



**Expert evaluation network  
delivering policy analysis on the  
performance of Cohesion policy 2007-2013  
Year 3 – 2013**

**Task 2: Country Report on Achievements of  
Cohesion policy**

**Luxembourg**

**Version: Final**

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**A report to the European Commission  
Directorate-General Regional Policy**

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## List of abbreviations

- AIR Annual Implementation Report
- CRP *Centre de Recherche Public* (Public research center)
- FNR *Fonds National de la Recherche* (National research funds)
- MA Managing Authority
- OP Operational Programme

## Executive summary

The evolution of the 2007-2013 ERDF intervention in Luxembourg has been positive compared to the previous periods concentrating its effort on two main areas - energy (renewable energy and energy efficiency) and innovation – and focusing innovation intervention on applied research and knowledge transfer and innovation promotion within firms. Since 2007, the programme received more than 104 candidate projects and approved 63 projects for a total cost of EUR 82.4 million with an ERDF contribution of EUR 24.3 million by the end of 2012 (including technical assistance). The implementation of the ERDF Operational Programme (OP) progressed in satisfactory manner – 98.5 % of the ERDF support has been committed (against 88.9% last year) by the end of 2012. The ERDF has contributed to increasing the capacity of renewable energy production (11,000 additional MWh by the end of 2012). The number of energy related projects reflects the increased awareness and intention of the municipalities to develop new sources of energy (biogas, sludge drying) and to reduce their energy consumption. In the policy area of "Enterprise support and RTDI", the ERDF contributed to strengthen applied research capacities and knowledge transfer, and to innovative start-ups creation through the incubator of Belval.

However, the programme should have to make a step further toward a stronger concentration of the intervention to maximise the effect of the small EUR 25 million ERDF budget. In the field of energy transition, the OP should be more clearly focused on some very specific renewable energy sources, and clearly targeted on demonstration projects (exemplary projects).

The support to research and innovation projects went to many topics proposed by the public research organisations, without a clear concentration on specific sectors that provide clear comparative advantage to Luxembourg, consistently with the Luxembourg industrial policy. A prioritisation of the main topics in the frame of the smart specialisation strategy is a key for the next programming period. The inclusion of joint enterprise-research partnerships into the selection criteria for projects led by public research organisations should be envisaged to better focused the ERDF intervention and its added value on fostering closer links between businesses and researchers. R&D collaboration, mutualisation of equipment, opening technological platforms to firms should be a key for the next programming period.

That would complement the intervention on the clustering development policy that has been recently renewed by the Ministry of Economy in October 2013. Clusters are a crucial element of Luxembourg's innovation policy since they bring together companies, research organisations and other actors in specific sectors to jointly develop technology-oriented projects. The renewed policy is structured around five main pillars and foresees enhanced cluster activities in the fields of business development, internationalisation, flagship projects, branding, and prospection and promotion. Therefore, a stronger alignment of ERDF innovation support intervention with the national cluster policy should be encouraged.

Finally, the selection process and the evaluation and monitoring system would benefit from external expertise in the appraisal of the projects, and external evaluation of both large ERDF funded projects and/or policies. For instance, the evaluation of the Luxembourg Cluster Initiative (results, impacts, and efficiency of the management system of the policy through

Luxinnovation acting as cluster manager) would be recommended to get a clearer vision on the optimal use of ERDF support for clusters development.

## 1. The socio-economic context

Main points from the previous country report:

- Luxembourg is a single NUTS 2 region with a slightly growing population of 502,000 (January 2010);
- In the 1950s and 1960s, the economy developed from agriculture to significant reliance on the steel industry. In the late 1970s, the industry declined and banking, which was concentrated in the city, emerged as the key driver of the economy. GDP per capita went on to become the highest in Europe (GDP per capita in PPS was over 2.5 times the EU average in 2009);
- Regional profiles remain diverse. The country can be divided essentially into three regions:
  - The central region hosts a high share of the financial service sector, public institutions, research centres and the university, and employs 70% of cross-border workers;
  - The Southern region is where the steel and mining industries were located and where the employment rate shrunk with the decline of industrial activities; even though manufacturing remains important and still accounts for 30% of total employment;
  - The Northern and Eastern regions are traditionally dependent on agriculture and tourism.

The recent 2008-2009 economic downturn impacted the Luxembourg macro-economic situation. First, the financial crisis put a strong pressure on the banking and financing sector, then it impacted on the "real" economy at the end of 2008. Almost all of the sectors have been affected, particularly the most open activities like the financing and industrial sectors, located in the Centre and Southern parts of Luxembourg. By October 2009, the unemployment rate grew to 6% (compared to 4.1% in 2007)<sup>1</sup> and the short time working increased. Within the framework of the European Recovery Plan, the Government adopted in March 2009 a "*Programme Conjoncturel*" including several measures addressing the main effects of the economic crisis, for a total cost of EUR 1,200 billion (i.e. 3% of Luxembourg GDP):

- Household purchasing power, mainly through tax reduction (EUR 600 million);
- Public works (EUR 70 million in 2009, EUR 80 million in 2010);
- Social housing (EUR 18 million);
- ICT services (EUR 104 million);
- New schemes for research and innovation (EUR 30 million);
- Financial support to companies in bankruptcy (EUR 30 million);
- Extension of unemployment insurance (EUR 130 million);
- Other measures such as simplification and shortening of administrative procedures for public building construction.

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<sup>1</sup> Cf. Etudes économiques de l'OCDE – Luxembourg, mai 2010.

To a certain extent, the "*Programme Conjoncturel*" succeeded by maintaining a growth rate at 3.5% in 2010 and 3.2% in 2011<sup>2</sup>, slightly higher than the expectations of the economic forecasts (2 to 3% of growth for 2010 and 2011). Even though the recent report edited by the National Statistics Office in July 2011 confirmed the recovery of the economy, there should be a slowdown in 2012 due to several macro-economic factors: inflation, oil price, public spending savings, etc.<sup>3</sup>

In addition, the market pressure on the public debts in Europe pushed the Government in 2011 (and 2012) to reduce public expenditures, and to remove the measures of the national recovery plan, in order to maintain the budget stability in the long term. In the short term, the Government is preparing the transition from an anti-cyclic policy intervention (public expenditures to address the effects of the economic crisis) to a budgetary stability policy. This still does not affect the funds for regional development. There is no available data showing evidence that the crisis is affecting regions differentially.

## **2. The regional development policy pursued, the EU contribution to this and policy achievements over the period**

### **The regional development policy pursued**

Main points from the previous country report:

- Luxembourg implements one ERDF OP (Competitive Objective) and is involved in one cross-border territorial co-operation programme (INTERREG IVA "Great region").
- The priorities of these two programmes are highly complementary: the national ERDF OP targets attractiveness for investment and jobs (axis 1) and knowledge and innovation (axis 2), while the Territorial Cooperation programme focuses on "economy", "space" and "people" (i.e. human resources) through the support for innovation, cross-border infrastructure development and the environment.
- Concentration of means is the main feature of Luxembourg's ERDF OP; considering the limited amount of ERDF resources available, the Managing Authority (MA) intended to avoid dispersion of effort and loss of added value. In the CBC programme, 22% of ERDF funding went to Enterprise support and RTDI.
- Thematically, innovation is the core element of the programmes: the "Competitiveness and Employment" OP 2007-2013 allocated 69% of ERDF finance to innovation (EUR 17 million), which is consistent with the growing support to innovation at the national level. The second core element of the two programmes relates to environment and energy (e.g. energy represents 9% of the planned ERDF allocation).
- Even though the entire country is eligible, the MA selects projects that tackle the main weaknesses specific areas: in urban areas (Capital city/centre; South), efforts are focused on economic diversification (through economic zoning) R&D and innovation; in

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<sup>2</sup> 12ème Actualisation du Programme de Stabilité et de Croissance du Grand Duché de Luxembourg pour la période 2011-2014, Avril 2011 "Growth and Stability Programme".

<sup>3</sup> Service central de la statistique et des études économiques du ministère de l'Économie et du Commerce extérieur.

rural areas (North, West, East), efforts are focused on the development of economic zones and on environmental protection.

- The ERDF OP only supports projects led by public or semi-public organisations (public research centres, national public agencies, local authorities etc.), which are less affected by the economic crisis.

### Developments since the 2012 report

The economic crisis has not led to any change in the thematic priorities and/or the allocation of EU funding of the ERDF programme, still concentrated on innovation and environment and energy transition. Addressing public organisations, the programme has not been affected by the crisis. However, the geographical scope of the programme changed slightly. Whereas initially the OP targeted 35% of the ERDF in rural areas, only 10% of the total ERDF committed focused on rural areas (EUR 1.2 million out of EUR 12.1 million), through two projects on energy production (bio gas) and environmental risk management (Risk Reseau and Minett-Kompost). This change reflects the overwhelming concentration of the funds on innovation and research projects led by public research organisations concentrated in the urban areas, but also the type of the beneficiaries which are mainly national bodies (GIE MyEnergy, Luxinnovation, Etablissement Public Fonds Belval) located in the urban areas (South and Luxembourg City). This change is not the result of the economic crisis, but of the bottom-up approach in the selection process of the projects.

### Policy implementation

Main points from the previous country report:

- In 2011, 19 new projects have been approved by the MA. They result both from the fourth call of projects launched in 2010 (some of these projects required some adjustments before final agreement reached in 2011), and from the fifth call of projects launched in 2011. Within this last call, 15 candidate projects were received, of which 8 have been directly approved by the steering committee of the programme
- 88,9 % of ERDF allocated funds were committed by the end of 2011 consistently with the plans ; the funds for axis 2 on research and innovation were already fully committed.

### Developments since the 2012 report

In 2012, the MA was able to record nine new application forms and launch a call for proposals in newspapers and on its website.

**Table 1 – Allocation of ERDF and commitments by end-2012**

ERDF Commitment rate end-2012	Allocated (EUR million)	Committed (EUR million)	Commitment Rate (%)
	25.2	24.9	98.5
ERDF Implementation rate end-2012	Allocated (EUR million)	Expenditure paid out by the beneficiaries included in payment claims sent to the MA (EUR million)	Implementation Rate (%)
	25.2	12.4	49

Source: AIR 2012.

Since 2007, the programme received 95 candidate projects and approved 58 projects for a total cost of EUR 72.9 million with an ERDF contribution of EUR 22.5 million (including the technical

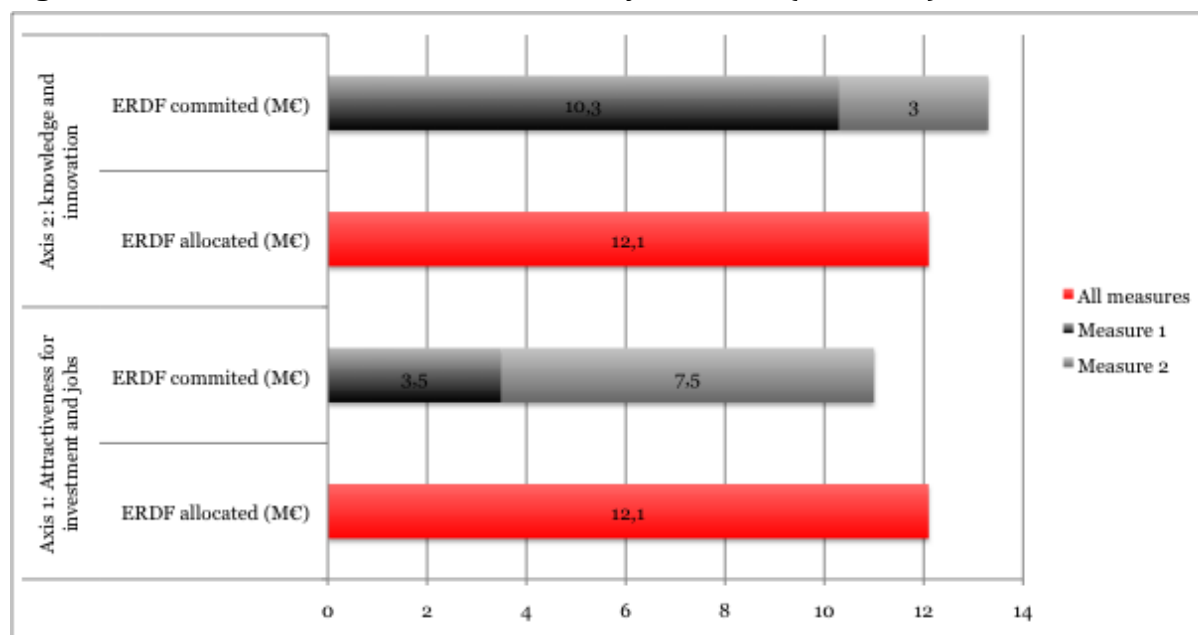
assistance). While the number of projects approved has undergone a slight increase compared to 2010, the amount of ERDF committed doubled. This can be explained by the selection of large strategic projects under both the axis 1 (e.g. project on the implementation of a biogas and composting unit in Mondercange – EUR 4 million) and axis 2 (e.g. project of the Luxembourg Centre for Biomedicine Systems (LCBS) – EUR 7.6 million total cost; EUR 2.6 million ERDF).

The figures show that the implementation of the ERDF OP is progressing in a satisfactory manner – **98.5 % of ERDF allocated funds were committed by the end of 2012**. It is safe to say that 100% of the ERDF will be committed at the end of the programming period, the funds for axis 2 on research and innovation are already fully committed.

The distribution of the ERDF committed by axis did not change compared to 2010. Axis 1 represents 45% of ERDF commitments, while axis represents 55% of the commitments. The ERDF intervention regarding axis 1 remains concentrated on a smaller number of projects (18) but with larger amount of financing, mainly in the field of renewable energy production and promotion. The support to innovation and research (axis 2) is spread among a higher number of small research projects.

With 12.4 million of ERDF declared expenditures by the end 2011, the implementation rate also increased compared to 2010 (49% versus 39% end of 2011). The MA is now more focused on the monitoring and management of the projects to increase this rate.

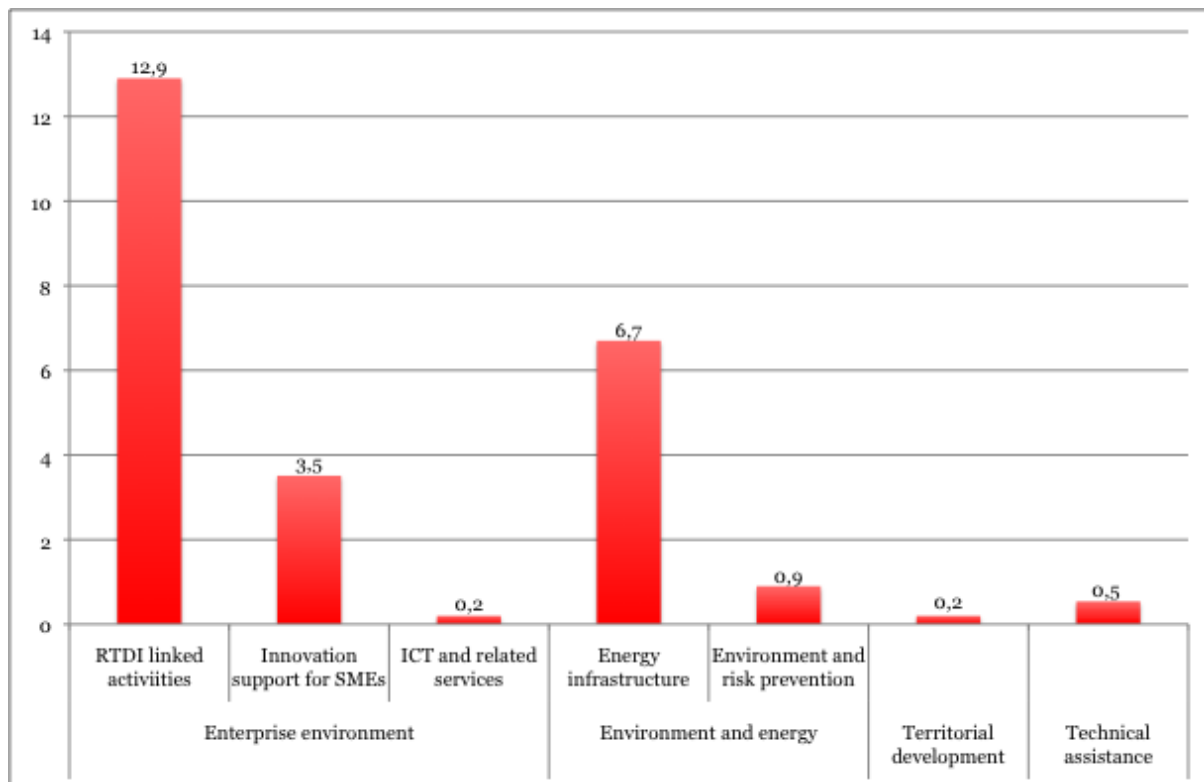
**Figure 1 – ERDF allocated and commitments by measures (end-2012)**



Source: AIR 2012

Note: Measures 1 & 2 of axis 1 are respectively “Improve basic infrastructure for economic growth and promote new economic activities” and “Strengthen synergies between environmental protection and economic”; Measures 1 & 2 of axis 2 are respectively “Increase investment in RTDI” and “Facilitate all forms of RTDI”.



**Figure 2 – ERDF commitment by policy areas – EUR million (end-2012)**

Source: AIR 2012.

### Achievements of the programmes so far

Main points from the previous country report:

- Enterprise support and RTDI
  - The number of research jobs created considerably increased compared to 2010 with 63 research jobs (+46 jobs compared to 2010).
  - 19 research projects supported of which 12 projects involved a research-enterprise joint partnership (5 was the initial target)
- Human resources and development
  - The physical indicators on job creation linked to the programme implementation show positive progress compared to 2010 (113 vs. 46).
- Environment and energy
  - 4,874 additional MWh by the end of 2011 versus a final target of 5,000 MWh.

### Developments since the 2012 report

#### Enterprise support and RTDI

The enterprise support and RTDI policy area represents a EUR 17.4 million ERDF allocation. By the end of 2012, EUR 16.61 million ERDF were committed with a particular focus on research and development projects (EUR 12.9 million). Interventions on enterprise support and innovation were mainly focused on supporting research-oriented projects, while support to

enterprises was only provided indirectly through the support to Luxinnovation, the national innovation agency.

Since 2007, 19 research and development projects have been supported, which is near the initial target as stated in the annual interim report (20 projects). The annual interim report also shows that the number of research jobs created has considerably increased compared to 2010 (+54 jobs). The estimation since 2007 (117) is also above the initial established target (50). However, it should be noted that the initial targets (in terms of jobs created and number of R&D projects) as stated in the annual interim report, has been modified compared to the figures included in the initial OP.

Compared to the previous programming period (2000-2006), progress has also been made in the support to the collaboration between researchers and enterprises. Among the 19 projects, the number of projects involving a researcher-enterprise joint partnership is above initial expectations (12 projects versus 5 expected), reflecting the stronger focus on the valorisation of research results and technology transfer.

The achievements in terms of support to business creation and the business environment (number of information society related projects, promotion of business, start-up creation) remain low, demonstrating the OP's strong focus on developing research capacities in public research organisations (e.g. new spaces for research infrastructures) and linking them to the enterprise sector. However, it should be noted that regarding the start-up creation/support indicator, the Belval Incubator cofounded by the ERDF is in operation only since July 2012. The incubator addresses a real need of young innovative entrepreneurs, by hosting 17 start-up companies by January 2013 with an occupation rate of 80%.

### Human Resources

This policy area is not directly targeted by the ERDF OP. The physical indicators on job creation linked to the programme implementation show positive progress compared to 2011 and 2010 (163 vs. 113 and 46). However, it seems that the final target of 2,000 jobs (stated in the OP document) is over ambitious with regard to the type of projects supported by the programme (research projects, promotion projects in the field of innovation or energy infrastructures projects, etc.).

### Transport and telecommunications

The ERDF OP does not support this policy area.

### Environment and energy

This policy area is the second core priority of the OP with a EUR 6.1 million ERDF allocation and EUR 7.6 million committed by the end of 2012. The OP provides more support to the development of renewable energies and energy efficiency than to environmental protection.

The number of renewable energy projects has doubled over the past two years (from 5 in 2010 to 11 projects in 2012), going over the initial target. By supporting energy infrastructure projects, the ERDF intervention has contributed to increasing the capacity of renewable energy production (11,000 additional MWh by the end of 2012 versus a final target of 5,000 MWh) and

should contribute to the reduction of greenhouse emissions, by the time the infrastructures are fully operational.

### Territorial development

This policy area is not a top priority of the OP. At the end of 2012 just one project had been supported within this policy area, without a clear effect and added value of the ERDF intervention<sup>4</sup>.

**Table 2 – Core Indicators by policy areas**

Policy area	Main indicators	Outputs and results
Enterprise environment	No. of RTD projects: 19 No. of cooperation project enterprises-research institutions: 12 No. of start-ups supported: 0 No. of information society projects: 3 No. of projects seeking to promote businesses, entrepreneurship, new technology: 2 Space for research infrastructures (sq. m.): 27,682	The main outputs and results of the intervention have been <ul style="list-style-type: none"> <li>The strengthening of research capacities in the public research organisations. For the research organisations, the ERDF are funds that complement the national resources and are fully coherent with the research strategy of the research centres. ERDF funded research allow the research organisations to fulfil their objectives stated in their performance contracts with the Ministry of Research, namely in terms of public-private collaborations. The development of applied research based on joint collaboration between research and enterprise (12 RTD projects out of 19) is clearly a positive output of the programme.</li> <li>The development of enterprise innovation projects and start-us creation through Luxinnovation and Belval Incubator. During the 2010-2012 period, Luxinnovation provided services to 180 innovation projects funded by the Government, and served as the European Contact Point for 350 candidate projects to European funding (FP7, Eurostar...) that get 50 M€ of funding from EU sources (FP7 mainly). Each year, Luxinnovation supports in average 40 individual enterprise.</li> <li>Clustering development though the support to Luxinnovation: created in 2002 by the Government, the Luxembourg Cluster Initiative counts now more than 220 members of 5 clusters.</li> </ul>
Human resources	Jobs created: 163 Jobs created for men: 99 Jobs created for women: 64 Research jobs created: 117	No direct support to human resources strengthening
Environment and energy	No. of renewable energy projects: 11 Additional capacity of renewable energy production (MWh): 11,000 Area rehabilitated (sq. km.): 0.2 Reduction greenhouse emissions (CO <sub>2</sub> and equivalents, kt): 10	The main outputs and results of the intervention have been the increased capacity of renewable energy production which reflects positively a progress consistently with the national plan for renewable energy and energy efficiency. In qualitative terms, some projects tested/demonstrated in real condition the feasibility of new techniques and methods (see. Good practice below). This type of project should be the priority, considering the small budget of the OP.
Territorial development	No. of projects ensuring sustainability and improving the attractiveness of towns and cities: 1	There are no real outputs regarding territorial development type of project (one project on the renovation of a square).

Source: AIR 2012.

<sup>4</sup> Projet d'aménagement de la place de la Résistance sur la Commune d'Esch-sur-Alzette (EUR 0.2 million of ERDF).

### 3. Effects of intervention

Within the "environment and energy policy" area, the ERDF clearly contributes to the promotion of the use of renewable energies sources and the energy efficiency management. Despite the fact the ERDF contribution remains modest compared to national public funding in the two areas, the ERDF intervention is consistent with the national policy agenda. This reflects the growing focus of the government on the development of renewable energies and energy efficiency. This is particularly true of biomass (identified as of great potential by the Government in the National Renewable Energy Action Plan), and on biogas production. The second largest project (EUR 1 million ERDF out of EUR 4 million) of the programme deals with ecological treatment of organic waste and production of purified biogas (MINNETT-KOMPOST testing phase is fully operational since February 2011). It also reflects the increased awareness and willingness of the municipalities to develop new sources of energy (biogas, sludge drying) and reduce their energy consumption. This had not been anticipated when the MA designed the financial plan for the OP.

However a clearer focused of the programme on the most efficient sources of renewable energies, and on pilot projects or demonstration projects should increase the added value of ERDF intervention (see project below). Clearly the ERDF budget cannot support massive intervention. Emphasis should be put on testing and demonstrating innovative solutions.

#### **Textbox 1 - Good practice of pilot/demonstration projects: construction of a plant for drying of sewage sludge by solar energy in Bettembourg**

The wastewater treatment plant of Bettembourg set up in the early 80's had no sufficient capacity to address the economic and demographic development of the local municipalities around Bettembourg. The extension of the treatment unit has been made in 2004-2009, but led to an increased production of sewage sludge raising the issue of their valorisation. The use of sewage sludge as fertilizer in agriculture is made more difficult due to a decrease in the acceptance of product in question by the agricultural world. Therefore, the project tested the feasibility of drying (by solar energy) the sludge in order to compress it into bullion and then use it as auxiliary fuel in the regional industry to produce energy or electricity and / or heat.

The direct outputs of the project have been the reduction of 60% sewage sludge (minus 6,500 tons per year) ; the reduction of the number of road transport ; the reduction of greenhouse gas emissions (1100 tons of CO<sub>2</sub> per year) and the creation of five full-time jobs.

Regarding the "Enterprise support and RTDI" policy area, compared to the previous period, the ERDF programme has increased its support to applied research projects, indirect promotion of innovation within firms (through Luxinnovation), development of enterprise/research collaborations, etc.. In addition there is decreased attention to purely research infrastructures, which is consistent with the increase in national investments in RDI.

Support to innovation within enterprises has been mainly channelled through Luxinnovation's (national innovation agency) PREDI project. PREDI has been structured around five actions: communication actions on innovation; support actions for young innovative entrepreneurs and researchers (start-ups and spin offs); implementation of a network of experts is assisting innovative companies (Alliance for Innovation); management of the clustering policy; and actions promoting national and EU RDI funding. The ERDF is contributing to innovation dissemination among local SMEs, to the implementation of the national cluster policy linking research organisations and enterprises, particularly SMEs, and to the provision of support services to young start-ups and spin-offs. Luxinnovation organized approx. 50 to 60 innovations

events annually, targeting more than 3,000 innovation stakeholders. It run also the management of the five clusters that bring together national stakeholders in the fields of biomedicine, environmental technologies, information and communication technologies, materials sciences and space technologies. Each is headed by a cluster president representing the private sector, who is assisted by two vice presidents from public research.

The ERDF interventions also contributed to strengthening the applied research capacities but also into a certain extent the knowledge and technological transfer capacities of the public research organisations. The UAM project is a good example of the effect of ERDF intervention in that field.

### **Textbox 2 - Good practice : platform of technological equipment for material characterization**

The UAM project is among the recent achieved projects (EUR 1.2 million ERDF). Led by a research department of the Public Research Center CRP Lippman, the project sought to implement a platform of technological equipment for material characterization; offering testing and prototyping services to the Luxembourg public and private research community. The ERDF support allowed to acquire new equipment and promote technological platforms. As a result, 200 national stakeholders have been contacted, a dozen of fairs and events organized and 30 SMEs use the platform. It fosters the collaboration with the Advanced Materials and Structures research department at CRP Henri Tudor (offering mutual access to equipment) and with the Jean Lamour Institute in Nancy on advanced materials; and also enhances the international visibility of research on advanced material in Luxembourg. The platform is now part of the CNRS European Associated Laboratory (LIPES) which pools human and material resources from the SAM department and Jean Lamour Institute towards a common, jointly-defined project designed to add value to their individual objectives. This Laboratory is the product of ten years of cross-border cooperation within the Great region

However, the support to research and innovation projects went to many topics proposed by the public research organisations, without a clear concentration on specific sectors that provide clear comparative advantage to Luxembourg, consistently with the Luxembourg industrial policy (cluster policy). The systematic inclusion of joint enterprise-research partnerships into the selection criteria for projects led by public research organisations should be envisaged to better focused the ERDF intervention and its added value on fostering closer links between businesses and researchers.

## **4. Evaluations and good practice in evaluation**

In Luxembourg, there has been over the period no real strategy in place for the evaluation of the effects of interventions co-financed by the ERDF and Cohesion Fund. This is not due to a lack of capacities (human or financial). In practice, the MA considers that the monitoring tools in place - the financial indicators, the results indicators, the annual interim report, the annual reports provided by the beneficiaries and the in situ control - are sufficient for ensuring the monitoring and an interim evaluation of the programme. The MA has not planned to carry out evaluations over the remainder of the programming period.

More generally the evaluation culture in Luxembourg is rather poorly developed within the public administration. Only a limited number of evaluations are available.

The evaluations were focused on the following research institutions of which applied research projects have been supported by the ERDF (only the National Research Fund - FNR is not supported by the ERDF):

- The FNR<sup>5</sup>: the evaluation focused on the internal functioning and management of the FNR rather than on the scientific strategy of the fund, in particular, on the optimisation of the funding process; the relationships with the public research organisations; the transparency of the evaluation process for beneficiaries; the communication strategy; and the management of information flow. The evaluation was based on three main methodological tools: interviews with stakeholders and beneficiaries of the FNR; workshops with the management board and interlocutors from other research funds in Europe; and a self-assessment report provided by the FNR. Presented to the Parliament in July 2011, the evaluation provided a basis for the preparation of the next performance contract 2011-2013 and the establishment of a new law on R&D funding and the FNR (e.g. one of the conclusions of the evaluation to exclude representatives of the Public Research Organisation for the FNR Scientific Committee is already in the legislation proposal).
- The CRP Gabriel Lipman - Evaluation of "*Science et Analyse des Matériaux*" (SAM); the CRP Henri Tudor - Evaluation of *Advance Materials and Structures* (AMS); the CRP Santé - Evaluation of the Department of Oncology; the CEPS - Evaluation of the "Population and Emploi" IRISS and RELex research units; the CVCE<sup>6</sup> - Evaluation of KEDL/ICT<sup>7</sup> research unit<sup>8</sup>: The observations and recommendations presented in these reports are based on a peer review by three experts from each field. The peer review consisted in the reading of a self-assessment report written by the research units and a hearing at the evaluation unit. The hearing was composed of a presentation, a group discussion of the self-assessment report and several individual interviews with the managing director of the institutions as well as researchers working in different sections and at different levels of the research units.

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<sup>5</sup> External Evaluation carried out by ITD-Eu (Matthieu Lacave).

<sup>6</sup> Centre Virtuel de la Connaissance sur l'Europe

<sup>7</sup> Knowledge Environment and Digital Libraries / Information and Communication Technologies

<sup>8</sup> External Evaluations carried out by Interface.

**Table 3 – Evaluation and studies carried out to assess the Cohesion policy performance**

Title and date of completion	Policy area and scope (*)	Main objectives (*)	Main findings	Methods used (*)	Full reference or link to publication
Evaluation of the FNR -2010	1	1	<p>Conclusions are organised around 7 recommendations :</p> <ol style="list-style-type: none"> <li>(1) Keep the scientific quality as a key objective and as the key selection criterion</li> <li>(2) Explicitly include in the performance contract a strategic objective of contributing to the international visibility and attractiveness of Luxembourg</li> <li>(3) Clarify the distribution of roles between the Scientific Council and the Board</li> <li>(4) Establishing an institutionalised platform of dialogue between the FNR Secretariat and the PROs</li> <li>(5) Improve the understanding of the selection process by the beneficiaries</li> <li>(6) Simplify the management of the programmes</li> <li>(7) Provide a clearer picture of the added value and impact of the FNR activities and communicating on them</li> </ol>	4	<a href="http://www.mcesr.public.lu/recherche/rapports_evaluation/Rapport_FNR.pdf">http://www.mcesr.public.lu/recherche/rapports_evaluation/Rapport_FNR.pdf</a>
Evaluation of "Science et Analyse des Matériaux" - CRP Gabriel Lipman - 2010	1	3	<p>Conclusions are organised around 6 recommendations :</p> <ol style="list-style-type: none"> <li>(1) Evaluate past projects</li> <li>(2) Set up a search committee for the succession of the director of the unit</li> <li>(3) Develop an integral internal R&amp;D chain</li> <li>(4) Create synergies with AMS at CR Henri Tudor</li> <li>(5) Actively seek to intensify the relationship with the University of Luxembourg</li> <li>(6) Foster the collaboration between institutions engaged in materials research and development by creating a common scientific council</li> </ol>	4	
CRP Henri Tudor - Evaluation of Advance Materials and Structures (AMS) - 2010	1	3	<ol style="list-style-type: none"> <li>(1) Formulate a research and development agenda by concentrating on a smaller number of key topics</li> <li>(2) Evaluate past projects</li> <li>(3) Reorganise the structure of AMS</li> <li>(4) Adapt the profile of the director of AMS</li> <li>(5) Create synergies with CRP Lipman (SAM unit)</li> <li>(6) Actively seek to intensify the relationship with the University of Luxembourg</li> <li>(7) Foster the collaboration between institutions engaged in materials research and development by creating a common scientific council</li> </ol>	4	<a href="http://www.mcesr.public.lu/recherche/rapports_evaluation/3Rapport_AMS.pdf">http://www.mcesr.public.lu/recherche/rapports_evaluation/3Rapport_AMS.pdf</a>
CRP Santé - Evaluation of the Department of Oncology - 2010	1	3	<ol style="list-style-type: none"> <li>(1) Improve the performance of LHCE</li> <li>(2) Set up a joint research programme for LHCE and NorLux</li> <li>(3) Improve the recruitment and development of human resources by strengthening internal and external collaborations</li> </ol>	4	<a href="http://www.mcesr.public.lu/recherche/rapports_evaluation/5Rapport_sante.pdf">http://www.mcesr.public.lu/recherche/rapports_evaluation/5Rapport_sante.pdf</a>
CEPS - Evaluation of the "Population and	1	3	<ol style="list-style-type: none"> <li>(1) Clearly define the mission of CEPS</li> <li>(2) Further invest in IRISS and RElex</li> <li>(3) Further invest in the recruitment and development of human resources</li> </ol>	4	<a href="http://www.mcesr.public.lu/recherche/rapports_evaluation/7rapport">http://www.mcesr.public.lu/recherche/rapports_evaluation/7rapport</a>

Title and date of completion	Policy area and scope (*)	Main objectives (*)	Main findings	Methods used (*)	Full reference or link to publication
Emploi <sup>9</sup> IRISS and RELEX research units – 2010			(4) Develop a data policy (5) Actively seek to intensify the relationship with the University of Luxembourg		t_iriss.pdf
CVCE <sup>9</sup> - Evaluation of KEDL/ICT <sup>10</sup> research unit – 2010	1	3	(1) Develop a strategy for KEDL (2) Develop a project management system for ENA 2010 (3) Foster the collaboration between CVCE's units (4) Obtain scientific and technological knowledge by recruiting new staff (5) Concentrate on developing cooperation potential (6) Conduct a formative evaluation of the whole CVCE	4	<a href="http://www.mcesr.public.lu/recherche/rapports_evaluation/9Rapport_CVCE.pdf">http://www.mcesr.public.lu/recherche/rapports_evaluation/9Rapport_CVCE.pdf</a>
CRP Gabriel Lippmann – Evaluation of GEOSAT and ECOSAT at the Environment and agro-Biotechnologies (EVA) – 2011	1	3	(1) Evaluate the investments in the observatories, i.e. data acquisition and database maintenance (2) Evaluate the investments in research on diatoms (3) Implement the new organisational structure (4) Invest in interdisciplinary projects (5) Collaborate with CRTE at CRP-HT (6) Collaborate with the University of Luxembourg (7) Maintain the current financing scheme	4	<a href="http://www.mesr.public.lu/recherche/rapports_evaluation/rapports_evaluation_2011/rapport_GEOSAT_and_ECOSAT_at_GL.pdf">http://www.mesr.public.lu/recherche/rapports_evaluation/rapports_evaluation_2011/rapport_GEOSAT_and_ECOSAT_at_GL.pdf</a>
CRP Henri Tudor – Evaluation of CRTE – 2011	1	3	(1) Define CRTE's future strategy (2) Simplify the organisation according to the future strategy (3) Simplify measure to foster internal cooperation (4) Further strengthen CRTE's research base (5) Invest in basic laboratory equipment and improve access to external infrastructure (6) Collaborate with GEOSAT and ECOSAT at CRP-GL	4	<a href="http://www.mesr.public.lu/recherche/rapports_evaluation/rapports_evaluation_2011/rapport_CRTE_HT.pdf">http://www.mesr.public.lu/recherche/rapports_evaluation/rapports_evaluation_2011/rapport_CRTE_HT.pdf</a>
CRP-Santé – Evaluation of the Laboratory of Cardiovascular Research – 2011	1	3.	(1) Promote systems biology as a horizontal approach (2) Assure the continuity of the Lucky registry (3) Improve the working conditions with respect to space (4) Develop a new organisational diagram and improve internal communication (5) Integrate bottom-up approaches in the development of a future research agenda (6) Set up a PhD programme and strengthen cooperation with the hospital	4	<a href="http://www.mesr.public.lu/recherche/rapports_evaluation/rapports_evaluation_2011/rapport_Cardiovascular_Research_CRP_Sant_.pdf">http://www.mesr.public.lu/recherche/rapports_evaluation/rapports_evaluation_2011/rapport_Cardiovascular_Research_CRP_Sant_.pdf</a>
CEPS/INSTEAD – Evaluation of	1	3	(1) Strengthen social, economic, political and cultural aspects in GEODE's research agenda	4	<a href="http://www.mesr.public.lu/recherche/rapports_evaluation/">http://www.mesr.public.lu/recherche/rapports_evaluation/</a>

<sup>9</sup> Centre Virtuel de la Connaissance sur l'Europe.

<sup>10</sup> Knowledge Environment and Digital Libraries / Information and Communication Technologies.



Title and date of completion	Policy area and scope (*)	Main objectives (*)	Main findings	Methods used (*)	Full reference or link to publication
geography and development (GEODE) – 2011			<ul style="list-style-type: none"> <li>(2) Use research results for European comparative research</li> <li>(3) Consolidate the unit with the support of the leading management of CEPS</li> <li>(4) Foster collaboration with the University of Luxembourg</li> <li>(5) Develop a research vision for CEPS</li> <li>(6) Set up financial planning and make the distribution of the block grant within CEPS more transparent</li> </ul>		<a href="http://rappports_evaluation_2011/rapport_GEODE_CEPS.pdf">rappports_evaluation_2011/rapport_GEODE_CEPS.pdf</a>
CRP Gabriel Lippmann – Evaluation of ISC – 2012	1	3	<ul style="list-style-type: none"> <li>(1) Define a research agenda</li> <li>(2) Implement an organisational structure and management processes</li> <li>(3) Formulate a human resource policy</li> <li>(4) Create a scientific culture</li> <li>(5) Review the concept for future strategic direction</li> <li>(6) Rethink the internal targets and think about additional performance indicators</li> <li>(7) Intensify the collaboration with the University of Luxembourg</li> </ul>	4	<a href="http://www.mesr.public.lu/recherche/rappports_evaluation/rappports_evaluation_2012/rapport_ISC_CRP_GL.pdf">http://www.mesr.public.lu/recherche/rappports_evaluation/rappports_evaluation_2012/rapport_ISC_CRP_GL.pdf</a>
CRP Henri Tudor – Evaluation of SSI – 2012	1	3	<ul style="list-style-type: none"> <li>(1) Define the core concepts</li> <li>(2) Develop an explicit research agenda</li> <li>(3) Elaborate sustainable funding besides EU grants while investing more time on EU project allocation</li> <li>(4) Increase the capacity of PhD students supervision</li> <li>(5) Think about additional performance indicators</li> <li>(6) Formulate objectives regarding the ASINE project and rethink the implementation in the organisational structure</li> <li>(7) Reinforce the entrepreneurial spirit</li> <li>(8) Formalise the living lab process</li> <li>(9) Improve bottom-up process and completely implement S2IP</li> <li>(10) Intensify the collaboration with the University of Luxembourg</li> </ul>	4	<a href="http://www.mesr.public.lu/recherche/rappports_evaluation/rappports_evaluation_2012/rapport_evaluation_SSI_CRP_HT.pdf">http://www.mesr.public.lu/recherche/rappports_evaluation/rappports_evaluation_2012/rapport_evaluation_SSI_CRP_HT.pdf</a>
CRP Santé – Evaluation of Public Health – 2012	1	3	<ul style="list-style-type: none"> <li>(1) Develop a common understanding of Public Health</li> <li>(2) Reorganise the DESP</li> <li>(3) Recruit a head</li> <li>(4) Increase the collaboration between units</li> <li>(5) Determine priorities for both Public Health research and Public Health activities and services</li> <li>(6) Elaborate a formal human resource policy</li> <li>(7) Think about additional performance indicators</li> <li>(8) Improve the dissemination of knowledge</li> <li>(9) Cover health economics and mental health</li> <li>(10) Improve the budget process</li> </ul>	4	<a href="http://www.mesr.public.lu/recherche/rappports_evaluation/rappports_evaluation_2012/rapport_evaluation_PH_CRP_Sante.pdf">http://www.mesr.public.lu/recherche/rappports_evaluation/rappports_evaluation_2012/rapport_evaluation_PH_CRP_Sante.pdf</a>

Source: Ministère de l'enseignement supérieur et de la recherche, Grand Duché de Luxembourg

Note: (\*) Legend:

**Policy area and scope:** 1. RTDI; 2. Enterprise support and ICT; 3. Human Resources (ERDF only); 4. Transport; 5. Environment; 6. Energy; 7. Territorial development (urban areas, tourism, rural development, cultural heritage, health, public security, local development); 8. Capacity and institution building; 9. Multi-area (e.g. evaluations of programmes, mid-term evaluations); 10. Transversal aspects (e.g. gender or equal opportunities, sustainable development, employment).

**Main objective and focus:** 1. assess the arrangements and procedures for managing or administering programmes; 2. support monitoring, or check the progress made in implementing programmes, such as many mid-term evaluations; 3. assess the outcome or effects of programmes in terms of the results achieved and their contribution to attaining socio-economic policy objectives.

**Method used:** 1. Counterfactual; 2. Cost-benefit analysis; 3. Other quantitative; 4. Qualitative.

The evaluations included in Table 3, except for FNR, are all about scientific quality (scientific excellence) in specific scientific and technological areas hence not directly related to policy. During the last 7 years, there has been a constant improvement of the quality of research in Luxembourg resulting in increasing publications in peer reviews and an increased share of competitive funding into the total budget of the public research organisations (from 10 to 20 to 25% in average currently). However, the evaluations carried out do not provide evidences on the effects of the Cohesion policy interventions on the high quality research improvement. It results more from the development of the FNR funding capacity. In addition, ERDF interventions have been more focused on applied research.

## 5. Further Remarks - New challenges for policy

The evolution of the 2007-2013 ERDF intervention in Luxembourg has been positive compared to the previous periods concentrating its effort on two main areas - energy (renewable energy and energy efficiency) and innovation – and focusing innovation intervention on applied research and knowledge transfer and innovation promotion within firms. The increasing number of joint research-enterprise partnerships, is a positive output of the programme.

However, we believe the programme should have made a step further toward a stronger concentration of the intervention to maximise the effect of the small EUR 25 million ERDF budget. ERDF funding in Luxembourg is complementary with other sources of national funding. It is sometimes difficult to identify the real added value of the intervention.

In the field of energy transition, the OP should be more clearly focused on some very specific renewable energy sources, and clearly targeted on demonstration projects (exemplary projects).

The support to research and innovation projects went to many topics proposed by the public research organisations, without a clear concentration on specific sectors that provide clear comparative advantage to Luxembourg, consistently with the Luxembourg industrial policy. A prioritisation of the main topics in the frame of the smart specialisation strategy is a key for the next programming period. The inclusion of joint enterprise-research partnerships into the selection criteria for projects led by public research organisations should be envisaged to better focused the ERDF intervention and its added value on fostering closer links between businesses and researchers. R&D collaboration, mutualisation of equipment, opening technological platforms to firms should be a key for the next programming period.

That would complement the intervention on the clustering development policy that has been recently renewed by the Ministry of Economy in October 2013. Clusters are a crucial element of Luxembourg's innovation policy since they bring together companies, research organisations and other actors in specific sectors to jointly develop technology-oriented projects. The renewed policy is structured around five main pillars and foresees enhanced cluster activities in the fields of business development, internationalisation, flagship projects, branding, and prospection and promotion. Therefore, a stronger alignment of ERDF innovation support intervention with the national cluster policy should be encouraged.

Finally, the selection process and the evaluation and monitoring system would benefit from external expertise in the appraisal of the projects, and external evaluation of both large ERDF

funded projects and/or policies. For instance, the evaluation of the Luxembourg Cluster Initiative (results, impacts, and efficiency of the management system of the policy through Luxinnovation acting as cluster manager) would be recommended to get a clearer vision on the optimal use of ERDF for clusters development.

## References

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## Annex 1 – Tables

See Excel Tables 1-4:

Excel Table 1 – Regional disparities and trends

Excel Table 2 – Macro-economic developments

Excel Table 3 - Financial allocation by main policy area

Excel Table 4 - Commitments by main policy area (by end-2012)

### Annex Table A - Broad policy areas and correspondence with fields of intervention (FOI)

Policy area		Code	Priority themes
1. Enterprise environment	RTDI and linked activities	01	R&TD activities in research centres
		02	R&TD infrastructure and centres of competence in a specific technology
		05	Advanced support services for firms and groups of firms
		07	Investment in firms directly linked to research and innovation (...)
		74	Developing human potential in the field of research and innovation, in particular through post-graduate studies ...
	Innovation support for SMEs	03	Technology transfer and improvement of cooperation networks ...
		04	Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres)
		06	Assistance to SMEs for the promotion of environmentally-friendly products and production processes (...)
		09	Other measures to stimulate research and innovation and entrepreneurship in SMEs
		14	Services and applications for SMEs (e-commerce, education and training, networking, etc.)
		15	Other measures for improving access to and efficient use of ICT by SMEs
	ICT and related services	11	Information and communication technologies (...)
		12	Information and communication technologies (TEN-ICT)

Policy area		Code	Priority themes
		13	Services and applications for citizens (e-health, e-government, e-learning, e-inclusion, etc.)
	Other investment in firms	08	Other investment in firms
2. Human resources	Education and training	62	Development of life-long learning systems and strategies in firms; training and services for employees ...
		63	Design and dissemination of innovative and more productive ways of organising work
		64	Development of special services for employment, training and support in connection with restructuring of sectors ...
		72	Design, introduction and implementing of reforms in education and training systems ...
		73	Measures to increase participation in education and training throughout the life-cycle ...
	Labour market policies	65	Modernisation and strengthening labour market institutions
		66	Implementing active and preventive measures on the labour market
		67	Measures encouraging active ageing and prolonging working lives
		68	Support for self-employment and business start-up
		69	Measures to improve access to employment and increase sustainable participation and progress of women ...
		70	Specific action to increase migrants' participation in employment ...
		71	Pathways to integration and re-entry into employment for disadvantaged people ...
		80	Promoting the partnerships, pacts and initiatives through the networking of relevant stakeholders
3. Transport	Rail	16	Railways
		17	Railways (TEN-T)
		18	Mobile rail assets
		19	Mobile rail assets (TEN-T)
	Road	20	Motorways
		21	Motorways (TEN-T)
		22	National roads
		23	Regional/local roads
	Other transport	24	Cycle tracks
		25	Urban transport
		26	Multimodal transport
		27	Multimodal transport (TEN-T)
		28	Intelligent transport systems
29		Airports	
30		Ports	
31		Inland waterways (regional and local)	
32		Inland waterways (TEN-T)	
4. Environment and energy	Energy infrastructure	33	Electricity
		34	Electricity (TEN-E)
		35	Natural gas
		36	Natural gas (TEN-E)
		37	Petroleum products
		38	Petroleum products (TEN-E)

Policy area		Code	Priority themes
		39	Renewable energy: wind
		40	Renewable energy: solar
		41	Renewable energy: biomass
		42	Renewable energy: hydroelectric, geothermal and other
		43	Energy efficiency, co-generation, energy management
	Environment and risk prevention	44	Management of household and industrial waste
		45	Management and distribution of water (drink water)
		46	Water treatment (waste water)
		47	Air quality
		48	Integrated prevention and pollution control
		49	Mitigation and adaption to climate change
		50	Rehabilitation of industrial sites and contaminated land
		51	Promotion of biodiversity and nature protection (including Natura 2000)
		52	Promotion of clean urban transport
53	Risk prevention (...)		
54	Other measures to preserve the environment and prevent risks		
5. Territorial development	Social Infrastructure	10	Telephone infrastructure (including broadband networks)
		75	Education infrastructure
		76	Health infrastructure
		77	Childcare infrastructure
		78	Housing infrastructure
		79	Other social infrastructure
	Tourism and culture	55	Promotion of natural assets
		56	Protection and development of natural heritage
		57	Other assistance to improve tourist services
		58	Protection and preservation of the cultural heritage
		59	Development of cultural infrastructure
		60	Other assistance to improve cultural services
	Planning and rehabilitation	61	Integrated projects for urban and rural regeneration
	Other	82	Compensation of any additional costs due to accessibility deficit and territorial fragmentation
83		Specific action addressed to compensate additional costs due to size market factors	
6. Technical assistance		84	Support to compensate additional costs due to climate conditions and relief difficulties
		81	Mechanisms for improving good policy and programme design, monitoring and evaluation ...
		85	Preparation, implementation, monitoring and inspection
		86	Evaluation and studies; information and communication