Barriers on the way to a CCS system

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BALTIC CARBON FORUM

Warsaw, Ministry of Economy, October 29-30, 2015

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components in a viable CCS system (potential barriers)

capture technology	**the physical system**
transport method and technology	
storage method and technology	
the entire physical CCS system	
legal issues (national and cross border)	the legal system
governance	**the societal system**
public acceptance (awareness comes first)	
political support	
a viable system	

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a scenario we don't want

1. enthusiasm and **narrow framing** in early days
2. concerns, negative events, media debates, conflicting interests, frustration, and the framing found irrelevant at later stages
3. **fragmentation** by interest groups
4. backlash, and the decision making system gets paralyzed

Narrow framing (such as **focus only on the physical system)** is **a serious barrier which, however,** can be avoided by stakeholder participation

Fragmentation can be made more difficult by early and proactive awareness building by stakeholder participation processes

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the physical system

Capture, transport and storage are established industrial processes – technology in itself is not a barrier. However, CCS is a system where capture, transport and storage must be developed simultaneously with coordination over the entire CCS chain. Interfaces:

- The physical connection between elements of the CCS infrastructure;
- Contractual arrangements between actors of the system (e.g. liability)
- Cost-effectiveness of CCS systems

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the physical system

IEA Insight Series, CCS 2014 - What lies in store for CCS?

“While storage is the last of the three steps of a CCS project, it must be **developed simultaneously with capture and transport, from the very beginning.** This is because reservoir characteristics and behavior may determine the design and operation of the whole CCS chain.

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legal issues

Just two reminders

1. An appropriate legal system is of course necessary but not enough for political and public acceptance. To this comes the whole issue of **governance** (with public and stakeholder involvement)

2. Public and stakeholder involvement can be used in developing legislation

Australian Government has suggested that, based on public concerns about CCS, liability of leakage and the linkage between CCS and other regulations on climate change, guidelines to secure public involvement through **consultation processes** when developing legislation and assessing CCS projects should promote **a transparent process** in all stages of the carbon capture and storage life cycle. (www.aph.gov.au/.../House_of_Representatives_co).

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Vattenfall and CCS in Germany

Vattenfall's Schwarze Pumpe project in Spremberg, north Germany

Alongside a 1,600MW power plant in north Germany, the demonstration experiment was planned to capture up to 100,000 tonnes of CO2 a year, compress it and bury it 3,000m below the surface of the depleted Altmark gas field, about 200km from the site.

The Guardian, 29 July 2009

"It was supposed to begin injecting by March or April of this year but we don't have a permit. This is a result of the ***local public having questions*** *about the safety of the project," said Staffan Gortz, head of carbon capture and storage communication at Vattenfall. He said he did not expect to get a permit before next spring:* ***"People are very, very skeptical."***

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Vattenfall cancels CCS Demonstration Project in Jänschwalde

German Energy Blog, December 6, 2011

Vattenfall AG announced the cancellation of its EUR 1.5 billion CCS demonstration project in Jänschwalde "We had to realise that there is presently **not the political will in Germany** to transpose Directive 2009/31/EC on the geological storage of carbon dioxide into a German CCS law", Tuomo Hatakka, CEO of Vattenfall commented the decision.

The German CCS bill contained a clause which gave the federal states the right to designate areas in which CCS was not allowed. Schleswig-Holstein and Lower-Saxony which had been lobbying for an opt-out clause for federal states were against.

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Vattenfall abandons research on CO2 storage

The Local, 07 May 2014

"We are evaluating our research portfolio in order to invest in R&D projects which can contribute more quickly to our business development," Research and Development Nordic head Karl Bergman said.

Now Vattenfall wants to sell all their German coal plants and mining assets

Summary

Vattenfall German CCS story was stopped by local opposition, regional opposition, national political unwillingness and economy

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Canada switches on world's first carbon capture power plant

The Guardian, October 1, 2014

Boundary Dam held up as first commercial-scale CCS plant and proof that coal-burning is compatible with cutting emissions

- The project went from concept stage to start-up in just five years.
- The venture is a partnership between the Canadian government, the province of Saskatchewan and facility owner SaskPower.
- The total cost of the project was $1.3 billion. Of that, $800 million was for the CCS process. The Boundary Dam project received $240 million from the federal government.

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Canada switches on world's first carbon capture power plant

The Guardian, October 1, 2014

Captured CO2 from the Boundary Dam facility will be **stored just two kilometers away** as part of the Petroleum Research Centre's (PTCR) Aquistore project. The majority of the captured gas is sold to operator Cenovus for **enhanced oil recovery** at its Weyburn oilfield. Cenovus has set up injection wells and built a **40 mile-long pipeline** connecting Weyburn with Boundary Dam.

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BARRIERS	Locals	Regions	National politicians and general public	Civil society	Economy
Vattenfall/ Germany	Strong opposition	Opposition	Resistance	Divergent	Bad
Boundary Dam/ Canada	On-site	CO2 used by oil industry Nearby	Support	?	State support

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Baltic Sea	?? Little awareness (off shore)	?? Little awareness	?? Little awareness	?? (Passive)	??

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Example - Swedish site selection programme final repository for spent nuclear fuel

In 1992 SKB announced a new phased site selection process based on municipality voluntariness at all steps, 8 municipalities were proposed for feasibility studies

A stepwise site selection process – see next page

In June 2009, SKB announced Östhammar to be the chosen site

In March 2011 SKB submitted a licence application. Now follows a review process with the Radiation Safety Authority, Environmental Court, Municipality (veto right), Swedish Government

Site selection programme

- 1992. Eight municipalities proposed for feasibility studies. Two of them stepped out after referenda
- 2000. Three municipalities proposed, two agreed. Östhammar and Oskarshamn
- 2002-2008 Site investigations with deep drilling
- 2002-2010. Formal EIA Process by SKB
- 2009. SKB announced Östhammar to be the chosen site
- 2011. SKB License application 2011

The "safe spaces"

(initiating body in red text)

- Simulated license application - the "Dialogue project" (regulators)
- Oskarshamn model, EIA-Forum, 1994 –2007 (municipality)
- RISCOM Model +safe space idea
- SKI/SSI hearings on site selection , 2001 (regulators)
- Transparency programme, 2006 – 2010 with RISCOM Hearings (Nuclear Waste Council)
- SKB Reference Group for copper corrosion, 2010 (SKB)

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Lessons learned

- Public and political acceptance is the main barrier, easy for Boundary Dam, impossible (the way it was done) for Vattenfall
- CCS in Baltic Sea – somehow in between the German and Canadian cases ?
- To get acceptance there must be something to accept – there must be awareness
- For CCS in Baltic Sea there is little or no awareness
- Awareness is created by public and stakeholder involvement
- Swedish case shows it can be done – be proactive and start early (now!)

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There are many processes and tools for stakeholder involvement

Citizen Advisory Group, Citizens' Jury, Citizens' Panels, Consensus Conference, Delphi Survey, Focus Groups, Partnership, Mediation forum, Opinion Polls, Public Hearings, Safe space (RISCOM Process), Roundtables, Scenario Workshop, Seminar, Surveys ,,,,,

See e.g. http://toolbox.ippaproject.eu/index

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One way to structure stakeholder involvement initiatives

Consensus shaping

Stakeholders agree to jointly develop solutions

Safe space approach

An active dialogue in which different stakeholders together increase their awareness and understanding of the issues and also of their respective views without being committed to find common solutions

Consultation

The public and stakeholders are asked to give their views and concerns

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Examples of processes and events

Basic approaches	Processes	Events
Safe space	Safe space process with reference group Simulation	Safe space (RISCOM) hearings Focus Groups
Consensus shaping	Partnerships	Consensus conferences Citizen juries
Consultation	EIA consultations	Interactive web sites Surveys

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One example – the safe space process

The safe space (RISCOM) process is designed for enhancing awareness and clarity in active dialogue between different stakeholders. The stakeholders together form the process on the basis of agreed principles.

1. Working group – ”pre understanding” and organization

2. Reference group with stakeholders (e.g. industry, communities, academia, authorities, NGO:s) – Formal agreement

3. The reference group sets the agreed principles in action

4. Knowledge building activities
5. Hearings with “stretching”
6. Documentation

The approach has been implemented in different sectors and in different other countries (Czech Republic, Poland)

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What to do - factors to take into account

Who you are

(determines what you can do, who can participate, etc.)

What is the aim of participation? What do you want?

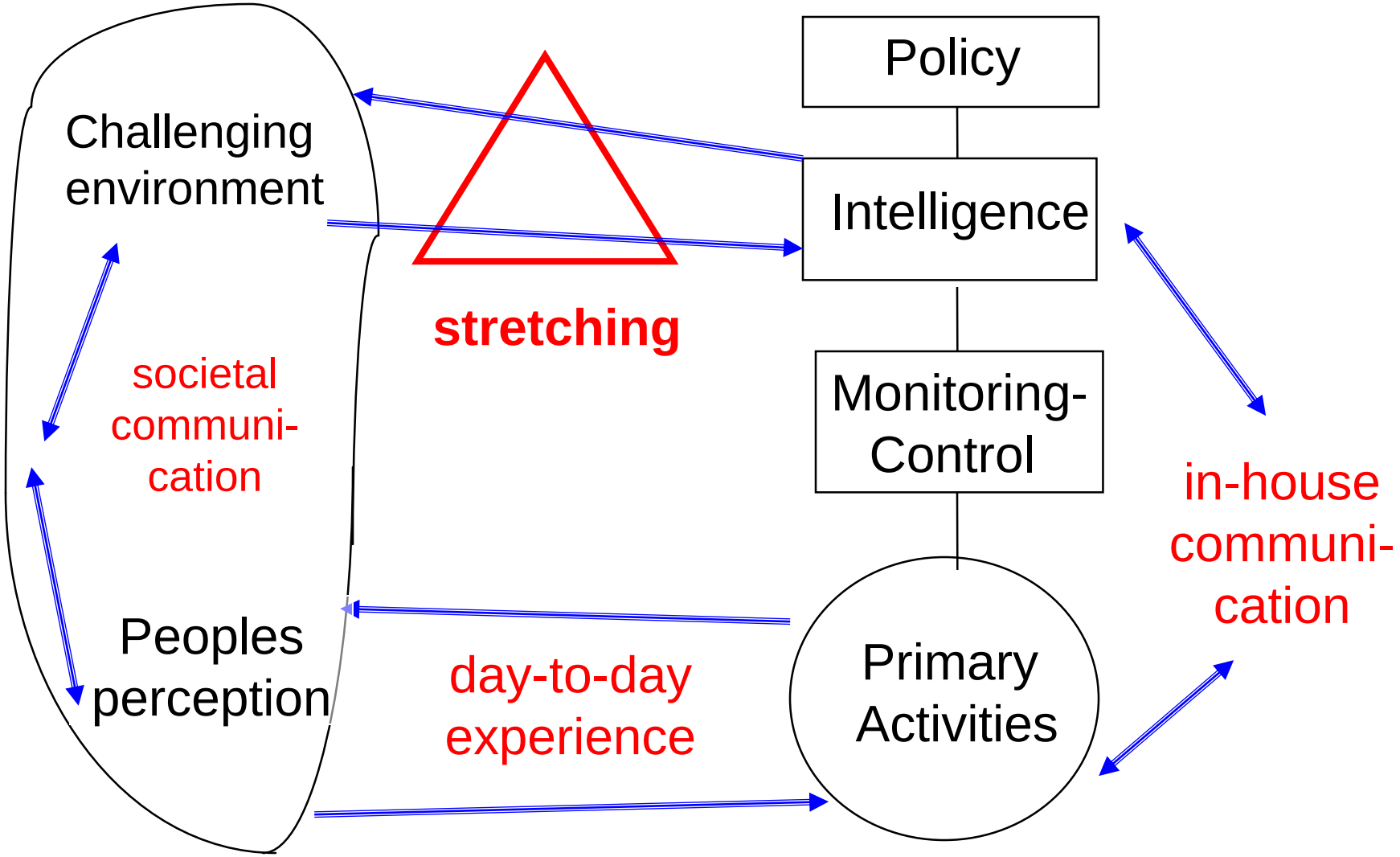
(Don’t promise more than you can keep!)

Signals you send

(funding, chairperson, secretariat, venues , etc.)

Trust – the process stands and falls with trust

Viable Systems Model



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Conclusions – barriers

Capture, transport and storage are established industrial processes – technology in itself is not a barrier (but needs to be optimized)

The CCS system is not yet developed for the Baltic Sea

There is little or no awareness – a prerequisite for acceptance

Conclusions – how to overcome the awareness barrier

Early and proactive stakeholder participation is needed. It may stabilize societal decision making and vaccinate against harmful fragmentation in sensitive phases of political decision making

Development of the physical CCS system should be done hand in hand with awareness building

Stakeholder involvement can be a resource also in developing legislation

There exist a number of stakeholder participation methods ready to use, tailored to the specific CCS situation

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Welcome to the SENIX Conference

Stockholm, June 13-15, 2016

The Role of Social Sciences in a Low-Carbon Energy Mix

This is the second conference in a series (SENIX 1 was held in Stockholm , May 25-27, 2015)

"Building the future energy system will meet social and political challenges. This is well acknowledged, but still there is insufficient action to involve the stakeholders needed for transparent and robust decision making by the end users of research in governments and government agencies, as well as by local and regional decision making bodies. The SENIX initiative intends to help bridging the gap between present day conditions and full recognition of the necessity to bring in the social issues up-front"

CCS will be a topic. Kirsty Anderson (Global CCS Institute) will have a Key Note speech and Sirin Engen (Bellona) is member of the programme committee

www.delegia.com/senix2016 (opens shortly)

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Thank you for your attention!