

Grand Duchy of Luxembourg

**Progress report under Article 22 of Directive 2009/28/EC
on the promotion of the use of energy from renewable sources**

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (2011 and 2012)
(Article 22(1)(a) of Directive 2009/28/EC)

Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources¹

	2011	2012
RES-H&C ² (%)	4.80 %	4.99 %
RES-E ³ (%)	4.07 %	4.64 %
RES-T ⁴ (%)	2.05 %	2.22 %
Overall RES share ⁵ (%)	2.87 %	3.13 %
<i>Of which from cooperation mechanism⁶ (%)</i>		
<i>Surplus for cooperation mechanism⁷ (%)</i>		

The figures for energy from renewable sources in Luxembourg for 2011 and 2012 are based on statistics from the SHARES model.

In the NREAP (Table 3), Luxembourg has quoted an intermediate target of 2.92 % for energy from renewable sources. The intermediate target achieved was 3.00 %. The 0.08 % surplus compared with the NREAP was achieved primarily as a result of faster growth in renewable energy sources in the heating and cooling sector, due mainly to the fact that a number of industrial undertakings added large installations. Renewable energy sources in the transport sector also performed better than assumed in the NREAP, due to the cautious approach taken in the NREAP, as it was still not certain when the plan was prepared if biofuels fulfilled the sustainability criteria. However, blending of 2 % biofuels in conventional fuels was proven with sustainable biofuels. The electricity sector progressed more slowly than assumed in the NREAP. A new regulation redefining feed-in tariffs for renewable electricity production plants is therefore in the pipeline and will enter into force in early 2014, in order to give new momentum to the production of renewable electricity.

¹ Facilitates comparison with Table 3 and Table 4a of the NREAP.

² Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Article 5(1)(b) and (4) of Directive 2009/28/EC) divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAPs applies.

³ Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Article 5(1)(a) and (3) of Directive 2009/28/EC) divided by total gross final consumption of electricity. The same methodology as in Table 3 of NREAPs applies.

⁴ Share of renewable energy in transport: final energy from renewable sources consumed in transport (cf. Article 5(1)(c) and (5) of Directive 2009/28/EC) divided by the consumption in transport of 1) petrol; 2) diesel; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1). The same methodology as in Table 3 of the NREAP applies.

⁵ Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of the NREAP applies.

⁶ In percentage point of overall RES share.

⁷ In percentage point of overall RES share.

Table 1a: Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)⁸

	2011	2012
(A) Gross final consumption of RES for heating and cooling	49.8	53.5
(B) Gross final consumption of electricity from RES	22.8	25.2
(C) Gross final consumption of energy from RES in transport	47.8	49.5
(D) Gross total RES consumption ⁹	120.6	128.2
(E) Transfer of RES to other Member States		
(F) Transfer of RES from other Member States and 3rd countries		
(G) RES consumption adjusted for target (D)-(E)+(F)	120.3	127.6

In 2011 and 2012, no energy from renewable sources was transferred from Luxembourg to other Member States and no energy from renewable sources was transferred from other Member States and third countries to Luxembourg.

Table 1.b: Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Luxembourg to meet the binding 2020 targets and the indicative interim trajectories for the shares of energy from renewable resources in electricity¹⁰

	2011		2012	
	MW	GWh	MW	GWh
Hydro ¹¹ :				
non pumped	34	102	34	103
<1MW	2	6	2	6
1MW–10 MW	32	96	32	97
>10MW	0	0	0	0
pumped ¹²	1,134	1,174	1,134	1,164
mixed ¹³	0	0	0	0
Geothermal	0	0	0	0
Solar:				
photovoltaic	41	26	75	38
concentrated solar power	0	0	0	0
Tide, wave, ocean	0	0	0	0
Wind:				
onshore	45	67	58	74
offshore	0	0	0	0
Biomass ¹⁴ :				
solid biomass	7	38	7	36
biogas	10	58	10	55
bioliquids	0	0	0	0
TOTAL¹⁵	148	291	187	306
of which in CHP	9	53	9	56

Overall, the installed capacity for energy production from renewable energy sources in the electricity sector (2011 and 2012) rose in comparison with the NREAP (2011: 120 MW; 2012: 151 MW). The production of renewable energy in the electricity sector was higher in 2011 and lower in 2012 than the values assumed in the NREAP. This is mainly due to the fact

⁸ Facilitates comparison with Table 4a of the NREAP.

⁹ According to Article 5(1) of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

¹⁰ Facilitates comparison with Table 10a of the NREAP.

¹¹ Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.

¹² **Compared with the NREAP, these values also include non-pumped values.**

¹³ In accordance with new Eurostat methodology.

¹⁴ Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

¹⁵ **Without pumped electricity.**

that the actual installed capacities of technologies with a high number of full load hours (hydro, biomass, biogas) are just below the values assumed in the NREAP.

Compared with the NREAP, the installed capacity for 2011 and 2012 and thus the energy output were higher for photovoltaic systems in particular. The value for installed capacity for 2012 was almost twice as high as the value assumed in the NREAP. This was due mainly to the fact that investment grants were reduced in 2013 and, above all, to the fact that the feed-in tariff will also be reduced at the beginning of each following year. Numerous plants were erected in late 2012 because of the reduction in feed-in tariffs announced for 2013. This explains the proportionally lower output despite the higher installed capacity in 2012.

The installed capacity of wind energy is slightly higher than the values assumed in the NREAP in both 2011 and 2012. However, wind output (2011: 67 GWh; 2012: 74 GWh) is lower than the values assumed in the NREAP (2011: 71 GWh; 2012: 98 GWh). This is due to poor wind conditions in the years concerned.

Hydro and biomass output and their installed capacities are slightly below the values assumed in the NREAP.

Table 1c: Total actual contribution (final energy consumption¹⁶) from each renewable energy technology in Luxembourg to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling (ktoe)¹⁷

	2011	2012
Geothermal (excluding low temperature geothermal heat in heat pump applications)	0	0
Solar	1.0	1.7
Biomass ¹⁸ :	51.7	54.5
<i>solid biomass</i>	45.7	47.5
<i>biogas</i>	6.0	7.0
<i>bioliquids</i>	0	0
Renewable energy from heat pumps:		
- of which aerothermal	1.2	1.2
- of which geothermal		
- of which hydrothermal		
TOTAL	53.9	57.4
<i>Of which DH¹⁹</i>	2.9	3.1
<i>Of which biomass in households²⁰</i>	14.8	17.6

Total energy consumption from renewable energy sources in the heating and cooling sector was much higher in 2011 and 2012 than the values forecast in the NREAP (2011: factor of 2.0; 2012: factor of 1.6).

This is due in particular to biomass. Final energy consumption in the heating and cooling sector from solid biomass is twice as high as that estimated in the NREAP (2011: 20.3 ktoe; 2012: 24.0 ktoe). This is due to the presence of several large industrial undertakings in the biomass sector (wood processing), which covers part of the heating requirement from biomass. Moreover, in the heating and cooling sector, three biogas plants were connected to

¹⁶ Direct use and district heat as defined in Article 5(4) of Directive 2009/28/EC.

¹⁷ Facilitates comparison with Table 11 of the NREAP.

¹⁸ Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

¹⁹ District heating and/or cooling from total renewable heating and cooling consumption (RES-DH).

²⁰ From the total renewable heating and cooling consumption.

the public gas network in 2011. Following completion of test phases in late 2011/early 2012, these plants fed in a total of 5.6 ktoe by the end of 2012.

More detailed information on the practical implementation of the corresponding regulation is contained in the report ‘2012 Report — Implementation of the Grand Duchy Regulation of 15 December 2011 on the production, remuneration and marketing of biogases sent to the European Commission at the end of May 2013.

Table 1d: Total actual contribution from each renewable energy technology in Luxembourg to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe)^{21,22}

	2011	2012
Bioethanol/ bio-ETBE	7	1
<i>Of which biofuels²³ Article 21(2)</i>	0	0
<i>Of which imported²⁴</i>	7	1
Biodiesel	39	46
<i>Of which biofuels²⁵ Article 21(2)</i>	0	0
<i>Of which imported²⁶</i>	39	46
Hydrogen from renewables	0	0
Renewable electricity	2	2
<i>Of which road transport</i>	0	0
<i>Of which non-road transport</i>	2	2
Others (as biogas, vegetable oils, etc.) – please specify	0	0
<i>Of which biofuels²⁷ Article 21(2)</i>	0	0
TOTAL	48	49

The proportion of energy from renewable sources in the transport sector in 2011 and 2012 is in part much higher than the figures quoted in the NREAP. This is due to the fact that, when the NREAP was prepared, there was uncertainty as to whether the renewable fuels fulfilled sustainability criteria. However, it transpired in practice that the mineral oil companies which import renewable fuels were able to provide the proof of compliance with sustainability criteria.

²¹ For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) last subparagraph.

²² Facilitates comparison with Table 12 of the NREAP.

²³ Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

²⁴ From the whole amount of bioethanol/bio-ETBE.

²⁵ Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

²⁶ From the whole amount of biodiesel.

²⁷ Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

2. Measures taken in the preceding 2 years and/or planned at national level to promote the growth of energy from renewable sources taking into account the indicative trajectory for achieving the national RES targets as outlined in your National Renewable Energy Action Plan (Article 22(1)(a) of Directive 2009/28/EC)

Table 2: Overview of all policies and measures

Name and reference of the measure ²⁸	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure	Change compared with NREAP
1. Check that potential administrative barriers have been eliminated	Legislative	Increase installed capacity and energy production from RES	Public administration	Already existing in part	Start: January 2010 End: December 2012	Grand Duchy regulation (Grand Duchy Regulation of 10 May 2012 introducing a new nomenclature and classification for classified establishments) makes provision for partial simplification of the Luxembourg Commodo-Incommodo procedure (approval procedure), which also applies to renewable energy.
2. At municipal level, check if renewable energies and energy efficiency can be integrated into local planning regulations.	Legislative	Increase installed capacity and energy production from RES	Municipalities	Existing	Start: September 2010 End: December 2011	A new law entered into force on 1 August 2011 (Law of 28 July 2011 amending the amended law of 19 July 2004 on local development). This is the first law providing for rational use of energy and use of renewable energies as a local policy objective. In future, the municipalities will be able to prescribe requirements for the purpose of increasing energy production from renewable energy sources.
5. The pace of renewable energies in new residential buildings has been forced since July 2012 by tightening up energy efficiency standards (increasing requirements in terms of energy performance and thermal insulation)	Legislative	Increase installed capacity and energy production from RES	Consumers	Existing	Start: July 2012	A new rule entered into force under the Grand Duchy Regulation in May 2012 amending the existing Regulation on the Energy Performance of Residential Buildings (Amended Grand Duchy Regulation of 30 November 2007 on the Energy Performance of Buildings). The pace of renewable energies in new residential buildings has been forced since July 2012 by tightening up energy efficiency standards (increasing requirements in terms of energy performance and thermal insulation). Provision has also been made for energy efficiency to be increased incrementally in 2015 and 2017 in light of the nearly-zero energy building requirement in Directive 2010/31/EU.

²⁸ Measure reference numbers are taken from the NREAP.

6. Check if guidelines, call templates and contract templates for central supply systems using renewable energy sources may be helpful in developing such systems. The corresponding documents are currently being drafted.	Informative, standardising, educational	Change of conduct. Increase installed capacity and energy production from RES	Consumers, planners, tradesmen, developers	Already existing in part	Start: September 2010 End: December 2013	The corresponding documents are available or are currently being prepared. myenergy publishes these documents on its website (www.myenergy.lu), where guidelines for planning wood-fired heating, solar heat systems, heat pumps, etc. are available.
10. myenergy is currently establishing (up to 2012) a nationwide network of information points, so that every citizen of Luxembourg has a regional contact point for questions on energy efficiency and renewable energies.	Informative	Change of conduct. Increase installed capacity and energy production from RES	Citizens	Already existing in part	Start: January 2009	The nationwide network of information points is progressing. The number of municipalities connected to the network was 73 (out of a possible 106) at the end of 2012.
14. The Trade Chambers holds a further training course every year for tradesmen who, if they pass the course, receive a quality label (<i>Energie fir d'Zukunft</i>) in the renewable energy and energy efficiency sectors. Another label (<i>Energie fir d'Zukunft+</i>) has been introduced, certifying that trainees who pass the course have more extensive knowledge	Educational, informative	Increase installed capacity and energy production from RES	Tradesmen	Existing	Start: 2001	Another label (<i>Energie fir d'Zukunft+</i>) has been introduced, certifying that trainees who pass the course have more extensive knowledge.
16. Check how information on net advantages, costs and energy efficiency of systems and equipment which use energy from renewable sources for heating, cooling and electricity can best be published for users. The corresponding documents are currently being prepared.	Informative	Change of conduct	Consumers	Existing	Start: September 2010 End: May 2012	The corresponding information and documents are available on the myenergy website (www.myenergy.lu).

18. First pilot projects for smart networks and intelligent meters have already been started by various network operators. These will be evaluated in order to decide on further action to improve the integration of renewable energy in power networks. A study into smart networks and intelligent meters has been completed. Network operators and the regulatory authorities are cooperating to organise the national rollout of smart networks and intelligent meters.	Infrastructure-related	Change of conduct	Network operators	Existing in part	Start: 2009	A study into smart networks and intelligent meters has been completed. The network operators and regulatory authorities are organising the national rollout of smart networks and intelligent meters. The Electricity Market Act (Amended Law of 1 August 2007 on the Organisation of the Electricity Market) anchors the targets for intelligent meters in legislation on the liberalisation of the electricity market. A joint venture between network operators (gas and electricity) was set up on 28 November 2012 with the objective of organising and coordinating smart networks and intelligent meters.
20. Check if current provisions need to be adapted in terms of cost allocation for connections and electricity grid infrastructures require technical adjustment.	Legislative	Increase installed capacity and energy production from RES	Public administration	Existing	Start: January 2011 End: August 2012	Amended Law of 1 August 2007 on the Organisation of the Electricity Market (for explanation of this, see chapters 2a and 2b).
23. Transposition of sustainability criteria for biofuels and other bioliquids into Luxembourg law.	Legislative	Change of conduct	Public administration, mineral oil companies	Existing	Start: January 2010 End: February 2011	A Grand Duchy Regulation entered into force in March 2011. The Grand Duchy Regulation of 27 February 2011 laying down Sustainability Criteria for Biofuels and Bioliquids regulates the sustainability criteria for biofuels and other bioliquids.
24. Investment aid is granted to private individuals for electricity and heat production from renewable energy sources. This aid should be adjusted to the targets during the implementation of this plan	Financial, legislative	Increase installed capacity and energy production from RES	Private individuals	Existing	Start: 2001	A revised aid programme entered into force on 1 January 2013 (Grand Duchy Regulation of 12 December 2012 establishing an aid scheme to promote the rational use of energy and energy from renewable sources in the housing sector). The reform was based extensively on the development trajectories pursued in the NREAP for renewable energy sources.
29. Feed-in tariffs for electricity from renewable energy sources. The amount and structure of feed-in tariffs are currently being revised within the framework of implementation of this plan.	Financial, legislative	Increase installed capacity and energy production from RES	System operators	Existing	Start: 1994	A revised regulation is currently being prepared and will probably enter into force in early 2014. The reform is based extensively on the development trajectories pursued in the NREAP for renewable energy sources.

30. Mandatory blending currently applies to all diesel and petrol fuels, in order to increase the use of energy from renewable sources in the transport sector. Mandatory blending has been supplemented by the sustainability criteria laid down in Directive 2009/28/EC.	Legislative	Increase energy production from RES	Mineral oil companies	Existing	Start: 2007	Mandatory blending has been supplemented by the sustainability criteria laid down in Directive 2009/28/EC (see also measure23).
34. Support for biogas production and feed-in into the gas network.	Financial, legislative	Increase installed capacity and energy production from RES	Investors	Existing	Start: 2011	A Grand Duchy Regulation entered into force on 26 December 2011: The Grand Duchy Regulation of 15 December 2011 on the Production, Remuneration and Marketing of Biogas is the first regulation to use a feed-in tariff to promote biogas production, preparation and feed-in into the gas network. The level of the tariffs laid down in the regulation is currently being reviewed.
35. Improved use of forests, especially private-owned forests	Financial, cooperative, infrastructure-related	Increase installed capacity and energy production from RES	Private forest owners	Closed	Start: September 2010 End: December 2012	Specific works and analyses were initiated with the Association of Private Forest Owners, such as inventory work on forest structures.
New 38. Check if a feed-in tariff should be introduced for heat produced from biomass	Financial, legislative	Increase installed capacity and energy production from RES	Investors	Planned	Start: September 2013 End: September 2014	Analyses of the formulation of a feed-in tariff have been started in this sector. Results are expected in 2014.

* Indicate if the measure is (predominantly) regulatory, financial or soft (i.e. information campaign).

**Is the expected result behavioural change, installed capacity (MW; t/year), energy generated (ktoe)?

***Who are the targeted persons: investors, end users, public administration, planners, architects, installers, etc? Or what is the targeted activity / sector: biofuel production, energetic use of animal manure, etc.?

**** Does this measure replace or complement measures contained in Table 5 of the NREAP?

2.a Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy (Article 22(1)(e) of Directive 2009/28/EC)

The elimination of potential administrative barriers in all sectors will be verified within the framework of the transposition of Directive 2009/28/EC. This will involve the ministries and administrations and, where necessary, the municipalities concerned. The effectiveness of a series of approval procedures has been checked within the framework of administrative simplification measures. The Grand Duchy Regulation of 10 May 2012 (Grand Duchy Regulation of 10 May 2012 on the Nomenclature and Classification of Classified Establishments) makes provision for various simplifications to the Luxembourg Incommodo-Commodo procedure (approval procedure), which also applies to energy from renewable sources (e.g. geothermal boreholes).

The Electricity Market Act (Amended Law of 1 August 2007 on the Organisation of the Electricity Market) contains the following provisions in its most recent amendment (2012) in connection with progress in evaluating and improving administrative procedures:

- grid operators are required to send energy producers using renewable sources detailed information on grid connection costs and connection schedules;
- the source of renewable energies (and thus the 20 % target for renewable energies in 2020) is used as a criterion for approval of energy production plants.

2.b Please describe the measures in ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements (Article 22(1)(f) of Directive 2009/28/EC)

Access for electricity from renewable sources to the public grid and the rules governing the assumption and allocation of grid connection and grid reinforcement costs are regulated under Article 5 of the Electricity Market Act (Amended Law of 1 August 2007 on the Organisation of the Electricity Market). During adaptation of the aforementioned law to Directive 2009/72/EU (Law of 7 August 2012), the Ministry of Economic Affairs amended the Electricity Market Act in order to guarantee access to electricity from renewable energy sources to the public grid, transport and distribution of electricity by the grid operator. Previously, electricity from renewable sources was merely granted priority access. The new rule therefore goes further and the Luxembourg regulatory authority was instructed when preparing calculating methodologies for grid usage costs to encourage grid operators to take account of progress in energy from renewable sources during grid expansion. Grid operators were also instructed to take measures to minimise the shutdown risk of renewable production plants. If production of energy from renewable sources has to be withdrawn, the grid operator must notify the regulatory authorities and propose measures to prevent this from happening in future. Generally speaking, the regulatory authority is required to help ensure that the grid is designed to be able to integrate energy from renewable sources without additional problems and to eliminate barriers to the integration of energy from renewable sources.

3. Please describe the support schemes and other measures currently in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan (Article 22(1)(b) of Directive 2009/28/EC)

Existing support schemes and other measures to promote energy from renewable sources are described in detail in the NREAP. Therefore, only measures which have been further developed since the NREAP are mentioned at this point.

- Re.: Point 4.2.2.(a) of the NREAP: Technical specifications

Investment aid for private individuals has been revised under the Grand Duchy Regulation of 12 December 2012 introducing an aid scheme to promote the rational use of energy and the use of energy from renewable sources. Technical specification-related quality requirements revised within that framework are listed below:

SOLAR HEAT

Solar heat systems for hot water

Use	Conditions
Single-family house	Heat meter Solar Keymark certified collectors
Multiple-family house	Heat meter Solar Keymark certified collectors

Solar heat systems for hot water and additional heating

Use	Conditions
Single-family house	Heat meter Solar Keymark certified collectors Collector surface $\geq 9 \text{ m}^2$ (flat surface collector) or 7 m^2 (evacuated tube collector) Hydraulic balancing
Multiple-family house	Heat meter Solar Keymark certified collectors Collector surface $\geq 9 \text{ m}^2$ (flat surface collector) or 7 m^2 (evacuated tube collector) Hydraulic balancing

PHOTOVOLTAICS

Conditions
Mounted on roof/façade or integrated into building envelope Maximum eligible peak capacity: 30 kWp per location

WOOD-FIRED HEATING

Central heating using wood pellets or wood chips

Use	Conditions
Single-family house	Emission limit value(*) Efficiency factor ≥ 90 % Output and combustion regulation, automatic loading and ignition
Multiple-family house	Emission limit value(*) Efficiency factor ≥ 90 % Output and combustion regulation, automatic loading and ignition

Wood pellet stove (with heat extraction into central heating circuit)

Use	Conditions
Single-family house	Emission limit value(*) Efficiency factor ≥ 90 % Heat extraction into heating circuit ≥ 50 % Output and combustion regulation

Central heating using split logs or a combination of split logs and pellets

Use	Conditions
Single-family house	Emission limit value(*) Efficiency factor ≥ 90 % Output and combustion regulation Buffer storage ≥ 55 l/kW
Multiple-family house	Emission limit value(*) Efficiency factor ≥ 90 % Output and combustion regulation Buffer storage ≥ 55 l/kW

(*) Compliance with the following criteria must be proven in a certificate from the heating installer:

- CO emissions ≤ 250 mg/m³ (at nominal load)
- particle emissions ≤ 50 mg/m³ (at nominal load)
- NOx emissions ≤ 200 mg/m³ (at nominal load)
- boiler efficiency factor ≥ 90 %
- firing efficiency factor ≥ 90 %.

HEAT PUMPS

Geothermal pumps (probes or collectors)

Use	Conditions
Single-family house	For heating only COP value B0/W35 or E4/W35 ≥ 4.3 max. inlet temperature: 35 °C Electricity meter Hydraulic balancing
Multiple-family house	For heating only COP value B0/W35 or E4/W35 ≥ 4.3 max. inlet temperature: 35 °C Electricity meter Hydraulic balancing

Air heat pumps/compact devices

Use	Conditions
Single-family house	For heating only COP value A2/W35 ≥ 3.1 max. inlet temperature: 35 °C Electricity meter Hydraulic balancing
Multiple-family house	For heating only Geothermal heat exchanger must be inserted COP value A7/W35 ≥ 3.3 max. inlet temperature: 35 °C Electricity meter Hydraulic balancing

- Re.: Point 4.2.3.(i) of the NREAP: Buildings – Support for energy from renewable sources in buildings

The Grand Duchy Regulation of 12 December 2012 revises investment aid for the following energy-efficient technologies and for use of energy from renewable sources in buildings. The main changes to aid for the use of energy from renewable sources are as follows:

- higher aid for geothermal heat pumps;
- higher subsidies for pellets and wood chip-fired boilers and introduction of aid for the installation of a split log boiler.

The following aid applies for energy from renewable sources from 1 January 2013:

SOLAR HEAT

Solar heat system for hot water

Use	Aid (%)	Maximum amount (EUR)
Single-family house	50	2 500
Multiple-family house	50	2 500/apartment ≤ 15 000/multiple-family house

Solar heat system for hot water and additional heating

Use	Aid (%)	Maximum amount (EUR)
Single-family house	50	4 000
Multiple-family house	50	4 000/apartment ≤ 17 000/multiple-family house

Additional flat-rate aid of EUR 300 (combination bonus) is paid when a solar heat system is installed, if the existing boiler is also replaced by eligible wood-fired heating or a heat pump.

PHOTOVOLTAICS

Use	Maximum amount (EUR)
20	500

WOOD-FIRED HEATING

Central heating using wood pellets or wood chips

Use	Aid (%)	Maximum amount (EUR)
Single-family house	40	5 000
Multiple-family house	30	4 000/apartment ≤ 20 000/multiple-family house

Aid for standardised wood fuel (pellets) has been increased in order to promote the use of biomass and thus renewable production systems in buildings.

Central heating using split logs

Use	Aid (%)	Maximum amount (EUR)
Single-family house	25	2 500

Wood pellet stoves

Use	Aid (%)	Maximum amount (EUR)
Single-family house	30	2 500

HEAT PUMPS

Geothermal pumps (probes or collectors)/heat pumps combined with latent storage and solar collectors

Use	Aid (%)	Maximum amount (EUR)
Single-family house	50	8 000
Multiple-family house	50	6 000/apartment ≤ 30 000/multiple-family house

Air heat pumps/compact devices (passive houses only)

Use	Aid (%)	Maximum amount (EUR)
Single-family house	25	2 500

- Re.: Point 4.2.4.(c) of the NREAP: Provision of information

1. myenergy is the Luxembourg contact point for information and basic advice on energy efficiency and renewable energy sources. In 2011 and 2012, myenergy added a hotline, thematic lectures, an information stand at events, 'infodays' and individual advisory sessions to the information available in brochures on its website (www.myenergy.lu). myenergy is planning further, more intensive campaigns and events to encourage acceptance of and demand for renewable energy sources and to increase awareness-raising and basic advisory activities in connection with renewable energies. In 2012, myenergy expanded its activities to the industrial sector and offers undertakings information and awareness-raising services under a voluntary agreement, together with help in applying for subsidies for the use of energy from renewable sources and energy efficiency improvements. myenergy has set up a special website for this purpose. Within the framework of measures in the climate protection sector, the government has entered into a climate pact with the municipalities (Law of 13 September 2012 creating a climate pact with the municipalities), in which questions concerning the use of renewable energies are discussed.
2. The number of myenergy 'infopoints' has been increased. At the end of 2012, myenergy had advice desks in 73 municipalities in Luxembourg.

- Re.: Point 4.2.4.(d) of the NREAP: Provision of information

The 'Energie fir d'Zukunft+' label was introduced in connection with the training of tradesmen. This label is awarded after practical further training to give employed or self-employed tradesmen valuable theoretical and practical expertise in the construction and renovation of energy-efficient buildings, including energy from renewable sources. Proper coordination and cooperation between trades is particularly important on building sites. Training comprises basic training, which is then expanded in specific training modules ('building envelope' and 'home automation').

Furthermore, annual round table discussions are organised which are designed to support targeted expansion of training in the renewable energies and energy efficiency

sectors by identifying any gaps in the training available. Working groups work to achieve coordinated expansion of the further training available.

In 2013, myenergy introduced the ‘myenergy certified’ label. This is a voluntary certification system for energy advisors. The ‘myenergy certified’ label attests to the energy advisor’s competence in the renewable energies and energy efficiency sectors and supports private individuals looking for energy services. Certification is intended for architects and engineers and experts licensed by the Ministry of Economic Affairs. Additional information is available at www.myenergy.lu.

- Re.: Point 4.2.4.(g) of the NREAP: Provision of information

In addition to public-sector bodies, various private undertakings now offer further training in the renewable energies and energy efficiency sectors. Overall, this has helped considerably in improving and expanding the further training available in Luxembourg. Admissions to the courses available also increased.

- Re.: Point 4.2.5.(a) of the NREAP: Certification of installers

The ministerial regulation issued by the Minister for Education and Vocational Training on 24 August 2012 (Ministerial Regulation of 24 August 2012 approving the revised programmes for the certificate of competency for ‘heating/plumbing engineer’ and ‘electrician’) transposes the provisions of Article 14 of Directive 2009/28/EU on the certification and qualification of installers. The training provided for in the Directive has been introduced in the training and further training courses for the tradesmen in question.

Preparatory work was carried out in 2012 and in early 2013 myenergy, the Luxembourg Trade Chambers and the IFSB (training institute for the construction industry) jointly launched the ‘LuxBuild2020’ initiative. This initiative is part of the European initiative ‘Build up skills, energy training for builders’ and obtained financial support from the EACI (Executive Agency for Competitiveness and Innovation).

The aim of the initiative is to improve further vocational training for tradesmen and building contractors by 2020, focussing on imparting the new techniques and skills needed as a result of increased requirements in terms of energy efficiency and energy from renewable sources for the building trade.

European and national targets in terms of the use of energy from renewable sources and energy efficiency will only be achieved if the building industry in Luxembourg has a sufficient number of qualified tradesmen at its disposal. Therefore, this initiative is an important building block in terms of implementing climate and energy policy. In addition to the qualitative challenge, the Luxembourg building industry also has to deal with a rising lack of skilled labour.

A detailed analysis of the current situation was carried out first and used as a basis for a broad working party to prepare the national roadmap for trade qualification up to 2020. Associations of installers, who are responsible for the practical implementation

of renewable energies, are especially interested in the success of this initiative. Specific measures are prepared and financing for them is requested from the EACI.

- Re.: Point 4.2.5.(c) of the NREAP: Certification of installers

See point 4.2.4.(d) and point 4.2.5.(a).

- Re.: Point 4.2.5.(d) of the NREAP: Certification of installers

Details on further training programmes and a list of the undertakings concerned are available on the Trades Chamber website (www.cdm.lu).

- Re.: Point 4.2.5.(e) of the NREAP: Certification of installers

See point 4.2.4.(d) and point 4.2.5.(a).

- Re.: Point 4.2.6.(e) of the NREAP: Expansion of electricity infrastructure — approval procedures

See point 2.a) and point 2.b).

- Re.: Point 4.2.10.(a) of the NREAP: Biofuels and other bioliquids — sustainability criteria

See first progress report under Article 22 of Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

- Re: Point 4.3.(g) of the NREAP: Financial support — electricity sector

The Grand Duchy Regulation of 12 December 2012 adapts investment aid for the following energy-efficient technologies for the use of renewable energies in buildings. The following aid applies for renewable energies from 1 January 2013:

Private individuals can apply for investment aid for electricity production from renewable energy sources for the following technologies:

PHOTOVOLTAICS

Aid (%)	Maximum amount (EUR/kWp)	Conditions
20	500	Maximum eligible peak output: 30 kWp per location Installation on roof/façade or integrated into building envelope

- Re.: Point 4.3.(g) of the NREAP: Financial support electricity sector — feed-in tariff for electricity from renewable energy sources

Feed-in tariffs for electricity produced from photovoltaics have been changed for installations that connect to the grid from 1 January 2013.

PHOTOVOLTAICS

Output class	Tariff
Electricity peak output \leq 30 kWp n: official year of first feed in	$264 \times (1 - (n - 2013)) \times 9.00/100$ EUR/MWh

The system must stand on a solid substrate (building, car park, road). The maximum nominal output of the system is 30 kWp.

Further changes to feed-in tariffs for the production of electricity from renewable energy sources are planned for early 2014.

- Re.: Point 4.4 of the NREAP: Aid for the heating and cooling sector

See point 4.2.3.(i).

3.1. Please provide the information on how supported electricity is allocated to final customers for purposes of Article 3 (6) of Directive 2003/54/EC (Article 22(1)(b) of Directive 2009/28/EC)

The Grand Duchy Regulation of 8 February 2008 on the Production of Electricity based on Renewable Energy Sources, published in Memorial A No 16 of 12 February 2008, regulates the feed-in tariff for electricity produced from renewable energy sources. Support for electricity from renewable energy sources is safeguarded through a feed-in tariff system.

The electricity produced is fed into the public grid and is accepted and paid for and then marketed by the grid operator. An amendment to this regulation is currently being processed, redefining some feed-in tariffs.

Proof of origin is issued by the Luxembourg regulatory authority for the electricity produced from renewable sources for which a feed-in tariff is paid under Luxembourg law. Under the Grand Duchy Regulation of 31 March 2010 on the Compensation Mechanism within the Framework of the Organisation of the Electricity Market (published in Memorial A No 59 of 19 April 2010), the regulatory authority can publish proof of origin. The income is paid into the compensation mechanism in order to reduce costs. Under the Grand Duchy Regulation of 21 June 2010 on the Electricity Labelling System (published in Memorial A No 98 of 30 June 2010), the electricity supplier which obtained the proof of origin at the time of sale can use it on the electricity label. The electricity label must be presented to every electricity customer.

4. Please provide information on how, where applicable, the support schemes have been structured to take into account RES applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(c) of Directive 2009/28/EC)

A production plant for producing biofuel from used fats was erected in Luxembourg a few years ago. It should be noted that the current regulations are continually reviewed and, where applicable, revised, in order to take account of and, where necessary, support new developments on the market. Generally speaking, plants that produce energy from renewable sources can obtain investment aid, which is granted for each specific plant depending on the project in question. Financial support is also available for innovation and research projects.

5. Please provide information on the functioning of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection against fraud of the system (Article 22(1)(d) of Directive 2009/28/EC)

Chapter II of the Grand Duchy Regulation of 8 February 2008 on the Production of Electricity from Renewable Sources (published in Memorial A No 16 of 12 February 2008) makes provision for a system of proof of origin.

The regulatory authority (Luxembourg Institute of Regulation) issues proof of origin (single electronic certificate in keeping with an international standard and the Principles and Rules of Operation) on request, based on the European Energy Certificate Scheme (ECS).

The regulatory authority, which is a member of the AIB (Association of Issuing Bodies) allows operators to participate in the electronic certificate management system by opening an account in the Luxembourg register via the Grexel Systems IT platform.

6. Please describe the developments in the preceding 2 years in the availability and use of biomass resources for energy purposes (Article 22(1)(g) of Directive 2009/28/EC)

Table 4: Biomass supply for energy use

	Amount of domestic raw material (*)		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU (*)		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non EU(*)		Primary energy in amount of imported raw material from non EU (ktoe)	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
<i>Biomass supply for heating and electricity:</i>												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**												
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**												
Energy crops (grasses, etc.) and short rotation trees (please specify)	8 167	9 873	2.22	2.67	-	-	-	-	-	-	-	-
Agricultural by-												

products/processed residues and fishery by-products **												
Biomass from waste (municipal, industrial, etc.) **												
Others (please specify)												
Biomass supply for transport:												
Common arable crops for biofuels (please specify main types)												
Energy crops (grasses etc.) and short rotation trees for biofuels (please specify main types)												
Others (please specify)	No data	No specific statistics										

* Amount of raw material if possible in m³ for biomass from forestry and in tonnes for biomass from agriculture and fishery and biomass from waste.

** The definition of this biomass category should be understood in line with Table 7 of part 4.6.1 of Commission Decision C(2009) 5174 final establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC

Compared with the available data on which the NREAP was based, there has been no fundamental change in the data available on biomass in Luxembourg.

Table 4a. Current domestic agricultural land use for production of crops dedicated to energy production (ha)

Land use	Surface (ha)	
	2011	2012
1. Land used for common arable crops (wheat, sugar beet etc.) and oil seeds (rapeseed, sunflower, etc.) (Please specify main types) Main type: silage maize	569	581
2. Land used for short rotation trees (willows, poplars). (Please specify main types)	no specific statistics	no specific statistics
3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum. (Please specify main types) Main types: Miscanthus, grass sorghum, green fodder	84	145

7. Please provide information on any changes in commodity prices and land use within your Member State in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources. Please provide where available references to relevant documentation on these impacts in your country (Article 22(1)(h) of Directive 2009/28/EC)

Due to incomplete data, if the figures for 2009 and 2010 are compared with the figures for 2011 and 2012, it is only possible to draw conclusions on land use in connection with grasses used for energy purposes. This has increased continuously since 2009 and has increased by a factor of 4 since 2010.

The commodity prices applied in Luxembourg are basically dictated by the international market. The very small quantities of raw materials produced in Luxembourg therefore only have a very marginal influence on commodity prices on the international market, if at all.

However, there has been an increase in Luxembourg in the price of raw materials used for biogas production, as a result of which adjustments to the feed-in tariff for biogas plants have been considered.

8. Please describe the development and share of biofuels made from wastes, residues, non-food cellulosic material, and lingo cellulosic material (Article 22(1)(i) of Directive 2009/28/EC)

Small quantities of biofuels are currently manufactured in Luxembourg from used fats. However, blending is currently carried out in neighbouring countries, so that mandatory blending is covered 100 % by imported biofuels. Second-generation imported biofuels were not recorded separately for 2011 and 2012.

9. Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within your country in the preceding 2 years. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within your country (Article 22(1)(j) of Directive 2009/28/EC)

No impact has been established in Luxembourg from the production of biofuels and bioliquids on biodiversity, water resources or water or soil quality. Little land is used and it represents a small proportion of agricultural land as a whole in Luxembourg.

10. Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources (Article 22(1)(k) of Directive 2009/28/EC)

Table 6: Estimated GHG emission savings from the use of renewable energy (t CO₂eq)

Environmental aspects	2011	2012
Total estimated net GHG emission saving from using renewable energy²⁹	440 080	452 900
- Estimated net GHG saving from the use of renewable electricity	298 550	305 390
- Estimated net GHG saving from the use of renewable energy in heating and cooling		
- Estimated net GHG saving from the use of renewable energy in transport	141 530	147 510

Source: Environment Agency Inventory of greenhouse gas emissions (2014 v1.2)

²⁹ The contribution of gas, electricity and hydrogen from renewable energy sources should be reported depending on the final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.

11. Please report on (for the preceding 2 years) and estimate (for the following years up to 2020) the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, as well as estimated potential for joint projects until 2020 (Article 22(1)(l) and (m) of Directive 2009/28/EC)

Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Luxembourg (ktoe)^{30,31}

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual/estimated excess or deficit production (Please distinguish per type of renewable energy and per origin/destination of import/export)	0	0	0	0	-37.8	-9.8	-45	-21.6	-74.5	-39.2	-66.1	-92.9

The figures given in Table 7 are identical to the figures in Table 9 of the NREAP. However, the figures up to 2012 have been replaced with the actual figures.

11.1. Please provide details of statistical transfers, joint projects and joint support scheme decision rules.

As stated in the NREAP, Luxembourg needs to take recourse to the cooperation mechanism under Directive 2009/28/EC in order to achieve its targets. The estimates and statements made in the NREAP still apply. Luxembourg has made various efforts to sound out and enter into cooperation with various countries. Due to difficulties encountered by various countries in accurately predicting possible surplus production of energy from renewable sources in and up to 2020, the various talks are progressing slowly. Talks have already been held with a large number of countries. Luxembourg has also participated in various committees (such as Concerted Action RES) and other workshops and has consistently highlighted its efforts and willingness to use cooperation mechanisms.

Luxembourg is of the opinion that statistical transfers are easier to implement, as fewer time-consuming selection and approval procedures are needed.

No final decision on a statistical transfer or a joint project has yet been taken.

12. Please provide information on how the share for biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates (Article 22(1)(n) of Directive 2009/28/EC)

The various shares in wet waste (in tonnes) are established on the basis of local surveys (from 1992, 1994, 2001, 2004/2005 and 2009) and extrapolated over the total quantity of waste.

The entire quantity of wet waste is then converted to dry waste based on wet waste factors and this is then used to establish the quantities of energy on the basis of the calorific value of the class of waste in question. Finally, the share of biodegradable carbon content is used to establish the biodegradable share of the waste class in question. In this way, the renewable

³⁰ Please use actual figures to report on the excess production in the two years preceding submission of the report, and estimates for the following years up to 2020. In each report Member State may correct the data of the previous reports.

³¹ When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe).

energy share of the waste is established and the renewable share of electricity production determined.