

BrightnESS Best Practice Workshop

Engineering aspects of large-scale In-Kind projects

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Summary

- Introduction
- Brightness
- ESS project
- Workshop scope
- Workshop expectations
- ESS High level engineering strategies

- A special thanks to
 - Brightness for making this workshop possible.
 - Elettra Sincrotrone Trieste for all the practical arrangements.
 - ESS Bilbao for hosting this workshop and a key In-Kind partner to the ESS project.
 - Chairmen's, speakers and participants.

BrightnESS in a Nutshell



EU-funded project within the European Commission's
Horizon 2020 Research and Innovation Program

BrightnESS serves as a risk mitigation tool in the delicate process of becoming fully operational

In-kind contribution

- The knowledge and skills of European companies, and institutes, are best deployed in In-Kind Contributions.*

Technical performance

- The highest technical performance is obtained from the ESS target, moderators* and detectors in order to deliver world class science.

Increase innovation impact

- The innovation impact of ESS will be increased through TTO, ILO, PCP activities, and through sustainability measures supporting the ERIC, new members and future user communities.

Objectives

SCIENTIFIC OBJECTIVES

Detectors

Developing
technologies

Moderators

Advancing cold
neutron moderators

Data

Enabling real time
processing

NON-SCIENTIFIC OBJECTIVES

Community
building

In-kind risk
management

Improving ESS
governance
structure

Industrial
participation,
knowledge
transfer

ESS design



High Power Linear Accelerator:

- Energy: 2 GeV
- Rep. Rate: 14 Hz
- Current: 62.5 mA

Target Station:

- He-gas cooled rotating W-target (5MW average power)
- 42 beam ports

Ion Source

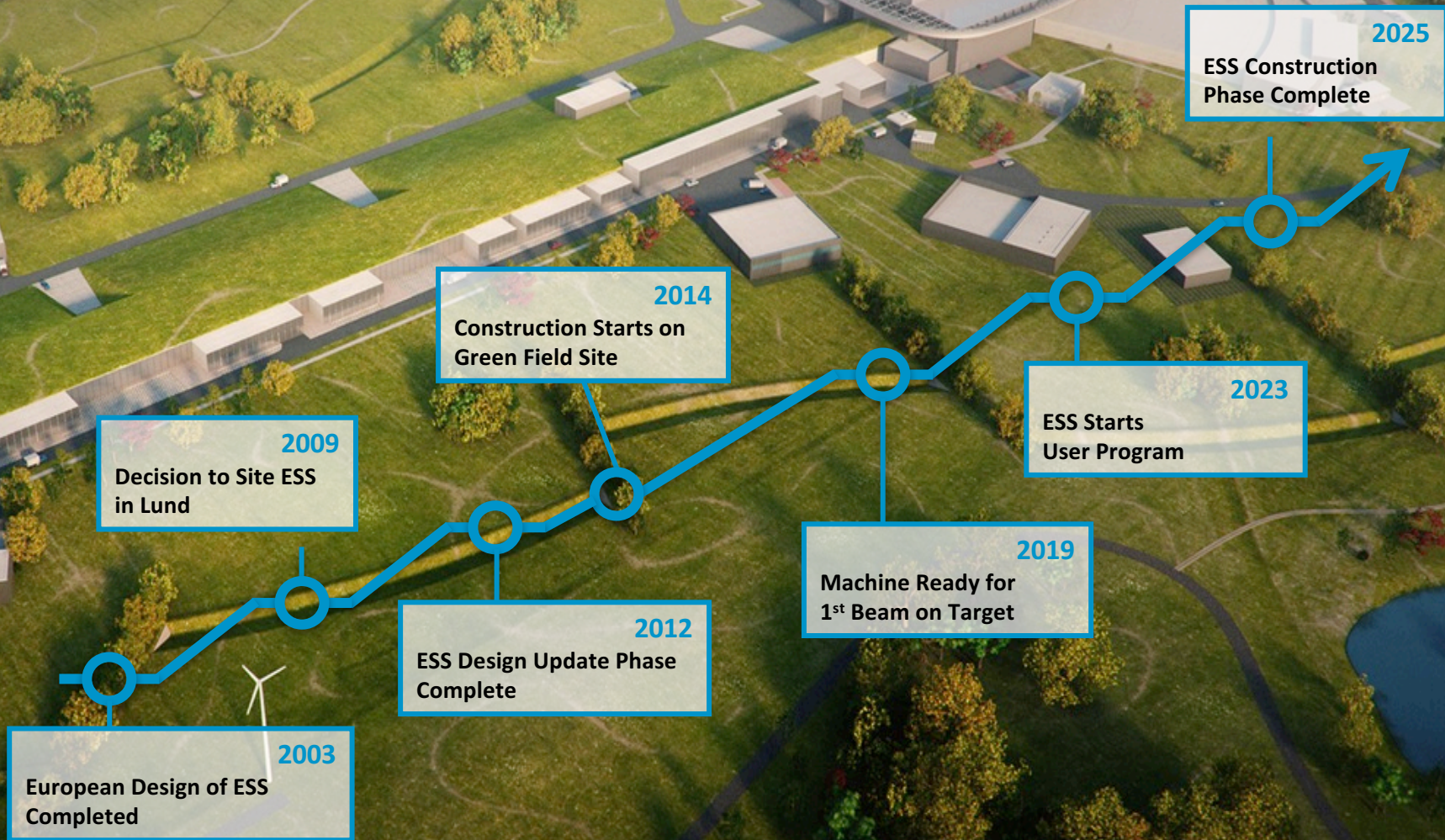
16 Instruments in
Construction budget

Committed to deliver 22
instruments by 2028

Peak flux ~30-100 brighter
than the ILL

Total cost: 1843 MEuros 2013

Journey to deliver the world's leading facility for research using neutrons



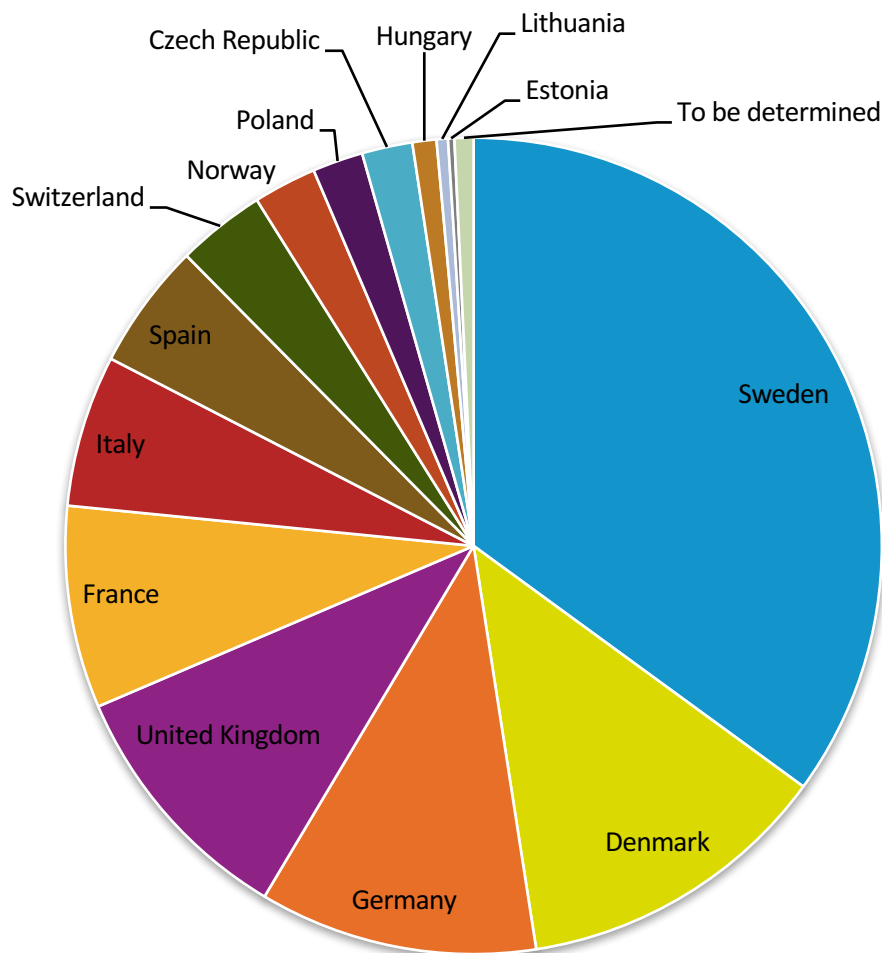
Construction investment

CURRENT

Sweden (member)	35.0 %
Denmark (member) *	12.5 %
Germany (member) *	11.0 %
United Kingdom (member)	10.0 %
France (member)	8.0 %
Italy (member)	6.0 %
Spain (founding observer) *	5.0 %
Switzerland (member)	3.5 %
Norway (member)	2.5 %
Poland (member)	2.0 %
Czech Republic (member)	2.0 %
Hungary (member)	0.95 %
Estonia (member)	0.25 %
Total *	~98.7 %

FUTURE

Belgium (founding observer)	<i>tbd</i>
Netherlands (founding observer)	<i>tbd</i>
Lithuania (future observer)	<i>tbd</i>
Greece (future observer)	<i>tbd</i>
Turkey (future observer)	<i>tbd</i>
Latvia, Portugal, Finland	<i>tbd</i>



* Includes Pre-construction Costs, Current Construction Commitment

ESS In-kind Partners

Aarhus University

Atomki - Institute for Nuclear Research

Bergen University

CEA Saclay, Paris

Centre for Energy Research, Budapest

Centre for Nuclear Research, Poland, (NCBJ)

CNR, Rome

CNRS Orsay, Paris

Cockcroft Institute, Daresbury

Elettra – Sincrotrone Trieste

ESS Bilbao

Forschungszentrum Jülich

Helmholtz-Zentrum Geesthacht

Huddersfield University

IFJ PAN, Krakow

INFN, Catania

INFN, Legnaro

INFN, Milan

Institute for Energy
Research (IFE)

Rutherford-Appleton Laboratory, Oxford (ISIS)

Kopenhagen University

Laboratoire Léon Brillouin (LLB)

Lund University

Nuclear Physics Institute of the ASCR

Oslo University

Paul Scherrer Institute (PSI)

Polska Grupa Energetyczna - PGE

Roskilde University

Tallinn Technical University

Technical University of Denmark

Technical University Munich

Science and Technology Facilities Council

University of Tartu

Uppsala University

WIGNER Research Centre for Physics

Wroclaw University of technology

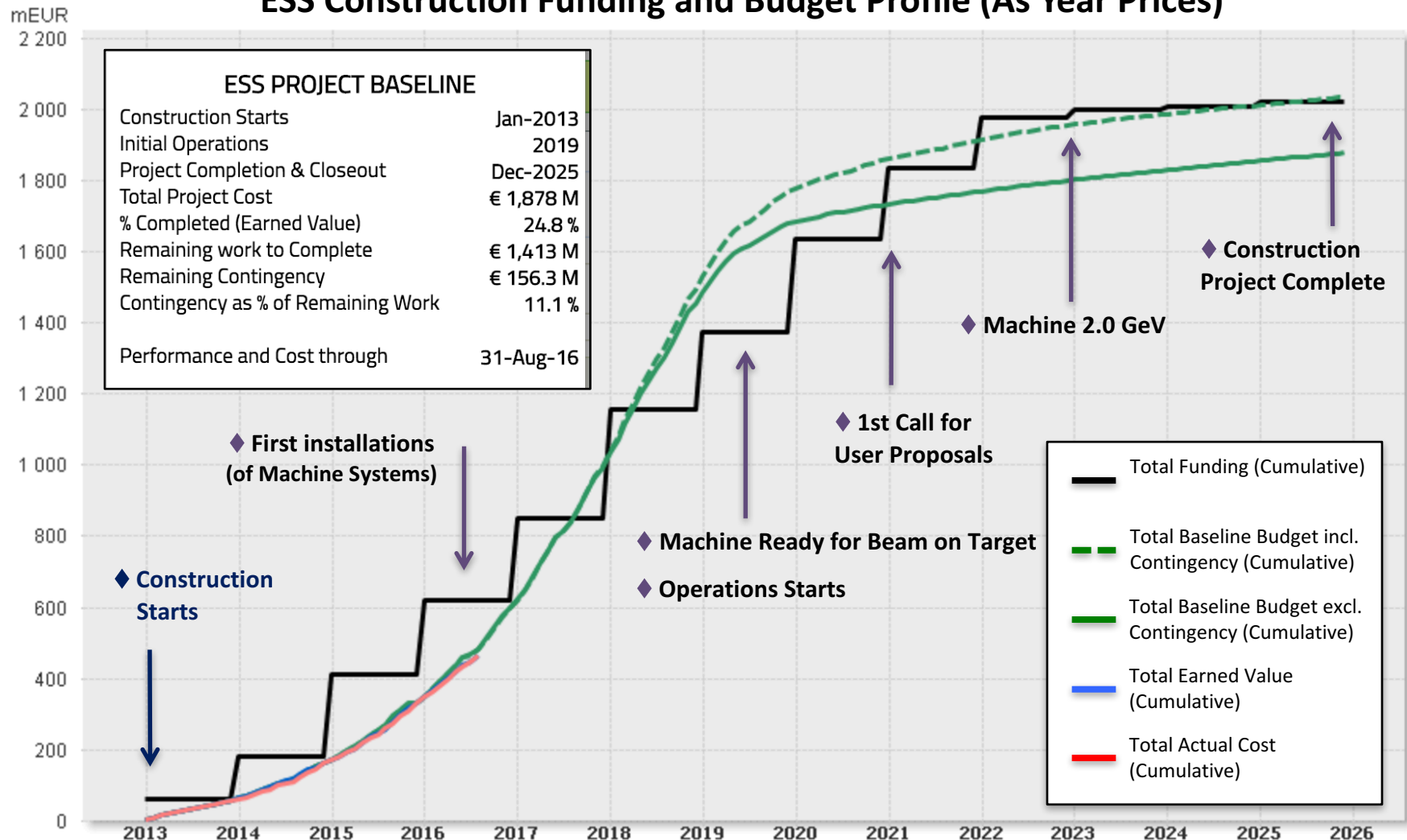
Warsaw University of Technology

Zurich University of Applied Sciences (ZHAW)



Construction Profile, Aug 2016

ESS Construction Funding and Budget Profile (As Year Prices)

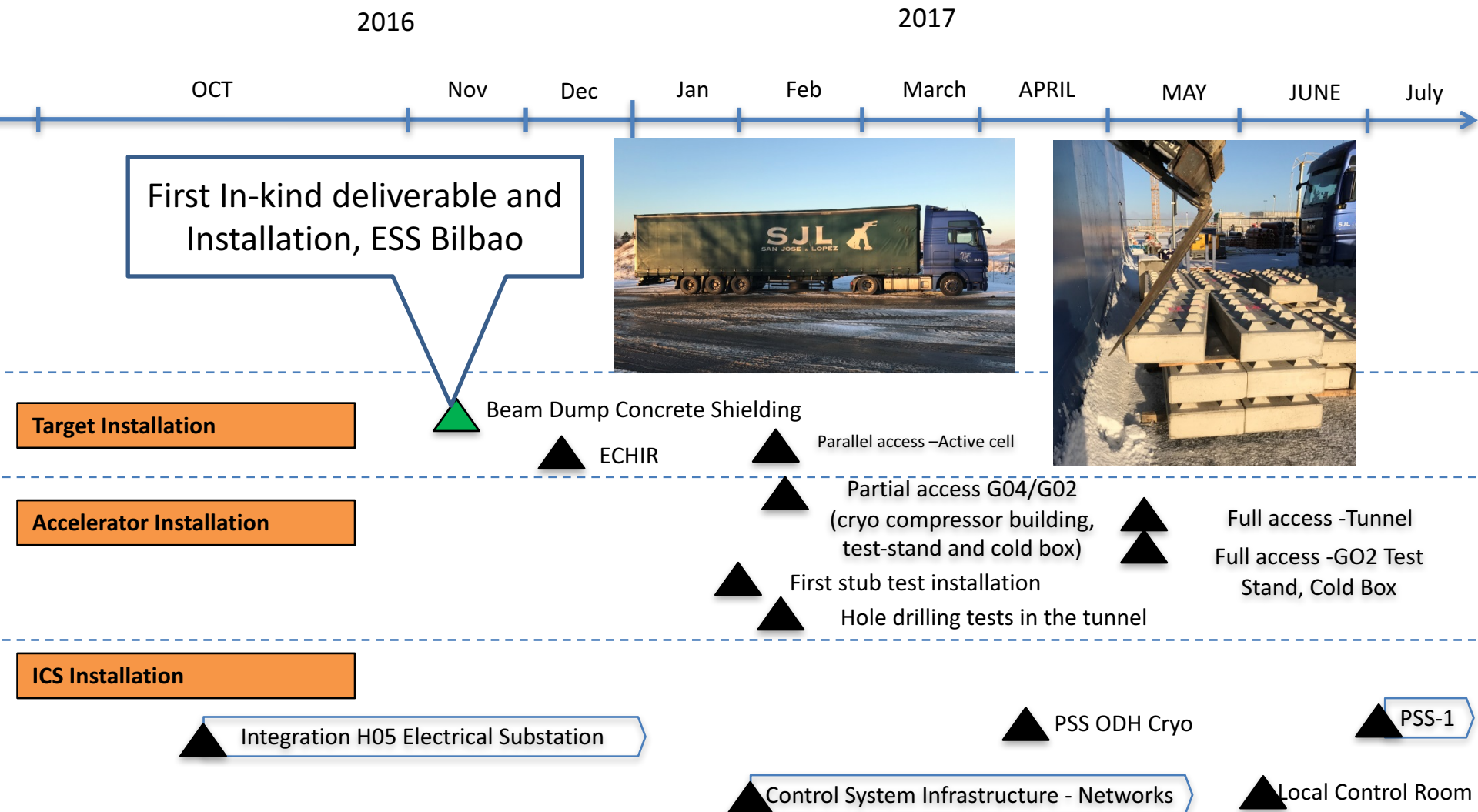




EUROPEAN
SPALLATION
SOURCE

November 2016

Schedule- Installation



ESS architectural view



ESS background and information

- A greenfield project and organization
 - No host laboratory or university.
 - Fixed construction budget, 1.843 M€.
 - Approximately 40% of the total budget as In-Kind.

Workshop scope

- The workshop will be dedicated to the engineering requirements and constraints of in-kind contributions (IKC) to large-scale research infrastructure projects.
- The aim of the workshop is to share experience and propose improvements to the engineering practices when working on IKC.
- The workshop aims to share knowledge gained from other large-scale projects, from partners and the ESS itself.

Workshop expectation

- To share knowledge and lesson learned for organizations having experience in large-scale In-Kind collaborations during 2 days
 - Interesting talks.
 - Fruitful discussions.
 - Good advices and recommendations.
- Please remember to keep focus on engineering during the sessions and each chair has an important role to guide the discussions
 - In-Kind
 - Engineering
 - Topic

High level engineering strategies for ESS

- Standardization
 - One governing document being the reference for all aspects of standardization at ESS.
 - Cross-organizational Working Groups for standardization
 - Electrical, Mechanical, Electronics.
 - A common engineering manual.
 - Standard PLM and design/support tools
 - ESS standard offered to ESS In Kind partners.
- Integration
 - Requirements and interface documents.
 - One common coordinated 3D master model
 - Buildings, machine, instruments.
 - Integration reviews.
 - Coordinated overview of installation/commissioning.
- Project Information Management
 - One PLM platform and well defined structures for consolidation and management of documented information
 - Repositories.
 - Structures for technical documentation with build in support for baselining, reports etc.
 - A complementary collaborative platform to the PLM solution in Confluence from the Atlassian suite.

Thank you!

