



**EXPERT EVALUATION NETWORK
DELIVERING POLICY ANALYSIS ON THE
PERFORMANCE OF COHESION POLICY 2007–2013
YEAR 1 – 2011**

**TASK 1: POLICY PAPER ON RENEWABLE ENERGY AND
ENERGY EFFICIENCY OF RESIDENTIAL HOUSING**

LUXEMBOURG

VERSION: FINAL

MATTHIEU LACAVE

ITD–EU

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

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LIST OF ABBREVIATIONS

- EEN – Expert Evaluation Network
- ERDF – European Regional Development Fund
- ESF – European Social Fund
- FIT: Feed-in tariffs
- NREAP: National Renewable Energy Action Plan
- OP – Operational Programme

1. EXECUTIVE SUMMARY

The National Renewable Energy Action Plan (2010) sets a clear target of 11% of the gross final energy consumption originating from renewable sources. The strategy is based on three pillars: extensive use of the national potential for renewable energies (biomass, wind, solar thermal, heat pumps); increased use of biofuels in the transport sector; cooperation mechanisms allowed by the EU directive 2009/28/CE.

The Luxembourg policy mix to promote renewable energies and energy efficiency of residential housing combines direct support to investment in the two areas (grants to households and businesses), and indirect support through feed-in tariffs (electricity production from renewable sources), regulatory interventions (e.g. energy performance certificates for residential housing), "eco-loans" from the private banking sector (energy efficiency of residential housing), and awareness and promotion campaigns (MyEnergy). National public support amounted to around EUR 25 million in 2010. It appears however impossible to obtain a clear distribution of this amount between the two areas and by type of renewable sources. By March 30, 2011, six projects had been approved for an amount of EUR 5.7 million of ERDF co-funding, well over the EUR 2.2 million originally planned, resulting in the over consumption of the ERDF allocation. The managing authority still expects to spend EUR 7 to 8 million ERDF at the end of the programming period. ERDF interventions mainly support renewable energies (EUR 5.1 million) on biomass (2 large projects) and hydro. In the area of energy efficiency of residential housing, support is only provided indirectly to the MyEnergy agency in charge of promotion and awareness campaigns.

If the ERDF contribution still remains modest compared to national public funding in the two areas, the ERDF programming trend is consistent with the national policy agenda, since it reflects the growing focus of the government on the development of renewable energies and energy efficiency. Concentrating ERDF interventions on biomass and the promotion of an efficient use of energy, especially in residential housing (through MyEnergy) is also rather complementary and consistent with the national policy. The National Renewable energy Action Plan identifies biomass as of great potential in Luxembourg. ERDF support is provided to public and non-profit organisations, whereas the national aid schemes target households and businesses.

The rationale of public intervention in both policy areas is clearly stated in the national plans as well as in the ERDF OP: protecting the environment and combating climate change; reducing the country energy dependency and securing energy supply; and supporting economic development by attracting and/or strengthening the development of

manufacturing and service companies generating new jobs that cannot be relocated (this is the purpose of the 'Eco-Innovation Cluster').

Direct support to investment depends both on the categories of beneficiaries and the types of renewable energy sources. For households, the support rate varies according to the technology used (i.e. photovoltaic, micro-cogeneration CHP¹, and heating system); for businesses, the support rate is 45% of the eligible costs whatever the technology. Regarding the feed-in tariffs, they vary according to the different types of renewable energy sources. The calculation of the tariffs takes into account the variation of electricity production costs and the profitability rates of each type of renewable energy, and the size of the production system. Tariffs finally depend on the date of the year of the first connection to the grid. However, no public information is available on the cost of electricity production by type of renewable energy sources, nor on to what extent the market prices of residential housing include a premium for the energy efficiency of the building.

¹ Micro combined heat and power.

2. NATIONAL POLICY

Even though the situation is steadily and slowly improving, compared to other European countries, Luxembourg performs badly both in terms of renewable energy as a share of gross final energy consumption and electricity generated from renewable sources (respectively 2.1% and 4.1% in 2008 – see Annex Figure 1 and 2). The main renewable sources are hydro and biomass. However, the LUXRES study (2007) on the renewable energies potential in Luxembourg concluded that the potential would reach, in an optimistic scenario, a maximum of 4.5% of the final consumption by 2020, whereas the EU directive 2009/28/CE on the promotion of the use of energy from renewable sources targets 11% by 2020 as the share in the final energy consumption coming from renewable sources.

For achieving the EU target, the Government of Luxembourg has adopted a number of plans, laws and regulations and financial incentives since the last decade with three clear targets: 11% of the gross final energy consumption coming from renewable sources, 11.8% of electricity consumption originating from renewable energy sources and a reduction of 9% of the annual average energy consumption by 2020.

Achieving these targets, and taking into account the low potential of Luxembourg (LUXRES, 2007), relies on three priorities (National Renewable Energy Action Plan, 2010):

- Extensive use of the national potential for renewable energies. Concerning electricity, biomass and wind will represent the two top performers (Annex Figure 3). Luxembourg plans to multiply by 4.6 the wind electricity production by 2020². In households, the technologies of solar thermal energy and heat pumps will increasingly be used in addition to biomass.
- Extensive use of renewable energy sources in transport, i.e. by requiring that a percentage of biofuels be added to regular fuel.
- Cooperation mechanisms allowed by the EU Directive, due to the limited national potential and according to the current situation³.

The Luxembourg policy mix in these areas is a combination of direct support (grants to investment), indirect support (feed-in tariffs), regulatory interventions and awareness raising actions. There is no tax credit system.

Luxembourg intends to continue the promotion of renewable energies in the electricity sector through feed-in tariffs and incentives to investment. The regulations regarding

² However, the location of the planned investments is still not identified due to a number of constraints (environmental, air traffic...).

³ The Renewable Energy Directive establishes "cooperation mechanisms" allowing MS to control how their renewable energy resources are jointly developed (statistical transfer), co-financed (the production is shared statistically), or their support schemes joined or harmonised.

electricity production based on renewable energy sources (2008)⁴ introduce different FIT for electricity produced from renewable energy sources (See Annex Figure 4). This is the main public instrument for achieving the goal of exploiting the full potential of Luxembourg renewable energy sources. Projects which benefit from the FIT can also benefit from investment incentives (see section 5).

In 2009, a second regulation⁵ created an aid scheme for physical persons for promoting the rational use of energy and the use of renewable energy sources in the residential housing sector. The aid scheme supports the construction of housing with high energy savings, and works in the existing buildings for reducing their energy consumption. It also encourages the use of solar thermal energy systems, heat pumps, pellet or wood chip furnaces and replacing low yield furnaces.

The aid scheme complements the regulation concerning the energy performance of residential buildings (2007), which transposed the European directive 2002/91/EC. The implementation of the regulation is mainly based on indirect support through regulatory and awareness raising measures. A large awareness campaign has been launched for promoting the national aid scheme (PRIME House campaign). The Government also signed in May 2008 an "energy efficiency partnership" with the banks for encouraging "eco-loans" (with lower interest rates) to households for building and renovating residential housing. The same regulation includes an obligation of the owners to obtain an energy performance certificate before selling or renting their house⁶. Finally, the Energy Agency was reorganised by creating a new subsidiary, MyEnergy, in charge of the awareness and communication campaigns on energy saving, and the promotion of the national aid scheme supporting the rational use of energy especially in the residential housing sector.

There are no available data concerning the distribution of public support (excluding the feed-in tariffs) between the different types of renewable energy sources. Globally, it is estimated that the total cost of the implementation of the NREAP should be EUR 830 million by 2020, with the creation of 1,500 to 1,600 jobs⁷, which means a dramatic increase of the financial support by the Government, compared to the current situation. In 2010, the national budget provided EUR 25.7 million for supporting the development of renewable energies and the energy efficiency (approximately the same as in 2008 and 2009).

⁴ Règlement Grand ducal relatif à la production d'électricité basée sur les sources d'énergies renouvelables (February 8, 2008).

⁵ Règlement du Grand ducal instituant un régime d'aides pour la promotion de l'utilisation rationnelle de l'énergie. et la mise en valeur des énergies renouvelables (April 20, 2009)

⁶ From January 2010, all owners that wish to sell or rent their property must present an energy performance certificate. This obligation is also applicable when the owners plans to make major changes in the building. ..

⁷ <http://www.europaforum.public.lu/fr/actualites/2010/07/krecke-energies-renouv/index.html>

It is worth mentioning that the crisis did not lead to any change in the long-term policy targets by 2020. It does not result from the literature and policy documents that the support has been intensified in order to counter the effects of the economic downturn. On the opposite, heavy pressure on public finance led to a reduced national budget on renewable energy and energy efficiency in 2011 (around EUR 23 million).

As a small Country, without real decentralised system, the support and incentives provided do not vary between regions or areas.

3. ERDF AND COHESION FUND SUPPORT AND CONTRIBUTION TO NATIONAL POLICY

The ERDF OP 2007–2013 (EUR 25 million of ERDF) supports the development of renewable energies through direct funding (investment grants) and, indirectly, energy efficiency through the support to MyEnergy.

Renewable energies and energy efficiency related measures are to be found in the first priority "Contribute to make Luxembourg more attractive for investment and employment" which aims at stimulating economic growth and employment through investment in infrastructure, promotion of new economic activities, and better synergies between environmental protection and economic growth. Measure 1.2. "Strengthening synergies between environmental protection and economy" includes "sub-measure" 1.2.2. "Encourage renewable energy sources and promote the rational use of energy", which directly contributes to the achievement of the Luxembourg targets in the renewable energies and energy efficiency as stated in the NREAP:

- encouraging the introduction of renewable energies production systems;
- promoting energy efficiency;
- awareness raising.

About EUR 2.2 million of ERDF funding was originally allocated to the sub-measure 1.2.2. representing only 9% of the total ERDF funding for the programming period : EUR 1.7 million on RE (with no prioritization by type of renewable sources⁸), and EUR 0.5 million on FOI Code 43, which includes among other things the support to energy efficiency management projects.

However, programming significantly differs from what had been planned in 2007. By March 30, 2011, six projects had been approved for an amount of EUR 5.7 million, mainly on renewable energies, well above the ERDF allocation of EUR 2.2 million, resulting in an over

⁸ The same ERDF allocation was planned for solar (FOI 40), biomass (FOI 41) and hydroelectric, geothermal and others (FOI 42) (see Annex Table B)

consumption of the ERDF funds. The managing authority still expects to spend between EUR 7 to 8 million ERDF funds allocated by the end of the programming period.

Among the 6 projects, 3 concern renewable energies (EUR 5.1 million of ERDF), mainly biomass production system (2 projects) and hydro (1 project). The larger project on biomass (EUR 4 million of ERDF) aims at supporting a pilot infrastructure for biogas production from bio-waste, vegetal and green grass covering a population area of 118,000 inhabitants (over 20% of population). The managing authority having made the choice to provide ERDF support only to non-profit and public organisations, wind and solar energy projects have not been supported so far and will not be supported in the future, as they are generally private-driven. In addition, the national aid scheme (combining feed-in tariffs and investment incentives) for wind and solar energies are considered as sufficiently attractive and accordingly not requiring additional support from ERDF.

Three projects concern energy efficiency management (EUR 0.6 million of ERDF). Two of them support MyEnergy activities: setting-up of a regional and decentralised network of MyEnergy 'Infopoints' providing information and advice to consumers and the building sector leading actors, especially regarding residential housing; support to the participation of the MyEnergy to national fairs. Interestingly, the third project supports a foresight study, led by the public research centre CRP Tudor, on the evolution of the energy consumption in Luxembourg (modelling of different scenarios), with the aim of providing policy-makers with a tool supporting decision-making.

The ERDF programming level is consistent with the national policy agenda, since it reflects the growing focus of the government on the development of renewable energies and energy efficiency. However, the increasing ERDF support is not explicitly linked to combating the economic crisis.

Focusing ERDF interventions on biomass and the promotion of energy efficiency, especially in the residential housing sector (through MyEnergy) is also rather complementary and consistent with the national policy. The NREAP identifies biomass production as of great potential in Luxembourg. ERDF support is provided to public and non-profit organisations, whereas the national aid schemes target households and businesses.

However, it is worth stressing that the scale of ERDF support compared to the national support is still rather limited, representing over the period EUR 1 million per year, i.e. 5% of the national budget dedicated to renewable energies and energy efficiency.

The INTERREG IV A "Grande Région" programme supports renewable energy and energy efficiency projects in Luxembourg. Involving Luxembourg, Lorraine (France), the Walloon Region, the German speaking community of Belgium and the German Länder of Saarland and Rhineland-Palatinate, priority 2 aims at "Improving the quality of life, increasing the

attractiveness of the individual areas and protecting the environment". The measure 2.3 "Valorisation and protection of the environment" dedicates EUR 4 million to renewable energy and energy efficiency, representing only 3.8% of the total ERDF allocation. Measure 2.3 aims at encouraging: the production of renewable energies and the promotion of their use for reducing fossil energies consumption; the definition of joint strategies for an optimal consumption of energies; and the reduction of greenhouse gas emissions.

By July 2010, Luxembourg partners were involved in three renewable energy and energy efficiency related projects, for a total ERDF contribution of EUR 2.2 million. Consistently with the NREAP and the Luxembourg ERDF OP, the major part of the funding targets energy production from biomass. Optibio gaz is an applied research project involving the Public Research Centre Lippmann; it aims at developing pilot projects for biogas production (biomethanisation) and creating a network of expertise in biomass production in the Great Region. Another project, Enerbiom also concerns a biomass pilot production unit involving both public and private research institutions and Chambers of Agriculture; the project is focused on the selection of the best sources of agricultural biomass (plant selection) and the identification of the optimal energetic valorisation of each type of plants. The third project, Polenergie, concerns the exchange of good practices in energy efficiency management, especially in the residential housing sector.

4. RATIONALE FOR PUBLIC INTERVENTION

The rationale for public intervention of the ERDF is clearly stated in the 2007–2013 OP and does not differ from the Luxembourg National Reform Programme and the NREAP justifications for the Luxembourg government interventions.

Basically, public interventions (ERDF, Government) rely on three reasons and are expected to deliver environmental and economic returns on investment:

- Environmental protection: the support to the development of renewable energies is contributing to the limitation of emissions of greenhouse gases (Kyoto Protocol) and to the fight against climate change. "Renewable energy" ERDF measures are included in the measure entitled "Strengthening the synergies between environmental protection and economy".
- Reduction of the energy dependency: support to renewable energies and energy efficiency in residential housing is seen as an important driver for, at least partially, overcoming the energy dependency and securing the energy supply.
- Economic development: reducing energy imports and developing locally based energy production sources also offer the opportunity to attract and create manufacturing and service companies, innovative in the areas of renewable energies

and energy efficiency, and therefore to generate new jobs in a local market that is sheltered from possible relocation of the industry. For instance, consistently with the ERDF interventions (both under the measure 1.2.2. and the axis 2 on innovation support), the Ministry of Economy adopted in 2009 an "Action Plan for the Eco-Technologies" paving the way for the creation of an Eco-Innovation Cluster (with a specialisation in energy efficient buildings).

There is no explicit reference made in the OP to the profitability of investment in renewable energies and energy efficiency. In consequence no distinction is made with respect to the profitability of investment between the different types of renewable energies and the different ways of improving the energy efficiency of housing.

The public debate is very active; NGOs (e.g. Greenpeace) and the Green Party criticised the extensive use of bio-fuels for achieving the NREAP target, stressing the risk in terms of protection of the biodiversity and the possible non-sustainable use of bio-fuels. In addition, a great concern emerges about the capacity to find relevant locations and speed-up the building process of wind and biomass infrastructures.

5. RATE OF SUPPORT AND PROFITABILITY

The FIT system resulting from the 2008 regulation, which modified a previous regulation (1994), varies according the different types of renewable energy sources: hydraulic, wind, photovoltaic, biogas, biomass or scrap wood, and depending on the size of the production units for a period of 15 years (Annex Table F). The availability of adequate funding (for financing the feed-in tariffs) is ensured by a compensation mechanism known as "*Fonds de Compensation*" (cf. section 6).

The FIT have been determined taking into account the potential of each renewable energy in Luxembourg (as defined in the LUXRES report) and the production costs and profitability rates of each source of renewable energy. For instance, regarding biomass and biogas, the tariffs has been determined for maximizing the energy efficiency of the infrastructures by encouraging an optimal use of the heat generated. Regarding hydroelectricity, the tariff aims at developing strongly the potential, even though it is limited.

The FIT depend on the size of the production units and are decreasing over a period of 15 years. They thus take into account the economies of scale generated by large-scale projects, but also the expected decrease of the investment required due to technological innovation which make cheaper the cost of infrastructure (even though for solar energy the decreasing rate is only 0.25% by year). In addition, the decreasing rates also incentivise the investors to implement as soon as possible their projects in order to take benefit over the period from

the more advantageous FIT, which by the way contributes to a faster achievement of Luxembourg targets in terms of renewable energy and energy efficiency.

Last but not least, the calculation of FIT also takes into account the investment incentives from which investors may benefit. In effect, projects which benefit from FIT can at the same time benefit from investment incentives. In 2008, when the FIT system has been adopted, the rate of investment support (grant) was as follows: 20–25% for wind, 30% for solar photovoltaic, 20% for hydroelectricity, 50% for biogas, 20% for solid biomass⁹. However, investments incentives resulting from 2009 and 2010 regulations depend on the category of beneficiaries: for households¹⁰, investment incentives are specific to the technology (i.e. photovoltaic, micro-cogeneration CHP, and heating system); for businesses all renewable sources are targeted¹¹ (See Annex Table G).

The rate of support does not vary in relation to the changes in the cost of fossil fuels, or in the case of residential housing, in the cost of electricity or heating.

6. COSTS, PUBLIC SUPPORT AND PRICES

Renewable energies:

As already stated (section 2), no financial data are available concerning the distribution of the public support between the different types of renewable energy sources. No public information is available concerning the cost of electricity production by type of renewable energy sources¹².

An amount of about EUR 25 million per year is dedicated to renewable energies and energy efficiency in the national budget. Apart from the national budget, the FIT system is financially guaranteed by the "*Fonds de compensation*". Created in 2001, after the opening of the electricity market (2000), and revised in 2005 and 2007, the mechanism aims at supporting the financing of the over-costs of the energy production based on cogeneration and renewable energy sources by spreading the burden of the over-costs on all the final clients of electricity. The contribution rates vary between three different types of clients (A, B, C) depending on the level of consumption. Basically the first category concerns households, the second businesses and SMEs, and the third one large industrial companies

⁹ Parliamentary debate, Reply from the State Secretary in charge of the relationship with the Parliament (Sept. 2007) http://www.chd.lu/wps/PA_1_084AIVIMRA06I4327110000000/FTSByteServingServletImpl/?path=/export/exped/sexpdata/Mag/039/622/063281.pdf

¹⁰ Règlement Grand ducal, April 20, 2009 (ibid.)

¹¹ Article 8 of the Law establishing a new aid scheme on environment protection and rational use of natural resources (February 18, 2010) : 45% of cofinancing of the eligible costs (ie. eligible costs are the difference of costs between a classical energy infrastructure and a renewable energy infrastructure).

¹² The feed-in tariffs calculation took into account the production costs by source of renewable energy, however no public document is available.

("big" electricity consumers). However, with the increasing development of cogeneration and renewable energies, the over-costs supported by the final clients has significantly increased, and will increase even more in the near future due to the NREAP targets. For this reason, the law of finance approving the 2011 budget¹³ introduced the possibility for the State to contribute directly to the "*Fonds de Compensation*" for reducing the financial burden imposed on the final clients. For the year 2008, the total costs of "alternative" energies (including cogeneration and electricity from renewable sources) was EUR 22 million¹⁴.

Energy efficiency in residential housing:

At the moment, there is no information available in the different reports and data on the existence of a premium price in the market prices or rents of residential housing using energy efficiency systems.

7. CONCLUSIONS

The decreasing share of the national budget dedicated to renewable energies and energy efficiency in 2011 (from EUR 25 million in 2010 to EUR 23 million in 2011) is a negative signal. This should however not affect ERDF programming as new ERDF projects are already in the pipe line.

There is little evidence of the impact of ERDF interventions on energy efficiency in residential housing. Support is provided to MyEnergy (indirect support); there has been so far no market analysis of the impact of energy efficiency works on the market prices or rents of residential housing.

Finally, discussions are in progress to assess the impact of the feed-in tariffs on the development of renewable energy sources and, possibly, to adapt the tariffs according to the energy market changes and the evolution of the electricity production costs.

¹³ Loi du 17 décembre 2010 concernant le budget des recettes et des dépenses de l'Etat pour l'exercice 2011 – <http://www.legilux.public.lu/leg/a/archives/2010/0249/a249.pdf#page=3>

¹⁴ Institut Luxembourgeois de Régulation (ILR), 2009 Activity Report, page 39.

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INTERVIEWS

Claude Hornick, Institut Luxembourgeois de Régulation – Service énergie (director)

Mathias Behm, Institut Luxembourgeois de Régulation – Service énergie (manager)

Bob Simon, Managing Authority, Ministry of Economy and Trade, Regional Policy Directorate (manager)

Ministry of Economy, Energy Directorate

TABLES AND FIGURES

Annex Table A – Production plants

<u>CENTRALES DE PRODUCTION AU LUXEMBOURG</u>				
	31.12.2008		31.12.2009	
	Puissance installée [kW]	Nombre de centrales	Puissance installée [kW]	Nombre de centrales
COGENERATION:				
Centrales industrielles:	29 200	3	29 200	3
Petites Centrales:	72 520	72	75 002	76
Microcentrales:	693	40	693	40
Autoproduction:	2 560	1	2 560	1
Total:	104 973	116	107 455	120
THERMIQUE:	383 600	2	383 600	2
HYDRO-ELECTRIQUE:				
Centrale de pompage:	1 100 000	1	1 100 000	1
Centrales Moselle, Sûre:	32 300	4	32 300	4
Microcentrales:	1 832	25	1 892	27
Total:	1 134 132	30	1 134 192	32
EOLIENNE:	42 915	42	42 930	43
BIOGAZ:	6 174	27	7 101	26
GAZ DES STATIONS D'EPURATION D'EAUX USEES:	1 602	3	1 922	4
GAZ DE DECHARGE:	0	0	75	1
PHOTOVOLTAIQUE: (*)	24 562	2 149	26 357	2 254
TOTAL DE TOUTES LES CENTRALES:	1 697 958	2 369	1 703 632	2 482
TOTAL DE TOUTES LES CENTRALES (HORS CENTRALE DE POMPAGE):	597 958	2 368	603 632	2 481

(*)Pour les centrales photovoltaïques le nombre de centrales correspond au nombre de contrats existants entre les producteurs et les gestionnaires de réseaux

Source: Rapport de l'Institut Luxembourgeois de Régulation sur l'évolution des marchés de l'électricité et du gaz naturel au Grand-Duché du Luxembourg, Année 2009 – Institut Luxembourgeois de la régulation – August 2010

Annex Table B – ERDF allocation by FOI code– Operational Programme 'Luxembourg'

Renewable energy	Allocation (EUR million)	FOI / total FEDER (%)	Commitments (EUR million) *
39 wind	0.3	1.0	0.0
40 solar	0.5	2.0	0.0
41 biomass	0.5	2.0	4.3
42 hydroelectric, geothermal and other	0.5	2.0	0.9
Total	1.8	7.0	5.1
Energy efficiency in residential housing			
43 Energy efficiency, co-generation, energy management **	0.5	2.0	0.6
78 Housing infrastructure	0.0	0.0	0.0
Total	0.5	2.0	0.6
Total 39–43	2.3	9.0	5.8
Total ERDF+Cohesion fund	25.2	100.0	
* 6 projects under sub-measure 1.2.2 committed (March 30, 2011)			
** Not: not all investment is for energy efficiency in residential housing			

Source: DG REGIO and Managing Authority

Annex Table C – List of projects adopted for the measure 1.2 “Reinforce synergies between environmental protection and economic growth

Project manager	Name of the project	ERDF commitments (EUR)
GIE My Energie	Développement d'un stand "My Energie"	69,225
Syndicat Minett-Kompost	Installation de compostage et de biogaz à Mondercange Lot 1, équipement technique et éléments de construction immanents	4,000,000
STEP Bettembourg	Solare Klärschlamm-trocknungsanlage	875,000
CRP-Henri Tudor / (CRTE)	Analyse de conséquences environnementales et économiques de scénarios énergétiques au Luxembourg (LUXEN)	78,000
My Energie GIE	Mise en place d'un réseau "infopoints"	492,087
Cne de Mamer	Centrale énergétique et réseau de chaleur "Nahwärmeverbund Energieturm Capellen"	271,400

Source: Ministère de l'Economie et du Commerce extérieur – Direction de la politique régionale

Annex Table D – ERDF allocation by FOI code – Operational Programme Interreg IVA Grande Region

	Allocation EUR million	% allocated for the measure 2.3.	FOI / total FEDER
Renewable energy			
39 wind	0.8	3.0	0.8
40 solar	0.8	3.0	0.8
41 biomass	0.8	3.0	0.8
42 hydroelectric, geothermal and other	0.8	3.0	0.8
Total	3.2		3.0
Energy efficiency in residential housing			
43 Energy efficiency, co-generation, energy management	0.8	3.0	0.8
78 Housing infrastructure	0		0.0
Total 39-43	4.0		3.8
TOTAL ERDF	106		

Source: Operational Programme Interreg IVA Grande Region

Annex Table E – Projects approved in the field of Energy efficiency in residential housing and renewable energies (sub-measure 2.3) of the OP Greater Region 2007–2013 (EUR million)

Name of the Project	Total allocation	ERDF contribution	Luxembourger Partner
Optibiogaz	1.7	0.9	National research centre Gabriel Lippmann
Polenergie	0.5	0.2	Réidener Energiatelier asbl
Enerbiom	2.2	1.1	National research centre Gabriel Lippmann

Source: <http://www.interreg-4agr.eu/fr/page.php?pageld=348>

Annex Table F – Feed-in-Tariffs by type of renewable energy sources

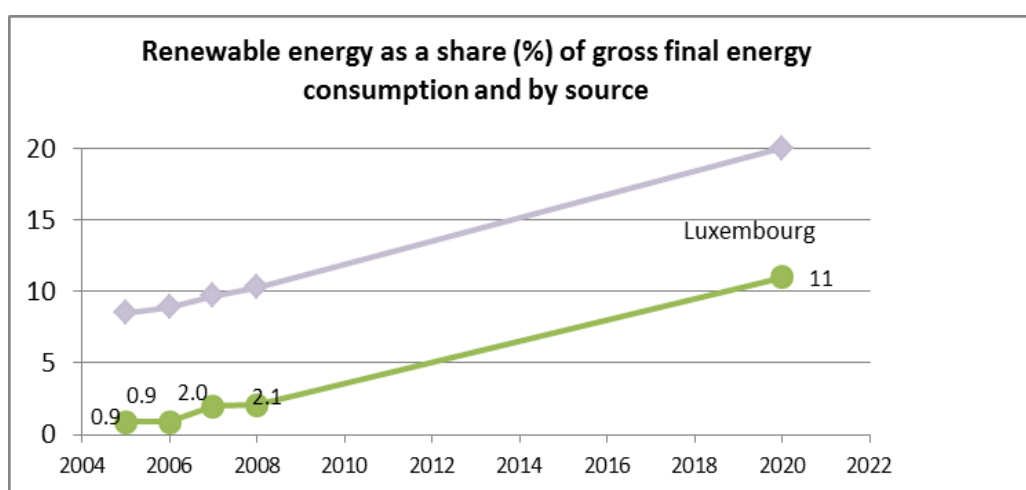
Photovoltaics	Electrical peak performance < 30 kW _p	0.4200 EUR/kWh for 15 years in the case of a first electricity feed-in in 2008
		0.4074 EUR/kWh for 15 years in the case of a first electricity feed-in in 2009
		0.3948 EUR/kWh for 15 years in the case of a first electricity feed-in in 2010
		0.3822 EUR/kWh for 15 years in the case of a first electricity feed-in in 2011
		0.3696 EUR/kWh for 15 years in the case of a first electricity feed-in in 2012
	30 kW _p < electrical peak performance • 1 MW _p	0.3700 EUR/kWh for 15 years in the case of a first electricity feed-in in 2008
		0.3589 EUR/kWh for 15 years in the case of a first electricity feed-in in 2009
		0.3478 EUR/kWh for 15 years in the case of a first electricity feed-in in 2010
		0.3367 EUR/kWh for 15 years in the case of a first electricity feed-in in 2011
		0.3256 EUR/kWh for 15 years in the case of a first electricity feed-in in 2012
Wind	0,082 – 0,083 EUR/kWh during 15 years (according to the years of electricity feed-in).	
Hydro energy	electrical nominal capacity • 1MW	0.104 to 0.105 EUR/kWh for 15 years (according to the years of electricity feed-in).
	1 MW < electrical nominal capacity • 6 MW	0.084 to 0.085 EUR/kWh for 15 years (according to the years of electricity feed-in).
Biomass	Electrical nominal capacity • 1 MW	0.143 à 0.145 EUR/kWh for 15 years (according to the years of electricity feed-in).
	1 MW < electrical nominal capacity • 5 MW	0.123 à 0.125 EUR/kWh for 15 years (according to the years of electricity feed-in).
Old and scrap wood	Electrical nominal capacity • 1 MW	0.128 à 0.130 EUR/kWh for 15 years (according to the years of electricity feed-in).
	1 MW < electrical nominal capacity • 5 MW	0.108 à 0.110 EUR/kWh for 15 years (according to the years of electricity feed-in).
Biogas	Electrical nominal capacity < 150 kW	0.148 à 0.150 EUR/kWh for 15 years (according to the years of electricity feed-in).
	150 kW < electrical nominal capacity • 300 kW	0.138 à 0.140 EUR/kWh for 15 years (according to the years of electricity feed-in).
	300 kW < electrical nominal capacity • 500 kW	0.128 à 0.130 EUR/kWh for 15 years (according to the years of electricity feed-in).
	500 kW < electrical nominal capacity • 2500 kW	0.119 à 0.120 EUR/kWh for 15 years (according to the years of electricity feed-in).
Sewage gas		0.064 à 0.065 EUR/kWh for 15 years (according to the years of electricity feed-in).

Sources : NREAP 2010 ; Règlement Grand Ducal, February 8, 2008 ; INTERREG IVA project "PôlEnergie" seminar (http://www.polenergie.eu/files/primess_gdl_ser.pdf)

Annex Table G – Investment incentives for energy production from renewable sources

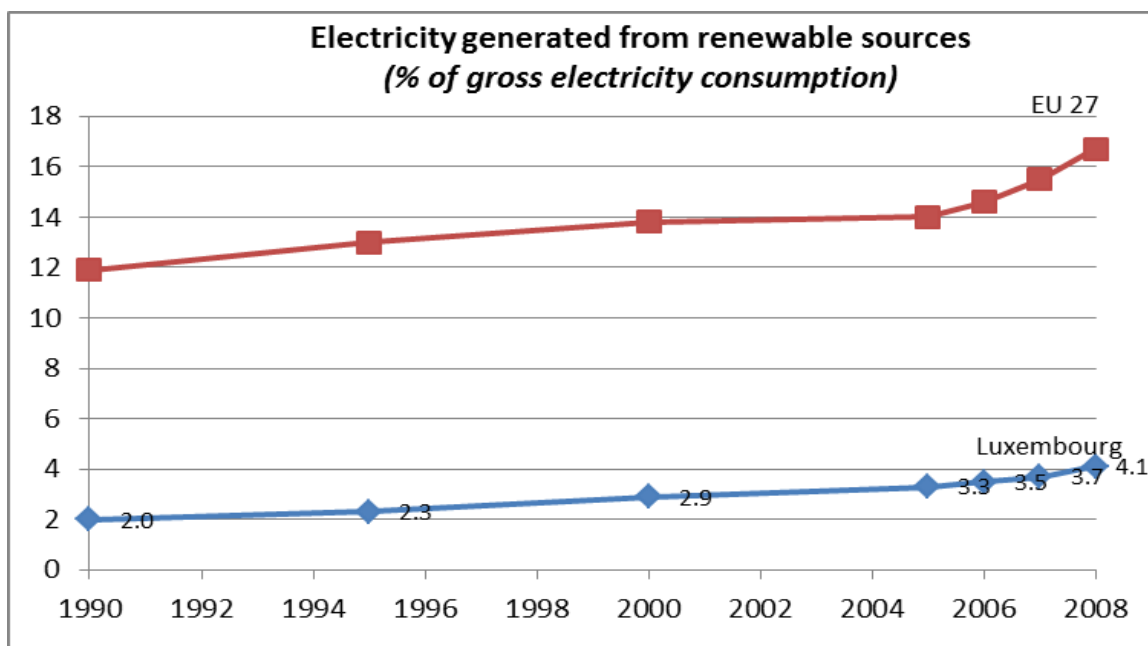
Beneficiary	Investment incentives
Individuals (Règlement Grand Ducal, April 2009)	Photovoltaic: 30% – max. EUR 1,650 per KW peak
	Solar thermal system: 50% – max. EUR 3,000 to EUR 5,000
	Wood heating: 25%-30% – max. EUR 2,000 to EUR 4,000
	Microcogeneration: 25% – max. EUR 3,000
	Heat pumps : 40% – max. EUR 3,000 to EUR 6,000
Companies (Loi, February 2010)	All renewable energy technologies targeted 45% of the eligible costs. Eligible costs are the difference of costs between classical energy production infrastructures and renewable energy production infrastructures

Sources : Règlement du Grand ducal instituant un régime d'aides pour la promotion de l'utilisation rationnelle de l'énergie et la mise en valeur des énergies renouvelables (April 20, 2009) ; Loi relative à un régime d'aides à la protection de l'environnement et à l'utilisation rationnelle des ressources naturelles (February 18, 2010).

Annex Figure 1 – Renewable energy as a share (%) of gross final energy consumption and by source

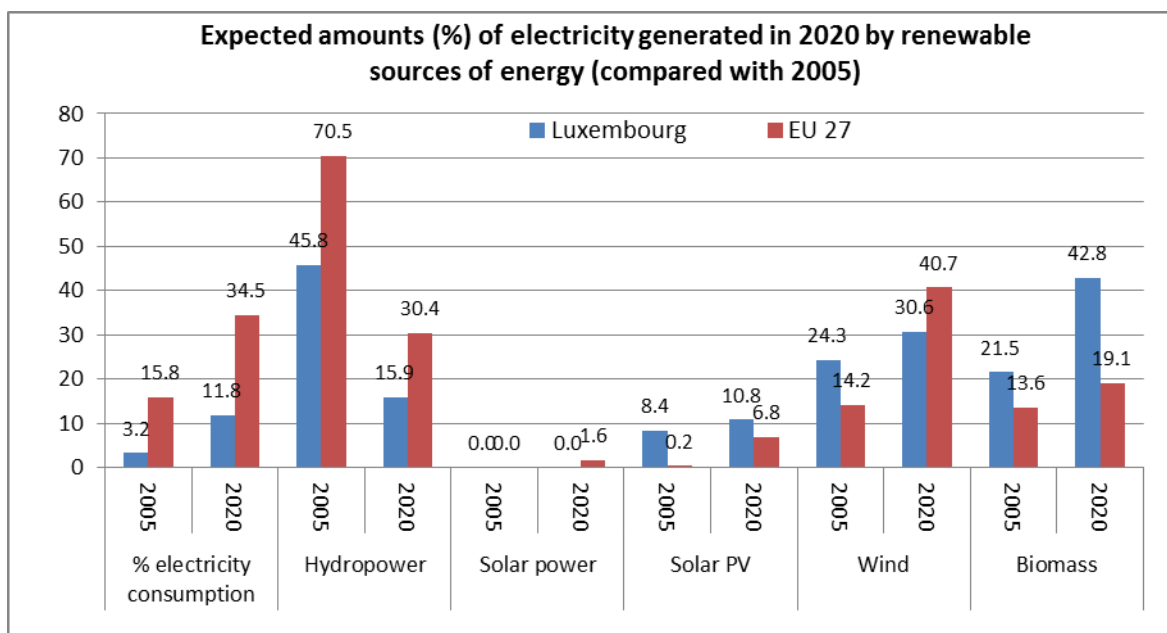
Source: Eurostat

Annex Figure 2 – Electricity generated from renewable sources



Source: Eurostat

Annex Figure 3 – Expected amounts of electricity generated in 2020 by renewable sources of energy



Source: Eurostat

Annex Figure 4 – Energy and energy efficiency measures in the Luxembourg Budget 2010

Running expenditures		2010 adopted budget
Ministry of Economy	Mesures destinées à promouvoir et à mettre en œuvre des mesures dans le domaine de l'efficacité énergétique et des énergies renouvelables..	250 000 €
	Participation financière aux frais de fonctionnement du Groupement d'Intérêt Economique "My Energy"	600 000 €
	Regroupement comptable des dépenses du ministère de l'Economie et du Commerce Extérieur	14 594 068 €
Ministry of Sustainable Development and Infrastructures	Participation financière aux frais de fonctionnement du Groupement d'Intérêt Economique "My Energy".	600 000 €
	Etudes, conseils, planification et réalisation de projets pilotes en matière d'utilisation rationnelle et de promotion d'énergies nouvelles et renouvelables mis en oeuvre par l'Agence de l'énergie ou d'autres organismes: dépenses diverses. (Sans distinction d'exercice)	50 000 €
	Participation de l'Etat au financement de projets de promotion des économies d'énergie et de l'utilisation des énergies nouvelles et renouvelables au niveau local et régional réalisé par les communes et les syndicats de communes.	95 000 €
	Participation aux frais d'organisations non gouvernementales pour la réalisation d'actions de promotion des économies d'énergie et de l'utilisation des énergies renouvelables au niveau régional et local. (Sans distinction d'exercice)	35 000 €
	Prime d'encouragement pour l'électricité produite à partir de l'énergie éolienne, hydraulique, solaire et de la biomasse. (Crédit non limitatif et sans distinction d'exercice)	13 000 000 €
	Total des dépenses courantes du ministère en matière d'énergies	13 780 000 €
	Regroupement comptable des dépenses du Ministère du Développement durable et des infrastructures	913 577 065 €
	Total des dépenses courantes en matière d'énergies	14 630 000 €
Total des regroupements comptables des ministères		928 171 133 €
Capital expenditures		2010 adopted budget
Ministry of Economy	Application de la législation en matière d'aide à la protection de l'environnement, à l'utilisation rationnelle de l'énergie et à la production d'énergie de sources renouvelables: subventions en capital. (Crédit non limitatif et sans distinction d'exercice)	1 000 000 €
	Mesures destinées à promouvoir l'utilisation rationnelle de l'énergie et le développement des énergies renouvelables. (Sans distinction d'exercice)	100 000 €
	Total des dépenses courantes du ministère en matière d'énergies	1 100 000 €
	Regroupement comptable des dépenses du ministère de l'Economie et du Commerce Extérieur	68 513 900 €
Ministry of Sustainable Development and Infrastructures	Mesures destinées à promouvoir une utilisation rationnelle de l'énergie, à la réalisation d'économie d'énergie et une valorisation des énergies renouvelables et nouvelles. - Participation à des projets pilotes et contrats de recherches. (Sans distinction d'exercice)	10 000 €
	Mesures destinées à promouvoir une utilisation rationnelle de l'énergie, une utilisation des énergies renouvelables et nouvelles et une réalisation d'économies d'énergie. - Participation aux frais d'études et aux dépenses d'investissement. (Crédit non limitatif et sans distinction d'exercice)	10 000 000 €
	Total des dépenses courantes du ministère en matière d'énergies	10 010 000 €
	Regroupement comptable des dépenses du Ministère du Développement durable et des infrastructures	374 298 500 €
Total des dépenses en capital en matière d'énergies		11 110 000 €

Source : <http://www.igf.etat.lu/pb2011.pdf>