related to energy under thematic objective 7: "(e) improving energy efficiency and security of supply through the development of smart energy distribution, storage and transmission systems and through the integration of distributed generation from renewable sources". Considerations in relation to investments under this investment priority are not included in this thematic guidance fiche.

3.3. Non eligible operations

Both the ERDF and the CF regulations exclude support to “*investment to achieve the reduction of greenhouse gas emissions from activities listed in Annex I to Directive 2003/87/EC*”, including combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste). The rationale for this exclusion is that ERDF/CF investments would just foster a reduction in the price of emission permits, without achieving additional decreases in the volume of emissions (as the number of permits remains fix, so does the volume of greenhouse gas emissions).

However, recitals (3) and (7) respectively of these same regulations clarify that “*that exclusion should not restrict the possibility of using the ERDF [or the Cohesion Fund] to support activities that are not listed in Annex I to Directive 2003/87/EC even if those activities are implemented by the same economic operators, and include activities such as energy efficiency investments in district heating networks, smart energy distribution, storage and transmission systems and measures aimed at reducing air pollution, even if one of the indirect effects of such activities is the reduction of greenhouse gas emissions, or if they are listed in the national plan referred to in Directive 2003/87/EC*”.

In particular, installations exclusively using biomass are not covered by Directive 2003/87/EC, as well as units which use fossil fuels only during start-up or shut-down of the unit. In parallel, investment in renewable-based co-generation, or combined heat and power (CHP), is possible and not subject to size restriction. As a consequence, when an investment combines renewables and combustion installations with a rated thermal input exceeding 20 MW, the part of the operation relating to combustion installations shall not be eligible.

Moreover, both the ERDF and the CF regulations exclude support to undertakings in difficulty.

It should also be noted that the Commission proposal sought to exclude ERDF support to investments in infrastructure providing basic services to citizens in the area of energy **in more developed regions**, as it is expected that these regions are already sufficiently endowed with this kind of infrastructures, and investments can be financed from user charges and/or national budgets. This exclusion was not endorsed by the co-legislators.

Consequently, the Commission will particularly assess the actual need for support to energy infrastructures in more developed regions, on the basis of the individual programming documents submitted in due course by the MS and managing authorities.

Finally, for the Cohesion Fund, the co-legislators agreed to widen the scope of support to energy efficiency in housing. Accordingly, any proposal in this sense should be subject to particular scrutiny.

4. KEY MEASURES LINKED TO INVESTMENT PRIORITIES

4.1 Indicative Actions of high European added value for the ERDF and the CF

The Commission has identified a number of actions⁵ which can be expected to make a significant contribution to the achievement of the targets and objectives of the Union strategy for smart, sustainable and inclusive growth and which shall act as a reference point in the preparation of programmes.

For the ERDF and the CF, these include:

- investment in the wider use of Energy Performance Contracting in the public buildings and housing sectors
- energy efficiency and renewable heating and cooling in public buildings, in particular the demonstration of zero-emission and positive-energy buildings, as well as deep renovation of existing buildings to beyond cost-optimal levels;
- energy efficiency measures and renewable energy use in SMEs (including information campaigns);
- innovative renewable energy technologies, in particular technologies mentioned in the Strategic Energy Technology Plan and in the Energy Roadmap 2050, along with second- and third-generation biofuels;
- supporting marine-based renewable energy production, including tidal and wave energy
- integrated low-carbon strategies and sustainable energy action plans for urban areas, including public lighting systems and smart grids.

4.2 Promoting the production and distribution of energy derived from renewable sources / Promoting research and innovation in and adoption of low-carbon technologies / Promoting the use of high-efficiency co-generation of heat and power

4.2.1 Why should the ERDF and the CF co-finance this kind of investments?

RES enable us to diversify our energy supply and get access to non or very low polluting energy sources. This increases security of supply and improves overall competitiveness creating new industries, jobs, economic growth and export opportunities, whilst also reducing our greenhouse gas emissions. Strong RES growth to 2030 could generate over 3 million jobs⁶, including in SMEs. Maintaining Europe's leadership in renewable energy will also increase our global competitiveness, as "clean tech" industries become increasingly important around the world.

The cost of RES is not determined solely by the availability of renewable energy sources such as wind, solar, biomass or water resources; project costs are also driven by administrative

⁵ SWD(2012) 61 final Part II, 14.3.2012, *Elements for a Common Strategic Framework 2014 to 2020*

⁶ See Commission Staff Working Document on "Exploiting the employment potential of green growth" accompanying the Employment package COM (2012) 173, p. 8, <http://ec.europa.eu/social/main.jsp?catId=89&langId=en&newsId=1270&moreDocuments=yes&tableName=news>, and Ragwitz et al (2009), *EmployRES*, Fraunhofer ISI Germany http://ec.europa.eu/energy/renewables/studies/doc/renewables/2009_employ_res_report.pdf. More ambitious RES policy targets trigger investments and hence employment in knowledge intensive generation technologies. Capital-intensive technologies such as photovoltaic and wind off- and on-shore, solar thermal and heat pumps dominate in absolute terms under a strong RES promoting policy. For many of these technologies, the construction phase is the most labour intensive one.

costs and capital costs. A combination of measures, including simplification of administrative regimes, stable and reliable support schemes and easier access to capital, for example through public support schemes, should be used to contribute to the competitiveness of RES. This will address barriers such as complicated authorisation procedures, the lack of one-stop-shops, the creation of registration procedures, planning processes that may take months or years and fear of retroactive changes to support schemes increase project risk. Such high risks, particularly, in countries with stressed capital markets, result in a very high cost of capital, raising the cost of RES projects and undermining their competitiveness.

Today, most RES technologies benefit from national support schemes⁷, but only a small share of the energy market is affected: less than a third of the 19% of our electricity from renewable energy is sheltered from market prices⁸. Cohesion Policy funding should be used to complement existing support schemes to ensure added value of funding.

To ensure their cost-effectiveness and expose producers to market price risk which encourages technology competitiveness, MS should continuously adjust their support schemes to ensure that ultimately mature technologies operating in competitive markets, with a well-functioning carbon market, are no longer supported. Support for RTDI and other financial or administrative support should be ensured for newer, less mature technologies. MS can use Cohesion Policy funding in addition to national public funding and other schemes to ensure adequate levels of support.

The guidance prepared by the Commission on best practice and experience gained in RES support scheme reform should be taken into consideration⁹. This will help ensure greater consistency in national approaches and avoid fragmentation of the internal market. The following principles are best practice in the EU and might be used by MS planning to reform their schemes:

- Financial support should be limited to what is necessary and should help making renewables competitive.
- Support schemes should be flexible and respond to falling production costs. As they mature, technologies should be gradually exposed to market prices and eventually support must be fully removed. In practical terms this means that feed in tariffs should be replaced by feed in premia or other support instruments which give incentives to producers to respond to market developments.
- Governments must avoid unannounced or retroactive scheme changes. Investors' legitimate expectations concerning the returns on existing investments must be respected.
- MS should better coordinate their renewable energies strategies to keep costs low for consumers, in terms of energy prices and taxes.

4.2.2 Where should the money go and how to invest?

⁷ Exceptions, or partial exceptions include hydropower, some geothermal and biomass sources, heat pumps and solar heating in some markets.

⁸ http://ec.europa.eu/energy/renewables/doc/communication/2012/comm_en.pdf

⁹ http://ec.europa.eu/energy/gas_electricity/internal_market_en.htm

The Renewable Energy Directive sets ambitious targets for all MS, for the EU to reach the Europe 2020 target of a 20% share of energy from RES by 2020 and a 10% share of RES specifically in the transport sector. It also improves the legal framework for promoting renewable electricity, requires national action plans that establish pathways for the development of RES, creates cooperation mechanisms to help achieve the targets cost effectively and establishes sustainability criteria for biofuels and bioliquids.

In general, since Cohesion Policy funds are a crucial tool for helping MS achieve their Europe 2020 objectives, the basis for determining the nature of support should be national priorities in terms of developing RES which are indicated through MS' National Renewable Energy Action Plans (NREAPs). This should be complemented by the Commission's progress reports, which inter alia identify weaknesses in MS' efforts to implement their plans and thus areas needing further support.

Strong coherence is required between the main strategic documents related to RES in the given MS or region on the one hand and the OPs on the other. The NREAPs include different RES technologies (also technologies connected with distributed generation, such as solar panels, geothermal heat pumps or small wind farms), but to make it more operational and to ensure that production of energy exploits the local energy potential, there might be a need to prepare regional renewable energy development strategies.

In many MS, given the national support framework already in place for RES, the focus of Cohesion Policy support under this investment priority should be on innovative RES technologies, in particular technologies mentioned in the Strategic Energy Technology Plan (SET-Plan)¹⁰ and in the Energy Roadmap 2050. RES use in heating and cooling is another area of priority. This area has been much less covered by the national support frameworks than electricity. The use of power-to-gas technologies, converting renewable electricity into hydrogen that can be used in fuel cells applications (combined heat and power (CHP) or mobility) or blended into natural gas grids can also be an important way of integrating RES in the energy system, when appropriate.

In MS where national support schemes have proved insufficient and the availability of national funding is limited and the ability of consumers of electricity to pay higher electricity prices is also limited, the focus of support should be not only on innovative RES technologies, but also on decentralised RES electricity production and on renewable heating and cooling production strengthening energy independence and contributing to the growth of the regions.

It is important to ensure coordination with already existing instruments, including both funding and non-funding instruments. Support from Cohesion Policy funds should not duplicate support from revenue obtained from auctioning allowances under the EU Emission Trading System (ETS) and should complement national support schemes for RES. Support should therefore focus on areas where current initiatives are insufficient.

¹⁰ The SET-Plan, adopted by the EU in 2008, is a first step to establish an energy technology policy for Europe. It is a strategic plan to accelerate the development and deployment of cost-effective low carbon energy technologies, with a goal of: (1) Accelerating knowledge development, technology transfer and up-take; (2) Maintaining EU industrial leadership on low-carbon energy technologies; (3) Fostering science for transforming energy technologies to achieve the 2020 Energy and Climate Change goals; and (4) Contributing to the worldwide transition to a low carbon economy by 2050. It has set up a governance system for technology development at EU level and established the basis for a research and innovation system built on national and regional capacities. The May 2013 Commission Communication "Energy Technologies and Innovation" suggested that the rapidly evolving energy landscape requires a system approach and responsiveness to new developments. See also footnote 2 above.

In general, RES investments may generate a revenue-generating stream. For this reason, the bulk of investment should be made by the private sector, in particular in mature RES technologies. It is up to MS and regions to ensure that public funding does not replace but complements and leverages private investment in accordance with State aid rules. Against this background, the possible use of financial instruments with European Structural and Investment (ESI) Funds contribution should be considered if the ex-ante assessment in line with Article 37(2) of the CPR has established evidence of market failure or a sub-optimal investment situation and investments are expected to be financially viable. Grants should be used primarily to support innovative technologies.

Further detailed analysis is recommended at national and regional level in order to design optimal financing schemes that will support RES development. Taking into account experience from the 2007-2013 programming period, it is important to create a clear system of support from the Cohesion Policy funds, avoiding over compensation at the individual project level. As a basis for designing schemes as well as individual projects, a financial analysis thus needs to be carried out, ensuring that investments are incentivised and optimally leveraged with the right level of support, thus triggering a maximum of investment with a minimum of public support.

As regards governance, MS and their authorities should also design the relevant priorities on capacity building within administrations, in particular at regional and local level since RES production is often managed at regional/municipal level, put the right focus on awareness raising and education on environmentally-friendly behaviour and pro-actively involve NGOs and other civil society organisations that can have a high level of expertise and outreach for the success in implementing co-financed measures.

As to the content of the investments, the aim has to be to create European added value and also to design the support to contribute to activities where it can bring the best socio-economic added value and regional development on the ground, including local jobs. Decentralised RES production can contribute to job creation and the local economy by improving the energy independence, reducing energy costs, using local feedstock supplies (e.g biomass/biogas/waste heat)¹¹, local equipment installers, etc. The OECD study on “Linking renewable Energy to Rural Development” (link in section 5) provides interesting insights on such links, as well as the study mentioned in footnote 5 above.

In the framework of the focus on decentralised RES, an option that should be considered is the integration of RES in Community Led Local Development (CLLD). Decentralised RES that are supported by local groups involving a broad range of stakeholders, including civil society, can represent a real opportunity for renewed socio-economic activity, especially in remote places like rural areas, islands or mountainous zones.

As regards renewable electricity, whilst significant investment in this sector is undertaken using private funding and existing public support mechanisms, there are elements where, due to inadequate grid infrastructure or as a result of the structure of grid operation and management, further support might be needed. Isolated (off grid) local electricity systems (currently frequently using diesel powered generation) for instance have high external costs,

¹¹ As regards ERDF or CF bio-economy investments, the scope of relevant EAFRD investments needs to be considered. Moreover, as a general consideration as regards biomass installations, a thorough assessment of the planned installation would need to be done so as to ensure that all relevant environmental standards are respected, including those related to air quality.

and support to municipalities or other local entities in converting to RES power should be a priority.

Renewable heating and cooling is vital to decarbonisation, as in many MS the share of heating in the final energy consumption exceeds that of electricity. A shift in energy consumption towards low carbon and locally produced RES, including through district heating systems, is needed. Local production and infrastructure facilities for biogas are also important, since taking advantage of existing heating gas networks is highly cost effective, however linking production and infrastructure is currently lacking and expensive. RES heating and cooling has largely been neglected so far. Only some MS have targeted regulatory or financial instruments to support the use. Given its size in the final energy consumption, this area needs to be prioritised.¹²

Investments in cogeneration, or combined heat and power (CHP), using a significant share of RES, and RES-based district heating should be based on so called 'useful heat demand'. This means that investments on improving energy efficiency and reducing energy demand have to be carried out in a first step, and only the remaining heat demand should be the basis for investments in CHP and district heating, in a second step, with priority given to RES use. In order to achieve this in a proper way, the investments have to be part of an overall coherent low-carbon strategy.

For small-scale RES investments in buildings and SMEs, see also the separate guidance fiche on energy efficiency investments for further aspects.

As concerns the use of RES in transport, most MS have committed in their NREAPs to increase the contribution of the 2nd generation biofuels and renewable electricity use in transport for meeting their binding 10% RES transport targets. Currently, 2nd and 3rd generation biofuel technologies are insufficiently developed, and also not sufficiently supported. Investments in advanced biofuel technology development can contribute to job creation and the local economy, using local feedstock supplies and synergies with the agriculture and forestry sector. Major investment will be needed in most MS to increase the contribution of these technologies and to honour their NREAP commitments.

As to investments in RTDI in sustainable energy, for ERDF investments in RTDI under thematic objective 1, national or regional research and innovation smart specialisation strategies (RIS3) are an ex-ante conditionality. In assessing their position and assets in the context of the development and the subsequent implementation of their strategies, MS and regions are invited to make full use of the knowledge developed in the framework of the SET-Plan. They can benefit considerably from using the SET-Plan Roadmaps, which put forward concrete action plans aimed at raising the maturity of seven identified technologies to a level that will enable them to achieve large market shares by 2050. The Technology Map and the Capacity Map also give an indication about leading countries and companies in various technologies. In concrete terms, this might lead to a focus on activities/projects such as test facilities for wind and photovoltaics, automatised manufacturing processes for wind and photovoltaics, first of a kind/first industrial scale projects for concentrated solar power and biofuels (2nd generation).

¹² According to the new Energy Efficiency Directive, MS shall carry out a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling by 31 December 2015. However, this will be late in relation to the Cohesion Policy programming process.

All regions will have to invest a significant amount of ERDF funding in sustainable energy, including RES, energy efficiency and smart grids, under thematic objective 4. However, not all regions have the potential to specifically invest ERDF funding in state-of-the-art RTDI for sustainable energy and only a certain number of regions are likely to conclude through the RIS3 process that they will focus a large share of ERDF resources for RTDI in the area of RES (and/or energy efficiency¹³). Nevertheless, every MS and region should aim to capitalise on the funding opportunities in a smart way and invest in advancing its local RTDI capabilities under thematic objective 4 and also make sure that they are aware of the results of RTDI activities carried out elsewhere (e.g. results from research projects supported by Horizon 2020 as well as other relevant EU level and national research programmes and projects, including RTDI financed by Cohesion Policy funds in the context of the research and innovation smart specialisation strategies) so that they can examine the possible use of these results in their own region. There might also be a need for a focus on the removal of certain market barriers, such as social acceptance, and on training needs in the various technologies listed in the SET-Plan Technology Map.

4.3 Developing smart distribution systems at low and medium voltage levels

4.3.1 What are smart grids?

Smart grids means an electricity network that can integrate in a cost efficient manner the behaviour and actions of all users connected to it, including generators, consumers and those that both generate and consume, in order to ensure an economically efficient and sustainable power system with low losses and high levels of quality, security of supply and safety. Smart grids could be described as an upgraded electricity network to which two-way digital communication between supplier and consumer, smart metering and monitoring systems have been added. A smart metering system means an electronic system that can measure energy consumption, providing more information than a conventional meter, and can transmit and receive data using a form of electronic communication, and is usually an inherent part of smart grids.

4.3.1 Why should the ERDF and the CF co-finance this kind of investments?

Without serious upgrading of existing grids and metering, RES generation will be put on hold, security of the networks will be compromised, opportunities for energy saving and energy efficiency will be missed, and the internal energy market will develop at a much slower pace.

Smart grids can manage direct interaction and communication among consumers, households or companies, other grid users and energy suppliers. It opens up unprecedented possibilities for consumers to directly control and manage their individual consumption patterns, providing, in turn, strong incentives for efficient energy use if combined with time-dependent electricity prices. Improved and more targeted management of the grid translates into a grid that is more secure and cheaper to operate. Smart grids will be the backbone of the future decarbonised power system. They will enable the integration of vast amounts of both on-shore and off-shore RES and electric vehicles while maintaining availability for conventional power generation and power system adequacy. Moreover, the deployment of smart grids provides an opportunity to boost the future competitiveness and worldwide technological leadership of EU

¹³ See also the separate guidance fiche on energy efficiency investments for further aspects in relation to this.

technology providers, such as the electrical and electronic engineering industry, consisting mostly of SMEs. Finally, smart grids provide a platform for traditional energy companies or new market entrants such as ICT companies, including SMEs, to develop new, innovative energy services while taking due account of data protection and cyber-security challenges. That dynamic should enhance competition in the retail market, incentivise reductions in greenhouse gas emissions and provide an opportunity for economic growth.

The EU is still in the early stages of the actual deployment of smart grids. Today, only around 22% of EU households have some sort of smart meter installed, although most do not necessarily provide the full scale of services to consumers. Public support for smart meters deployment may be envisaged to the extent that they provide additional services and functionalities beneficial for the consumers and for the grids. MS were due to report to the Commission by September 2012 on the results of their cost-benefit analysis regarding the roll-out of smart metering systems and on the measures and plans they have adopted in relation to the Commission Recommendation on preparations for the roll-out of smart metering systems. The Commission will publish a report in the first quarter of 2014 on "*Benchmarking the Smart Metering Deployment in the EU-27*", which will assess the status of smart metering roll-out and degree of readiness across the EU also on the basis of the cost-benefit analysis submitted by MS.

At present, there is a considerable gap between actual and optimal investment in Europe, which can only partly be explained by the current economic downturn. Investors are still struggling to find the optimal model for sharing costs and benefits along the value chain. There are still some uncertainties regarding whether consumers will embrace these new technologies, how to choose cost-effective technologies and which technical standards should apply to smart grids in the future.

Government-level support for deployment has so far been limited, even when compared with other parts of the world. Public investments in local/regional smart grid pilot projects will substantially help to remove existing technical and non-technical uncertainties associated with the full deployment at national/EU level. Investments in smart grids will also have substantial cross-cutting impacts at local/regional level.

4.3.2 Where should the money go and how to invest?

The SET-Plan complements research actions with deployment-oriented actions. Projects and investments in the area of smart grids must now aim for ‘real life’ demonstration and validation, solving system integration issues and demonstrating the business cases. They must also demonstrate how consumers can benefit most from the introduction of these systems.

Implementation of smart metering systems are a first step towards the deployment of smart grids (a smart meter shows the general consumption, the current amount, amount in the past 24 hours, costs, etc.). In this context, an important goal is also to empower and educate consumers/change consumer behaviour. Smart distribution networks and smart meters (respecting minimum requirements) can help achieving higher level of efficiency and could be encouraged in particular in relation to the introduction of distributed generation (e.g. photovoltaics).

Cohesion Policy funds should invest mostly in smaller low voltage distribution infrastructures, while the Connecting Europe Facility will invest in larger scale cross-border high-voltage transmission infrastructure.

Close to the citizens, Cohesion Policy investments could include stimulating innovative investments in low voltage distribution systems by opening business opportunities to new/local entrants, in both the ICT and energy sectors; promoting new energy services at local level which improves local market transparency and retail market competition; empowering local consumers by active energy management and demand response services; optimising local/regional exploitation of large-scale distributed energy resources and improving flexibility, quality and reliability of the low voltage distribution systems.

The development of urban sustainable energy action plans and mobility action plans should be encouraged and supported as part of broader low-carbon and urban development strategies in order to facilitate optimisation and coordination of investments, i.e. an integrated approach. Under the Covenant of Mayors¹⁴, some 3300 Sustainable Energy Action Plans have been developed and submitted by signatories so far (situation early 2014). Those can be used as a good reference and example.

Grid operators and suppliers are expected to carry the main investment burden. However, unless a fair cost sharing model is developed and the right balance is struck between short-term investment costs and long-term profits, the willingness of grid operators to undertake any substantial investment might be limited. It is up to MS and regions to ensure that public funding does not replace but complements and leverages private investment in accordance with State Aid rules. Public intervention should thus be used to address market failures. Support via financial instruments should be chosen in instances where there is potential for revenues which are sufficient to pay back the investment, while grants should be used if there is no such potential.

¹⁴ The Covenant of Mayors is a movement launched by the Commission (Energy DG) involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of RES on their territories. By their commitment, Covenant signatories aim to meet and exceed the EU 20% CO₂ reduction target by 2020.

5. LESSONS FROM THE PAST AND RESULT ORIENTATION

Although the investments in RES are increasing and there are several good examples of measures or projects co-financed by Cohesion Policy already in place¹⁵, there is still only limited information on the effectiveness of the different support measures under EU Cohesion Policy. This is basically a new area for Cohesion Policy investments in the 2007-2013 period, and the results of the interventions will be evaluated during the ex post evaluation exercise for the current period.

As to result orientation in view of the 2014-2020 period, once a managing authority has made a decision on which needs should be addressed, it is necessary to formulate a specific objective: the content of an investment priority adapted to the circumstances of the region or the sector under consideration.

Definition of specific objectives:

- What do you want to change in the region and / or MS?
- And how will you know if the need is being addressed? This requires a result indicator with a baseline and a target.

Examples of result indicators:

- Total installed capacity (in MW)
- Number of units producing RES (RES electricity producers, CHP/co-generation plants)
- Number of buildings retrofitted with RES equipment / connected to RES-based district heating system

However, for sake of clarity the programme should not multiply result indicators. Once the most appropriate indicators have been selected, the programme should provide a baseline, set a target and plan for appropriate monitoring during the lifetime of the programme.

After having answered the question *what* should be changed, the programme needs to answer *how* this change will be achieved, by which actions.

Definition of actions:

Which factors influence the result indicator? Which of these factors will be selected to be influenced by the programme?

What are the actions to do so?

The common output indicators for the ERDF and the CF always need to be included.

As regards buildings, the technical guidance on “Financing the energy renovation of buildings with Cohesion Policy funding” gives further details and explanations on these aspects (link in section 5).

¹⁵ See in particular the Cohesion Policy Expert Evaluation Network Report on the achievements of cohesion policy including a policy paper on renewable energy and energy efficiency in residential housing for every MS and a synthesis report; link in Annex I.

Some horizontal issues, based on the evaluation evidence

Horizontal issues	Evaluations find...	Questions to ask
Demand analysis	It is crucial that the selection of needs to be addressed and consequent projects is based on an analysis of wider objectives and constraints on regional development.	Can it be demonstrated that the use of RES is a constraint to the regional development? Is a demand analysis of good quality available?
Selection of result indicators and setting of targets	For ERDF interventions in the 2000-06 period, there is a limited amount of data available on outputs and results.	Do the proposed indicators reflect the specific objective? Where possible, are the indicators used consistently across programmes?
Target setting for output indicators	The comparison of indicators and targets used suggests that overly ambitious and overly cautious target setting is widespread.	Are the targets realistic given the form of intervention, financial input, past performance and targets set for comparable interventions in other programmes? Has the target setting been documented?
Holistic approach	The appropriate means of increasing the share of RES should be considered holistically.	Have the demand for proposed services been properly analysed?

Annex I: Links and relevant sources of policy know-how in this field

European Commission

- **Cohesion Policy Expert Evaluation Network Report** on the achievements of cohesion policy including a policy paper on renewable energy and energy efficiency in residential housing for every MS:
http://ec.europa.eu/regional_policy/information/evaluations/index_en.cfm#1 (scroll down to 2011 reports)
- **Technical guidance on “Financing the energy renovation of buildings with Cohesion Policy funding”**:
http://ec.europa.eu/regional_policy/information/brochures/index_en.cfm#5
- **JESSICA Horizontal (thematic) studies**, including
 - Energy Focused Urban Development Funds
 - JESSICA for Smart and Sustainable Citieshttp://ec.europa.eu/regional_policy/thefunds/instruments/jessica_horizontal_en.cfm
<http://www.eib.org/products/jessica/studies/horizontal.htm>
- **Smart Specialisation Platform**:
<http://s3platform.jrc.ec.europa.eu/home>
- **RIS3 Guide: Connecting Smart and Sustainable Growth through Smart Specialisation**, with a chapter on research and innovation for sustainable energy:
http://ec.europa.eu/regional_policy/sources/docgener/presenta/green_growth/greengrowth.pdf
- **REGIO case study “Wave Hub” project, UK**:
http://ec.europa.eu/regional_policy/projects/practices/details.cfm?pay=UK&the=68&sto=2458®ion=ALL&lan=7&obj=ALL&per=ALL&defL=EN
- **REGIO case study “ERDF – Promotion of renewable energy sources in Burgenland”, AT**:
http://ec.europa.eu/regional_policy/atlas2007/austria/at11_en.htm
- **Urban development in the EU – Case studies of 50 projects supported by the ERDF during the 2007-2013 period**, of which some including a renewable energy component:
http://ec.europa.eu/regional_policy/activity/urban/goodpracticemap_en.cfm
- **Renewable Energy Directive**:
http://ec.europa.eu/energy/renewables/targets_en.htm
- **National Renewable Energy Action Plans (NREAPs)** provide information on 10 year renewable energy strategy of each MS, and they include very detailed information on the current support schemes and other support measures for renewable energy. They can be consulted at:
http://ec.europa.eu/energy/renewables/action_plan_en.htm
- **Biennial MS Renewable Energy progress reports** provide regular updates on most recent developments in renewable energy support framework (e.g. changes or new rules that have come into force since the adoption of NREAPs), progress reports available at:

http://ec.europa.eu/energy/renewables/reports/reports_en.htm

- **Commission guidance to Member States on state intervention in electricity markets:**
http://ec.europa.eu/energy/gas_electricity/internal_market_en.htm
- **“European Commission guidance for the design of renewables support schemes”**
Staff Working Document:
http://ec.europa.eu/energy/gas_electricity/doc/com_2013_public_intervention_swd04_en.pdf
- **2012 RES Communication and Staff Working Document** (with update on MS national support schemes):
http://ec.europa.eu/energy/renewables/communication_2012_en.htm
- **2011 Study: "Financing Renewable Energy in the European Energy Market":**
http://ec.europa.eu/energy/renewables/reports/2011_en.htm (scroll down a bit)
- **The European Strategic Energy Technology Plan (SET-Plan):**
http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm
- **Technology and Innovation Strategy 2020 and beyond:**
http://ec.europa.eu/energy/technology/strategy/strategy_en.htm
- **Strategic Energy Technologies Information System – SETIS:**
<http://setis.ec.europa.eu/>
- **The SET-Plan Technology Map 2011** (<http://setis.ec.europa.eu/newsroom-items-folder/2011-technology-map-of-the-set-plan-now-available>) describes the status of 18 technologies/sectors (mainly RES, Energy Efficiency, Grids, Storage) but also others (nuclear, CCS) with the reference for each technology to:
 - technological state of the art including estimation of the costs (capital and operational costs as well as integration costs)
 - market and industry status with information about leading countries and eventually companies in the sectors
 - barriers to large scale deployment
 - Research, Demonstration and Innovation priorities – mainly references to the SET-Plan European Industrial Initiatives Technology Roadmaps (2010-2020)
- **The SET-Plan Capacity Map 2011** covers the R&D spending in the SET-Plan priorities including those of MS per sector¹⁶:
<http://setis.ec.europa.eu/newsroom-items-folder/2011-capacities-map-of-the-set-plan-now-available>
- **Energy Efficiency Directive:**
http://ec.europa.eu/energy/efficiency/eed/eed_en.htm
- **2011 Commission Communication “Smart Grids: from innovation to deployment”:**
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0202:FIN:EN:PDF>

¹⁶ In an old set of data from 2007, all the SET-Plan technologies were included but the most recent set of data from 2009 covers only 3 sectors: Wind, Photovoltaics and Concentrated Solar Power.

- **Commission recommendation on preparations for the roll-out of smart metering systems:**
http://ec.europa.eu/energy/gas_electricity/smartgrids/smartgrids_en.htm
- **Guidelines for Cost Benefit Analysis of Smart Metering Deployment:**
<http://ses.jrc.ec.europa.eu/reports-books-and-magazines>
- **Guidelines for conducting a cost-benefit analysis of Smart Grid projects:**
http://ec.europa.eu/energy/gas_electricity/smartgrids/smartgrids_en.htm
- The Joint Research Centre provides an **interactive map** on which country does what so far regarding **smart grids**:
<http://ses.jrc.ec.europa.eu/project-maps>
- **JRC site on smart grids and smart metering systems:**
<http://ses.jrc.ec.europa.eu/>

Meetings organised by DG REGIO

- **COCOF technical meeting on Sustainable Energy, March 2011:**
http://ec.europa.eu/regional_policy/archive/conferences/energy2011/index_en.cfm
- **"From policy to practice....boosting Cohesion Policy's contribution to sustainable energy", June 2009:**
http://ec.europa.eu/regional_policy/archive/conferences/energy2009/index_en.htm

External Documents and Links

- **OECD study “Linking Renewable Energy to Rural Development”, including case studies from DK, ES, IT, NL, SE, FI, UK, Norway, Canada and the US:**
http://www.oecd-ilibrary.org/urban-rural-and-regional-development/linking-renewable-energy-to-rural-development_9789264180444-en
- **Study ”EmployRES – The impact of renewable energy policy on economic growth and employment in the European Union”:**
http://ec.europa.eu/energy/renewables/studies/doc/renewables/2009_employ_res_report.pdf
- **Brugel study ”When and how to support renewables? Letting the data speak”:**
<http://www.bruegel.org/publications/publication-detail/publication/811-when-and-how-to-support-renewables-letting-the-data-speak/>
- **RES Legal website:**
<http://www.res-legal.eu/>
- **INTERREG IV C capitalisation report on renewable energy:**
<http://www.interreg4c.eu/good-practices/capitalisation/renewable-energy/>
- **INTERREG IV C Projects:** http://www.interreg4c.eu/approved_projects.html
Among others:
 - 4 POWER – Making offshore wind a reality: <http://www.4-power.eu/>
 - GEO.POWER on geothermal energy: <http://www.geopower-i4c.eu/>

- BIO-EN-AREA on bioenergy: <http://www.bioenarea.eu/>
 - RETS: Renewable Energies Transfer System project: <http://www.rets-project.eu/>
 - Regions4GreenGrowth: <http://www.regions4greengrowth.eu/>
 - RENREN: <http://www.renren-project.eu/>
 - More4NRG: <http://www.more4nrg.eu/>
- **Intelligent Energy Europe Projects:** <http://eaci-projects.eu/iee/page/Page.jsp>
Among others:
- PV Legal working on overcoming legal-administrative barriers during planning and installation processes (including grid connection) of photovoltaic (PV) systems: <http://pvlegal.eu/>
 - The RE-Shaping project analysed the efficiency of European renewable energy market and includes detailed policy effectiveness assessments per MS: <http://www.reshaping-res-policy.eu>
 - The project REPAP2020- Renewable Energy Policy Action Paving the Way for 2020: <http://www.repap2020.eu/>
 - SF-ENERGY Invest:
 - [Collaborative Actions for Triggering Investments in Sustainable Energy Actions using Regional and Structural Funds](#) (BE, BG, CZ, DE, EE, FR, NL, AT and PT)
 - A Manual for financing RES and EE projects with Structural and Cohesion Funds: http://www.sf-energyinvest.eu/uploads/media/Manual_English_01.pdf
 - A brochure with 10 success stories of projects funded by SF: http://www.sf-energyinvest.eu/uploads/media/sf_energy_invest_brochure_04.pdf
 - Recommendations for better use of SF for EE and RES (coming soon)
 - ENERGY 4 COHESION – E4C:
 - [Energy Actions for Europe's Cohesion](#) (BE, CZ, EE, DE, EL, HU, IT, LV, LT, PL and SK)
 - PROMOSCENE:
 - [Promoting the use of Structural Funds and Cohesion Funds for energy investments in New Member States and Candidate Countries](#) (BG, CZ, CY, PL and RO)
- **Covenant of Mayors** - Committed to local sustainable energy: http://www.eumayors.eu/index_en.html
- **Pact of Islands** – Sustainable Energy Actions for Islands: <http://www.islepact.eu/html/index.aspx>
- **Energy Cities** – The European Association of local authorities investing in their energy future: http://www.energy-cities.eu/spip.php?page=index_en
- **International Renewable Energy Agency**, with interesting studies and publications: <http://www.irena.org>