BrightnESS

Building a Research Infrastructure and Synergies for Highest Scientific Impact on ESS

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Deliverable D2.7: "IKC Work Package Assignment Plan"

1 Project Deliverable Information Sheet

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3 List of Abbreviations

ERIC	European Research Infrastructure Consortium
ESS	European Spallation Source
FC	Field Coordinator
IKC	In-Kind Contribution
IKFC	In-Kind Field Coordinator
IKRC	In-Kind Review Committee
TA	Technical Annex
WP	Work Package
BPP	Best Practice Platform

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6 Executive Summary

The primary goal of BrightnESS Work Package 2 has been to maximize the success of delivery of In-Kind contributions for the construction of the ESS. These tasks have focused on risk identification and mitigation by enhancing the communication processes between partner and the ESS and between the partners themselves. In particular activities have focused on clarity of information and processes, support to tasks for the execution of project tasks and improving methods for work. Lessons learnt have been shared and best practices from other large-scale infrastructure projects examined. Management of the In-Kind processes is challenging considering that the value of In-Kind can approach 700 MEuro. To assist the management, one of the tasks of Work Package 2 has been to develop a software package to track agreements, the associated technical annexes and the milestone dates for all parties involved in the ESS. From the start of BrightnESS to its end, these activities have been highly successful as proven by the fact that close to 300 MEuro of In-Kind contributions have been identified and endorsed with a forecast of close to 600 MEuro as In-Kind contributions to the ESS. It is of fundamental importance that the work performed during BrightnESS continues during ESS construction and initial operation. This continuity is guaranteed by the persistence of the network that has been established with the Field Coordinators and project managers, both in partner countries and at the ESS. Furthermore, the knowledge gained has been stored on the BrightnESS WEB site both for the ESS but also for benefit of the community at large, especially large scale multi-disciplinary infrastructure projects with Europe. In addition, the In-Kind management program XRM+ and its database of contacts and project status will persist and provide valuable support for the accreditation of In-Kind and be used for eventual In-Kind when the ESS is in operation. This report outlines the sustainable actions of BrightnESS Work Package 2.

7 Report on Implementation Process and Status of Deliverable

7.1 Introduction

The aim of BrightnESS Work Package 2 has been to monitor the coordination and technical progress of In-Kind Contributions (IKC) between partners and with ESS, and to maximize the possibility for all to deliver value during the Construction Phase according to the ESS IKC process (See Deliverable D2.5). This approach that has largely centered around increasing the capacity

and knowledge on In-Kind processes and management has helped minimize and mitigate the technical and non-technical risks associated with those contributions. This was especially relevant since IKC risk management was not foreseen in the original ESS Cost Book.
The objectives of Work Package 2 have been met through the implementation of the following four tasks:

- Task 2.1: Preparation of project implementation and training of resources needed,
- Task 2.2: Development and implementation of an information system for the coordination of IKC activities,
- Task 2.3: Development of an IKC 'Best Practice' system and standards,
- Task 2.4: Creation of an IKC network of Regional Hubs.

Task 2.1 included an analysis of risks both at the ESS and the partner institutes. This task formed the foundation of work for task 2.4. The second task was the development of an information management system to handle the In-Kind agreements and associated Technical Annexes. This work was composed of the identification of required information for In-Kind management based on a contact database. The system was designed in collaboration with Elettra-Sincrotrone Trieste and the ESS and coded by the former. The system provides easy access to agreements, reports and the status of In-Kind contributions from ESS partners. The system also facilitates the generation of status reports for the ESS council and other governing bodies. The third task involved the development of a WEB based depository of information and the organization of events to share and disseminate Best Practice information. Four such events took place during the project and covered aspects of project execution from engineering best practices to an understanding of VAT mechanisms that may be applicable on installation work performed by a partner on Swedish territory. The last task, 2.4, concerned the creation of a network of regional hubs with Field Coordinators that:

- Assisted the timely and qualitative delivery of IKC in their region,
- Were involved and supported all three phases of the IKC process,
- Had regular meetings between the ESS HQ and other Regional Hubs,
- Participated in the organization and facilitation of Task 2.3 (the best practice workshops).

The activities of Task 2.4 were directly linked to global ESS Project milestones and key performance indicators. Field Coordinators were additional resources for the In-Kind activities,

they enhanced the communication channels, assisted in addressing risks and risk mitigation of In-Kind processes. Above all they, strengthened interfaces, reinforce quality, standards and best practices by facilitating the flow of critical information between partners.

7.2 Overview of IKC progress per partner country

The work inside WP2 was largely carried out through six regional Hubs. The choice in the allocation of the regional hubs depended on the capacity of the different institutes, the number and complexity of their IKCs and the level of interdependent development work between institutes of different IKC countries. The coordination of all activities in WP2 was based in the Nordic Hub. In the following sections details of technical activities executed at the Regional Hubs will be presented.

The Nordic Hub, as coordinator for all the activities within WP2, led the daily management of the four tasks associated with this WP. This activity focused in particular on the suitable training of the Field Coordinators, based on an initial risk analysis and evaluation of mitigation actions. The risk analysis from both the ESS and from partner institutes (e.g. beneficiaries) that are part of WP2 was the basis of the first deliverable D2.1. The Nordic Hub was also responsible for providing the necessary training to the different Regional Hubs, as the goals of the Hubs varied depending on their needs and progress of the individual IKCs. The ESS has benefitted from the work conducted through the actions of WP2 as seen by the progress in In-Kind agreements and Technical Annexes during the project duration. This progress is reported in the following country tables, shown below, which show the increase in work done on IKCs since the start of BrightnESS (September 2015 to August 2018). Figure 1 shows the progress in the identification and allocation of In-Kind contributions to the ESS from 2014 for the forecasted and expected situation at the end of 2019. During BrightnESS Work Package 2 has assisted in the conversion of planned and potential In-Kind contributions to solid endorsed (by the In-Kind Review Committee) or Council Approved contributions. The work represents an increase of endorsed/approved In-Kind with a value of close to 300MEuro.

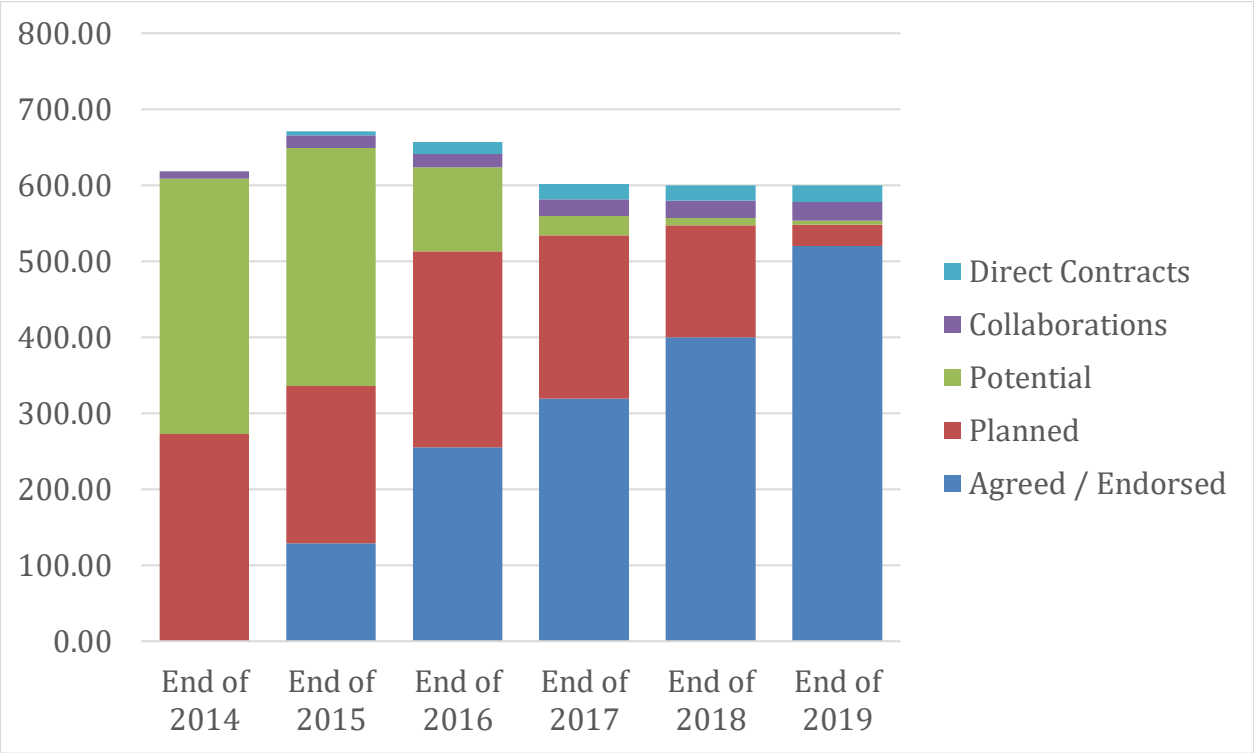

Figure 1: Vertical Scale in Millions of Euro. Progress of In-Kind contributions over the past years. 2018 and 2019 are forecasts, for 2018 the forecasted expectations are accurate. Of relevance is the conversion of planned and potential contributions to agreed and/or endorsed from the start of BrightnESS (end of 2015) to the forecasted end value of 2018.

WP2 has been instrumental in reaching these results through increased communication, the setting up of organizations in hub countries and the identification and mitigation of risks. The nature of work conducted by the Field Coordinators has been quite diverse and reflects the different levels of maturity of the In-Kind activities in a given country. Of note is the increased networking between partners for joint solution to issues and the clarification of interfaces, both of technical and procedural natures. Examples of this networking are the sharing of knowledge for CE markings or VAT issues and the understanding of technical interfaces in the construction of cryomodules for the ESS linac.

It is of great importance that the work conducted over the project duration persists in time and the benefits extend to future activities for the construction of the ESS. The following sections describe the sustainable aspects of project work conducted at the various hubs. The persistence of these actions or organizations will minimize risks to the ESS and its partners and ensure a successful conclusion to the construction of the ESS and its instruments.

Czech Republic - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	37 M€	37 M€		
In-Kind Objective	70% (25.8M€)	82.5% (30.4M€)	4.6M€	18%
TAs Approved	1 TAs Approved (5.59M€)	4 TAs Approved (18.3 M€)	12.71M€	227%
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	NA	NA
TAs Accredited	0 TAs Accredited (0M€)	1 TA Accredited (0.2 M€)	0.2M€	100%
IKC Agreement Signed	UJF (Signed)	UJF (Signed)		

Estonia - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	4.6 M€	4.6 M€		
In-Kind Objective	70% (3.2M€)	70% (3.2M€)	0M€	0%
TAs Approved	3 TAs Approved (0.32M€)	9 TAs Approved (1.9 M€)	1.58M€	494%
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	0M€	NA
TAs Accredited	0 TAs Accredited (0M€)	1 TA Accredited (0.2 M€)	0.2M€	100%
IKC Agreement Signed	Tallinn Technical University (Signed); Tartu University (Signed)	Tallinn Technical University (Signed); Tartu University (Signed)		

France - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	147M€	147M€		
In-Kind Objective	90% (132.7M€)	90% (132.7M€)	0M€	0%
TAs Approved	0 TAs Approved (0M€)	12 TAs Approved (96M€)	96M€	100%
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	0M€	NA
TAs Accredited	0 TAs Accredited (0M€)	2 TAs Accredited (0.4 M€)	0.2M€	100%
IKC Agreement Signed	IKC Agreements: CEA (Qtr 4 2016), LLB-CEA-CNRS (Qtr 2 2106), CNRS (Qtr 2016)	IKC Agreements: CEA (Signed), LLB-CEA-CNRS (Qtr 4 2018), CNRS (Signed)		

Germany - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	182M€	182M€		
In-Kind Objective	70% (127.4M€)	66% (123.3M€)	-4.1M€	-3%
TAs Approved	0 TAs Approved (0M€)	0 TAs Approved (0M€)	0M€	NA
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	0M€	NA
TAs Accredited	0 TAs Accredited (0M€)	0 TAs Accredited (0.0 M€)	0	0%
IKC Agreement Signed	IKC Agreements: FZJ (Qtr 1 2016), TUM (Qtr 1 2016), HZG (Ongoing)	IKC Agreements: FZJ (Qtr 3 2018), TUM (Qtr 3 2018), HZG (Qtr 3 2018)		

Note: Although it might seem that no progress has been made in Germany, the challenges that both Partners and ESS faced are a result of a set of legislative rules and procedures in Germany that make executing In-Kind Contributions rather difficult. The hub's Field Coordinators have been very active in facilitating the communication, and interfacing between ESS and different German partners in order to expedite the resolution of many challenges, including but not limited to VAT, Insurance, and most importantly, Liability. The Field Coordinators have also offered advice to other hubs on how to circumvent certain challenges during many workshops, but also regular Bi-Weekly Meetings.

Hungary - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	17.6M€	17.6M€		
In-Kind Objective	70% (12.3M€)	70% (12.3M€)	-4.1M€	-3%
TAs Approved	1 TA Approved (2.2M€)	9 TAs Approved (3.2M€)	1M€	45%
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	0M€	NA
TAs Accredited	0 TAs Accredited (0M€)	4 TAs Accredited (0.2 M€)	0.2M€	100%
IKC Agreement Signed	IKC Agreements: Wigner (Qtr 1 2016), Centre for Energy Research (Qtr 1 2016), Atomki (Signed)	IKC Agreements: FZJ (Qtr 3 2018), TUM (Qtr 3 2018), HZG (Qtr 3 2018)		

Italy - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	110.1M€	110.1M€		
In-Kind Objective	81% (89.4M€)	81% (89.4M€)	0M€	0%
TAs Approved	0 TAs Approved (0M€)	8 TAs Approved (62.3M€)	62.3M€	100%
TAs Endorsed	0 TAs Endorsed (0M€)	7 TAs Endorsed (1.4M€)	1.4M€	NA
TAs Accredited	0 TAs Accredited (0M€)	0 TAs Accredited (0.0 M€)	0M€	0%
IKC Agreement Signed	IKC Agreements: CNR (Qtr 1 2016), INFN (Qtr 1 2016), Elettra (Qtr 1 2016)	IKC Agreements: INFN (Signed), CNR (Qtr 3 2018), Elettra/INFN Trilateral (signed as required)		

Norway - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	46.1M€	46.1M€		
In-Kind Objective	40% (18.4M€)	40% (18.4M€)	0M€	0%
TAs Approved	1 TA Approved (0.25M€)	8 TAs Approved (5.9M€)	5.65M€	2260%
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	0M€	0%
TAs Accredited	0 TAs Accredited (0M€)	6 TAs Accredited (0.9 M€)	0.9M€	100%
IKC Agreement Signed	IKC Agreements: Oslo Univ (Qtr 1 2016), IFE (Signed), Adger Univ (Qtr 2 2016), Bergen (Qtr 20 2016)	IKC Agreements: Bergen (Signed), IFE (Signed), Oslo Univ (Signed)		

Poland - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	33.2M€	33.2M€		
In-Kind Objective	70% (23.2M€)	76% (25.2M€)	2M€	9%
TAs Approved	0 TAs Approved (0M€)	9 TAs Approved (26.4M€)	26.4M€	100%
TAs Endorsed	0 TAs Endorsed (0M€)	0 TAs Endorsed (0M€)	0M€	0%
TAs Accredited	0 TAs Accredited (0M€)	0 TAs Accredited (0M€)	0M€	0%
IKC Agreement Signed	IKC Agreements: Oslo Univ (Qtr 1 2016), IFE (Signed), Adger Univ (Qtr 2 2016), Bergen (Qtr 20 2016)	IKC Agreements: Bergen (Signed), IFE (Signed), Oslo Univ (Signed)		

Spain - ERIC Founding Observer

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	92.15M€	50.3M€	41.85M€	-45%
In-Kind Objective	80% (73.7M€)	93% (47M€)	26.7M€	-36%
TAs Approved	0 TAs Approved (0M€)	0 TAs Approved (0M€)	0M€	0%
TAs Endorsed	0 TAs Endorsed (0M€)	13 TAs Endorsed (33,7M€)	33.7M€	100%
TAs Accredited	0 TAs Accredited (0M€)	0 TAs Accredited (0M€)	0M€	0%
IKC Agreement Signed	IKC Agreements: ESS Bilbao (Qtr 3 2016)	IKC Agreements: ESS Bilbao (Qtr 3 2018)		

Note 2: In 2017 Spanish Government decided to decrease the contribution to the ESS from 5% to 3%. Nevertheless, the principal Spanish Partner Institute, ESS Bilbao, is currently executing work on more than 30M€ worth of In-Kind Contributions. Spain has recently (April 2018) become a member of the ESS ERIC, and discussions regarding the Main In-Kind Agreement have started, facilitated by the Spanish and Nordic-Baltic Field Coordinators.

Switzerland - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	64.5M€	64.5M€		
In-Kind Objective	70% (42M€)	70% (42M€)	0M€	0%
TAs Approved	0 TAs Approved (0M€)	7 TAs Approved (19.9M€)	19.9M€	100%
TAs Endorsed	0 TAs Endorsed (0M€)	3 TAs Endorsed (0.1M€)	0.1M€	100%
TAs Accredited	0 TAs Accredited (0M€)	1 TA Accredited (0.5M€)	0.5M€	100%
IKC Agreement Signed	IKC Agreements: PSI (Qtr 2 2016), ZHAW (Qtr 1 2016)	IKC Agreements: ZHAW (Signed), PSI (Signed)		

Note 3: In 2018, Council approved the first ESS instrument, signed between the Paul Scherrer Institute in Switzerland and the ESS. This marks a major milestone for ESS project.

United Kingdom - ERIC Founder

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	184M€	184M€		
In-Kind Objective	70% (129M€)	70% (129M€)	0M€	0%
TAs Approved	0 TAs Approved (0M€)	0 TAs Approved (0M€)	0M€	0%
TAs Endorsed	0 TAs Endorsed (0M€)	11 TAs Endorsed (60.4M€)	60.4M€	100%
TAs Accredited	0 TAs Accredited (0M€)	0 TAs Accredited (0M€)	0M€	0%
IKC Agreement Signed	IKC Agreements: STFC (Qtr 2 2016), Uni of Edinburgh (Qtr 2 2016), Uni of Huddersfield (Qtr 2 2016), Uni of Birmingham (Qtr 2 2016)	IKC Agreements: STFC (Qtr 3 2018)		

Note 4: Although the Main In-Kind Agreement has not been signed between The United Kingdom and the ESS, collaboration activities are very much underway between the partners. This is best exemplified by the many Technical Annexes endorsed, which will be approved by the Council once the main In-Kind Agreement is signed. Currently, the main In-Kind Agreement has been fully agreed by STFC and the ESS and is waiting for a side letter from the UK Ministry to proceed.

Sweden - ERIC Founder - Host Country

			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	645M€	645M€		
Total Collaborations Signed	8 Collaborations Signed (13.3M€)	9 Collaborations Signed (14.3M€)	1M€	8%
Total Collaborations Planned	0 Collaborations Planned	0 Collaborations Planned		

Denmark - ERIC Founder - Host Country				
			Change in value between 2015 and 2018	
	Q4 2015	Q2 2018	In MEUR	In %
Total Contribution	230M€	230M€		
Total Collaborations Signed	2 Collaborations Signed (3M€)	9 Collaborations Signed (4M€)	1M€	33%
Total Collaborations Planned	2 Collaborations Planned (0.4M€)	4 Collaborations Planned (6.7M€)	6.3M€	1575%

7.3 WP2 Sustainable Activities

The four tasks of work package two have led to organisations, procedures, databases or networks that will persist beyond project termination. This minimizes the risk to the ESS and partners and introduces an additional means of ensuring successful delivery of In-Kind contributions. In addition, lessons learnt are shared within the broader European community of collaborative large-scale infrastructure projects. Example of such activities are reported in the following sections.

7.3.1 Gallia Hub

Activities conducted at the Gallia Hub have followed the double objective of (i) helping to bridge the gap between industry and institutes as well as multiple IKC Partners and (ii) assisting the ESS with the coordination of the In-Kind contribution process. Through BrightnESS, different issues were dealt with, such as VAT exemption, CE Marking, shared risks among others. This has brought additional knowledge and experience to the French partners on multi-partner and international projects.

The Gallia Hub has been active in putting in place a coherent set of actions that will continue to be active after BrightnESS and assist the ESS project. The Gallia Hub has organized and been part of numerous events at national and international levels to bring awareness on the ESS Project, assist ESS to find qualified partners and facilitate the communication and networking between all stakeholders (ESS, Institutes and Industry). Indeed, such events strongly favour networking between academics and industrials but also actually between ESS Partners themselves as it offers them a good opportunity to organise ad hoc meetings. These

communication channels are now well established and will persist after the end of BrightnESS. Furthermore, the work conducted in WP2 has enabled the expansion of a French Industry Network for the ESS and has given tools and support to the French ILO for the ESS. Additionally, all the documents from these events (trainings, workshops, industry days etc.) have been saved electronically in a common workspace and can be viewed by all people working on the ESS project at Irfu. If needed, there is the possibility to extend this access to others French partners

To assist the ESS on the coordination of the In-Kind contribution process, the Gallia Hub has ensured continuity in its support. The Gallia Hub has been highly involved in helping and assisting ESS to ensure the success of the four Best Practices Workshops for In Kind Partners. French participants invited to these workshops have been selected to be the most relevant people in relation to the matter of the workshop. The Gallia Hub, whenever possible, has also provide support to French partners on project management and technical aspects.

The Gallia Hub has been part of the Field Coordinators (FCs) network which has worked together to facilitate the in-kind contribution process. This work has resulted in the sharing of information on a weekly basis. For example, recently the Gallia hub has shared feedback on the installation of the SKID for the RFQ in Lund.

7.3.2 North West Hub – The United Kingdom

STFC had a specific responsibility in the grant agreement to establish a Project Office to: (1) Function as the coordination point for all the UK's IK contributions to ESS, (2) Provide advice and support to Project Managers in areas such as STFC procurement, financial processes and Project Management best practice along with ESS processes and information, (3) coordinate the IKC updates to the UK-ESS Board allowing the Board to better understand and therefore deal with the risks to the UK's contributions to ESS.

The Project Office is now established and fully staffed, with six assigned people and will continue its role post BrightnESS as the key coordination point for all the UK's IK contributions to ESS. This will include continuation of: (1) Monitoring and risk mitigation for IK, (2) Frequent contact with IK partners and ESS, (3) Producing reporting information such as dashboards, risk registers etc. to communicate progress, issues and risks, (4) Communication and information exchange with the network now established as a result of BrightnESS across the IK partners.

Field Coordinators in the UK have spent some time understanding ESS processes and supporting and advising UK IK project managers on these to clarify and improve the IK delivery. This includes: (1) Understanding the contents of the In Kind Agreement and Technical Annexes as well as the process of In-Kind Review Committee endorsement and amendments, (2) understanding the ESS document management system CHESS, (3) understanding the logistics arrangements and associated requirements for site access including ID06 cards and (4) understanding the ESS change control process.

The Field Coordinators have transferred information, gained at the BrightnESS training and Best practice workshops and through understanding of ESS processes, via a Project Manager's Forum they set up. This was a monthly meeting attended (remotely) by the Project Managers for each of the In-kind Work Packages being undertaken by the UK.

For tasks that established communication channels between hubs for the mitigation of risks associated to the interfacing of In-Kind contributions (i.e., fixtures, alignment, standards, etc.), Field Coordinators attended the biweekly WP2 call to report into the work package leaders and also to share information and issues identified with the other Hubs. STFC also hosted WP2 general meeting at ISIS.

Specific interactions with other hubs included: (1) A visit to CEA to discuss and learn from their approach to risk management and project office support, (2) numerous communications between hubs on cross cutting topics including warranties, CE marking, logistics, VAT and In-Kind agreements which have been hugely beneficial in understanding the issues and possible approaches, (3) exchanges on specific IK topics including visiting CEA to discuss and learn from their approach to risk management and project office support, conversations with Field Coordinators from the Central and Gallia hubs regarding VAT and exemption certificates, discussion with the Central hub Field Coordinators on the governance arrangements for the IK in the UK and on common NSS challenges, communication and sharing of information with the south east hub regarding the Niobium tender to make sure lessons are being shared, exchanges with the Iberia hub regarding stub installation and the sharing of Radio Frequency Distribution system (RFDS) specifications to make ensure the UK respective project teams were communicating and sharing knowledge together with the sharing of delivery and acceptance documentation. Hub-hub

discussions included Instrument procurement approaches for NBOA with both the central and Iberia hubs together with the sharing of contact details for technical leads.

Many of the tasks listed in the earlier sections have essentially been about sharing lessons e.g., the various inter-regional hub conversations have all been about topics where either the UK is further advanced and is sharing the lessons learnt (eg. sharing our RFDS spec with Bilbao) or where other hubs when further ahead and the UK can learn from their experience (eg. the Niobium tender where INFN had already completed their tender). In a similar way the monthly project manager's forum has been used to ensure lessons learnt are being shared both from UK Field Coordinators to the project managers and between project managers. For example, the RFDS project has already delivered a lot of equipment to the ESS and therefore the project manager shared his experience with logistics and working on the ESS site with the other project managers. The BrightnESS best practice workshops are used in a similar way both to learn and share lessons.

7.3.3 North West Hub - The Netherlands

For the Netherlands, in the north west hub, all major activities were focused on having the Netherlands becoming a member of ESS. These activities involved reviews with ministries, RID, Dutch companies and ESS on the division over scientific and industrial contribution. A major step in the funding process was the detailed roadmap application that was sent to the ministry on June 1, 2017 and has since been discussed but has so far not been successful. The Netherlands has, however, extended its Observer status this year and both Dutch scientists and industry have been primed and are ready to participate in membership actions. The Dutch Field Coordinator has participated in all activities and training sessions conducted through WP2 and is a repository of knowledge for a fast start-up of activities following an eventual membership of the Netherlands.

7.3.4 South East Hub – Italy

Activities of the Field Coordinators in the South East hub Italy led to the creation of a network of industrial partners, capable of delivering high technology products fulfilling the technical and schedule requirements of big international scientific collaborations. This is fundamental for the INFN because it allows to create value over time, through a wider choice of partners according to the project requirements, which results in reduced time and complexity during the tender procedures. During the project, the development of the Data Management System (DMS) has

allowed the LASA laboratory (based in Milan) to optimize the management of production processes, documents workflow and the valuing and sharing of content. The development of the DMS for quality assurance/control of the medium beta cavities has provided the INFN with its own platform, without maintenance costs and customable for future projects.

BrightnESS has led to sustainable actions that will persist after project termination. The personnel at the INFN has improved its Project Management Processes, acquiring more competence in planning, executing and achievement of the objectives. This allows the INFN to acquire new skills and continuously improve and optimize the process to contributing to scientific collaborations and take corrective actions in a timely manner avoiding delays and overspending. Through BrightnESS the INFN has expanded its European Science Network and has strengthened its collaboration with the Italian research community, such as CNR and ELETTRA, both Italian partners involved in the ESS project.

Furthermore, BrightnESS has allowed the formation of a network of industry partners from small and medium enterprises, which is the backbone of Italian industry, and securing long-term suppliers for research projects. From of the point of view of the industrial partners involved in the delivery of the IKC to ESS a large effort has been made in term of investment in technical capabilities and improvements to quality assurance, thus becoming more competitive and skilled for future scientific projects and technological challenges.

The network of Field Coordinators and their associated national Hubs will be further developed in order to support the Partners' IK work as they in turn transition from contracting and design activities, through manufacture into installation and commissioning. The need for an excellent channel of communication between the partners and ESS will become even greater during this phase of the project than it was earlier and will benefit from BrighntESS activity. Increasing amounts of information will need to be transferred, both around quality assurance documentation and around the logistical challenges of getting the many In-Kind contributions to the ESS and have them integrated into a fully functioning system. These actions will take advantage from the established network of In-Kind Field Coordinators.

7.3.5 South East Hub – Hungary

Similar to other hubs, the Field Coordinator for Hungary has assisted in the coordination and dissemination of information and the clarification of national procedures in relation to ESS activities performed by hub partners. The Field Coordinator has strengthened the coordination between the ESS, IK partners and the Hungarian ESS Board, which is composed of Hungarian partners and the National Office for Research, Development and Innovation (NORDI), to assess and mitigate the risks associated with Hungarian IK contributions. A Memorandum of Understanding for Funding In-kind Contributions was reached between ESS ERIC and NORDI and these actions will continue beyond project termination. The Field Coordinator worked on obtaining an Ex Ante Statement on VAT Status of In-kind Contributions for Wigner RCP from the Hungarian Tax and Customs Administration which will serve for all Hungarian In-Kind Contributions. The Field Coordinator coordinated activities of Hungarian delegates in various ESS bodies and advisory committees and this role will continue.

7.3.6 Iberia Hub

The Iberia hub Field Coordinators provided support at the ESS-Bilbao to achieve 13 signed Technical annexes with one in preparation at the time of this report (representing around 47 M€). This support with continue beyond BrightnESS and benefits from the interactions within the tasks that permitted clarification and dissemination of critical information, such as logistics at the ESS, VAT related consequences of In-Kind installations on Swedish territory, CE markings and conformity, etc… In addition the Field Coordinators monitored the ESS-Bilbao work package planning and activities (milestones, regular meetings with work package leaders and ESS interface personnel). A lot of effort was placed on supporting the work in the preparation for the Calls for Tender and procurement tracking, by understanding ESS IK processes and communicating to partners and industry. This knowledge has been shared in the Iberia hub at all levels. Activities involved understanding Quality Assurance/Control ESS requirements and supporting Quality Control work for Spanish IK contributions. Support was also given in the coordination for the planning of future installations.

The Field Coordinators also worked with the ESS-Bilbao Director to enable Spain to successfully become a Founding Member of the ESS ERIC. Activities post-BrightnESS will focus on industry contact and the sharing of knowledge gained during the BrightnESS project.

7.3.7 Central Hub

BrightnESS was essential to build a better collaboration between hub Partners and the ESS and amongst the Partners, as well as maximizing the value of In-Kind contributions to the ESS through the creation of a network of contacts. BrightnESS has enabled the Field Coordinators to share best practices and lessons learnt and build the foundation for a well-consolidated collaboration, which will benefit not only the ESS project, but also many future projects. We are confident that the “bridges” constructed during BrightnESS will continue to exist after the end of the project.

The Field Coordinator has interacted with SMEs such as Swiss Neutronics (CH), Mirrotron (HU) and Swagelok (DE). Also, significant effort was invested into getting two contracts in place in time with CDT (DE) and Airbus-DS, and into consolidating the collaboration with ESS (SE), LLB (FR), PSI (CH) and CNRS (IT), which are strategic partners for the development of instruments for the European Spallation Source. CDT (DE) will be a key supplier of detectors for ESS, and as a SME, it is constantly depending on uncertainties related to when customers will place an order. Therefore, FZJ has been working hard on establishing a collaboration agreement which will benefit all stakeholders involved. CDT is subcontractor of JCNS for the development of innovative neutron detectors. Airbus is subcontractor of ZEA-1 for the development of fast rotating chopper systems. Furthermore, collaborative efforts with another EU project (SoNDe) which also involves another SME: IDEAS (NO), may result in a spin-off.

BrightnESS has assisted the establishment of the German Project/Programme Office with four people assigned. This project office contains the Central hub Field Coordinator who has been the main point of contact for all BrightnESS related issues. A Controller and a Quality Manager Engineer have also assigned to the project.

With the formation of the Programme Management Office, several processes on documentation management, monitoring and controlling, and quality management were established at the FZJ, and this knowledge was shared with the other Partners from the Central Hub.

Through the participation of training workshops organized by BrightnESS at the ESS, and other instrument specific meetings (IKON, etc), the Field Coordinators obtained detailed knowledge of the IK delivery process, logistics, VAT on installation, quality management and CE certification, etc. Furthermore, through the Field Coordinators network, experience with obtaining the

necessary documentation for installation in Sweden (e.g. ID06 cards) was exchanged, and the process of obtaining such documentation was significantly faster. The Field Coordinator was in charge of maintaining communication with all partners in the Central Hub (DE, CH, CZ). This was done by frequent phone calls, visits and face to face meetings, where the information obtained on the above mentioned events was shared with all stakeholders. Furthermore, the Field Coordinator was continuously participating on project, programme and infrastructure meetings; as well as having continuous interactions with In-Kind Group at ESS, and other hubs through the biweekly video conferences. Such actions are now part of the project office and will persist beyond BrightnESS.

The organization and/or contribution of several workshops and meetings supported and organised through BrightnESS have proven to be of great value in resolving several issues related to the In-Kind Contributions to the ESS. Of note were the “German Contribution Workshop” in November 2016, the “Shielding Workshop” in March 2017, and the “Industry Day” in June 2018.

Lessons learned were also a topic of communication during the biweekly video conferences. Furthermore, the use of the communication management tool used by ESS (Confluence) was widely spread over the BrightnESS period and an internal cloud to share documents was established at the FZJ.

7.3.8 Nordic Hub

BrigthnESS has given the ESS and its partners a remarkable opportunity to strengthen some of the core activities related to the construction of ESS facility via In-Kind contributions. The primary benefits of BrightnESS are the creation of a network of personnel and project organisations, located at partner institutes, that work on risk identification and mitigation through increased transfer of knowledge at all levels and the creation of a persistent database of best practices. The latter is public and can be accessed through the BrightnESS WEB site. In addition, the XRM+ code permits the continual tracking of agreements and associated technical annexes and provides instant reports that give the current status of activities per country and per partner institute. This information is available to all partners.

Work package 2 had a strong impact on how the ESS reacted to In-Kind collaborations and partnerships by placing a strong emphasis on closer partnerships, more active collaboration and

the timely sharing of lessons learnt. The Nordic hub, hosting the management of WP2 together with the local management of IKC at the ESS, permitted an effective means of communication to hubs and to the ESS organization and its procedures. Interface personnel at the ESS were assigned the task of communicating queries from hubs to ESS project leaders and service administration. These interfaces will continue activities beyond BrightnESS and guarantee support to partners and ESS management. BrightnESS emphasized the need for partner-partner communication and assisted several projects by sharing lessons learnt and reporting to ESS management suggestions for improvement and optimization. Task 2.3, with the organization of the best practice workshops has benefitted all ESS players (and other large-scale projects) through the meetings and maintaining the presentations and conclusions on the BrightnESS WEB site. Figure 2 shows a screen shot of the WEB page where this information can be accessed.

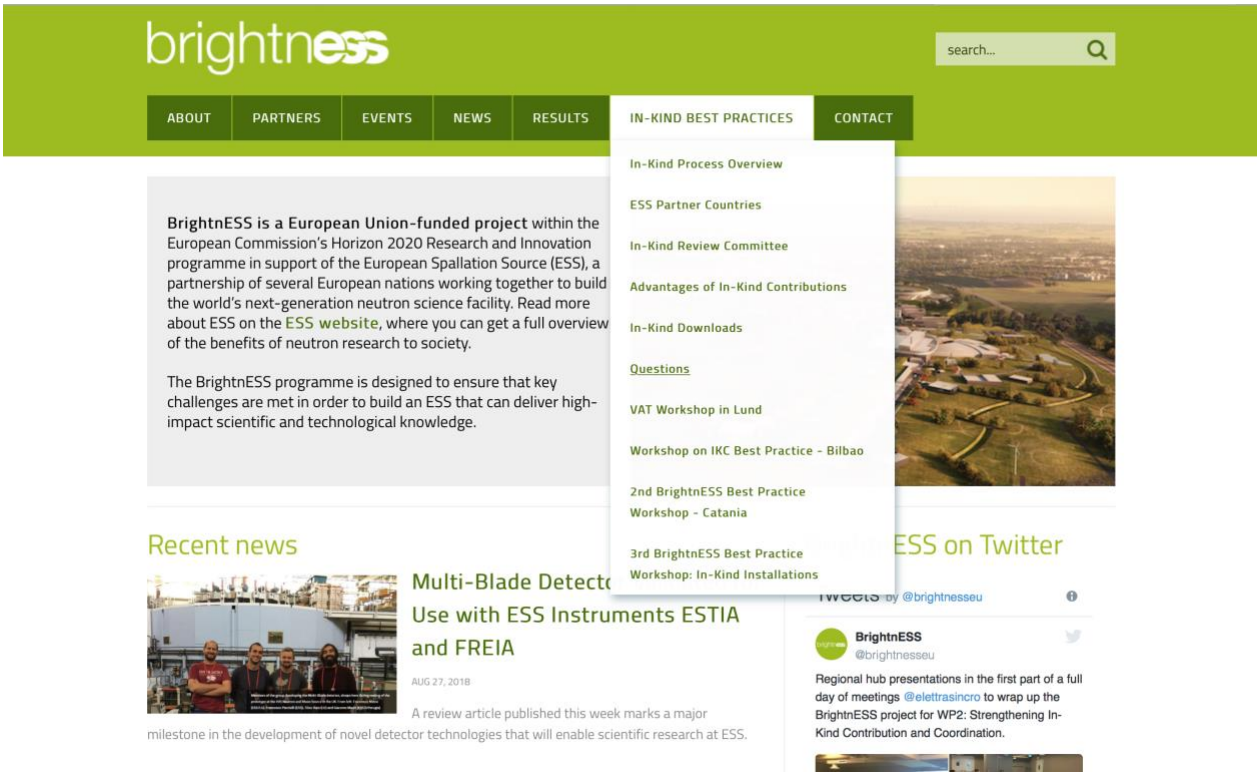

Figure 2: Screen shot of the BrightnESS WEB page showing a drop-down menu from which information and presentation given at the Best Practice workshops can be found.

Workshops were held during the project where information was disseminated, aggregated, and implemented across a number of organizations, on a variety of topics, including, but not limited to CE Markings, VAT, Installation Activities, Integration at ESS, etc. Finally, the Field Coordinator Network provided both ESS and the Partners with a strong, and responsive communication body

– which in turn resulted in quick and efficient communication channels as well as mitigation of upcoming risks or uncertainties. The combined results of these interactions and activities of Field Coordinators, workshops and training events has led to a number of Technical Annexes (Schedules) being signed in the past three years as discussed in the introduction to this report.

The ESS project will retain contact with and further utilize the remaining strong network of Field Coordinators which has proven to be integral to the development, implementation, and execution of the In-Kind activities. The Nordic-Baltic Hub will emphasize its efforts to further solidifying its work in the past three years.

The Nordic-Baltic Field Coordinator has created a strong network of contacts which have been integrated with the ESS project in numerous different ways. These relationships span both the Nordic-Baltic region itself, but also the wider European community invested in working on the ESS project. Examples being communication with the Estonian ILO, which proved to be extremely valuable and was a gateway to a number of stakeholders in Estonia, facilitating the appointment of new In-Kind Review Committee Members (IKRC) as well as VAT Workshop participants. Similar contact occurred in Norway, in addition the Field Coordinator worked closely with the head of IFE's Physics Department, Bjørn Hauback, who today is the chairperson of the In-Kind Review Committee that endorses In-Kind agreements, technical annexes and reports directly to the council of the ESS.

The XRM+ platform which has been developed together with Elettra-Sincrotrone Trieste is an invaluable tool for the entire ESS organization. Created in unison with the team's requirements, but also external stakeholder's expectations, the XRM+ tool was designed with the inherent complexity of In-Kind activities in mind. XRM+ is a one-of-a-kind tool which had to be developed from the ground up to serve the peculiar needs of managing and accounting for In-Kind. Its ease of use and reliability have allowed the central In-Kind Management Team to efficiently and accurately understand and predict current and future In-Kind Trends. Extensive development work at Elettra-Sincrotrone Trieste with ESS input resulted in software architecture that was integrated into the ESS IT Business Solutions systems and is now a single IT Infrastructure Framework under the Atlassian Software package. This package is now running on ESS servers. XRM+ provides its users with a vast array of reporting tools, schedule performance tools, documents repository, interfaces for financial control (call-offs) etc. The flexibility of the software technologies at the ESS has allowed for an optimization of XRM+ functions, for example a direct link with the Primavera

P6 Scheduling Platform. With the new link set-up, XRM+ can download monthly milestone data directly from P6, allowing users to compare Technical Annex (Schedule) contract Milestones directly with that in the ESS official planning tool. XRM+ is a highly useful tool for the ESS and its partners, and the platform will be maintained and supported by the ESS to assure a consistent and up-to date understanding of In-Kind Data for years to come. Figures 3 to 8 show some screenshots of the XRM+ code running on ESS servers.

The Nordic-Baltic Field Coordinator working from the central In-Kind group at the ESS facilitated Field Coordinators. This assistance was quick access to In-Kind procedures and processes at the ESS, the dissemination of time critical information and direct communication with higher ESS management of emerging risks and means to mitigate identified by partners.

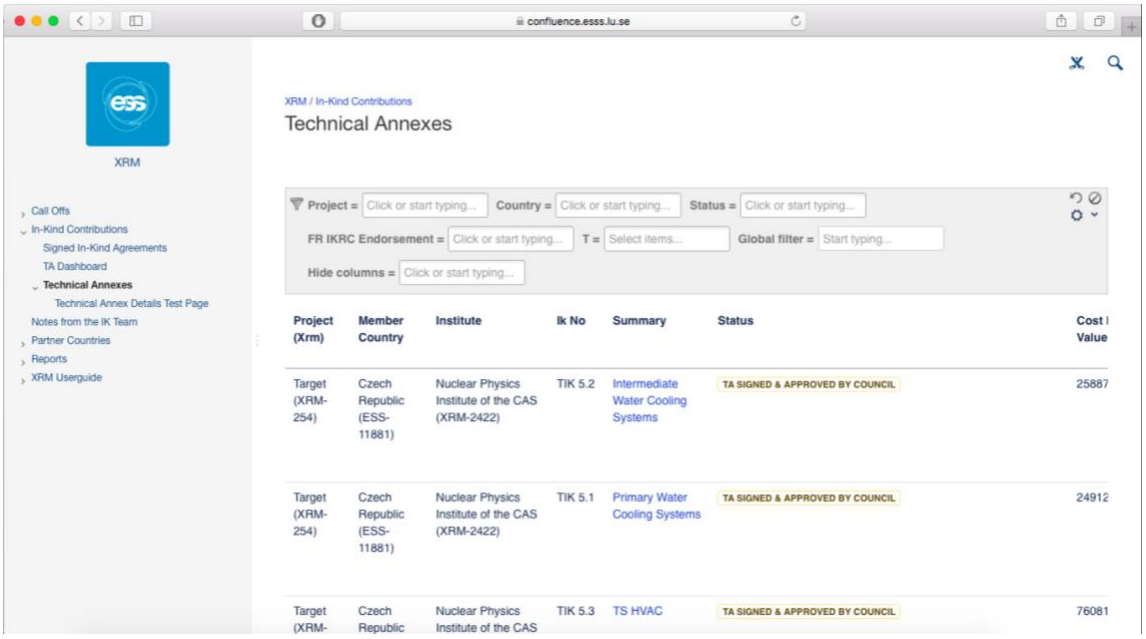

Figure 3: XRM+ Technical Annexes View

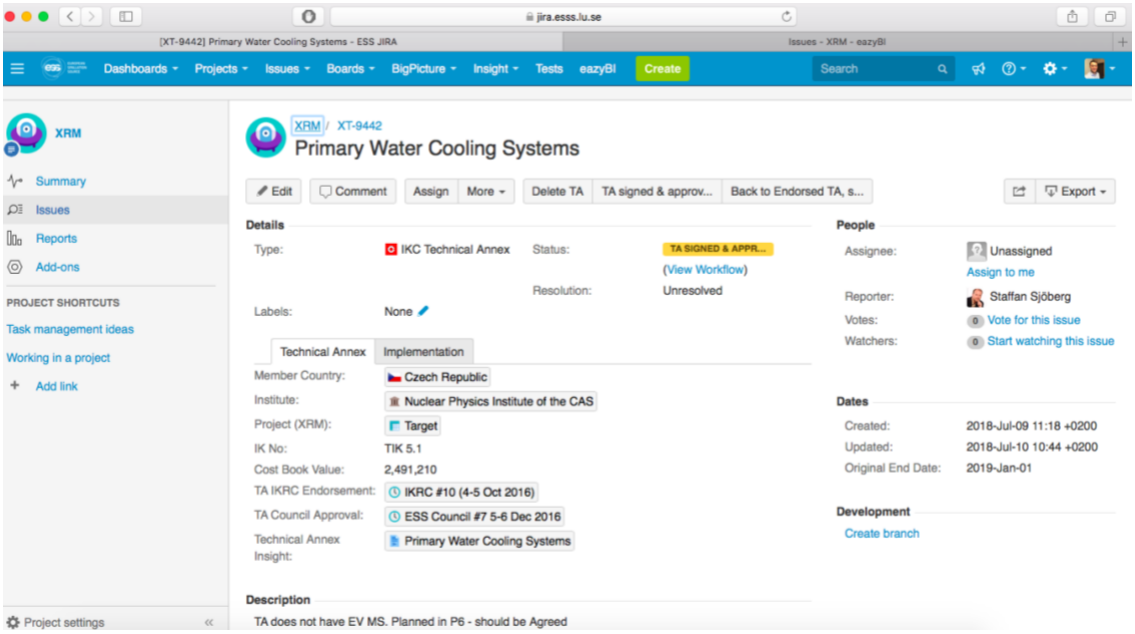

Figure 4: XRM+ Individual Technical Annex View

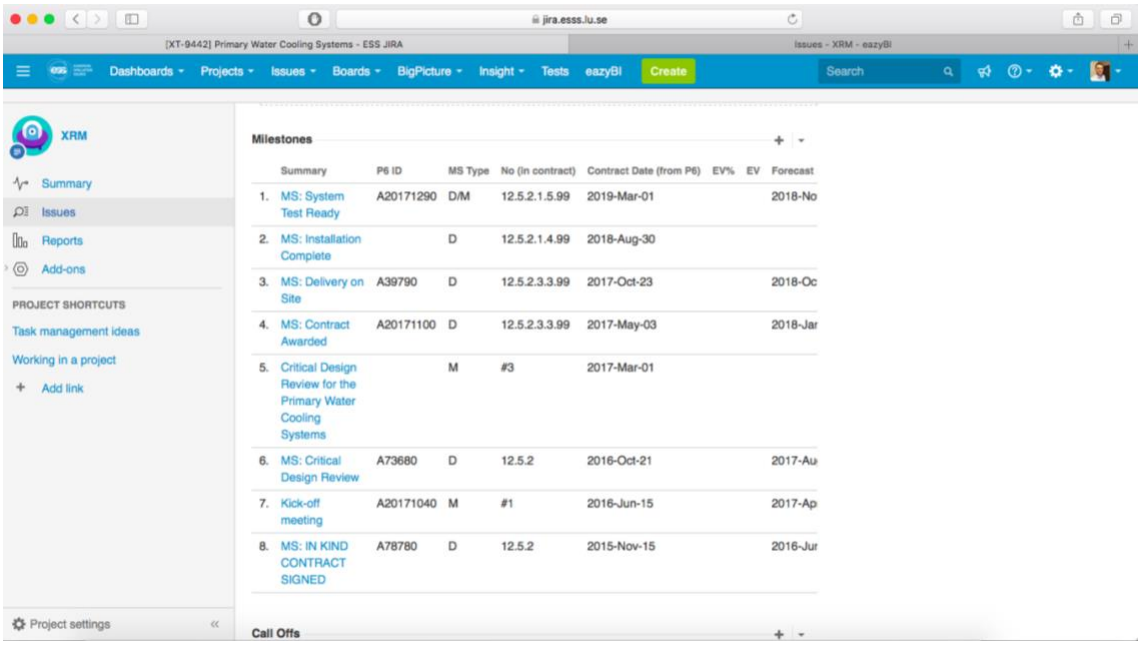

Figure 5: XRM+ Milestones View

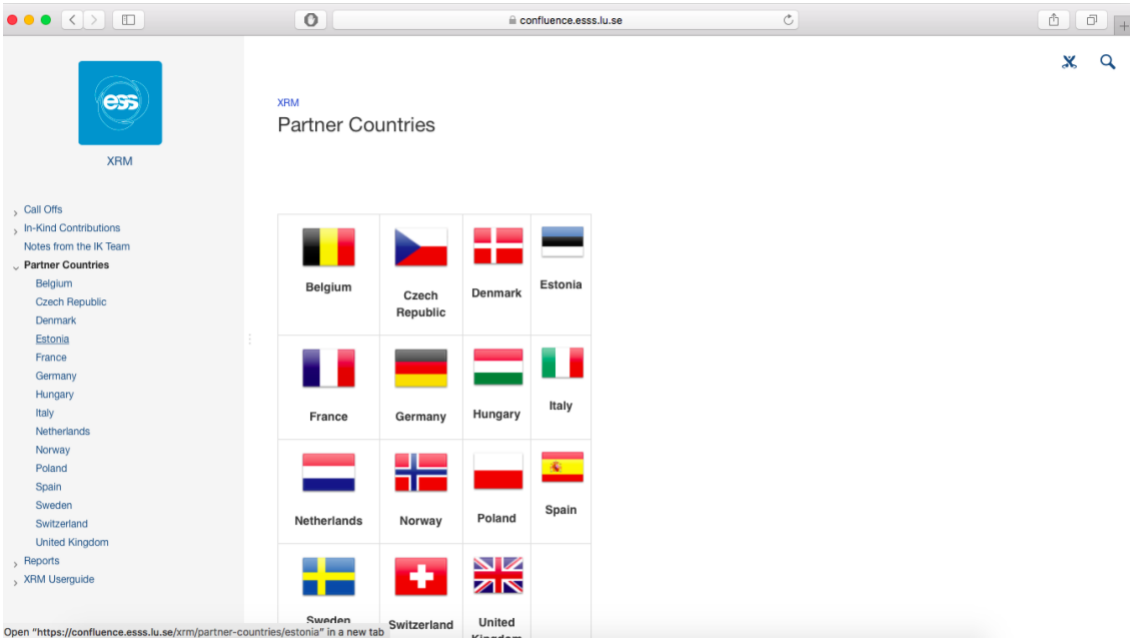

Figure 6: XRM+ Country Level View

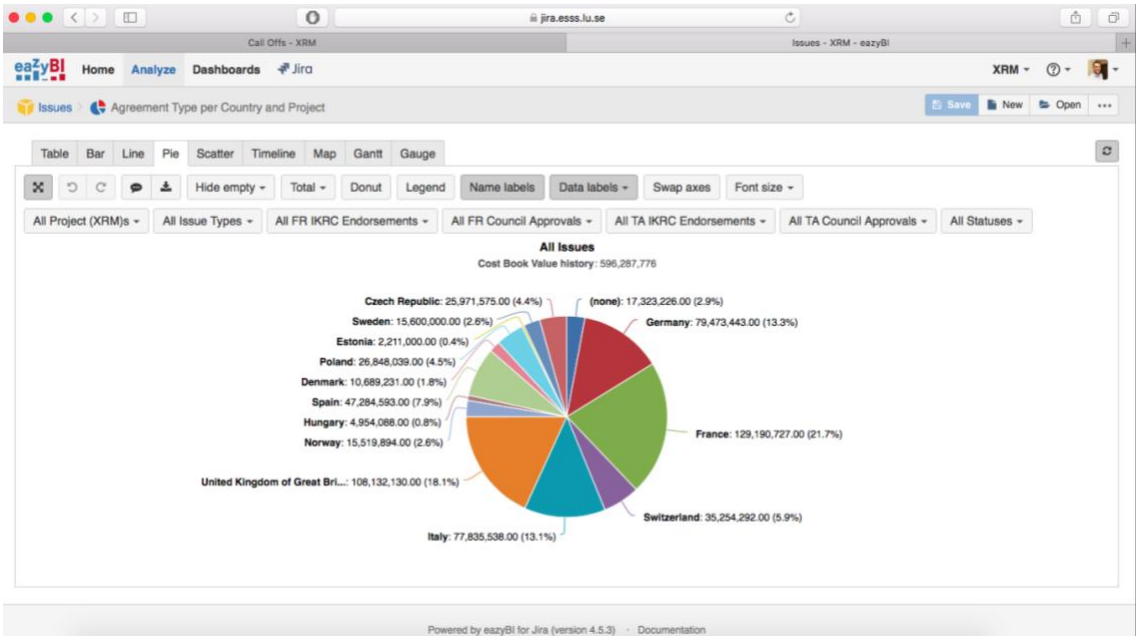

Figure 7: XRM+ EaZyBI Analysis Pane

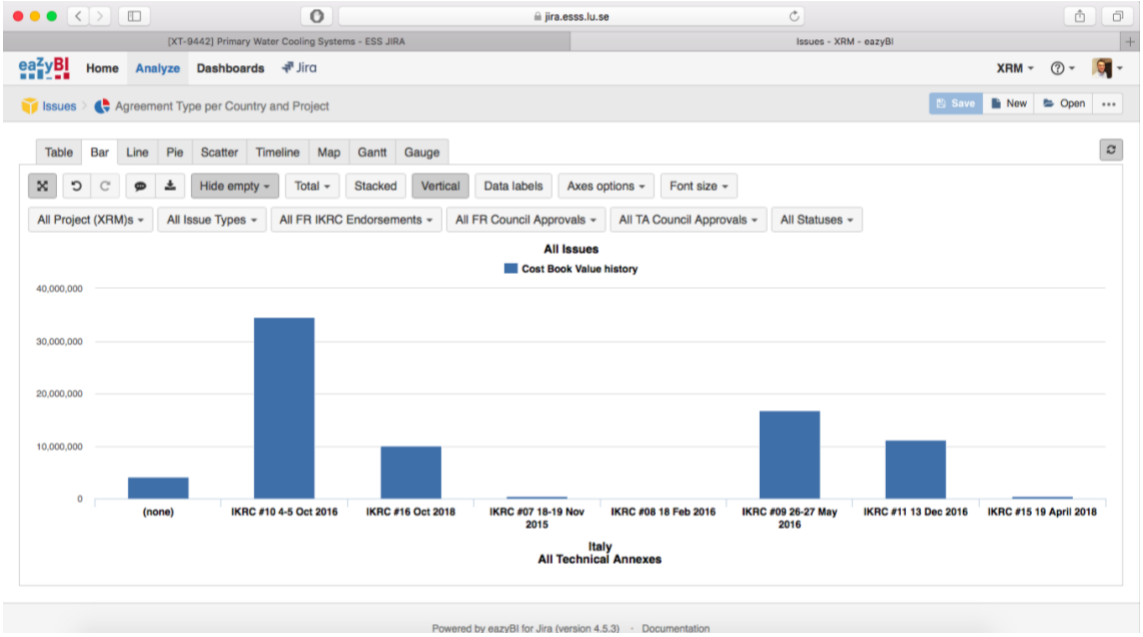

Figure 8: XRM+ EaZy BI Customizable Reports

8 Conclusions

BrightnESS Work Package 2 has been instrumental in assisting partners and the ESS to reach it goals for the identification and conversion to endorsed and/or approved In-Kind Contributions. The work package has enabled a highly effective network of personnel and organisations at partner countries, established interfaces at the ESS towards partners, enhanced partner-to-partner interactions, strengthened institute to industry communication, established a database of best practices for large-scale infrastructure project engineering and implementation and provided a highly effective software package for the management and optimisation of In-Kind contribution management. The majority of these actions will persist beyond BrightnESS and ensure the continuation of In-Kind contribution management towards the successful construction and operation of the ESS.