



EUROPEAN
SPALLATION
SOURCE

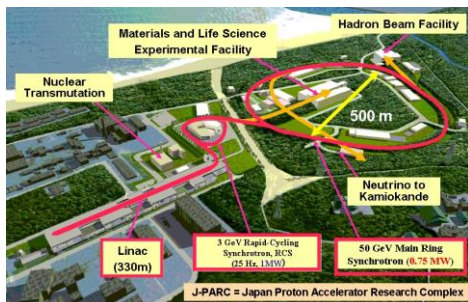
Responsible
Renewable
Recyclable

Thomas Parker
October 2013

What is the European Spallation Source ?



- One of Europe's largest planned research infrastructure
- Will bring new insights to the grand challenges of science and innovation
- Collaborative project: Includes more than 17 countries
- 2014: Start of construction phase of the world's most powerful linear proton accelerator
- 2019: Provide the world's most advanced tools for studying materials with neutrons (~ 450 employees; > 2500 users / year)



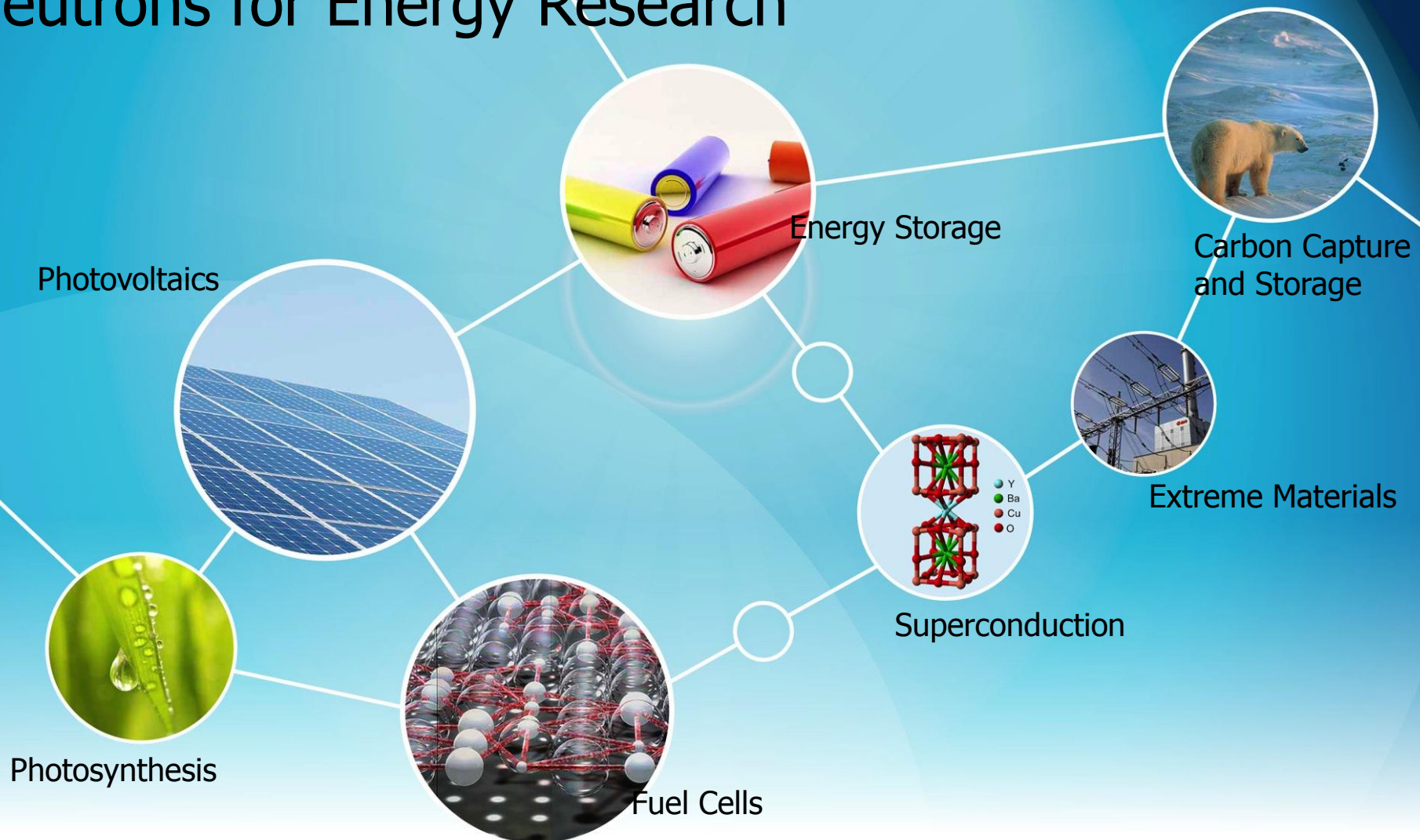
Japan 2008:
JPARC (<1 MW)



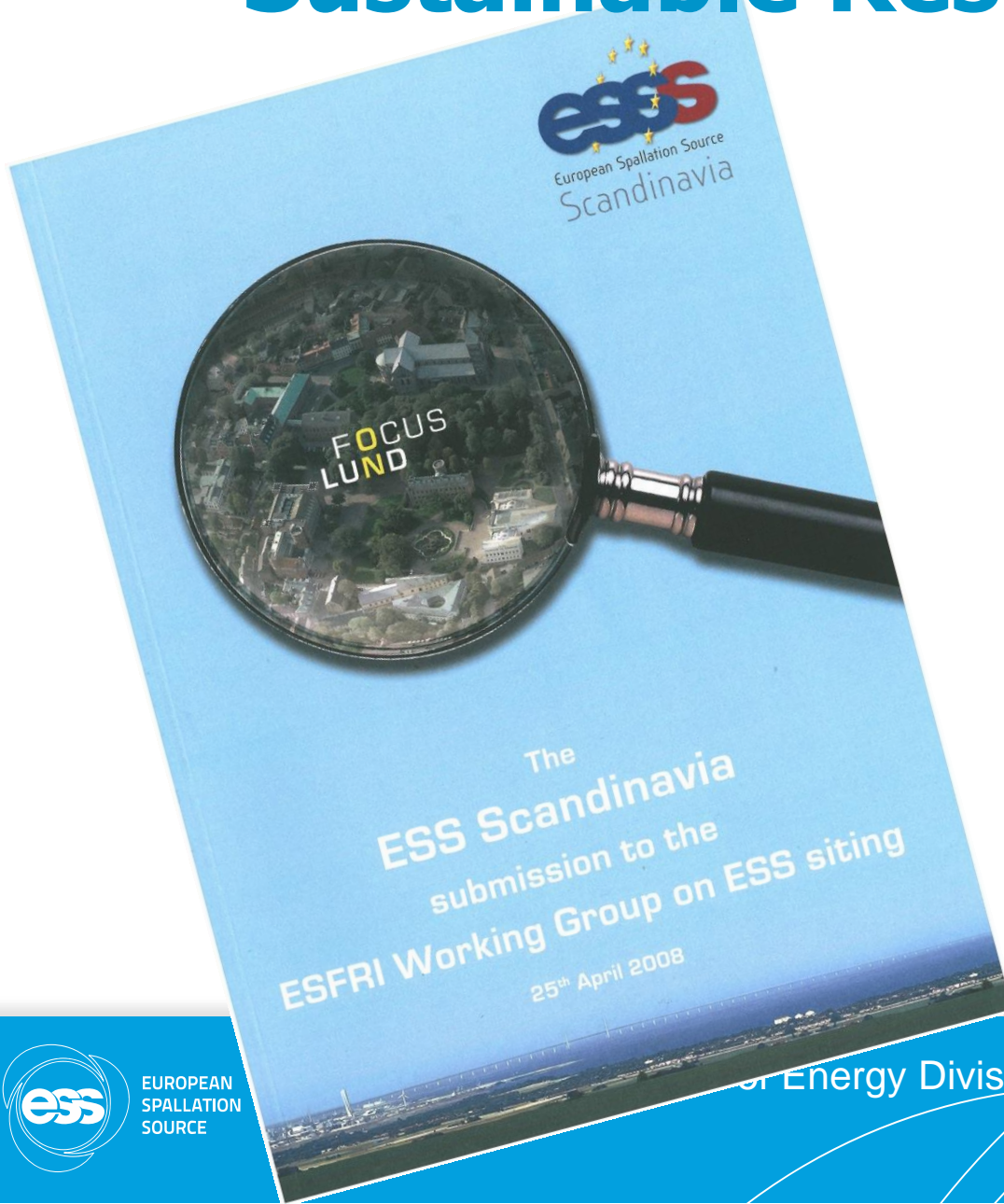
USA 2006:
SNS (<1.4 MW)

The main contribution from ESS to a more sustainable society is the science

Neutrons for Energy Research



The Scandinavian Commitment: A Sustainable Research Centre



✓ **Responsible**

Energy Efficiency

✓ **Renewable**

Power from renewable sources

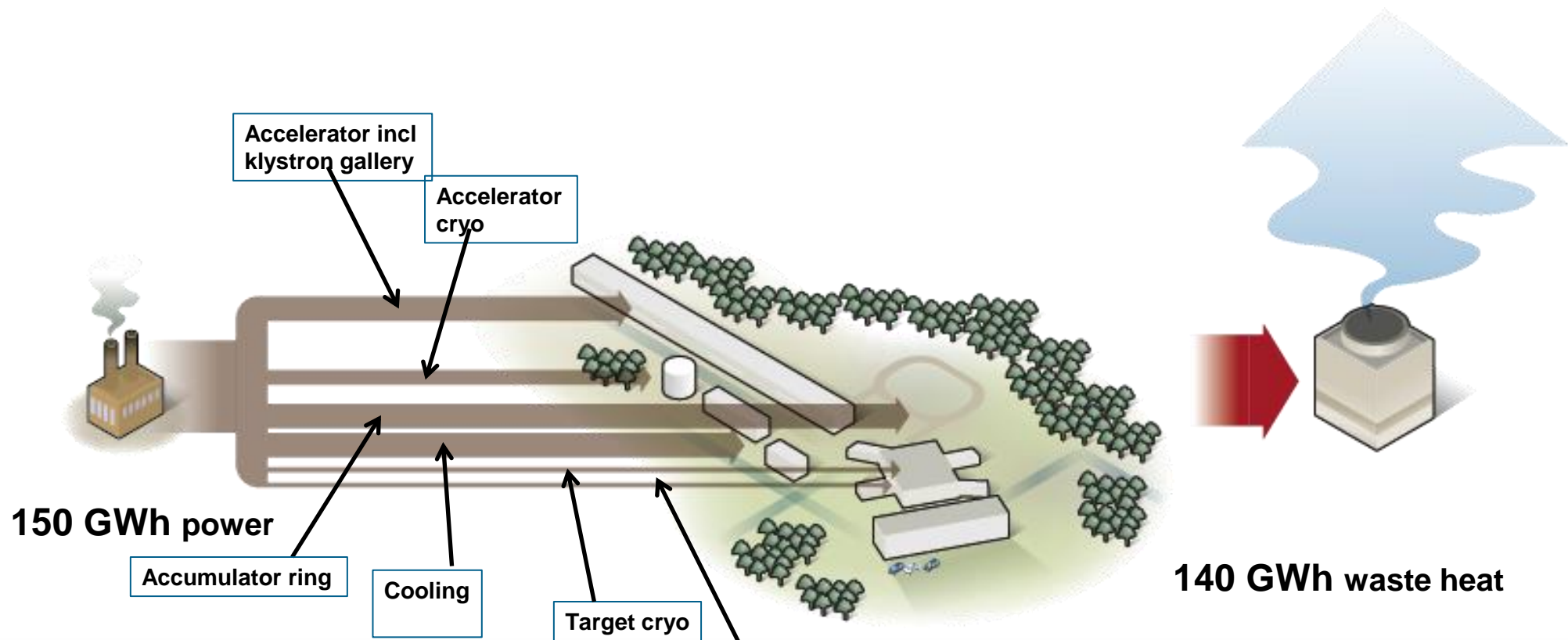
✓ **Recyclable**

ESS's cooling is Lund's heating

Energy Inventory

Spallation Neutron Source at Oak Ridge National Laboratory

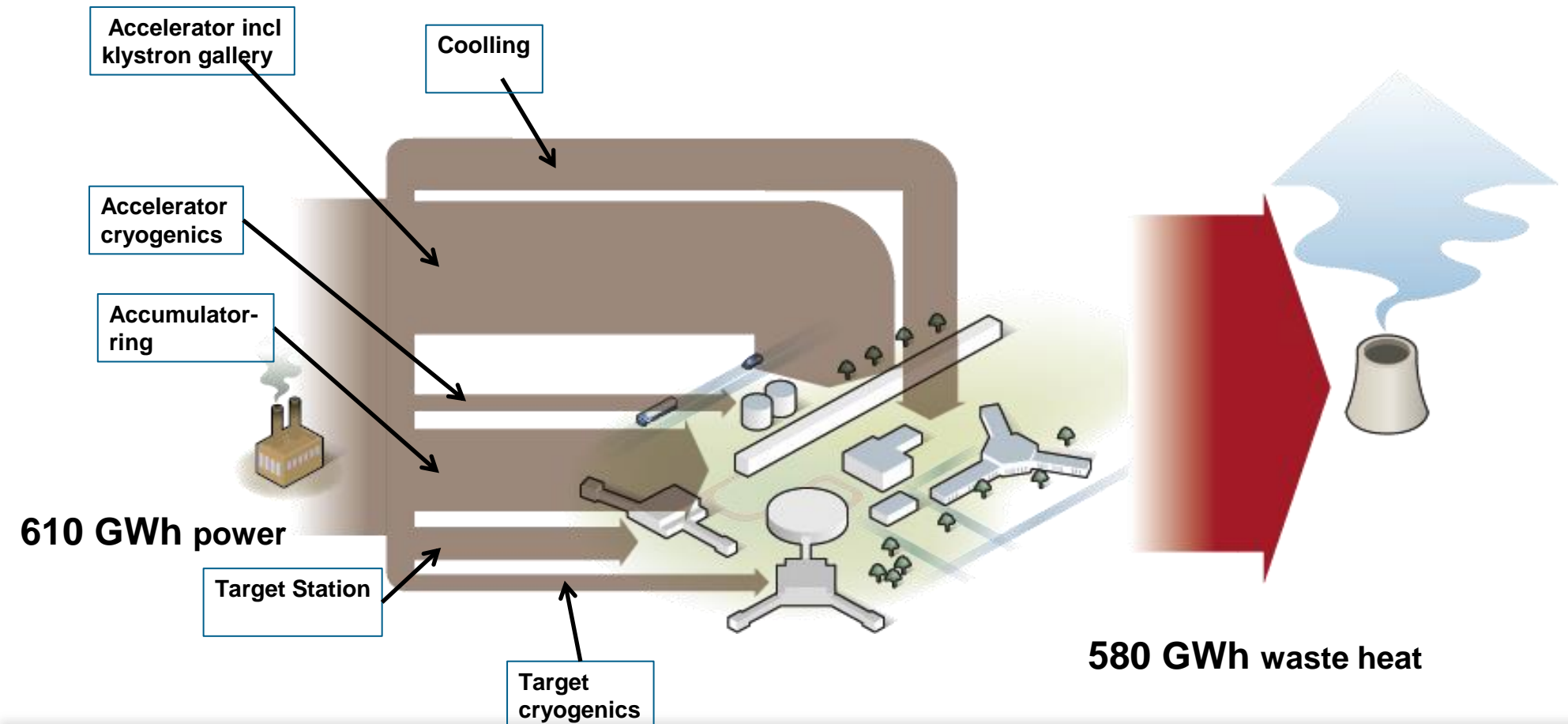
At 1 MW beam from accelerator



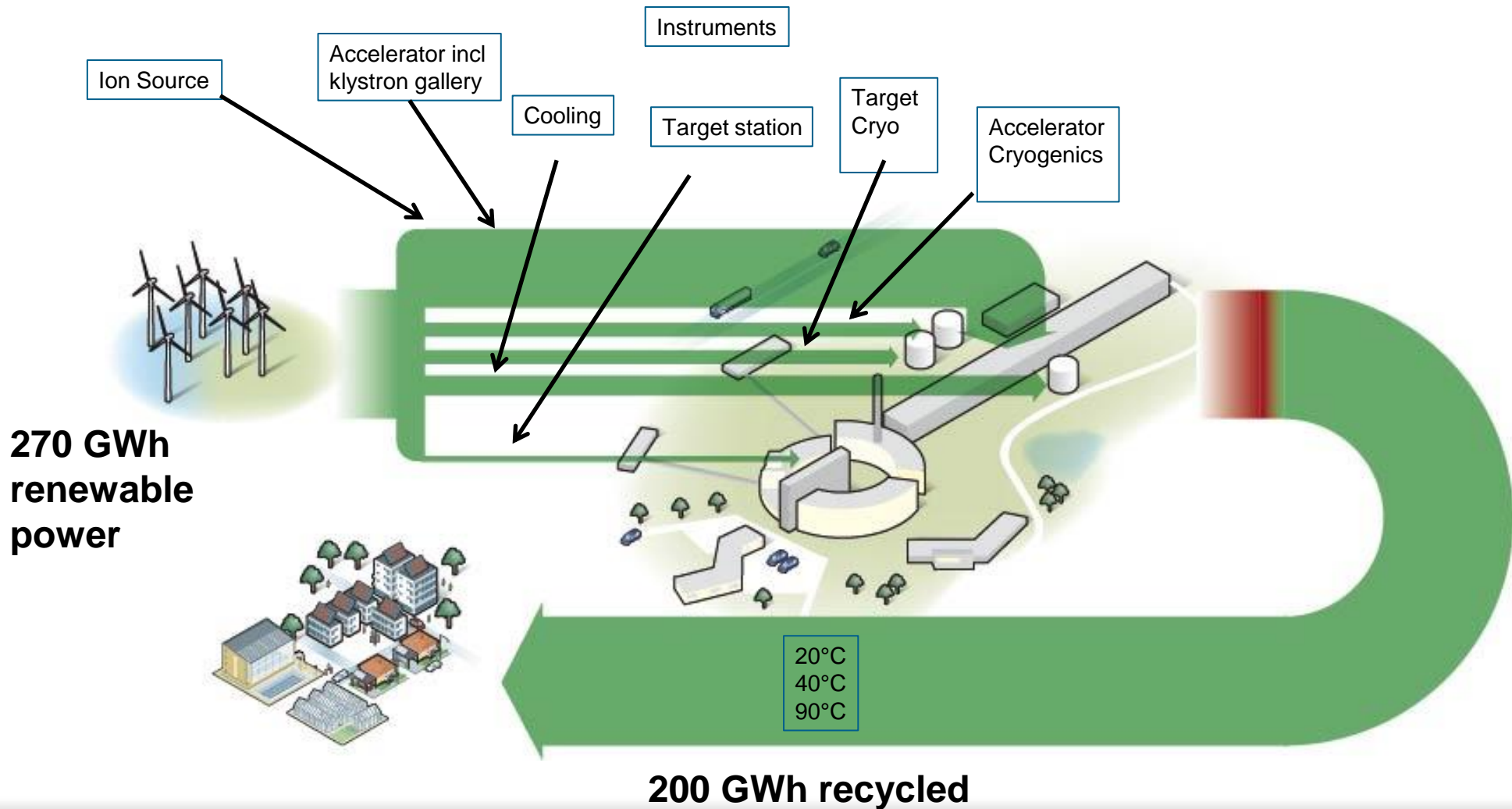
Energy Inventory

ESS Pan-European Project 2002

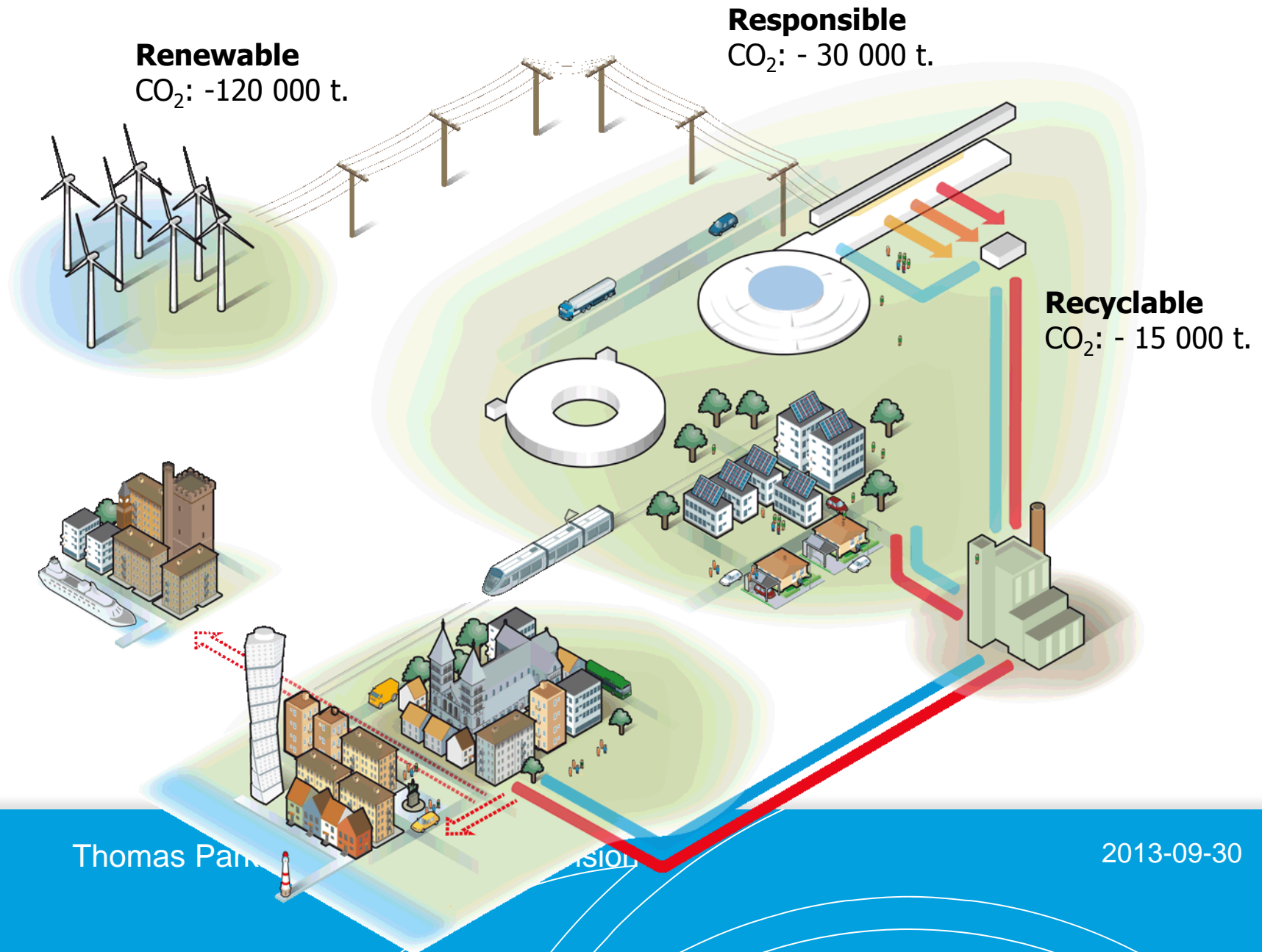
5 MW beam on target



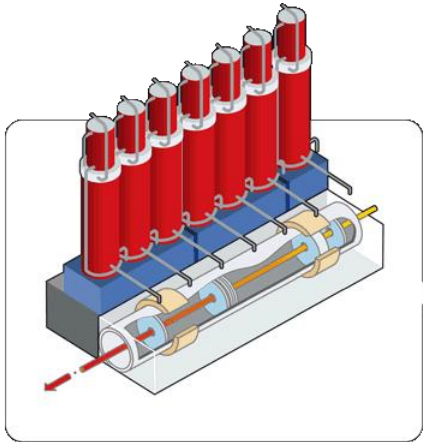
Energy Inventory ESS 2012, 5 MW



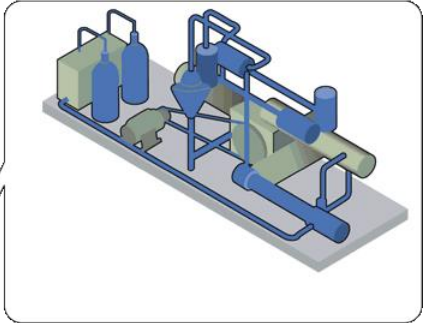
Responsible – Renewable – Recyclable



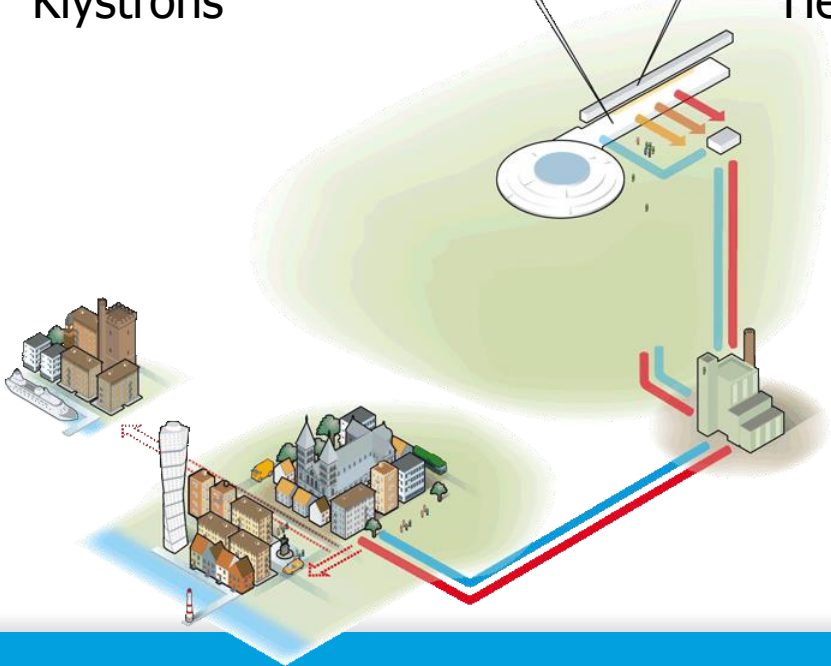
High-temperature cooling



Klystrons

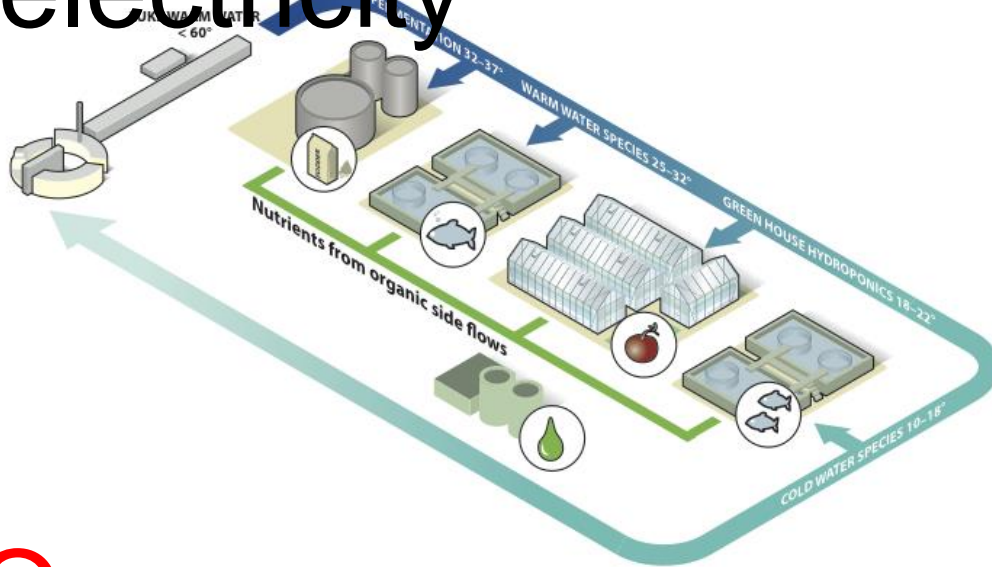


Helium Compressors



Open Call for heat recycling solutions

Recycle heat without using electricity



Open
now!

Thomas Parker, Head of Energy Division



Key Success Factors

- Government commitment
- Green Field effort
- Functioning free market for electrical power
- “Blessed” with heat demand
- District heating predominant heating form, 80°C sufficient
- Low temperature heating in buildings 40°C

Conclusions

- The energy strategy Responsible Renewable Recyclable was instrumental in winning ESS
- “Responsible, Renewable, Responsible” is neither perfect nor universal, but is being implemented and will be a benchmark for future development.
- Attention to temperature in design of machine and buildings
- Collaboration is a key success factor.
- Innovation is a requirement.

Thank You !

2019

ESS European Research
Infrastructure Consortium

- "Operations Phase"

2014

ESS AB

- "Project Phase"

2010

ESS AB

- "Design Update Phase"

2007

ESS Secretariat

- "Campaign Phase"