D2.2   INVENTORY OF R&D PROJECTS

ENERGIC OD
European NEtwork for Redistributing Geospatial Information to user Communities - Open Data

Project title	European NEtwork for Redistributing Geospatial Information to user Communities - Open Data
Call identifier	CIP-ICT-PSP-2013-7
Project acronym	ENERGIC-OD
Starting date	01.10.2014
End date	30.09.2017
Funding scheme	Competitiveness and Innovation Framework Programme (CIP) - ICT Policy Support Programme - Pilot B
Contract no.	620400
Deliverable no.	2.2
Deliverable name	Inventory of R&D projects
Work Package	WP2. State of the art in R&D, projects & technologies
Nature[1]	R
Dissemination[2]	PU
Editor	Miguel Latre (UNIZAR)
Authors	Miguel Latre (UNIZAR), F.J Lopez-Pellicer (UNIZAR), Covadonga Fernández (UNIZAR)
Contributors	Maria Liberti (CNR-IIA), Michael Müller (AED-SICAD), Ralph Pfannkuche (AED-SICAD), Yves Riallant (AFIGEO), Frederique Mojon-Lumier (BRGM), Gregory Delobelle (BRGM), Olivier Frézot (BRGM), Stefania de Zorzi (NOW), Roger Longhorn (NOW), Gwenaël Guillaume (CNRS), Thomas Portier (DEPTH), Julia Ernst (GEOKOMM e.V), Michael Bauer (GEOKOMM e.V), Marek Baranowski (IGiK), Annett Frick (LUP), Stefan Braumann (LUP), Mattia Previtali (POLIMI), Raffaella Brumana (POLIMI), Branka Cuca (POLIMI), Luigi Barazzetti (POLIMI), Frank Iden (SRP), Tino Desjardins (SRP), Silvano de Zorzi (VEN), Eugenio Ferrer (ALKANTE), Olivier Bedel (ALKANTE)
Date	19-Dec-2014

---

[1] R = Report, P = Prototype, D = Demonstrator, O = Other

[2] PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services).

ENERGIC OD Consortium

National Research Council of Italy (CNR-IIA)
Italy

AED-SICAD Aktiengesellschaft (AED-SICAD)
Germany

Association Française pour l'Information
Géographique (AFIGEO)
France

Bureau De Recherches Geologiques et Minieres
(BRGM)
France

Global Infotech (NOW)
Italy

Centre National de la Recherche Scientifique (CNRS)
France

Depth France Sas (DEPTH)
France

Verband der GeoInformationswirtschaft
Berlin/Brandenburg (Geokomm)
Germany

Instytut Geodezji i Kartografii (IGIK)
Poland

Luftbild Umwelt Planung GmbH (LUP)
Germany

Politecnico di Milano (POLIMI)
Italy

Gesellschaft für Stadt-und Regionalplanung mbH
(SRP)
Germany

Regione del Veneto (VEN)
Italy

Universidad de Zaragoza (UNIZAR)
Spain

Alkante Sas – Geonet (ALKANTE)
France

Revision history

Version	Date	Modified by	Comments
0.1	12-12-2014	Miguel Latre, F.J Lopez-Pellicer, Covadonga Fernández	First version of the R&D projects inventory
0.2	20-12-2014	Miguel Latre, F.J Lopez-Pellicer, Covadonga Fernández, Michael Müller, Ralph Pfannkuche, Yves Riallant, Frederique Mojon-Lumier, Gregory Delobelle, Stefania de Zorzi, Roger Longhorn, Gwenaël Guillaume, Thomas Portier, Julia Ernst, Michael Bauer, Marek Baranowski, Annett Frickl, Stefan Braumann, Mattia Previtali, Raffaella Brumana, Branka Cuca, Luigi Barazzetti, Frank Iden, Tino Desjardins, Silvano de Zorzi, Eugenio Ferrer, Olivier Bedel	Second version of the R&D projects inventory, with relevance assessment by partners. First version of this companion report.
0.3	26-12-2014	Miguel Latre, Maria Liberti, Mattia Previtali, Raffaella Brumana, Branka Cuca, Luigi Barazzetti	Minor corrections to the report, assessment of relevance to the inventory

ABBREVIATIONS AND ACRONYMS

Term	Explanation
CIP	Competitiveness and Innovation Framework Programme
CORDIS	Community Research and Development Information Service
CSV	Comma-Separated Values Format
EC	European Commission
ENERGIC OD	European NEtwork for Redistributing Geospatial Information to user Communities - Open Data
FP7	Seventh Framework Programme
FP-ICT	FP7 Information and Communication Technologies Programme
GEOSS	Global Earth Observation System of Systems
GI	Geographic Information
GMES	Global Monitoring for Environment and Security, currently known as Copernicus
GNSS	Global Navigation Satellite System
ICT	FP7 Information and Communication Technologies Programme
INSPIRE	Infrastructure for Spatial Information in the European Community
ISO	International Organization for Standardization
OD	Open Data
OGC	Open Geospatial Consortium
R&D	Research and development
SDI	Spatial Data Infrastructure
SoS	System of Systems
SWOT	Strengths, Weaknesses, Opportunities and Threats Analysis
URL	Uniform Resource Locator

WCS	OGC Web Coverage Service Interface Standard
WFS	OGC Web Feature Service Interface Standard
WMS	OGC Web Map Service Interface Standard
WP	Work Package
WP2	Work Package 2. State of the art in R&D, projects & technologies
WP3	Work Package 3. Open Data Survey
WPS	OGC Web Processing Service Interface Standard

TABLE OF CONTENTS

INDEX OF TABLES

1. EXECUTIVE SUMMARY

There currently exist many open data and geographic information related initiatives that have produced various results and new technologies. An inventory of these results is essential for the efficient implementation of the ENERGIC OD project. The main objective of WP2 is to provide a state-of-the-art study in R&D in the domains tackled by the rest of work packages, emphasizing the technological aspects. In order to do so, an inventory of R&D projects (in particular European projects in progress or already completed) in the domains relevant to ENERGIC OD is going to be performed, and their strengths, lacks and convergences will be evaluated.

The inventory of R&D projects is the result of the "Review of relevant sources" step of the methodology defined in D2.1 (Report on scope and methodology of the state-of-the-art study). This inventory includes European Commission funded projects from the Seventh Framework Program, as well as inputs from partners regarding national or local SDIs and national or local INSPIRE and open data initiatives or platforms. A selection of the FP7 projects of this inventory will be used in D2.3 (R&D State-of-the-art report), while the projects, together with the other initiatives and platforms will be passed as input to WP3.

This companion report complements the inventory by describing its structure and contents. It also explains how the methodology defined in D2.1 was applied, the different data sources used and the validation mechanisms used, estimating precision and recall based on control lists.

2. INTRODUCTION

The world of geographic information (GI) is, at present, extremely heterogeneous. User and system requirements, too varied to be satisfied by a single system or technology, have led to an utter lack of agreement on interoperability standards, creating a barrier to realizing the full exploitation potential of GI. ENERGIC OD addresses these problems by adopting a broker architectural approach, designed, developed and implemented in recent research activities.

There currently exist many open data and geographic information related initiatives that have produced various results and new technologies. An inventory of these results is essential for the efficient implementation of the ENERGIC OD project. The main objective of WP2 is to provide a state-of-the-art study in R&D in the domains tackled by the rest of work packages, emphasizing the technological aspects. In order to do so, an inventory of R&D projects (in particular European projects in progress or already completed) in the domains relevant to ENERGIC OD is going to be performed, and their strengths, lacks and convergences will be evaluated.

The inventory of R&D projects is the result of the "Review of relevant sources" step of the methodology defined in D2.1 (Report on scope and methodology of the state-of-the-art study). This inventory includes European Commission funded projects from the Seventh Framework Program, as well as input from partners regarding national or local SDIs and national or local INSPIRE and open data initiatives or platforms. The point of this inventory is not in the exhaustiveness of the project inventory, but in its

capacity to identify successful technologies applied to the domains in the scope of ENERGIC OD. A selection of the FP7 projects of this inventory will be used in D2.3 (R&D State-of-the-art report), while the projects, together with the other initiatives and platforms will be passed as input to WP3.

This companion report complements the inventory by describing its structure and contents, and by explaining how the methodology defined in D2.1 was applied to compile the inventory, and how it was validated.

3. STRUCTURE OF THE INVENTORY

The information on the projects, platforms and initiatives has been arranged when possible, according to the Dublin Core standard [DC]:

Title	Title of the project, initiative or platform. MANDATORY
Creator	Name of the main responsible organisation of the project, initiative or platform, if applicable.
Subject	Keywords describing the project, initiative or platform. If possible, they should belong to the set of domains in the scope of ENERGIC-OD.
Description	Brief, textual description of the project, initiative or platform, as provided by their responsible part.
Publisher	If applicable
Contributor	Names of other parties involved in the project, initiative or platform, if applicable and practical.
Date	Start date and, if applicable, end date of the project, initiative or platform.
Type	One of *project*, *initiative* or *platform*. One of *European*, *national*, *local*.
Format	Not likely applicable
Identifier	Main URL or access point of the project, initiative or platform. MANDATORY
Source	Not likely applicable
Language	Language or languages of the project, initiative or platform.
Relation	Not likely applicable
Coverage	Geographical area covered by the project, initiative or platform.
Rights	Any restriction regarding the inclusion of information regarding the project, initiative or platform or its technologies used in the state-of-the-art report.

Two more columns have been added to the inventory regarding the project score and relevance to ENERGIC OD:

Score	Number of ENERGIC OD domains mentioned in the objectives of the European Project.
Relevance	Assessment of relevance to ENERGIC OD made by the partners based on the project results and their knowledge of the project. The first column assesses relevance (very relevant, relevant, might be relevant) by number of partners. The second column assesses non-relevance by number of partners.

4. CONTENTS OF THE INVENTORY

The inventory contains 581 projects, platforms and initiatives. Of them, 444 are EC funded projects. These are presented ordered by descending score, with the projects assessed as relevant by the partners first. The breakdown of the projects regarding score and assessed relevance by the ENERGIC OD partners is presented in Table 1.

Table 1. Projects by score and relevance

Score	Number of projects	Number of relevant projects	%
11	3	3	100%
10	1	1	100%
9	5	4	80%
8	8	7	88%
7	9	8	89%
6	12	10	83%
5	23	12	52%
4	43	25	58%
3	70	5	7%
2	134	10	7%
1	138	9	7%

For D2.3, a selection of projects for a SWOT analysis will be made, including all the projects of assessed relevance, together with those reaching a minimum score, being this minimum score to be defined.

5. DEVELOPMENT OF THE INVENTORY

European Commission funded projects have been searched initially through the CORDIS platform. In particular, data from the European Union Open Data published by CORDIS[3] was used. The file "FP7 Projects extract", in CSV format, updated on 12 Nov 2014, contains the following information of 25,543 projects: record number, project reference number, acronym, title, objective, start and end dates, total cost, EC contribution, programme, subprogrammes, call, brief and story.

For each project, the objective was searched for keywords related to the domains of ENERGIC OD, according to the keyword expansion presented in Table 2 and the relevance of the project was manually assessed in case of coincidence. Data was arranged in matrix form and, finally an estimate to the relevance to ENERGIC OD based on how many domains are mentioned in their objective was calculated. Projects with 0 score were removed.

Table 2. Keywords used for search projects related to ENERGIC OD domains.

Domain	Keywords to search for	Remarks
User groups & needs	'user groups', 'user communities', 'user needs', 'use cases'	
Virtual Hubs & Brokered Architectures	'virtual hub', 'broker', 'brokered architectures'	
Geospatial Information	'geospatial', 'geographic information'	
Open Data	'open data'	
GI applications & services	'application', 'service'	*
Technical requirements and specifications	'requirement', 'specification'	*
Redistribution, access and reuse of GI	'redistribution', 'access', 'reuse',	*
Data interoperability, harmonization & integration	'interoperability', 'harmonization', 'integration'	*
INSPIRE	'INSPIRE'	
Standardisation	'standard', 'standardization', 'ISO'	*
System of systems	'system of systems', 'SoS'	
Licences, constraints, legal affaires	'licences', 'legal constraints', 'rights'	*
Metadata	'metadata', 'catalogue', 'metainformation'	
GMES/Copernicus	'GMES', 'Copernicus'	
Economics and business models	'business model', 'financial sustainability'	*
Volunteered GI & crowdsourcing	'VGI', 'volunteered', 'crowdsourcing'	*
GNSS	'GNSS'	

---

[3] https://open-data.europa.eu/en/data/dataset/cordisfp7projects

Domain	Keywords to search for	Remarks
GEOSS	'GEOSS'	
Semantic data, ontologies	'semantic data', 'ontology', 'thesaurus'	*
Spatial Data Infrastructure	'spatial data infrastructure', 'spatial infrastructure', 'SDI'	
OGC services	'OGC', 'WMS', 'WFS', 'WCS', 'WPS'	
Galileo	'Galileo'	
Governance	'Governance'	*
Data models	'data model', 'data models', 'model'	
Policy making	'policy making', 'decision'	*
Geoportal	'geoportal'	
georeferencing	'georeferencing', 'georeference'	
Real time GI	'real time'	*
in-situ data	'in situ'	*

* Only in projects already marked as related to GI or OD

5.1 Validation

In order to assess the recall of the search, the results were compared with the list of EC projects from the INSPIRE forum[4] (that list a subset of INSPIRE related projects have already been funded by EC Programmes and national programmes) and the input relating European Projects provided by one of the partners (Politecnico di Milano, POLIMI). Only 25 FP7 projects out of 74 listed in the INSPIRE forum were retrieved, and only 4 FP7 projects out of 12 listed by POLIMI were retrieved.

These results pointed out the need for inclusion for other data sources regarding EC funded projects, since the initial list of FP7 projects did not include some calls. The new data sources were the datasets CIP[5] and FP-ICT[6] from the European Union Open Data Portal. They are authored by the European Commission - DG CNECT and cover a period running from 2008 until end of 2013. They contain 233 CIP projects and 2393 FP-ICT projects. They structure differs from the one regarding the FP7 projects: project number, acronym, call description, instrument, year of first signature, duration and strategic objective code and description.

---

[4] http://inspire-forum.jrc.ec.europa.eu/pg/pages/view/1668/funded-projects
[5] https://open-data.europa.eu/es/data/dataset/ict-research-projects-under-eu-fp7/resource/bbb03a58-a80b-4862-bd0a-c484be9ad2a8
[6] https://open-data.europa.eu/es/data/dataset/ict-research-projects-under-eu-fp7/resource/b3d8879f-4ad4-4173-82c0-56d6fbf0f896

Since the objectives are not present with these datasets, only those projects falling in strategic objectives related to ENERGIC OD were searched in CORDIS in order to retrieve their description. In the case of CIP projects, these strategic objectives were *"Digital Libraries : European Digital Library aggregating digital content in Europeana"*, *"Public Sector information: Legal aspects of Public Sector Information"*, *"Public Sector information : Geographic Information"*, *"Towards a cloud of public services"*, *"Open Data and open access to scientific information"* and *"Supporting sustainable growth"*. In the case of FP-ICT projects, they were *"ICT for environmental services and climate change adaptation"*, *"ICT for Environmental Management and Energy Efficiency"* and *"e-Science environment"*.

After considering these new datasets, the recall of the results increased, as showed in Table 3. The projects still not found belong to the Sixth Framework Programme.

Table 3. Total and found number of projects, including call type.

	Total	Found	FP7	CIP	FP-ICT
POLIMI list	12	8	4	3	1
INSPIRE list	74	47	25	11	11

Regarding the precision of the results, searching through the projects objectives does not assure the relevance of the project with ENERGIC OD, since the objectives do not involve actual project results. Taking this into account, the list with calculated scores has been used as the basis for a manual revision of the most scored projects according to the partners' prior knowledge of them and taking into account the framework keywords presented in D2.1. (Report on scope and methodology of the state-of-the-art study) and taking mainly into account the actual results of the projects.

Additionally, partners were invited to suggest other projects relevant to ENERGIC OD that might not been present in the top list with calculated scores due to a low score or that did not belong to the initially selected FP7 temporal extent.

5.2   Other projects, initiatives and platforms

ENERGIC OD partners have also knowledge regarding the domains in the scope of ENERGIC OD in their respective countries, so they will provide also information national and local SDIs, INSPIRE related initiatives, open data initiatives, etc. Increasing the range of partners' contributions from projects to include platforms and initiatives will make the inventory more useful to WP3. These contributions have been integrated into the R&D projects inventory, with an empty value as score.

6. REFERENCES

	References
D2.1	ENERGIC OD Consortium, 2014. *Report on scope and methodology of the state-of-the-art study.*
DC	Dublin Core Metadata Initiative, 1995-2014. *DCMI Metadata Terms.* http://dublincore.org/