

The work of ex-ante evaluation of
economic effects of ESS in Lund, Sweden:
Risks associated with 'blackboxing'

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Short presentation

- Sociologist of science.
- PhD in *research policy* (2009)
 - Thesis *Small science on big machines* about the historical development of synchrotron radiation in political and scientific context; 3 cases: MAX-lab, ESRF, SSRL at SLAC
- Current activities:
 - Institutional transformation of DESY and SLAC
 - Research organization in academia in Sweden
 - Study of big science in the 20th century
 - Ex-ante evaluation of socio-economic impacts of ESS
- Research Policy Institute, Lund University; Dept for Theory of Science, University of Gothenburg; Dept of Sociology, Wuppertal University

The ESS project

- Neutron spallation source, currently with a long pulse target station
- Idea over 20 years old:
 - Early 1990s: first initiatives, ESS council in 1993
 - 1999: OECD 'recommendation' (SNS, J-Parc, ESS)
 - 2002: Bonn conference, no decision
 - 2003-2009: Sweden, Spain, Hungary contenders
 - 2009: 'Decision' in favor of Lund

ESS: anomaly in Sweden, problem child in Europe

- Europe:
 - No decision yet (after 20 years!)
 - Big countries have withdrawn, nobody has pledged definitive financial support
 - Dead 2002 but incorporated in ESFRI plans
- Sweden:
 - Political project, weak scientific support
 - Never scientifically evaluated, never properly anchored (Comparison: MAX IV)
 - Presented to public and policymakers as "a laboratory from heaven"
 - **Swedish unpreparedness**

The Politics of European scientific collaboration: conditions

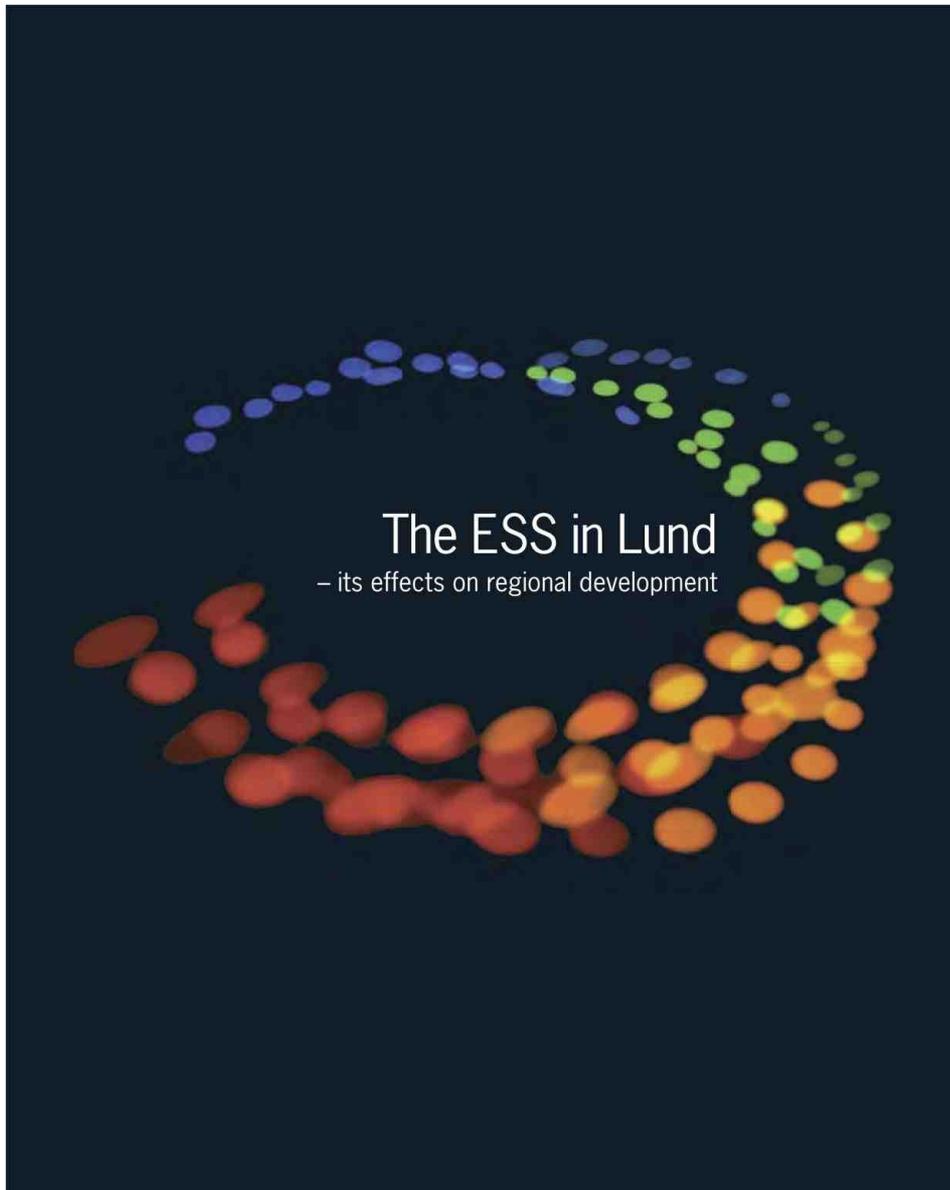
- No precedent (external to EC/EU)
- Ad hoc agreements
- Closed doors negotiations, horse-trading
- Mirrors of big politics
 - CERN and reconstruction
 - ILL, ESO and the France-Britain strains
 - ESRF and the France-German unity
 - XFEL and German-Russian complications

The Politics of European scientific collaboration: trouble

- Who will pay and how much?
 - British, Italian imbalance in ESRF, “perverted mechanism” in XFEL of small countries paying little
- Site-selection
 - CERN II issue 1967-1972
 - ESRF and Wind Tunnel agreement: Köln/Strasbourg/Grenoble
 - Exceptions: ESO, ILL, XFEL (funding issues)
- Fair return and in-kind contributions
- Scientific fair return?
- Result: Structural inertia and political lock-ins

What is the problem?

- Improper understanding of **scientific, technological** and **political** details
- Blackboxing
- Examples:
 - Intensity boost? 5 MW?
 - Need for neutrons?
 - Boon to Swedish science?
- *Focus here: economic impacts.*
- Politics, science, technology fundamentally important to assessments of future economic benefits



PriceWaterhouseCoopers
(2009): *The ESS in Lund –
its effects on regional
development*

147 pages, versions in
English and Swedish

Commissioned and funded
by the Regional Council
(with co-financing from EU
structural fund)

Promises

- 0.08 per cent higher GRP/year
= €1.6 billion higher GRP by 2040
- An increase in the number of jobs by 700/year
= 23,000 more jobs by 2040
- “For every million we put in, **we will get eight or nine back**”
(Allan Larsson, chief negotiator for Sweden, on Swedish national public radio, September 25, 2009)
- GRP of Skåne region “is **expected to grow with 214 billion SEK**, or perhaps even as much as 302 billion SEK, until 2040”
(Local daily Sydsvenska Dagbladet, January 14, 2009)

What lies behind?

- Blackboxing of the facility project
 - Scientific: What will it do?
 - Technological: How is it constructed?
 - Political: Who will pay and how?
- Failure to account for the specifics of the Swedish research system
- Expectations

This last year...

ESS MAX IV i regionen – TITA
December 2011



Utbildnings- och kompetensbehov i spåren av ESS och MAX IV – ett kunskapsunderlag (TA3)
Oxford Research



ESS MAX IV i regionen-TITA
Region Skåne samarbetar med alla kommuner i Skåne, Lunds universitet, Invest i Skåne, ESS AB, Malmö högskola, Länsstyrelsen i Skåne län, Högskolan Kristianstad, Region Blekinge, SLU Ämne och Blekinge Tekniska Högskola.



ESS MAX IV i regionen – TITA
Oktober 2011



Affärsmöjligheter i spåren av ESS & MAX IV (T16)
Oxford Research



ESS MAX IV i regionen-TITA
Region Skåne samarbetar med alla kommuner i Skåne, Lunds universitet, Invest i Skåne, ESS AB, Malmö högskola, Länsstyrelsen i Skåne län, Högskolan Kristianstad, Region Blekinge, SLU Ämne och Blekinge Tekniska Högskola.



ESS MAX IV i regionen – TITA



Industrins framtida kopplingar till ESS och MAX IV
- Exempel på internationella och regionala initiativ



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Reports on education demands and competence in the region, business opportunities, and the need for support structures in the surrounding innovation system

What we have done

- Serious background information, case studies, nuances and problematizations
- There are no free lunches!
- Important distinctions:
 - direct/indirect
 - long-term/short-term
 - Traditional (basic) science focus / envisioned innovation capacity

Un-blackboxing

- Scientific and technological fundamentals
 - Function and purpose of ESS
 - Frontier science and technology: challenges
 - Contingency and serendipity
- Political reality (Sweden and Europe)
 - Sweden's lack of precedent (unpreparedness?)
 - Europe's historical quandaries
- Innovation system and knowledge economy
 - Nothing comes for free

Results

- Challenges:
 - Supply-driven innovation capacity (basic science, path dependence)
 - Political framework (shares, fair return, in-kind contributions)
 - Taking things for granted
- Policy recommendations:
 - Adequate financing: Securing funds for renewal of experimental equipment (cf. ESRF)
 - Mandate to work with industry (political framework)
 - Regional effort: ESS cannot do this themselves

But the black box is still there

- Still overly optimistic sentiment
- Widespread lack of nuance and elementary understanding
- Still no deal
- Tremendous challenges ahead for Swedish science