Deep Geological Disposal of Spent Fuel in Sweden

Christopher Eckerberg
President

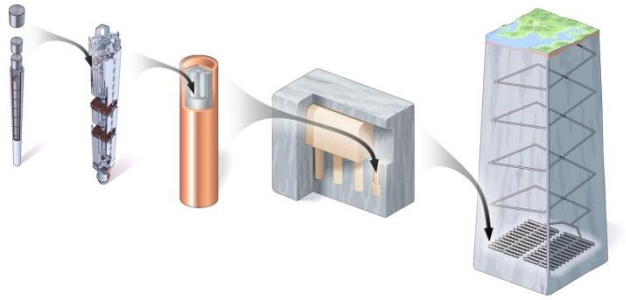
Swedish Nuclear Fuel and Waste Management Corporation

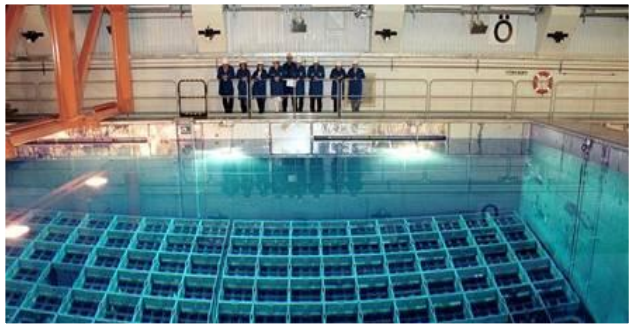
Early decisions

Early decisions on:

- Direct disposal
- Independent interim storage
- R&D for spent fuel disposal
- Responsibilities
- Financing system

(Early is late 70´s/early 80’s)

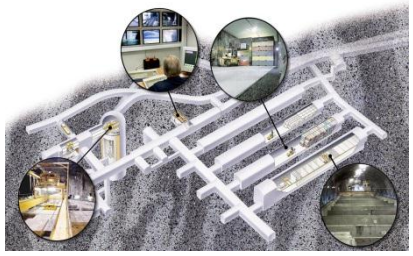


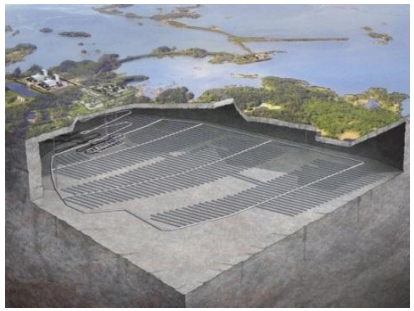


Present situation Back-end

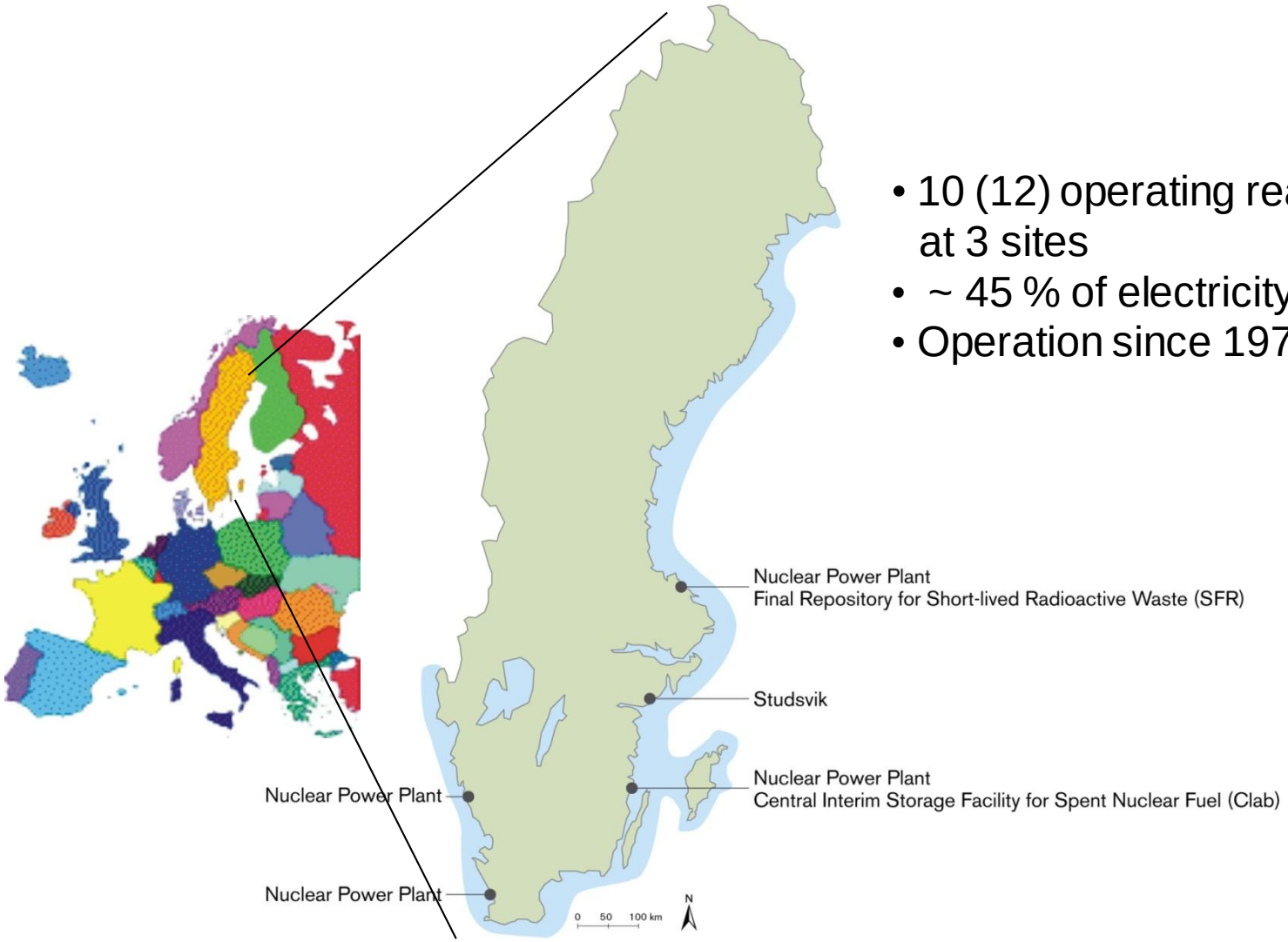
- **Interim storage, Clab**, in operation since 1985. Application to extend capacity until 2035.
- **Low level waste repository, SFR,** in operation since 1988. Application for extension.
- Sea based **transport system** in operation since 1982.
- **Licence application** for spent fuel repository and encapsulation plant. Disposal expected around 2030.








Nuclear Sweden

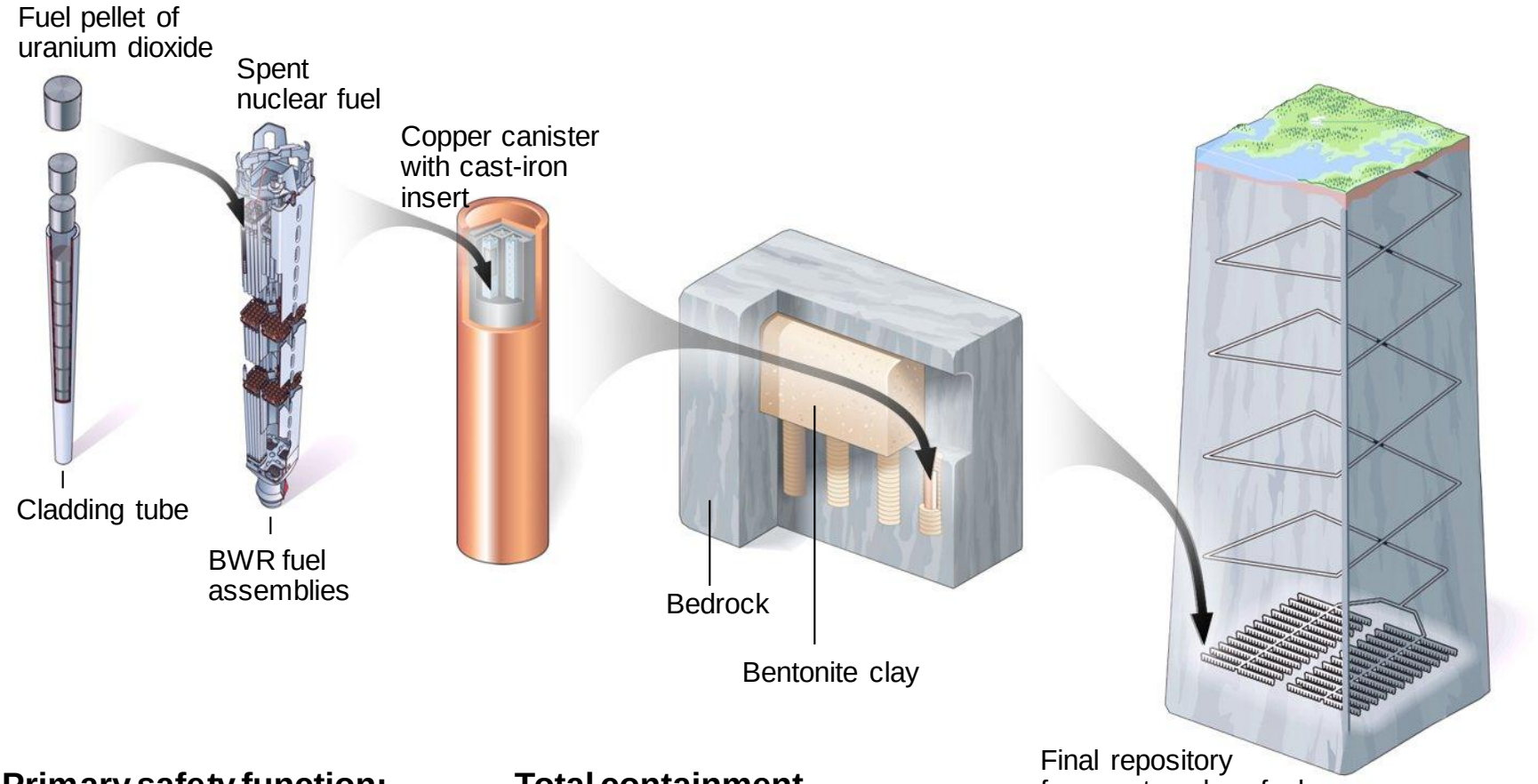


- 10 (12) operating reactor units at 3 sites
- ~ 45 % of electricity
- Operation since 1972/1985

Sweden and reprocessing

- Early plans. Reprocess all fuel.
  Build Swedish reprocessing plant
- Contracts for reprocessing abroad (UK and France)
- Change of policy around 1980 for technical, economic, strategic and political reasons
- Contracts sold and fuel swapped to avoid dual disposal system
- Small quantity reprocessed in UK. No return of waste. Plutonium to be kept in UK

The KBS-3 method for disposal of spent nuclear fuel



Primary safety function: **Total containment**
Secondary safety function: **Retardation**

Research, development and siting

Technology implementation, licensing and building of encapsulation plant and repository

Site investigations, Technology development

Feasibility studies and development of scientific basis

Methodology development

1976 m/s Sigyn in operation

1985 Clab in operation

1990 SFR in operation

1995 Äspö Hard Rock Laboratory

2000 Canister Laboratory

2005 Bentonite Laboratory

2010 Site selection Forsmark

2015 m/s Sigrid in operation

RD&D programme reviewed and approved every three years

Siting of the repository for spent nuclear fuel

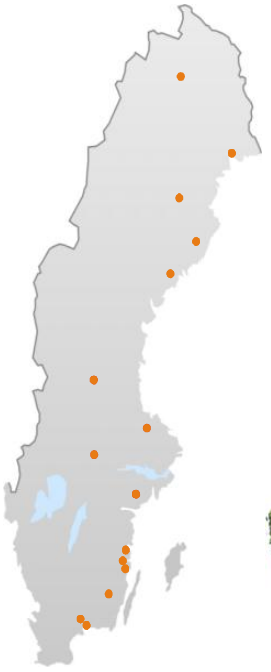
Knowledge accumulation

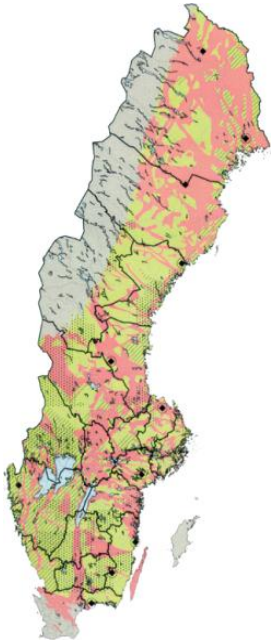
Siting process

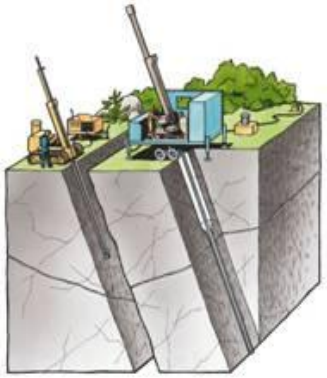
Hultsfred
Malå
Nyköping
Oskarshamn
Storuman
Tierp
Älvkarleby
Östhammar

Oskarshamn (Laxemar)
Östhammar (Forsmark)

Decision on site
2009







Study sites
1977-1985

General siting studies
1990s

Feasibility studies
1992-2001

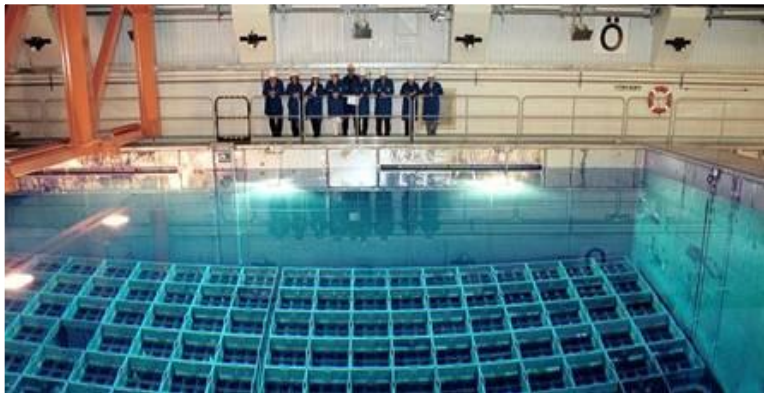
Site investigations
2002-2007

Licensing

Construction

Public consultation and involvement - key to success

- Broad national information
- Focused dialogue with potential local communities
- Strong local involvement of SKB and municipalities
- Ear-marked funding for municipality involvement



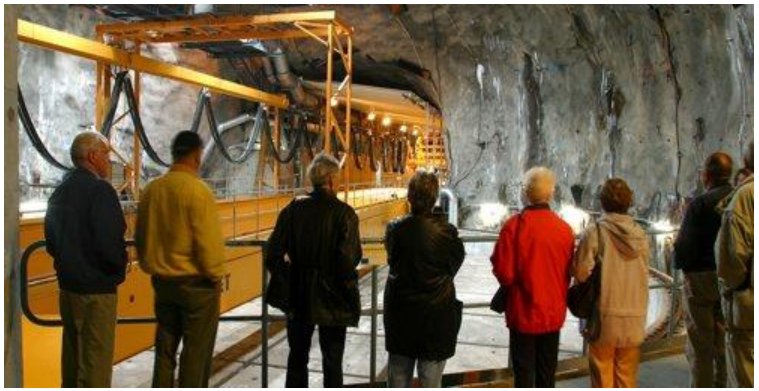
From then to now

Protests against drilling at a study sites

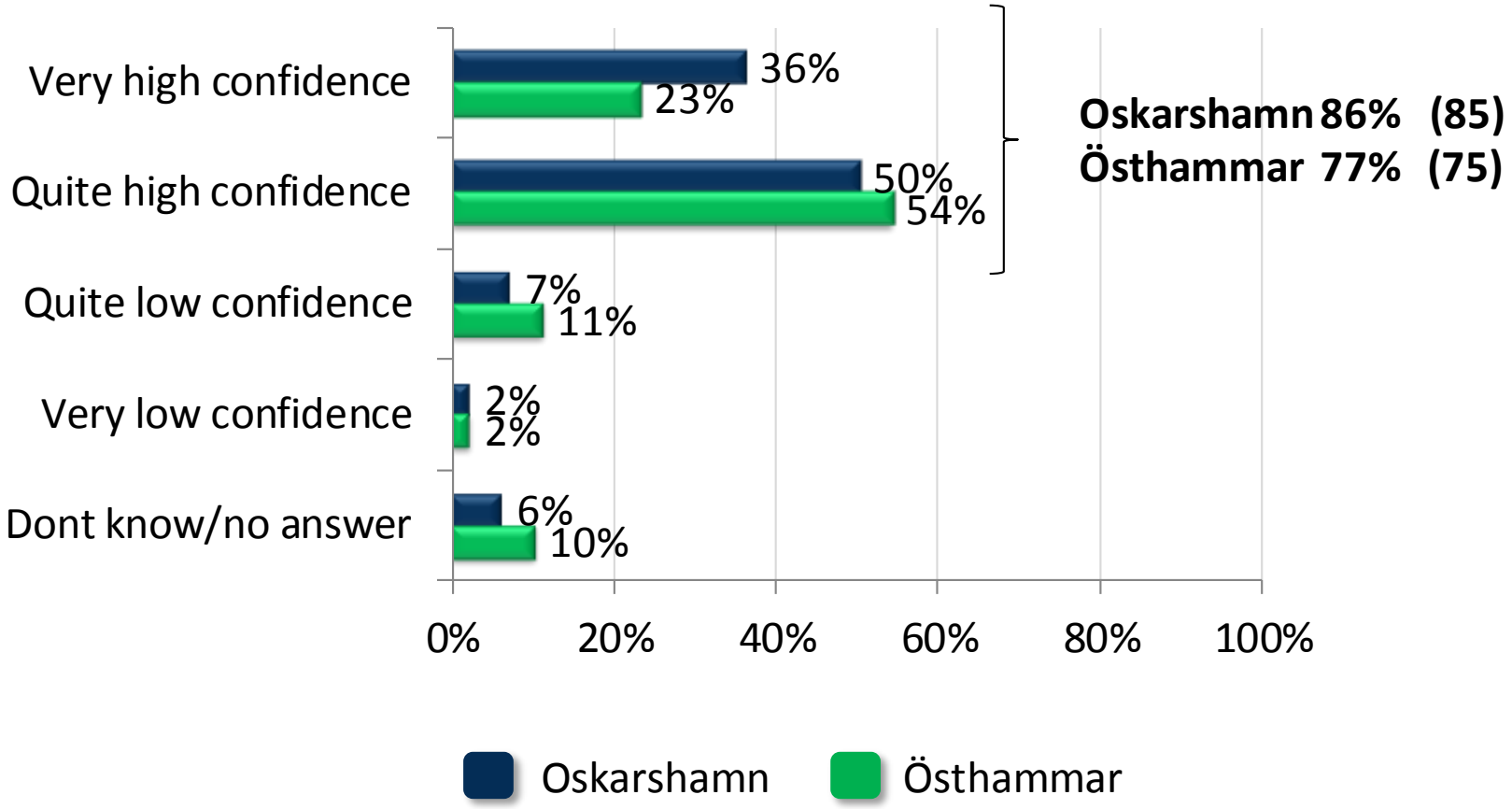
Announcement of site selection Forsmark
June 3rd, 2009

Talking with local people – being present

Visits to facilities



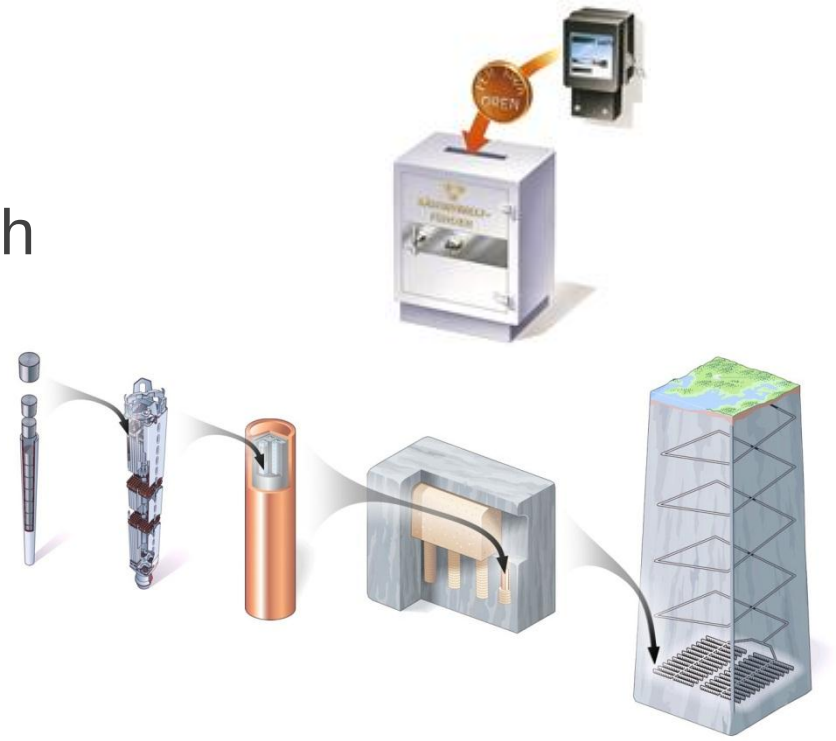
Opinion 2015



Steady progress in both municipalities. High confidence in SKB.
SKB's future plans and activities will have a positive impact in the municipalities

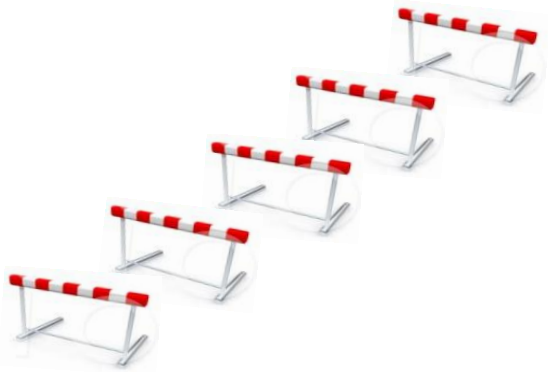
Factors for success

- Clear responsibilities for implementation and financing
- Scientific/engineering approach
- Trustworthy regulator
- Strong public involvement
- Close cooperation with local municipalities



Remaining challenges

- Licensing and accepting a First of a Kind facility
- Going from theory to practice – Industrialization
- Keeping public confidence



Thank you for your attention