



The European Spallation Source

John Womersley, Director General

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EUROPEAN
SPALLATION
SOURCE

Neutron science



Energy

Environment and climate

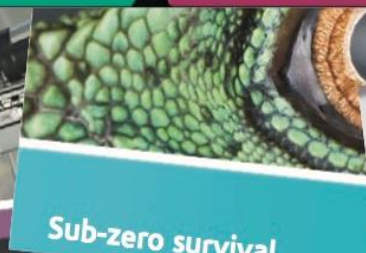
Medicine and health

Electronics and IT

Manufacturing and industry

Natural world

Heritage science



Hydrogen-fuelled society

Sub-zero survival

Super superconductors

Disease resistant crops

Tackling chemical waste in the pharmaceutical industry



Flexible plastic solar cells

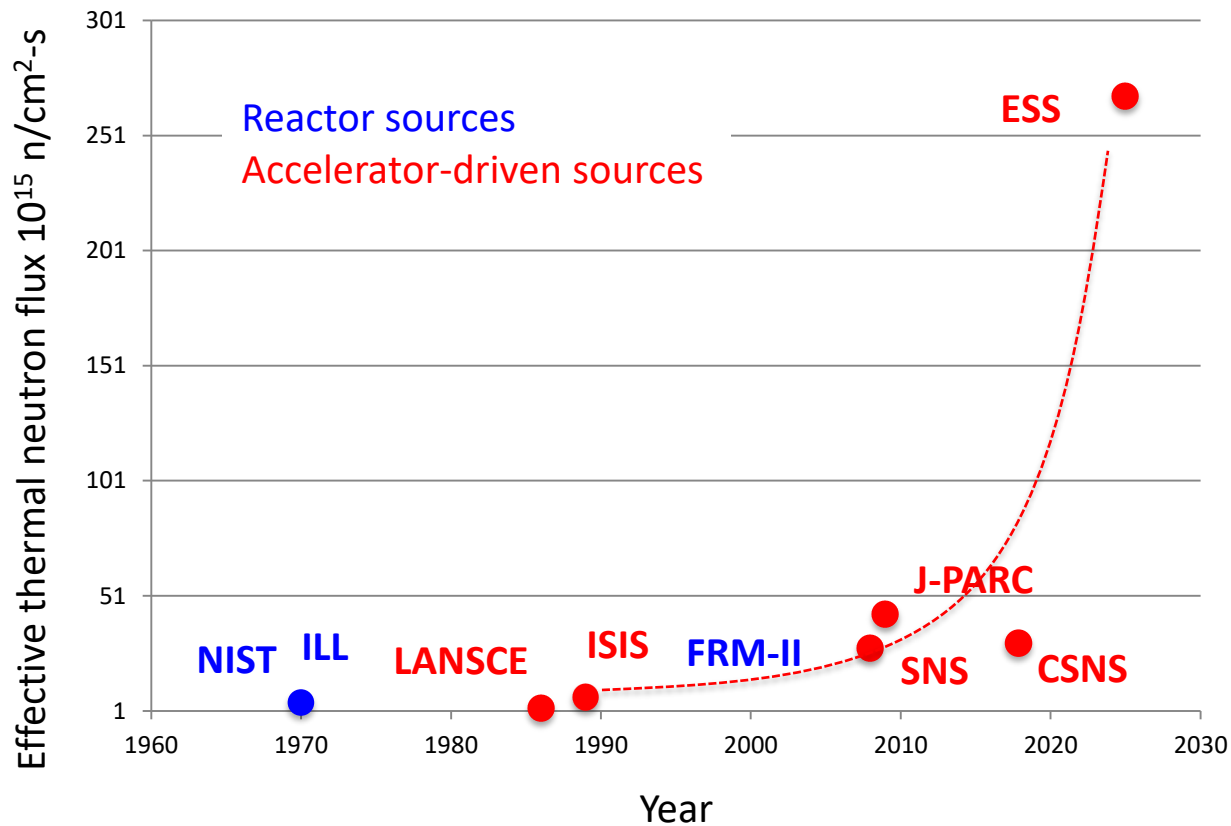
Tracking cholesterol

Enhanced oil recovery

Infection sensors

Stress relief in the air

ESS Mission: Build the world's brightest neutron source



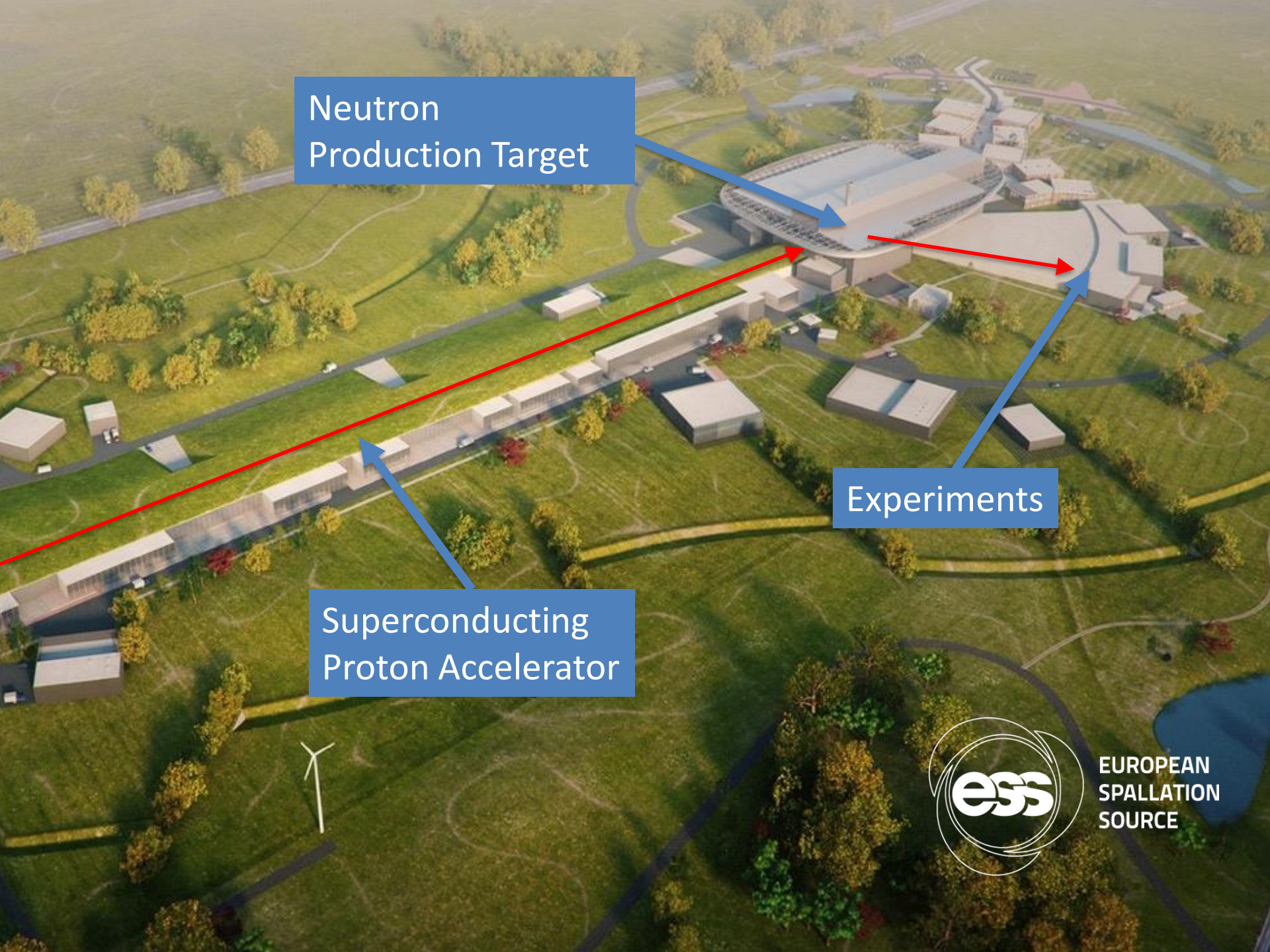
Neutron
Production Target

Experiments

Superconducting
Proton Accelerator



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Some numbers

1843 M€ construction cost

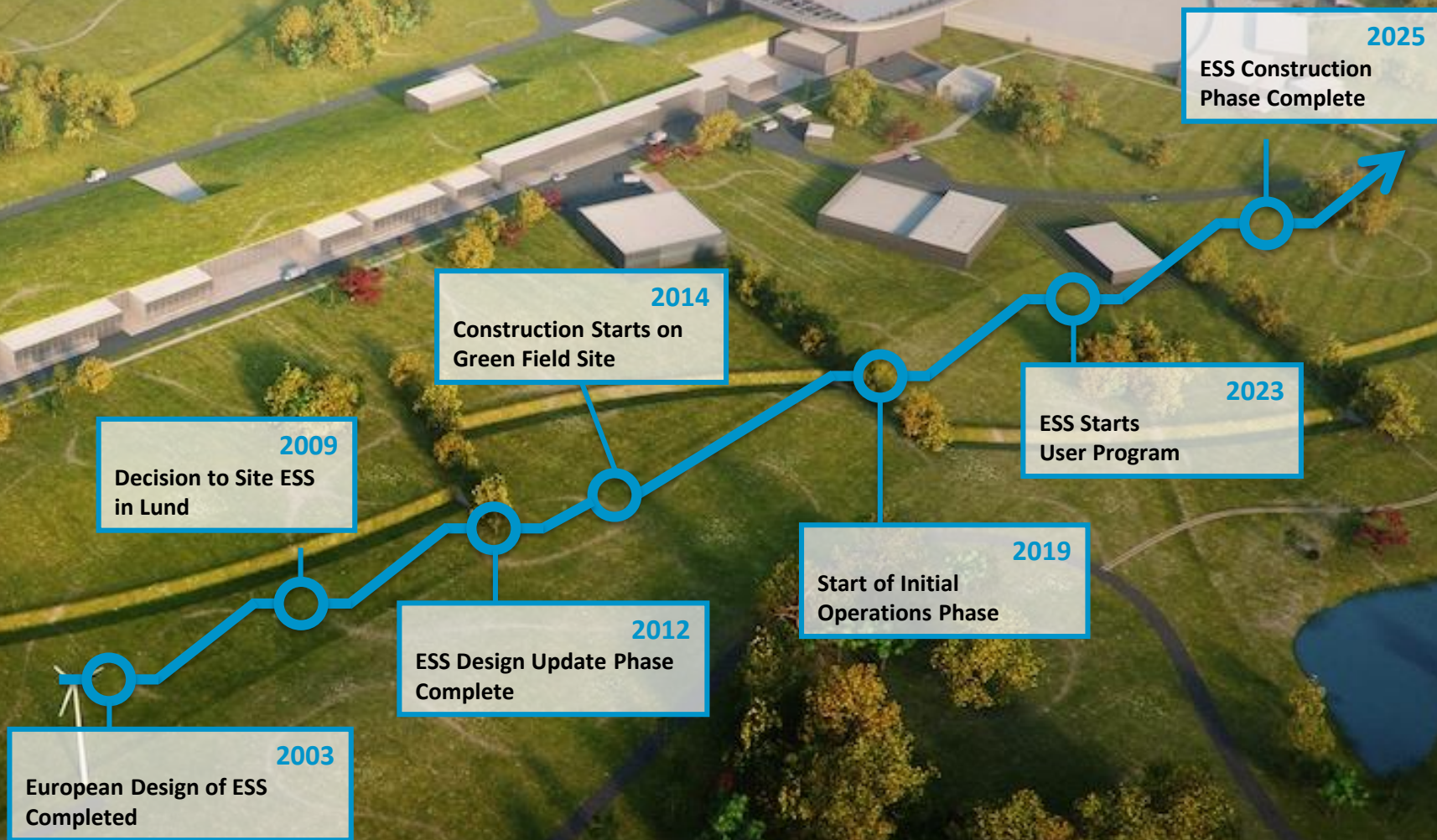
5 MW world's most powerful particle accelerator

15 experimental stations

20 × more sensitive on average than today's best

800 experiments per year

2023 first science for users



Financing includes cash and deliverables

The European Spallation Source ERIC established in 2015

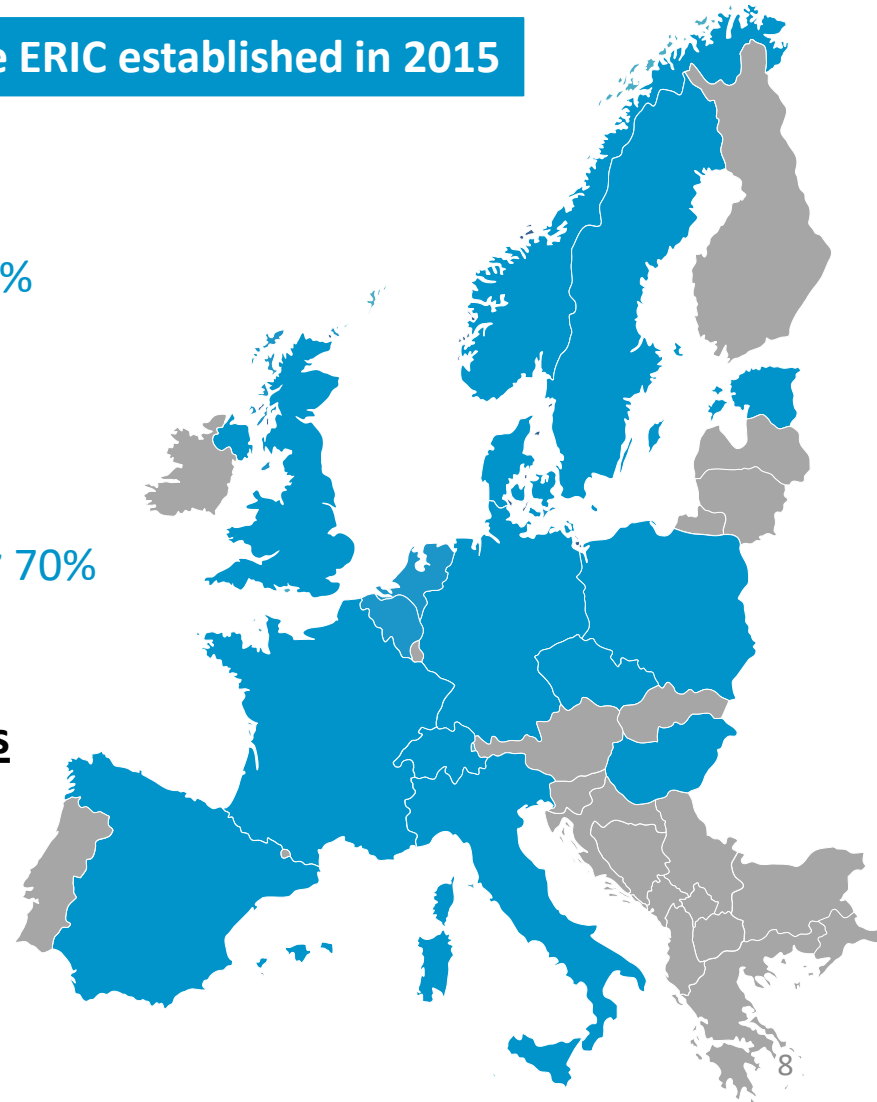
Host Countries Sweden and Denmark

Construction 47.5% Cash Investment ~ 97%
Operations 15%

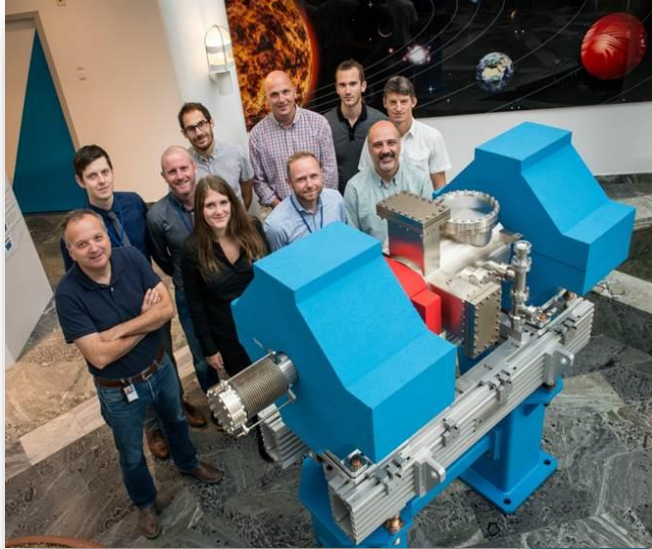
Non Host Member Countries

Construction 52.5% In-kind Deliverables ~ 70%
Operations 85%

15 European Member and Observer Countries



ESS In-kind Partners



Forschungszentrum Jülich
 Helmholtz-Zentrum Geesthacht
 Huddersfield University
 IFJ PAN, Krakow
 INFN, Catania
 INFN, Legnaro
 INFN, Milan
 Institute for Energy
 Research (IFE)

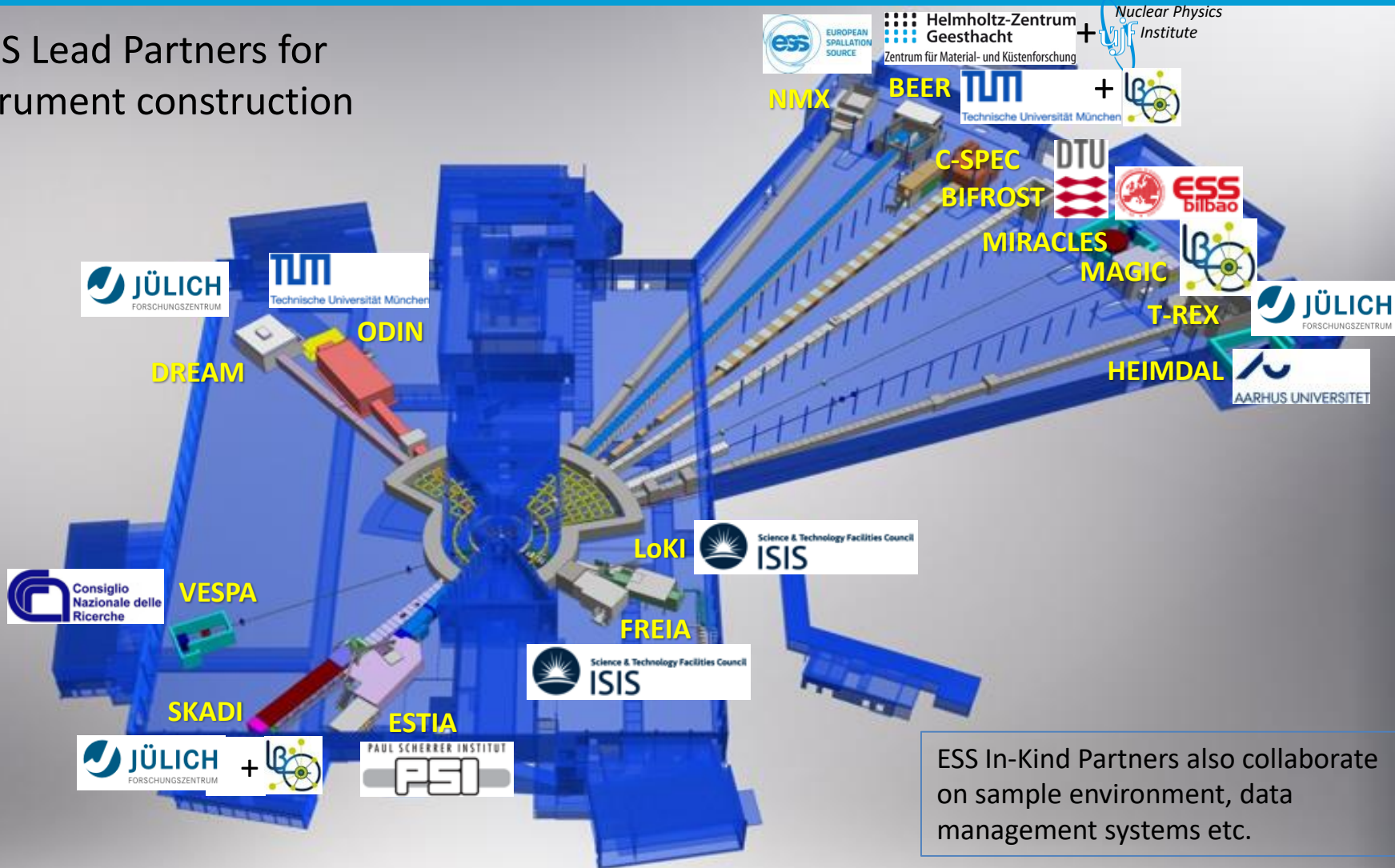


ISIS - Rutherford-Appleton Laboratory, Oxford
 Laboratoire Léon Brillouin (LLB)
 Lund University
 Nuclear Physics Institute of the ASCR
 Oslo University
 Paul Scherrer Institute (PSI)
 Polish Electronic Group (PEG)
 Roskilde University
 Tallinn Technical University
 Technical University of Denmark (DTU)
 Technical University Munich (TUM)



NSS Neutron Instrument positions

ESS Lead Partners for
instrument construction



ESS In-Kind Partners also collaborate on sample environment, data management systems etc.

Data Management and Software Centre

COBIS, Copenhagen University North Campus



Provide world leading scientific software and scientific computing support for neutron scattering at ESS

Scientific Software

ESS experiment control system, Data acquisition, Data correction software, visualization, and software to model and analyze experimental data sets.

Data center operations

Store and catalogue ESS datasets, provide ESS users remote access to their data, computing for live data correction, and analysis software during and after experiments.

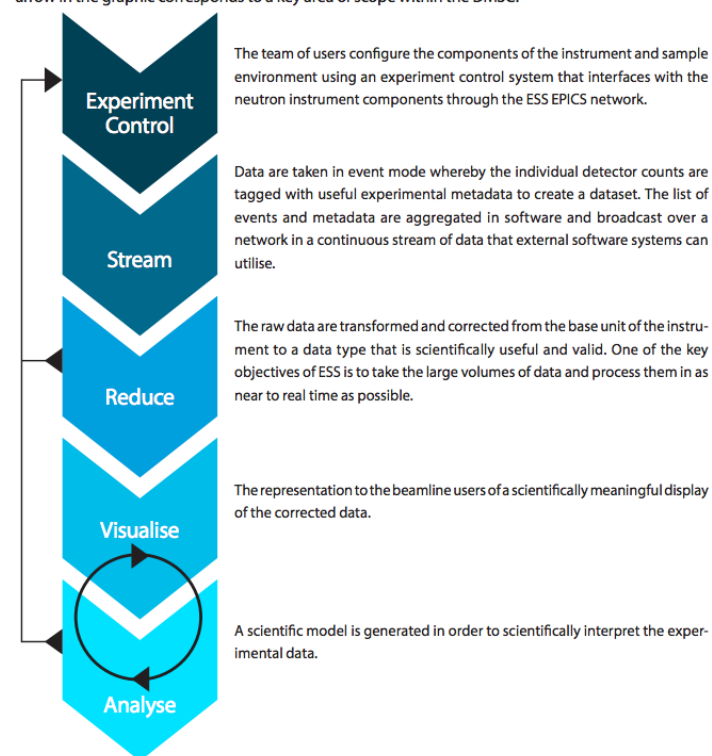
User support

Support ESS users with data treatment and analysis.



From Lund to Copenhagen, and Back Again

The figure illustrates a typical data flow for a neutron scattering experiment. Each arrow in the graphic corresponds to a key area of scope within the DMSC.



Data Flow / Experiment Control

A key objective is to build in from the start the capability for the interconnected software systems to control the experiment. The lines connecting parts of the data flow to the experiment control represent this functionality.

Iterative Workflow

The circle in the graphic represents the iterative workflow of scientific modelling and visualisation of model and experimental data that is often used.

Civil Construction Groundbreaking



September 2014



Now

Accelerator & Klystron Gallery



Linac



Phase reference line installation in G01





Klystron Gallery
MEP – Test & Commissioning

Mock-up of waveguides in stub

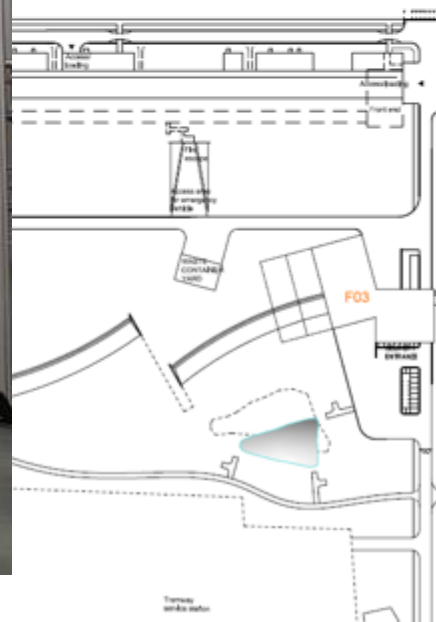


Progress on RF Test Stand 2 in G02

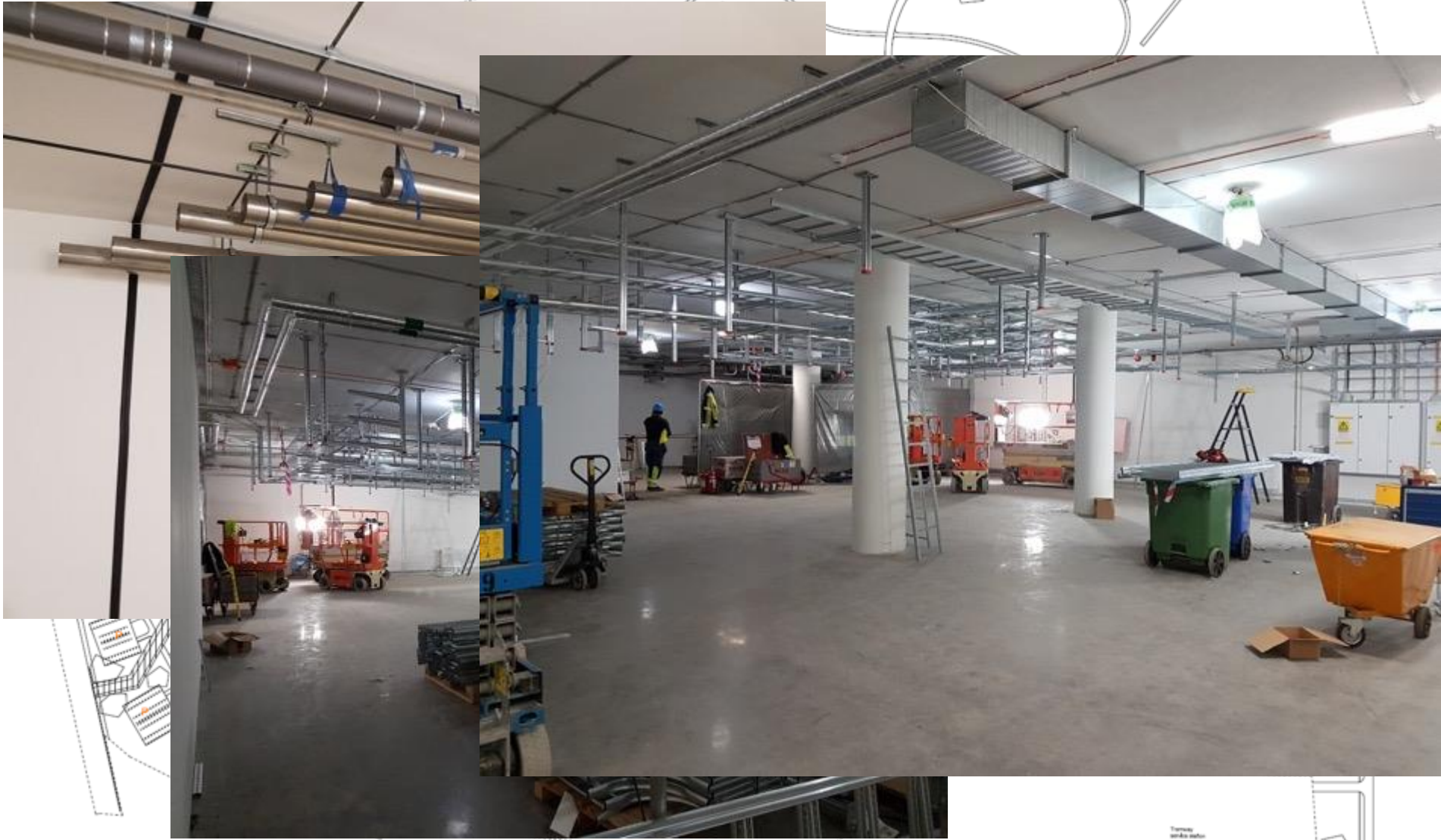


Installation of Racks,
Cable Trays and Power
Distribution

2



On-going installation of Ion Source and LEBT

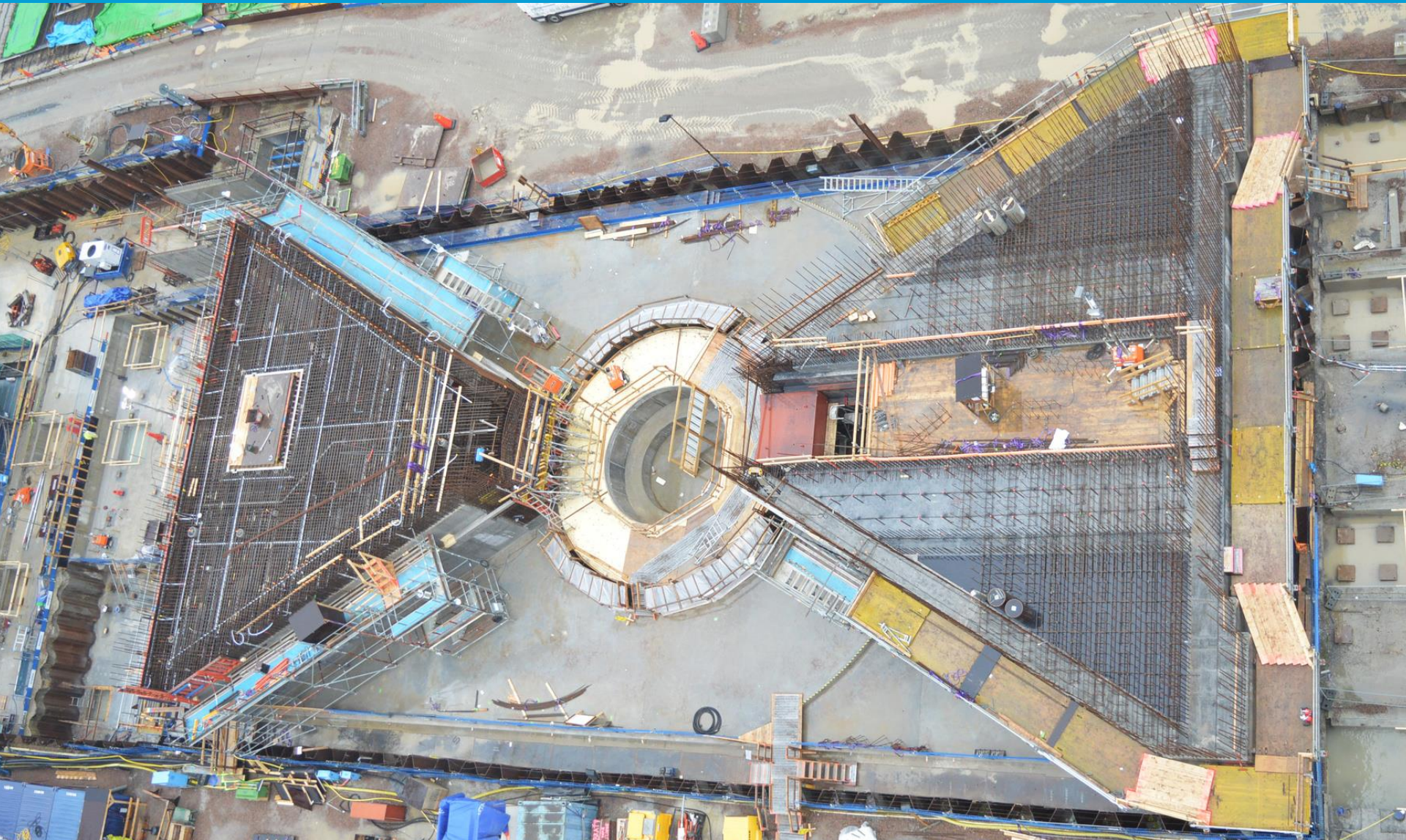


Ion Source Delivery December 2017



Target Monolith Overview

November 2017



Active Cells Area November 2017



E-buildings (long instrument halls)

November 2017

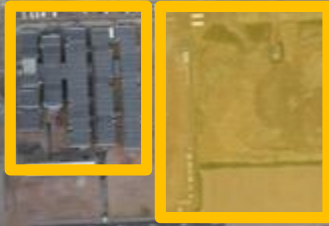


Move to Construction Site

Permanent
Office
Campus

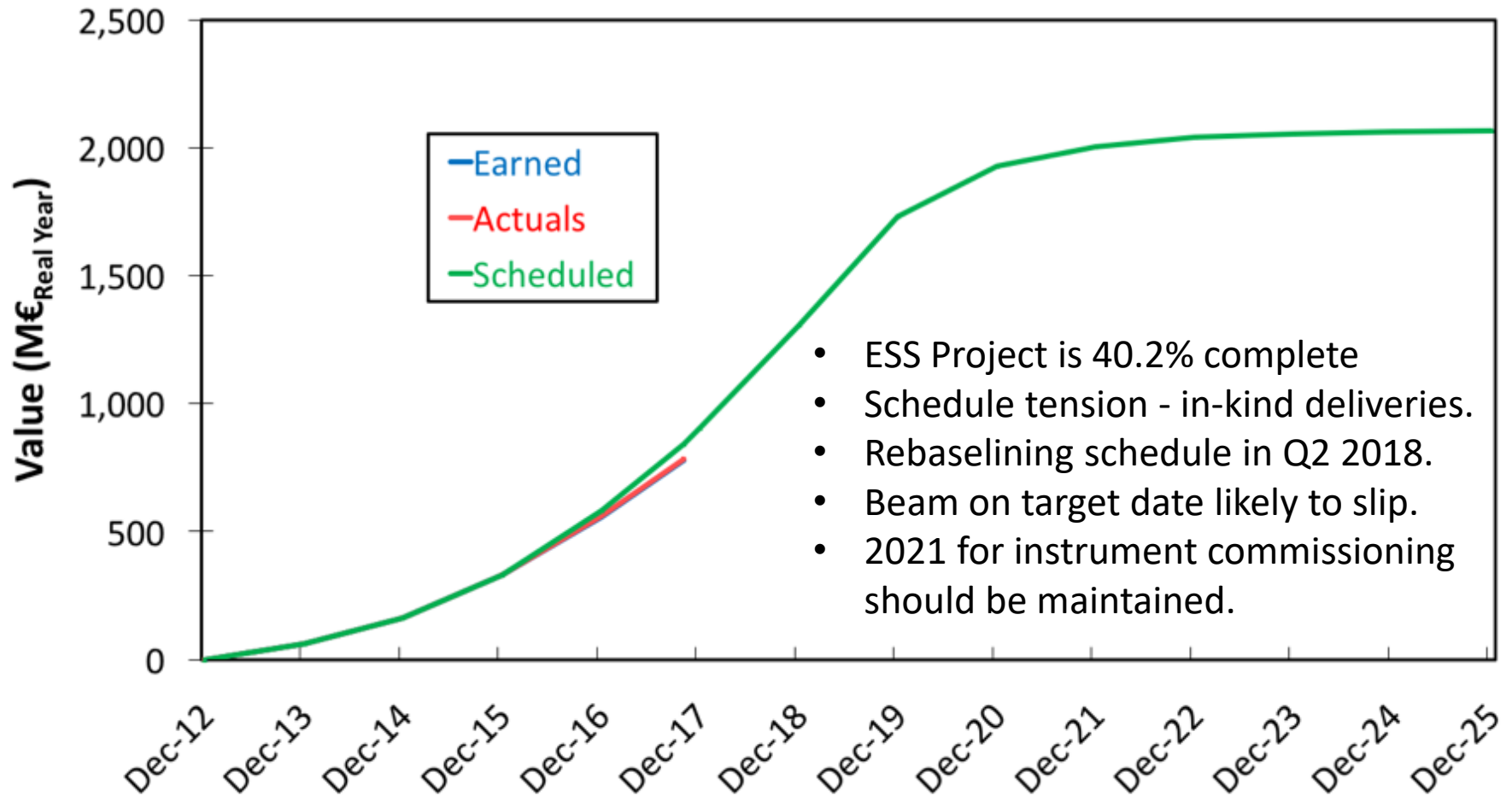
Current Skanska + ESS offices

New 2018 ESS offices



Lund Tramway Depot

ESS schedule



Science Village Scandinavia



SCIENCE VILLAGE SCANDINAVIA

SPACE Building: Reception, exhibition space, guest house for MAX IV and ESS (~100 rooms), office and meeting space, restaurant



Tramway to Lund C station

Thank you!

@johnwomersley

@essneutron

europeanspallationsource.se