POLISH-NORWEGIAN RESEARCH PROGRAMME

CCS 2013 CALL
DESCRIPTION OF THE CALL AREA

Establishing a CO_2 storage pilot is the most effective step to ensure further development of CCS. This is one of the goals of this call for proposals launched under the Polish-Norwegian Research Programme. Other areas of interest for this call include: R&D within capture and storage, environmental studies and social science studies to enhance public and political awareness. The following topics will ensure good progress within CCS in Poland and Norway.

1. STORAGE PILOTS

Knowledge, methods and technologies to monitor storage sites and the geosphere above a storage site should be further developed and tested. Testing of methods and tools is most effective in actual and real injection projects. This also deals with methods and procedures to counteract possible undesirable incidents and environmental impact. Increased lifetimes of equipment and installations used in development of a storage site will simplify operations and can contribute to reducing costs. This call therefore encourages applications on onshore storage pilots. Due to the limited funding period under this call, it is recommended to build on already existing infrastructure.

Applicants are particularly encouraged to incorporate innovative thinking and interdisciplinary cooperation into CO_2 storage technology development efforts.

Expected impact: Experience from injection, monitoring and validation of models that describe the storage site, the CO_2 plume and the migration of CO_2.

2. NEW INNOVATIVE SOLUTIONS FOR CO_2 CAPTURE

Under this call, the programme is seeking to grant proposals for projects related to the long-term development of new, innovative solutions for CO_2 capture. There is a great need for novel concepts that can significantly reduce the costs associated with CO_2 capture from industrial processes and power production in the long term. This includes what may be classified as next-generation capture technology.

Project proposals must include an assessment of the potential of the proposed technologies to boost efficiency and cut costs compared with the most mature technologies.

Expected impact: Improved understanding and evaluation of new innovative CO_2 capture technologies and how they can improve the CO_2 capture efficiency.

3. NEW KNOWLEDGE THAT FACILITATES LARGE-SCALE CO_2 STORAGE

Geological storage of CO_2 requires that CO_2 remains safely stored for thousands of years. New knowledge on how to avoid migration of CO_2 out of the storage reservoir is required. Improved or new monitoring methods and technologies are required to ensure safe transport and storage of CO_2.

Expected impact: The project should result in recommendations for how to prevent unintended migration of CO_2, including guidelines for characterisation of possible storage sites and required monitoring plan for the operational and post-operational phase. Improved understanding of the required monitoring frequency, resolution, methods and costs.

4. ENVIRONMENTAL IMPACT

The environmental impact of capture processes and potential leaks in connection with transport or storage should be addressed. Better understanding of possible effects of leakages on nature is also required. In addition to environmental impact analyses, it will be desirable to carry out Life Cycle Assessment (LCA analyses), both to map the total environmental footprint of a complete CCS/CCU chain (carbon: capture and storage, capture and utilisation) and to assess individual components and processes. Models and procedures for this should be established.

Projects that produce new knowledge about the potential environmental impacts associated with the realisation of large-scale CO_2 storage will therefore be eligible for funding.

Expected impact: Improved models for determination of anomalies based on biological input and numerical simulations. / Technology for reducing amine emissions to be available for full-scale application. / Procedures and models developed for environmental impact analyses.

5. ENHANCING PUBLIC AND POLITICAL AWARENESS OF CCS

A key for successful deployment of CCS is enhanced public and political awareness of possible hazards and benefits associated with CCS. This call therefore opens for social science studies that can pave way for realistic assessment of CCS by the general public and the political systems in Norway and Poland.

Reference should be made to international studies and best practice manuals for public and political awareness published by the IEA GHG and GCCSI.

Expected impact: Advice on how to handle public concern and political challenges with respect to CCS in a realistic manner.

EXAMPLES OF RELEVANT BUT NOT EXCLUSIVE TOPICS IN THIS CALL:

- capture processes such as: innovative next generation solvent and sorbent based processes, membrane based processes, and Chemical looping (CLC) based processes for pre-combustion, post-combustion and oxyfuel CO_2 capture technologies
- evaluation of energy savings for new different innovative capture processes, including the whole value chain
- developing new knowledge that facilitates large-scale CO_2 storage (mechanisms preventing leakage of CO_2; possible migration paths in faults, anticline structures; quantification and modelling of potential subsurface and surface leakage impacts
- increasing knowledge about the pressure development in CO_2 storage reservoirs including modelling of pressure development and greater insight into how CO_2 storage reservoirs respond to the pressure build up
- gaining a better understanding about how CO_2 injected for enhanced oil recovery (EOR) can be combined with permanent CO_2 storage
- developing new, ground-breaking methods and equipment for the monitoring, measurement and verification of stored CO_2
- increasing knowledge about storage capacity, injectivity and the long-term effects of stored CO_2
- close knowledge gaps related to environmental consequences of capture, transport and storage of CO_2
- close knowledge gaps related to degradation in nature and toxicological examination of substances originating from amine-based CO_2 capture
- emissions to air from other than amine-based capture processes
- LCA analyses for the entire CCS/CCU chain, as well as, for example, for production of amines and other absorbents and adsorbents
- developing methods and tools for analysing and assessing the overall environmental consequences of CCS, including reducing the uncertainty in such analyses
- public acceptance, mechanisms for how CCS could be incentivised on short and long turn, and impact of deployment of CCS.