

## **European Spallation Source**

ESS Partner and Industry Day Paris, 7 February 2014

Jim Yeck
CEO & Director General

#### **Dimensions of ESS**

A Next Generation Materials Research Infrastructure



#### PROJECT/FACILITY

A partnership of 17
European nations
committed to the goal of
collectively building and
operating the world's
leading facility for research
using neutrons by the
second quarter of the 21st
century.



#### **SCIENCE**

The most powerful spallation source with the highest flux and realtime data acquisition

- Life science
- Soft condensed matter
- Chemistry of materials
- · Energy research
- Magnetism and superconductivity
- Engineering materials and geosciences
- Archaeology and heritage conservation
- Fundamental and particle physics

#### **SOCIETY**

Research directly related to societal values Opportunity to benefit from the innovation capacity of industry.

Driver for job creation



#### Neutrons are special

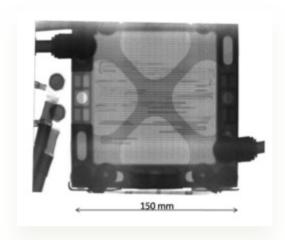
# **EUROPEAN**

#### **Charge neutral**

#### S=1/2 spin

#### **Nuclear scattering**

#### Deeply penetrating

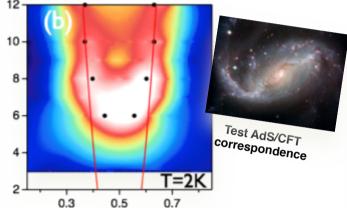


Li motion in fuel cells



Help build electric cars

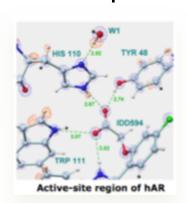
Directly probe magnetism Sensitive to light elements and isotopes



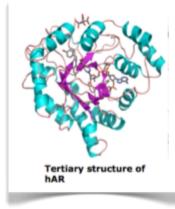
Solve the puzzle of High-Tc superconductivity



Efficient high speed trains

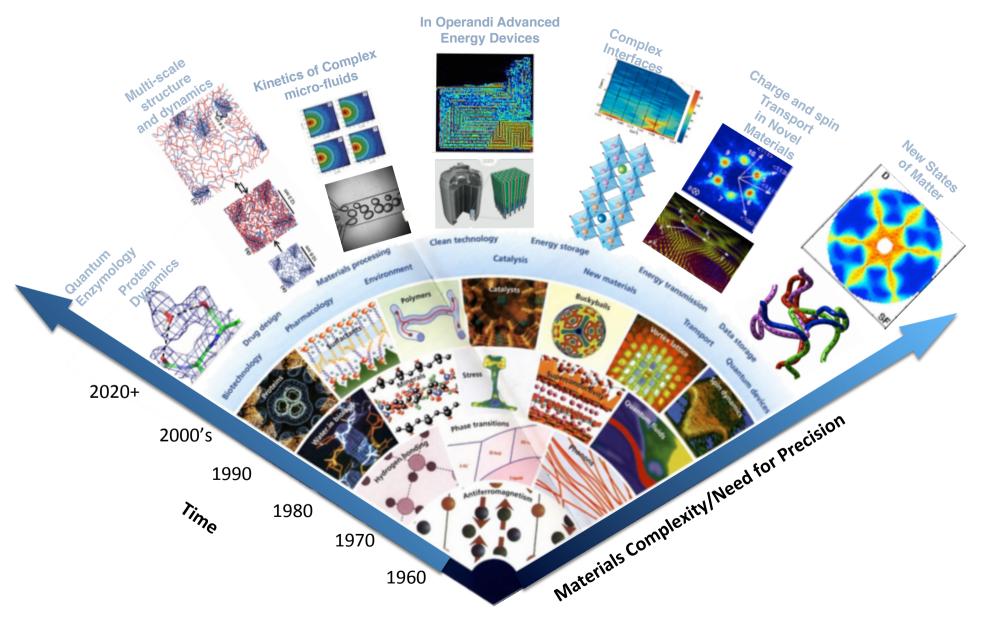


Actives sites in proteins



Better drugs

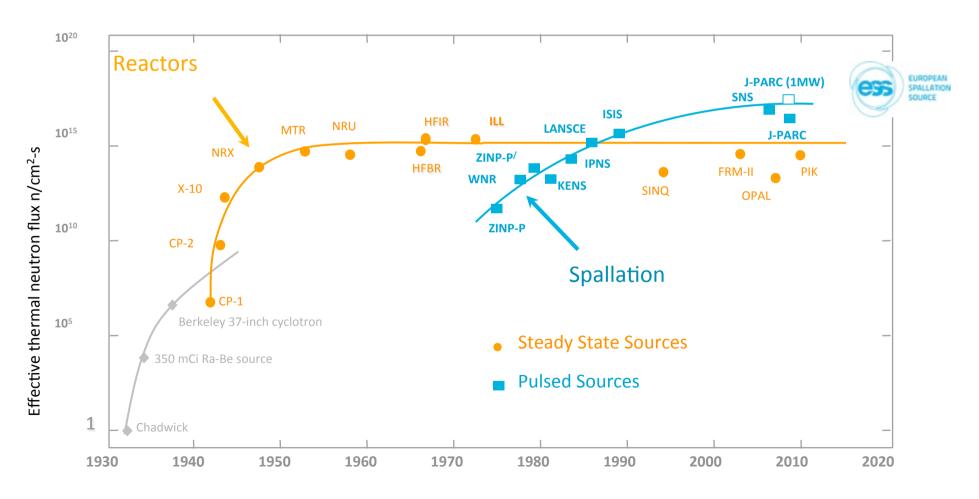
## **Science with Neutrons Past-Present and Future**



### ESS - Bridging the Neutron Gap

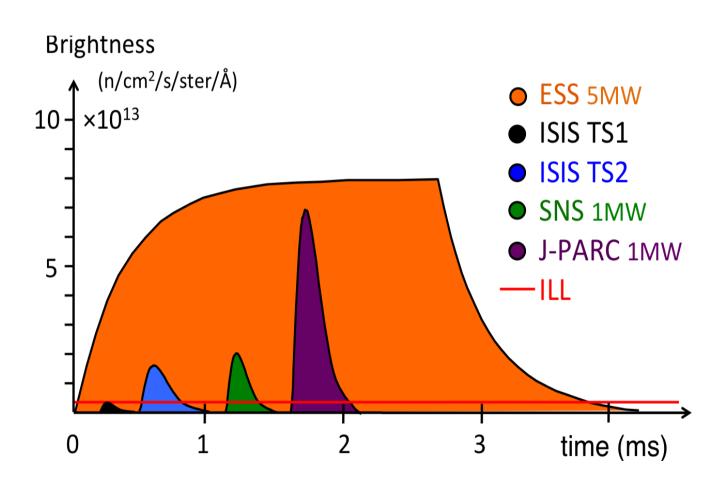


- ESS will be more powerful and several times brighter than existing facilities
- Compliments existing neutron scattering facilities



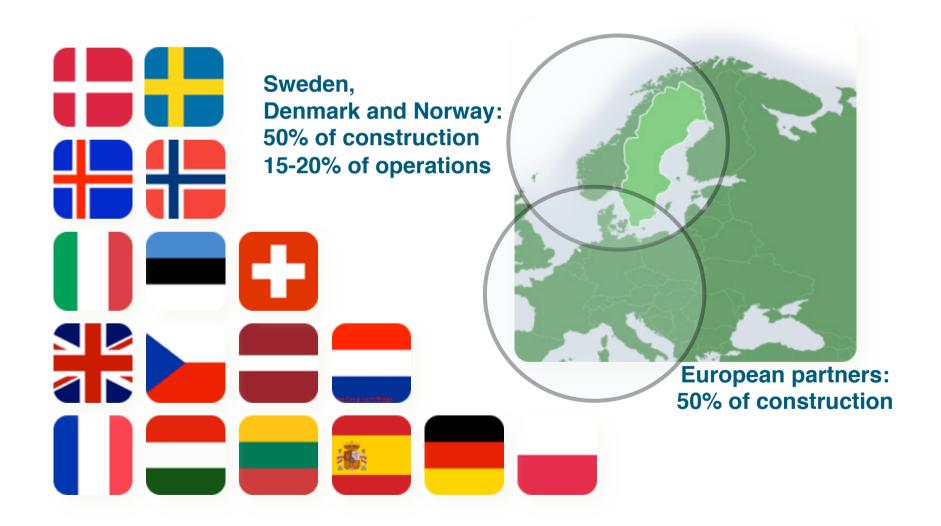
## ESS is a long pulse source





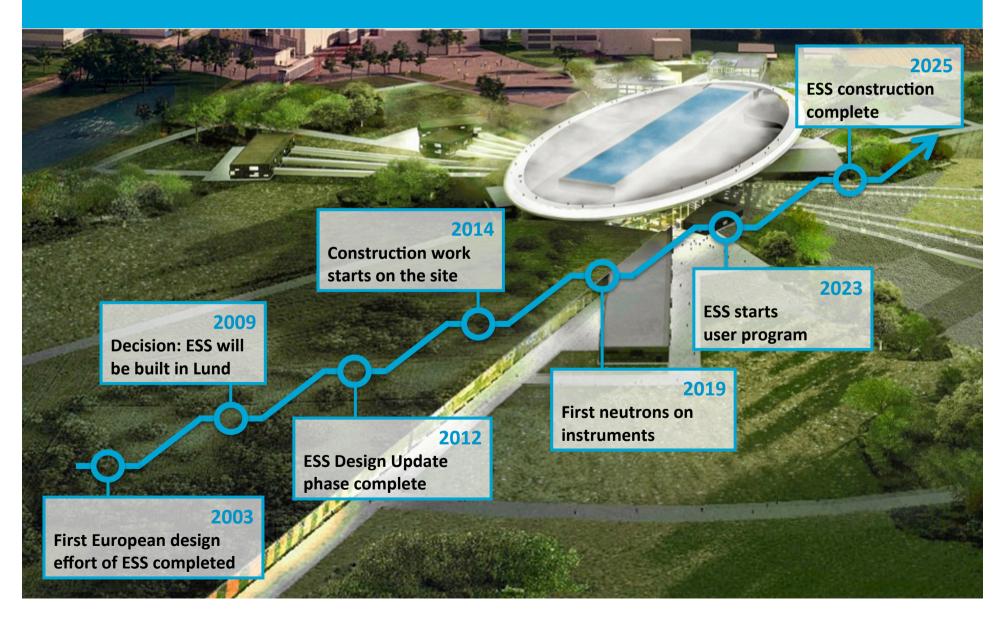
## **Largest European science project**





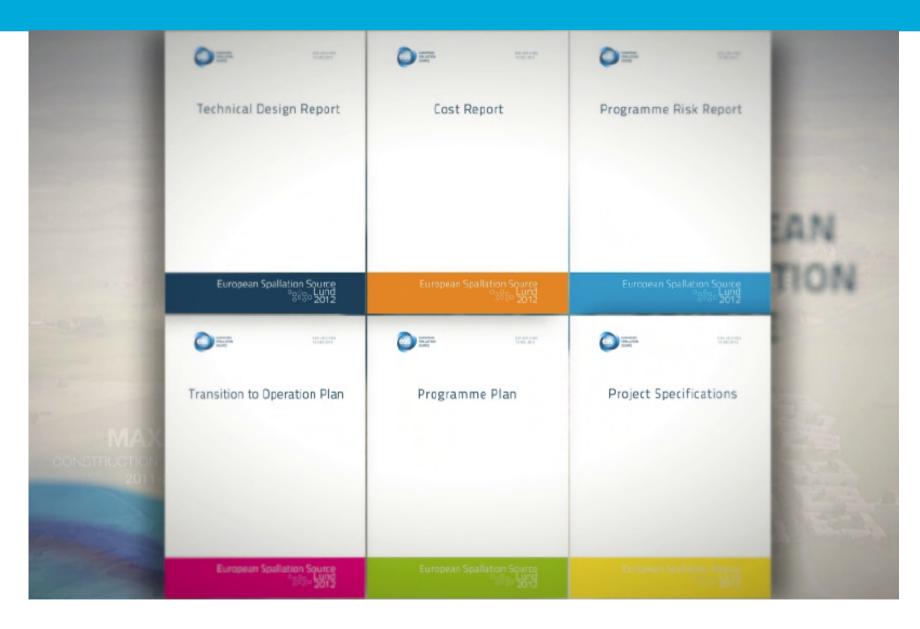
## Road to realizing the world's leading facility for research using neutrons





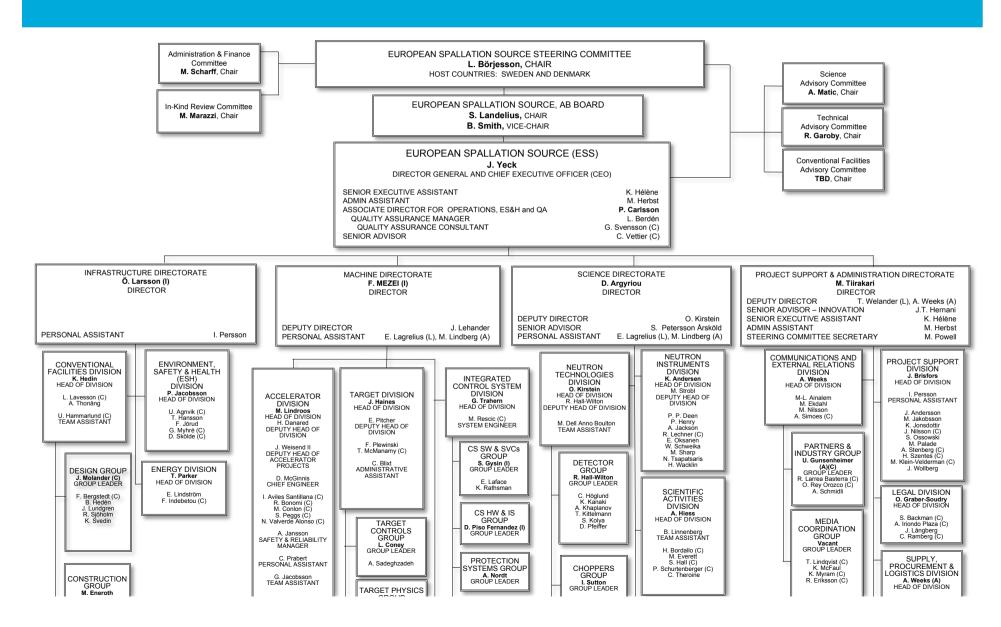
## Design update delivered 2012





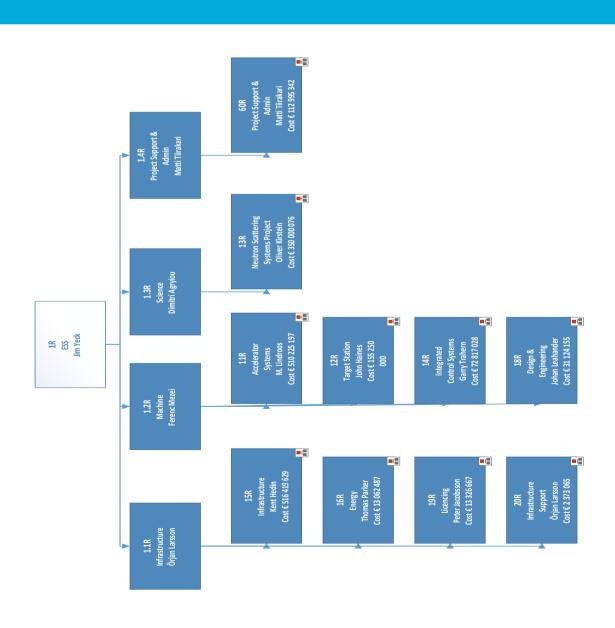
#### **ESS** organization





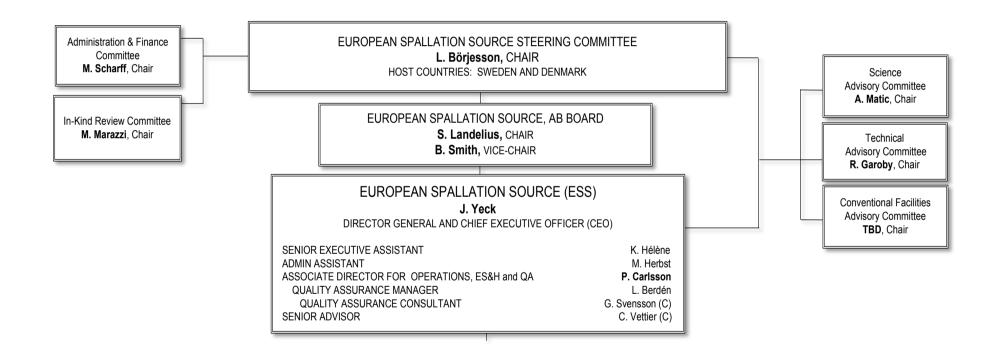
## ESS work breakdown structure





#### **ESS** organization





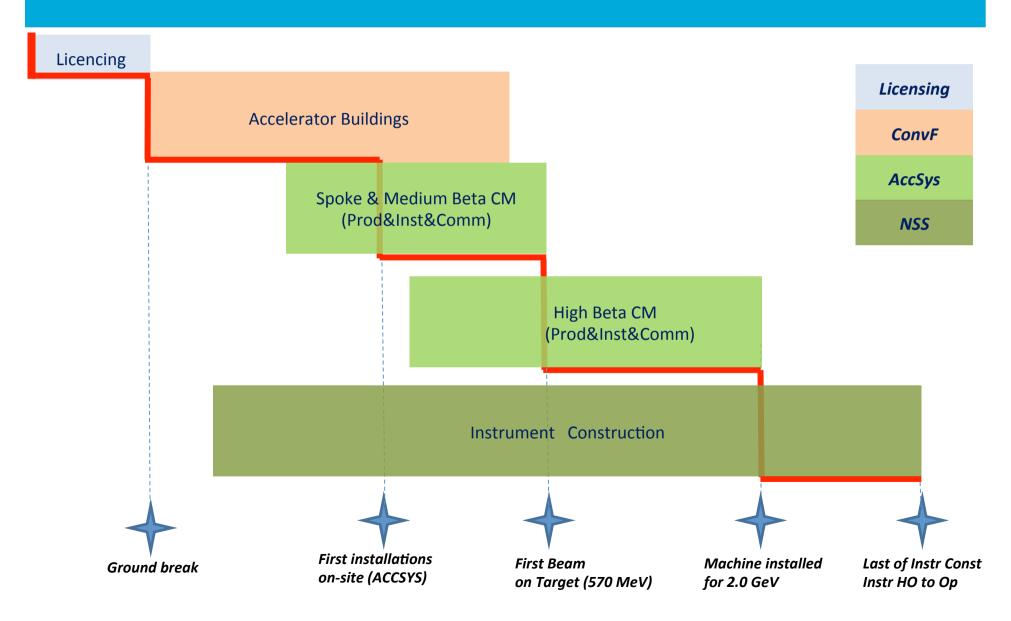
## Preparing the project



- Deliver on the Technical Design Report performance and Steering Committee commitments
  - 5 MW accelerator capability
  - Construction cost of 1,843 B€
  - Operations cost target of 140 M€
  - 22 "public" instruments
- Start w/ unconstrained resources (technically limited schedule) and develop credible project execution plans
- Comprehensive review of project baseline and execution plans
- Secure funding and resources and align schedules with the available resources

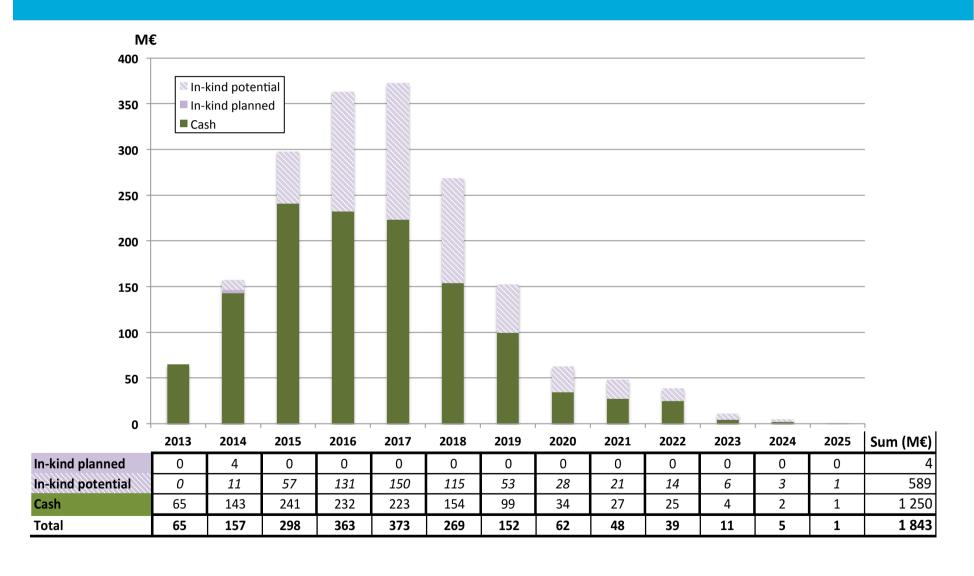
#### **Critical Path**





#### Cash vs. In-kind





## Commissioning and operations

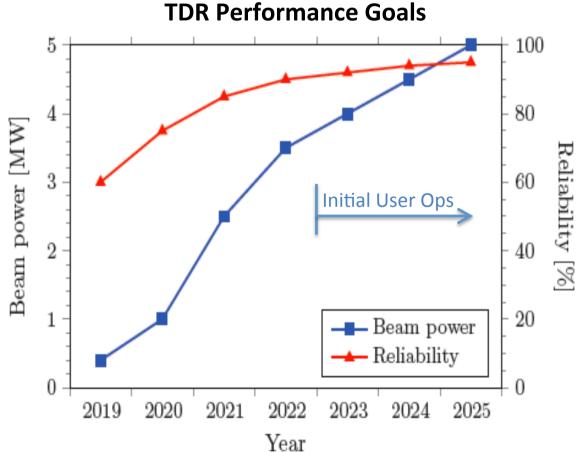


#### **Criteria for start of Initial Operations:**

Deliver a measurable number of moderated neutrons to an instrument.

#### **Strategy**

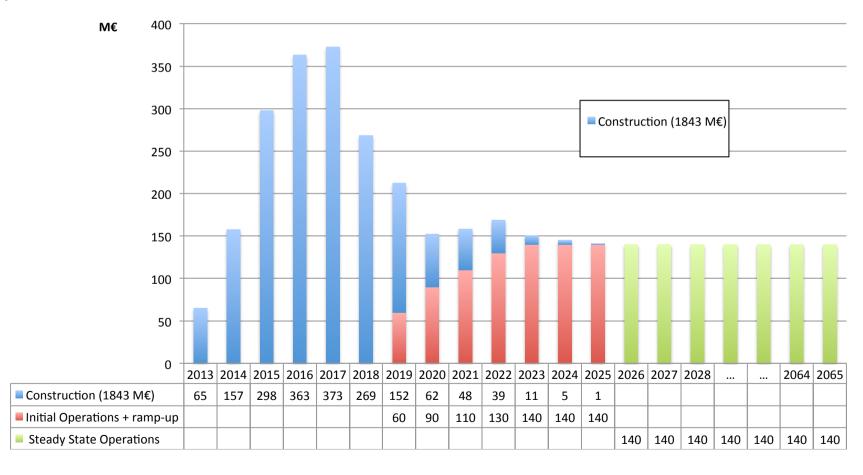
- Initially keep radioactivity and doses low to allow hands on maintenance.
- Ramp up power quickly to find limitations and increase reliability before user operations start.



## Initial Operations planning & budget



## Status of activity and resource planning for transition to operations



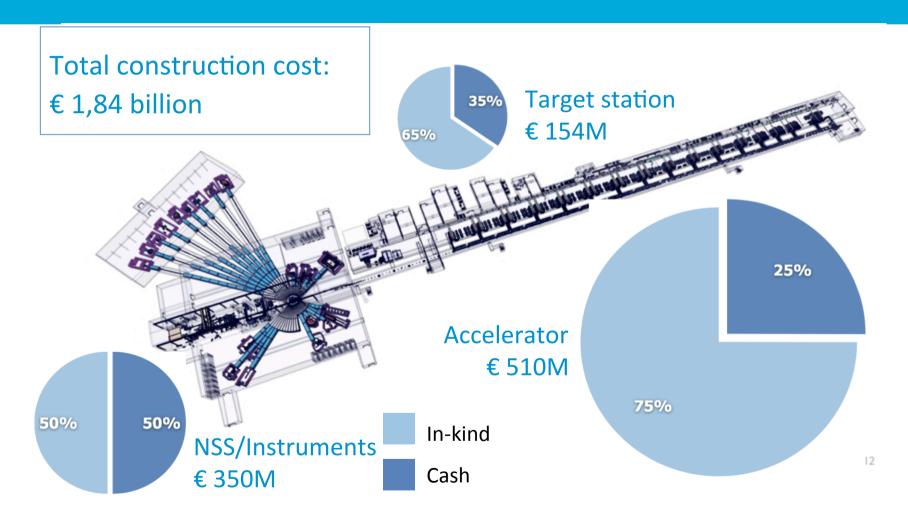
#### Next 6 months



- Letters of Intent or Agreements with Member countries
- Demonstrate accelerator and target station technology readiness
  - key interfaces resolved for a civil construction start
- Increase engagement of the scientific user community and continue selection of instruments for engineering development
- Partner days to promote opportunities to participate in ESS construction
- Select conventional facilities partner company/start final design in Feb 2014
- Secure permits for facility construction and establish Project Performance Measurement Baseline by May 2014
- Start facility construction!

## **ESS In-kind contributions potential**





#### French In-Kind contribution potential



- Our collaboration has already identified work packages valued at ~215 Meuro as in-kind possibilities from France
- Potential areas for cooperation include:
  - Accelerator
  - Target Station
  - Integrated Control Systems
  - Neutron Scattering Systems and Instruments
- Partner and industry day is about sharing information, establishing contacts and networks, and exploring possibilities



#### Je vous remercie cordialement de votre attention!

## Thank you very much for your attention!

Thank you to all speakers and Antoine Daël and to the committee who helped organise this event!

Antoine Daël, Christine Porcheray, Catherine Clerc, Marjorie Nanteuil, Sylvain Desert, Pascale Delbourgo, Alex C. Müller, Amina Taleb, Jean-pierre Caminade, Sebastién Bousson