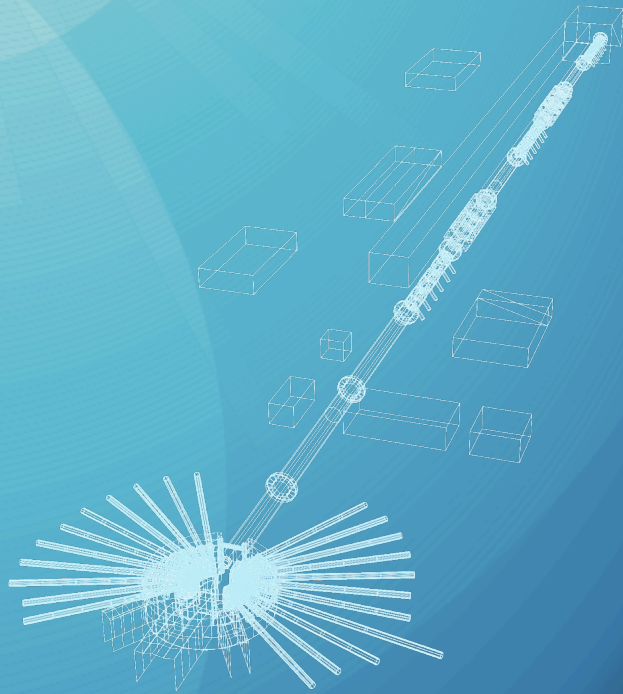


# European Spallation Source ESS AB



EUROPEAN  
SPALLATION  
SOURCE

Axel Steuer  
ESS AB, Box 176  
Stora Algatan 4  
22100 Lund, Sweden

# ESS in a Nutshell

## The ESS "Reference Design"

- A 623 m long, 5MW, proton linear accelerator at 1.0 GeV, 5 mA
- 2 ms pulses, 16.6 Hz (60 ms period)
- A liquid metal target, mercury or lead/bismuth, possibly rotating?
- 22 neutron instruments
- To support a 5000-strong user community
- 450 staff
- Capital Cost (Jan 2008) 1,478 M€
- Operating Cost 103 M€ p.a.
- Decommissioning Cost 344 M€
- First neutrons 2018/2019



# Historic Moment for ESS

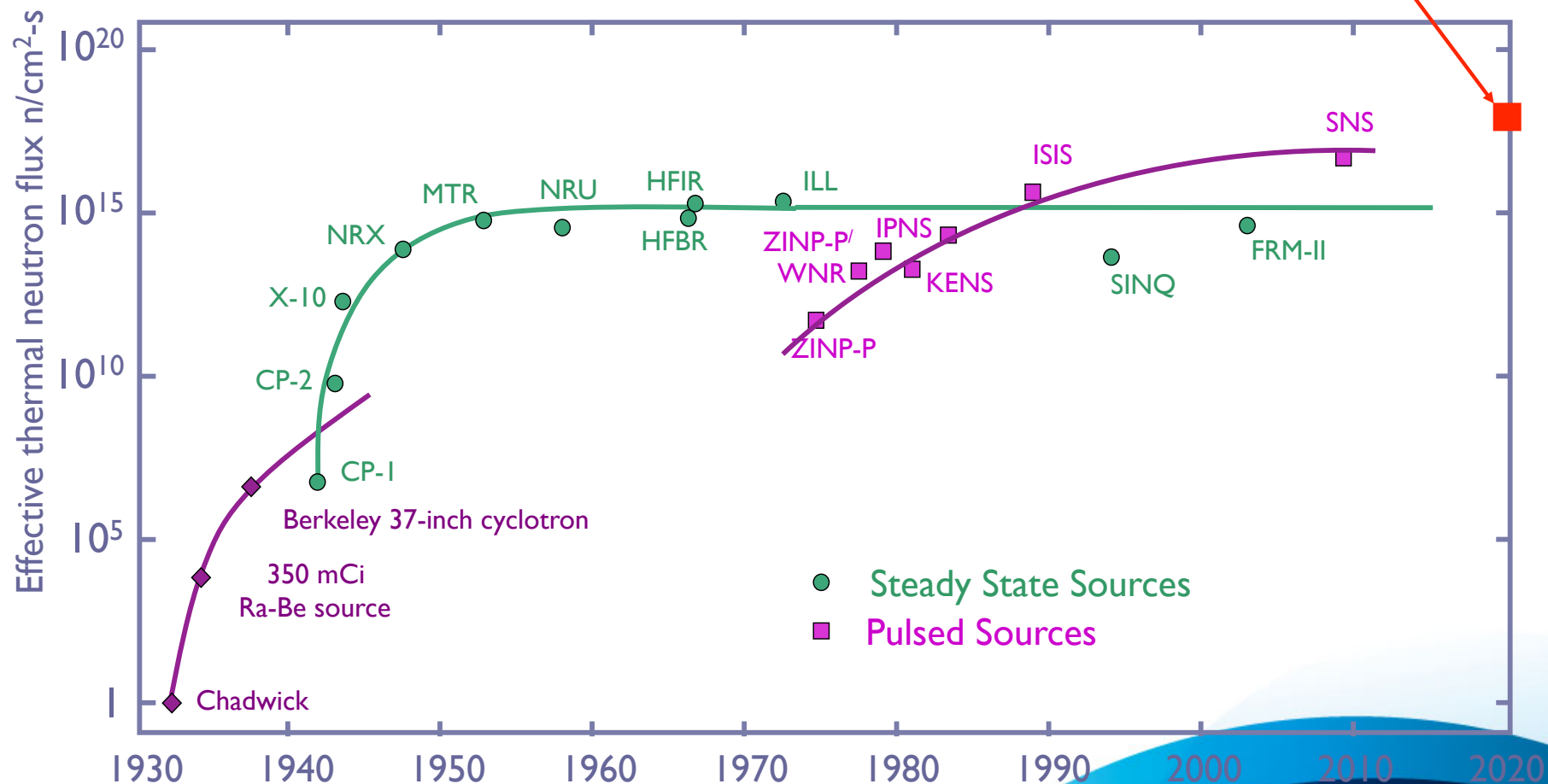
28<sup>th</sup> May 2009, 11.20pm: Competitiveness Council in Brussels;  
Sweden 7, Spain 2, Hungary 0

Skämtsam Leijonborg på blixervisit i Lund  
(29<sup>th</sup> May 2009 10am)



# ESS, a world leading facility

evolution of neutron sources characteristics



(Updated from *Neutron Scattering*, K. Skold and D. L. Price, eds., Academic Press, 1986)



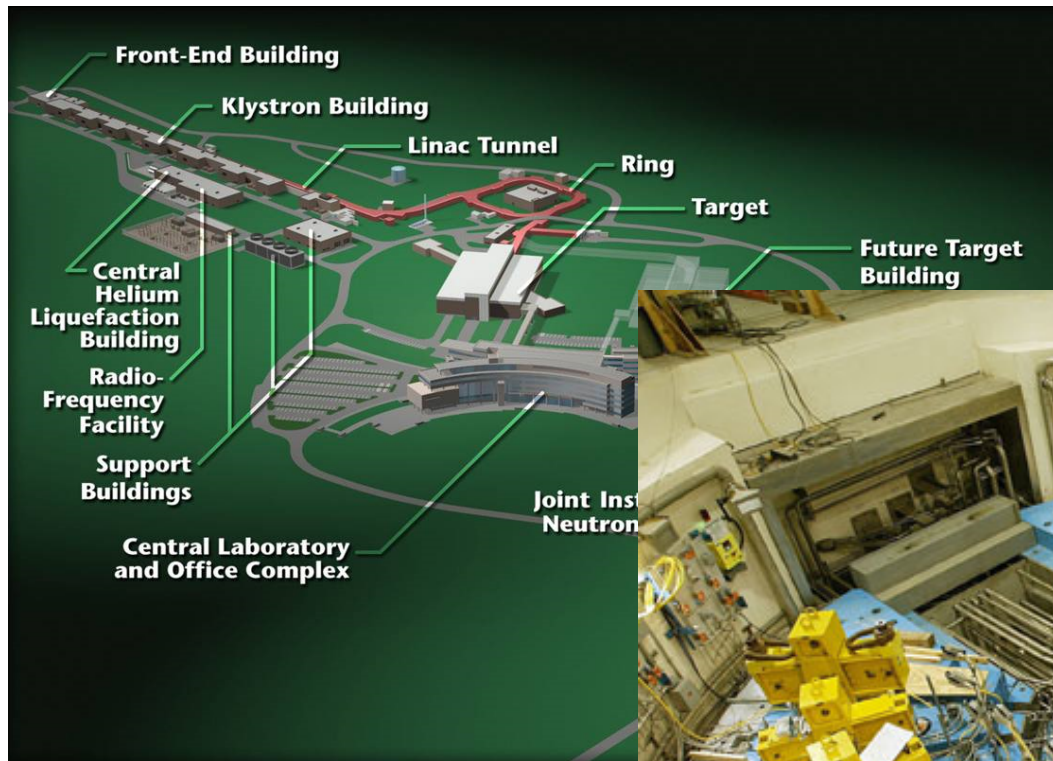
# The neutron landscape



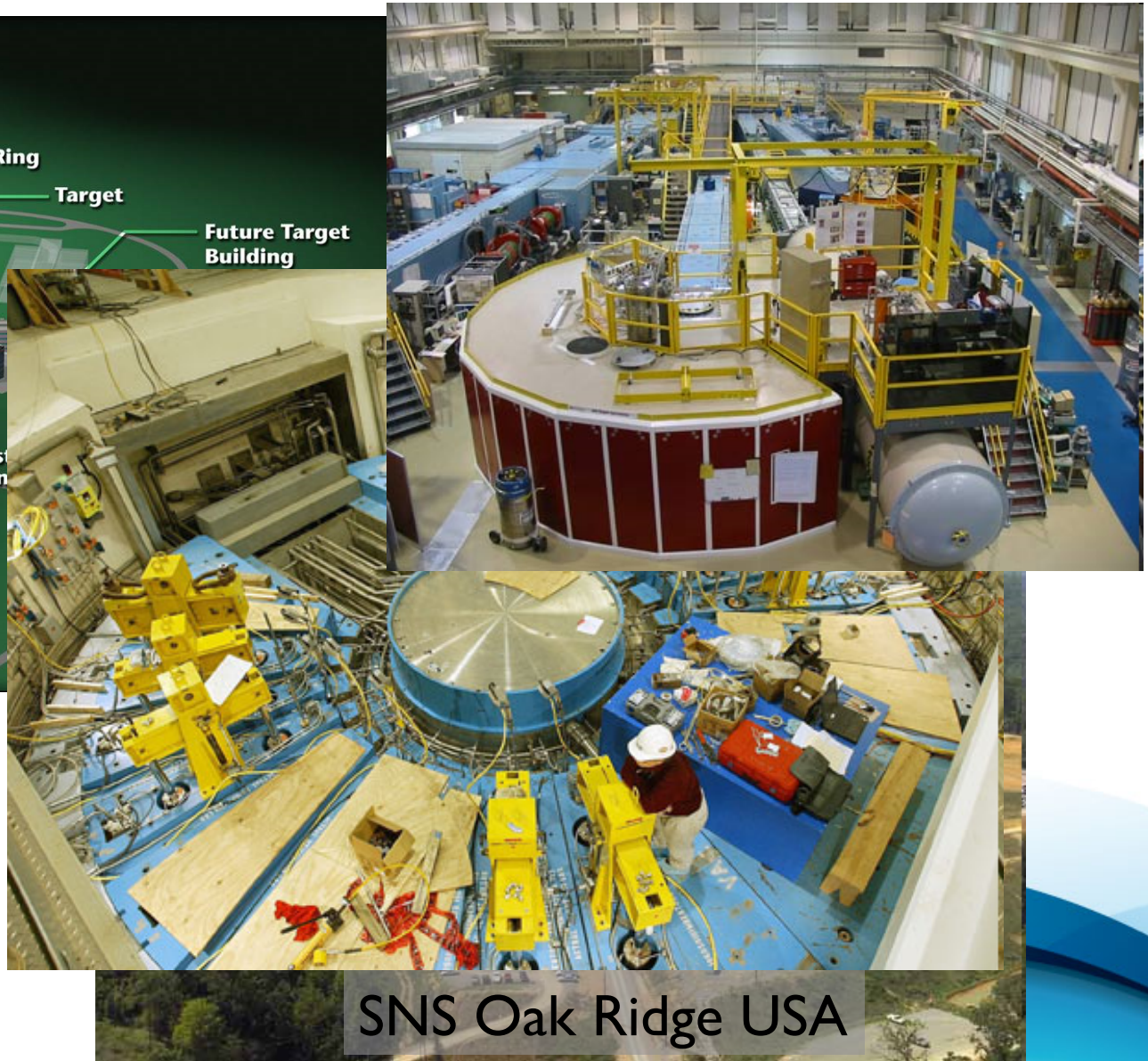
ISIS TS2



# The neutron landscape



1 MW Spallation  
Neutron Source in  
Oak Ridge NL  
(compl. 2006)

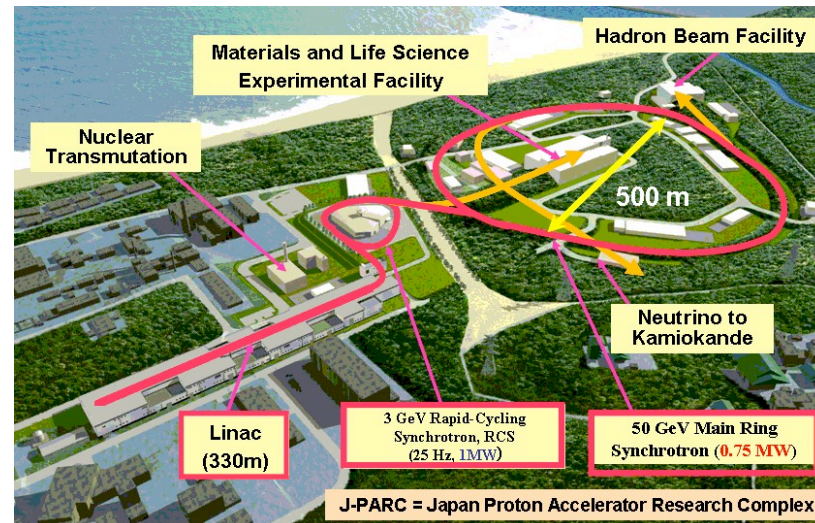


SNS Oak Ridge USA



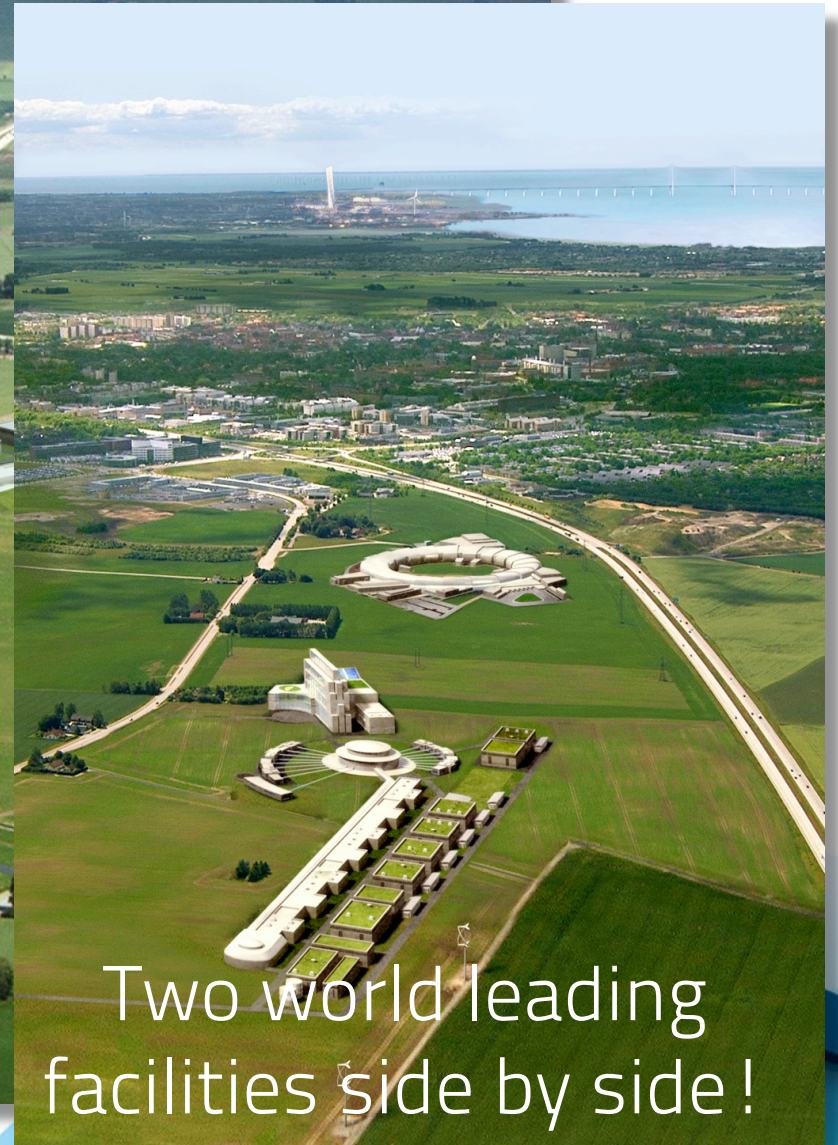
# Japanese 1MW Spallations Source

- > JSNS, part of JPARC, Tokai, JAEA
- > 1 MW short pulse
- > Operational since 2008





# Fast forward: The ESS in 2020





# Lund North East: A Vision!



# ESS: The status quo



# We have got the Partners

Sweden, Denmark and Norway  
50% of construction costs



16 Partners today



Spain, France, Germany, Italy, Switzerland, Hungary, Czech Republic,  
Poland, Netherlands, Estonia, Latvia, Lithuania & Iceland  
the remaining 50%

# We have got the money !

## Capital (ca. 100%)

50% Sweden (32.5%+2.5%) Denmark (12.5%) Norway (2.5%)  
38.5% Germany, France, Switzerland, Italy & Spain  
8% Poland, Hungary, Estonia, Latvia, Lithuania, Iceland,  
Czech Republic & Netherlands  
7% Belgium, Portugal, Slovakia, Slovenia, & Romania

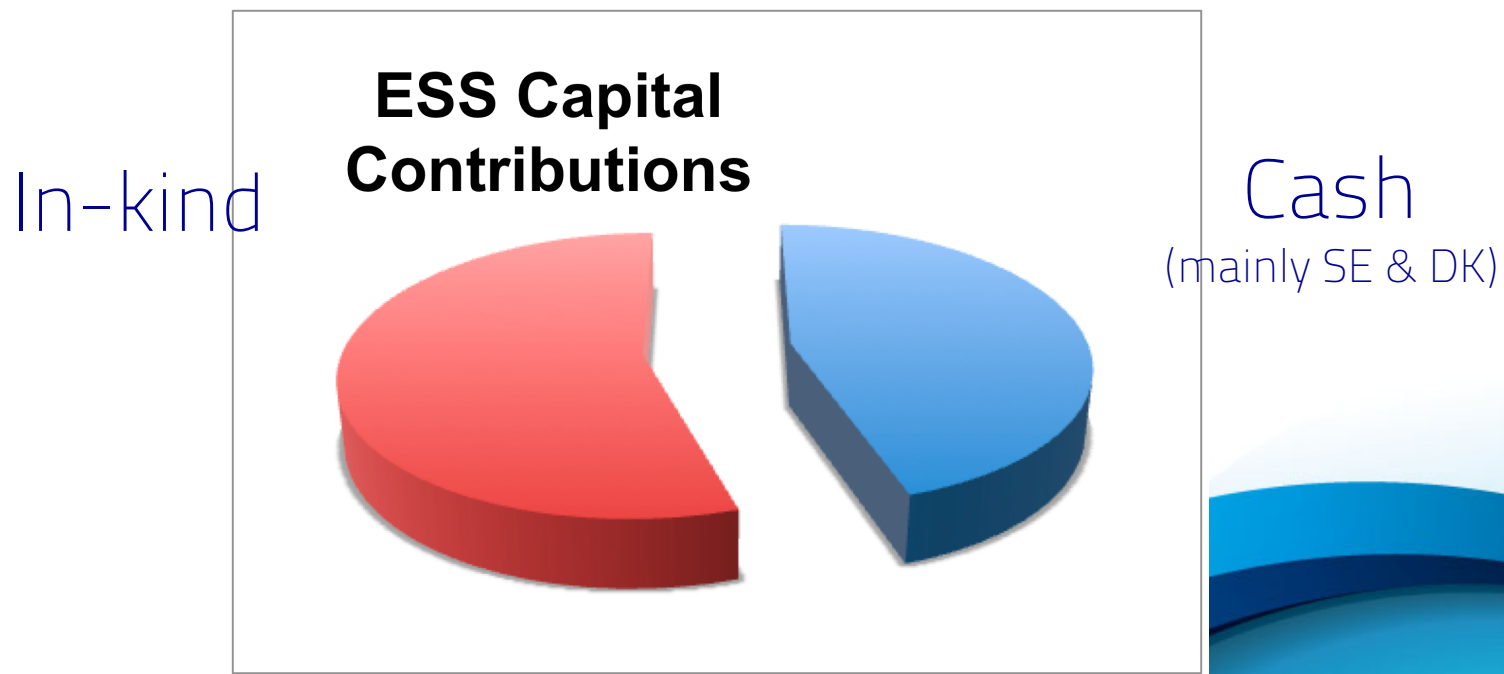
## Operations (ca. 100%)

22.5% Scandinavia  
55% Germany, France & UK  
22% Spain, Switz, Italy, Poland, Hungary, Est, Lat, Lit, Ice.  
8% Czech, NL, BE, PO, SVa, Sve, RO



# Two Income streams

1. **Cash** to be spent centrally  
& handled by the ESS team: 45%
2. **In-kind** to be spent by the 14 partners  
but specified by the ESS team: 55%



# The company: ESS AB

>20<sup>th</sup> April 2010 ESS AB was founded

>Directors:

Sven Landelius, Chairman of the ESS AB Board of Directors.



Katarina Bjelke, Director General, Ministry of Education

Lars Börjesson, Secretary General for Research Infrastructure, Swedish Research Council

Per Eriksson, Rector, Lund University

Dec. 2010: Danish Co-Host become shareholders

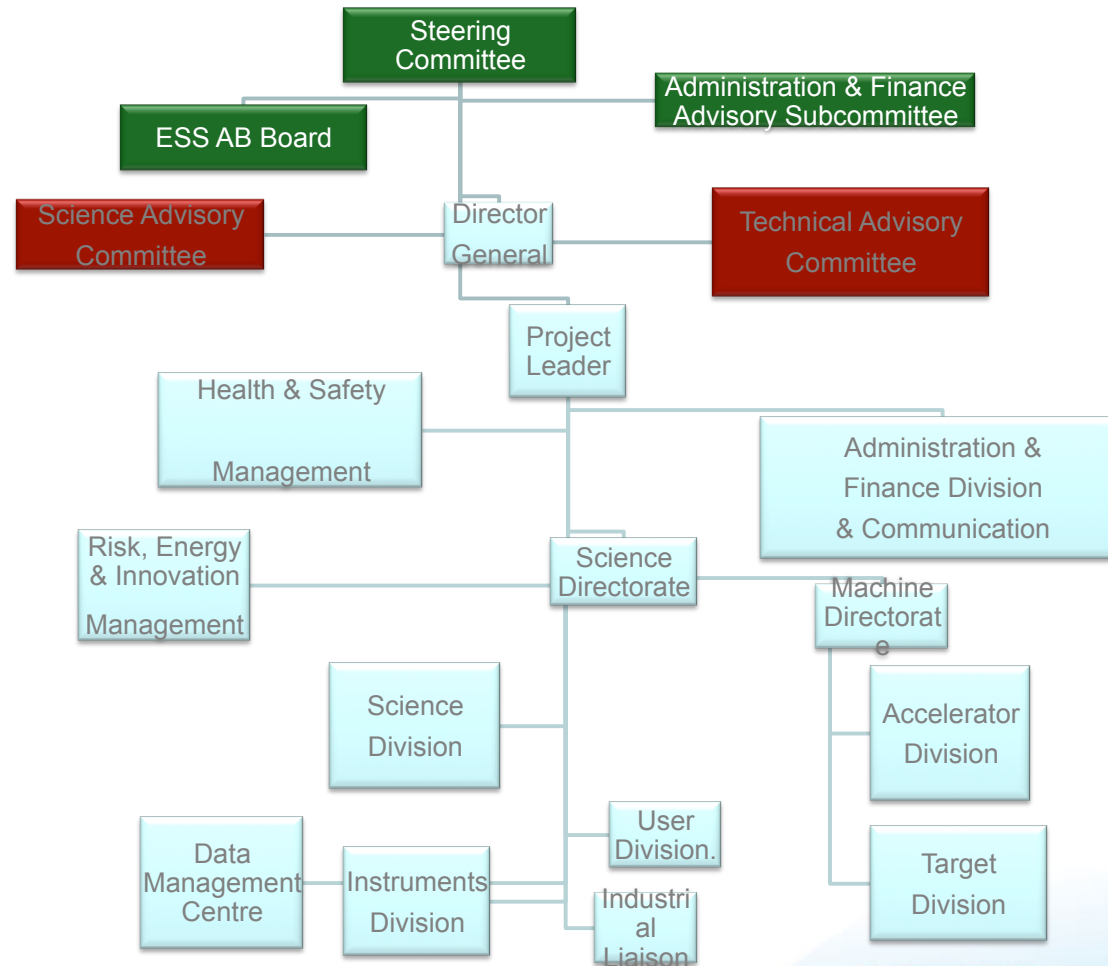
-26 percent of the shares

-Inge Maerkedahl, DG, Danish Agency for Research and Innovation

-Lars Goldschmidt, Deputy DG, Confed. Danish Industry

-Lars Kolte, Denmark's Chief Negotiator for ESS

# ESS AB: The company structure



DG/CEO: Colin Carlile

PL: Kjell Moller

CoB: S Landelius

DoS: Dimitri Argyriou

MD: Patrik Carlsson

Acc.: Mats Lindroos

Target.: Ferri Mezei

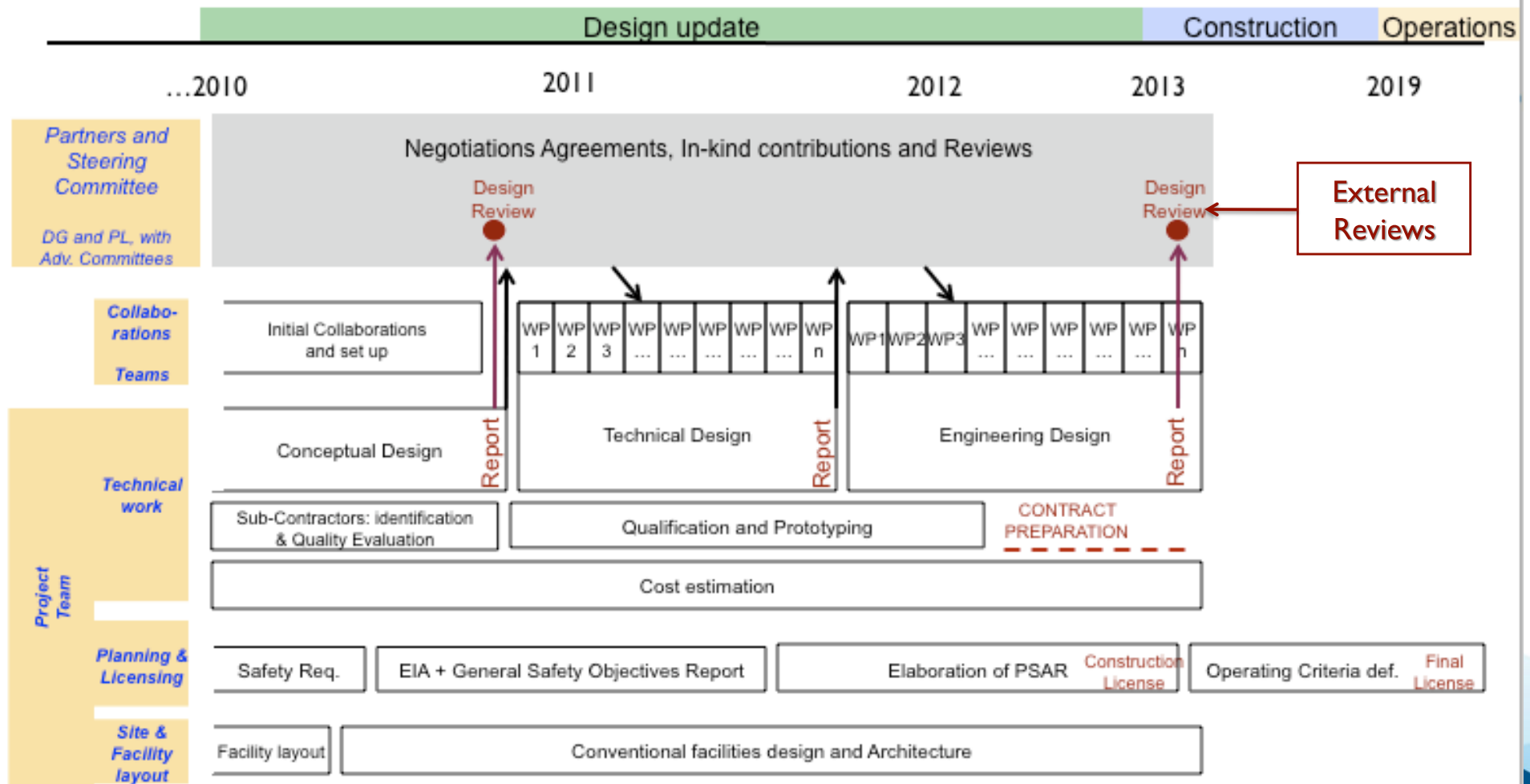
# ESS AB: Rough time line

- **Design update phase: 2010-2012**
  - **MoU Feb 2011, Paris**
  - **Convention End 2012???**
- Construction phase 2013-2018
- Completion phase: 2019-2025
- Full operation: 2025-2065?
- Decommissioning: ...

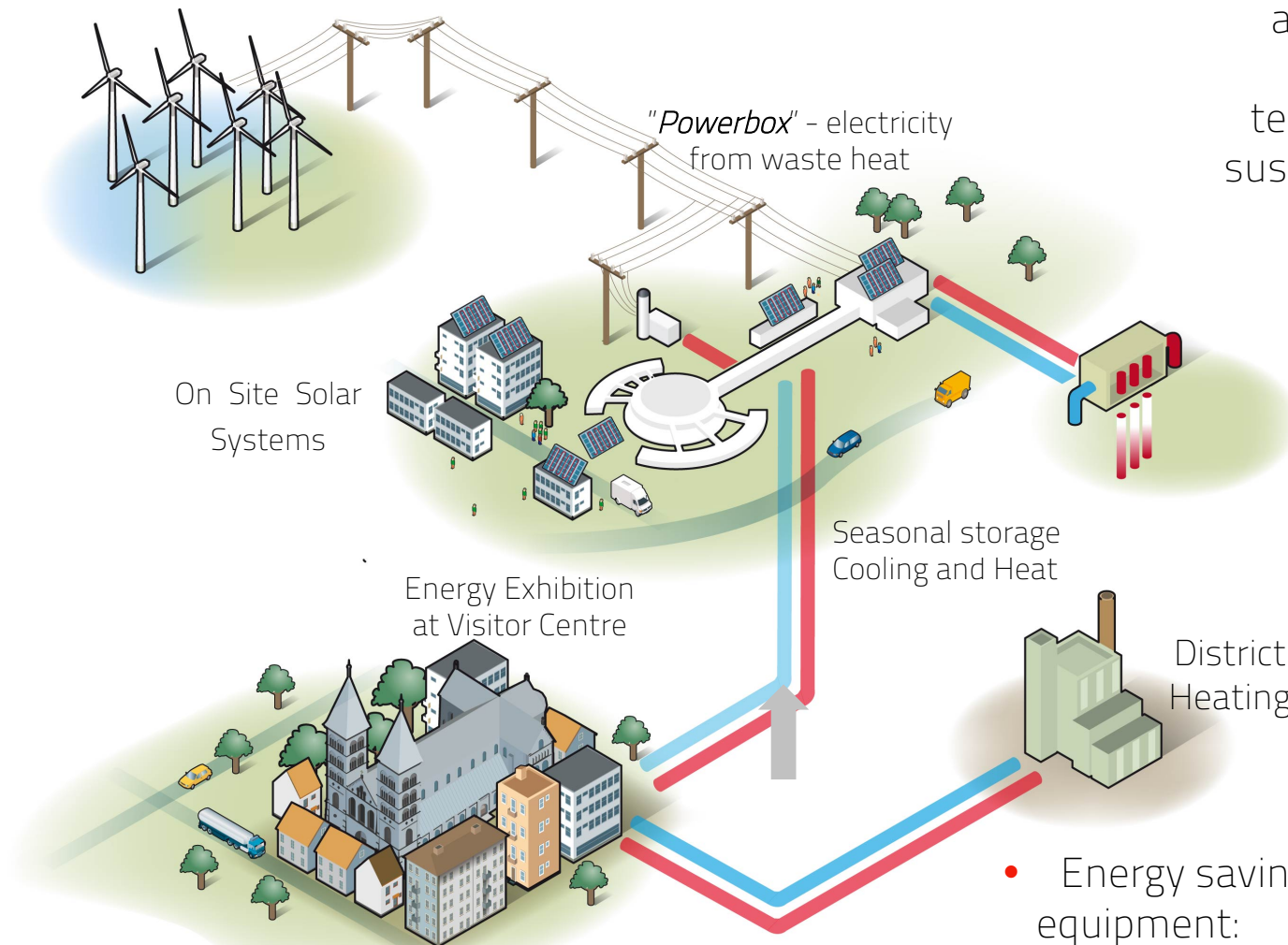




# Pre-construction phase - overview



# ESS Energy Solution – Development and Demonstration

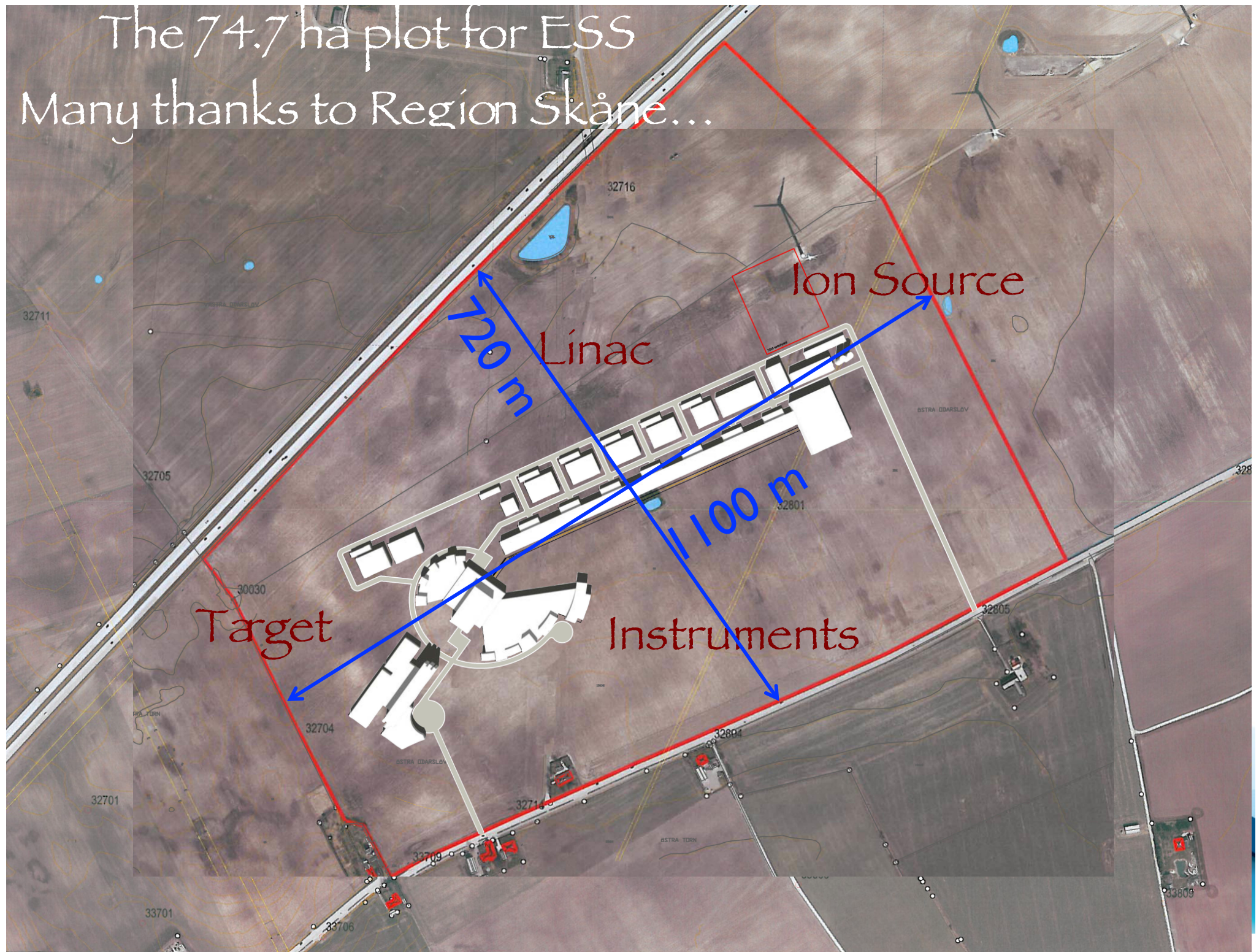


- Research, Development and Demonstration of emerging energy technologies strengthen sustainability message and energy culture

- Energy savings in improved efficiency equipment: 20 %
- CO2 global impact: 0 ton/year
- Investments connection DH: 1 M€
- Operating costs (revenue): - 1,5 M€



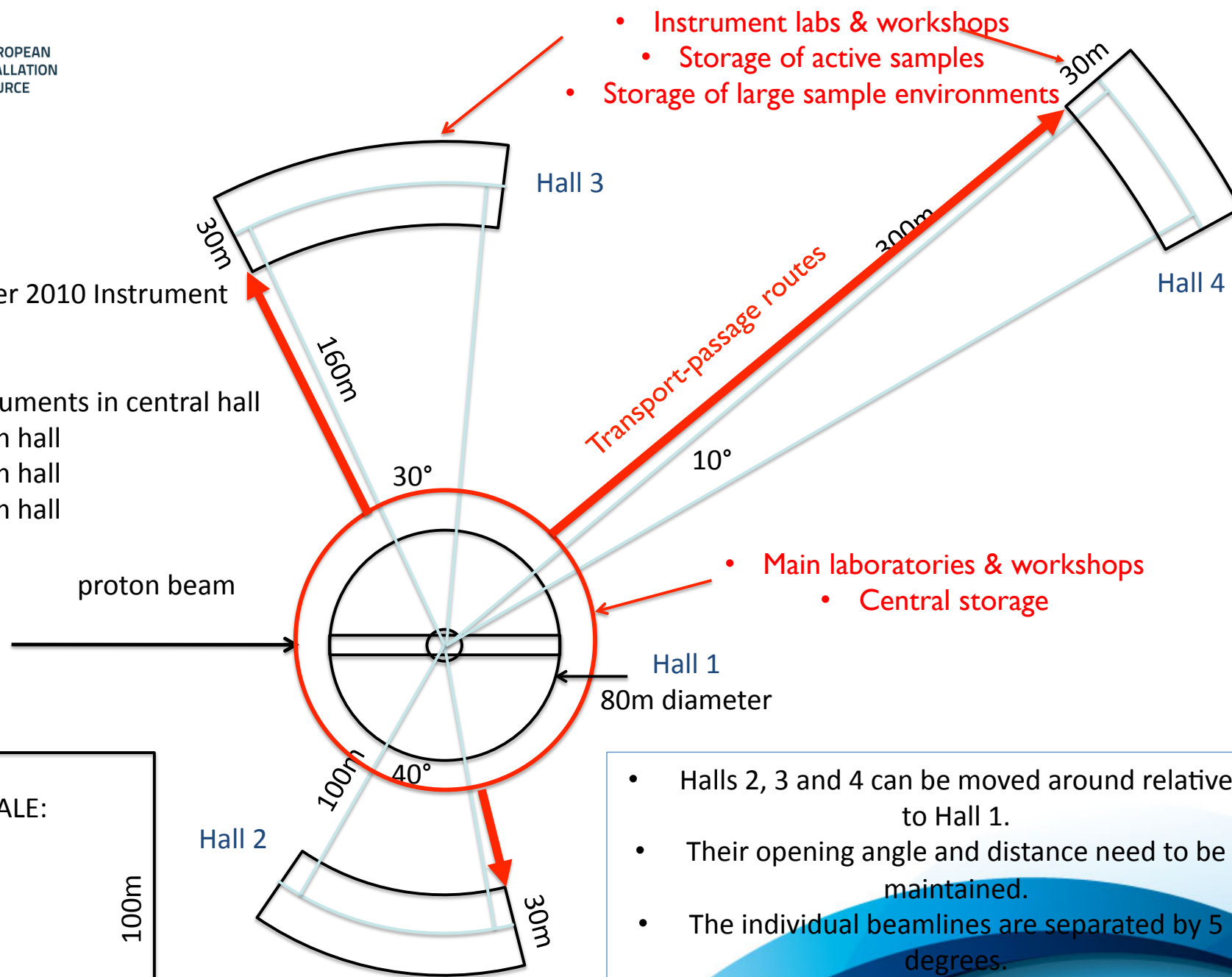
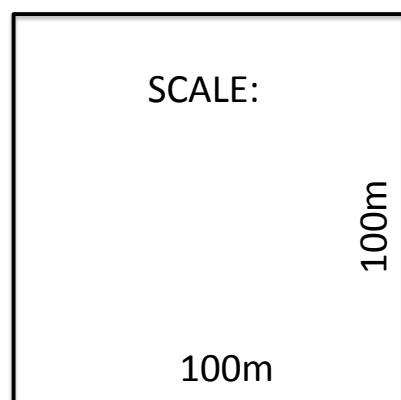
The 74.7 ha plot for ESS  
Many thanks to Region Skåne...





## 27<sup>th</sup> December 2010 Instrument layout

- 30% of instruments in central hall
- 30% in 100m hall
- 30% in 160m hall
- 10% in 300m hall



- Halls 2, 3 and 4 can be moved around relative to Hall 1.
- Their opening angle and distance need to be maintained.
- The individual beamlines are separated by 5 degrees.



# Now what about neutrinos?

Suite of instruments?  
Fundamental Physics?

We would like to hear more from you!

- > Is long pulse suitable?
- > What are the technical requirements?
- > What detector distance from the target?
- > What size/weight will the detector be?
- > Will it be above/underground?
- > .....

# ESS Science & Scientists Meeting Berlin, May 2012

ESS Science Symposia  
Sponsored (12.5kEUR) workshops



Historically: 3N2M workshop in Lund,  
December 2009  
Lindroos & Vettier



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SPALLATION  
SOURCE

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The road to the Sustainable Society is paved with Materials Science

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## Kick-off meeting about the ESS Design Update, Science and Instruments

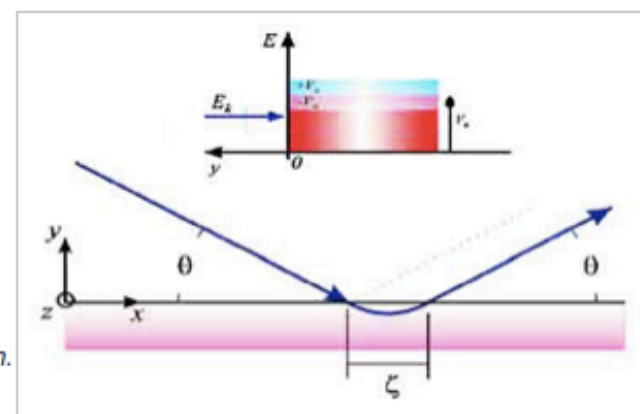


Saturday, 19 February 2011 19:05

On the 22nd and 23rd July 2011 ESS will arrange a kick-off meeting to discuss the future scientific goals of the facility as a satellite to the ECNS meeting.

– It will be a way for us to inform the research community of the progress so far and to get the science community involved in the development of the first set of instruments, says Dimitiri Argyriou, Science Director at ESS AB. A new generation of neutron facility also needs a new generation of instruments, but to get that we need input and involvement from the community that will use them.

The meeting will start on Friday afternoon with a plenary session and will continue on the next day. Later Friday evening the work will continue in the more relaxed atmosphere of the dinner. We



Thank you for your attention!



150 years of Italian Unity

