



INSPIRE
Infrastructure for Spatial Information in Europe

Member State Report: Luxemburg, 2013

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1 INSPIRE Reporting – Overview of requirements

There are five topics addressed in the Reporting chapter of the IR:

1. Organisation, co-ordination and quality assurance

The first part of this section is concerned with the way in which the contact point and co-ordinating structure for the infrastructure for spatial information are organised – the body responsible, its associated co-ordinating structure and some information about how this works. The second part offers the MS the opportunity to report on quality assurance processes within the infrastructure for spatial information (as required by Art 21 of the Directive).

2. Contribution to the functioning and coordination of the infrastructure

The second section asks for information about the stakeholders involved in the infrastructure for spatial information – including a description of their roles, how they co-operate, how they share data/services and how access is made to services via the INSPIRE geo-portal.

3. Usage of the infrastructure for spatial information

Having some or all of the various components of the infrastructure for spatial information in place is important, but equally important is if, or how much, the infrastructure is being used. This part of the report is intended to give MS the opportunity to comment and explain the results of the indicators on the usage of the different services, and to describe how spatial data and services are being used by public bodies and if possible (because it is recognised that this is difficult to observe) how they are being used by members of the general public. Because of the environmental emphasis of the Directive MS are particularly encouraged to find and describe examples of use within the field of environmental policy. The report should also describe examples of cross-border usage, efforts to improve cross-border consistency and examples of the use of transformation services.

4. Data sharing arrangements

Chapter 5 of the INSPIRE Directive is concerned with data sharing. It has not been possible to derive adequate indicators to monitor data sharing – the subject does not lend itself to quantitative methods in a way that would provide meaningful output. It is a major part of the Directive however and so this Chapter is dealt with, in terms of monitoring and reporting, by asking MS to describe data sharing arrangements in their 3 yearly reports. MS are required to provide an “*overview*” of data sharing arrangements i.e. not all such agreements have to be listed and described (which would be very difficult and extremely onerous) – but MS are encouraged to provide sufficient description to enable readers to understand the main type or types of agreement that are used – both for sharing of data between public bodies in the MS and between those public bodies and the institutions of the EU. An important section also required is a description of known barriers that may be inhibiting the sharing of spatial data and services, and what steps the MS are taking to overcome those barriers.

5. Cost and benefit aspects

Finally, the Directive requires MS to quantify the costs and benefits involved in the establishment and maintenance of the infrastructure for spatial information *that are directly attributable to the implementation of the Directive*. The report should attempt to estimate the costs and to provide examples of benefits as described in the IR. As with other aspects of the report MS are responsible for deciding the depth/level of reporting that they find appropriate to satisfy the IR and to provide a suitable level of information for stakeholders.

2 How to use this template

This template provides a structure Member States can use to collect and transmit the reporting information to the EC.

This template mainly reflects the list of elements required by the Commission Decision 2009/442/EC on monitoring and reporting. These are the mandatory elements. For every chapter the relevant article of the implementing rules on monitoring and reporting will be reported.

Also some optional features, not strictly required by the relevant legislation, are included. These features can either contain a suggestion on what elements can be grouped under a certain topic foreseen by the legislation or they can contain additional elements that enhance the readability of the document. These features are optional.

You have full rights to deliver this report in your own language, we will then translate it internally. Of course if the report will be already in English, or accompanied by its English translation, that will be welcome.

Disclaimer: This document will be publicly available as a 'non-paper', as it does not represent an official position of the Commission, and as such can not be invoked in the context of legal procedures.

3 Executive summary

4 Abbreviations and Acronyms

INSPIRE Directive	Directive 2007/2/EC
MS	Member State
SDI	Spatial Data Infrastructure
OGC	Open GIS Consortium
ACT	Administration of Cadastre and Topography
PCH	Administration des Ponts et Chaussées (Road administration)
ASTA	Services Techniques de l'Agriculture (Agricultural services administration)
AGE	Administration de la Gestion de l'Eau (Water management administration)
AEV	Administration de l'Environnement (National environment agency)
ANF	Administration de la Nature et des Forêts (National Nature and Forest agency)
MDDI	Ministère du développement durable et des infrastructures (National ministry of sustainable development and infrastructures – head ministry ANF and AEV and environmental matters in general)
WMS	Web Map Service
WFS	Web Feature Service
LSDI	Luxembourgish Spatial Data Infrastructure
ILDG	Infrastructure Luxembourgeoise de Données Géographiques (Luxembourg Spatial Data infrastructure LSDI)
LSDI	Luxembourg Spatial Data Infrastructure (= ILDG)
CTIE	Centre des Technologies de l'Information de l'Etat (National IT administration)

5 Introduction

- Background

To deal with the impact of the INSPIRE directive, Luxembourg's Government has created an interdisciplinary and inter-ministerial task force. This group has gained in number of members and in importance since its first creation, and its main role is to take care of the Luxembourgish Spatial Data Infrastructure (LSDI) / ILDG (Infrastructure Luxembourgeoise de Données Géographiques). This group is led by the Administration of Cadastre and Topography (ACT), who is responsible for an important part of the geographic data actually available in the Grand-Duchy.

At ACT a special department is dedicated to the ILDG and to its technical backbone, the national geoportal. The geoportal team consists of a handful of specialists that

- Manage and develop the geoportal in general, the mapping tools, the shop, the webservices, the databases etc
- Operate the IT infrastructure on which the geoportal runs
- Work on geodata sets and metadata
- Operate the shop and handle the orders

The metadata is managed using the online metadata editor and validator of the ACT's geoportal (<http://www.geoportal.lu>).

All the datasets and services that are relevant for INSPIRE can be discovered in the geoportal's metadata catalogue, can be visualised in the geoportal map viewer, accessed /

downloaded through OGC webservices (WMS, WFS) or ordered online through the geoportal's shop module.

All the metadata that is available in the catalogue (or through the geonetwork-based CSW service) are compliant with INSPIRE and have been validated using the online INSPIRE metadata validator.

The metadata editor is available to every stakeholder, so that everyone can create and define the metadata sets of the datasets and services that he defines as being relevant for INSPIRE Annexes I, II and III.

The Monitoring Document for 2013 lists all the datasets and services that are defined in the metadata catalogue at the current state.

- Method used to compile the report

Co-ordination and quality assurance (Art. 12)

5.1 Coordination (Art. 12.1.)

5.1.1 Member State contact point

Art. 12.1. (a) the name, contact information, role and responsibilities of the Member State contact point;

Name and contact information

Member State Contact Point	
Name of the public authority	Administration du Cadastre et de la Topographie
Contact information:	
Mailing address	54, av Gaston Diderich
Telephone number	+352 44 901 1
Telefax number	+352 44 901 333
Email address	ecadastre@act.etat.lu
Organisation's website URL	http://www.act.etat.lu
Contact person (if available)	Francis Kaell
Telephone number	+352 44 901 244
Email address	Francis.Kaell@act.etat.lu
Contact person - substitute (if available)	Jeff Konnen
Telephone number	+352 44 901 261
Email address	Jeff.Konnen@act.etat.lu

Role and responsibilities

The Administration of Cadastre and Topography (ACT) is a central player in Luxembourg in the field of geodata. Indeed, among the legal responsibilities of ACT appear the creation, updating and delivery of the main basic geodata like the cadastral map and its subsets, the different topographic and cartographic maps and databases, the digital terrain model, the official national orthophoto etc. Considering this and the fact that many years ago ACT has launched an innovative project that finally would lead to the creation of the national geoportal, it seems natural that ACT has been given the lead of the LSDI task force and that ACT assumes the role of INSPIRE contact point.

The indicated contact person, M. Francis Kaell, is the head of the Geoportal Department inside the ACT and is thus responsible for the geoportal which is the central distribution point for all the INSPIRE relevant data sets and services.

All other public bodies concerned by geodata relevant for INSPIRE are closely linked to the LSDI, and provide delegates for the LSDI coordination committee CC-ILDG (Comité de Coordination de l'Infrastructure Luxembourgeoise de Données Géographiques).

5.1.2 The coordination structure

Art. 12.1.

- (b) the name, contact information, role and responsibilities, organisation chart of the coordinating structure supporting the contact point of the Member State
- (c) a description of the relationship with third parties;
- (d) an overview of the working practices and procedures of the coordinating body;
- (e) comments on the monitoring and reporting process.

Name and contact information

Coordinating structure supporting the MSCP	
Name of the coordination structure	Comité de Coordination de l'Infrastructure Luxembourgeoise de Géodonnées CC-ILDG
Contact information:	
Mailing address	B.P. 1761 L-1017 Luxembourg
Telephone number	+352 44901 - 1
Telefax number	+352 44901 - 333
Email address	Francis.Kaell@act.etat.lu
Organisation's website URL	http://www.act.public.lu
Contact person (if available)	M. Francis Kaell
Telephone number	+352 44901 - 244
Email address	Francis.kaell@act.etat.lu
Contact person - substitute (if available)	M. Jeff Konnen
Telephone number	+352 44901 - 261
Email address	Jeff.konnen@act.etat.lu
Date and period of mandate	permanent

Role and responsibilities

The CC-ILDG is an organisation that acts as a steering committee of all the activities concerning the creation, updating, management and distribution of geographic data, either in analog or in digital form. The idea behind this committee is to gather the geodata stakeholders' decision makers or their representatives, in order to create a platform for a coordinated approach in all activities concerning geodata.

Organisation chart

The committee has been created in 2009 and is organised as follows:

President: one senior representative of Administration du Cadastre et de la Topographie (ACT) – actually assumed by M. Raymond DHUR, director of ACT

Vice president: one senior representative of Administration du Cadastre et de la Topographie (ACT) – actually vacant

Members: the members are representatives of their respective public organizations, appointed by their ministers or directors in charge. Among the collaborating institutions figure the following:

- Administration du Cadastre et de la Topographie ACT
- Administration des Ponts et Chaussées PCH
- Administration de la Gestion de l'Eau AGE
- Ministère du développement durable MDDI
- Administration des services techniques de l'agriculture ASTA
- Administration de l'environnement AEV
- Administration de la Nature et des Forêts ANF
- Service géologique du Luxembourg AGL
- Ministère des Finances MFin
- Ministère des Transports MT
- Service central de la statistique et des études économiques STATEC

- Inspection générale de la sécurité sociale IGSS
- Musée national d'Histoire et d'Art MNHA
- Musée national d'Histoire Naturelle MNHN
- Ministère du Tourisme
- Ministère du Logement
- Communauté des Transports
- ...

Thematic Working Groups: following the actual subjects on the agenda, the detailed work is done within smaller groups, called Working Groups. They consist of several representatives and work independently on their subject, produce the needed deliverables and report to the general assembly.

The actual WGs are:

- WG for legislation purposes
- WG for points of interest
- WG for water data
- WG for geodata politics
- WG for the management of metadata

Relation with third parties

Relations of the CC-ILDG with third parties always happen following the administrative hierarchy procedures: contact is made via the president, and actual director of ACT, via the Minister of Finance, with the minister responsible for the third party in case of a public body, or directly with the third party in the other cases

Overview of working practices and procedures

The CC-ILDG has been designed as a collaborative instance, and has been operational until now without any official system of rules. Luxembourg's INSPIRE law text institutionalizes the CC-ILDG but does not give any precisions about its working principle. A more precise rule text, which will determine the working procedures in the future, can be established later, but so far no effort has been undertaken in this matter, as the committee works well actually. The concrete working practices that have been followed until now consist in near-monthly general assemblies, at the head offices of ACT in Luxembourg or at another member's headquarters, where all the activities are discussed and decided. While in 2009 the central topic that dominated the agendas was INSPIRE and its implementation in Luxembourg, the following years essentially consisted in work on technical realisations.

At the same time, next to INSPIRE, which puts a huge workload on the small workforce available, the CC-ILDG has nevertheless been able to initiate other projects, which need common studies and activities between several actors. This leads to interesting synergy effects and in the long run to a much more cost effective cooperation. Several examples may illustrate this new approach, which is only possible because of the new central coordination in the field of geodata:

- Tourisme.geoportail.lu : collaboration between ACT and Ministry of tourism to create a tourism geoportal with dwelling and bike tracks
- Eau.geoportail.lu : AGE and ACT cooperate intensively to publish the well-known water-GIS in the geoportal, and to manage AGE's geodatabase
- Many members work together to create a new public address database, and to establish a procedure to update it.

- Agriculture.geoportail.lu : the agriculture geoportal is the result of a cooperation between ASTA and ACT
- Different sections of the ministry of lodging and the geoportal department work together on internet mapping based systems to detect parcels that eventually fall under pre-emption clauses or to evaluate the durability of habitation buildings.
- An important base for this (and other systems) is POI data which so far does not exist as official geodata sets. A sub-working group of the CC-ILDG with members of different concerned ministries and administrations will start working on this subject from March 2013.

Following eventual new demands that may be made, new different working groups will be created to treat those specific themes.

5.1.3 Comments on the monitoring and reporting process

5.2 Quality Assurance (Art. 12.2.)

5.2.1 Quality assurance procedures

Art. 12.2. (a) a description of quality assurance procedures, including the maintenance of the infrastructure for spatial information

The Geoportal, which is the LSDI's backbone, is constantly kept up-to-date and at a state-of-the-art level regarding IT infrastructure. The entire geoportal is running on a farm of clustered virtualised machines, that are fully backed up, and a physically distinct set of machines has been set up for disaster recovery purposes. A geographically more distant and appropriate site has been built up and prepared for disaster recovery purposes of Luxemburg's state services. In 2013 the disaster recovery installation of the geoportal is planned to be moved to this site, to strengthen the layout and general probability of availability in case of major incidents.

Specialised software has been implemented to continuously scan the different webservices available at the geoportal. Low trigger levels make sure that the staffs are immediately informed if webservices tend to have too long response times or time out, if databases tend to react slowly or if the mapping portals have problems when displaying content from local or distant databases.

In regard to the usability, during the last 3 years much work has been dedicated to improve the geoportal's applications in terms of functionality and ergonomic quality. The mapping tool available at <http://map.geoportal.lu> has been adapted to stricter norms of usability, making it available even for partially disabled users. The tool is based on open source libraries and integrates highly reactive tile server technology, a 4 language multi-lingual approach, a high performance one-field search function, complex combined back-ground handling, legends and metadata information as well as versatile object information, with a fully re-usable API. Many developments are done in the scope of a permanent cooperation with partners in Switzerland and France, using the same base for their applications. Databases have been doubled and their respective servers integrated in clusters to maintain a high level of availability. The shop has been improved and a newly designed wizard helps the general public customer order his official cadastral extract in the geoportal.

For quality assurance in terms of geodata, it is important to establish strong links between the ILDG, the geoportal team, and the data holders and producers. In the actual state, a great part of the available geodata comes from ACT itself, which means that different departments of ACT act as data producers and managers while the geoportal & ILDG

department takes care of the integration of the data in the geoportal databases, and publishes and delivers the data. This guarantees that there will be no problems in terms of availability of the cadastral parcel data, the topographic and cartographic databases and all the other geodata ACT providers. The links with SGL, PCH and AGE, as well as with the environmental ministries are very strong and are based on excellent relationships between the directors and on a common goal regarding optimized fulfilment of the official obligations in terms of geodata. For other data, that might be taken into consideration for INSPIRE in the future (updating of Monitoring & Reporting in the coming years), this level of co-operation has yet to be established.

5.2.2 Analysis of quality assurance problems

Art. 12.2. (b) an analysis of quality assurance problems related to the development of the infrastructure for spatial information, taking into account the general and specific indicators

Concerning quality problems of geodata, many datasets are not too problematic, in the sense that they are quite static:

- the official orthophoto is renewed in a 3 year cycle, and does not need any maintenance during this term
- the official maps have a longer renewal cycle (6 years)
- the official cartographic databases are not (yet) updated incrementally

The transformation of this data into the dedicated INSPIRE database is problematic in the sense that these datasets have a different data model than the one prescribed by the data specifications and that the INSPIRE data model, incorporated in our INSPIRE database can often only be filled out partially. In the future, when the datasets will be renewed, the corresponding INSPIRE data specifications will be respected.

One geodata ensemble which is more difficult to manage in terms of quality however, is the cadastral map:

- The parcel layer is continuously updated in a specialised procedure, as well as the corresponding database. Due to the complexity of the actions undertaken, errors on the data level regularly occur. It is important to be very effective in the quality control when the weekly synchronisation is performed. The good news in this regard is however, that from January 2013 on, ACT has started its new and improved management system for cadastral data and surveying, shutting down the system that had been used for nearly 2 decades. In the scope of this change, the cadastral map has been integrated in a new database, inherent quality problems have been corrected and new rules for data quality have been installed.
- The cadastral buildings' dataset is far from completion, workforce is lacking to achieve completion so far.

Administrative borders have recently been subject to significant changes as the actual policy in Luxemburg encourages municipalities to join. The original dataset in the geoportal is actualised to represent the correct situation of the communal borders in accordance to the legislation. The dataset compiled for the INSPIRE geoportal is updated at least once a year.

Metadata quality can also be a problem in general as it is difficult to make sure that the datasets are complete and their contents compliant to the rules.

5.2.3 Measures taken to improve the quality assurance

Art. 12.2. (c) a description of the measures taken to improve the quality assurance of the infrastructure

In terms of data quality, the geoportal department of ACT has established several procedures that are able to identify major problems concerning the data and their availability.

- specialized software permanently scans the general availability of the WMS & WFS webservices, as well as their response time, and files alarm messages when certain trigger values are passed
- during data synchronisation, several critical data are analysed manually, graphically and statistically, before the new dataset version is released into the geoportal database and the webservices
- the virtualisation of the servers is complete by now, which allows a more flexible management and an easier implementation of high availability measures.
- Databases have been doubled in database clusters

Concerning quality of metadata, much effort has been put into the development of the metadata editor and manager of the geoportal. This internal application is designed to allow every data provider to create and submit his own metadata sets. New metadata can be tested for conformity with ISO and INSPIRE specifications, and have to be validated by the metadata superuser before they can go online and be linked to products, datasets or layers in the geoportal.

5.2.4 Quality certification mechanisms

Art. 12.2. (d) where a certification mechanism has been established, a description of that mechanism

A very complete monitoring mechanism has been defined in order to continuously track the availability and performance of machines, services, webpages etc. A central server regularly sends check requests to every service to be monitored and dispatches warnings through eMail and SMS to the concerned actors.

6 Functioning and coordination of the infrastructure (Art.13)

6.1 General overview description of the SDI

- Vision / policy / strategy (where applicable, reference could be given to existing documents, as well as a short summary within the report)

Luxembourg's SDI has not been created solely to respond to the INSPIRE obligations, but the need of a more coordinated and organised approach to the national geodata subject had been recognised earlier. Indeed, more and more public authorities need maps to represent their core data, or are involved in the capture or creation process of geographically presentable information. Therefore, the overall demand of GIS and geomatics specialists, GIS software, web mapping, interoperability, data exchange etc has constantly been on a rise to a degree that government actors have asked for a better organised and eventually more centralised approach.

Upon this demand, ACT and the National IT administration CTIE (Centre des Technologies de l'Information de l'Etat) launched a study on the possibilities, impacts and needs of a national SDI, based upon the geoportal, which previously had been created and launched by ACT.

As a result, ACT was assigned the new task of building the Luxembourg's SDI around the technical backbone of the geoportal and was granted the right and budget to put into place a new department and a specialists team fully dedicated to this new national task.

The main targets of the LSDI are

- the optimised use of the public geodata sets at Government level
- easier access to geodata in general, better availability
- better basis for decision taking
- respect of the general standards and norms
- centralised know-how and support to all public bodies
- metadata creation, updating and management
- geodata creation, updating and management
- support in GIS and geodata project management for all the public bodies
- centralised geodata and metadata extraction and delivery

6.2 INSPIRE Stakeholders

Art. 13 (a) an overview of the various stakeholders contributing to the implementation of the infrastructure for spatial information according to the following typology: users, data producers, service providers, coordinating bodies

Stakeholders contributing to the implementation of the SDI could be classified according to the following typology: users, data producers, service providers, coordinating bodies)

The following table shows the actually identified stakeholders of INSPIRE in Luxembourg.

Name of stakeholder or group of stakeholders	Role(s)
Administration du Cadastre et de la Topographie ACT (National Cadastre and Topography administration)	coordinating body, service provider, data producer, user
Centre des Technologies de l'Information de l'Etat (National State Information Technology administration)	coordinating body, service provider
Administration des Ponts et Chaussées PCH (Road administration)	service provider, data producer, user
Administration de la Gestion de l'Eau AGE (Water management administration)	data producer, user
Administration des services techniques de l'agriculture ASTA (Agricultural technical services administration)	data producer, user
Institut Viti-Vinicole IVV (National Viniculture Institute)	data producer, user
Administration de l'environnement (Environment administration)	data producer, user
STATEC (Statistics administration)	data producer, user
Ministère du développement durable et des infrastructures MDDI (Ministry of sustainable development)	data producer, user
Service géologique du Luxembourg SGL (Geological department)	data producer, user
Inspection générale de la sécurité sociale (Social security inspection)	data producer, user
Musée National d'Histoire Naturelle	data producer, user
Musée National d'Histoire et d'Art	user
Ministère des Transports (Transportation ministry)	user
Ministries & other state services in general	data producer, user
Municipalities in general	data producer, user
Public research centers, university	data producer, user

Ministère du Logement (Ministry of housing)	data user
Ministère de la Famille (Family ministry)	data producer, user
Service des sites et monuments (data producer, user
Musée National d'Histoire Naturelle (National natural history museum)	data producer, user
CNRA Centre national de recherche archéologique (National archeology department)	data producer, user
Communauté des Transports CDT	data producer, user
Private software producers	user

6.3 Role of the various stakeholders

Art. 13 (b) a description of the role of the various stakeholders in the development and maintenance of the infrastructure for spatial information, including their role in the coordination of tasks, in the provision of data and metadata, and in the management, development and hosting of services

Name of stakeholder or group of stakeholders	Role(s)
Administration du Cadastre et de la Topographie (National Cadastre and Topography administration) - ACT	<p>ACT was, together with CTIE, responsible for the concept study about the need, feasibility and impacts of a national SDI in Luxembourg. ACT had started developing the so-called eCadastre solution, which was continuously further developed into the national geoportal (www.geoportal.lu). One of the main points of this study, concluded by the report of the 3rd January 2008, was the analysis in how far ACT's geoportal would be a suitable technical platform for a national SDI, already taking into account the needs established by the INSPIRE directive. The resulting diagnosis said that the geoportal, in its main functionalities, was principally very well equipped to respond to the different needs enumerated and considered in the study.</p> <p>As a consequence, government took the official decision to have the national SDI created, and entrusted ACT with the coordination, organisation and management of this infrastructure. Funds were made available to implement a dedicated workforce in a dedicated department at ACT. This department has been active since the beginning of 2009, but the necessary minimal workforce was only available at the end of 2009. At present, a 6 person team manages the geoportal, its IT platform, its content, its services, functions etc.</p> <p>On the other hand ACT also acts as a geodata provider, as mentioned above : cadastral map, parcels, buildings, region names, topographic content in digital and analog form, administrative boundaries, maps, orthoimagery, digital terrain models and address points are basic geographic content</p>

	<p>created, maintained and provided by ACT.</p> <p>The geoportal and LSDI department also provides general geodata and GIS knowhow as well as project management support to other public bodies, in the field of geodata. By doing so, it helps making GIS developments compliant to the general principles of the LSDI in order to facilitate data compliance, exchange, and standardisation and in order to lower costs. Furthermore, it ties the different geodata holding public sectors together in a common effort to find, prepare, adapt and make available new geodata content, not only in the scope of INSPIRE but in general.</p>
<p>Centre des Technologies de l'Information de l'Etat (National State Information Technology administration) - CTIE</p>	<p>CTIE was the official initiator of the GIS and LSDI study mentioned above. Its department for internet project coordination was often asked for help in new GIS or e-mapping projects and felt obliged to take a more general and collaborative approach. After the study, after ACT took over the real production tasks, CTIE remained involved: the entire networking infrastructure of Luxembourg's government is under its control and the cadastral database as well. In this sense, there are still interactions.</p> <p>More specifically, the cadastral alphanumeric database with the owner data is managed at CTIE, as well as the address database. Webservices delivering cadastral information either for the geoportal or other appliances, are created, adapted and maintained by CTIE.</p> <p>CTIE is also responsible for the national public sector's graphical appearance regulation, which defines the way public websites have to be designed ergonomically and graphically. In collaboration with CTIE, ACT's geoportal department has analysed the functionalities of the geoportal's mapping tools and made important functional adaptations to make it compliant to the national and international norms. Among others, adaptations aimed at a better compliance with the 3wc norms. After these adaptations, CTIE decided to replace all existing mapping tools in the official state web sites by maps from the geoportal, implementing the geoportal's mapping API in CTIE's content managing systems.</p>
<p>Administration des Ponts et Chaussées (Road administration) - PCH</p>	<p>PCH is a main actor in the field of geodata. Many internal data are created and maintained, but none that have been considered as INSPIRE relevant at the present date. IT and GIS knowhow is important however, therefore PCH is a key actor in the LSDI. PCH maintains an important national website showing the actual traffic situation, works and problems. This site, which counts between 3.000 and 30.000 distinct users a day, has been completely rebuilt from scratch using the geoportal's API, and now shows maps from the geoportal.</p>
<p>Administration de la Gestion de l'Eau (Water management administration) - AGE</p>	<p>AGE is a very important data producer, as it maintains one of the most widely used geodata ensembles called the water GIS. More than 60 water related themes are produced and maintained with updating rhythms varying from yearly down</p>

	to daily. AGE has delegated all issues related to data publication to ACT and the geoportal, and collaborates closely in the scope of INSPIRE.
Administration des services techniques de l'agriculture (Agricultural technical services administration) - ASTA	ASTA produces important data sets that are used to calculate the agriculture subsidies. They are also published in a dedicated thematic mapping portal http://agriculture.geoportail.lu
Institut Viti-Vinicole IVV (National Viniculture Institute)	The IVV has been a longtime partner of the geoportal and its vineyard datasets are displayed in the thematic mapping portal http://agriculture.geoportail.lu
Administration de l'environnement (Environment administration) - AEV	AEV maintains interesting data that might become relevant for INSPIRE later, like the polluted areas. Different departments maintain highly interesting data sets and have started a closer collaboration with the geoportal and the LSDI. The AEV, together with its superordinated ministry, the Ministère du développement durable et des infrastructures (MDDI) and the closely related Administration de la Nature et des Forêts (ANF) is working currently closely together with the geoportal team to create a new dedicated thematic mapping portal for the environment. It has been published on the URL http://emwelt.geoportail.lu in April 2013. Among the published are the national protected zones, remarkable trees, organisational subdivisions, hunting zones and noise maps.
Service central de la statistique et des études économiques STATEC (Statistics administration)	STATEC maintains interesting data that might become relevant for INSPIRE later, if it is possible to establish spatial links.
Ministère du développement durable et des infrastructures (Ministry of sustainable development)	The MDDI is responsible for environment and infrastructure and has under its responsibility the technical administrations AEV, PCH and ANF. The ministry as well as the named administrations maintain interesting data that may partially be relevant for INSPIRE, like Natura 2000 zones.
Service géologique du Luxembourg AGL (Geological service) - SGL	SGL is an important geodata producer as it is responsible for the geological maps and related information.
Inspection générale de la sécurité sociale (Social security inspection) - IGSS	IGSS maintains interesting data that might become relevant for INSPIRE later, in so far they can be rendered as geographic data.
Musée National d'Histoire Naturelle	This actor maintains interesting data that might become relevant for INSPIRE later, in so far they can be rendered as geographic data.
Musée National d'Histoire et d'Art	This actor maintains interesting data that might become relevant for INSPIRE later, in so far they can be rendered as geographic data.
Ministère des Transports (Transportation ministry)	This actor maintains interesting data that might become relevant for INSPIRE later, in so far they can be rendered as geographic data.

Ministries & other state services in general	These actors maintain possibly interesting data that might become relevant for INSPIRE later, in so far they can be rendered as geographic data.
Municipalities in general	These actors in general maintain interesting data, but normally no datasets that might become relevant for INSPIRE.
Public research centers, university	These actors maintain possibly interesting data that might become relevant for INSPIRE later, in so far they can be rendered as geographic data.

6.4 Measures taken to facilitate sharing

Art. 13 (c) a general description of the main measures taken to facilitate the sharing of spatial data sets and services between public authorities and a description of how sharing has improved as a result

Before the implementation of the LSDI, data sharing was quite difficult even among closely related administrations and services.

The problems were manifold :

- There was neither public knowledge of the existing data, nor about its specifications, availability, restrictions
- Metadata did not exist.
- Except for the basic geodata offered by ACT (cadastre, topography, orthophotos and DLM), there were no laws or regulations that defined and allowed the exchange of this data, even among state bodies.
- If information was created and maintained in a way that would qualify it as "geodata content" in the modern sense, its structure and technical specifications generally were very specific to its local use, and rarely adapted for other purposes. Data models were not designed to allow a broader multi-user approach.
- Data exchange was all but simple, and generally the re-use was limited to a display as graphic background information.

One of the principal goals of the new SDI was to offer new ways to improve this situation. In this regard, one of the main principles of the LSDI has been the publication of all geodata via standardised geographic network services. At the current state, mostly OGC compliant services are implemented, but more services, based on different techniques and protocols, can follow.

When the first versions of WMS and WFS services of cadastral and topographic datasets were available (in 2007), several ministries and administrations, that otherwise had to rely on regular deliveries on CD or other physical supports, switched over to the webservices and implemented them into their internal GIS systems. In some cases this led to a significant reduction of the regular workload, which had previously been necessary to locally install and make available the new data versions. Several new systems have either been realised or are planned, that rely on the delivery of existing geodata via webservices, to make this content available either in professional intranet GIS applications or in commonly accessible internet applications.

These new possibilities in data sharing do however not remain restricted to the mere public sector: more and more private data users (engineering firms, architects etc) show their

interest in accessing geodata from public bodies via webservices, when they need them in the scope of projects.

Next to the webservices, the geoportal department also maintains a tilecache database of nearly all of the existing geodata. Its first destination is the series of mapping portals of the geoportal, like <http://map.geoportal.lu>, <http://agriculture.geoportal.lu>, <http://tourisme.geoportal.lu> etc., which essentially rely on tile cache data to ensure great availability and speed. This tile cache database, duly accessible on the internet, can be made available to users instead of or in combination with the webservices. One example of a successful integration of the geoportal's tilecache with local thematic data is the traffic density and incident monitoring site <http://cita.lu>.

Several recently launched projects intend to rely on the tilecache database. It seems clear that it will play a major role in geodata exchange on the national level.

Another important aspect, at least on the level of the state administrations and ministries, are the enlarged technical possibilities of collaboration because many public bodies are linked together via the State network and use the same GIS platform. For example, the search and localizing function of the mapping portals has also been made available in the form of a REST service, allowing other ministries to integrate this powerful tool in their local GIS systems.

6.5 Stakeholder cooperation

Art.13 (d) a description of how stakeholders cooperate

This could for example include the description of:

- Written framework for cooperation
- Working groups (list of active working groups)
- News letters, other publications (references)
- Description of the National geoportal (including URL), and where relevant regional or thematic portals

Until now, cooperation has not yet been fixed in written statements, but is nevertheless real.

It happens on different levels:

- The initial way of cooperating generally is a permanent dialog and the willingness to announce and make available data when it seems that others may need it for their projects. If such projects are launched, practical collaboration can happen on a bilateral level between the geoportal team and the department owning the project, on a multilateral level between the concerned parties, or more generally on the level of a dedicated working group of the ILDG.

As the cooperation among geodata stakeholders is coordinated within the CC-ILDG, the most representative cooperation projects tend to happen in the respective CC-ILDG working groups. The actual WGs are:

- WG for water data: There is a particularly strong collaboration between ACT's geoportal department and AGE. It essentially concerns the publication of water data via the mapping portals and webservices of the geoportal, but also the management of the water geodatabase, the updating procedures of the published geodata and the metadata sets about the datasets, the layers and webservices. Regularly, data have also been exchanged in the scope of scientific studies related to water themes.

- WG for the management of metadata: this WG is a permanent working force, trying to make sure the necessary metadata is collected, verifying and validating its content and managing the metadata catalogue of the geoportal.
- WG for the inventory of relevant datasets for INSPIRE: this WG has done preliminary work to the overall activities of the CC-ILDG and its recurrent task is to identify possible new stakeholders of INSPIRE as well as datasets that may enter into the scope of the INSPIRE directive.
- WG for POI data : this WG works on new datasets that will add many new interesting informations to the geoportal and different specific map-based systems. First destination is the tourism portal and the future system for the evaluation of the durability of habitation buildings at the housing ministry.
- WG for geodata policy : as there are nearly no law texts about geodata (except for ACT's data), and many new ways to deliver and re-use them (webservices, download services, tilecache, API), it has become inevitable to start thinking about a general approach to the matter.
- An important step towards a future re-use of data often is their publication in a public or semi-public mapping portal, as the knowledge of existing datasets often triggers their integration in other contexts.

Generally, written requests for access to data or webservices are the beginning of the procedure of delivery or the technical realisation of the connections. Cooperation is limited neither to a participation in the CC-ILDG, nor to the reciprocal use or exchange of geodata in whatever form, but is also effective in practical issues. For example, ACT and SGL decided to centralise the sale of all geological maps and other scientific geological material at ACT's sale desks and the geoportal. This collaboration, started about 3 years ago, is a great success and has allowed staff and money saving with a better service for the citizen. It has made geological information easier accessible and more visible, while significantly unburdening the SGL staff and better using the capacity of ACT's sale department.

Another important aspect in terms of cooperation is the collaboration between the principal actors in the Luxembourgish geodata sector on state level, and the communal sector. Indeed, due to the territorial autonomy of the municipalities, at least the more important ones tend to build up huge and interesting data sets, based on the data made available by ACT and other State bodies. In the future, it will be very important to involve the municipalities' representatives, as well as the communal syndicates, in the LSDI's activities. Actually, there exist 3 mapping portals, created by the geoportal department on behalf of a municipality government: <http://wellenstein.geoportal.lu>, <http://remich.geoportal.lu> and <http://preizerdaul.geoportal.lu>. Apart from the general background layers and orthophotos coming from ACT, they contain the urban land-use plans of the municipalities. Two more major municipalities have already decided to follow this example and have started to work together with the geoportal department to publish its own mapping portal in the context of the geoportal. As the municipalities represent the lowest administrative level in Luxemburg, and as they have nearly no legal obligation to create and maintain geodata that play a role in environmental themes, municipality level geodata will hardly appear in Luxemburg's INSPIRE data.

6.6 Access to services through the INSPIRE Geoportal

Art.13 (e) a description of the access to the services through the Inspire geo-portal, as referred to in Article 15(2) of Directive 2007/2/EC

All geodata that have been considered INSPIRE relevant at the current state, are available via INSPIRE Spatial Data Services. In order to be compliant as far as possible with the INSPIRE regulations, relevant geodata sets are transferred to a separate INSPIRE database, the data model of which is kept compliant to the data specifications. From this database, the dedicated INSPIRE spatial data services are served. The database, the services as well as the metadata about the services and datasets are integrated in a dedicated geoportal :

<http://inspire.geoportail.lu/geoportal/catalog/main/home.page>

This national INSPIRE-geoportal coexists with the general geoportal, but is limited to the data and services entering in the scope of the directive, as well as the corresponding metadata. In terms of languages it sticks to English.

In this national geoportal dedicated to INSPIRE, data sets and services for the different INSPIRE themes can be searched for and metadata as well as maps can be displayed.

Apart from this national access point, the data sets and services can also be found at the INSPIRE geoportal as they have been integrated in the data base.

7 Usage of the infrastructure for spatial information (Art.14)

7.1 Use of spatial data services in the SDI

Art.14 (a) the use of the spatial data services of the infrastructure for spatial information, taking into account the general and specific indicators

This could include an explanation of how this information was collected, and how it should be interpreted/understood.

We distinguish different types of spatial data services:

7.1.1 GEOPORTAL.LU

The backbone of the Luxemburg's SDI is the Luxembourgish geoportal which opens up an access to the different users.

On one hand, there are different viewers allowing registered or public users to view the data that are relevant to the LSDI.

- <http://www.geoportal.lu> is the general page of the geoportal informing the users about available datasets and services as well as view or order data. Specialists can obtain a login giving them access to special functions such as advanced querying / overlay capabilities of cadastral information.
- <http://map.geoportal.lu> is the general public web mapping platform bringing the LSDI's data to the general public. It is simple to understand and use for the general public and contains the basic functionality people are used to (zoom, pan, search, print). The speed of the data display can be compared to the speed of all the other popular map portals on the internet. This portal as well as its thematic avatars <http://tourisme.geoportal.lu>, <http://agriculture.geoportal.lu>, <http://eau.geoportal.lu> etc have an enormous success and have gained their place in Luxemburg's daily life. An average number of 3.000 distinct users use the mapping portals on working days, and approximately 1.500 on week-end days. They generate 1,5 TByte of traffic a month and print an average of 17.000 PDF-maps a month.

The use of the portal is monitored by an analysis of the weblogs, allowing us to know the number of hits per day at a fine granular level.

Furthermore, the most important clicks on the geoportal are logged to allow us to have a very detailed overview of the usage of the geoportal.

Finally, a monitoring tool is used to track availability and response time of the different parts of the LSDI.

7.1.2 OGC-Compliant Webservices

The LSDI offers a lot of OGC compliant webservices (WMS,WFS,WCS,CSW).

These are oriented to 4 types of users:

- Users that are inside Luxemburg's State Network (wsetat.geoportal.lu/...)
- Users that have a login and a data sharing agreement with the Luxembourgish State (wssec.geoportal.lu/...)
- General Public (ws.geoportal.lu/...)
- Users that want to access INSPIRE compliant and relevant data (wsinspire.geoportal.lu/...)

The use of these webservices is analysed through web server logs and a special function has been developed to track the requests one by one so that statistics at feature level become possible. For this detailed tracking, the entire TCP traffic has to be parsed.

The figures declared in 2013's Monitoring are taken from the web server logs.

7.2 Use of the spatial datasets

Art.14 (b) the use of spatial data sets corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC by public authorities, with particular attention to examples in the field of environmental policy and/or policies and activities which may have an impact on the environment (air and emission policies, waste related policies, inland-coastal-marine policies, biodiversity related policies, horizontal policies such as public access to environmental information, environmental liability, environmental and strategic impact assessments,...) – 'greening' of the Common Agricultural Policy, energy and transport policies, security policies with an environmental dimension (for example maritime security).

Examples could cover the use made for:

- a) the implementation of measures and programmes as laid down in various elements of the EU environmental acquis;
- b) the monitoring of such measures, the monitoring of pressures, the state-of-the-environment, impact assessments.

Examples could demonstrate the added value of INSPIRE measures with regard to use of the spatial datasets for policies above. Examples could also provide a state-of-play of progress achieved and problems still outstanding. In this respect, examples could be provided of multi-purpose use of spatial data sets collected for a particular policy which may have an impact on the environment (for example Land-parcel Information / cross-compliance – LPIS related to agricultural subsidies contains real-world spatial data covered by INSPIRE – land-use/cover etc.)

The real use of the offered data and services has started to be considerable. Whereas the number of requests on the webservices was very low in 2012, except for the orthophotos, most of the geodata sets have been requested several thousand times. In comparison to the general use of the national webservices (with data not adapted to INSPIRE), these figures are encouraging.

INSPIRE Webservice	Requests 2013 (15.4.2013)	Requests 2012	Total
wsinspire.geoportail.lu/services/inspire/ad/mapserver/inspireviewservice	502	870	1372
wsinspire.geoportail.lu/services/inspire/au/mapserver/inspireviewservice	13980	11078	25058
wsinspire.geoportail.lu/services/inspire/el/mapserver/wmsserver	8501	514	9015
wsinspire.geoportail.lu/services/inspire/ge/mapserver/wmsserver	8637	378	9015
wsinspire.geoportail.lu/services/inspire/gn/mapserver/inspireviewservice/eng	8544	578	9122
wsinspire.geoportail.lu/services/inspire/hy/mapserver/inspireviewservice/eng	21946	33375	55321
wsinspire.geoportail.lu/services/inspire/lc/mapserver/wmsserver	374	660	1'034
wsinspire.geoportail.lu/services/inspire/oi/mapserver/wmsserver	189213	479293	668506
wsinspire.geoportail.lu/services/inspire/tn/mapserver/inspireviewservice	21312	58905	80217

Compared to the use of the webservices, the real delivery of vector data was nearly not existent as there was only 1 download in the last years.

7.3 Use of the SDI by the general public

Art.14 (c) if available, evidence showing the use of the infrastructure for spatial information by the general public (where possible with clear reference to applicable EU policies such as public access to environmental information, in the context of dissemination to – consultation of – the public as required in various environmental legal acts.

The ministries and administrations dealing with environmental themes in Luxemburg (MDDI, AEV, ANF) are currently building a new general public mapping portal on <http://emwelt.geoportail.lu>. It has been launched in April 2013.

7.4 Cross-border usage

Art.14 (d) examples of cross-border use and efforts made to improve cross-border consistency of spatial data sets corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC. Examples with regard to policies requiring cross-border collaboration and information exchange are of particular interest (floods, marine strategy directive, water framework and daughter directives, etc.)

7.5 Use of transformation services

Art.14 (e) how transformation services are used to achieve data interoperability

All the LSDI's webservices can be used in EPSG:2169 (local Luxembourgish SRS) or in EPSG:4326 (WGS84 Lat/Lon) for interoperability.

The available Map Viewers are able to reproject the data or (at least) indicate the mouse coordinates in EPSG: 4326

8 Data sharing arrangements (Art.15)

8.1 Data sharing arrangements between public authorities

Art.15 (a) requests an overview of data sharing arrangements that have been, or are being, created between public authorities inside the country.

In order to facilitate correct understanding of the report, the overview and examples should at least cover the following two items:

- Overview and examples of existing or being created data sharing arrangements that provide open and free data access, without any further restrictions or conditions for use and free of charge for commercial and non-commercial use?
- Overview and examples of existing or being created types of data sharing arrangements, such as framework agreements, one time licences, using widely known licensing schema, etc.?

Additionally, answers to the following questions would be helpful:

- Is there a need for a specific legislative basis to provide open spatial data? What is already adopted or planned to adopt?
- Are licenses available in electronic and machine-readable forms?

The Luxembourgish Law stipulates that the data can be shared free of charge between all the public authorities. That's why a set of non-secured OGC-compliant webservices (WMS/WFS) are available to all the people having access to the state network.

The re-use of data, either in the form of physical delivery, webservices, or tile cache access has become normal. Many actual projects, where data from different institutions are needed, rely on this new form of availability of geodata, at least on the level of State authorities. Some examples:

- mobiliteit.lu, a system to plan journeys with public transportation facilities
- a map based system for the analysis of preemption rights on parcels at the Housing ministry
- a map based system for certification of buildings at the Housing ministry
- a new mapping portal for environmental data
- a planned new mapping portal for land organization, which is scheduled to go online in autumn 2013
- a project of a map based POI management application

8.2 Data sharing arrangements between public authorities and Community institutions and bodies

Art.15 (b) requests an overview of data sharing arrangements that have been, or are being, created between public authorities and Community institutions and bodies, including examples of data sharing arrangements for a particular spatial data set.

In order to facilitate correct understanding of the report, the overview of data sharing arrangements between public authorities and Community institutions and bodies should include answers to the following three questions, including examples of particular spatial data set and services, or categories of spatial data set and services, for example based on the annexes of the INSPIRE Directive:

- Can any spatial data sets and services be accessed by the Community institutions and bodies without any arrangement?
- Which arrangements provide free and open access to spatial data sets and services to the Community institutions and bodies?

- Which arrangements require payment from the Community institutions and bodies that use the spatial data sets and services (Article 17(3) of INSPIRE Directive¹)?

Commission Regulation (EU) No 26/2010² – on spatial data sets and services – provides additional context to access under harmonised conditions. The Guidance on the Regulation³ suggests an INSPIRE licence model. Please indicate how the INSPIRE license could be implemented with regard to the legislative system and the existing or being created licenses in the country.

Community institutions and bodies can access the data available in the LSDI through Webservices. The geoportal's webservices aimed at INSPIRE are either freely usable in the internet (if the corresponding geodata are free) or an access can be opened on request and if the legal conditions are met. Once a convention has been signed and a price fixed for the access to the data, Community institutions and bodies can access the data.

Most of Luxemburg's official geodata is available at no cost, and generally there exists no special legislation detailing any limitations or general conditions for their delivery and use. Excepted are the maps and databases produced by ACT: topographic maps and databases, orthophotos and cadastral data underlie a regulation which stipulates the costs and conditions for the delivery of these datasets or extracts from them. This is the reason why those datasets are not freely available at the geoportal and why the corresponding INSPIRE data services are not freely accessible.

However, this regulation grants free delivery to any State level public authority as well as bodies associated with this level. Generally, the commission and similar public European institutions are considered equal in this sense.

8.3 Barriers to the sharing and the actions taken to overcome them

Art.15 (c) requests a list of barriers to the sharing of spatial data sets and services between public authorities and between public authorities and the Community institutions and bodies, as well as a description of the actions which are taken to overcome those barriers.

Commission Regulation (EU) No 26/2010 – on spatial data sets and services – again provides additional context. It requests an overview of procedure to provide the conditions applicable to the Community institutions and bodies in compliance with this Regulation in metadata element 8.1, referred to in part B of the Annex to Commission Regulation (EC) No 1205/2008⁴ (procedure for updating metadata for spatial data sets and services). We strongly encourage providing related information in this section of the country report.

In addition to the above, we recommend including an overview of other ways how and where the Community institutions and bodies can access up-to-date information on data sharing arrangements between public authorities and Community institutions and bodies.

Most of Luxemburg's official geodata is available at no cost, and generally there exist no particular barriers to their exchange either among the national bodies or with European public authorities.

¹ DIRECTIVE 2007/2/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

² COMMISSION REGULATION (EU) No 268/2010 of 29 March 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions

³ [Guidance](#) on the 'Regulation on access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions';

⁴ COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata

9 Cost / Benefit aspects (Art.16)

9.1 Costs resulting from implementing INSPIRE Directive

Art.16 (a) requires an estimate of the costs resulting from the implementation of Directive 2007/2/EC for the period 2010-2012.

In order to facilitate correct understanding of the report, please indicate what is included in the estimation of costs (e.g. hardware, software, staff time) and how you have approached the estimation (e.g. indicate what proportion of the costs are attributed to INSPIRE or related initiatives such as eGovernment).

Please indicate either monetary costs (e.g. on hardware or staff) and/or staff time (days, months) related to the items listed below.

IT Infrastructure (Hardware and core software components)

- Set up costs (one-off costs)
- Maintenance (recurrent yearly costs)

Metadata for data and services falling under INSPIRE Directive and that are indicated in the Monitoring Tables.

- Set up costs (one-off costs)
 - Software (adapting software, creating new software, setting catalogues)
 - Production
 - Creation of metadata for discovery
 - Creation of metadata for evaluation and use (new metadata elements required by Data Specifications Implementing Rules)
 - Testing for compliance
 - Participation of national experts into INSPIRE development process
- Maintenance costs (recurrent yearly costs)
 - Software (adapting software, creating new software, setting catalogues)
 - Production
 - Maintenance of metadata for discovery MD
 - Maintenance of MD for evaluation and use
 - Testing for compliance

Data interoperability/harmonisation for data falling under INSPIRE Directive and that are indicated in the Monitoring Tables

- Set up costs (one-off costs)
 - Development (mapping of concepts, setting up tables, setting up registries)
 - Software (adapting software, creating new software) for data transformation
 - Production
 - Creation of INSPIRE compliant dataset and related support services
 - Testing for compliance
 - Participation of national experts into INSPIRE development process
- Maintenance (recurrent yearly costs)
 - Software for data transformation including maintenance of registries
 - Production
 - Maintenance of INSPIRE compliant dataset and related support services
 - Testing for compliance
 - Maintaining coherence cross domains that evolve

Network services falling under INSPIRE Directive and that are indicated in the Monitoring Tables

- Set up costs (one-off costs)

- *Development Software (adapting software, creating new software) for network services (Discovery, view, Transformation, Download, Invoke)*
- *Production:*
 - Set up of INSPIRE compliant services
 - Testing for compliance
 - Participation of national experts into INSPIRE development process
- *Maintenance (recurrent yearly costs) of INSPIRE compliant network service*

Monitoring and reporting

Development: refining of tools e.g. online tools, registries etc.

Production: Collection of monitoring data and filling of templates by stakeholders

Reporting: Coordination activities to collect examples of good practice and as well as difficulties in implementation, cost and benefit consideration, assessment together with stakeholders

Coordination and horizontal measures

Setting up coordination structures, national contact point activities

Activities that relate to the data and service sharing obligations

Supporting activities:

- Training and education organised by different stakeholders in the public and private sectors.
- Development of Guidance document to support implementation of INSPIRE and use.
- Participation in INSPIRE-related workshops/seminars/standardisation activities.
- Coordinating mechanisms at different levels of government.
- Outreach, Counselling and Support.
- Awareness rising in the private sector and at different levels of government.

From 2001 - 2009 the realisation of Luxemburg's geoportal and the related projects generated a total cost of about 2.000.000 EUR (external services, IT material, software, developments, internal project management, internal workforce, maintenance).

The following table summarizes and categorizes the cost for the subsequent years:

Year	2010	2011	2012
Internal agents of ACT	150.000 EUR	200.000 EUR	200.000 EUR
Permanent external workforce for the geoportal & LSDI department	390.000 EUR	440.000 EUR	440.000 EUR
External services	70.000 EUR	160.000 EUR	140.000 EUR
IT acquisitions (Hard- & software)	85.000 EUR	70.000 EUR	80.000 EUR
Maintenance	25.000 EUR	25.000 EUR	25.000 EUR
	720.000 EUR	895.000 EUR	885.000 EUR

The total costs of the geoportal, from 2001 until 2012 can be summarized by approximately 4.500.000 EUR.

The figures for external services in 2011 and 2012 also contain the cost for the adaptation of the mapping portals to the W3C accessibility requirements in 2011 and the ergonomics and usability study from 2012, both financed by CTIE.

9.2 Benefits observed

In choosing the examples, the following may be worth considering:

- 1) Choose examples that have quantitative measures (e.g. increase in data use, more data sharing, savings in time and money, better policy outcomes, etc.).
- 2) Distinguish between:
 - Core benefits for public authorities in improving environmental policies and policies that affect the environment (primary objective of INSPIRE)
 - Broader side effects of implementing the Directive (e.g. benefits of increased interoperability across environmental information systems, and between environmental and other sectoral policies (e.g. agriculture, transport, regional policy, etc.).
- 3) Identify who are the main beneficiaries (public administrations, business and citizens).
- 4) Cross border examples could include reporting on data sharing arrangements with neighbouring countries.
- 5) Consider whether any undesired side effects of implementing INSPIRE are also worth reporting.

An alternative way of considering benefits is to organise them into three main categories:

- 1) Efficiency
- 2) Effectiveness
- 3) Broader Socio-economic benefits (or democratic benefits)

Examples of elements that can be considered under each heading are:

Efficiency

- Efficiency gains due for example to increased data availability, ease of use, better data sharing:
 - Time saved in internal queries
 - Time saved in internal processes
 - Time saved in serving the public
 - Reduced cost of integrating data
 - Better re-use of existing datasets (reduced need for new data collection)
- More motivated employees e.g. because they are able to respond better to work demands, and see increased opportunities to develop in their profession.
- Better organisational structures and interoperable IT architectures leading for example to cost savings for information management.

Effectiveness

- Reduced administrative burden (e.g. in reporting on environmental legislation)
- Increased intra-institutional collaboration (across different departments in the same institution)
- Increased inter-institutional collaboration (across different organisations and levels of government from local to national).
- Increased awareness in different levels of governments of the benefits of delivering services on a spatial basis.
- Improved policy implementation, monitoring, and evaluation.

Broader Benefits

- More inclusive services (e.g. on line accessibility of services reduces divide between large/urban and small/rural administrations and improves services to citizens and businesses).
- Greater transparency and accountability
- Greater participation by the public

- Greater opportunities for business to innovate and build new services and applications based on INSPIRE data.

As indicated at the beginning of this Section, the headings above are not intended to be prescriptive, but only as an aide to Member States in the preparation of their reports.

The existence of the national geoportal, seen independently from the INSPIRE initiative, has brought great benefits to Luxemburg's public sector bodies, private firms and the citizen in general. Geodata and related information is made available in many forms and contribute to many interesting common projects. At national governmental level, the following examples illustrate this new way to collaborate:

- The national water geoportal <http://eau.geoportal.lu> turns on the geoportal platform and is technically managed by ACT's geoportal department. It shows national water data coming from AGE as well as background geodata from ACT and some other layers delivered by other ministries. Recently, the system has been modified to show live data from the production water database at AGE rather than synchronised and less actual data cached by ACT. A common effort is currently dedicated to improve the contents of the layer metadata.
- On demand and in permanent collaboration with the tourism ministry, <http://tourisme.geoportail.lu> has been built, a mapping portal displaying all the officially acknowledged hiking, bicycle and mountain bike trails. These geodata sets are created, updated and managed within the geoportal database, via dedicated new functions that allow geoportal users to create their own geodata content in the system. Again, the existing infrastructure could be re-used and the only expenses apart from minor implementation and configuration costs were the investments for the development of the new functionalities. On the side of the data itself, the benefits are enormous, as no reliable data about the trails existed before, and also because of the avalanche effect of new data being published as a reaction to other data that is made available.
- At the ministry of housing, two important projects have been started, in relation with geodata and online mapping. The first project concerns a map based online system that indicates possible pre-emption rights on parcels, based on an analysis of different geodata sets coming from communal and state administrations. The second project is about map-based analysis of the sustainability of residential buildings. In this system many new geodata sets have to be integrated in order to allow the required analysis to be made. Different public and private contributors are involved to gather and prepare the required information.
- A new common project has been started to build a POI management application, to be used by many public bodies dealing with this type of data.
- The different series of webservices ws.geoportail.lu, wsetat.geoportail.lu, wssec.geoportail.lu and wsinspire.geoportail.lu are widely-used as well as the technical know-how of other actors than ACT to propose their own data via webservices has grown.
- The new environmental geoportal is actually receiving its last refinements and has gone online in April 2013. Many interesting datasets managed by ANF, MDDI and AEV are visible in this portal.
- The geoportal's mapping API is actually been promoted and documented. Many applications or public websites have switched their integrated maps to this API (nearly 20 state websites managed by CTIE, tourism website <http://visitluxembourg.lu>, traffic website <http://cita.lu> ...).

A very encouraging recent development is the rising interest of local municipality governments in access to webservices (essentially for cadastral data), but also in a more intense collaboration to create dedicated map portals with communal data. 3 such portals already exist, and 2 major municipalities have started their relative projects in this sense.

Nearly 50% of the municipalities have their GIS connected to at least one of the geoportal's webservices.

Private firms start discovering the free INSPIRE webservices, among whose the orthophotos are the most popular. But also the first implementations of the API have been planned.

The general public shows unexpected high interest in the geoportal, above all for the mapping portals. On "normal" working days, about 6.000 distinct users work in the different mapping portals or API-powered applications and websites. On week-end days, about 3.000 single users are generally counted. On special days, these figures can rise up to 25.000 single users. Nearly 17.000 maps are printed monthly with the mapping portals' printing function. Seen in relation with the 500.000 inhabitants of the country, this obvious popularity of the geoportal is rather stunning and prove the benefits for the citizen.

However, where is the benefit of the national activities in regard of INSPIRE ?

INSPIRE has obliged the national governments to take action in the geodata domain and these obligations have helped the national geoportal to thrive and to add the European and international dimension to the original scope, which was limited to the national needs. Due to INSPIRE, a national law had to be adopted regarding geodata, and their exchange and availability. This law has inaugurated and officialised a permanent collaboration between the public instances working in the domain of metadata. ACT has been granted new responsibilities in regard to the tasks as national INSPIRE node, and the related budget has allowed to install a new and dedicated department with highly qualified specialists who deal not only with the needs formulated by INSPIRE but also help in the construction process of the national SDI. The INSPIRE-webservices are used to a sufficient extent (see above) to be reassured of the necessity of having them actualized and maintained. The available geodata is thus re-used and in general their availability is a welcome help in private and public projects.

INSPIRE and the geoportal have been integrated on the list of important factors in the national administrative simplification program.

10 Conclusions

Since its very beginnings, Luxembourg's Spatial Data Infrastructure has helped resolving many problems in the field of geodata. In the coordination committee CC-ILDG, stakeholders' representatives regularly meet, discuss, decide and collaborate actively on the level of common projects or in thematic working groups. The different technical ways to manage and exchange geodata are used more and more. New geodata sets are regularly "discovered", announced, adapted and made available, leading to interesting projects involving data from different origins.

The obligations derived from the INSPIRE directive put a supplementary strain on the agenda: not only the internal national needs in terms of geodata creation, availability and accessibility had to be met but also the needs of the European Commission.

Concerning the legislation, Luxembourg has issued a law in 2010, transposing the INSPIRE directive : "Loi du 26 juillet 2010 portant transposition de la directive 2007/2/CE du Parlement européen et du Conseil du 14 mars 2007 établissant une infrastructure d'information géographique dans la Communauté européenne (INSPIRE) en droit national"

On the technical side, Luxembourg is quite well positioned and is willing to continue doing its best to meet the requirements issued in the directive. The small size of the country has to be considered as a disadvantage though, as the smallest country has to fulfil the same needs as the larger countries, even if technical, human and financial resources are less important. Of course, especially regarding the content itself, Luxembourg has an easier situation than the big countries, as there are only quite a small number of involved bodies, and the political structure of the country and its public bodies is quite simple. What's more, the state bodies working in the field of geodata have a long tradition of cooperation, and the new means provided by LSDI can build on the preliminary experiences.

11 Annexes

11.1 List of organisations – names and contact details

Organisations	Contact for INSPIRE questions	Address
Administration du Cadastre et de la Topographie (National Cadastre and Topography administration)	M. Francis Kaell Francis.kaell@act.etat.lu	54, avenue Gaston Diderich L-1420 Luxembourg (+352) 44901-1
Centre des Technologies de l'Information de l'Etat (National State Information Technology administration)	M. Pierre Schilling (vice director) Pierre.schilling@ctie.etat.lu	1, rue Mercier B.P. 1111 L - 2144 - Luxembourg Luxembourg Tél. : (+352) 49925-1 Fax : (+352) 48 23
Administration des Ponts et Chaussées (Road administration)	M. Tom Schuller Tom.schuller@pch.etat.lu	38, bvd de la Foire B.P. 243 L-2012 Luxembourg Luxembourg Tél: +352 45 05 91 Fax: +352 45 32 98 E-mail: info@pch.public.lu
Administration de la Gestion de l'Eau (Water management administration)	M. Stéphane Levy Stephane.levy@eau.etat..lu	51-53 rue de Merl L-2146 Luxembourg Luxembourg Tél.: (+352) 260286-1 Fax: (+352) 260286-63 E-mail: info@eau.public.lu
Administration des services techniques de l'agriculture (Agricultural technical services administration) - ASTA	Mrs Anne Peschon Anne.peschon@asta.etat.lu	16, route d'Esch B.P. 1904 L-1019 Luxemburg
Administration de l'environnement (Environment administration) - AEV	Mrs Sophie Capus Sophie.Capus@aev.etat.lu	Administration de l'Environnement 16, rue Eugène Ruppert L - 2453 Luxembourg
Service central de la statistique et des études économiques STATEC (Statistics administration)	M. Paul Zahlen Paul.Zahlen@statec.etat.lu	STATEC B.P. 304 L-2013 Luxembourg Fax: (+352) 46 42 89

Ministère du développement durable et des infrastructures (Ministry of sustainable development)	M. Patrick Grivet Patrick.Grivet@mev.etat.lu	4, boulevard F. D. Roosevelt L-2450 Luxembourg Adresse postale: L-2940 Luxembourg Tél : (+352) 2478-2478 Fax : (+352) 46 27 09
Service géologique du Luxembourg AGL (Geological service) - SGL	M. Roby Colbach robert.colbach@pch.etat.lu	Administration des ponts et chaussées 38, bvd de la Foire B.P. 243 L-2012 Luxembourg Luxembourg Tél: +352 45 05 91 Fax: +352 45 32 98
Inspection générale de la sécurité sociale (Social security inspection) - IGSS	M. Raymond Wagener Raymond.Wagener@igss.etat.lu	Ministère de la Sécurité sociale 26, rue Sainte Zithe L-2763 Luxembourg Tél. : (+352) 247-86311 Fax : (+352) 247-86328 E-mail : mss@mss.etat.lu
Musée National d'Histoire Naturelle	Mrs Tania Walisch twalisch@mnhn.lu	25, rue Münster L-2160 Luxembourg
Musée National d'Histoire et d'Art	M. André Schoellen Andre.Schoellen@mnha.etat.lu	Marché-aux-Poissons L- 2345 Luxembourg

11.2 List of references for the compilation of the report

- LSDI concept study document 2008