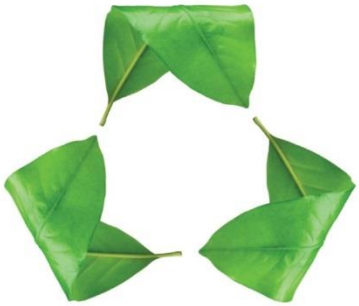
Construction and Demolition Waste management in

Luxembourg

V2 – September 2015



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Screening factsheet

1 Summary

Construction and Demolition Waste (CDW) management national performance

Luxembourg elaborates statistics on Construction and Demolition Waste (CDW) based on the List of Wastes established by the EC Decision 2000/532/EC and following the Regulation (EC) 2150/2002 of the European Parliament of 25 November 2002 on waste statistics[1] as amended by the Commission Regulation (EU) 849/2010 of 27 December 2010[2] (CED-Stat). Official figures of CDW generation are reported to Eurostat and are identical to the figures maintained in the national statistics of Luxembourg. As shown in Table 1, in 2012, Luxembourg generated a total quantity of **585 542 tonnes of CDW.**

Out of that volume, mineral waste from construction and demolition (EWC 12.1 or W121), excluding soils and naturally occurring materials across all NACE rev.2 categories was 558 051 tonnes in 2012.[3] Construction sector (NACE rev.2 category F) generated the majority of it: **523 346 tonnes in 2012**.[3]

The quantities of metal, glass, plastic and wood waste (categories 061, 062, 063, 071, 074 and 075) in the **construction sector only** (NACE rev.2 category F) was **27 491 tonnes in 2012**.

When applying the calculation method set out in Commission Decision of 18 November 2011 (2011/753/EU), Luxembourg achieved in 2012 **a recovery rate of 88.4%** (see Table 1). The Luxembourgish Environmental administration indicated that the rate was as much as **93%** in 2012.[4] However, it seems that the latter rate does not take into account the quantity of mineral waste from construction and demolition from outside the construction sector (other NACE categories and households).

Table 1: CDW generated and recovered in Luxembourg following CED-Stat methodology

Line	Waste category	Quantity in 2012 (tonnes)	2011 (tonnes)	2010 (tonnes)
1	CDW recovery other than energy recovery: backfilling	0	16 000	15 000
2	CDW recovery other than energy recovery – except backfilling	517 516	NA	NA
3	**Materially recovered amount of construction and demolition waste *(=lines 1+2)***	**517 516**	**506 306**	**527 242**
4	Mineral waste from construction and demolition (EWC 12.1 or W121: concrete, bricks and gypsum waste, waste bituminous road surfacing material, mixed construction waste) across all NACE categories	558 051	NA	NA
5	Metallic, glass, plastic and wood waste generated by the construction sector (06.1, 06.2, 06.3, 07.1, 07.4, 07.5)	27 491	NA	NA
6	**Total amount of generated construction and demolition waste *(=4+5)***	**585 542**	**579 924**	**580 449**
7	**Recovery rate calculated for the target for construction and demolition waste referred to in Article 4(1) of Commission Decision of 18 November 2011 (2011/753/EU) *(=line 3/line 6)x100)***	***88.4%***	***87.7%***	***90.8%***

[1] OJ L 332, 9 December 2002, p. 1-36

[2] Commission Regulation (EU) No 849/2010 of 27 September 2010 amending Regulation (EC) No 2150/2002 of the European Parliament and of the Council on waste statistics (OJ L 253, 28.9.2010, p 2-41); available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010R0849&from=FR

[3] Eurostat Waste database: Generation of waste (env_wasgen)

[4] Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 16/04/2015

The volume of **soils waste (W126)** generated in 2012 was **6 506 223 tonnes**.[3] Mineral and solidified waste represented 7 033 070 tonnes.

The excavated soils are currently considered as the major issue in Luxembourg and the Environmental administration has been preparing official documentation aiming at improving their treatment.[5] Private sector actors also pointed out that contaminated excavated soils were the major problem, notably because the cost of depollution is born by the owner of the waste, i.e. the owner of the soil at the moment of the construction, and not by the original polluter.[6]

CDW management practices

Luxembourg established a national statistical code for backfilling. However, only a small proportion of the CDW taken into account for calculation of the EU recovery target is backfilled, 15kt and 16kt respectively in 2010 and 2011, while none of that waste was backfilled in 2012.

This does not mean that backfilling is not used as a recovery operation. In Luxembourg, backfilling is a frequent recovery method for excavated soils. In 2012, 272 461 tonnes of excavated soils were backfilled.

Construction companies tend to reuse waste from construction activities directly at the construction sites. Therefore, the amount of generated waste can be underestimated.[7]

Because of its limited area, Luxembourg exports an important part of its CDW. In 2012, the country exported 386 345 tonnes of CDW. The quantities of exported non-hazardous and hazardous CDW are almost the same, 190 000 tonnes and 197 000 tonnes. The contaminated soils (category 17 05 03) represent the majority of exported hazardous CDW: 174 100 tonnes (See Table 5).

Main obstacles to sustainable CDW management

- Training and awareness of workers in the construction sector on how to reduce and sort CDW, increase accessibility to workers of small and medium-sized companies as well as to short-term contract workers and workers who do not speak the local language
- End-market issues for some recyclable materials:
    - Quantity of materials – some materials are generated in too small quantities to allow development of profitable recycling value chains (concrete)
    - Often down-cycling - backfilling rather than production of aggregates, because of the need of those materials for road construction (concrete)
    - Price of raw materials is sometimes too low to provide an incentive for the use of recycled materials (ex. sand)
- Quantity of excavated soils, and especially contaminated excavated soils: financial burden of depollution is on the owner, not on the polluter.

Main drivers to sustainable CDW management

- Binding regulatory framework:
    - Legal obligation to collect waste from construction sites selectively “to the extent possible” or have it sorted in case it is collected in mixed form in one of the authorized inert waste treatment facilities
    - Legal obligation to carry out pre-demolition audits, including inventory of materials, treatment for each material according to waste hierarchy and special attention paid to hazardous materials
- Centrally planned and supervised infrastructure of inert waste treatment facilities:

[5] Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l’environnement - Luxembourg environmental administration), 16/04/2015
[6] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[7] General waste management plan, January 2010; available at:
http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
And also Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015

    - Network of regional treatment facilities set up in accordance with the Directive Sectoral Waste Management Plan on Inert Waste. Each facility must be duly authorised and is subject to inspections.
- Market conditions serving as incentives to sorting at source
    - Financial: reducing and sorting waste at site is less expensive than not sorting => companies go as far as preferring buying pre-manufactured components (in factories, materials are carefully used and measured, whereas at site there is a chance of unused raw materials that go to waste).
    - Demand-side: given that more and more clients are interested in certified buildings (such as BREEAM, HQE), construction companies feel that they increase their competitiveness by learning to prevent and sort waste at the construction site
- Support of public bodies, notably of SuperDrecksKëcht (SDK)
    - SDK introduced a certification program specific to management of CDW, which helps construction sites prevent generation of waste and sort it properly. Certified sites are inspected on a monthly basis. These regular visits are aimed at detecting difficulties and helping overcome them.
    - SDK also provides to companies a free software which helps reduce and optimise generation of waste
- Demand for some materials, examples:
    - Demand for excavated soils for backfilling
    - Demand for scrap iron from the steel industry

2 Definitions concerning construction and demolition waste (CDW) and management

In this section the definitions of waste used in Luxembourg are detailed.

2.1 Definition of waste

The relevant piece of legislation that defines waste is the Law of 21 March 2012 on management of waste (LMW).[8] The LMW defines both waste and hazardous waste in exactly the same wording as the Waste Framework Directive (WFD):

- "'waste': any substance or object which the holder discards or intends or is required to discard"
- "'hazardous waste': waste which displays one or more of the hazardous properties listed in Annex V".

Annex V which is referred to in the definition of hazardous waste (2nd bullet point) contains exactly the same list of properties than the corresponding Annex III of the WFD.

In other terms, Luxembourg waste definitions are exactly the same as those contained in the WFD.[9]

2.2 Definition of construction and demolition waste (CDW)

There is no official definition for Construction and Demolition Waste (CDW) in Luxembourg.

Article 8 of the 2012 LMW Luxembourg transposes the List of Wastes established by the EC Decision 2000/532/EC into Luxembourg law as a whole, by simple reference to it:

- "**Wastes are listed in the List of Wastes established by the Decision 2000/532/EC**. The use of the appropriate code is mandatory in any administrative procedure or act in relation to the execution of this Law."

Luxembourg environmental administration confirmed that Luxembourg used both LoW and CED-Stat.[10]
No codes of the EU LoW are excluded from the Luxembourg classification.

In consequence:

- Construction and demolition wastes are those listed under codes 17 01 01 to 17 07 03 of the EU List of Waste.
- There is no clear distinction between construction and demolition wastes.
- **Naturally occurring materials excavated** in the course of construction activities and other uncontaminated soils are **excluded from the definition of CDW**. However, they are included in the group of "inert wastes". Excavated soils account for a large majority of inert waste.[11]
- **Non-CDW generated** by construction operations (e.g. packaging waste, municipal-like waste, WEEE, etc.) is **not included in the definition**.

Until the 2012 LMW, Luxembourg **had two definitions of inert waste**, one contained in the 1994 LMW specific to Luxembourg, while the 2003 regulation on landfilling transposed the definition contained in the Directive 1999/31/EC of 26 April 1999 on the Landfill of Waste ("Landfill Directive").

[8] Law of 21 March 2012 on management of waste; available at: http://www.legilux.public.lu/leg/a/archives/2012/0060/a060.pdf#page=2
[9] Confirmed also in Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 16/04/2015
[10] Email exchange with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 10 April 2015
[11] Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 16/04/2015

The 1994 LMW defined inert waste **as only originating from the construction sector**. The definition was as follows:

- "Waste constituted, almost totally, of soil and mineral rock resulting from their extraction on the occasion of construction works and which are not contaminated by hazardous substances or other elements potentially generating nuisance
- Mineral waste resulting from road works that may contain hydraulic, bituminous or tar-based binders
- Result from construction, renovation or demolition sites, that are principally of mineral nature and that are not contaminated by hazardous substances or other elements potentially generating nuisance."[12]

The 2006 LMW **harmonised the national definition of inert waste** by adopting the definition contained in the 1999 Landfill directive, which only takes into account the "inert" character of waste and **can originate from different activities, one of them being construction and demolition activities**:

- "waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater". [13]

2.3 End of Waste (EoW) status

The 2012 LMW[14] defines "end-of-waste" status exactly in the same words as the WFD.

Certain specified waste shall cease to be waste: "when it has undergone a recovery, including recycling, operation and complies with specific criteria to be developed in accordance with the following conditions:

- (a) the substance or object is commonly used for specific purposes;
- (b) a market or demand exists for such a substance or object;
- (c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.
- The criteria shall include limit values for pollutants where necessary and shall take into account any possible adverse environmental effects of the substance or object."

In application of the possibility given to Member States by the WFD, the 2012 LMW provides that Grand-Ducal regulations can precise criteria on when certain substances or objects cease to be waste (article 7 par. 2 of the 2012 LMW).

In addition, again in application of the possibility given to Member States by the WFD, the 2012 LMW provides that unless abovementioned regulations have been taken, decisions can be taken on a case-by-case basis, deciding that certain substances or objects cease to be waste (article 7 par.2 of the 2012 LMW).

As of today, no specific regulations precising criteria for end-of-waste for specific materials have been identified in Luxembourg, apart from EU regulations on that issue (that are directly applicable in Luxembourg).

By-products and waste that has ceased to be waste are no longer considered as waste and thus are not submitted to controls applicable to waste. Those products can circulate as any other products. Installations

[12] Directive Sectoral Plan, Inert Waste, Current situation; available at: http://www.environnement.public.lu/dechets/dossiers/dechets_inertes/pds_decharges_dechets_inertes/doc_technique/PDS_doctec_chap_7_1.pdf

[13] See page 206 of General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf

[14] Law of 21 March 2012 on management of waste; available at: http://www.legilux.public.lu/leg/a/archives/2012/0060/a060.pdf#page=2

that use them are not considered as waste treatment installations and are not subject to waste treatment requirements.[15]

2.4 Definitions of waste treatment operations

Luxembourg LMW[16] defines reuse ("réemploi"), recycling ("recyclage") and recovery ("valorisation") in exactly the same terms as the EU WFD:

- "'Reuse': any operation by which products or components that are not waste are used again for the same purpose for which they were conceived"
- "'Recovery': any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations"
- "'Recycling': any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but **does not include** energy recovery and **the reprocessing into materials that are to be used** as fuels or **for backfilling operations**"

The annex II referred to by the definition of recovery (2nd bullet point) is corresponding exactly to annex II of the WFD giving the non-exhaustive list of recovery operations.

In consequence, as it is mentioned in the above definitions (3rd bullet point), backfilling is excluded from the definition of recycling in Luxembourg. And given that Luxembourg follows the guidelines by Eurostat on reporting data on waste treatment[17] operations,[18] official statistics exclude backfilling from the definition of recycling in CDW reporting.

Luxembourg law provides definition of backfilling. Annex VI of the Grand-Ducal Regulation of 24 February 2003 as amended relating to landfilling of waste defines **the "criteria of distinction between landfilling of inert waste and backfilling constituted of inert waste"**.[19] These criteria are as follows:

A deposit constitutes a **recovery** operation:

- When objective of the operation is other than evacuation of waste. The operation must have a determined utility and has to be justified by a plausible and manifested need. The objective must be wanted and explicitly declared by the promoter.
- The realisation of the objective must be effectuated as rapidly as possible. The maximum delay of realisation shall not exceed a delay that is "technically reasonable".
- In the event that the appropriate waste is not available, the objective must be realised with raw materials.
- Examples of objectives include: creation of a noise barrier along a highway or an industrial zone, creation of a platform with a view to install an activity zone, creation of a platform at agricultural farms in order to allow better circulation of machinery or to deposit products, creation of a slope for construction of a road or of a railroad.
- In such conditions the deposit is referred to as "**backfilling**".

A deposit constitutes an operation of **elimination** of waste:

- When its primary purpose is to evacuate waste. There is no imminent need other than to eliminate waste which is the main rationale of the decision to realise the deposit.
- There is no time limit in which the deposit must be realised and which would be conditioned by the will to lead the deposit to its final vocation.
- Advancement of deposits is conditioned solely by quantity of proposed waste. In absence of waste, no raw materials are acquired to continue realisation of deposit

[15] Luxembourg administration website, available at: http://www.guichet.public.lu/entreprises/fr/actualites/2011/04/27-dechets/
[16] Law of 21 March 2012 on management of waste; available at: http://www.legilux.public.lu/leg/a/archives/2012/0060/a060.pdf#page=2
[17] Eurostat website, Statistics on waste management ; available at: http://ec.europa.eu/eurostat/web/waste/waste-generation-and-management/management
[18] Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 16/04/2015
[19] Règlement grand-ducal of 24 February 2003, as amended; available at: http://www.legilux.public.lu/leg/a/archives/2006/0036/index.html

- In this case, the deposit is called “landfill”
- This appreciation does not change when after the decommissioning of the landfill, the site will be conducted to new destination (industrial zone, activity zone, forest or agriculture zone after reconstitution of the landscape for a landfill created in a quarry.
- In such conditions the deposit is referred to as “**landfill**”.

3 Legal Framework – Waste Management Plans and Strategies

In this section the legal framework governing CDW management in Luxembourg is presented.

3.1 Legislation concerning CDW in Luxembourg

First pieces of legislation:

- Law of 17 June 1994 on prevention and management of waste;[20]
- Laws of 19 February 1997 amending Law of 17 June 1994 on prevention and management of waste;[21]
- Law of 25 November 2005 amending amended Law of 17 June 1994;[22] and
- Law of 1 December 2006 amending Law of 17 June 1994 on prevention and management of waste.[23]

Current legislative framework resulting from transposition of the Waste Framework Directive (WFD)

Two pieces of legislation provide the framework for management of construction and demolition waste:

- **Law of 21 March 2012 on management of waste** (LMW)[24], which transposed the WFD in Luxembourg law. The LMW also provides that the law’s annexes (replicating the ones of the WFD) will be adapted to revisions of the WFD’s Annexes.
    - Article 26 “Inert Waste, Construction Waste and Demolition Waste”
        - Obligations to prevent generation of waste prior to a construction operation (Par. 1)
        - Building site waste must be collected selectively “to the extent possible” and in case that it is collected in mixed form, it must be submitted to sorting (Par. 2) these obligations apply to works executed by physical persons as long as they are “feasible” (Par. 4)
        - Obligation to carry out a pre-demolition audit: Prior to any demolition, materials used in the building to be demolished must be identified and listed in a pre-demolition inventory. The inventory must precise selected collection of each material and corresponding treatment in line with waste hierarchy. Contamination by other materials must be avoided. Particular attention must be paid to dangerous substances (Par. 3).These obligations apply to works executed by physical persons as long as they are “feasible” (Par. 4).
        - Municipalities are obliged to set up infrastructure for selective collection of building site wastes, in particular construction and demolition wastes.
        - Reuse of collected inert wastes is mandatory in public tender facets relating to construction of roads and other buildings (Par. 7)
        - A Grand-Ducal regulation can define quality norms for material coming from recycling of inert wastes. These norms may vary according to different use of those materials (Par. 8)

[20] Mém. A 1994, p.1076; Rectificatif, p.1322
[21] La loi du 19 février 1997 modifiant la loi du 17 juin 1994 relative à la prévention et à la gestion des déchets (Mém. A 1997, p. 718; Rectificatif Mém. A 1997, p. 3296)
[22] La loi du 25 novembre 2005 modifiant la loi modifiée du 17 juin 1994 relative à la prévention et à la gestion des déchets (Mém. A 2005, p. 3272)
[23] La loi du 1er décembre 2006 modifiant la loi du 17 juin 1994 relative à la prévention et à la gestion des déchets (Mém. A 2006, p. 3752)
[24] Law of 21 March 2012 on management of waste; available at: http://www.legilux.public.lu/leg/a/archives/2012/0060/a060.pdf#page=2

- Waste disposal is carried out exclusively within the network of regional landfills. This network is established in compliance with the General Waste Management Plan and the corresponding Sectoral Directive Plan. Other landfills are forbidden (par. 9a)
- Regional landfills must be equipped with infrastructures allowing recycling of recoverable inert waste (Par 9b)
- **The Sectoral Directive Plan on Inert Waste** provides that inert waste must be disposed of at the closest landfill to the building site.[25]

- The Law defines obligations applicable to hazardous waste (Article 23):
  - Obligations of treatment (Par. 1)
  - Obligation to ensure traceability (Par. 2)
  - Prohibition to mix hazardous waste and in case of mix, they must be separated (Par. 3)
  - Obligation of packaging and labeling (Par. 5)
- The Law defines further obligations applicable to all categories of waste:
  - Authorisation and registration obligations of companies or bodies that collect or transport inert waste from road works, excavation and demolition works (Article 32)
  - Obligations of operators of waste management facilities (Article 33)
  - Obligations of companies to keep registries (Article 34) and prepare annual reports (Article 35)
  - Regime of prohibited activities, inspections and sanctions (Articles 42 to 47)

- The **Grand-Ducal Regulation of 24 February 2003 on landfilling of waste**, as amended.[26] The Regulation transposes the 1999 Landfill Directive and notably:
  - Sets out criteria and procedures for admissibility to landfilling of inert waste;
  - Prohibits landfilling of inert wastes containing hazardous substances in significant quantities;
  - Provides distinction between landfilling and backfilling (see detail in 2.4).

Municipalities levy **taxes on landfilling**. In the past, it was pointed out that the lack of harmonisation of communal taxes hampered smooth functioning of the regional network of inert waste landfills, because waste would be transported to less expensive localities.[27] Today, these taxes are more harmonised.[28]

Work in progress

Currently, the Ministry of Environment prepares documentation on how to improve management of **excavated soils**. As of the date of the consultation (16 April 2015) the documents were not signed by the Minister and thus no more details could be communicated by the Ministry. [29]

No other ministerial or legislative work has been reported.

3.2 Waste management plans (WMP) and Strategies

In 2010, Luxembourg adopted a **General Waste Management Plan** (Plan général de gestion des déchets).[30]

Chapter 24 "Construction site waste" covers three categories of waste: inert waste (including construction and demolition waste), assimilated waste (including packaging) and hazardous waste.

Chapter 23 covers "Inert Waste" and concentrates on construction and demolition waste. As explained in section 2.2, until 2006, Luxembourg used the term "**inert waste**" to designate "non-

[25] General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[26] Grand-ducal Regulation of 24 February 2003 as amended on landfilling of waste; available at: http://www.legilux.public.lu/leg/a/archives/2006/0036/a036.pdf#page=2
[27] General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[28] Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015
[29] General waste management plan, January 2010, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[30] General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf

contaminated mineral waste originating from construction and demolition".[31] Since 2006, the definition of inert waste is identical to the definition of Directive 1999/31/CE (Landfill Directive).[32] The chapter covers demolition waste, road work waste and excavation soils. Excavation soils account for around 70% of inert waste. [33]

The General Waste Management Plan also **stands for National Waste Prevention Plan** and was accepted as having these two roles by the European Commission.[34]

The Sectoral Directive Plan on Inert Waste provides that inert waste must be disposed of at the closest landfill to the building site.[35]

In addition to these national plans, companies have to elaborate a **Waste Prevention and Management Plan** (Plan de prévention et de gestion des déchets, PPGD).[36]

3.3 Legal framework for sustainable management of CDW

This section aims at identifying specific legislation that would create good conditions for a sustainable management of CDW.

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
National/regional obligation for selective demolition?	National - YES	LMW 2012, article 26 (3)	
National/regional sorting obligation (on-site or in sorting facility)?	National – YES: sorting obligation on site and if collected in mixture, obligation to submit to sorting later on.	LMW 1994, article 20 (3); today LMW 2012, article 26 (2)	
Obligation of municipalities to set up inert waste landfills	In addition, municipalities are obliged to provide facilities to collect separately CDW, including from households as far as feasible.	LMW 1994, article 20 (1), LMW 2012, article 26 (5)	

[31] See page 207 of General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[32] See page 206 of General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[33] Page 207 of General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[34] Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 16/04/2015
[35] General waste management plan, January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[36] Ministry of Environment website, Plan de Prévention et de Gestion de Déchets ; available at : http://www.environnement.public.lu/guichet_virtuel/GV_dechets/GV_production/ppgd/

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
National/regional separate collection obligation for different materials (iron and steel, plastic, glass, etc.)?	National - YES	LMW 2012, article 26 (2) before: 1994 Law on Prevention and Management of Waste	
Obligation for separate collection and management of hazardous waste from C&D operations? Please specify	National - YES	1994 LMW, article 18 and 20, LMW 2012, article 23	
Related Green public procurement requirements: Reuse of collected inert wastes is mandatory in public tender facets relating to construction of roads and other buildings	National - YES	LMW 1994, article 20 (4), LMW 2012, article 26 (7)	
Related Green public procurement requirements: To ensure that inert waste is disposed of in the closest landfill, the requirement must be included in public tender facets	National - YES	Sectoral Directive Plan on Inert Waste	Indicated in the General Waste Management Plan[37]

3.4 Targets

Luxembourg's objective for 2020 is 70% recovery, the same as in the EU directive. According to Luxembourgish authorities (Environmental administration), Luxembourg achieved 93% recovery of CDW (excluding soils and naturally occurring materials) in 2012.[38]

There are no other national, regional, sectorial or material-specific objectives. [39]

4 Non legislative instruments

In this section, any other instruments that may specify how the country is addressing the question of CDW management are highlighted, as these instruments might be creating conditions for a sustainable management of CDW.

[37] General Waste Management Plan (Plan général de gestion des déchets), January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[38] Email exchange with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 10 April 2015
[39] Email exchange with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 10 April 2015

Key waste management and sustainable building non legislative instruments

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
Public support to CDW sustainable management SuperDrecksKëscht - general support to construction and demolition works[40]		1992	http://www.superdreckskescht.lu/fr/Construction.html
Public labelling specifically on CDW SuperDrecksKëscht label is attributed to construction sites which are managed according to the waste prevention and management rules of SuperDrecksKësch: These construction sites are accompanied and audited by counselors of SuperDrecksKëscht[41]	More and more companies and promoters adhere to principles of SuperDrecksKëscht.(pggd) SDK worked with 28 chantiers, 2014, of which 10 obtained the label – it was the big construction sites[42]		http://www.superdreckskescht.lu/fr/Construction.html
Public certification Certification of engineering and architects bureaus and consultancies which have to put in practice the concept of sustainable CDW[43]	As of 31 December 2008, 16 architect and engineering bureaus dispose of such certificate (license) [44]		
Private labelling Several certification schemes BREEAM, *HQE (French), DGNG (German), LEED (US)*	Companies free to choose		Example/case study: City Gates is certified Breeam and SDK: they applied for SDK label because it covers also their CDW obligations under BREEAM. Hence SDK helped them free of charge to conform themselves with BREEAM as well.[45] BREEAM compliance is a voluntary initiative but the market pushes to conform to it because there is an ever

[40] General Waste Management Plan (Plan général de gestion des déchets), January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[41] General Waste Management Plan (Plan général de gestion des déchets), January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[42] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[43] General Waste Management Plan (Plan général de gestion des déchets), January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[44] General Waste Management Plan (Plan général de gestion des déchets), January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[45] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015

			increasing demand for BREEAM-certified buildings. [46] HQE : https://www.pwc.lu/en/sustainability/docs/pwc-certification-hqe.pdf; http://assohqe.org/hqe/ DGNB: http://www.dgnb-system.de/en/system/certification_system/ NRDC: http://www.nrdc.org/buildinggreen/leed.asp
Extended producer responsibility scheme in operation?	NO		

[46] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015

Key CDW management requirements and standards

Description	Occurrence (Yes/No) Mandatory (Yes/No) Scope & exemptions	Year established	National or regional (specify if regional)	Details of Public sector and Industry enforcement/ involvement/ collaboration	Levels of performance e.g. tonnes recycled,% coverage	Further information/ web-site
Requirement for pre-demolition audits	Mandatory – see legislative measures in Chapter 3					
Standards for recycled CDW	EN 206-1 BETON (for concrete) – national implementation document DNA EN 206; EN 12620 aggregate concrete ; EN 13055-1 light aggregates – part 1 ; CDC-GRA Aggregates					
Selective demolition/ plan for large demolition sites/demolition standard	Mandatory – see legislative measures in Chapter 3					*Are these obligations enforced in practice?*

Key CDW management guidance and tools

Description of guidance/ tool	Scope	Year established/ produced	National or regional (specify if regional)	Public sector and/or Industry lead organisation	Levels of use (high/ medium/low) or specify	Further information/ web-site
Guide de la Construction et de la Rénovation durable	Sustainable construction	2009	National	Centre de Ressources des Technologies pour l'Environnement: http://www.crtib.lu/Leitfaden/index.jsp?section=FR		
Public software on CDW optimisation SuperDrecksKëscht: OYAT software calculates waste ahead of the operation : was designed to help prevention of CED generation[47]	CDW	Not precised	National	Public	Especially bigger companies	http://www.superdreckskescht.lu/fr/Betriber-building-sites-documents-downloads.htm

[47] SuperDrecksKëscht, Software OYAT; presentation available at: http://www.superdreckskescht.lu/fr/Betriber-building-sites-documents-downloads.htm

Technical guidelines/standards/ Codes of Practice for use of CDW in construction application

Description of guidance/ tool	Scope	Year established/ produced	National or regional (specify if regional)	Public sector and/or Industry lead organisation	Levels of use (high/ medium/low) or specify	Further information/ web-site
None identified nor put forward by stakeholders – this might be because of existence of legal obligations						

Procedures for treatment of hazardous waste

In Luxembourg, hazardous waste must be collected in a separate waste stream in specifically designed containers.

The 2012 LMW defines obligations with regard to hazardous wastes (article 23), including

- Obligations of treatment respective of human health (Par. 1)
- Obligation to ensure traceability (Par. 2)
- Prohibition to mix hazardous waste and in case of mix, they must be separated (Par. 3)
- Obligation of packaging and labelling (Par. 5).

5 CDW management performance – CDW data

In this section the performance of CDW management in Luxembourg is presented. This section particularly seeks to gather all available data and information about CDW generation and treatment, exports/imports, and treatment facilities in Luxembourg.

Summary

Year	2008	2009	2010	2011	2012	2013
Generated CDW (tonnes)	NA	NA	**580 449**	**579 924**	**585 542**	NA
Recovered CDW (tonnes)	NA	NA	**527 242**	**506 306**	**517 516**	NA
Backfilled CDW (tonnes)	NA	NA	**15 000**	**16 000**	**0**	NA
Landfilled CDW (tonnes)	NA	NA	NA	NA	**7 012**	NA
Energy recovery if any (tonnes)	NA	NA	NA	NA	NA	NA

5.1 CDW generation data

The Luxembourg Statistical office does not publish data on C&D waste generation. The only data available are the data that are communicated to Eurostat. Luxembourg authorities indicated that there is no other official data besides that reported to Eurostat.

Mineral waste from construction and demolition (EWC 12.1 or W121) **across all NACE categories** was **558 051 tonnes in 2012**. [48] The construction sector generated the majority of it: **523 346 tonnes in 2012**.[48]

The quantities of waste in the construction sector only (NACE F) of categories 061, 062, 063 (metal wastes, ferrous, non-ferrous and mixed), 071 (glass waste), 074 (plastic waste), 075 (wood waste) is **27 491 tonnes in 2012**.

The construction sector generated a total amount of **14 142 280 tonnes of waste**,[48] of which the volume of **soils waste** generated in 2012 was reported to be **6 506 223 tonnes**.[48]

Luxembourg environmental administration indicated that they only elaborate statistics for Eurostat, following the CED-Stat methodology. The amount of waste generated following the CED Stat methodology was of

[48] Eurostat Waste database: Generation of waste (env_wasgen)

5 121 118 tonnes in 2012. The data on generation of construction and demolition waste communicated by the Luxembourg environmental administration appear in Table 2.

Table 2: Generation of CDW in Luxembourg 2012 (Methodology CED-Stat)

Code	Quantity in kg
Year 2012	**5 121 118 249**
0	**4 943 492 353**
17 01 01	71 889 430
17 01 02	6 390 000
17 01 03	7 507
17 01 07	214 247 906
17 02 01	18 460 582
17 02 02	5 996 910
17 02 03	879 672
17 03 02	203 599 434
17 04 01	829 795
17 04 02	887 731
17 04 03	91 867
17 04 04	288 269
17 04 05	42 009 391
17 04 06	1 087
17 04 07	3 417 433
17 04 11	954 452
17 05 04	4 322 163 300
17 05 08	3 969 820
17 06 04	655 651
17 08 02	5 584 141
17 09 04	41 167 975
1	**177 625 896**
17 01 06	102 410
17 02 04	3 937 642
17 03 01	4 757 057
17 03 03	1 004 055
17 04 10	158 030
17 05 03	159 318 460
17 06 01	90 640
17 06 03	210 022
17 06 05	7 517 055
17 09 02	1 755
17 09 03	528 770

5.2 CDW treatment data

Luxembourg environmental administration indicated that they only elaborate statistics for Eurostat, following the CED-Stat methodology.

Data for years 2010 and 2011 as reported by Member States pursuant to Commission Decision 2011/753/EU, appear in the following table.

Table 3: Generation, treatment and recovery rate of C&D waste for 2010 and 2011 as reported by Member States to the European Commission pursuant to Decision 2011/753/EC

Method EStatW	2010 (t)				2011 (t)			
	Generation	Recovery	Backfilling	Rate	Generation	Recovery	Backfilling	Rate
LU	580 449	527 242	15 000	90.8%	579 924	506 306	16 000	87.3%

Table 4: Treatment of CDW in Luxembourg 2012 (Methodology CED-Stat)

Code	Quantity in kg
Year 2012	**4 794 309 480**
D01	**3 190 667 350**
17 01 01	1 951 780
17 01 07	5 059 890
17 05 04	3 183 655 680
R04	**54 615 720**
17 04 01	6 424 885
17 04 02	47 328 005
17 04 04	2 518
17 04 05	136 662
17 04 07	715 318
17 04 11	8 332
R05	**1 276 544 480**
17 01 01	69 905 500
17 01 02	6 390 000
17 01 07	209 115 820
17 03 02	204 264 980
17 05 04	759 028 720
17 09 04	27 839 460
R13	**21 010**
17 02 01	2 610
17 09 04	18 400
R5B – is a national code for backfilling, given that there is none at European level	**272 460 920**
17 05 04	272 460 920

5.3 CDW exports/imports data

Luxembourg exports an important part of its CDW. In 2012, the country exported 386 345 tonnes of CDW. The quantities of exported non-hazardous and hazardous CDW are almost the same, around 190 000 tonnes and 197 000 tonnes. The contaminated soils (category 17 05 03*) represent the majority of exported hazardous CDW: 174 100 tonnes (See Table 5).

Luxembourg imported 57 772 tonnes of CDW, among which aluminium (17 04 02) and iron and steel (17 04 05) are the most imported materials. Luxembourg imports very small quantities of hazardous CDW (less than 2 000 tonnes in 2012) (See Table 5).

Table 5 Imports and exports of hazardous and non-hazardous CDW (2012, CED-Stat methodology)[49]

Imports

Code	Quantity in kg
Year 2012	**57 772 448**
TOTAL (Non-hazardous)	**55 901 988**
17 01 01	196 050
17 01 07	382 900
17 02 01	4 720
17 02 03	1 230
17 03 02	1 251 630
17 04 01	6 418 893
17 04 02	47 314 000
17 04 05	58 030
17 04 11	72 700
17 05 04	20 000
17 06 04	1 460
17 08 02	38 660
17 09 04	140 715
TOTAL (Hazardous)	**1 871 460**
17 03 01	13 490
17 05 03	1 850 540
17 06 03	400
17 06 05	7 030

Exports

Code	Quantity in kg
Year 2012	**386 344 735**
TOTAL (Non-hazardous)	**189 122 908**
17 01 01	228 200
17 01 03	6 880
17 01 07	98 137
17 02 01	3 361 046
17 02 02	5 415 330
17 02 03	76 772
17 03 02	686 536
17 04 01	705 946
17 04 02	1 427 282
17 04 03	38 441
17 04 04	386 844
17 04 05	52 444 572
17 04 07	1 606 275
17 04 11	946 331
17 05 04	107 037 980
17 05 08	3 969 820
17 06 04	1 000
17 08 02	2 499 740
17 09 04	8 185 776
TOTAL (Hazardous)	**197 221 827**
17 01 06	93 010
17 02 04	3 908 210
17 03 01	12 259 087
17 03 03	619 180
17 05 03	174 099 600
17 06 01	69 220
17 06 03	475 050
17 06 05	4 343 795
17 09 02	1 755
17 09 03	1 352 920

5.4 CDW treatment facilities data

In 2010, the national network of regional inert waste landfills included 11 landfills in exploitation. Three of them are exploited by the company Recyma SA. Recyma opened a new landfill site in Strassen in spring 2015. The other operators are Cloos SA (2 sites), specialised in recycling of stone waste, Carrière Feidt, Heirens Constructions, Bälder, Hein, Tragec and Entreprise Neu SARL.

Recyma is a private society which was set up in 1990s at the request of construction companies. The other companies are mostly quarries.[50]

[49] Figures provided by Mr Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 23 April 2015

[50] Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015

An important issue in Luxembourg is the lack of space to set up landfills for inert waste, notably due to requirements of the legislation on Habitats or Natura 2000.[51]

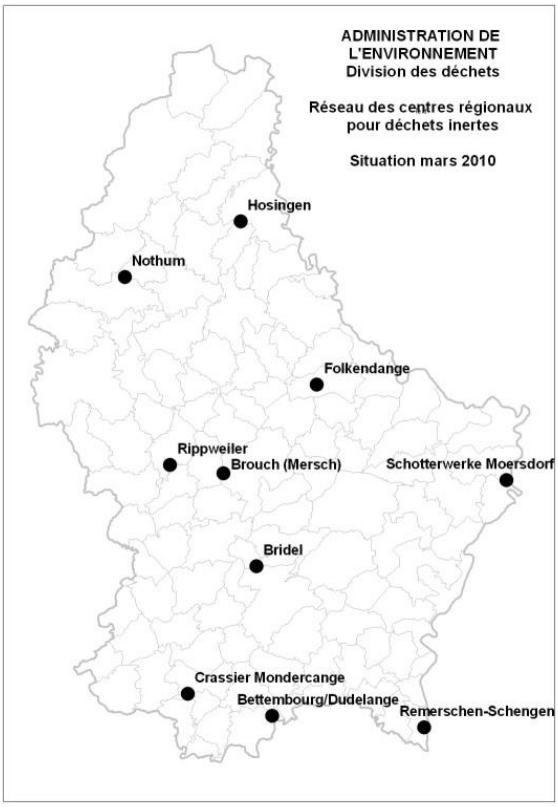

Figure 1: national network of regional inert waste landfills 2010[52]

The Environmental administration provides a link to the figures on quantities of disposed and recycled **inert** waste in these authorised centres (see Table 6).

Table 6: Inert waste disposed of or recycled in authorised inert waste landfills (in thousand tonnes) 1992 - 2012[53]

Year	1992	2000	2005	2006	2007	2008	2009	2010	2011	2012
Precision: This table takes only a part of inert waste disposed by landfilling or backfilling. From 2010, the indicated quantity corresponds to the backfilling of inert waste [54]										
1/ Disposal of inert waste (inert waste defined as in the Landfill directive)										
- Volume of inert waste disposed in the regional centres for disposal of inert waste (inert waste defined as in the Landfill directive)	1 071	4 395	4 152	3 615	4 997	5 910	6 468	6 054	6 507	3 466

[51] Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015
[52] Luxembourg environmental administration; available at: http://www.environnement.public.lu/dechets/dossiers/dechets_inertes/Reseau_decharges_dechets_inertes/index.html
[53] Adapted from Statec figures; available at: http://www.statistiques.public.lu/stat/TableViewer/summary.aspx
[54] In original language: “Ce tableau ne reprend qu'une partie des quantités de déchets inertes éliminés par des dépôts ou remblais. À partir de 2010, la quantité affichée correspond au remblayage de déchets inertes. »)

Year	1992	2000	2005	2006	2007	2008	2009	2010	2011	2012
2/ Recycled inert waste	**119**	**2 294**	**3 435**	**3 158**	**4 192**	**2 149**	**2 744**	**2 101**	**1 775**	**3 512**
- Volumes recycled in regional centres and mobile and stationary recycling facilities installations (1992 and 1995 estimation)	119	1 920	1 747	1 479	1 954	1 380	1 727	1 838	1 322	1 396
- Other backfilling (2001-2004 : estimation)	-	-	1 427	1 455	1 187	202	391	81	66	1 934
- Inert waste exported for recycling and subject to a notification procedure	-	374	261	224	1 051	567	626	182	386	182
3/ Inert waste imported and subject to a notification procedure	-	17	3	4	5	1	-	-	-	-

The 2010 General Plan on Management of Waste indicates that "data communicated to Administration and concerning only duly authorized recovery and disposal facilities are clearly lower than volumes generated in reality. It should then be concluded that approximately **one third of inert waste are either reused at the construction site or disposed of or recycled other than authorized circuits, or deposited exclusively in backfills in accordance to the legislation on protection of nature where the inventory of deposited volumes is not generally done**."[55]

Since 2010, the situation had not changed and construction companies continue to reuse an important amount of inert waste by themselves.[56]

Landfills for inert waste are subject to regular inspections.[57] Environmental administration visits landfill sites up to 3 times per year. These inspections are not announced ahead of the visit and consist in verification of materials that are deposited in containers at the landfill site.[58]

An example of materials accepted and price list is shown in Figure 2.

[55] Page 210 of : General Waste Management Plan (Plan général de gestion des déchets), January 2010; available at: http://www.environnement.public.lu/dechets/dossiers/pggd/pggd_plan_general.pdf
[56] Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015
[57] Website of Environmental administration; available at: http://www.environnement.public.lu/dechets/dossiers/dechets_inertes/Reseau_decharges_dechets_inertes/index.html
[58] Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015

Price net in Euros, per ton, VAT-excluded				
1st January 2015				
Accepted materials		**Nothum**	**Hosingen**	**Strassen**
				open spring 2015
Excavated soil				
	dry/humid	4,8	4,8	5,30*
	sludge	6,2	6,2	6,2
Demolition materials				
	sorted (0/500)	1,24	1,24	1,24
	not sorted (0/500)	3,9	3,9	3,9
Concrete products				
	armed(<600)	2	2	2
	armed (<600)	4	4	4
	strongly armed (<600)	8	8	8
	strongly armed (>600)	10	10	10
Rock materials (0/500)		FREE	FREE	FREE
Stone construction materials (0/250, max 10% thin) **		-2,5	-2,5	-2,5
Vegetated land **		-1,5	-1,5	-1,5
Other				
	Slag(<500)	FREE	FREE	FREE
	Bricks	1,49	1,49	1,49
Material sales	Nothum	Hosingen	Strassen	
Recycled material 0/45 Type 2	4,7	4,7	4,7	
Sifted recycled material 20/70	5,1	5,1	5,1	
Refusal 0/20	FREE	FREE	FREE	
Arable land	12,39	12,39	12,39	
* adapted according to municipality tax				
** in form of n/c at the invoicing				
Copyright 2004. All rights reserved.				

Figure 2: Accepted materials and price list, Recyma SA[59]

5.5 Future projections of CDW generation and treatment

No reported figures on projection of CDW generation and treatment have been identified.

[59] Recyma; available at: http://www.recyma.lu/fr/liste_prix/index.htm

5.6 Methodology for CDW statistics

The national statistics on CDW generation follows Eurostat guidelines. No planned changes of methodology have been reported.

6 C&D waste management in practice

In this section the CDW management "on ground" in Luxembourg is presented.

6.1 CDW management initiatives

Description of initiative	Scope	Year established	National, regional, local (specify which local area/region)	Public sector and/or Industry lead organisation	Levels of performance e.g. tonnes recycled	Further information/ web-site
SuperDrecksKëscht fir Betriber® – public body supporting sorting, recovery and recycling of waste generated at the construction site	CDW	1992	National	Public	Since 1992, 3500 companies have participated in the initiative. 2000 obtained the label. Ex. Of companies at the website[60]	http://www.cdm.lu/entreprise/labels/le-label-superdreckskescht-fir-betriiber and http://www.sdk.lu/de/Home.html

6.2 Stakeholders' engagement

The table below aims to gather information on the existing initiatives – identified above – or other initiatives identified by the stakeholders themselves, together with a preliminary assessment of the enabling factors/obstacles, advantages/drawbacks, and other relevant comments.

Description of initiative	Scope, year established, actors involved	Advantages/ Enabling factors	Disadvantages/ Obstacles	Further information/ web-site
Mandatory sorting of CDW +market conditions	1990s	Companies are obliged to sort or submit CDW to sorting. Mixed waste is more expensive to dispose of than sorted waste (*)	Awareness of workers: challenge is to educate and train workers on construction sites to sort properly waste	

(*) Example – WUST Luxembourg, building site City Gates

[60] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015

WUST is a Belgian company but it has also some activity in Luxembourg (9 workers in Luxembourg >< 100 workers in Belgium). [61]

The price of the collection was cited as one of the incentives to sorting/recycling of waste, for reasons explained above (less weight + better sorted materials -> less containers -> lower cost).

6.3 Waste legislation enforcement

EU procedures

Luxembourg faced infringement procedure regarding transposition of EU waste law. In 2002, the European Court of Justice considered that Luxembourg did not transpose the European List of Waste referred to by the Directive on Hazardous Waste. [62]

National enforcement

In Luxembourg, environmental administration (Le Ministère du Développement durable et des Infrastructures) is responsible to control the conformity of the construction activities with CDW legislation.

It was not possible to retrieve reliable information on frequency of inspections. Some of the interviewed stakeholders indicated that there were **very few inspections** to verify the conformity with CDW legislation. There may have been cases where legislation is not fully respected, such as waste being used for backfilling.[63] However, these cases seem to be rather marginal and exceptional to the most of the interviewed stakeholders.

The SDK voluntary labelling scheme implies that an SDK-agent verifies regularly – every month – the conformity with the label conditions. The SDK agent checks for instance that containers are well sorted, that instructions on sorting are clearly indicated at the building site and he also verifies the follow-up data on waste (an excel file which indicated per type/quantity of waste its end-of-life, including a receipt of a treatment facility attesting how the given waste was treated (EU-waste treatment codes)). These visits are not aimed at punishing but at advising how to correct/improve the system in place. [64]

6.4 Drivers / barriers to increase CDW recycling

This sub-section identifies the main drivers and barriers that affect (directly/indirectly) the recycling efforts and boost/impede CDW recycling rates and overall performance in Luxembourg.

[61] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015
[62] Paperjam, Législation sur les déchets, la Commission poursuit le Luxembourg (19 December 2002) ; available at : http://paperjam.lu/communique/legislation-sur-les-dechets-la-commission-poursuit-luxembourg
[63] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015 and Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015
[64] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015 and Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015

Factor / characteristic / element in CDW recycling chain	Drivers	Barriers
Eco-design to facilitate selective demolition	▪ Currently companies are encouraged to design buildings in the way that takes into account its selective demolition ▪ New initiatives put in place: a study shall be carried out in the subject to better understand different material flow and value chains[65]	▪ Old buildings – often difficult to know what they are made of
Reduction/prevention	▪ Cost of waste treatment ▪ SDK – software OYAT allows planning and optimization of material and waste ▪ Pre-manufacturing	▪ Training
Treatment facilities	▪ Obligation for municipalities to set up landfills for inert waste => Network of authorised treatment facilities	▪ Lack of space
Sorting	▪ Mandatory sorting of waste ▪ Mandatory pre-demolition audit ▪ It costs more to landfill than to reduce waste, sort it and/or recover it => companies are encouraged to sort ▪ Public program SDK to help companies implement sustainable CDW management ▪ SDK: Helps companies to reduce and sort waste properly	▪ Workers not always trained to sort properly
Recycling	▪ Steel: presence of steel industry (Arcelor Mittal) that produces iron from recycled materials	▪ Often downcycling of concrete (use for backfilling): because of the need of that material for construction of roads. Otherwise, that material would have to be imported => low quantities of material do not allow upcycling[66] ▪ Price of raw material is sometimes lower than the price of recycled material

[65] Interview with Daniele Waldmann, Assistant Professor at University of Luxembourg, 27/04/2015
[66] Interview with Daniele Waldmann, Assistant Professor at University of Luxembourg, 27/04/2015

7 CDW sector characterisation

In this section some specific characteristics of the CDW management sector in Luxembourg are presented.

7.1 Sector characteristics

The interactions between actors along the C&D waste recycling value chain are summarised in figure below.

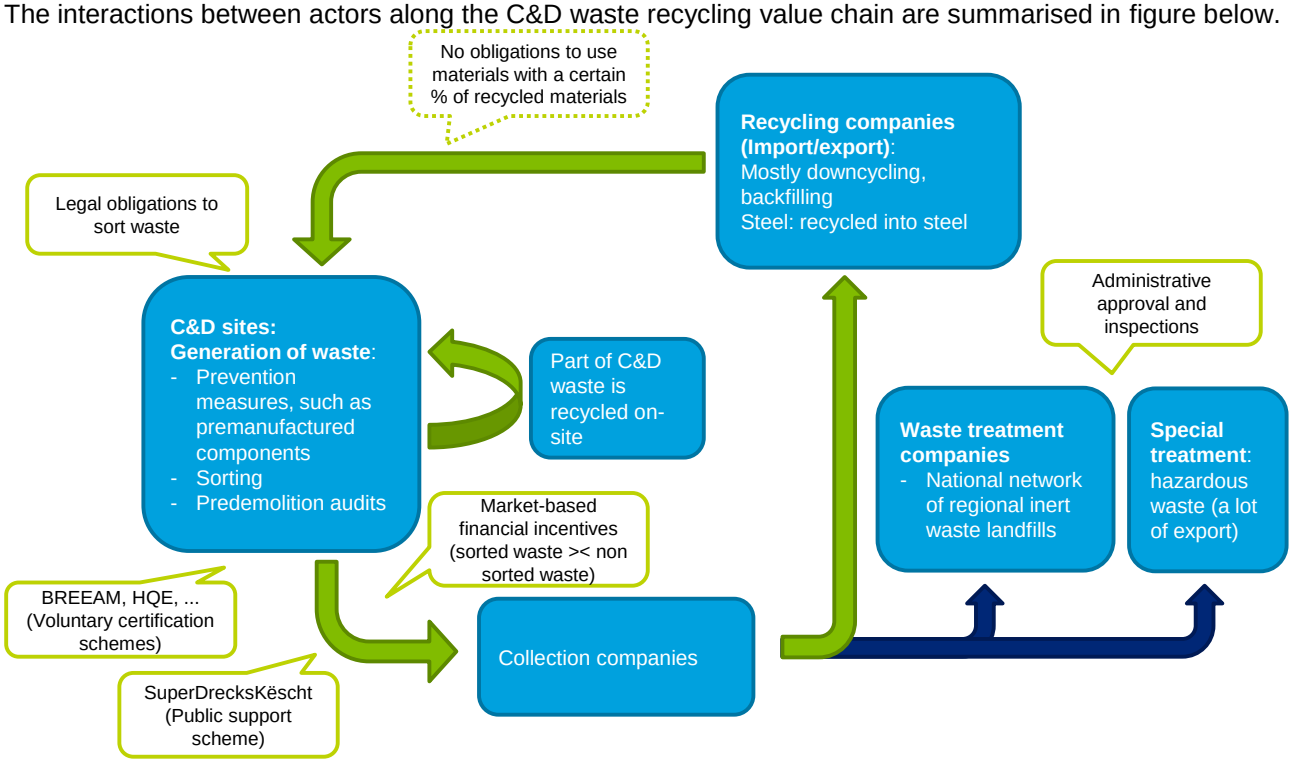

Figure 3: Actors and drivers in the C&D recycling value chain

Treatment actors

There are two main companies in charge of **treatment** of CDW (called “déchetteries”):[67]

- Lamesch,[68] subsidiary of SITA SUEZ Environnement.; and
- Polygone.[69]

Big building sites have contracts with these two companies.

Collection actors

There are more bigger-size actors in the **collection market**, and notably: [70]

- Lamesch (mentioned above);
- Polygone (mentioned-above);
- Hein; [71]
- Horsch;[72]
- SuperDrecksKëscht (SDK) – has also a collection activity, but it is only for small quantities of waste, mostly problematic waste;
- Ecotec.[73]

There are not organisations representing specifically actors of the collection or treatment sector.

[67] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[68] www.lamesch.lu
[69] http://www.polygone.lu/
[70] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[71] http://www.heingroup.lu/index.php/fr/
[72] http://www.horsch.fr/index.php?id=18606&L=3
[73] http://www.ecotec.lu/fr

7.2 Exports / imports of CDW

Being a small country, Luxembourg does not have the capacity to recycle all the CDW and hence a substantial part of CDW is exported to the neighbouring countries, 386 345 tonnes in 2012.[74] (See Table 5)

The exceptions are aluminium and the scrap iron which are imported (See Table 5). Iron is imported because of the presence of Arcelor Mittal.[75]

7.3 CDW as landfill cover

CDW is mainly used for backfilling. Luxembourg uses mostly fertile soils to cover inert waste landfills.[76]

7.4 Market conditions / costs and benefits

There are currently no state/legislation incentives to recycling. Construction companies do not benefit from any state aids or financial support from the state in exchange for recycling.[77]

Yet, it is less expensive for companies to sort materials (and recover them) than not to do so.

In fact, the treatment of waste represents a cost for the construction companies. The current market prices provide both incentives to prevent waste generation and for sorting waste that has been produced, as follows:[78]

- Incentive to prevent waste generation: The price is based on the quantity of waste (volume/weight) -> the less waste is produced, the less the construction company pays to the waste treatment company ("déchetterie")[79]
- Incentive to sort: The market prices for collection/treatment of sorted waste are lower than prices for collection/treatment of mixed waste ("tout-venant", "déchets mélangés").[80]

Obstacles to CDW recycling

None market-related obstacles have been identified. There are enough companies to collect the waste. When CDW is not well sorted, collection companies might refuse to collect the waste.[81]

One of the obstacles is lack of space for containers at building sites for instance in the city of Luxembourg.[82]

The main obstacles are linked to behaviour at the construction site: the issue is mainly to inform the workers. Sectoral construction institute which is financed by the construction companies provides training courses, and these trainings include 2 hours dedicated to the CDW reduction and sorting. The training represents a cost, and hence small companies might avoid to provide training in order to save on expenses.[83]

7.5 Recycled materials from CDW

Regarding norms of recycled materials, it is reported that Luxembourg follows French or German norms.[84] In the Luxemburgish transcription of the norm N260 for cement, the new norm goes a little further in favour of recycling.[85]

There are not any available norms requiring that materials contain a proportion of recycled material as it is the case in Switzerland and Germany.[86]

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[74] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[75] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[76] Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015
[77] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[78] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015
[79] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015
[80] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015
[81] Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 15/04/2015
[82] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[83] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[84] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[85] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015

It was reported that Luxembourg does not have the capacity to recycle most of CDW generated in its territory and hence the majority of CDW is exported to the neighbouring countries.[87]

The exception is the scrap iron which is imported, because of presence of Arcelor Mittal. [88]

The approach to recycling of CDW waste differs for each material.[89]

Steel:

Luxembourg does not produce steel of raw materials any longer, since it has shut down furnaces in 1990s. All steel is produced from recycled steel.[90] But the steel industry is specific from this point of view. The situation is not the same for other materials.[91]

Cement:

Cement is a low added value product. Cimalux is the only cement producer in Luxembourg and it is strongly dependent on the situation in Luxembourg and the larger region surrounding Luxembourg. The demolition waste is essentially used for downcycling, as backfilling, not for production of aggregates. There are 3 main reasons for this:

- Insufficient quantity of material to set up profitable recycling plants
- Enough raw materials and thus low prices (ex. Sand, in France unexploited quarries): to allow for recycling, raw materials would have to be more expensive than recycled materials. Exception gravel: in 10-15 years there may be incentive to invest.
- The materials are needed for downcycling, notably backfilling[92]

Soil:

Excavated soils are used for backfilling.[93]

Glass:

Most of glass waste in CDW is recovered by recycling industries, either to produce glass or isolation materials.[94]

Wood:

Wood coming from the construction sector is sorted and recovered, either recovered through energy recovery or in cogeneration with pellet production.[95]

Plastics:

Recyclers are confronted with multimaterial polymers which complicate recycling.[96]

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[86] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[87] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[88] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[89] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[90] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[91] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[92] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015 and Interview with Daniele Waldmann, Assistant Professor at University of Luxembourg, 27/04/2015
[93] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[94] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[95] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015
[96] Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16/04/2015

7.6 Construction sector make up

Actors

There are 7 to 8 major actors in the construction sector, including notably the following:

- Felix Giorgetti Construction is the largest one;[97]
- CBL SA;[98]
- Crea Haus Construction;[99]
- Constantini;[100]
- CLE;[101]
- Perrard.[102]

Then, there are a lot of small companies, and almost no medium-sized companies.

Employment

The construction sector is characterized by a lot of subcontracting (typical for the sector), with a lot of levels of sub-contractors, including other EU neighbouring countries (e.g. a Luxembourg firm subcontracts to a Polish firm which, on its turn, subcontracts to a Ukrainian firm). Hence, there are a lot of languages on a building site which does not facilitate the communication and explanation of sorting to workers.[103]

Level of activity

Since 2005, the activity in the construction sector was maintained at same levels, with a small decline in 2013 compared to 2010-2012. However, the construction sector has performed well and has not been affected by a crisis.[104] The inflow of workers and businesses to Luxembourg from abroad creates the demand for new infrastructures.[105]

[97] http://www.gio.lu/fr/construction-g%C3%A9nie-civil-travaux-routiers-au-Luxembourg
[98] http://www.cbl-sa.lu/
[99] http://www.creahaus.lu/
[100] http://www.costantini.lu/qui.php
[101] http://www.cle.lu/FR/Organisation.aspx
[102] www.perrard.lu/
[103] Interview with Mr. Eric Corrignan, In charge of SDK labelling program, SuperDrecksKëscht, 15/04/2015
[104] Interview with Daniele Waldmann, Assistant Professor at University of Luxembourg, 27/04/2015
[105] Interview with Daniele Waldmann, Assistant Professor at University of Luxembourg, 27/04/2015

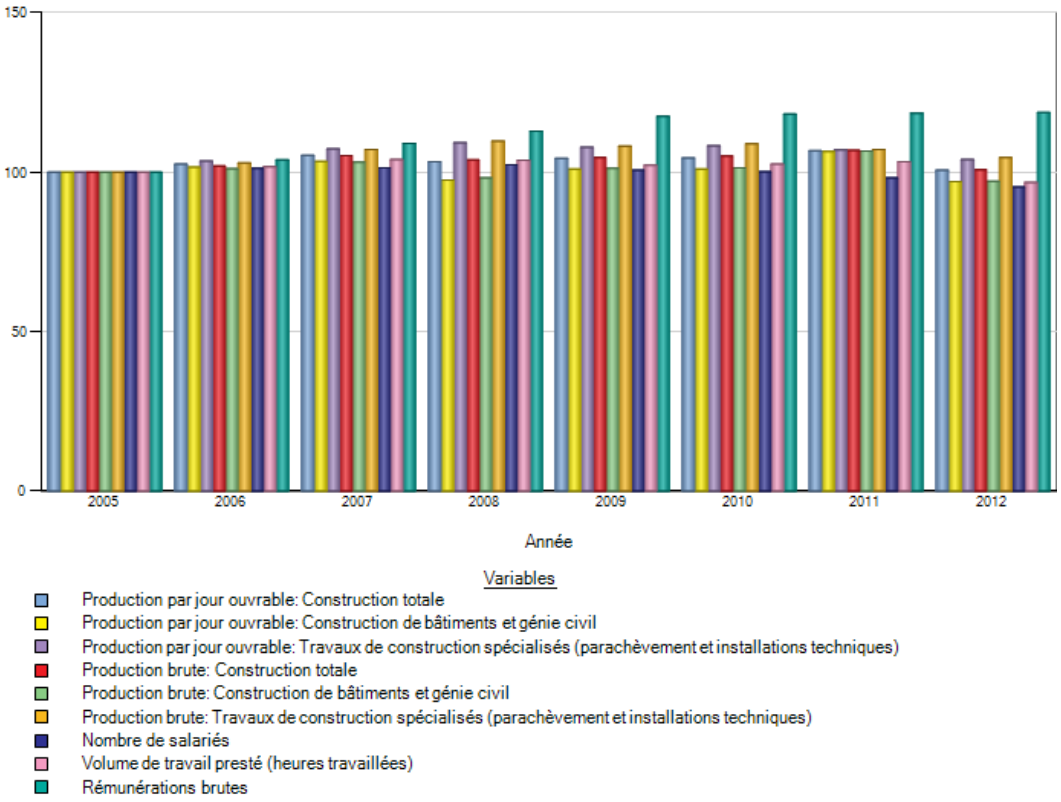

Figure 4 Activity index of the construction sector 2005 – 2012, 2005 being baseline=100[106]

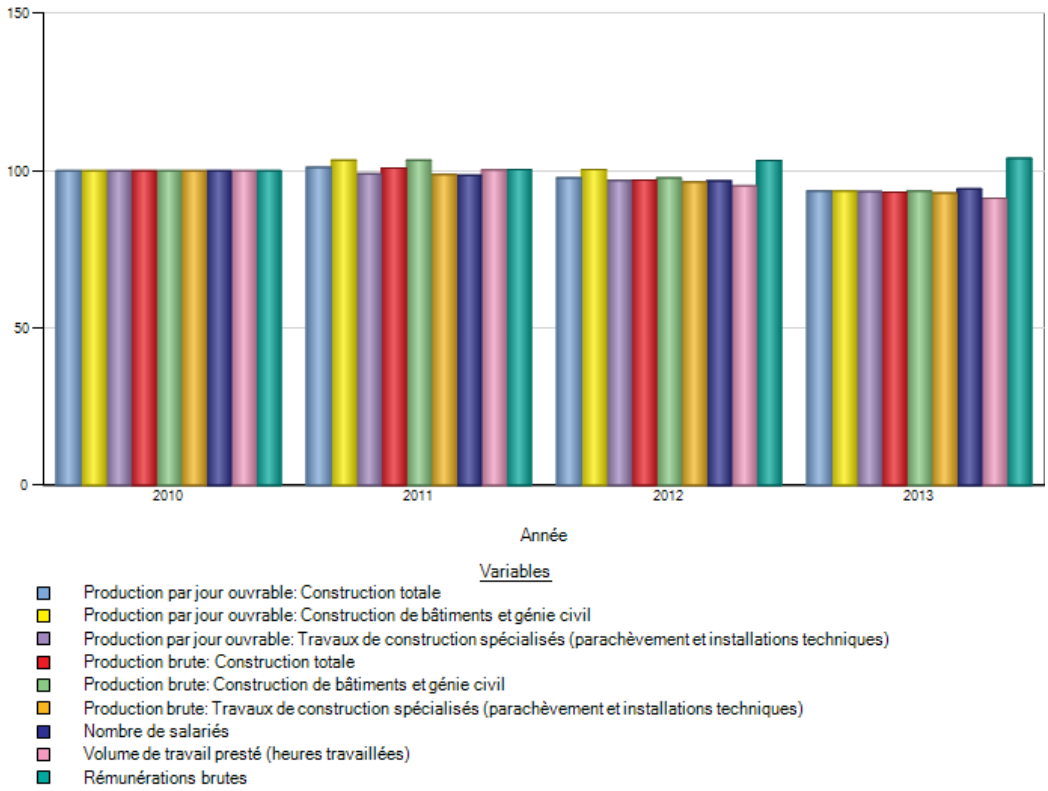

Figure 5: Activity index of the construction sector 2010 – 2013, 2010 being baseline=100[107]

[106] STATEC, Luxembourg Statistics Bureau, available at : http://www.statistiques.public.lu/stat/ReportFolders/ReportFolder.aspx?IF_Language=fra&MainTheme=4&FldrName=4&RFPath=36

[107] STATEC, Luxembourg Statistics Bureau, available at : http://www.statistiques.public.lu/stat/ReportFolders/ReportFolder.aspx?IF_Language=fra&MainTheme=4&FldrName=4&RFPath=36

In April 2015, the majority of the polled construction sector companies expected the level of activity to be stable in the following months.[108] 40% of polled actors in the building construction sector (NACE 41) and of specialized construction activities (NACE 43) consider that the construction activity is not limited by any factor. In the sector of civil engineering (NACE 42), 44% considered that the activity was expecting limitation of activity due to insufficient demand.

[108] The monthly poll on the expectations regarding the level of activity in the construction sector (April 2015); available at: http://www.statistiques.public.lu/stat/ReportFolders/ReportFolder.aspx?IF_Language=fra&MainTheme=4&FldrName=4&RFPath=36

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- Interview with Mr. Alain Detilleux, In charge of Quality & Prevention, WUST Luxembourg, 14/04/2015
- Interview with Mr. Sébastien Ghiezen, Works Supervisor at the SDK-labelled building site City Gates WUST Luxembourg, 14/04/2015
- Email exchange with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 10/04/2015
- Interview with Mr. Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 16/04/2015
- Figures provided by Mr Yves Jacoby, In charge of CDW issues, AEV (Administration de l'environnement - Luxembourg environmental administration), 23/04/2015
- Interview with Mr. Christian Rech, President of Group of construction material producers (Groupement des fabricants de matériaux de construction), also Engineer at Cimalux, the only cement producer in Luxembourg 16 April 2015
- Interview with Mr. Alain Jacob, Director General, Group Lamesch, 20/04/2015
- Interview with Daniele Waldmann, Assistant Professor at University of Luxembourg, 27/04/2015
- Interview with Mr. Pol Faber, Administrator at Recyma, 29/04/2015

All categories of stakeholders were thus interviewed and all our contacts responded to our solicitation, either by answering to our questions or forwarding to a more relevant contact.

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- STATEC, Luxembourg Statistics Bureau, available at: http://www.statistiques.public.lu/stat/ReportFolders/ReportFolder.aspx?IF_Language=fra&MainTheme=4&FldrName=4&RFPath=36