



Session 2: Where do we go next?

**IEAGHG Storage Networks:
Meeting the Needs of the R & D
and wider CCS Community**

Breakout Session 3 – Future focus and direction
(by Network)

Storage Networks' Future



- **What is the role of the networks in wider CCS community?**
- **What should the networks be doing that they aren't doing now?**
 - Can the group formulate new ideas and directions for the networks?
 - Are new networks needed?
 - Are any existing networks no longer needed?
 - Are cross-network issues being adequately addressed?
 - Specific priorities for the group's network
- **(Plenary discussion) Priorities for networks and network activities?**
 - Priorities for the networks as a whole

Environmental Impacts of CO₂ Storage

Future focus and direction

Breakout Session 3



What is the role of Workshop-Series in wider CCS community?

see breakout 1



What should the NW be doing in the future

Formulate new ideas & directions for NW

- understanding of processes, relating fluxes to impacts (e.g. groundwater)
- impacts of brine and mobilized substances
- mobilized hydrocarbons (other substances)
- try to include more information from industrial analogs
- drawing the appropriate information from suitable natural and industrial analogs, define differences to storage, compiling analog database, putting analogs into conte



Networking Issues:

Providing information and co-operation with communication experts/science journalists etc.

Correctly naming WS/Pseudo-Network

Joint research opportunities or proposals would be good
(difficult to develop in bi-annual meetings, international funding)

Are cross NW issues being adequately addressed ?

More interaction between NWs needed.

Organization? e.g. Topical Workshops/sessions including members from various Networks?

Modelling Network

Future directions

Key issues



- **Scale:**
 - Multiple time and spatial scales: reservoir, leakage pathways, overburden, shallow aquifers → how to incorporate all the components
 - Comparison between **models of sedimentary basin**
 - **Interference** between multiple injections
 - **Upscaling approaches** for instance incorporation of capillary pressure model in large scale model
- **Knowledge management and model updating:**
 - how to use monitoring data to update the model, to improve the model?
 - What's the efficient procedure (workflow) to support risk assessment
- **Impurities**
- **CO2 EOR e.g. Residual Oil Zones, Optimisation of storage**

New ideas, directions



- **Current network format works well**
- **More online material e.g. Benchmark** (currently the Sleipner case)
- **Validate the workflow for model updating:**
 - Joint meeting with monitoring
 - on virtual test site ?
 - IEAGHG study ?
- **Organisation:**
 - Frequent rotating the steering committee
 - More collaboration with other networks (multiple combination of networks, but with specific technical topics)

Risk assessment network



- The RA NW agrees that is the over arching umbrella or horizontal group that will interface with the other NW, capturing their needs and supporting their own risk related development, including input from social NW
- Change the name of the NW to Risk management
- **Get CCS projects more involved in this network**
- Review, update and publish terminology report public
- The network should talk more to outside: regulators, NGOs...



- Prioritize what we should achieve in the short term and long term: prioritize things we wrote in the past 3 years (pooling by by e-mail) .
- The network should be responsive to the needs of the ISO TC 265 (several members of the network are already involved in it)
- How uncertainties affect the outcomes of RA?. How to deal with bias?



- Do not forget that risk management includes monitoring and preventing/corrective measures. What are we going to do with this?
- 1st joint network should be with ???
- Organize reporting session of other NW as an input to every NW annual meeting.
- Can we organize virtual meetings in-between the annual meetings: e.g. on induced seismicity
- Organize webinars to present a complete project

Monitoring Network



- Role of networks in CCS community
- What should the networks be doing that they are not doing now

Role of networks in CCS community



- International updates
- Small enough forum to have small group interaction
- Frank technical discussions
- Informal
- Benchmarking one project against another

What should the networks should be doing that they are not doing now



- Not enough between-networks interactivity
 - Need cross-cutting topic-driven workshops , with action of follow-through
 - How to get interaction without sacrificing depth in the network ? Need annual monitoring network meeting
 - Back-to back meeting same place, session overlapping
 - Ambassadors from one network to another

More what networks should be doing



- Webinars for more frequent meeting
 - not archived – need frank discussion
 - With peers and colleagues
 - Small conference, time for specific areas
- IEA GHG Networks Collaboration with other professional meetings
 - Run a focused meeting
 - Elevate IEA GHG role

More what networks should be doing



- Joint meeting used more for cross-fertilization
 - Administrative and planning not as valued as technical data and discussion

Monitoring Network Priorities



- Field implementation, demonstration, applications important to the network
- Locations at a place where projects are active=new influx
- Promote best practice via example and lessons learned (failure included!)
- Maintain connection with Natural Analogs and Risk
- Do not damage the value of network meetings by dilution

Topic driven workshop/possible new network/cross-cutting



- Performance assurance
 - History matching
 - Contingency
 - Mitigation
 - Remediation
 - Closure and post closure

Radical departures



- Mergers
- Murders
- Frankenstein - reconfigurations

Wellbore Integrity Network



- **What is the role of this network in wider CCS community?**
- **What should the network be doing that they aren't doing now?**
 - Can the group formulate new ideas and directions for the network?
 - Are new network needed?
 - Are any existing network no longer needed?
 - Are cross-network issues being adequately addressed?
 - Specific priorities for the network
- **(Plenary discussion) Priorities for networks and network activities?**
 - Priorities for the networks as a whole

Relevance of WBI network to CCS



- Wells are the linkage between reservoirs and the surface. They drive risk and allow monitoring. They are a rich subject for modeling. Wells are primary source of potential environmental impacts.

New topics



- Design of cement and casing in response to a variety of geochemical and geomechanical environments
- Should consider leakage potential of wells drilled and abandoned (i.e., without casing).
- Monitoring abandoned wells
- Security of long-term abandonment (>100 years)
- Impacts of fracking and seismicity on WBI

Questions and answers



- New networks needed? No
- Are any networks not needed? No
- Are cross-network issues being adequately addressed?
 - Network interaction: difficult/impossible with annual meetings in disparate locations
 - Meetings organized on a theme with participation from several networks
 - Concurrent-session meeting of all networks with a plenary session

Future of the network



- Difficult to hold the meetings on a geographic basis when the expertise/membership is localized
- Organizing meetings has been challenging
- Utilization (CO₂-EOR) focus in US and Canada increases the importance of WBI
- Progress recently has been slow on key issues such as frequency/permeability due to difficulty in involving industry
- The only network with substantial amount of real data to work with (including laboratory work)

Alternatives



- Every two-year meetings
- Joint meetings with other networks
- Distribution of WBI tasks among other networks

What will be lost with abandoning the WBI Network



- Industry participation in a key area
- Connection between CO₂-EOR experience and CCS occurs in the WBI network
- Will lose material research and operational focus areas
- WBI network has historically had the best participation from industry
- Modeling network primarily focused on reservoirs? Monitoring network is focused on plume ID and shallow leakage effects?
- The most disciplined group