



Design Study



# European Grid Initiative Design Study (EGI\_DS)

## THE EGI KNOWLEDGE BASE – THIRD SNAPSHOT

WORK PACKAGE 3  
EGI FUNCTIONS DEFINITION

**EU DELIVERABLE: D3.5**

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**Abstract:** This document describes the evolution of the *EGI Knowledge Base*, as of month 27 of the EGI\_DS project. The knowledge base is intended to provide updated information on the state of European distributed computing infrastructure to inform National Grid Initiatives of each other and the European infrastructure. The site itself – at <http://knowledge.eu-egi.eu> – is the WP3 deliverable D3.5.



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For more information on EGI\_DS, its partners and contributors please see [www.eu-egi.eu](http://www.eu-egi.eu)

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	Name	Partner/Activity	Date	Signature
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<b>Reviewed by</b>				
<b>Approved by</b>				

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## 1. INTRODUCTION

### 1.1. PURPOSE

This document describes the website known as the *EGI Knowledge Base*, as of month 27 of the EGI\_DS project. The knowledge base is intended to provide updated information on the state of European distributed computing infrastructure to inform National Grid Initiatives of each other and the European infrastructure. The site itself – at <http://knowledge.eu-egi.eu> – is the WP3 deliverable D3.5; hence this is a software deliverable, not a document deliverable.

What follows is thus a brief description of the status of this site up to December of 2009, plus some considerations on the content of the original Use Cases prepared by WP2.

### 1.2. DOCUMENT ORGANISATION

Section 2 provides a high level summary of this document. Section 3 presents a final overview of the EGI Knowledge Base (EGI KB), including some general statistics and notes on how the content of the KB has been used by EGI-related project proposals. Section 4 gives an assessment of the Use Cases in the KB to see how representative they are of scientific research across the ERA, concerning in particular needs related to distributed computing infrastructures.

### 1.3. TARGET AUDIENCE

This document is a public deliverable intended to inform all the EGI related stakeholders, as well as readers not directly related with EGI (e.g. from other geographical areas) and the general public.

### 1.4. REFERENCES

**Table 1: Table of references**

- R 1 The EGI Knowledge Base: <http://knowledge.eu-egi.eu>
- R 2 EGI\_DS D3.1 First EGI Functions Definition <http://www.eu-egi.eu/functions.pdf>
- R 3 EGI\_DS D3.2 Final EGI Functions Definition <http://web.eu-egi.eu/fileadmin/public/Deliverables/d3.2-postrev-v3.2.pdf>
- R 4 EGI Knowledge Base Use Cases – Main page [http://knowledge.eu-egi.eu/knowledge/index.php/Use\\_Cases:Main](http://knowledge.eu-egi.eu/knowledge/index.php/Use_Cases:Main)
- R 5 EGI Knowledge Base Use Cases – Derived clustered information [http://knowledge.eu-egi.eu/knowledge/index.php/Derived\\_clustered\\_information](http://knowledge.eu-egi.eu/knowledge/index.php/Derived_clustered_information)

### 1.5. DOCUMENT AMENDMENT PROCEDURE

Amendments, comments and suggestions should be sent to the authors.

## 1.6. TERMINOLOGY

This subsection provides the definitions of terms, acronyms, and abbreviations used in this document.

### Glossary

AM	Associate Member of the EGI Council
API	Application Programming Interface
ARC	Advanced Resource Connector
CA	Certification Authority
CAO	Chief Administrative Officer
CERN	European Organization for Nuclear Research
COO	Chief Operational Officer
CPU	Central Processing Unit
CTO	Chief Technical Officer
DEISA	Distributed European Infrastructure for Supercomputing Applications
EC	European Commission
EDG	European Data Grid
EGEE	Enabling Grids for E-science
EGI	European Grid Initiative
EGI_DS	European Grid Initiative Design Study
eIRG	e-Infrastructure Reflection Group
ENOC	EGEE Network Operation Centre
ERA	European Research Area
ERI	European Research Infrastructure
EU	European Union
EUGridPMA	European Policy Management Authority for Grid Authentication
FTE	Full Time Equivalent
GGUS	Global Grid User Support
LHC	Large Hadron Collider
MC	Middleware Consortia
MCB	Middleware Coordination Board
MoU	Memorandum of Understanding
NGI	National Grid Initiative
NREN	National Research and Education Network
OGF	Open Grid Forum
OMII	Open Middleware Infrastructure Institute for Europe
PB	Policy Board
QA	Quality Assurance



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ROC	Regional Operating Centre
SDC	Strategic Discipline Cluster
SLA	Service Level Agreement
SSC	Specialised Support Centres
UCO	User Coordination Officer
UCS	User Community Services
UFSC	User Forum Steering Committee
UMD	Uniform Middleware Distribution
UNICORE	Uniform Interface to Computing Resources
US	United States of America
VDT	Virtual Data Toolkit
VO	Virtual Organisation
WLCG	Worldwide LHC computing Grid Project
WP	Work package

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## 2. EXECUTIVE SUMMARY

The purpose of the EGI Knowledge Base (KB) is to provide a single location where the EGI / NGI environment can be described, while at the same time giving a direct voice to all the main stakeholders in an efficient, dynamic and non-centralised manner. The MediaWiki tool was used to create this site, as it provides a proven, powerful and easy tool for this purpose.

Overall, the EGI KB has been useful for the purposes of the EGI\_DS project in publishing information about the European NGIs, various European grid-related projects, and especially the ongoing work in the project of planning and setting up the European Grid infrastructure.

The efforts made by the EGI\_DS project, together with collaborations with projects such as EGEE III, increasing interactions with ESFRI projects, and an alliance between middleware consortia, have laid the ground for the establishment of a truly connected pan-European Distributed Computing Infrastructure.

The ongoing usefulness of the EGI KB is also reflected in the availability of a comprehensive set of Use Cases [R 4, R 5]. These have proven very useful in representing the needs of the European scientific community in regards to computational infrastructures, and have been used as a guide in several EGI-related project proposals, as well as the “core” EGI InSPIRE proposal, as shown in the analysis of section 4.

The contents of the EGI KB, appropriately restructured to reflect the more stable reality of the EGI ecosystem, are an important basis on which to build a central EGI informational tool, which should be inherited by the EGI-InSPIRE project.

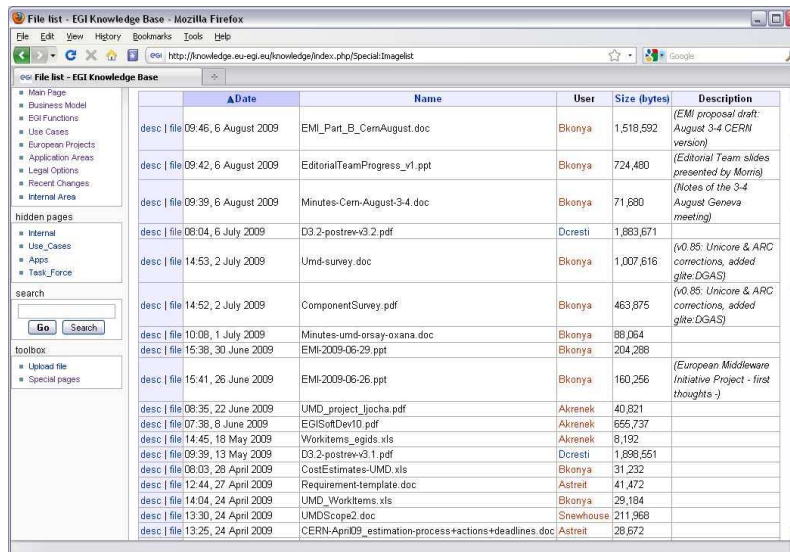
## 3. END-OF-PROJECT OVERVIEW OF THE EGI KNOWLEDGE BASE

In these final months of the project, the EGI KB has not seen much in the way of updates. On the other hand, the content already present has proven useful as reference for various project proposals, as already mentioned in EGI\_DS deliverable D3.3 and further described in subsection 3.2 of this document. The latest evolution of the KB essentially reflects the types of activity undertaken during this period, as priority is obviously given to the organisation of project proposals and the efforts made by the NGIs to establish themselves as supporting members of EGI.

### 3.1. GENERAL STATISTICS

Much of the data in this section can be obtained (dynamically) by going to <http://knowledge.eu-egi.eu/knowledge/index.php/Special:Statistics>. As of December 2009, there were **2,258** total pages in the database. This number includes “talk” pages, minimal “stub” pages, redirects, and others that probably (according to the Wiki stats) don't qualify as content pages. Excluding those, there are **113** pages that Wiki considers to be “probably legitimate content pages”. However, considering that there were only a handful of “talk” pages created in the EGI KB, and that some “stub” pages (pages with little content) may be more significant than the average Wiki “stub” (e.g. some very short NGI pages may have been counted as “stubs”), there may be more than 113 contentful pages.

**176** files have been uploaded. The most recent ones concern the work of the Middleware consortia in planning their future activities and projects (as described in 3.2), and the progressively modified versions of the EGI Functions deliverable D3.2:



Date	Name	User	Size (bytes)	Description
09:46, 6 August 2009	EMI_Part_B_CernAugust.doc	Bkonya	1,518,592	(EMI proposal draft August 3-4 CERN version)
09:42, 6 August 2009	EditorialTeamProgress_v1.ppt	Bkonya	724,460	(Editorial Team slides presented by Morris)
09:39, 6 August 2009	Minutes-Cern-August-3-4.doc	Bkonya	71,680	(Notes of the 3-4 August Geneva meeting)
08:04, 6 July 2009	D3.2-postrev-v3.2.pdf	Dcresti	1,883,671	
14:53, 2 July 2009	Umd-survey.doc	Bkonya	1,007,616	(v0.85: Unicon & ARC corrections, added glite-DGAS)
14:52, 2 July 2009	ComponentSurvey.pdf	Bkonya	463,876	(v0.85: Unicon & ARC corrections, added glite-DGAS)
10:08, 1 July 2009	Minutes-umd-orsay-oxana.doc	Bkonya	88,064	
15:38, 30 June 2009	EMI-2009-06-29.ppt	Bkonya	204,268	
15:41, 26 June 2009	EMI-2009-06-26.ppt	Bkonya	160,256	(European Middleware Initiative Project - first thoughts -)
08:35, 22 June 2009	UMD_project_ljocha.pdf	Akrenek	40,821	
07:38, 8 June 2009	EGISoftDev10.pdf	Akrenek	655,737	
14:45, 18 May 2009	Workitems_egids.xls	Akrenek	8,192	
09:39, 13 May 2009	D3.2-postrev-v3.1.pdf	Dcresti	1,898,551	
08:03, 29 April 2009	CostEstimates-UMD.xls	Bkonya	31,232	
12:44, 27 April 2009	Requirement-template.doc	Astreit	41,472	
14:04, 24 April 2009	UMD_Workitems.xls	Bkonya	29,184	
13:30, 24 April 2009	UMDScope2.doc	Snewhouse	211,968	
13:25, 24 April 2009	CERN-April09_estimation-process+actions+deadlines.doc	Astreit	28,672	

At least one of the numbers quoted at this page seems incorrect, namely the number of registered users, which was given at 78. This number conflicts with the number of registered users one can count by going to the “User list” pages (<http://knowledge.eu-egi.eu/knowledge/index.php/Special:Listusers>) and counting all registered users; this latter count reveals roughly 178 users – a number virtually unchanged since the last EGI KB snapshot, D3.3.

The most viewed pages are:

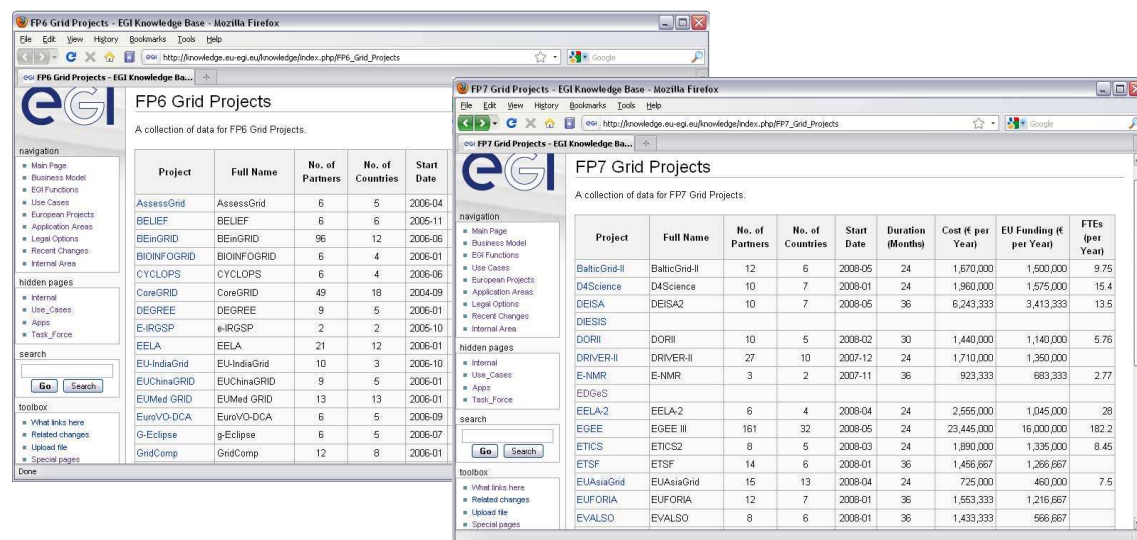
1. [Main Page](#) [with 19,990 hits since the KB was setup]
2. [European Projects](#) [5,059]
3. [EGI Functions](#) [4,052]
4. [UMD](#) [3,712]
5. [Use Cases:Main](#) [3,583]
6. [Application Areas](#) [2,953]
7. [Business Model](#) [2,240]
8. [Italy](#) [2,143]
9. [Use Cases:Main Page](#) [2,100]
10. [EGEE](#) [2,057]

The first three pages listed probably reflect visits to these pages by the general public; starting with entry 4 (UMD), it becomes apparent that the page visits probably represent the work of relevant editors and accesses by collaborating partners. The UMD page itself is not in the main menu, hence it would seem to have been accessed by people who were independently aware of its existence. The

apparently similar entries 5 and 9 refer to two distinct pages, as entry 9 is actually the main page of the Internal Use Cases area. Finally, the presence of the Italy page is probably due to the work of the Italian content manager, which is also one of the main KB editors.

Overall, this is consistent with a predominance of editing activities over “passive” visits throughout the lifetime of the KB. If this tool is adopted by the EGI environment as an informational site, one would expect to see some of the more public pages listed as the most viewed.

The KB includes articles on **49** grid-related FP6 and FP7 projects, (22 from FP6 and 27 from FP7), plus some articles or “stubs” on important national or regional projects (e.g. D-Grid, NDGF, OMII-UK). There are also a few overview pages on these projects:



The screenshot shows two browser windows from Mozilla Firefox displaying data from the EGI Knowledge Base. The left window shows the 'FP6 Grid Projects' page with a table listing 12 projects. The right window shows the 'FP7 Grid Projects' page with a table listing 15 projects. Both tables include columns for Project, Full Name, No. of Partners, No. of Countries, Start Date, Duration (Months), Cost (€ per Year), EU Funding (€ per Year), and FTEs (per Year).

Project	Full Name	No. of Partners	No. of Countries	Start Date
AssessGrid	AssessGrid	6	5	2006-04
BELIEF	BELIEF	6	6	2005-11
BEInGRID	BEInGRID	96	12	2006-06
BIOINFGRID	BIOINFGRID	6	4	2006-01
CYCLOPS	CYCLOPS	6	4	2006-06
CoreGRID	CoreGRID	49	18	2004-09
DEGREE	DEGREE	9	5	2006-01
e-IRGSP	e-IRGSP	2	2	2005-10
EELA	EELA	21	12	2006-01
EU-IndiaGrid	EU-IndiaGrid	10	3	2006-10
EUChinaGRID	EUChinaGRID	9	5	2006-01
EU-Med GRID	EU-Med GRID	13	13	2006-01
EuroVO-DCA	EuroVO-DCA	6	5	2006-09
G-Eclipse	g-Eclipse	6	5	2006-07
GridComp	GridComp	12	8	2006-01

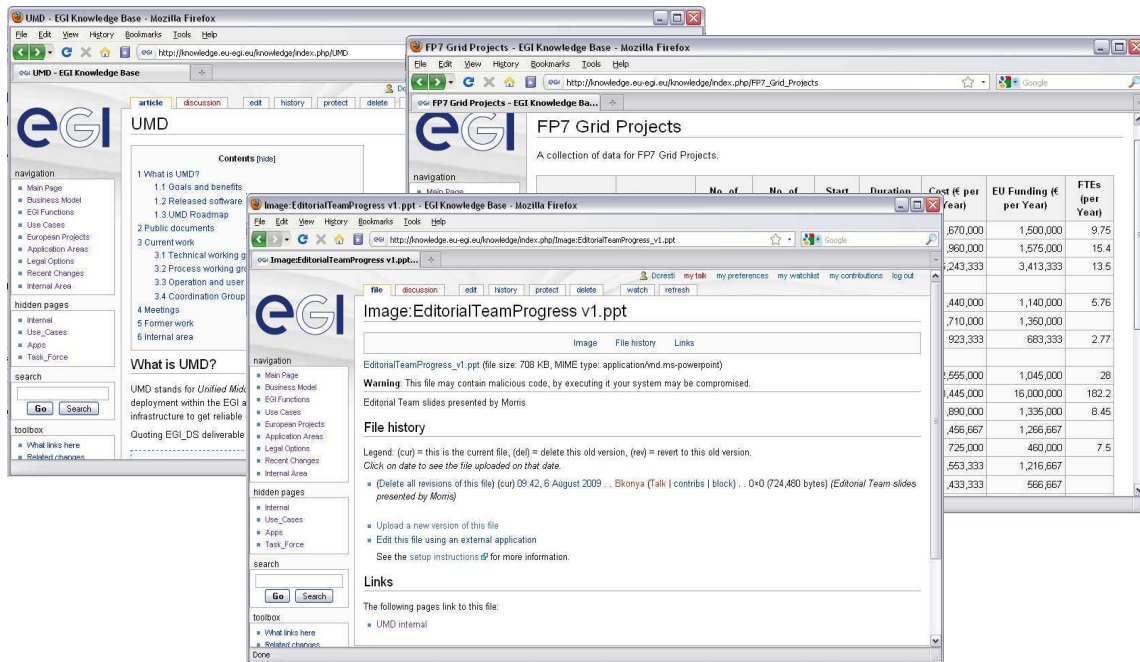
Project	Full Name	No. of Partners	No. of Countries	Start Date	Duration (Months)	Cost (€ per Year)	EU Funding (€ per Year)	FTEs (per Year)
BalticGrid-II	BalticGrid-II	12	6	2008-05	24	1,670,000	1,500,000	9.75
D4Science	D4Science	10	7	2008-01	24	1,960,000	1,575,000	15.4
DEISA	DEISA2	10	7	2008-05	36	6,243,333	3,413,333	13.5
DIESIS								
DORII	DORII	10	5	2008-02	30	1,440,000	1,140,000	5.76
DRIVER-II	DRIVER-II	27	10	2007-12	24	1,710,000	1,350,000	
E-NMR	E-NMR	3	2	2007-11	36	923,333	683,333	2.77
EDGeS								
EELA-2	EELA-2	6	4	2008-04	24	2,555,000	1,045,000	28
EGEE	EGEE III	161	32	2008-05	24	23,445,000	16,000,000	182.2
ETICS	ETICS2	8	5	2008-03	24	1,890,000	1,335,000	8.45
ETSF	ETSF	14	6	2008-01	36	1,456,667	1,266,667	
EUAsiaGrid	EUAsiaGrid	15	13	2008-04	24	725,000	450,000	7.5
EUFORIA	EUFORIA	12	7	2008-01	36	1,553,333	1,216,667	
EVALSO	EVALSO	8	6	2008-01	36	1,433,333	566,667	

The project pages were mostly created by the projects themselves, while the tables were the work of the main KB editors. These pages, appropriately updated with new EGI-related projects, could become essential to the cohesiveness of the related communities as the KB would continue to provide an easy central reference point projects to know about each other and for EGI to maintain contact with them.

### 3.2. USE OF THE EGI KB FOR EGI-RELATED PROJECT PROPOSALS

Aside from the use of the EGI KB to upload all of the successive updates of the EGI\_DS Functions deliverable D3.2, as discussed in the previous KB snapshot (D3.3), one group has made extensive use of this tool in this period, namely the Middleware group.

The three middleware consortia – ARC, gLite and UNICORE – together with a few additional partners have created several articles on the future development of the European Unified Middleware Distribution (UMD), and uploaded a large number of files, some of which are in the internal area.



It should be noted that the UMD Internal page shows a systematic analysis of the Use Cases and requirements by the middleware task force, see

[http://knowledge.eu-egi.eu/knowledge/index.php/UMD\\_internal](http://knowledge.eu-egi.eu/knowledge/index.php/UMD_internal)

Although access to this content is restricted, it exemplifies how a single tool – the EGI KB – can serve an important communication role between stakeholders, if it is actively used.

It should again be noted that some of the partners in the UMD-related proposal, EMI, were also among the main editors of the EGI KB. If this tool is to be used for its intended purpose, there must be more awareness and better access for content managers from the NGIs and the collaborating projects. The coordination of these activities should be taken up by personnel within EGI.eu.

### 3.3. THE NGI PAGES

The NGI pages describe each of the NGIs so that other NGIs can compare themselves, and find the solutions that other NGIs have chosen to any problems facing them in their evolution. As mentioned in earlier snapshots, these pages are only modified occasionally, by the NGI representatives or their content managers, as the need arises.

It is strongly recommended, once EGI is established, to retain these pages and ask the NGI content managers to keep them updated, according to an agreed rough template. It is also recommended, in order to ease the workload on the NGIs and avoid dispersing information, to make an attempt to integrate information from the e-IRG knowledge base, or to try to “merge” the two, since having a single place to publish updated NGI information is more efficient.

#### 4. EVALUATION OF ORIGINAL USE CASES

Use cases for the desired EGI were collected at an early stage in the EGI Design Study project. We wish to evaluate how those desires match the EGI as designed, in practice, at the end of the project. The use cases covered a wide range of activities related to the role of different actors - end user, infrastructure provider, network administrator, funder, policy maker etc. These roles allow the clustering of the use cases into different classes covering specific tasks as grid infrastructure operation, application support, middleware development and subsequent management and others.

Recently, many EU project proposals have been submitted to the EU Commission to provide funding for the tasks of the EGI. Therefore it makes sense to perform the evaluation of the original use cases against the upcoming set of EU project proposals and investigate in detail if the use cases really matched the requirements expressed in the corresponding project proposals. A table (see Table 2 for details) matching the individual use cases to the research intent of several selected project proposals have been introduced. The selection of appropriate proposals have been done in a way mimicking the coverage of all critical services expected from worldwide, sustainable grid environment and is indicated (together with more detailed projects description) as follows

EGI InSPIRE	operation of sustainable grid
EMI	middleware development and support
CHAIN	globalization of grid efforts
ROSCOE	applications support
SAFE	application support
ESMI	security monitoring and incident handling
CUE	dissemination activities
TAPAS	application porting
StratusLab	provision of cloud/grid technologies

Therefore the requirements set out in the original use cases have been partitioned among EGI itself and the EGI ecosystem, that is, the related proposals that have been submitted along with EGI-InSPIRE. In particular:

- **European Grid Initiative: Integrated Sustainable Pan-European Infrastructure for Researchers in Europe (EGI InSPIRE).** This will be achieved through:
  - The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that will be increasingly sustained beyond specific project funding.
  - The continued support for researchers within Europe and their international collaborators that are using the current production infrastructure.
  - The support for current heavy users of the infrastructure in Earth Science, Astronomy & Astrophysics, Fusion research, Computational Chemistry and Materials Science, Life Sciences and High Energy Physics as they move to sustainable support models for their own communities.
  - Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.

- Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure so as to provide transparent access to all authorised users.
- Establishment of processes and procedures to allow the inclusion of new DCI technologies and resources (e.g. Cloud infrastructures, volunteer desktop grids, etc.) into the production infrastructure as they mature and demonstrate value to the European community.
- **European Middleware Initiative (EMI)**. It plans to be a close collaboration of the three major middleware providers, ARC, gLite and UNICORE, and other software providers. It will deliver a consolidated set of middleware components for deployment in EGI (as part of the Unified Middleware Distribution or UMD), PRACE and other DCIs, extend the interoperability and integration between grids and other computing infrastructures, strengthen the reliability and manageability of the services and establish a sustainable model to support, harmonise and evolve the middleware, ensuring it responds effectively to the requirements of the scientific communities relying on it.
- **Co-ordination and Harmonisation of Advanced eInfrastructures (CHAIN)**. It aims to coordinate and leverage collaboration efforts in the area of electronic infrastructures between Europe and the rest of the world, with a vision of a harmonised and optimised interaction model for them, and specifically Grid interfaces between the different infrastructures. The project will elaborate a strategy, define the instruments and deploy them in order to ensure coordination and interoperation. To this end, first, the project will define and deploy a coherent operational and organisational model, where a number of EU countries/regions will act, in collaboration with EGI.eu, as bridges/gateways to other regions/continents. Furthermore, the project will validate this model by supporting the extension and consolidation of worldwide virtual communities, which increasingly require distributed facilities (large instruments, distributed data and databases, digital repositories, etc.) across the regions for trans-continental research. Finally, the project will act as a worldwide policy-watch and coordination instrument, by exploring and proposing concrete steps for the coordination with other initiatives and studying the evolution of e-Infrastructures.
- **Robust Scientific Communities for EGI (ROSCOE)**. It focuses on building robust, self-supporting, and self-reliant scientific communities. The project will help the communities towards such transition, enable the communities to achieve their scientific goals, nurture nascent communities through interactions with mature ones, and transfer management expertise to EGI.eu. Mature Virtual Research Communities (VRC) within ROSCOE are: High-Energy Physics, Life Sciences, Computational Chemistry & Materials Science Technology, and Computer Science & Engineering. ROSCOE targets three nascent VRCs: Photon Science concerning users of synchrotron radiation (light) sources, Complexity Science concerning the analysis of complex, interconnected systems, and Humanities. The 36-month work plan includes activities to foster collaboration within and between VRCs, to lower barriers to grid adoption by the members of the communities, and to push the evolution of the grid to maximize its utility.
- **SSCs for Astronomy & Astrophysics, Fusion and Earth Science (SAFE)**. It aims at bringing together Grid Specialised Support Servers (SSCs) for Astronomy & Astrophysics, Earth Science and Fusion scientific domains, one in each domain. SAFE will propose, in collaboration with EGI, to strengthen these Grid SSCs by sharing expertise, cross-fertilization among the partners, and interaction with the relevant user communities. All this work will be done with the objective that by the end of SAFE, the three SSCs will be the bridge between

their community and the EGI infrastructure, i.e. their expertise will be well visible in their community and recognized by both Grid and Scientific communities.

- **European Security Monitoring Infrastructure (ESMI).** Security vulnerabilities and incidents are two of the greatest risks for the European Grid Initiative (EGI). Security monitoring is a vital tool for operational security but is currently immature in Grids. The ESMI project, a collaboration of three partners already very active in the area, targets the provision of a security monitoring infrastructure and tools to support both strategic and tactical levels of operational security for distributed grid infrastructures. The project encompasses information, policies, and controls. In the current EGEE-III and initial EGI infrastructures the raw information gathering is conducted by machines, but most information dissemination, analysis and control is exercised by people. This proposal focuses on defining a roadmap in cooperation with the EGI CSIRT for the development of a comprehensive framework for security monitoring and appropriate policy-driven reaction, developing a high-quality set of operational tools, enhancing the current approaches to the generation of operational security information and its gathering, and beginning the exploration of security information dissemination, analysis and operational control by machines.

ESMI encompasses a complex realm that requires both policy and technical advances, involving resolution of significant uncertainties, all areas needing extensive research and software development that is evaluated via prototypes built in a high-quality environment and deployed in the EGI distributed environment. ESMI will contribute to innovation in EGI.

ESMI aims to:

- Define, develop and maintain an integrated security monitoring infrastructure to protect EGI and DCIs
- Integrate and extend the many sources of security information, and store the information in a repository
- Provide advanced analysis, reflecting current risk analysis, that identifies issues deemed critical/important
- Rapidly provide security information and suggest reaction to the EGI, NGI and site security officers
- **Creating Users of E-infrastructures (CUE).** It builds on the work of EGEE and ICEAGE projects and its goals are to:
  - reinforce the impact of EGI and e-Infrastructures both in academic and business research;
  - define and deliver a programme of dissemination and educational events;
  - provide dissemination and educational tools to EGI and NGIs;
  - enable the NGIs to enlarge the number of users of EGI;
  - develop novel ways of presenting e-Infrastructures to prospective users and communities;
  - raise awareness of and transfer know-how about grid technology both to the public and business sectors;
  - leverage EGI and related technologies towards business adoption with a particular focus on SMEs.
- **Team to Assist Porting Applications to e-Science infrastructures (TAPAS).** It aims to identify, collect and document those use cases where the EGI grid, desktop grids and supercomputing grids provide compelling solutions for e-Science applications and will

- provide technological consultation, focused training and technical application porting services around these use cases and around emerging new ways of e-Infrastructure usage. Clients of the TAPAS services can be individuals, groups, scientific and business communities, application developers who would like to enable new of applications on EGI-like cluster grids (primarily on EGI itself) and/or on BOINC like desktop grids and supercomputing grids.
- **StratusLab.** It aims at service provisioning, networking and research of technologies that will bridge cloud and grid infrastructures to simplify and optimize the use and operation of existing distributed computing infrastructures (e.g. EGEE/EGI). The project will incorporate cloud and virtualization innovation into existing Grid infrastructures by integrating cloud technologies and services within Grid sites; and by enriching existing computing infrastructures with “IaaS” cloud-like delivery paradigms.

This way of use cases evaluation involves a potential risk that some of the proposals will not be eventually funded that would lead to the situation when a non-trivial part of use cases and corresponding required services will not be covered at all.

**Table 2: Summary of EGI DS Knowledge Base use cases and their matching to the EU project proposals (the concrete, specific use case can be listed in details using the appropriate associated URL pointer).**

No.	Pointer	EGI Function	Use Case title	Project Proposal
1	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Reputation of provided services	EGI InSPIRE
2	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	VO already supported by sites needs more computing power for 1 month starting from next week	EGI InSPIRE
3	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	VO needs increase storage/CPU ratio, so they want to negotiate this with 20 sites and track the process of enabling this	EGI InSPIRE
4	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	RC needs resources for new VO and wants to cut (re-negotiate) resources for already supported VOs.	EGI InSPIRE
5	<a href="#">URL</a>	Application support	Enabling grid for the Bioinformatics community	ROSCOE
6	<a href="#">URL</a>	Coordination of middleware development and standardization	Middleware releases and security updates' propagation to Grid sites.	EMI, EGI InSPIRE
7	<a href="#">URL</a>	Training efforts, Outreach and Dissemination	Guide novice users to the Grid	CUE
8	<a href="#">URL</a>	Application support	Support of individual user community	ROSCOE/SAFE

No.	Pointer	EGI Function	Use Case title	Project Proposal
9	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Operate a national science grid and act as a resource broker for national research communities in international co-operation.	EGI InSPIRE
10	<a href="#">URL</a>	Security	Grid certificates authorities	ESMI
11	<a href="#">URL</a>	Application support	Provision of licences of commercial codes	ROSCOE/SAFE
12	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Resource market mechanisms	EGI InSPIRE
13	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Funding mechanisms	EGI InSPIRE
14	<a href="#">URL</a>	Components selection, validation, integration and deployment	Middleware tailoring according to virtual organisation needs	EMI
15	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Creating and operating a regional infrastructure in Latin America interoperable with EGEE/EGI.	CHAIN
16	<a href="#">URL</a>	Training efforts, Outreach and Dissemination	Organize and run a Grid School for newcomers with new application(s).	CUE
17	<a href="#">URL</a>	Application support	Participation of the EELA1 Project in the WISDOM Data Challenge-II	ROSCOE
18	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Creation of a pilot intercontinental Infrastructure extending the European Grid infrastructures in China and interoperating with the equivalent Chinese Grid Infrastructures, in line with the support of the intercontinental extension of the European Research Area (ERA).	CHAIN
19	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Installation of a Grid Site in China or Europe.	CHAIN
20	<a href="#">URL</a>	Coordination of middleware development and standardization	Interconnect the existing European and Chinese Grid Infrastructures, EGEE and CNGrid, through interoperability.	EMI
21	<a href="#">URL</a>	Coordination of middleware development and standardization	Running gLite and GOS middlewares in a IPv6 network.	EMI, EGI InSPIRE, CHAIN
22	<a href="#">URL</a>	Training efforts, Outreach and Dissemination	A new community needs to port its application on the grid.	TAPAS
23	<a href="#">URL</a>	Components selection, validation, integration and deployment	Accessing the EGEE gLite middleware service through a web portal (GENIUS).	EMI

No.	Pointer	EGI Function	Use Case title	Project Proposal
24	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Creation of a Regional Infrastructure as an extension of EGEE to the North African and Middle East Countries.	CHAIN
25	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Installation of grid sites in the Mediterranean area.	EGI InSPIRE
26	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Integration of Applications into the e-Infrastructure.	ROSCOE/SAFE
27	<a href="#">URL</a>	Coordination of middleware development and standardization	Interoperability between different grid middleware (gLite-GTRS)	EMI
28	<a href="#">URL</a>	Coordination of middleware development and standardization	Accessing e-Infrastructure from Windows platforms	EMI
29	<a href="#">URL</a>	Application support	Employment of remote farms for the ATLAS online monitoring, calibration and filtering system	ROSCOE
30	<a href="#">URL</a>	Application support	Evolution of pollution clouds in the atmosphere	SAFE
31	<a href="#">URL</a>	Application support	Analysis of Water Quality in Reservoirs	SAFE
32	<a href="#">URL</a>	Application support	Visualization of Plasma in Fusion Reactors	SAFE
33	<a href="#">URL</a>	Application support	Detection and Extraction of compact objects in CMB maps	SAFE
34	<a href="#">URL</a>	Application support	Brain Perfusion Application	ROSCOE
35	<a href="#">URL</a>	Application support	UltraSound Computing Tomography	ROSCOE
36	<a href="#">URL</a>	Application support	e-imrt simulation and diagnostic tool	ROSCOE
37	<a href="#">URL</a>	Application support	Visualization of Quantum Chemistry	ROSCOE
38	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Sharing the Infrastructure of a Research Center	EGI InSPIRE
39	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Providing Access to Large Distributed Infrastructure to Private Researchers	StratusLab
40	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Providing Access to Large Distributed Infrastructure to Public Researchers	StratusLab
41	<a href="#">URL</a>	Application support	Use of e-Infrastructure to support Engineering Applications	ROSCOE
42	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Integrating Private Infrastructure for Commercial Usage	StratusLab

No.	Pointer	EGI Function	Use Case title	Project Proposal
43	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Integrating an small/medium research resource center	EGI InSPIRE
44	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Build European Grid infrastructure based on Grid middlewares from different providers	EGI InSPIRE, EMI
45	<a href="#">URL</a>	Application support	Utilization of computational chemistry/molecular modelling packages	ROSCOE
46	<a href="#">URL</a>	Application support	Licensing of commercial software to be used within Grid environment	EGI InSPIRE, ROSCOE
47	<a href="#">URL</a>	Components selection, validation, integration and deployment	Support for development of specific user-friendly frameworks to access worldwide grid infrastructure	ROSCOE
48	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Collaboration within international research communities	EGI InSPIRE
49	<a href="#">URL</a>	Application support	Bulk submission of computational jobs	SAFE, EMI
50	<a href="#">URL</a>	Security	User management within the grid environment	ESMI, EGI InSPIRE
51	<a href="#">URL</a>	Development and operation of build and test systems	Grid services development, tuning and deployment	EGI InSPIRE
52	<a href="#">URL</a>	Training efforts	Application group "grid guru" training and support	TAPAS
53	<a href="#">URL</a>	Components selection, validation, integration and deployment	Support for user-empowered services	TAPAS
54	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	e-Infrastructure Continuity	EGI InSPIRE
55	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Data provision	EGI InSPIRE
56	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	EU e-Infrastructures Sharing	EGI InSPIRE
57	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	International dimension	CHAIN
58	<a href="#">URL</a>	Coordination of middleware development and standardization	Standardization of Middleware	EMI
59	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Sustainability	EGI InSPIRE
60	<a href="#">URL</a>	Components selection, validation, integration and deployment	New tools	EGI InSPIRE

No.	Pointer	EGI Function	Use Case title	Project Proposal
61	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Communication - with (supported) VOs, operational entities and other sites	EGI InSPIRE
62	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Registering a VO	EGI InSPIRE
63	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Updating VO information	EGI InSPIRE
64	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Allocation of core grid services (user registration service, catalogues etc.)	EGI InSPIRE
65	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Integrating VO owned resources to the grid	EGI InSPIRE
66	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	User support integration with the general grid support	EGI InSPIRE
67	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Baseline resource requirements (including software, like specific compilers, MPI...)	EGI InSPIRE, ROSCOE, SAFE
68	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Exceptional resource needs (for a limited period of time, "data challenges")	EGI InSPIRE
69	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Communication with operational entities (grid operator, sites, others)	EGI InSPIRE
70	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	VO specific software installation on sites	EGI InSPIRE
71	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Controlling job distribution	EGI InSPIRE
72	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Monitoring the jobs	EGI InSPIRE
73	<a href="#">URL</a>	Application support	Testing of new versions of VO software	ROSCOE, SAFE
74	<a href="#">URL</a>	Components selection, validation, integration and deployment	Preparation of the VO software to middleware upgrades (testing, integration)	EGI InSPIRE, EMI
75	<a href="#">URL</a>	Components selection, validation, integration and deployment	Requesting changes to the middleware	EMI, EGI InSPIRE



No.	Pointer	EGI Function	Use Case title	Project Proposal
76	<a href="#">URL</a>	Training efforts	Training	CUE
77	<a href="#">URL</a>	Application support	Support for porting an application	TAPAS
78	<a href="#">URL</a>	Application support	Support for using an (existing) application for a (existing) VO	ROSCOE, SAFE
79	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Problem support during production	EGI InSPIRE
80	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Help for planning (status of available resources)	EGI InSPIRE
81	<a href="#">URL</a>	Security	Security incident handling	ESMI
82	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Planning and work coordination, best practices, overall agreed procedures	EGI InSPIRE
83	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Monitoring - sites	EGI InSPIRE
84	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Handling of trouble tickets	EGI InSPIRE
85	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Resource allocation	EGI InSPIRE
86	<a href="#">URL</a>	Application support	Resource usage	EGI InSPIRE
87	<a href="#">URL</a>	Outreach and dissemination	Getting started	CUE
88	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Site configuration for a VO	EGI InSPIRE
89	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Communication with a VO - getting informed of VO events (data challenges)	EGI InSPIRE
90	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Communication with a VO - contacting VO managers	EGI InSPIRE
91	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Communication with a VO - contacting a specific VO user	EGI InSPIRE
92	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Trouble ticketing - grid problems, network problems	EGI InSPIRE
93	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Trouble shooting	
94	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Monitoring	EGI InSPIRE
95	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Reporting errors	EGI InSPIRE
96	<a href="#">URL</a>	Security	General information on security issues	ESMI

No.	Pointer	EGI Function	Use Case title	Project Proposal
97	<a href="#">URL</a>	Application support	Create a tele-immersion service. (Part of the AMI lab construction (AMbient Intelligence laboratory. Funded by the national program «APIΣTEIA»)	ROSCOE
98	<a href="#">URL</a>	Application support	Large-scale brain simulation	ROSCOE
99	<a href="#">URL</a>	Application support	Advancing Clinico-Genomic Clinical Trials on Cancer (ACGT)	ROSCOE
100	<a href="#">URL</a>	Application support	Molecular Dynamics on the GRID: non-linear dynamics and spectroscopy of biomolecules	ROSCOE
101	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Support for the dynamic creation of VOs	EGI InSPIRE
102	<a href="#">URL</a>	Application support	Introducing a new healthcare organization and connecting (plug-in) it with the rest of ACGT	ROSCOE
103	<a href="#">URL</a>	Application support	Introducing a new data providing source to the ACGT	ROSCOE
104	<a href="#">URL</a>	Application support	Implementation of new data analysis and knowledge discovery services	ROSCOE, SAFE
105	<a href="#">URL</a>	Application support	Design and execution of scientific workflows	TAPAS, EMI
106	<a href="#">URL</a>	Application support	Uniform access to the whole ACGT environment through the ACGT Web Portal	ROSCOE
107	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Expand Virtual Organization outside of country	CHAIN
108	<a href="#">UC-NGI-NT-II</a>	Operation of a reliable Grid infrastructure	Prevent fragmentation of European grid computing	EGI InSPIRE
109	<a href="#">URL</a>	Coordination of middleware development and standardization	Engage in future grid middleware redesign for European grid computing and beyond	EMI
110	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Grid services for a European infrastructure for the curation of scientific data	EGI InSPIRE
111	<a href="#">URL</a>	Application support	Virtual heart simulator	ROSCOE
112	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Virtual Research Environments for Scientific Computing	ROSCOE
113	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Quality-of-Service (QoS) bandwidth demand	EGI InSPIRE



No.	Pointer	EGI Function	Use Case title	Project Proposal
114	<a href="#">URL</a>	Application support	LHC on-line filtering	ROSCOE
115	<a href="#">URL</a>	Application support	Adaptation of commercial software to Grid environment	ROSCOE, SAFE
116	<a href="#">URL</a>	Application support	Parallel software application execution on specific resources	EMI, ROSCOE, SAFE
117	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Privately funded hardware	StratusLab, EGI InSPIRE
118	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Single user with no VO assignment needs to enter the Grid	CUE
119	<a href="#">URL</a>	Coordination of middleware development and standardization	Release of New Grid Middleware	EMI
120	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Adding a new NGI/EGI site	EGI InSPIRE
121	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Functionality alert at some NGI site	EGI InSPIRE
122	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Resources negotiation for VO	EGI InSPIRE
123	<a href="#">URL</a>	Application support	Running astrophysical application in EGEE grid	SAFE
124	<a href="#">URL</a>	Application support	User accesses SM-PSE	ROSCOE
125	<a href="#">URL</a>	Application support	User accesses intermediate results	EGI InSPIRE
126	<a href="#">URL</a>	Application support	User accesses data stored in the grid	EGI InSPIRE, EMI
127	<a href="#">URL</a>	Application support	User accesses data stored in the grid through known LFN	EGI InSPIRE, EMI
128	<a href="#">URL</a>	Application support	Integration of application into K-Wf Grid	TAPAS
129	<a href="#">URL</a>	Components selection, validation, integration and deployment	Integration of new middleware component into K-Wf	EMI
130	<a href="#">URL</a>	Security	User joins K-Wf Grid infrastructure	CUE
131	<a href="#">URL</a>	Application support	User accesses K-Wf Grid application	CUE
132	<a href="#">URL</a>	Coordination of middleware development and standardization	Leading Middleware Development	EMI, EGI InSPIRE
133	<a href="#">URL</a>	Application support	Bioinformatics on the Grid	ROSCOE



No.	Pointer	EGI Function	Use Case title	Project Proposal
134	<a href="#">URL</a>	Application support	Application- oriented use case:	SAFE
135	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Estabilishing resource-operational centers	EGI InSPIRE
136	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Infrastructure-oriented use case	EGI InSPIRE
137	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Estabilishing resource-operational centers	EGI InSPIRE
138	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Joining the grid	CUE
139	<a href="#">URL</a>	Training efforts, Outreach and Dissemination	Organizing a grid educational center	CUE, TAPAS
140	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Encouraging and helping local research centers to create VOs	EGI InSPIRE
141	<a href="#">URL</a>	Application support	Disaster Prediction	SAFE
142	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	New Community	CUE
143	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	New Resource Provider	EGI InSPIRE
144	<a href="#">URL</a>	Coordination of middleware development and standardization	Local Middleware development	EMI
145	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Application for Funds	EGI InSPIRE
146	<a href="#">URL</a>	Components selection, validation, integration and deployment	Update of Middleware	EMI
147	<a href="#">URL</a>	Coordination of middleware development and standardization	Middleware Sharing	EMI
148	<a href="#">URL</a>	Coordination of middleware development and standardization	Extension of middleware to new knowledge domains	EMI
149	<a href="#">URL</a>	Components selection, validation, integration and deployment	Discovery of middleware components	EMI
150	<a href="#">URL</a>	Components selection, validation, integration and deployment	Hardening of middleware	EMI



No.	Pointer	EGI Function	Use Case title	Project Proposal
151	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Regional participation in the European Grid Infrastructure	CHAIN
152	<a href="#">URL</a>	Application support	Epidemiological Analysis on the Grid	ROSCOE
153	<a href="#">URL</a>	Application support	Medical Image Analysis on the Grid.	ROSCOE
154	<a href="#">URL</a>	Application support	Metagenomics Analysis on the Grid	ROSCOE
155	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Registering to use ILDG.	ESMI
156	<a href="#">URL</a>	Security	Obtaining a valid X.509 certificate	CUE
157	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	Data management client operations on different platforms	EGI InSPIRE
158	<a href="#">URL</a>	Application support	Search for scientific data	EGI InSPIRE
159	<a href="#">URL</a>	Operation of a reliable Grid infrastructure	EGEE compliant storage elements at HPC centres	EGI InSPIRE
160	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	New partners ask for a new VO	CHAIN, EGI InSPIRE
161	<a href="#">URL</a>	Application support	Use Cases related to Earth Science (ES) Applications	SAFE
162	<a href="#">URL</a>	Mechanisms for resource provisioning to Virtual Organizations	Partners join an existing VO	EGI InSPIRE
163	<a href="#">URL</a>	Joining the grid	Interworking with other extra-EGI Grids	CHAIN
164	<a href="#">URL</a>	Resource provisioning to VO	National VOs	EGI InSPIRE
165	<a href="#">URL</a>	Resource provisioning to VO	Lightweight VO across a few countries	EGI InSPIRE, CHAIN
166	<a href="#">URL</a>	Resource provisioning to VO	MultiNational VOs	EGI InSPIRE, CHAIN
167	<a href="#">URL</a>	Resource provisioning to VO	External VOs	CHAIN
168	<a href="#">URL</a>	Joining the grid	Subsidiarity	EGI InSPIRE
169	<a href="#">URL</a>	Coordination of middleware development and standardisation	Diverse Middleware Stacks	EMI
170	<a href="#">URL</a>	User support for individual application group	Identification of Common Criteria to Assess New and Existing Grid Applications	ROSCOE, SAFE

No.	Pointer	EGI Function	Use Case title	Project Proposal
171	<a href="#">URL</a>	User support for individual application group	Categorization and Publication of Grid Applications on a Common Web Repository	ROSCOE, SAFE
172	<a href="#">URL</a>	User support for individual application group	A Comprehensive Gridification Guide to Assist Application Developers	TAPAS
173	<a href="#">URL</a>	Operation of a reliable grid infrastructure	Policy documents as NGI interaction modelling framework	EGI InSPIRE
174	<a href="#">URL</a>	Operation of a reliable grid infrastructure	NGI profiling and development monitoring	EGI InSPIRE
175	<a href="#">URL</a>	Operation of a reliable grid infrastructure	Interoperability of national and regional Grids	CHAIN, EGI InSPIRE
176	<a href="#">URL</a>	Operation of a reliable grid infrastructure	Distributed Grid operations and support of interoperating national and regional Grids	CHAIN
177	<a href="#">URL</a>	Operation of a reliable grid infrastructure	EGI and national/regional Service Level Agreements	EGI InSPIRE
178	<a href="#">URL</a>	Training efforts, Outreach and Dissemination	Standardized Training Materials on a Common Web Repository	CUE, TAPAS
179	<a href="#">URL</a>	Training efforts, Outreach and Dissemination	Trainer Community Information Database	CUE
180	<a href="#">URL</a>	Application support	Remote Instrumentation on the Grid	ROSCOE, SAFE

## 5. CONCLUSIONS

The purpose of the EGI Knowledge Base (KB) is to provide a single location where the EGI / NGI environment can be described, while at the same time giving a direct voice to all the main stakeholders in an efficient, dynamic and non-centralised manner.

The knowledge base includes 113 useful pages and 176 uploaded files of information. These reasonably cover the original EGI use cases and the EGI functionality as well as summarising other research projects taking place in parallel. These provide a basis for stakeholders to learn about the EGI itself as it has been developing.

The information about individual NGIs has been less detailed, since it was the duty of individual NGI to provide this rather than project members. Consequently, there was little motivation for them to expose the state of their national organisation to the review and possible criticism of others. However, as the NGI become more robust they will be motivated to provide details of their achievements and these will then serve as models for other NGI where they could still be useful.

The contents of the EGI KB, appropriately restructured to reflect the more stable reality of the EGI ecosystem, are an important basis on which to build a central EGI informational tool, which should be inherited by the EGI-InSPIRE project.