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Abstract

This study examines experience of the mainstreaming of climate policy objectives into cohesion policy in the current (2014-2020) and earlier programming periods, including with respect to its urban dimension, and to territorial cooperation. It identifies the implications of the Paris Agreement on climate change, and makes recommendations for further development of climate mainstreaming in cohesion policy in future programming periods.

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LIST OF ABBREVIATIONS

CAP	Common Agricultural Policy
CBC	Cross-border Cooperation
CEF	Connecting Europe Facility
CF	Cohesion Fund
$CO_{2\ eq}$	Carbon dioxide equivalent
CPR	Common Provisions Regulation
EAFRD	European Agricultural Fund for Rural Development
ERDF	European Regional Development Fund
ESIF	European Structural and Investment Funds
ETC	European Territorial Cooperation
EU	European Union
EUR	Euro
EUSAIR	EU Strategy for the Adriatic and Ionian Region
EUSALP	EU Strategy for the Alpine Region
EUSBSR	EU Strategy for the Baltic Sea Region
EUSDR	EU Strategy for the Danube Region
ExAC	Ex ante conditionalities
GHG	Greenhouse Gas
GW	Gigawatt-hour
MA	Managing Authority
MFF	Multiannual Financial Framework
Mt	Million tonnes
MW	Megawatt-hour

OP	Operational Programme
RES	Renewable Energy Sources
SME	Small and medium-sized enterprises
TNC	Transnational Cooperation
TO	Thematic Objective

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EXECUTIVE SUMMARY

Background

The European Council, the European Parliament, the Council, and the Commission identified the contribution of cohesion policy to the delivery of climate objectives as a key priority for the 2014-2020 period. New elements of process were introduced, including the drawing up of a Partnership Agreement between Member State and Commission before the development of operational programmes, in part to ensure that programmes addressed climate objectives; and mechanisms were introduced to cohesion policy programmes to help track the delivery of a target to spend at least 20% of the overall EU budget on climate change. Meanwhile, since the adoption in 2013 of legislation on the 2014-2020 Multiannual Financial Framework, in 2015 the EU successfully concluded the Paris Agreement with other parties to the UN Framework Convention on Climate Change. The Paris Agreement was ratified by the EU and entered into force in November 2016. Experience in implementation of the current approach to climate mainstreaming, and the implications of the Paris Agreement, will need to be taken into account in the design of the next programming period for cohesion policy; as will the connections between climate change and the urban dimension; and the connections between climate change and European territorial cooperation.

Aim

This study examines experience in the use of the European Structural and Investment Funds (ESIF) to deliver climate policy objectives, with a particular focus on the funds that fall under the remit of the REGI committee (the European Regional Development Fund (ERDF) and the Cohesion Fund (CF)). It looks at the mechanisms introduced in the 2014-2020 programming period to ensure the mainstreaming of climate objectives, and identifies both successes, and areas which could be improved. It then considers the implications of the Paris Agreement for future programming periods, and sets out recommendations. The research has been based on a review of relevant legislation, policy documents, guidelines, and literature, together with an assessment of monitoring information provided on the DG REGIO website.

Findings and recommendations

The study looks sequentially at the previous experience of climate mainstreaming, in the 2007-2013 programme period; at the mechanisms used in the current (2014-2020) programming period; and at the implications of this experience, in combination with the new context created by the Paris Agreement, for future cohesion programmes.

The analysis of climate mainstreaming in the 2007-2013 programming period suggests that **there were many positive attempts by the managing authorities** responsible for programmes **to integrate climate objectives**. However, **the lack of a clear overarching structure**, and in particular **the lack of common mechanisms for setting climate-relevant targets and monitoring progress towards them**, made it **difficult to draw lessons on the effectiveness** of climate-relevant spending.

The study focuses in more detail on two specific aspects of programming in the 2007-2013 period: the **urban dimension**, and **territorial cooperation**:

- Climate policy objectives have a particular relevance in the urban context, both in terms of the potential contribution of cities towards mitigation objectives; and in terms of the adaptation challenges facing cities. However, **there has not yet been a systematic attempt to integrate climate policy objectives into the urban dimension of cohesion policy**.

- Territorial cooperation programmes were a rich area for cooperation on climate objectives, with **a tendency for transnational programmes to identify renewable energy as a priority,** and for **cross-border programmes to include a focus on climate awareness-raising** and research activities.

The commitment by the EU institutions to mainstream climate further into EU programmes in the 2014-2020 MFF, with an **explicit objective of spending 20% of the EU budget on climate objectives**, was **accompanied by a number of new mechanisms to improve the focus of ERDF and CF expenditure on shared EU policy objectives**. The approach adopted in the ESIF, and particularly in the ERDF and CF, showed **a relatively high level of ambition and completeness in respect of both climate-relevant inputs and results**. As regards inputs**, the mechanisms introduced in cohesion policy for monitoring performance against the overall 20% climate spending targets are sophisticated** in comparison to other policy areas, although still show **some weaknesses**. As regards the impact of spending, **the coherence and precision of climate-relevant impact and result indicators has improved** for ERDF and CF as compared to the previous programming period. However, it still **does not provide enough clarity on the contribution of cohesion policy to delivery of the EU's overall climate objectives**.

On the basis of these findings, and an analysis of the context created by the Paris Agreement, **the study identifies a number of areas for potential improvement** in the next programming period. To ensure that climate mainstreaming of EU expenditure is more effective in delivering climate objectives, **a clear link should be drawn between the contribution of cohesion expenditure and Member States' overall delivery of climate mitigation targets**. A **common methodology for assessing** the **climate mitigation impacts** of investments and programmes (to address risks of double-counting and to ensure that impacts are measured against a clear baseline, and are genuinely additional to business-as-usual actions) would be an important first step.

The **Paris Agreement underlines the importance of meeting the 2030 targets** for the EU, but, just as importantly, **it identifies an overall ambition of limiting global warming to well below 2°C, and to pursue efforts to limit it to 1.5°C** above pre-industrial levels. This implies that EU programmes should include a focus on, firstly, **coherence of all investments with the required long-term decarbonisation trajectory**, and, secondly, on measures likely **to facilitate or unlock more ambitious decarbonisation potential**, and on the **development of new market for low carbon goods and services**. This has particular implications for **territorial cooperation programmes**, given the importance of **greater integration of energy markets** to maximise the effectiveness of grid management responses to energy efficiency and renewable energy supply, **and for cities, whose role as a testing ground for delivering radical decarbonisation could be further facilitated** through cohesion policy.

Finally, we recommend that in line with its "Budget focused on results" initiative, **the Commission should identify in quantitative terms the expected contribution of future cohesion programmes** (alongside other areas of the budget expected to contribute to mitigation and adaptation) **to the delivery of overall EU climate objectives**.

1. INTRODUCTION

The overall aim of this in-depth analysis is to take stock of how cohesion policy contributes to tackling climate related challenges, including through its urban dimension. It also looks at the possible evolution of the post 2020 cohesion policy in terms of its contribution to the Paris Agreement.

Periodic changes to our planet's climate are not a new phenomenon, and are influenced by a wide range of factors. In the past they were due to natural causes; nowadays however man made emissions of greenhouse gas (GHG) emissions, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) have led temperatures to exceed global annual averages for 38 consecutive years and to impact natural and human systems across the globe. Halting this trend (**climate change mitigation**) is the greatest challenge of the 21st century. It implies a transition from GHG emitting modes of operation to low- or zero-carbon activities. Focusing on sectors that pollute the most such as energy, transport, buildings or agriculture is a priority, but all sectors should contribute to climate action and the goal of stabilising Earth's climate before tipping points are reached and irreversible changes take place. Energy efficiency improvement, renewable energy sources, sustainable transportation are only a few examples of investment areas contributing to climate change mitigation.

However, even if global efforts to reduce emissions prove effective, some level of climate change impacts are currently impacting and will continue to impact global ecosystems and societies. Climate change **adaptation**, next to climate change mitigation, is therefore a key component of climate action. It can be delivered through a vast array of measures, usually tailored to specific vulnerabilities of regions or geographic areas they cover e.g. flood and drought protection plans.

Recognising the global nature of the challenge, in December 2015 195 countries gathered under the auspices of the United Nations Framework Convention on Climate Change (UNFCC) and negotiated **the Paris Agreement**[1]. They agreed to limit global warming to well below 2ºC and pursue efforts to limit it to 1.5ºC. The Paris Agreement is a continuation of earlier international community efforts, notably the UNFCC itself and the Kyoto Protocol.

In parallel but linking to these earlier international initiatives, the EU and its Member States have established the **2020 Climate and Energy Framework**. Adopted in 2009, the package sets three targets:

- 20% cut in greenhouse gas emissions (from 1990 levels);
- 20% of EU energy from renewables;
- 20% improvement in energy efficiency.

While the first two targets are binding, the energy efficiency target is indicative. All three however are embedded in EU legislation[2]. The time horizon for their achievement in 2020, but at the end of 2016 the Commission put forward a successor package of legislative proposals in energy and climate (named "**Clean Energy for All Europeans**" package[3]) with a 2030 horizon;

[1] An authentic text of the Paris Agreement is available on: http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

[2] A full list of EU legislation under the 2020 Climate and Energy package is available on the website of the Directorate General for Climate Action (DG CLIMA): https://ec.europa.eu/clima/policies/strategies/2020_en#tab-0-1

[3] EC (2016), "Clean Energy for All Europeans – unlocking Europe's growth potential", press release http://europa.eu/rapid/press-release_IP-16-4009_en.htm

its climate mitigation target of a collective 40% reduction in emissions by 2030 has been incorporated into the EU's commitments under the Paris Agreement.

EU cohesion policy has contributed to EU climate action, with an increased emphasis in the 2007-2013 period, but it was not until the programming decisions for the current period (2014-2020) that climate action has been given a prominent place among the policy objectives. Cohesion policy is delivered through three funds:

- the European Regional Development Fund (ERDF)
- the Cohesion Fund (CF) and
- the European Social Fund (ESF).

Together with the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF) these constitute the European Structural and Investment Funds (ESIF). The funds are governed each by their own specific instrument, but also by a general regulation, known as the Common Provisions Regulation (CPR) adopted in 2013[4] .

Even though climate challenges affect all human and natural systems, EU political leaders have recognised how significant they are and could be in Europe's **urban areas** that are home to some 359 million people. As towns and cities account for roughly "80% of energy use and generate up to 85% of Europe's GDP" they are considered "engines of the European economy and (…) catalysts for creativity and innovation"[5]. In 2011, under the Hungarian Presidency, the Directors General responsible for urban development agreed on the Budapest Communiqué on European urban areas facing demographic and climate challenges[6]. They state, among others that "The threat climate change poses to urban areas should be managed and any opportunities that it presents should be exploited". They also urged all Member States actively to promote integrated sustainable urban development policies at all levels. In this vein, the urban dimension (including urban climate action) of cohesion policy in the 2014-2020 period has been reinforced as compared to its previous programming periods. At least 5% of the ERDF budget is now earmarked to support **integrated sustainable urban development strategies** addressing economic, environmental, climate, demographic and social challenges. The strategies will provide a framework for selection of individual operations.

[4] Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006, OJ L 347, 20.12.2013 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1303

[5] DG REGIO website: http://ec.europa.eu/regional_policy/en/policy/themes/urban-development/

[6] Hungarian Minister of Interior (2011),"Budapest Communiqué on European urban areas facing demographic and climate challenges", https://www.mmr.cz/getmedia/253a7f6f-c93f-48f2-ba3b-2e8f271ae7b7/Budapest_Communique_270420111

2. COHESION POLICY 2007-2013 AND CLIMATE-RELATED CHALLENGES

KEY FINDINGS

- The absence of consistent and coherent monitoring of climate inputs and results, made it difficult to reach a conclusion on the overall contribution of programmes to climate objectives.
- A number of operational programmes (at national and regional level, as well as territorial cooperation programmes) entailed a significant focus on climate objectives.
- Cost-effectiveness of climate investment was not always a priority under the projects and programmes submitted to the ex post evaluations.
- Use of grants to support energy efficiency improvements for carefully selected groups of beneficiaries was identified as an aspect of good practice. Positive experience of the use of financial instruments for urban investment in cities under the JESSICA initiative, combined with enthusiasm for the potential for increasing the investment impact of EU funds, led to an enhanced scope for the use of financial instruments in the 2014-2020 period.
- A steep learning curve on climate investment among managing authorities and other stakeholders in the 2007-2013 period may nevertheless have helped prepare the ground for further climate mainstreaming in the 2014-2020 period.
- The lack of a clear overarching structure for climate contributions in the 2007-2013 programming period, however, made it difficult to draw general lessons.

2.1. Experience from the 2007-2013 programming period

Climate change has been an important priority for European Union (EU) policymakers since before the signing of the Kyoto Protocol, and has therefore progressively been integrated into key instruments, particularly the EU budget. The contribution towards climate mitigation objectives in line with the renewed Lisbon Strategy (see Box 1) was a key element in the process of dialogue between the Commission and Member States in the approval of operational programmes for ERDF and Cohesion Fund in the 2007-2013 programming period. Between 2007 and 2013, the total amount of structural and cohesion funds allocated to environmental programmes (of which almost 14 % dedicated to climate action) has doubled as compared to the earlier programming period and reached some EUR 100 billion (ca. 30% of the total). Climate change allocations over the period reached an estimated EUR 47.8 billion[7] (see Table 1). DG REGIO data shows also that climate change related investment took up around 14% of EU-27 total cohesion policy funds (see Figure 1).

The absence of consistent and coherent monitoring of climate inputs and results, however, made it difficult to reach a conclusion on the overall contribution of programmes to climate objectives. An insight from the ex post evaluation of the energy efficiency investment under the Cohesion Policy Programmes 2007-2013[8] concludes, among other findings,

[7] COWI (2016), "Mainstreaming of Climate Actions into ESI Funds", https://ec.europa.eu/clima/sites/clima/files/budget/docs/report_mainstreaming_of_climate_action_en.pdf

[8] Le Den, X., Riviere, M., Lessmann, F., Herms, S., Nesbit, M., Paquel, K. and Illes A. (2015) Energy efficiency in public and residential buildings. Final report. Work Package 8. Ex post evaluation of Cohesion Policy Programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and Cohesion Fund (CF). A report for the European Commission by Ramboll and the Institute for European Environmental Policy, Brussels, October 2015.

> "when used, [energy efficiency] relevant and/or specific indicators were very different across programmes, limiting the possibilities to analyse, aggregate or compare achievements".

As a result there is little quantitative evidence of the cohesion policy contribution to climate change mitigation and adaptation through energy efficiency investment. The Commission's summary of the policy's main results includes statements like: "the investments led to the construction of 4 900 km of roads, mostly motorways (…)" as well as to "construction or upgrading of 1 500 km of TEN-T railway". In terms of climate investment however, all it says is:

> "energy efficiency measures in public buildings reduced the consumption of fossil fuels considerably, which in turn helped to cut energy costs and contributed to fight global warming"[9].

There were, however, a number of positive examples of the use of structural and cohesion funds to deliver climate objectives. A number of programmes took advantage of changes to the eligibility of expenditure on energy efficiency and renewable energy investment in housing through ERDF. The changes expanded the funding eligibility for residential buildings to all Member States (including EU-15) and granted the Member States the freedom to define eligible housing categories. They were introduced in the wake of the 2008/2009 financial crisis and in response to policymakers' efforts to ensure early deployment of expenditure to maximise its impact on growth[10]. While many managing authorities had limited experience in energy efficiency investment, and faced a steep learning curve in developing proposals, there were some important success stories, and a significant growth in capacity for future spending in this field.

Table 1: Overall climate change allocations under the EU's cohesion policy 2007-2013 (EUR)

Objective	Community amount	Climate change amount	Climate change	of which	
				Direct	Indirect
Convergence	281 316 597 521	42 846 300 641	15.2%	4.7%	10.6%
Regional Competitiveness and Employment	55 173 775 952	3 925 240 597	7.1%	4.2%	2.9%
European Territorial Cooperation	7 831 459 588	1 055 029 061	13.5%	9.1%	4.4%
TOTAL	**344 321 833 061**	**47 826 570 299**	**13.9%**	**4.7%**	**9.2%**

Source: DG REGIO SFC2007 (2010)[11]

[9] EC (2016), 9 Ways cohesion policy works for Europe: Main Results 2007-2013, fact sheet http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp1_synthesis_factsheet_en.pdf

[10] Regulation (EC) No 397/2009 of the European Parliament and the Council of 6 May 2009 amending Regulation (EC) No 1080/2006 on the European Regional Development Fund as regards the eligibility of energy efficiency and renewable energy investments in housing.

[11] http://ec.europa.eu/regional_policy/sources/activity/statistics/2007_environment_climate.pdf

Box 1: Lisbon Strategy vs Europe 2020 role in climate mainstreaming under the cohesion policy funds

In the 2007-2013 programming period from 60 to 75% of cohesion policy funds were earmarked to priorities set out in the Lisbon Strategy. The link between the strategy and cohesion policy was made indirectly, through the national reform programmes, which included statements about the contribution of cohesion policy, rather than directly through cohesion policy instruments and programmes themselves.

In the 2014 - 2020 programming period the cohesion policy's link to the Europe 2020 strategy is direct and manifests itself in country-specific recommendations on Member States' National Reform Programmes, through the Partnership Agreements leading to a number of investment programmes. Moreover, roughly a half of the appropriations under the current MFF are delivered through the eleven thematic objectives (two of which are dedicated to climate change mitigation and adaptation) which are common for all ESI Funds and reflected into investment priorities (ERDF, ESF and CF) or Union priorities (European Maritime and Fisheries Fund (EMFF) and European Agricultural Fund for Rural Development (EAFRD).

This reinforcement between EU strategies and the deployment of cohesion policy funds, as well as harmonisation of priority objectives throughout the funds, may have important implications for climate investment. **Both the Lisbon Strategy** (especially after its renewal in 2005) **and the Europe 2020 objectives include orientations towards a low-carbon transition; but they differ in the mechanisms translating them into investment choices on the ground**. Robust mechanisms ensuring that high-level EU strategic priorities drive policy implementation in the Member States appear to be an important stimulus for climate action, especially in those Member States that are relatively reluctant to adopt ambitious climate change mitigation strategies.

2.2. Energy efficiency

According to the DG REGIO ex post evaluation of the 2007-2013 programme period[12], allocations to the "Energy efficiency, co-generation, energy management" priority theme[13] from the ERDF and CF amounted to EUR 6.1 billion – 2% of the total ERDF/CF allocated by operational programmes. While systematic information was not collected on the proportion spent on energy efficiency, it was estimated that EUR 3.4 billion were allocated to support energy efficiency investments in public and residential buildings. The allocations for the priority theme increased markedly over the course of the programming period, by 45% from initial intentions to spend EUR 4.2 billion. The increase is partly due to the expansion in eligibility of energy efficiency expenditure in the EU 15 Member States, and partly because of a recognition that projects in this field may secure early economic benefits from ESIF expenditure. By the end of 2014, expenditure on the priority theme amounted to EUR 4.7 billion. For several reasons however, including legal constraints and risk aversion, managing authorities were slow to make use of innovative approaches to the use of ERDF/CF funds, including financial instruments (loan funds in particular). 90% of the funds committed to the priority theme were in the form of non-repayable grants, with loans making up only 8%; however, the self-financing nature of energy efficiency investment, with cost savings following initial investment costs, suggest that loans may in many cases be a more appropriate mechanism.

[12] Le Den et al., op. cit.

[13] A total of 86 priority theme codes helped capture investment nature under the Cohesion Policy in the 2007-2013 period. "Priority themes" are the predecessors of "intervention codes under 2014-2020 programming period.

The relatively novel nature of energy efficiency expenditure under the ESIF made it difficult for Member States and for managing authorities to ensure that the planned investments took place and were successful; and the programme-specific approach to the definition of output indicators meant that it was difficult to identify the benefits of energy efficiency expenditure in a coherent and comparable way across the EU Member States. For example, not all programmes identified carbon savings from their energy efficiency investments; and where carbon savings were identified, it was not always clear that they were linked to the relevant investments, rather than a broader measure of the progress of energy efficiency in the Member State or programme area concerned. For instance:

> "climate change mitigation was commonly indicated in Operational Programmes as one of the drivers behind the support, while in interviews and in the workshop, some Managing Authorities suggested that reductions in GHG emissions were not a real driver behind including energy efficiency interventions in the programme (in contrast to stimulation of a market for energy efficiency investment)."

The evaluation further demonstrates that the context in which the cohesion policy funds are deployed should be taken into account when measuring their effectiveness. It notes: "although much hope was placed in the contribution of ERDF and CF investments in delivering climate and energy policy objectives, they are not a silver bullet to meet the energy efficiency goals set in the EU legislation, even in those Member States which chose the highest intensity of ERDF/CF allocations (…), cohesion policy investments need to be set in the context of the broader mix of policies at EU, national and regional level in delivering energy and climate targets. **Goals for the contribution from ERDF/CF to the delivery of climate and energy targets should therefore be set explicitly taking into account the context of other financial and policy instruments and should clearly identify the specific contribution of Cohesion Policy**."[14]

2.3. Renewable energy investments

While DG REGIO did not commission a specific ex-post evaluation on the Cohesion Policy's support for renewable energy between 2007 and 2013, the European Court of Auditors (ECA) published a special report on this issue which also provides estimates on the financial contributions. As explained earlier, estimating the total ERDF and CF allocation for energy efficiency has been very challenging; nevertheless compared to the broad and unspecific code[15] under which energy efficiency allocations needed to be reported by the Member States to the Commission during the 2007-2013 programming period financial figures on allocations for RES could be more easily aggregated as four specific priority codes were in place in 2007-2013.[16]

According to the ECA[17] total ERDF and CF allocations to RES during the 2007-2013 programming period amounted to EUR 4.7 billion, which is 1.7% of total ERDF and CF allocations. Allocations per Member State show a varied picture which is presented in **Error! Reference source not ound.** 1. The highest share at 10% was allocated by Malta nevertheless this is still not significant if one considers Malta's needs to reach its national RES target of 10% by 2020 and that the country had almost no RES capacity in 2007 and only reached 2% by 2012.

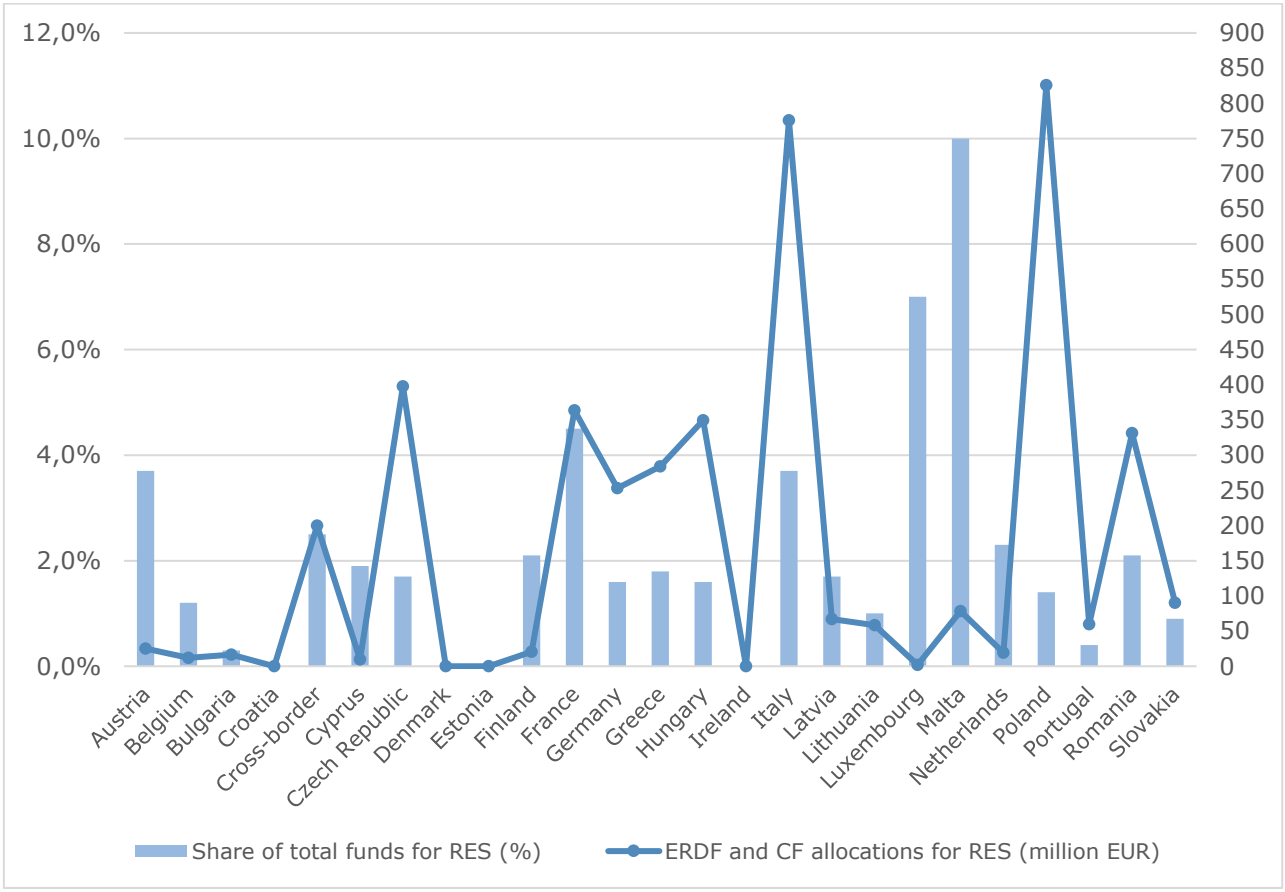
[14] Ibidem.

[15] Code 43: "Energy efficiency, co-generation, energy management.

[16] Code 39: "Renewable energy: wind", code 40: "Renewable energy: solar", code 41: "Renewable energy: biomass", and code 42: "Renewable energy: hydroelectric, geothermal, other".

[17] ECA (2014) 'Cohesion policy funds support to renewable energy generation — has it achieved good results?' Special report No. 6.

Figure 1: ERDF and CF allocations for RES during the 2007-2013 programming period in absolute and relative terms[18]



Source: based on Court of Auditors (2014)

While overall contributions of ERDF and CF to RES during the 2007-2013 programming period are considered to be low – in particular in view of the 2020 RES targets (see below) – support has substantially increased compared to the 2000-2006 period when only EUR 0.6 billion was allocated to RES. Furthermore, support is expected to significantly increase in the 2014-20 programming period.

The ECA have audited 24 RES projects in six Member States (Malta, Austria, Poland, Finland and the UK) supported by the 2007-2013 ERDF and CF funds. The cumulative budget of the audited projects is around EUR 190 million which is only about 4% of the overall amount dedicated to RES under the Cohesion Policy over that period. Based on the audited sample, the ECA provided a set of conclusions and recommendations.

Cost-effectiveness (at both programme and project levels) was not found by the ECA to be a guiding principle for those OPs which proposed to finance RES generation. One of the reasons for this was that Member States were not using the most up to date data on renewables which would have been critical given the fast development of RES technology and the rapidly changing costs. Overall, the audited RES projects only created a very limited added value as Member States have not carried out accurate needs assessments. Furthermore, in many cases – similar to energy efficiency investments – high co-financing rates were applied which essentially led to the crowding out of private investments.

[18] No figures were available on Denmark, Estonia, Ireland and Croatia.

A low level of uptake of funds for RES projects was also identified to be a key problem. By 2012, only 58% of ERDF and CF funds for RES projects have been absorbed which is much lower compared to the overall ERDF and CF average at 87.7% or event energy efficiency projects (84.5%). The absorption of ERDF and CF funds for all funds and for energy efficiency and RES projects are presented in Table 2 for those six Member States that were audited.

Table 2: Absorption of ERDF and CF funds for energy efficiency and RES projects in 6 Member States ('projects selected for funding at the end of 2012')

Member State	Absorption of ERDF and CF funds for all projects (%)	Absorption of ERDF and CF funds for EE projects (%)	Absorption of ERDF and CF funds for RES projects (%)
Austria	75.6	287.3	50.6
Finland	90.8	34.5	30.6
Malta	88.1	37.9	43.3
Poland	85.4	112.2	57.8
United Kingdom	84.7	73.6	49.9
Average in all MS	**87.7**	**84.5**	**58.0**

Source: Court of Auditors (2014)

Overall, ERDF and CF support for RES was not found to be a key driving source in achieving the 2020 RES objectives (for detailed information see annex 4). While the quantitative data presented by the ECA shows the limited impact of the ERDF and CF funds it also reflects on the lack of data on accurate project results.

The three main recommendations by the ECA with regards to future RES projects supported under cohesion policy focus on the need to ensure:

- greater cost-effectiveness of projects;
- stable and predictable RES-relevant regulations, and
- better monitoring and evaluation of results[19].

2.4. Adaptation

ERDF and CF expenditure appear to have placed less of a priority on addressing adaptation objectives, and the evidence for the contribution was not systematically collected. In part this reflects the nature of adaptation – effective integration of adaptation priorities should mean that all investments (whatever their rationale, and whatever the policy objectives of public sector investment) are designed with future climate projections in mind, and are resilient to the potential impacts of climate change, at least as much as it should require the funding of projects which are explicitly and primarily aimed at increasing resilience. While there are isolated examples (quoted in Commission material) of, for example, investment in flood defences[20], there is insufficient data available to assess the overall contribution of expenditure on adaptation.

[19] ECA (2014), op. cit.

[20] For example, a project to raise flood protection levels in the Prut Barlad catchments, in Romania; and the Hany-Tiszasüly flood-control system in Hungary.

It is worth noting however that in 2013 the Commission adopted an EU strategy on adaptation to climate change[21]. It is focusing on (i) promoting action by Member States, (ii) "climate proofing" action at EU level, and (iii) better decision making. The strategy is currently being evaluated, but it is already clear that is has encouraged strategic approaches to adaptation at a Member State level. The strategy objectives are supported by ESI Funds as well as Horizon 2020 and LIFE under 2014-2020 MFF[22]; and the strategy includes a commitment to facilitate the climate-proofing of cohesion policy.

2.5. Urban development

No systematic analysis of the climate mainstreaming in urban development investment under 2007-2013 cohesion policy programming period has been conducted so far. Some relevant information in this respect could be found in the ex post evaluation of 2007-2013 cohesion policy programmes focusing on urban development and social infrastructure[23] The evaluation report shows that 17% of activities related to urban development were dedicated to "Environmental protection and energy efficiency" and 8% of activities related to social infrastructure were "Energy efficiency measures" (investment in social infrastructure often involved energy efficiency upgrading of buildings such as health and housing infrastructure).

The outputs and results that have been captured do not offer much clarity about the contribution of the evaluated programmes to the climate change adaptation and mitigation. According to the ex post evaluation, climate action investment was not a priority of urban development investment, even though "a majority of projects are reported by the implementing bodies to be part of integrated urban development strategies"[24]. In principle such integrated strategies should now tackle the economic, environmental, *climate*, social and demographic challenges of urban areas (the list of requirements for urban strategies set out in Article 7 of the ERDF regulation for 2014-2020[25], emphasis added), but in the absence of a reference to climate in the equivalent article (article 8) in the ERDF regulation for the 2007-2013 period[26] it is unclear to what extent climate objectives were promoted in projects realised under such strategies.

Box 2 JESSICA's support to climate investment in Lithuania

In 2007 – 2013 programming period JESSICA - Joint European Support for Sustainable Investment in City Areas instrument was introduced. Developed by the European Commission with support of the European Investment Bank and the Council of Europe Development Bank, JESSICA offered support to those Member States who chose to invest some of the structural fund allocations through revolving funds. It was used to promote sustainable urban infrastructure, including energy efficiency improvements and green infrastructure in cities.

For instance in terms of energy efficiency investment in Lithuania's housing sector under the 2007-2013 programming period,

[21] COM(2013) 216 final of 16.4.2013.
[22] Comprehensive source of information on EU's adaptation activities can be found on Climate-ADAPT website: http://climate-adapt.eea.europa.eu/
[23] Metis (2016) Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF): Work Package 10: Urban Development and Social Infrastructure, http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp10_final_en.pdf
[24] Ibidem.
[25] Regulation (EU) No 1301/2013 of the European Parliament and of the council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal
[26] Regulation (EC) No 1080/2006 of the European Parliament and of the Council of 5 July 2006 on the European Regional Development Fund.

> "the take-up rate of the JESSICA-supported national programme within the Lithuanian Promotion of Cohesion programme was very slow, as homeowners were reluctant to take on long-term loan commitments. In 2013, the JESSICA mechanism was therefore amended: municipalities were asked to select the most energy inefficient multi–apartment buildings for renovation. According to the new renovation model, homeowners do not need to take on any organizational and credit commitments directly. Credit commitments are made by a homeowners' association or administrator assigned by the municipality, borrowing in the name of the homeowners. By removing the organizational burden as well as direct credit commitments from the homeowners, the new model led to an intensification of modernisation of multi–apartment buildings under JESSICA programme. To further streamline energy efficiency interventions, and to address the collective action bottleneck in multi-apartment buildings, a simplified consenting procedure was applied; for interventions in residential buildings a simple majority of home owners (50% plus one) in one building was sufficient to enter the programme and use the support for investment covering the entire building and all its home owners. Close cooperation with the national energy agency was in place to maintain an overview of potential beneficiaries and timing of projects."[27]
>
> As a follow up, in the 2014-20 programming period, new support (EUR 90 million) for the refurbishment and modernisation of multi-apartment buildings in Lithuania will be provided under the JESSICA II fund. Around 9,000 apartments are expected to be refurbished to higher energy efficiency standards[28].

However, climate change is recognised as an important issue for cities in particular, a recognition which is at the origin of initiatives such as the Covenant of Mayors for Climate & Energy[29]. On the one hand, climate impacts (for example, heat impacts in Southern Member States; flood risks; disease risks; and immigration pressures), and the impact of mitigation policies (for example, electrification of the vehicle fleet and public transport; new business opportunities linked to the circular economy and to green sectors generally; new approaches to heating buildings), will profoundly affect the nature of urban economies over the decades to come. And on the other hand, cities are capable both of acting as motors of radical decarbonisation (for example, by facilitating the introduction of new technologies; by investing in energy efficiency, renewable energy, and other forms of mitigation; and by nurturing green technology hubs), and of benefiting significantly from the co-benefits of climate action (for example, reduced air pollution from decarbonisation of transport; health and quality of life impacts of green infrastructure and ecological approaches to climate adaptation).

[27] Le Den, X., Riviere, M., Lessmann, F., Herms, S., Nesbit, M., Paquel, K. and Illes A. (2015) Energy efficiency in public and residential buildings. Final report. Work Package 8. Ex post evaluation of Cohesion Policy Programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and Cohesion Fund (CF). A report for the European Commission by Ramboll and the Institute for European Environmental Policy, Brussels, October 2015, p. 84.

[28] EIB website: http://www.eib.europa.eu/products/blending/jessica/index.htm

[29] The Covenant of Mayors for Climate & Energy brings together thousands of local and regional authorities voluntarily committed to implementing EU climate and energy objectives on their territory. It was initiated in 2008 by the European Commission, and focuses today on both mitigation and adaptation aspects of climate change. See more information of the Covenant's official website: http://www.covenantofmayors.eu/index_en.html

2.6. European Territorial Cooperation activities

Around 13.5% (ca. EUR 1 billion) of EU overall contribution to European Territorial Cooperation (ETC) under the 2007-2013 cohesion policy funds was dedicated to climate investment (see Table 1 in section 2.1).

The ex post evaluation of 2007-2013 cohesion policy programmes[30] commissioned by DG REGIO, demonstrated that transnational cooperation programmes (TNC), with EUR 1.766 billion allocated budget funded 1,134 projects "mainly in the field of environment and climate change". The cross border cooperation (CBC) with EUR 5.574 billion EUR allocation funded over 6 800 projects including 1 292 projects related to the management of natural resources, natural threats, climate change, and biodiversity.

Cross border cooperation

Around 19% of the overall ERDF budget dedicated to the 67 CBC programmes that have undergone evaluation was distributed across 10 environmental sub-themes. Of them, the five most important were: Sustainable management of natural resources (15%); Water management (10%); Risk management (10%); Climate change and biodiversity (10%) and Renewable energy (9%). Examples of overall ERDF allocation shares to climate-related interventions in three selected CBC programmes are provided in Table 3.

Investment in risk prevention and management:

> "aimed at increasing resilience, focused on preparedness, early prevention and management of risks. Outputs were typically the establishment of common management and monitoring structures and the building of capacity for the involved personnel (notably in the following CBC programmes: Romania-Bulgaria (41), 2 Seas (17), Latvia-Lithuania (38) and Spain-Portugal (1))."

CBC contributed also to the harmonisation of activities in the field of flood prevention and protection at river basin level (Hungary-Slovakia (44), Austria –Czech Republic (30)[31].

Investment in climate change and energy efficiency had smaller budget allocations than those in risk prevention and management and had "more of a pilot character and concentrated on research activities or on raising awareness among institutional and professional stakeholders or citizens". The evaluators noted also that the cross-border added value of intervention in the field of energy efficiency and renewable energy was not always clear.

With relevance to climate action, the CBC programmes contributed to improving the integrated environmental management through, inter alia, "producing shared academic and policy oriented knowledge on common environmental related issues" and specific contributions such as:

- management of CO_2 neutral solutions e.g. Flanders-The Netherlands (20);
- soil and land management reducing emissions e.g. Lithuania – Poland (51), and
- strategic planning for coastal integrated management e.g. 2 Seas (17).

[30] ADE (2016), Ex-post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF): Work Package 11: European Territorial Cooperation. http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp11_final_report.pdf

[31] Ibidem. P. 97.

Table 3: Examples of climate-related share of allocation to Environment priority in three selected CBC programmes

Intervention codes	France (Channel) – England (18)	Romania – Bulgaria (41)	South Baltic (50)
39: Renewable energy: wind	4%	0%	22%
41: Renewable energy: biomass	4%	0%	0%
42: Renewable energy: hydroelectric,geothermal and other	4%	0%	0%
43: Energy efficiency, co-generation, energy management	16%	0%	15%
49: Mitigation and adaptation to climate change	10%	0%	0%
51: Promotion of biodiversity and nature protection (including Natura 2000)	37%	7%	5%
53: Risk prevention (including prevention plans)	2%	33%	0%

Source: ADE (2016) based on OPs Annual Implementation Reports, 2014

It is impossible however to estimate the CBC contribution to climate change mitigation and adaptation in quantitative terms. The ex post evaluations notes that:

> "Results were not measurable on an aggregate basis as indicators did not permit a quantitative assessment of the main effects of the CBC outputs."

The main identified result of the CBC was "creation or consolidation" of a regional identity. Although this result might not seem concrete (as it is deprived of tangible results in terms of e.g. CO_2 emission reduction or number of regions with a climate-risk prevention plans), it could be regarded as a key step facilitating future climate policy implementation. Cross border challenges, such as renewable electricity integration to the power grid or bioregional responses to a changing climate, certainly require strong regional identities across the EU.

Transnational cooperation

Transnational cooperation programmes 2007-2013 were much smaller in terms of budget allocated and number of projects than CBC programmes. The ex post evaluation of 2007-2013 cohesion policy looked at 13 TNC programmes. They focused predominantly on the "Environment" priority (taking up 35% of all programmes), which includes climate mitigation and adaptation.

> "Renewable energy, coastal management and water management were the three most frequent issues addressed through TNC projects in the environmental field."

The main outputs of TNC programmes were: promotion of biodiversity and nature protection (joint knowledge networks, operational tools, specialised equipment, awareness raising), integrated water management and flood prevention, and environmental risk prevention and

management shared systems. The results, according to the ex post evaluation findings, include "improved risk prevention (flood risks for example) and better protection and exploitation of maritime resources (…) (examples in the Baltic Sea Region or North Sea Programme)."

> "They were mainly due to the **reinforcement of institutional capacities** at transnational level. The multi-level governance in Maritime Spatial Planning in the Baltic Sea programme is a good example of how a TNC project has contributed to the creation of a common potential in the cooperation area, enhancing a participative transnational model of governance in the field of maritime spatial planning."[32]

Between 2007 and 2013, European Territorial Cooperation programmes were often very broad and dispersed, funding a wide-range of projects rather than focusing on large-scale effects of specific priority such as climate action. Their budget allocations were also relatively small and not well coordinated with other cohesion policy programmes. Moreover, the monitoring system was not designed to capture any tangible, climate–specific results. Finally both CBC and TNC were in line with the Lisbon Strategy, but the evaluators noted that:

> "the EU regulations and guidelines did not specify in detail how European Territorial Cooperation was expected to contribute to the Lisbon Strategy. They left room for both pursuing cooperation as an end in itself and as a means to economic and social integration."

European Territorial Cooperation has been strengthened in the 2014-20 programming period as compared to the 2007-2013 period. Member States cooperation at macro-regional and sea-basin levels is encouraged (see Box 3); with a particular relevance to climate change adaptation measures. Better alignment with the Europe 2020 Strategy, and reformed monitoring schemes of the cohesion policy programmes in general may indicate that the ETC's contribution to climate policy goals of the EU will be greater and better documented than in the past.

Box 3 Climate change and the macro-regional strategies

In recent years, macro-regional strategies have been emerging in the EU. These strategies offer an opportunity to complement the traditional national and territorial policies and address issues and challenges at a multi-sectoral, multi-country (including non-EU countries) and multi-governance level. The need for such strategies is also reflected in the CPR .

As of 2017, four macro-regional strategies have been adopted. These are: the EU Strategy for the Baltic Sea Region (EUBSR)[33] adopted in 2009, the EU Strategy for the Danube Region (EUSDR)[34] developed in 2011, the EU Strategy for the Adriatic and Ionian Region (EUSAIR)[35] adopted in 2014 and the EU Strategy for the Alpine Region (EUSALP)[36] adopted in 2016.

These strategies have the potential to further strengthen cooperation between multiple countries and address common challenges, such as climate change. For instance, the EUBSR helped to foster cooperation on climate change adaptation and supported the development of the Strategy on Adaptation to Climate Change in the Baltic Sea Region[37].

[32] Ibidem, p. 110.
[33] http://ec.europa.eu/regional_policy/en/policy/cooperation/macro-regional-strategies/baltic-sea/
[34] http://ec.europa.eu/regional_policy/en/policy/cooperation/macro-regional-strategies/danube/
[35] http://ec.europa.eu/regional_policy/en/policy/cooperation/macro-regional-strategies/adriatic-ionian/
[36] http://ec.europa.eu/regional_policy/en/policy/cooperation/macro-regional-strategies/alpine/
[37] http://baltadapt.eu/index.php

The EUSDR also promoted the implementation of various environmental and climate projects, such as the development of a common methodology for natural risk assessment and management under climate change. While it is still early to fully comment on the implementation of the EUSAIR a thematic focus on climate change adaptation also appears to be an important area[38].

The use of macro-regional strategies could be further mainstreamed into Cohesion Policy as they have the potential to lead to coordinated regional actions in various fields, including climate change mitigation and adaptation. Experience so far suggests that the role of these strategies is more significant in fostering adaptation and climate risk management actions rather than mitigation. At the same time, these strategies are only briefly mentioned in the EU's Adaptation Strategy.

[38] EC (2016) 'Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of EU macro-regional strategies', {SWD (2016) 443 final},COM(2016) 805 final

3. STOCK-TAKING OF CLIMATE MAINSTREAMING IN THE 2014-2020 COHESION POLCY

KEY FINDINGS

- The EU institutions committed to devote at least 20% of the EU budget to climate change adaptation and mitigation in the 2014-2020 programming period. Mechanisms for monitoring this in cohesion policy are relatively sophisticated in comparison to some policy areas, although still show some weaknesses.
- The coherence and precision of climate-relevant impact and result indicators has been improved as compared to the previous programming period; but still does not provide enough clarity on the contribution of cohesion policy to delivery of the EU's overall climate objectives. The consistency and integrity of reporting of emissions reductions needs to be further improved.
- The introduction of mechanisms such as the Partnership Agreement, and climate-relevant thematic objectives, has been effective in improving the mainstreaming of climate in programmes.
- The thematic objectives introduced as part of the programming of ESIF expenditure include two which are particularly relevant for climate. Thematic objective 4 (low-carbon economy) is primarily addressed by ERDF and CF (87% of a total EUR 64 billion commitment. Thematic objective 5 (climate resilience) is less prioritised by ERDF and CF, which represent just under a quarter of the total EUR 42 billion commitment.

The European Council, in reaching agreement on the broad outlines of the 2014-2020 Multi-Annual Financial Framework in February 2013, decided that:

> **"**Climate action objectives will represent at least 20% of EU spending in the period 2014-2020 and therefore be reflected in the appropriate instruments to ensure that they contribute to strengthen energy security, building a low-carbon, resource efficient and climate resilient economy that will enhance Europe's competitiveness and create more and greener jobs.**"**[39]

The commitment thus comprises two elements: the first is the decision to ensure that climate objectives should be mainstreamed into spending programmes, the second that the resources spent on climate objectives should amount to at least 20% of the total. These elements find separate expression in the relevant regulations governing spending programmes (listed in chapter 2 Context).

This section identifies the main elements of the approach to mainstreaming climate change into cohesion policy expenditure, and to tracking climate expenditure in pursuit of the 20% target. There are essentially two broad elements to this process. The first is a structured approach to programming decisions, with the introduction of a new mechanism called a Partnership Agreement, which outlines, for each Member State, a strategic approach agreed between the Member State and the European Commission for ESIF investment over the 2014-2020 period. The second is the detailed monitoring of commitments and expenditure in order to assess the level of climate-relevant expenditure.

[39] European Council 7/8 February 2013 Conclusions, EUCO 37/13, https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/135344.pdf

3.1. Mainstreaming of climate policy objectives in 2014-2020 programmes: the Common Provisions Regulation and the thematic objectives

There are two broad elements to mainstreaming of climate objectives in ESIF programmes. The first is the treatment of climate objectives in the newly-introduced Partnership Agreements; the second is the use of thematic objectives to investment programmes.

3.1.1. Partnership Agreements

The Common Provisions Regulation (CPR), which governs all 5 of the ESIF (see below) sets out an overarching aim "to deliver the Union strategy for smart, sustainable and inclusive growth" (as well as the Fund-specific missions pursuant to their Treaty-based objectives). It also aimed to ensure a more purposeful and structured approach to programming, through the adoption of 11 thematic objectives (which are dealt with in the following section), the establishment of a Common Strategic Framework, set out in an Annex I to the regulation, and the innovation of Partnership Agreements with the Member States.

The Common Strategic Framework (CSF) provides strategic orientation to the programming at Member State and regional levels. It also defines a number of horizontal policy principles and cross-cutting policy objectives including climate change mitigation and adaptation. Section 5.2 "Sustainable development" of the CSF is particularly important in relation to climate mainstreaming, and stipulates that:

> "Managing authorities shall undertake actions throughout the programme lifecycle, to avoid or reduce environmentally harmful effects of interventions and ensure results in net social, environmental and climate benefits. Actions to be undertaken may include the following:
>
> (a) directing investments towards the most resource-efficient and sustainable options;
> (b) avoiding investments that may have a significant negative environmental or climate impact, and supporting actions to mitigate any remaining impacts;
> (c) taking a long-term perspective when 'life-cycle' costs of alternative options for investment are compared;
> (d) increasing the use of green public procurement."

The process for programming expenditure includes a requirement on Member States to prepare a Partnership Agreement setting out, at Member State level, the intended use of ESIF expenditure over the programme period. The Partnership Agreement then needs to be agreed with the Commission, following a process by which the Commission assesses its consistency with the CPR itself, and with the Member State's National Reform Programme and relevant Country Specific Recommendations. The detailed requirements of the Partnership Agreement are set out in article 15 of the CPR, and include (i) an indication of expected results per thematic objective and (ii) an indicative allocation of support per fund per thematic objective, as well as a total indicative amount of support for climate objectives. They are also required to explain how the horizontal principle of sustainable development, established in article 8 of the CPR, will be implemented. Article 8 of the CPR divides this principle into the following areas:

- environmental protection requirements;
- resource efficiency;
- climate change mitigation and adaptation;

- biodiversity and ecosystem protection;
- disaster resilience;
- risk prevention and management.

However, Partnership Agreements were not required to set out in detail any mechanisms (including those referred to in section 5.2 of the Common Strategic Framework, as referred to above) by which Member States would ensure that negative impacts of investment on climate objectives were avoided.

The Partnership Agreements were in part informed by Commission position papers for each Member State, prepared in 2012 while the MFF legislation was still in the process of negotiation; and were adopted in the form of Commission decisions between February 2014 and October 2014. A detailed and comprehensive assessment of the impact of Partnership Agreements on the effectiveness and climate-relevance of programmes has yet to be carried out; and an important consideration in any assessment of their effectiveness will be the extent to which expenditure in practice has followed the principles and objectives set out in the Partnership Agreements.

However, a review of the Partnership Agreements shows that climate action is always explicitly mentioned by the Member States with regards to the TO 4 and 5[40]. TO 4 (low-carbon economy) represents 10.4% of the overall budget allocation and has been given an average budget allocation in most Member States. Only Luxemburg prioritised it with the highest budget allocation. TO 5 (climate change adaptation) has been allocated 5.7% of the budget and is not used in Luxemburg[41].

Moreover our assessment of ESIF programming in two Member States, Poland and Hungary (see Annexes 2 and 3, and Box 3) suggests that the Partnership Agreements have been influential in ensuring a greater degree of focus on climate objectives, and in integrating ESIF expenditure into national strategies more effectively than was the case in the 2007-2013 programming period. Cohesion policy is a major investment driver in both Poland and Hungary, complementing national level strategic orientations that do not always prioritise climate action. We have therefore focused on these two Member States as test cases, where the added value of climate mainstreaming in Cohesion policy should be among the greatest in the EU-28.

Box 4 Beneficial role of Partnership Agreements

Assessment of Member State Partnership Agreements and programming documents suggests that the strategic approach for the 2014-2020 programming period is having some beneficial effects, particularly in Member States for whom ESIF represents a significant proportion of public funds available for investment. In **Poland** it appears that the Partnership Agreement and operational programmes place significantly greater emphasis on climate objectives and the delivery of climate mitigation in particular than do national funding programmes. In **Hungary**, there is a clear emphasis on the delivery of climate and energy targets, particularly for renewable energy, and the national climate mitigation and adaptation strategies place considerable emphasis on ESIF expenditure. A detailed overview of the climate mainstreaming approaches in Polish and Hungarian Partnership Agreements and operational programmes is provided in Annexes 2 and 3.

[40] COWI (2016), op.cit.

[41] Pucher, J. et al. (2015), Review of the Adopted Partnership Agreement, study for REGI committee of the EP, http://www.europarl.europa.eu/RegData/etudes/STUD/2015/563393/IPOL_STU(2015)563393_EN.pdf

3.1.2. Thematic objectives

The CPR requires Member States to take into consideration the climate change mitigation and adaptation potential of investments made with the support of the ESI funds[42]. They should also ensure that such investments are "resilient to the impact of climate change and natural disasters such as increased risks of flooding, droughts, heat waves, forest fires and extreme weather events".

To ensure that investment made across the EU addresses EU level priorities, the CPR sets out eleven thematic objectives. Two of them:

- "Supporting the shift towards a low-carbon economy in all sectors" (TO 4), and
- "Promoting climate change adaptation, risk prevention management" (TO 5)

are explicitly linked to climate action. In addition, a TO 6 "Preserving and protecting the environment and promoting resource efficiency" holds significant potential to deliver on climate objectives. According to estimates by COWI (2016) TO 6 could carry as much as 42.4 % of ESI Funds allocation to climate change in the 2014-2020 programming period, more than TO 4 and 5 combined (see Table 4).

Table 4: Share of ESI Funds allocations to climate change by thematic objective in the 2014-2020 programming period

Thematic Objective	%
TO 1: Strengthening research, technological development and innovation	1.5
TO 2: Enhancing access to, and use and quality of, ICT	>0
TO 3: Enhancing the competitiveness of SMEs	0.7
TO 4: Supporting the shift towards a low-carbon economy in all sectors	34.3
TO 5: Promoting climate change adaptation, risk prevention and management	6.5
TO 6: Preserving and protecting the environment and promoting resource efficiency	42.4
TO 7: Promoting sustainable transport and removing bottlenecks in key network infrastructures	9.7
TO 8: Promoting sustainable and quality employment and supporting labour mobility	4.8
TO 9: Promoting social inclusion, combating poverty and any discrimination	
TO 10: Investing in education, training and vocational training for skills and lifelong learning	
TO 11: Enhancing institutional capacity and efficient public administration	0.1
Total	**100**

Source: COWI (2016)

[42] Article 8 of the CPR.

While all three TOs are part of the sustainable growth agenda[43], thematic objectives 4 is one of the main priorities for the ERDF while TOs 5, and 6 are the focus of the CF. Interestingly, thirteen Member States who do not benefit from Cohesion Fund, allocate almost 60% of their overall ESIF support to climate change through the TO6 which indicates that they may use the EAFRD as the backbone of their ESIF supported climate action. In EU-15 covered by the Cohesion Fund, 30% of ESIF support to climate change is distributed under TO6 heading. Only Czech Republic, Greece and Malta plan for the EAFRD to carry most (>60%) of ESIF supported climate action[44].

The CPR attempts to ensure that EU level policy objectives are reflected in operational programmes, but in a way which respects the national circumstances and other policy orientations of each Member State. The Partnership Agreements are a key element in achieving this; they were developed by each Member State, in response to initial recommendations from the European Commission, and are then agreed between each Member State and the Commission, before being formally adopted by the Commission. A Partnership Agreement outlines a Member State's strategy and proposes a list of operational programmes. The agreements are thus expected to ensure that Member States deliver on the objectives set at the EU level, namely the eleven thematic objectives set out in the CPR.

As mentioned in section 1 (Box 1), in the 2014-2020 programming period cohesion policy is closely aligned with the Europe 2020 strategy. Partnership Agreements must explain how the EU 2020 climate change objectives will be addressed in the use of ESI Funds. In principle, support to the same types of investment is available in all regions. However, a level of differentiation has been introduced through the thematic concentration thresholds in the fund-specific regulations; for instance the ERDF allocations to TO4 "supporting the shift towards a low-carbon economy in all sectors" should not be lower than 20% in more developed regions, 15% is transition regions, and 12% in less developed regions[45].

Thematic Objective 4: low-carbon economy

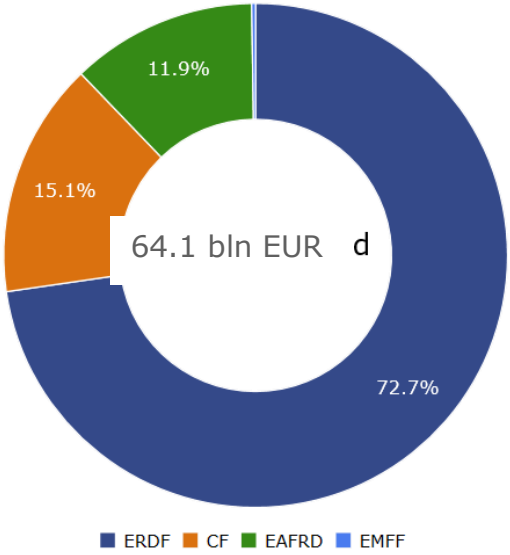
It is expected that the TO 4 "Supporting the shift towards a low-carbon economy in all sectors" with a total cumulative budget of EUR 64 116 416 483 (EU and national contributions combined) will be delivered mainly through the ERDF, but not without significant support by the CF and EAFRD (see Figure 2).

[43] Sustainable growth is part of of the Europe 2020 strategy launched in 2010 to create the conditions for smart, sustainable, and inclusive development. It covers two flagship initiatives: "Resource efficient Europe" and "An industrial policy for the globalisation era". More information is available on the Commission's website: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/sustainable-growth/index_en.htm

[44] COWI (2016), op. cit.

[45] Article 4 of the ERDF regulation.

Figure 2: Total budget share by fund: the Low Carbon Economy



Source: InfoRegio

According to the ERDF regulation (Article 5) and CF regulation (Article 4), the TO 4 "supporting the shift towards a low-carbon economy in all sectors" will be fulfilled through seven investment priorities focused on promotion and development of:

- production and distribution of energy derived from renewable sources;
- energy efficiency and renewable energy use in enterprises;
- energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector;
- smart distribution systems that operate at low and medium voltage levels;
- 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;
- use of high-efficiency co-generation of heat and power based on useful heat demand.

In addition, the ERDF regulation mentions also "research and innovation in, and adoption of, low-carbon technologies" among the relevant investment priorities. It is worth noting also that **promotion of low carbon strategies for urban areas** are prioritised by both the ERDF and CF.

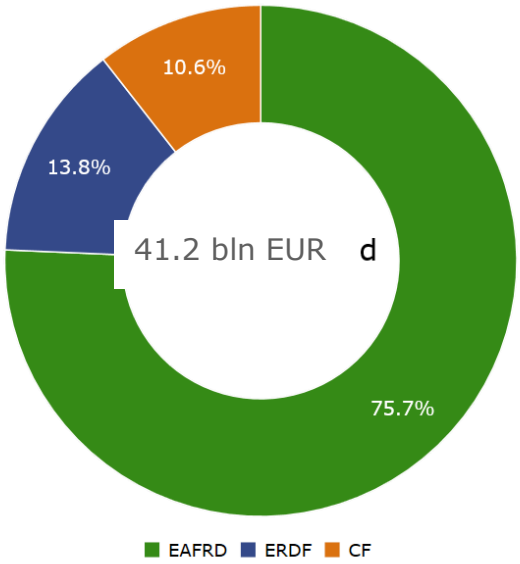
These priorities reflect the strategic objectives of the 2020 Climate and Energy Package (presented in more detail in section 2 Context)[46], and will be delivered through projects such as energy efficiency improvement in buildings, modernisation and upgrades of public transport, renewable energy projects in small and medium enterprises. In particular, and with relevance to urban development, the investment in sustainable transportation under TO 4 will go hand in hand with TO 7 (Promoting sustainable transport and removing bottlenecks in key network infrastructures) low carbon investment.

[46] EC (2008), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - 20 20 by 2020 - Europe's climate change opportunity, COM/2008/0030 final, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52008DC0030

Thematic objective 5: adaptation and risk prevention

The ERDF and CF are considered less central to delivery of Thematic Objective 5, which focuses more on climate adaptation, and which has a total cumulative budget of EUR 41 236 429 465. TO 5 will instead be mainly delivered through the EAFRD, but with contributions through the ERDF and CF amounting to less than a quarter of the total (see Figure 3).

Figure 3: Total budget share by fund: Climate Change Adaptation & Risk Prevention



Source: InfoRegio

The TO 5 "promoting climate change adaptation, risk prevention and management" includes just two investment priorities:

- supporting investment for adaptation to climate change, including ecosystem-based approaches;
- promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems.

Other thematic objectives

The focus of the overview above is on the climate-specific thematic objectives 4 and 5. Thematic objective 6 however is equally important to climate action, considering that some 42.4% of its overall allocation is expected to be climate-relevant[47]. For instance with regard to the European Territorial Cooperation Goal, climate action is supported through multiple TOs, but mostly TO6 (Preserving and protecting the environment and promoting resource efficiency)[48].

Horizontal mainstreaming of climate action to other TOs is relatively modest, although the importance of TO1 (Strengthening research, technological development and innovation) in this respect should be highlighted. As many as 19 Member States reflected climate action in their allocations under this TO[49], confirming that research and innovation can be a strong ally of both climate change mitigation and adaptation.

[47] COWI (2016), op. cit.
[48] Ibidem
[49] Ibidem.

Beyond the thematic objectives, the cohesion policy for the 2014-2020 period puts a clear emphasis on the role of European cities and towns and their sustainable development. Sustainable urban development will be supported through integrated strategies co-funded by the ERDF (a minimum of 5% of ERDF budget for the 2014-2020 period). A new instrument called the Integrated Territorial Investment (ITI) was introduced to facilitate the delivery of integrated urban actions across priority axis, OPs and TOs[50].

3.1.3. Urban dimension

The urban dimension of cohesion policy is more visible in the current period than it was in 2007-2013. Funding is channelled mainly through the ERDF, but also through CF, ESF and EAFRD. According to Commissioner Corina Crețu "at least 50% of the ERDF resources for the period will be invested in urban areas. This could increase even further, later in the period."[51] About EUR 15 billion from the ERDF is dedicated to cities, for them to manage the funds directly. As noted by the European Environment Agency "although climate change adaptation is not a major focus in this, the support for green infrastructure might be considerable, as a major emphasis is on urban rejuvenation and brown field regeneration"[52].

Indeed, urban investment priorities include:

- Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector
- 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, and
- Taking action to improve the urban environment, to revitalize cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures[53].

Urban areas can support their climate action through cohesion policy instruments such as Community-led Local Development (CLLD) and Integrated Territorial Investments (ITI). These instruments are flexible in that they can combine overlapping elements of the OPs across the priority axes, and are open to a relatively wide array of beneficiaries. In the 2014-2020 period, climate action in urban areas is also supported through financial instruments developed under ESIF, similar to those financed under the JESSICA initiative in the 2007-2013 period, see box 2 in section 2.5)[54]. Low carbon economy and climate change adaptation are also supported under interregional programmes, namely Interreg Europe and Urbact III.

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[50] EC (2012), Integrated Sustainable Urban Development: Cohesion Policy 2014-2020, http://ec.europa.eu/regional_policy/sources/docgener/informat/themes2012/urban_en.pdf

[51] Speech by Commissioner Crețu to the 4th EU Capital Mayors meeting in Vienna, 21 April 2015: https://ec.europa.eu/commission/commissioners/2014-2019/cretu/announcements/2014-2020-period-has-put-urban-dimension-very-heart-cohesion-policy_en

[52] EEA (2016), "Urban adaptation to climate change in Europe 2016 — Transforming cities in a changing climate", https://www.eea.europa.eu/publications/urban-adaptation-2016

[53] Crome, B. (2014), "The Urban Dimension in the Cohesion Policy 2014-2020", http://www.eib.org/attachments/general/events/2014_01_30_csi_europe_crome_en.pdf

[54] Examples in the 2014-2020 period include: the State Housing Development Fund (ŠFRB) in Slovakia, providing loans for energy efficiency improvements, including complete renovations of buildings, and the Green Fund in Sweden, which provides risk capital to SMEs for products and services reducing CO2 emissions; examples in the 2007-2013 period included the successful Estonia example of a JESSICA fund to finance energy efficiency improvements in multi-apartment blocks, and the FIDAE holding fund in Spain (See: www.idae.es), which drew together funds from 10 regional operational programmes to finance energy efficiency and renewable energy investments.

The leaders of EU cities and towns also have access to capacity building and innovation driving tools to support their climate action. For instance the Urban Innovative Action (UIA) supported by the ERDF co-finances up to 80% of the costs (max. EUR 5 million) of transformational action that goes beyond business as usual, and which works in practice and provides lessons learnt for other stakeholders[55]. One example of a UIA supported project is Gothenburg's "Fossil Free Energy District" in Sweden, with a goal of supporting "energy transition in urban areas by demonstrating scalable and replicable solutions for energy efficiency and smart energy management in public infrastructure and housing sector; the adoption of low carbon energy production and moderating the demand for heating and cooling; and deployment of innovative, renewable-based solutions to heat/cool buildings and neighbourhoods". Support to innovative actions in the area of sustainable urban development is stipulated in the Article 8 of the ERDF regulation.

All in all, the 2014-2020 period of cohesion policy programming offers a wide portfolio of instruments to tackle territorial challenges and support sustainable development in urban areas, including climate action. Their success will depend on urban stakeholders' (notably local communities and the private sector) awareness of climate change related challenges and their capacity to use the funds and know-how made available.

By way of comparison, as an indication of how other economies are tackling the challenge of integrating climate policy objectives in urban policy, Box 5 below presents how the territory of Hong Kong promotes its climate adaptation priorities by involving the private sector – an important climate change and urban dimension stakeholder.

Box 5 Hong Kong Climate Resilience Roadmap for Business[56]

Published in 2015 "Hong Kong Climate Resilience Roadmap for Business" recommends business sector to start mainstream climate change action to all the critical business decisions related to buildings, infrastructure, financial and insurance systems. It recognises that business action must be taken in parallel to governmental initiatives but in a manner that integrates approach across government, business and the wider community. Private sector is an important stakeholder in the Hong Kong's government agenda on climate action – "Hong Kong's growth and prosperity is reliant primarily upon six key business sectors ("the Sectors"): property holding and management, construction, transport, finance, manufacturing and the retail supply chain, and energy transmission and generation". The Sectors are vulnerable to the following climate change impacts:

- Flooding and Landslides: Strong Winds, Storm Surge, Sea Level Rise and Heavy
- Rainfall;
- Heat Stress;
- Water Scarcity;
- Health – Heatstroke and Disease;
- A Compromised Supply Chain.

In 2012 Bloomberg estimated[57] that in Hong Kong, USD 35.9 billion worth of assets were at risk from flooding, with this total rising to USD 1.2 trillion by 2070.

The "Roadmap" is by no means a new initiative to involve business sector in Hong Kong to take climate action, advances in this area has been on-going for several years. The action is taken "Businesses in Hong Kong have over the years invested considerable

[55] http://www.uia-initiative.eu/en/about-us/what-urban-innovative-actions

[56] Business Environment Council Limited (2015), "Hong Kong Climate Resilience Roadmap for Business" https://bec.org.hk/files/images/Resource_Centre/Publications/BEC_Hong_Kong_Climate_Resilience_Roadmap_for_Business_report.pdf

[57] Bloomberg Business (2012) Top 20 Cities with Billions at Risk from Climate Change

resources and made concerted efforts to lessen our vulnerability to adverse weather. In recent years, this has accelerated with the inclusion of systematic risk analysis to take into account climate change effects. Certain sectors stand out in their efforts. The transport sector has put considerable effort into planning alternative routes, putting in place emergency systems as well as reducing cooling needs and using materials which are resilient to heat stress. The energy sector has put in place robust infrastructure that ensures our energy supply is maintained at its highest reliability even in times of extreme weather conditions. (…) The property /construction sector has modified building design to adapt to higher wind speeds, while living accommodation in new buildings is generally raised considerably above sea level. To reduce the exposure of workers to heat stress on site, the construction sector is increasing the use of automation and pre-fabrication methods."

The authors of the roadmap issue two sets of recommendations, one for business sector and one for the government. The recommendations for the government include:

- Establish a ministerial level body to enhance internal government deliberation on climate related issues to help Hong Kong optimise its efforts, and put in place mechanisms to enable on-going dialogue with critical business sectors on goals, plans and implementation.
- Articulate new goals and put in place a plan post the Conference of the Parties negotiations in Paris (COP 21) for Hong Kong to reduce its GHG emissions, adapt and be more resilient.
- Support the collection and dissemination of relevant data, and provide funding for and encourage research relevant to climate risk, adaptation and resilience in Hong Kong.
- Continue to spread awareness of the impacts of climate change amongst the public, inform business of action that needs to be taken, and exemplify good practice.

3.2. The tracking of climate-related ERDF and CF expenditure in the 2014-2020 programming period

3.2.1. Twenty percent of EU spending for climate action objectives

The Commission's interpretation of the 20% objective has been based firmly on the principle that, to maximise the effectiveness of EU expenditure, it should aim wherever possible to deliver multiple objectives and exploit synergies[58]. The 20% objective therefore does not mean that no more than 80% will be spent on other objectives; delivering multiple objectives from the same expenditure means that, for example, ERDF expenditure on climate change can contribute significantly to the jobs and growth objective, or to combating social exclusion, at the same time. Total contributions to all policy objectives measured in this way could thus amount to a sum significantly greater than 100% of the total EU budget. In other words, the Commission perceives the 20% target as a political rather than a budgetary objective. In its response to the ECA report (2016), it stressed that "a budgetary interpretation alone does not reflect the EU's approach to mainstreaming"[59].

This in turn has implications for the monitoring system for the delivery of the 20% target. In applying the climate markers system of tracking climate expenditure, adapted from the

[58] See for instance EC (2016), "Assessment of climate action. How to assess the mainstreaming of climate action in the Partnership Agreements for the European Structural and Investment Funds (ESIF) in the period 2014-2020", https://ec.europa.eu/clima/sites/clima/files/docs/08-climate_assessment_fact_sheet-pa_en.pdf

[59] ECA (2016), op. cit.

approach developed by the OECD[60], expenditure is either regarded as not contributing to climate objectives (a 0% contribution); as contributing significantly towards climate objectives (a 40% contribution), or as primarily contributing towards climate change (a 100% contribution). This climate markers system is applied to ESI Funds but also to the EU budget as a whole, with significant contributions to climate expenditure also coming from certain centrally managed instruments such as Horizon 2020 and LIFE. The political importance attached to the 20% target, and the fact that treating expenditure as being climate-relevant does not mean that it cannot also be used to contribute significantly to other objectives, means that policymakers at European level, and programming and managing authorities, are faced with a temptation to maximise the reported climate contribution of their programmes and investments.

In addition, the European Court of Auditors has warned recently:

> "there is a serious risk that the 20% target will not be met without more effort to tackle climate change. The implementation of the target has led to more, and better-focused, climate action funding in the European Regional Development Fund and the Cohesion Fund. In the European Social Fund, and in the areas of agriculture, rural development and fisheries, however, there has been no significant shift towards climate action and not all potential opportunities for financing climate-related action have been fully explored."[61]

3.2.2. Assigning climate markers to intervention categories and intervention fields

For the ESI funds the detailed contribution of climate expenditure is assessed not by reference to the thematic objectives, but through a separate mechanism: the intervention categories. The Common Provisions Regulation (CPR) calls in article 8 for:

> "assigning a specific weighting to the support provided under the ESI funds at a level which reflects the extent to which such support makes a contribution to climate change mitigation and adaptation goals. The specific weighting assigned shall be differentiated on the basis of whether the support makes a significant or a moderate contribution towards climate change objectives. Where the support does not contribute towards those objectives or the contribution is insignificant, a weighting of zero shall be assigned."

This approach is based on (but does not exactly replicate) the OECD's recommended "Rio Markers" approach to monitoring climate policy expenditure; it identifies types of expenditure considered to have either a 100% coefficient (significant contribution), a 40% coefficient (moderate contribution), or a 0% coefficient (no contribution or insignificant contribution). For the ERDF and CF, the approach is developed in considerable detail through the intervention codes established under Commission Implementing Regulation 215/2014[62], which sets out 9 broad categories of intervention, and a total of 123 separate intervention fields under those

[60] See OECD (2011), "Handbook on the OECD-DAC Climate Markers" (although note that the methodology was developed for tracking development assistance expenditure) https://www.oecd.org/dac/stats/48785310.pdf

[61] ECA (2016), op.cit.

[62] Commission Implementing Regulation (EU) No 215/2014 of 7 March 2014 laying down rules for implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund with regard to methodologies for climate change support, the determination of milestones and targets in the performance framework and the nomenclature of categories of intervention for the European Structural and Investment Funds, OJ L 69, 8.3.2014, p. 65–84.

categories – those which are identified as climate-relevant are listed in Annex 1 of this study, together with the climate coefficient ascribed to each of them.

The approach adopted has the merit of consistency across programmes, and has been described as "a transparent, consistent and mechanical method for calculating support for climate action"[63], however, there also appear to be some imperfections. In particular, the success of the mechanism relies heavily on the approach adopted by managing authorities to identifying expenditure fields – many projects may potentially cover a number of categories of expenditure, and there may be a temptation to choose the intervention fields with the higher climate markers in order to maximise the reported performance against climate targets. (For example, an investment could include elements which are relevant to research and innovation in a large enterprise, and elements which involve the promotion of energy efficiency; recording it under the former category would have a 0% marker; recording it under the latter would have a 100% marker.)

The Commission's assessment of performance on the 20% target, included in a working paper published alongside its mid-term review of the MFF[64], is based on expenditure committed under the intervention fields. The European Court of Auditors report on performance against the 20% target suggests that there are weaknesses in the Commission's approach to the use of markers; however, the main weaknesses identified, particularly those where it considers the markers are applied in an over-generous manner, concern the Common Agriculture Policy funds: the EAFRD and the European Agricultural Guarantee Fund. A key weakness in the approach, however, is that it does not distinguish between the contribution of expenditure to climate mitigation objectives, and the contribution to climate adaptation objectives. The two policy objectives are very different in nature, with different outputs and targets; not being able to identify separately the contribution to each therefore makes it difficult for policymakers to assess the adequacy of the contribution.

3.2.3. Monitoring outputs and results

In addition to the tracking of expenditure on climate outputs and results will also be monitored. Partly in response to the weaknesses identified in the monitoring of outputs and results in the 2007-2013 period (see section 2 above) the EU legislators have introduced a much more standardised approach, including a set of common output indicators. Climate and energy relevant common output indicators[65] for ERDF support under the investment for growth and jobs are:

- Additional capacity of renewable energy production (MW),
- Number of households with improved energy consumption classification (households),
- Decrease of annual primary energy consumption of public buildings (kWh/year),
- Number of additional energy users connected to smart grids (users), and
- Estimated annual decrease of GHG (tonnes of CO_{2eq}).

In addition, with relevance to climate change adaptation, the following common output[39] indicators have been adopted:

- Population benefiting from flood protection measures (persons),
- Population benefiting from forest fire protection measures (persons),

[63] COWI (2016), op. cit.
[64] C SWD(2016) 299 final: Commission staff working document accompanying the Communication from the Commission to the European Parliament and the Council "Mid-term review/revision of the multiannual financial framework 2014-2020".
[65] Annex I of the ERDF regulation.

- Total surface area of rehabilitated land (hectares),
- Surface area of habitats supported in order to attain a better conservation status hectares).

It should be noted that some Urban Development specific indicators, namely:

- Public or commercial buildings built or renovated in urban areas (square meters),
- Rehabilitated housing in urban areas (housing units), and
- Population living in areas with integrated urban development strategies (persons)

are closely linked to climate investment especially in terms of energy efficiency and climate change mitigation and adaptation strategies. This link is embedded in article 7 of the ERDF regulation which stipulates that the ERDF should support sustainable urban development through integrated strategies that tackle the economic, environmental, climate, social and demographic challenges of urban areas. Such integrated actions shall be supported with at least 5% of the ERDF resources allocated at national level under the Investment for growth and jobs goal[66]. Digitalisation can also be an important catalyst for decarbonisation[67].

3.3. Expected results in practice

3.3.1. Mitigation – outline of Commission information on impact of mainstreaming

There is very little information available on the contribution to climate change mitigation and adaptation under the cohesion policy 2014-2020 so far. It is certain however that it is different for each of the ESIF. The expectations about the final, aggregate results have been derived from ESIF operational programmes and presented by DG REGIO on its Open Data website (InfoRegio).

According to InfoRegio data, ESI Funds will contribute to GHG emission decrease by 27 336 120 tonnes of CO_{2eq} per year (Figure 2). Over 90% of that figure is decided under operational programmes, and around 4% has been implemented[68].

The recorded emission level in 2015 was 4 451 Mt CO_{2eq} in 2015[69]. To achieve the 2020 target (a 20% GHG emission reduction by 2020 compared with 1990 levels) EU's emissions should not exceed 4 588 Mt CO_{2eq} in 2020. It means that on average, the EU's GHG emissions could increase by 27.4 Mt CO_{2eq} per annum between 2015 and 2020 and still meet the legislated target of 20% cut in greenhouse gas emissions from 1990 levels[70]. The EEA's projections however show that even under a conservative scenario (WEM, with existing measures), 4 387 Mt CO_{2eq} will be emitted by EU in 2020, so the 20% target will be overshot. The WEM scenario represents a 64 Mt CO_{2eq} emission reduction between 2015 and 2020, or 12.8 Mt CO_{2eq} per year.

A more ambitious projection, known as the WAM scenario (with additional measures) projects 133 Mt CO_{2eq} emission reduction between 2015 and 2020, or 26.6 Mt CO_{2eq} per year. The estimated annual reduction of GHG emission as programmed under the ESI Funds (27.3 Mt CO_{2eq}, figure 5) therefore appears at first sight to be slightly above the levels needed to achieve

[66] Article 7 of the ERDF regulation.
[67] Tagliapietra, S., Zachmann, G., Going local: empowering cities to lead EU decarbonisation, Policy Contribution, Issue n°22 | 2016, http://bruegel.org/2016/11/going-local-empowering-cities-to-lead-eu-decarbonisation/
[68] https://cohesiondata.ec.europa.eu/themes/4
[69] EEA (2016), Greenhouse gas (GHG) emission trends, projections and targets in the EU, https://www.eea.europa.eu/data-and-maps/daviz/greenhouse-gas-ghg-emission-trends-2#tab-chart_1
[70] See: Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ L 140, 5.6.2009, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0029

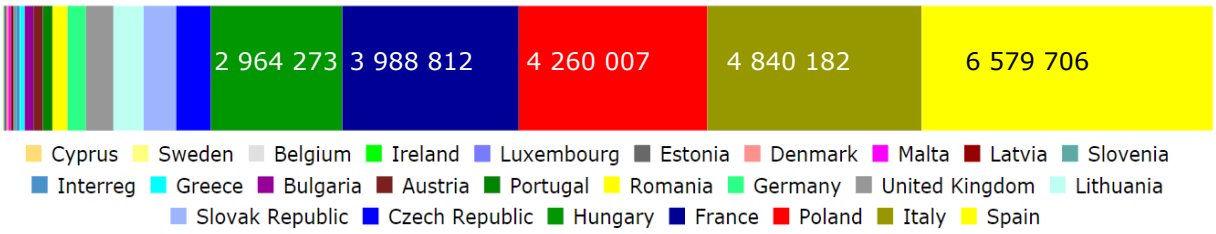
a 25% GHG emission reduction by 2020, compared with 1990 levels (and the optimistic WAM scenario to come true).

However, this points to the key underlying weakness in the emissions reductions estimates associated with operational programmes and individual projects. In the absence of a stringent and consistent common methodology for estimating the emissions benefits, it is not possible to know whether the savings recorded are:

- Additional to business as usual (for example, investment in renewable power installations may already be assumed to be happening as a response to other low carbon policies).
- Net emissions savings (for example, an energy efficiency improvement as part of an upgrade of an industrial process may record savings based on the energy demand before the upgrade, but in practice, the total energy demand may even have increased as a result of the upgrade, for example, in response to increased output because production is now more profitable).
- Double-counted with other emissions reduction policies (for example, the saving in energy emissions from an energy efficiency project may record the full current carbon impact based on the current carbon-intensity of energy production – but as carbon intensity of energy production reduces, so too will the annual carbon savings of the project).

While some efforts have been made to ensure a rigorous approach to the estimation of emissions savings (for example "CO2MPARE: the CO2 Model for Operational Programme Assessment in EU Regions"[71]), uptake is voluntary and has not been assessed. If cohesion policy is to be seen as a serious instrument addressing delivery of the EU's climate and energy targets, its results need to be measured in a way which is consistent with the measurement of those targets.

Figure 4 Estimated annual decrease of GHG: overview of programme targets (tonnes of CO_2 equivalent)[72]



Source: InfoRegio

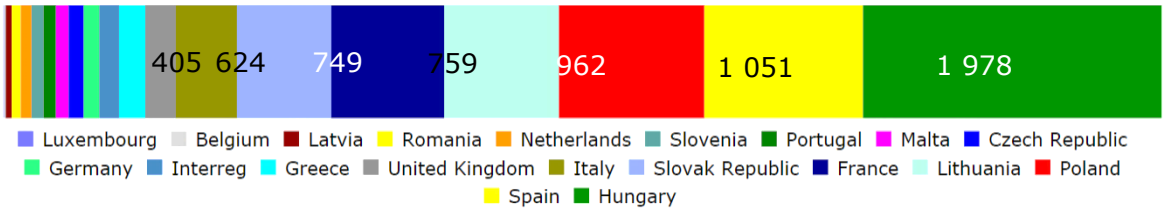
In terms of renewable energy sources, the cumulative ambition set out by Member States in their programmes is to install 7.67 GW of additional capacity with the support of ESI Funds

[71] Hekkenberg, M. et al. (2013), CO2MPARE - CO2 Model for Operational Programme Assessment in EU Regions Improved carbon management with EU Regional Policy, final report, http://ec.europa.eu/regional_policy/sources/docgener/presenta/co2mpare/CO2MPARE_Final_report.pdf

[72] The figures not displayed but provided on InfoRegio for the Member States at the lower range of the estimated annual decrease of GHG emissions are (Tonnes of CO2eq):Czech Republic 785 400, Slovakia 738 580, Lithuania 680 000, UK 623 101, Germany 411 796, Romania 342 542, Portugal 215 482, Austria 213 000, Bulgaria 198 412, Greece 102 733, Iterreg 82 450, Slovenia 63 000, Latvia 62 710, Malta 57 100, Denmark 41 000, Estonia 40 000, Luxembourg 15 000, Ireland 13 505, Belgium 11 058, Sweden 6 271, and Cyprus 0. Source: InfoRegio https://cohesiondata.ec.europa.eu/themes/4

(Figure 6). So far about 11% of that volume has been committed under operational programmes (funding commitment to the selected projects).

Figure 5: Additional capacity of renewable energy production: overview of programme targets (MW)[73]

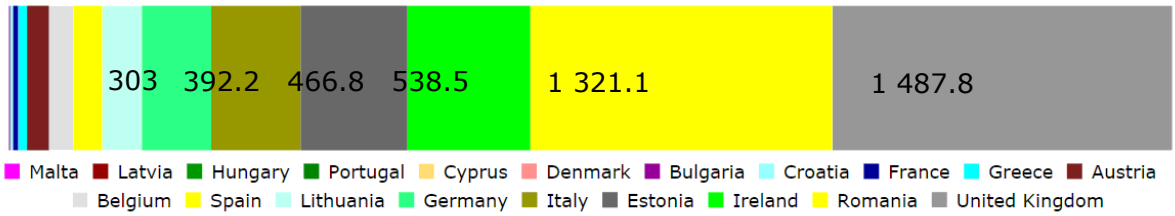


Source: InfoRegio

There is no information on the types of sources and energy that will feed into the planned 7.67GW of additional capacity (heat and power combined). To put this figure into perspective it represents around 1.5% of the additional installed RES capacity across EU required between 2012 and 2020 in order to ensure a 20% RES share in the overall energy mix (see Annex 4)[74].

According to the findings by COWI (2016), it is the EAFRD that takes up the lion share (57.1%) of all the ESIF 2014-2020 (especially in wealthier part of the EU, i.e. EU-13). One expected result is measured in hectares of "agricultural land under supported management contracts to reduce GHG and/or ammonia emissions" (figure 7 below). Overall out over 5 million ha to be managed with low-GHG gas and ammonia emission schemes, more than 1.6 million hectares are applying them already.

Figure 6: Agricultural land under supported management contracts to reduce GHG and/or ammonia emissions: overview of programme targets (thousand hectares)[75]



Source: InfoRegio

The results of cohesion policy investment relevant to climate mitigation depends also on the so called **ex ante conditionalities** (ExAC) laid down in Article 19 of the CPR. The aim of the ExAC is to ensure effectiveness and durability of supported investment by making sure that the policy, regulatory and institutional frameworks are fit for this purpose. The ExAC, a novelty in the 2014-2020 programming period, set general as well as "sector-specific and horizontal

[73] The figures not displayed but provided on InfoRegio for the Member States at the lower range of the estimated additional capacity of renewable energy production (MW) are: UK 202, Greece 174, Interreg 130, Germany 104, Czech Republic 100, Malta 84, Portugal 81, Slovenia 80, the Netherlands 72, Romania 60, Latvia 39, Belgium 11, and Luxembourg 5. Source: InfoRegio https://cohesiondata.ec.europa.eu/themes/4

[74] EEA (2016), Renewable energy in Europe 2016: Recent growth and knock-on effects, EEA Report No 4/2016, https://www.eea.europa.eu/publications/renewable-energy-in-europe-2016

[75] The figures not displayed but provided on InfoRegio for the Member States at the lower range of the estimated agricultural land under supported management contracts to reduce GHG and/or ammonia emissions (ha) are: Lithuania 173 400, Spain 127 769, Belgium 105 540, Austria 96 667, Greece 37 819, France 22 829, Croatia 12 000, Bulgaria 7 000, Denmark 213,and 0 in case of Cyprus, Portugal, Hungary, Latvia and Malta. Source: InfoRegio https://cohesiondata.ec.europa.eu/themes/4

conditions to be met at an early stage of implementation and by the end of 2016 at the latest"[76]. Under TO 4, the ExAC is that Member States should have carried out actions:

- "to promote cost-effective improvements of energy end use efficiency and cost-effective investment in energy efficiency when constructing or renovating buildings". In practice, this means that Member States are required to comply with key requirement of the Energy Performance of Buildings Directive (2010/31/EU)[77], the Energy Efficiency Directive (2012/27/EU)[78], and the Energy Services Directive (2006/32/EC)[79].
- "to promote high-efficiency co-generation of heat and power." In practice this means that Member States are required to comply with key requirements of Directive 2004/8/EC[80] on the promotion of cogeneration.
- "to promote the production and distribution of renewable energy sources." In practice this means that Member States are required to comply with key requirement of the Renewable Energy Directive (2009/28/EC)[81].

In cases of non-compliance with ExAC, the Member States are required to adopt an action plan on how to bridge the compliance gap.

Although it is too early to assess the full impact of this new requirement, a recent assessment by ICF et al. for the Commission concludes that application of ExAC has already:

> "helped identify situations in which relevant regulatory, institutional or strategic preconditions for effective intervention had not been met at the time of programme adoption. They have encouraged Member States to put in place necessary remedial actions and mobilise resources needed to address these issues."[82]

By aligning the policy, regulatory and institutional framework with investment needs the ExAC have the potential to remove important bottlenecks of low carbon transition. The introduction of ex ante conditionalities appears to be a powerful tool to enhance the contribution of ESI Funds to climate action, and climate change mitigation in particular[83].

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[76] InfoRegio website: http://ec.europa.eu/regional_policy/en/information/publications/studies/2017/the-value-added-of-ex-ante-conditionalities-in-the-european-structural-and-investment-funds-esi-funds

[77] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18.6.2010, p. 13–35, http://eur-lex.europa.eu/legal-content/en/ALL/?uri=celex:32010L0031

[78] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, OJ L 315, 14.11.2012, p. 1–56, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2012.315.01.0001.01.ENG&toc=OJ:L:2012:315:TOC

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[82] ICF, Potentia, Metis et al. (2016), « The implementation of the provisions in relation to the ex ante conditionalities during the programming phase of the European Structural and Investment (ESI) Funds", http://ec.europa.eu/regional_policy/sources/policy/how/studies_integration/impl_exante_esif_report_en.pdf

[83] More on ExAC added value can be found in EC (2017) "The Value Added of Ex ante Conditionalities in the European Structural and Investment Funds" COMMISSION STAFF WORKING DOCUMENT, SWD(2017) 127 final http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/value_added_exac_esif_en.pdf

3.3.2. Adaptation – outline of expected outcomes

The ERDF and Cohesion Fund contribution to TO 5 focuses on the investment priority "Promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems". Climate change caused natural disasters often have cross-border effects, and risk prevention is considered by the Commission to be "vital to preserving the capacity for further socio-economic development. It is also more effective than bearing the cost of inaction: for every EUR 1 spent on prevention, EUR 4 or more will be saved on response."[84].

Fulfilment of this priority can be achieved by putting in place a national or regional risk assessment as a part of the ExAC under TO 5. The ExAC sets out a requirement for the regional or national risk assessments to:

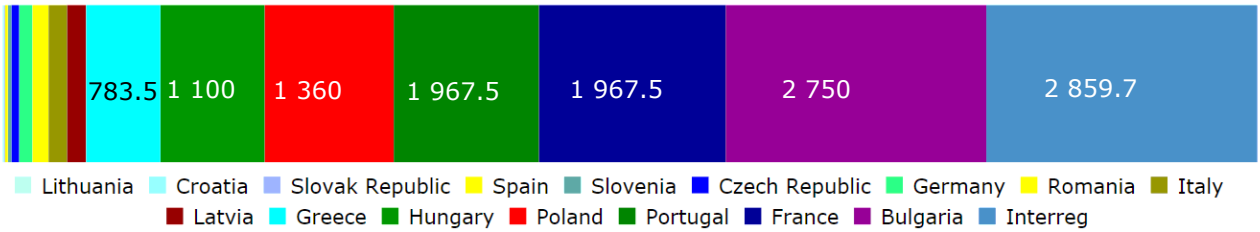
- include a description of the process, methodology, methods, and non-sensitive data used for risk assessment as well as of the risk-based criteria for the prioritisation of investment;
- include a description of single- risk and multi-risk scenarios;
- take into account, where appropriate, national climate change adaptation strategies[85].

Under the EAFRD key actions address:

- sustainable water management, including water efficiency (with regard to ecosystems), through the creation of on-farm water storage zones; support for water-efficient cropping patterns; and the establishment and management of forest protection belts against erosion;
- improved soil management through support for practices to prevent soil degradation and depletion of soil carbon stock, such as low tillage, winter green cover, and the establishment of agro-forestry systems and new forests;
- ensuring a high potential for adaptation to climate change and diseases and maintaining genetic diversity, especially by supporting local crop varieties and livestock breeds

An overview of programme targets provided on the InfoRegio website shows that 13.2 million people will benefit from flood protection measures as a result of the ESIF supported programmes implementation (see figure 7 below).

Figure 7: Population benefiting from flood protection measures: overview of programme targets (thousand persons)[86]



Source: InfoRegio

[84] EC (2016), Funding opportunities to support disaster risk prevention in the cohesion policy 2014-2020 period, http://ec.europa.eu/regional_policy/sources/docgener/informat/factsheet_disaster_risk_prevention_03.pdf

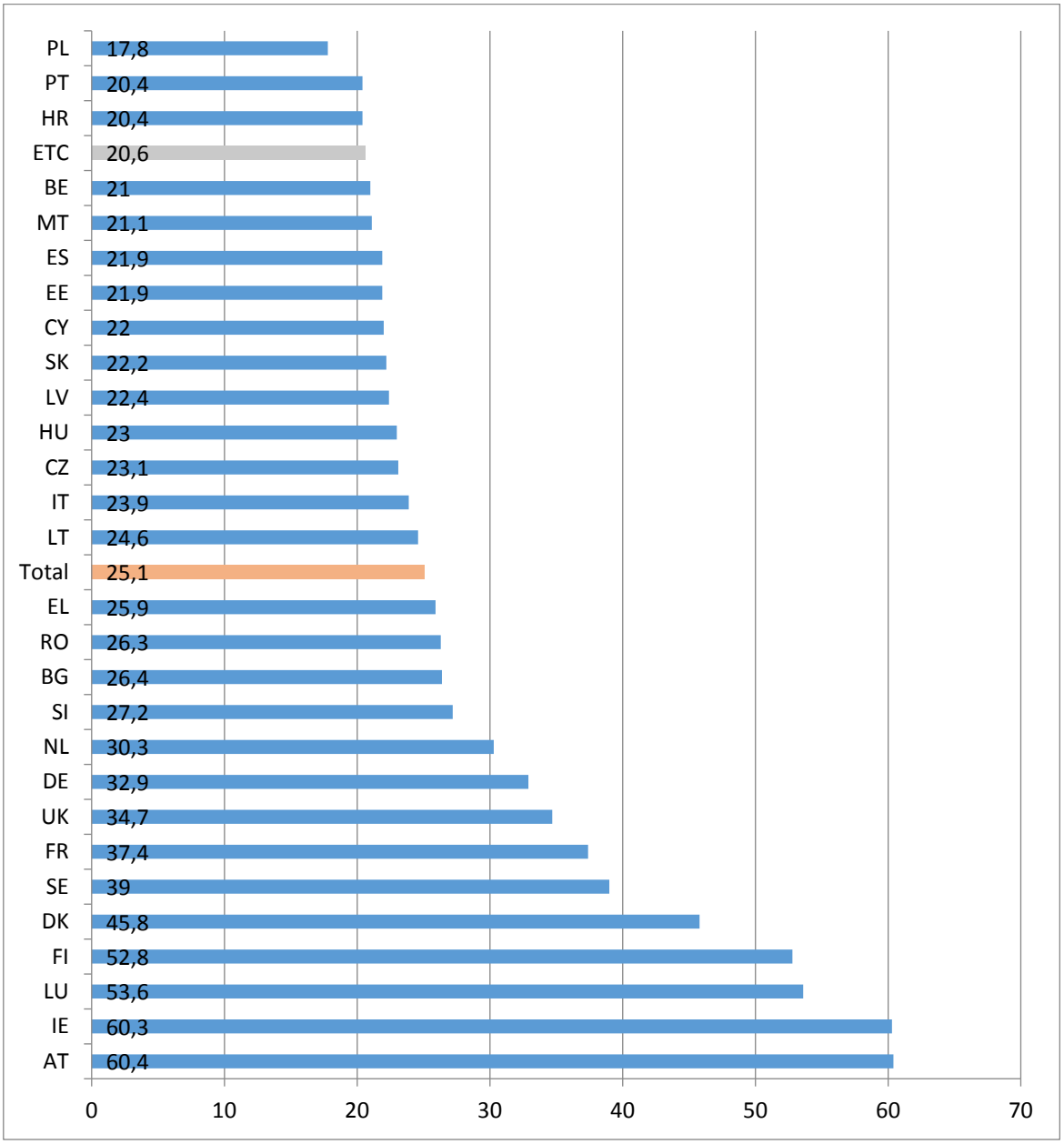
[85] Common Provisions Regulation, Annex XI : Ex ante conditionalities.

[86] The figures not displayed but provided on InfoRegio for the Member States at the lower range of the estimated population benefiting from flood protection measures are: 200 000 in Latvia, 196 040 in Italy, 170 000 in Romania, 140 000 in Germany, 80 000 in the Czech Republic, 38 427 in Slovenia, 31 609 in Spain, 12 744 in Slovakia, 10 000 in Croatia, and 3 200 in Lithuania. Source: InfoRegio https://cohesiondata.ec.europa.eu/themes/5

3.4. ESI Funds support to climate action in Member States

A study published by COWI in 2016 includes estimates on the share of allocations for climate action under all ESI funds for each MS (Figure 8) that show that the range of relative allocations is between 17.8% (Poland) to 60.4% (Austria).

Figure 8: Share of support for climate action under all ESI Funds per Member States



Source: IEEP based on COWI (2016), p. 36

It should be noted, however, that this data is based on the allocation to thematic objectives included in programmes, rather than on the more detailed intervention codes that the Commission is using to track expenditure.

As explained in the section 1 "Introduction" we have examined two examples of Member State implementation of ESIF programming requirements for 2014-2020, the results of which are set out in Annex 2 (Poland) and Annex 3 (Hungary).

4. POSSIBLE EVOLUTION OF THE POST-2020 COHESION POLICY

KEY FINDINGS

- In future MFFs the mainstreaming of climate objectives should be further improved, in particular by ensuring that EU expenditure provides a specific, measurable contribution towards the delivery of EU targets.
- Effectiveness of mainstreaming in the ERDF and CF could be improved by linking cohesion policy investments more closely to Member States' overall plans to deliver the 2030 targets, in the context of a trajectory leading to a longer- term decarbonisation of the EU economy (with a similar approach taken to other relevant areas of the budget, such as the first pillar of the CAP). The assessment of the performance of operational programmes should therefore consider the effectiveness of their contribution to GHG emission reduction.
- A common methodology is needed for assessing the climate mitigation impacts of investments and programmes, in particular to address risks of double-counting and ensure that mitigation impacts are measured against a clear baseline, and are additional to a business-as-usual scenario.
- The Paris Agreement reinforces the need for delivery of existing targets, but also points to the importance of progressively more ambitious action over the medium term. Policies need to be based on an ambitious long-term decarbonisation trajectory.
- The coherence between investment choices and long-term strategies should be strengthened in order to avoid investment lock-in or delays in reaching goals; this has particular implications for ERDF and CF investment.
- Mitigation from land use sectors is likely to become increasingly important; while this is likely to remain primarily the focus of EAFRD expenditure, ERDF and CF programmes can contribute through accompanying measures in respect of e.g. food waste management, bio-energy sustainability.
- Innovation policy and the urban dimension are fertile ground for synergies between climate objectives and the wider economic objectives of cohesion policy. Operational programmes should be closely linked to innovation policies at EU and Member State level, to ensure rapid deployment of new low-carbon technologies; cities should be emphasised as a testing ground for new approaches to achieving radical decarbonisation.
- There should be a close link between Member State approaches to the deployment of ESIF expenditure, and their national adaptation strategies and plans, particularly where EU funds represent a high proportion of available public expenditure.
- ESIF expenditure can contribute to the Paris Agreement aim of enhancing capacity for climate resilience, through identification by national authorities and the Commission of flagship projects providing lessons of broader relevance.

There are two broad requirements for the further development of climate mainstreaming in cohesion policy post-2020. The first is to ensure that mainstreaming is more effective, and more target-focused. The second is to identify and reflect the implications of the European Union's commitments under the Paris Agreement. We will deal first with the need for a more effective and target-focused approach.

4.1.1. More effective and target-focused climate mainstreaming

The commitment to spend 20% of the EU budget on climate objectives was an important step forward in ensuring that EU expenditure is focused on one of the key policy objectives identified by Parliament, Commission and Council. However, as noted in a number of places in this report, it has weaknesses in definition and in execution. In particular, the fact that the target reflects the aim of delivering multiple benefits from EU expenditure weakens the focus on climate objectives implied by the 20% target. It also creates perverse incentives for programming authorities to label expenditure as climate relevant, rather than to choose other categories of expenditure.

While the mainstreaming of climate objectives into cohesion expenditure has, as we note above, had a positive impact, particularly in those Member States where cohesion funding represents a significant proportion of available funds for public investment, there are therefore a number of areas where the mechanisms adopted could be strengthened, and focused more directly on the delivery of the EU's shared climate and energy objectives. In particular, we identify:

- A need for cohesion policy investments to have **a clear link to Member State plans for delivery of the overall mitigation requirements to deliver the 2030 targets**, and in particular for their achievements to be measured on the same basis.
- Delivery of emissions reductions in practice should be a **key element in the assessment of performance of operational programmes**, and should ideally be linked to the future availability of funding (for example, through the further development of performance reserves linked to climate).
- **Links with reporting obligations under the Energy Union governance** proposals should be clearly articulated.

Given this need for a clear link to delivery of mitigation targets, and the potential risk of bias we identify in the identification of climate relevance of projects, we recommend that early progress should be made in the development of a common methodology for identifying the net GHG implications of programmes and projects. While the need for greater clarity on the link between expenditure and delivery of mitigation targets applies throughout relevant areas of the EU budget, there are particular issues to be addressed in areas of the budget which (like cohesion policy, and like the CAP) operate under shared management.

- A **common methodology for assessing climate impacts** is needed, which ensures consistency of reporting across ESIF programmes, addresses risks of double-counting, reflects a clear baseline, and ensures that the carbon savings recorded are additional to the business-as-usual trajectory for the Member State or region concerned and that the net ESIF contribution to delivery of Member State and EU targets can be clearly identified.

A clearer focus on specific targets implies a distinction in programming and monitoring between climate mitigation on the one hand, and climate adaptation on the other hand. While objectively measurable targets for climate mitigation, in line with the overall EU targets, are relatively straightforward to define, climate adaptation and enhanced climate resilience are more complex to measure.

- While it would not be possible to develop targets similar to mitigation targets, with clear numbers and a similar level of coherence at the EU level, for climate adaptation, **Member States and programming authorities should be encouraged to identify clear and measurable objectives relevant to their own circumstances**.

- The **contribution of ESIF expenditure to climate resilience should be an important element in Member States' climate adaptation strategies and plans**, and should be responsive to emerging information on climate threats, **including** updated projections. The degree of emphasis on the contribution of ESIF expenditure should be proportionately greater in those Member States where EU funds represent a higher proportion of available public expenditure.
- Future ESIF supported investment could also **link to urban planning of green public infrastructure** that is, as recommended by the EEA, both larger and more accessible than today. A fabric of connected public green spaces and bodies of water can improve social cohesion and living conditions for all, avoiding socio-ecological inequities[87].

4.1.2. Paris Agreement

The key implications of the Paris Agreement for EU action on climate are to reinforce the need for effective delivery of existing targets, while emphasising the need for progressively more ambitious action over the medium to long term, with a wider range of economic sectors contributing. The Commission's communication "The Road from Paris"[88] notes that the 2030 targets were enshrined in the agreement, and concludes that therefore:

> "The EU needs to consolidate the enabling environment for the transition to a low carbon economy through a wide range of interacting policies, strategic frameworks and instruments reflected under the 10 priorities of the Juncker Commission".

However, there are a number of aspects of the Paris Agreement that clearly signal a requirement for greater ambition. The first of these is the overall ambition of limiting global warming to well below 2°C, and to pursue efforts to limit it to 1.5°C above pre-industrial levels. Both objectives, and particularly the 1.5° target, require a significantly more ambitious trajectory of emissions reductions from developed economies such as the EU. The introduction of a dynamic mechanism to take stock and strengthen ambition, including through a regular 5-year "global stocktake", is aimed at delivering this increased ambition, and thus has implications for the next and subsequent ESIF programming periods. There is thus a need both for greater urgency in the delivery of emissions reductions, and for policy to be based on an ambitious decarbonisation trajectory, avoiding lock-in of relatively carbon-intensive investment (for example, in transport infrastructure), and ensuring early investment in low-carbon infrastructure needed to facilitate longer-term emissions reductions. A cohesion policy response to this could therefore be based on the following principles:

- **Greater coherence of investment with a long-term decarbonisation trajectory for the region/Member State/ EU market as a whole**; while the main focus of this enhanced coherence should be on programming at Member State and regional level, it also has clear implications for transnational and cross-border cooperation mechanisms, given the importance of greater integration of energy markets in order to maximise the effectiveness of grid management responses to energy efficiency and renewable energy supply.
- **A focus on measures likely to be required to facilitate or unlock market potential for ambitious decarbonisation** (for example, the electrification of transport infrastructure);

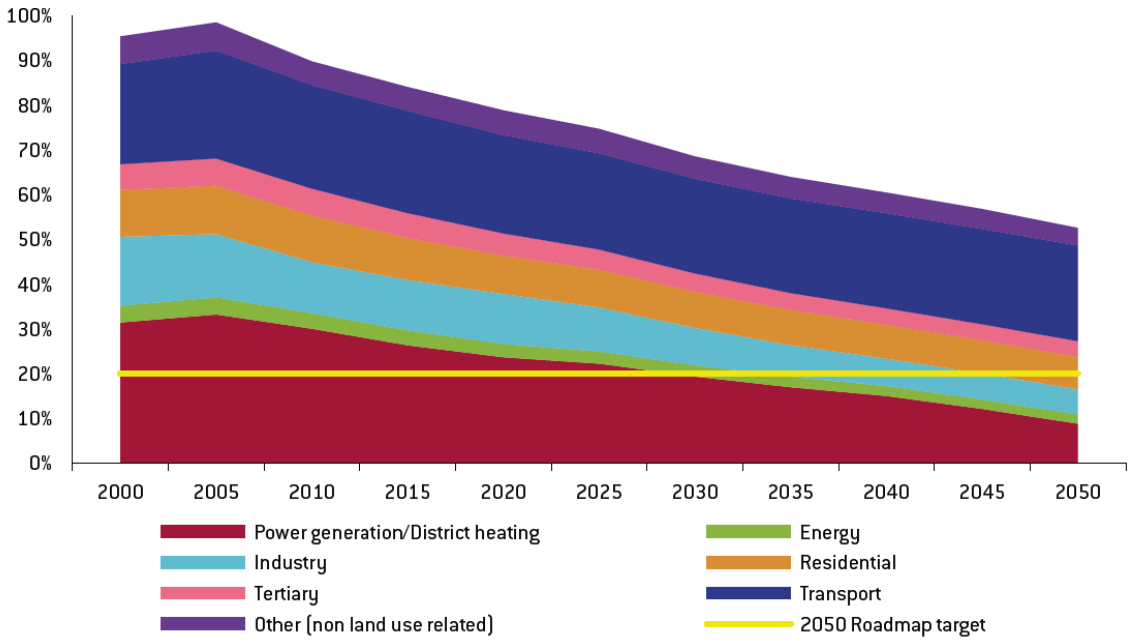
[87] EEA(2016), op. cit.
[88] COM (2016) 110 final "The Road from Paris: assessing the implications of the Paris Agreement"

- **The development of new markets for low carbon goods and services**, in order to ensure a more self-sustaining development of investment in future (for example, investment in the skills and infrastructure necessary for energy efficiency investment; or encouraging the development of a vibrant market for financing ambitious decarbonisation projects).

Box 6: Climate investment made under 2014-2020 seen from the mid-century perspective

The EU's current 2050 decarbonisation pathway is based on the 2 degrees Celsius global temperature rise in this century compared to pre-industrial levels. Such is also the lower range of the Paris Agreement ambition; the higher being 1.5 degrees Celsius temperature increase. The figure below compares the estimates of EU greenhouse gas emission reductions under current policies against its strategic targets by 2050.

EU GHG emissions reduction scenario under current policies vs 2050 target (1990=100%)



Source: Bruegel based on European Commission (2016)

Delivering on the 1.5 degree Celsius, or even 2 degree Celsius ambition requires significantly enhanced mitigation measures and revised GHG emission reduction scenarios. From this perspective, the investment made under 2014-2020 programming period is vital. It may boost low (or zero-) carbon transition in longer term (by creating relevant markets, infrastructure and technologies), but it can also lock in investment that is not in line with decarbonisation path ways. It is therefore important to look at the investment choices made today from the mid-century perspective[1] and set the stage for more ambitious targets delivered under future MFFs. As indicated in the Energy Roadmap 2050, "acting now can avoid costly changes in later decades and reduces lock-in effects"[1]. The Roadmap refers also to the IEA World Energy Outlook 2011 estimates that "for every $1 of investment avoided in the power sector before 2020 an additional $4.3 would need to be spent after 2020 to compensate for the increased emissions"[1]. It is worth noting that the risk of investment lock-in is not only relevant to climate change mitigation, but also (and in a rather acute way) to climate change adaptation, for example infrastructure resilience to extreme climatic events.

Moreover, a 1.5°C target will almost certainly require the EU and other developed economies to move towards net zero or negative emissions in the longer term, which in turn suggests an increased focus on sectors, such as agriculture and land use, where emissions reductions have proven difficult to achieve, and where there is potential for enhanced carbon sequestration. While the focus of this report has been on ERDF and CF expenditure, it will clearly be important for Member State approaches to ESIF investment to maximise the potential contribution of the European Agricultural and Rural Development Fund to delivery of carbon mitigation objectives[89]. In addition:

- **Accompanying measures in ERDF and CF operational programmes to facilitate land use mitigation may be of particular value** – for example, food waste reduction, ensuring greater sustainability of bio-energy, etc.

Given the overall level of ambition of the Paris Agreement, the Commission has in particular noted the importance of an emphasis on low carbon innovation. Expenditure on climate change under Horizon 2020 has increased significantly over the current financial perspective; however, the Commission notes (in "The Road from Paris") that future research investment should tap into "the synergies between energy, transport, circular economy, industrial and digital innovation".

- **Operational programmes should ideally be closely linked to innovation policies and EU and Member State level** to ensure maximum speed of deployment of new low-carbon technologies, in order to bring forward learning effects and cost reductions.

Finally, in terms of climate mitigation, the Commission has noted that "Smart cities and urban communities are the place where a big part of the future transformation will actually happen"[90]. As noted above in this report, cities are increasingly seen as key players in the energy and climate transformation. As the urban dimension of cohesion policy develops, further consideration should be given to the links with climate objectives, and in particular the scope for cities to be used as a testing ground for delivering radical decarbonisation alongside economic well-being.

- The extent to which **future cohesion policy facilitates an ambitious contribution from cities to the EU's climate transition**, and integrates it into a coherent decarbonisation agenda, will therefore be a key success criterion.

On adaptation, Paris establishes a new global goal which aims to enhance capacity for climate resilience and reducing climate vulnerability. The principle implications of this are likely to be for the EU's external expenditure.

- However, there is also value in identifying **flagship climate resilience projects** funded through cohesion policy, which can **provide valuable lessons both within and beyond the EU's borders**.

[89] See in this regard the recent report for the Agriculture Committee, "The consequences of climate change for EU agriculture: Follow-up to the COP 21 UN Paris Climate Change Conference", IEEP 2017.

[90] Ibidem.

5. SUMMARY AND CONCLUSIONS

KEY FINDINGS

- While climate mainstreaming in the 2014-2020 period represents a step forward, further change from 2020 onwards is necessary in order to (i) learn lessons from the implementation of mainstreaming and (ii) reflect the new policy context created by the Paris Agreement
- In particular, a clear link should be drawn between the contribution of cohesion programmes and Member States' overall delivery of climate mitigation targets; this implies greater standardisation of the assessment (and monitoring) of climate mitigation impacts.
- The Paris Agreement requires a greater focus on the contribution to, and compatibility with, long-term decarbonisation goals.
- In line with the "Budget focused on results" initiative, the Commission should identify the expected contribution of future cohesion expenditure to overall EU climate objectives.

The commitment to spend 20% of the EU budget on climate objectives, and the increased emphasis on integrating climate objectives into strategies for investment, has helped to improve the focus of Member State and regional programmes on climate mitigation and adaptation. While there was some evidence of a positive contribution to climate objectives from earlier programming periods, particularly 2007-2013, comparable data on inputs and results was lacking. Climate mainstreaming in the 2014-2020 period was thus an important step in ensuring that cohesion policy makes a clear and measurable contribution to a key EU policy objective.

However, experience of implementation of the climate mainstreaming requirements suggests that further ambition is required, both to improve the focus on the results of cohesion expenditure on climate change, and to reflect the changed policy context following the adoption and entry into force of the Paris Agreement. In particular, it now seems appropriate to move away from a focus on financial inputs (whose measurement is in any case likely to be imprecise), and towards a focus on the added value and in particular the concrete results of investment, in terms of reduced GHG emissions.

We have identified a number of recommendations:

- Cohesion policy investments should have a clear link to Member State plans for delivery of the overall mitigation requirements to deliver the 2030 targets, and in particular should be measured on the same basis.
- Delivery of emissions reductions in practice should be a key element in the assessment of performance of operational programmes, and should ideally be linked to the future availability of funding.
- Links with reporting obligations under the Energy Union governance proposals should be clearly articulated.
- A common methodology for assessing climate impacts is needed, which addresses risks of double-counting, reflects a clear baseline, and ensures that the carbon savings

recorded are additional to the business-as-usual trajectory for the Member State or region concerned.

- Member States and programming authorities should be encouraged to identify clear and measurable objectives on climate adaptation and resilience that are relevant to their own circumstances.
- The contribution of ESIF expenditure to climate resilience should be an important element in Member States' climate adaptation strategies and plans. The degree of emphasis on the contribution of ESIF expenditure should be proportionately greater in those Member States where EU funds represent a higher proportion of available public expenditure.
- In order to deliver the longer-term objectives of the Paris Agreement, there is a need for greater coherence of investment with a long-term decarbonisation trajectory for the region/Member State/ EU market as a whole.
- Future cohesion policy should include a focus on measures likely to be required to facilitate or unlock market potential for ambitious decarbonisation, and on the development of new markets for low carbon goods and services, in order to ensure a more self-sustaining development of investment in future
- Given the likely future importance of carbon sequestration and the GHG impacts of land use, accompanying measures in ERDF and CF operational programmes to facilitate land use mitigation may be of particular value.
- Operational programmes should ideally be closely linked to innovation policies at EU and Member State level to ensure maximum speed of deployment of new low-carbon technologies, in order to bring forward learning effects and cost reductions.
- The contribution of future cohesion policy to facilitating an ambitious contribution from cities to the EU's climate transition should be a key success criterion.
- Flagship climate resilience projects funded through future cohesion policy should be identified, in order to ensure that they provide lessons both within and beyond the EU's borders.

Finally, while these recommendations are largely focused on the mechanisms adopted by EU legislators and by the Commission for ensuring that Member States and programme authorities maximise the effectiveness of their delivery of climate objectives, it is also important for expenditure decisions at EU level to reflect the messages of the European Commission's "EU Budget focused on results" initiative[91]. It should thus be possible for the Commission, in bringing forward proposals for future cohesion expenditure, to estimate the intended impact in quantitative terms on delivery of the EU's climate targets; for legislators to bear those proposed targets in mind (and strengthen them as appropriate) in reaching their decisions on the budget and on the legislation governing programmes; and for the European public to be able to assess the effectiveness with which both national and EU-wide targets are delivered.

[91] For information on the EU Budget Focused on Results (BFOR) initiative see DG BUDG website: http://ec.europa.eu/budget/budget4results/initiative/index_en.cfm

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ANNEX 1: CLIMATE-RELATED INTERVENTION CODES AND THEIR ASSIGNED MARKERS

Category and intervention code	Coefficient
I. Productive investment	
003 Productive investment in large enterprises linked to low-carbon economy	40%
II. Infrastructure providing basic services and related investment	
009 Renewable energy: wind	100%
010 Renewable energy: solar	100%
011 Renewable energy: biomass	100%
012 Other renewable energy and renewable energy integration	100%
013 Energy efficiency renovation of public infrastructure, demonstration projects and supporting measures	100%
014 Energy efficiency renovation of existing housing stock, demonstration projects and supporting measures	100%
015 Intelligent energy distribution systems at medium+low voltage levels	100%
016 High efficiency co-generation and district heating	100%
021 Water management and drinking water conservation	40%
023 Environmental measures aimed at reducing/avoiding greenhouse gas emissions	100%
024 Railways (TEN-T Core)	40%
025 Railways (TEN-T comprehensive)	40%
026 Other Railways	40%
027 Mobile rail assets	40%
035 Multimodal transport (TEN-T)	40%
036 Multimodal transport	40%
039 Seaports (TEN-T)	40%
040 Other seaports	40%
041 Inland waterways and ports (TEN-T)	40%
042 Inland waterways and ports (regional and local)	40%
043 Clean urban transport infrastructure and promotion	40%
044 Intelligent transport systems	40%
IV. Development of endogenous potential	
065 Research and innovation infrastructure, processes, technology transfer and cooperation in enterprises focusing on the low carbon economy and on resilience to climate change	100%
068 Energy efficiency and demonstration projects in SMEs	100%
069 Support to environmentally-friendly production processes and resource efficiency in SMEs	40%
070 Promotion of energy efficiency in large enterprises	100%
071 Development and promotion of enterprises specialised in providing services contributing to low carbon economy/ resilience to climate change	100%
083 Air quality measures	40%
084 Integrated pollution prevention and control (IPPC)	40%
085 Protection and enhancement of biodiversity, nature protection and green infrastructure	40%
086 Protection, restoration and sustainable use of Natura 2000 sites	40%
090 Cycle tracks and footpaths	100%
100 Outermost regions: support to compensate additional costs due to climate conditions and relief difficulties	40%

Source: Commission Implementing Regulation (EU) No 215/2014 of 7 March 2014

ANNEX 2: ERDF AND CF PROGRAMMING IN POLAND

In May 2014 Poland and EC adopted a "Partnership Agreement"[92] (PA) setting down a strategy for use of cohesion policy funding over the 2014-2020 programming period. Poland may receive a total of EUR 77.6 billion, the highest allocated amount among the EU-28 for that period. Out of this, and estimated EUR 1.2 billion will be dedicated to adaptation.

Poland strives to dedicate 20% of its overall EU funds (including cohesion policy funds, EAFRD, CEF, EAGF, and EMFF) allocation to climate objectives. **The estimated share of climate related expenditure under the cohesion policy funds,** as set out in the PA, **is around EUR 11.7 billion** (EUR 22.7 billion from all funds including EUR 3.5 billion from EAFRD, EUR 1.5 billion from CEF, EUR 6 billion from EAGF).

An estimated **17.8% of the total ESIF financial allocation to Poland will be dedicated to climate action**[93] (see Figure 8 "Share of support for climate action under all ESI funds per Member States" in section 3.4). This is the lowest estimated *relative* ESIF allocation to climate action among EU-28. Nevertheless, the PA highlights importance of the EU funds contribution in national climate change mitigation and adaptation action.

In terms of mitigation, the PA refers to its links with the poor air quality in Poland resulting mostly from the so called **low level emission sources** i.e. inefficient fossil fuel heaters in urban areas. It also notes **energy security** considerations; Poland's significant investment needs in power infrastructure, namely grid and interconnectors. It recalls a risk of blackouts in case of heat waves exposing Polish power generation reliance on coal plants and cooling water availability. The measures to be supported are: improvement of energy efficiency, development of renewable energy sources, and demand side response ("smart" grid solutions). In urban areas, the main focus will be on investment in sustainable transportation (including promotion of public transport), building refurbishment and air quality improvements.

On adaptation, the PA refers to Poland's vulnerability to climate change and its lack of effective **risk management systems**. Particularly severe impacts of climate change, as stated in the PA, are expected in **urban areas, agriculture,** and on **the Baltic coast line**. The measures to be supported (under TO 5) are: reduction of vulnerabilities of areas and sectors with regard to climate change and improvement of risk management systems. In urban areas the focus will be on risk prevention and management plans, mainly flood and drought protection plans.

Concrete contributions of two main EU cohesion policy funds supporting climate action in Poland in 2014-2020 period are presented in Table 1 below.

[92] Ministry of Infrastructure and Development (2014), „Programowaniie perspektywy fiinansowej - Polska - 2014-2020", https://ec.europa.eu/info/sites/info/files/partnership-agreement-poland-may2014_pl.pdf
[93] COWI (2016), op. cit.

Table 1: Poland's indicative allocations for ERDF and the Cohesion Fund per Thematic Objective in Poland over 2014-2020 programming period

Thematic Objective	ERDF (mln €)	ERDF (%)	CF (mln €)	CF (%)
TO 1: Strengthening research, technological development and innovation	9 921	25%	0	0%
TO 2: Enhancing access to, and use and quality of, ICT	3 082	8%	0	0%
TO 3: Enhancing the competitiveness of SMEs	5 609	14%	0	0%
TO 4: Supporting the shift towards a **low-carbon economy** in all sectors	5 652	14%	3 537	15%
TO 5: Promoting climate **change adaptation**, risk prevention and management	419	1%	700	3%
TO 6: Preserving and protecting the environment and promoting resource efficiency	2 764	7%	3 108	13%
TO 7: Promoting sustainable transport and removing bottlenecks in key network infrastructures	8 964	22%	14 832	64%
TO 8: Promoting sustainable and quality employment and supporting labour mobility	219	1%	0	0%
TO 9: Promoting social inclusion, combating poverty and any discrimination	2 634	7%	0	0%
TO 10: Investing in education, training and vocational training for skills and lifelong learning	551	1%	0	0%
TO 11: Enhancing institutional capacity and efficient public administration	0	0%	0	0%
Technical assistance	399	1%	1 030	4%
Total	**40 214**	**100%**	**23 208**	**100%**

Source: Figures provided in the Partnership Agreement (2014)

In the 2014-2020 programming period Poland disburses cohesion policy funds through twenty two operational programmes, including sixteen regional OPs.

A lion share (27.4 bln EUR) of the overall cohesion policy funds in Poland is allocated under **the OP "Infrastructrure and Environment"** (OPI&E). This is the biggest OP ever adopted as part of the EU policies. Although the OPI&E provides support to almost all thematic objectives, three of them take up almost entirety of the OPI&E's budget:

- TO 7 sustainable transport and infrastructure (63.9 % including 18 % for rail);
- **TO 4 low-carbon economy (15 %);**
- **TO 5 climate change adaptation, risk prevention & management and environment protection (over 12 %)**[94].

Moreover investment in low carbon technologies are linked to innovation boosting measures supported under TO 1 and 3.

The expected impacts of the OP implementation that contribute to climate change mitigation include:

(i) increase in the share of **renewable energy** in gross final consumption to 15%,
(ii) **reduction of greenhouse gas emission** by 20.6% compared to 1990 levels;
(iii) decrease of travel time by road and rail between the main Polish cities to 3.7 hours, 522 kilometres of reconstructed or **upgraded railway**, and 167 new or modernised items of railway rolling stock.

An estimated EUR 452 million will be allocated to support the development of energy efficiency in buildings[95]. However, not all of the investments supported by the OPI&E can be considered climate-friendly without ambiguity (i.e. support will be given to new gas pipelines and motorways construction)[96].

The **regional OPs** allocation (EUR 31.3 billion divided into sixteen regional OPs) has also an important role to play in mainstreaming climate change funding. Taking into account the thematic objectives that are most suitable to accommodate climate investment, the regional OPs in Poland will allocate EUR **5.2 billion (ca. 17 % of the overall allocation) to low carbon economy transition** (TO 4, including 697 mln EUR allocation to energy efficiency in buildings) **and EUR 419 million (1.3 % of the overall allocation) to climate adaptation** (TO 5). Further EUR 2.3 billion (7.3 %) may be partly mainstreamed to climate objectives under the environmental protection and resource efficiency thematic objective (TO6).

To ensure that Polish investors make use of EU funds available over the 2014-2020 period, Polish government issued a "Guidance on preparing investment that takes into account climate change mitigation and adaptation including resilience to natural disasters"[97]. In general, taking into consideration Poland's climate and energy policies and readiness to benefit from EU's financial support, it is not an exaggeration to consider the Europe 2020 Strategy delivered through EU cohesion policy funds as *the key driver* of Polish climate change mitigation and adaptation action in the current programming period.

[94] DG REGIO official website, http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/poland/2014pl16m1op001
[95] Council of Ministers (2015), the National Reform Plan, http://ec.europa.eu/europe2020/pdf/csr2015/nrp2015_poland_en.pdf
[96] Ministry of Environment (2017), "Wykaz duzych projektow" http://www.funduszeeuropejskie.gov.pl/media/35304/20170324_WDP.doc
[97] Ministry of Environment (2015), Pordadnik przygotowania inwestycji z uwzględnieniem zmian klimatu, ich łagodzenia i przystosowania do tych zmian oraz odporności na klęski żywiołowe http://klimada.mos.gov.pl/blog/2015/10/30/poradnik_przygotowania_inwestycj/

ANNEX 3: ERDF AND CF PROGRAMMING IN HUNGARY

In August 2014, the European Commission together with Hungary has adopted the country's Partnership Agreement (PA)[98], which lays down the strategic framework of priorities and indicative allocations to the Thematic Objectives of the ESI Funds in Hungary. **In the 2014-202 programming period Hungary has allocated around EUR 21.9 billion for Cohesion Policy (ERDF, ESF, Cohesion Fund),** EUR 3.45 billion to the development of the agricultural sector and rural areas from the European Agricultural Fund for Rural Development (EAFRD) and around EUR 39 million for European Maritime and Fisheries Fund (EMFF).

Climate change objectives are already present at the level of the five main national priorities, which are also aligned with Hungary's National Development and Territorial Development Concept. These five priorities are the following:

- Improving the competitiveness and global performance of the business sector;
- Promoting employment through economic development, employment, education and social inclusion policies, taking account territorial disparities;
- Enhancing energy and resource efficiency;
- Tackling social inclusion and demographic challenges; and
- Implementation of local and territorial development aimed at promoting economic growth

The ESI Funds devoted to energy and resource efficiency are expected to provide a significant contribution to the country's objective to reduce energy consumption in buildings and to support the achievement of Hungary's renewable energy target of 14.65 %.

In total, according to a recently published report and estimate by COWI (2016) 23 % of all ESI Funds are dedicated to climate action. With this Hungary is in the lower middle-range amongst all EU Member States – the largest share at 60.4 % was estimated for Austria, while the lowest contribution was found at 17.8 % in Poland (see Figure 8 "Share of support for climate action under all ESI funds per Member States" in section 3.4).

Table 1 shows the share of allocation between the 11 Thematic Objectives[99] for ERDF and the Cohesion Fund. **For the directly climate-relevant thematic objective 4 (mitigation) 13.4 % and 14 % of the ERDF and CF were allocated, respectively**. **Nevertheless, for the adaptation theme (thematic objective 5) only the Cohesion Fund provided allocations at 14.6 %.** Thematic objectives 6 and 7 (protection of the environment and sustainable transport) can also support climate objectives and both the ERDF and CF provide allocations to them. For instance, the Cohesion Fund provides a significant share for sustainable transport objectives at 44.8 % of its total funds. These figures provide an indicative proxy on the level of climate change mainstreaming in the two funds and can provide a reflection on the overall 20 % climate-expenditure EU level target.

[98] Hungary's 2014-2020 PA can be accessed at the following website: https://ec.europa.eu/info/publications/partnership-agreement-hungary-2014-20_en

[99] The full description of Thematic Objectives can be found in earlier sections of this study.

Table 1: Hungary's indicative allocations for ERDF and the Cohesion Fund per Thematic Objectives

Thematic Objective	ERDF (mln €)	ERDF (%)	CF (mln €)	CF (%)
TO 1: Strengthening research, technological development and innovation	2,148.87	19.9%	0	0%
TO 2: Enhancing access to, and use and quality of, ICT	689.27	6.4%	0	0%
TO 3: Enhancing the competitiveness of SMEs	2,071.44	19.3%	0	0%
TO 4: Supporting the shift towards a **low-carbon economy** in all sectors	1,425.39	13.4%	845.60	14.0%
TO 5: Promoting **climate change adaptation**, risk prevention and management	0	0%	888.20	14.6%
TO 6: Preserving and protecting the environment and promoting resource efficiency	1,011.76	9.4%	1,397.48	23.2%
TO 7: Promoting sustainable transport and removing bottlenecks in key network infrastructures	631.01	5.8%	2,700.71	44.8%
TO 8: Promoting sustainable and quality employment and supporting labour mobility	1,497.95	13.9%	0	0%
TO 9: Promoting social inclusion, combating poverty and any discrimination	862.83	8.0%	0	0%
TO 10: Investing in education, training and vocational training for skills and lifelong learning	418.20	3.8%	0	0%
TO 11: Enhancing institutional capacity and efficient public administration	0	0%	0	0%
Technical assistance	0	0%	193.45	3.2%
Total	**10,756.78**	**100%**	**6,025.43**	**100%**

Source: own calculations based on EC (2014)

With regards to adaptation actions, the Hungarian PA particularly calls for the need to address water-use efficiency, to strengthen and improve the infrastructure for disaster risk reduction and to better inform the public. With regards to mitigation, the PA refers to the need to further reduce GHG emissions but at the same time to address Hungary's energy security concerns,

increase the use of renewable energy sources, improve buildings' energy efficiency and to improve energy generation and distribution. The role of sustainable transport in reducing emissions is also emphasised.

Moreover, Hungary's Partnership Agreement for the 2014-2020 programming period plays a significant attention on territorial dimensions, in particular in the area of urban development. Within the territorial OPs a dedicated share of ERDF funds (at least 5%) is allocated to sustainable urban development actions. The improvement of urban and suburban transport connections and developing more sustainable urban transport system also appear as an important focus areas.

In the 2014-2020 programming period Hungary adopted seven national OPs and is part of twelve cross-border, transnational and interregional OPs.[100] As presented above, ESI Funds channelled through the OPs play a key role in providing funding for mitigation and adaptation actions**. Mitigation objectives appear in five OPs, while adaptation actions are mainstreamed through three OPs.**

Hungary is currently in the process of adopting its second National Climate Change Strategy. The draft strategy[101] was recently published on the government's website as it was open for public consultation but it is expected to be adopted in the coming months.

The recently published draft Second National Climate Change Strategy for Hungary for the years of 2017-2030 (Nemzeti Fejlesztési Minisztérium 2017) provides financial estimates of the allocations under the various OPs for both mitigation and adaptation. **In total, EUR 3 024.1 million is estimated to be allocated to mitigation under these five OPs, while less than a third of this (EUR 892.7 million) is dedicated to adaptation actions under the three OPs** (Nemzeti Fejlesztési Minisztérium, 2017). The allocations between the various OPs is presented in Table 5. Unsurprisingly, the most significant contribution is coming from the Environmental and Energy Efficiency OP, which provides EUR 1,509.63 million for climate change objectives. Nevertheless, these are all ex ante figures and information on actual expenditures, which would provide a more accurate indication of projects being undertaken on the ground, still need to be seen at later stages of the programming period.

[100] For more information visit: http://ec.europa.eu/regional_policy/en/atlas/programmes/?search=1&keywords=&countryCode=HU&regionId=ALL&themeId=ALL&programType=ALL&objectiveId=ALL&periodId=3

[101] A 2017-2030 közötti időszakra vonatkozó, 2050-ig tartó időszakra is kitekintést nyújtó második Nemzeti Éghajlatváltozási Stratégiáról. 2017 március ,http://www.kormany.hu/download/f/6a/f0000/N%C3%89S_2_strat%C3%A9gia_2017_02_27.pdf#!DocumentBrowse

Table 5: Financial allocations for mitigation and adaptation in the Hungarian OPs for 2014-2020

OP	Indicative allocations for mitigation actions (million €)	Indicative allocations for mitigation actions (million €)	Total indicative allocations for climate objectives (million €)
Environmental and Energy Efficiency OP	713.6	796.0	1,509.6
Economic Development and Innovation OP	730.2	0	730.2
Territorial and settlement development OP	696.5	91.3	787.8
Competitive Central-Hungary OP	51.4	5.38	56.8
Integrated Transport OP	832.4	0	832.4
Total	**3024.1**	**892.7**	**3,916.8**

Source: own calculations based on Nemzeti Fejlesztési Minisztérium (2017)

The National Climate Change Strategy also provides a detailed description of the supported climate change mitigation and adaptation actions under these five OPs. Table provides an overview of the relevant priority axes of these OPs and the supported mitigation and adaptation actions. The Environment and Energy Efficiency OP provides support for a wide range of climate change objectives, including for instance energy efficiency and RES investments, building climate change impact databases and informing the public.

Table 2: Supported mitigation and adaptation actions under the Hungarian 2014-2020 OPs

OP	Priority Axis	Supported mitigation actions	Supported adaptation actions
Environmental and Energy Efficiency OP[102]	I. Adaptation to climate change impacts	n.a.	- Development of databases on climate change impacts - Supporting societal adaptation - Ensuring water-use efficiency - Improving resilience to water-related extreme weather events
	II. Development of water supply, wastewater disposal and cleaning, wastewater management	- Investments and improvements to optimize the utilization of sewage sludge, energy efficiency elements	n.a.
	IV. Nature protection and wildlife protection related developments	n.a.	- Protection of habitats - Strategic assessment on how to achieve the objectives of the EU biodiversity strategy at the national level
	V. Promoting energy and the use of renewable energy sources	- Promoting renewable energy-based electricity generation (not for buildings) - Buildings' energy efficiency improvements combined with RES - Improvement of district heating systems with the use of RES	- Awareness raising programs
Economic Development and Innovation OP[103]	IV. Energy	- Supporting energy efficiency and the use of RES in enterprises	n.a.
	VIII. Financial instruments	- Financial support for RES and energy efficiency	n.a.
Territorial and settlement development OP[104]	I. Creating local conditions to boost economic growth and increase employment	- Sustainable territorial/urban transport - Improving the energy efficiency of municipalities	- Urban development

[102] See more at: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/hungary/2014hu16m1op001
[103] See more at: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/hungary/2014hu16m0op001
[104] See more at: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/hungary/2014hu16m2op001

OP	Priority Axis	Supported mitigation actions	Supported adaptation actions
	II. Enterprise friendly and population preserving urban development	n.a.	- Territorial development in order to retain populations and to boost the economy (e.g. green infrastructure)
Competitive Central-Hungary OP[105]	IV. Tourism and nature protection developments	n.a.	- Strategic assessment on how to achieve the objectives of the EU biodiversity strategy at the national level
	V. Energy efficiency, smart grids and renewables	- Supporting energy efficiency and the use of RES in enterprises - Improving financial leverage for projects in Central-Hungary supporting energy efficiency and RES - Sustainable transport	n.a.
Integrated Transport OP[106]	I. Improve international road accessibility	- Improving access to national borders on the Hungarian TEN-T road network	n.a.
	II. Improve international railway accessibility	- Reducing travel time on domestic TEN-T lines - Improving the navigation security on the Danube	n.a.
	III. Developing sustainable urban suburban transport	- Preserving the urban-suburban public transport performance in the Central-Hungary region - Preserving the communal transport performance of rural suburban areas	n.a.

Source: own calculations based on Nemzeti Fejlesztési Minisztérium (2017)

[105] See more at: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/hungary/2014hu16m2op002
[106] See more at: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/hungary/2014hu16m1op003

ANNEX 4: 2007–2013 COHESION POLICY CONTRIBUTION TO THE RES 2020 TARGETS IN THE MEMBER STATES

Member State OP	Additional RES capacity as a result of ERDF and CF investments (MW)		Required additional RES capacity to meet the RES 2020 target (MW)		ERDF/CF contribution of total RES capacity to meet the RES 2020 target (in %)
	Planned	Reported (end of 2012)	By 2013	By 2020	
Austria	105	99	11,301	13,179	0.79
Belgium	No data available	No data available	3,06	8,255	Data not reported to EC
Bulgaria	No data available	No data available	4,232	5,189	Data not reported to EC
Cyprus	No data available	No data available	190	548	Data not reported to EC
Czech Republic	131	12	No data	No data	Data not reported to EC
Germany	29	118	71,621	110,934	0.03
Denmark	No data available	No data available	6,017	6,754	Data not reported to EC
Estonia	0	6	No data	No data	Data not reported to EC
Spain	No data available	No data available	49,722	69,844	Data not reported to EC
Finland	No data available	No data available	24,690	33,420	Data not reported to EC
France	1,161,307	1,833,445	39,628	62,167	Data not confirmed
Greece	156	106	6,872	13,271	1.18
Hungary	0	0	1,109	1,537	Data not reported to EC
Ireland	No data available	No data available	3,496	8,339	Data not reported to EC
Italy	5,215	2,893	32,524	43,823	11.9
Lithuania	0	173	1,289	1,635	Data not reported to EC
Luxembourg	5,000	11,000	179	347	Data not confirmed
Latvia	77	21	1,661	2,168	3.55

Member State OP	Additional RES capacity as a result of ERDF and CF investments (MW)		Required additional RES capacity to meet the RES 2020 target (MW)		ERDF/CF contribution of total RES capacity to meet the RES 2020 target (in %)
	Planned	Reported (end of 2012)	By 2013	By 2020	
Malta	No data available	No data available	36	160	Data not reported to EC
Netherlands	No data available	No data available	6,086	14,994	Data not reported to EC
Poland	972	246	4,444	10,335	9.4
Portugal	0	0	12,699	19,200	Data not reported to EC
Romania	200	275	9,635	12,598	1.58
Sweden	0	271	21,744	23,786	Data not reported to EC
Slovenia	355	120	1,258	1,693	21
Slovakia	98	72	2,144	2,746	3.57
United Kingdom	12,000	4,120	14,660	38,210	31.4
Croatia	No data available	No data available			Data not reported to EC
In total	**1,185,643**	**1,852,975**	**318,998**	**505,159**	**Data not confirmed**

Source: Court of Auditors (2014)

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