



Annual Programme Report No.3 Norway Grants 2009-2014

Programme CZ08 – Pilot studies and surveys on CCS technology

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Programme Operator: Ministry of Finance of the Czech Republic

**Programme Partner: Ministry of the Environment of the Czech
Republic**

Donor Programme Partner: NA

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1. Executive summary

The CZ08 Programme “Pilot studies and surveys on CCS technology” is aimed at increasing knowledge and international cooperation on CCS which shall be achieved via two program Outputs aimed at preparation of CCS pilots and raising public awareness. The programme structure consists of management of the programme, of a single open call for project proposals (2014) and an addressed call (2015, pursuant Art. 6.9 of the Regulation) for distribution of additional funds to running projects, of the Fund for bilateral relations (measures A and B) to support deeper cooperation between the projects promoters and entities in Norway, which is on the rolling basis opened till July 2017, and of Complementary actions. The programme does not have any donor programme partner.

The scope of CCS themes has been extended and updated by the Climate and Energy Package, approved by the European Council in 2014. The Czech Ministry of the Environment (MoE) in the role of Programme Partner is responsible for transposing the European Directive on the geological storage of carbon dioxide into national legislation and for observance during the practical application. In 2016 no substantial progress in legislative measures towards CCS practical application in CR was made.

The Annual Programme Reports No. 1 and 2 (2014, 2015) covered start and early stage of the CZ08 implementation, while the APR No.3 (2016) reports on advanced or even final phase of projects implementation and provides quite good estimates of reaching goals and fulfilling indicators.

In 2016, the finally identified rests in the regranting item amounting 115 902 EUR were transferred to the Fund for bilateral relations as the Programme continuously confirms its potential in bilateral relations between the CR and donor states institutions, as well as between other stakeholders in the CCS research community on international level. The PA amendment has been issued in the DoRIS system in July 2016.

The call for applications for grants from the Fund for bilateral relations on the Programme level – measure B (for promoters of running projects) - was launched in April 2015 and remains still open. In late 2016, the Call was modified and updated – the allocation was increased and the scope of eligible initiatives was extended (e.g. long term internships can be supported). Moreover, the funds shall stay available till 31/7/2017 and realization of the initiatives shall follow till September 2017. - So far, 10 applications were supported and realized.

The allocation for Complementary actions (reduced to 25 118 EUR) was partly utilized for organisation and visit of a joint bilateral seminar at the GHGT-13 conference in Lausanne, however, the main part - ca 20 000 EUR - remains still available. The PO shall decide on request for a possible transfer of the rests into the BF in early 2017.

The programme management structure is functional and effective. The Steering Committee met twice in 2016 (on 14 April and 7 December 2016). – Besides this, the NFP is in close contact with the PP (MoE) as well as with projects promoters mainly via a communication panel in the CEDR system.

The PO provides proper programme promotion and informs on the CCS programme on its web pages <http://www.eeagrants.cz>, specifically designed for the EEA and Norway Grants 2009-14. Information on the programme can be also found on the web pages of the Programme Partner (Ministry of Environment) http://www.mzp.cz/cz/financni_mechanismy_ehp_norska. - Each of projects promoters, in line with the publicity rules, had set up own web pages for the project with regular updates. – Beyond the regular publicity measures, the programme and projects were presented at a bilateral international

seminar “Cooperation between countries in the field of CCS, example of cooperation between Norway and the Czech Republic” organized jointly by promoters and the PO as an adjacent event at the GHGT-13 conference in Lausanne, Switzerland, in November 2016. - Three of four projects finished in 2016 – i.e. 3 final project conferences took place in Prague (in June and November 2016). - The PO plans to issue an article about the Programme in 1st Quarter 2017 and organise the Programme closing conference in autumn 2017 at which the brochures on the Programme will be distributed.

The risks of Programme implementation are fully under the control, well monitored and flexibly mitigated. The main risk of the Programme reported in the previous APRs was the limited time for implementation of projects. During 2015 and in 2016, the Programme and projects were prolonged so the risk decreased. The actual risks are related to proper spending allocated funds and/or commitment of the remaining funds within the Fund for bilateral relations which intends to absorb the savings and left-over from the budget headings Regranting and Complementary action.

2. Programme area specific developments

The CCS technology is still quite new topic in the Czech Republic, so the development in the sector is not very dynamic and compared to the previous period, trends in the sector couldn't be set yet. Despite potential sources from the European NER 300 programme for renewable energy within the Climate and Energy Package approved by the European Council in late 2014, the Norway grants are almost the only financial resources for funding in the area of CCS technology.

Pursuant to the European legislation (the Directive 2009/31/EC of the European Parliament and the Council on the geological storage of carbon dioxide and amending Directives 85/337/EEC, 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and 2008/1/EC and Regulation (EC) No. 1013/2006, the Czech Republic as a EU member is permanently obliged to explore the options for the geological storage of CO₂ and apply the eco-innovative tools and to implement demonstration pilot projects. The knowledge gained also thanks to deliverables and contributions from the CZ08 programme shall help to decide the CR position towards adoption of this new technology.

The Ministry of the Environment (MoE, the Programme Partner) is currently working on a document „Climate Protection Policy“ with an emission reduction outlook until 2050. It contains a chapter on the possibilities of achieving the reduction target of 80 % compared to 1990 levels and describes three scenarios, among which one assumes development of CCS technology and its deployment on power sources of 5000 MWe by 2050.

The CZ08 Programme provides significant contribution to research and pilot testing of possibilities in CCS. The MoE provides financial resources for Programme co-financing from the state budget and provides expertise and necessary advice during the assessments, reporting and/or evaluation.

3. Reporting on outputs

In 2016, the four projects supported within CZ08 were under regular implementation. Three of them focused on research and investigations , one aimed at increasing awareness on CCS in the CR – see

classification towards Outputs 1,2 below. All the projects were in their closing phases of implementation or have even finished, in full accordance to their extended time schedules. In particular - the 004 project (Masaryk University) finished by 30 June 2016, the 006 (CGS) by 30 November 2016 and the 003 (CTU) project by 31 December 2016. The last one - 005 (VSCHT) – is still under implementation, however, it has delivered most outputs and shall be duly settled till 30 April 2017.

The overview includes data reported in current monitoring reports or accessible from final drafts, contributing to particular Outputs and summarized for the Programme.

The Programme shall provide **increased knowledge and international cooperation on CCS** (a single Outcome) through two Outputs – via

- Output 1 - *Completed surveys to explore possibilities of the practical application of the CCS technology in the CR, including methods for the capture, transport and storage of the CCS*
- and Output 2 - *Increased knowledge of staff working in the state and public administration and awareness of the public on CCS technologies .*

Regarding the Output 1, three projects (003, 005, 006) are contributing. The fourth one (004) is targeted at the Output 2. One of the three projects (namely 006) within Output 1 provides also some contribution to Output 2.

The progress in contribution to programme Outputs is illustrated in the table below. As to Output 1, the completion of surveys and studies, as well as introduction of methods cannot be reported until projects completion reports shall be submitted in 2017. On the opposite, knowing the recent final achievements of the 004 project, the Output 2 (raising awareness on CCS) indicators have been reached in 2016 :

Achieved Output indicators by projects

Project No./ Promoter	Project name	Output 1		Output 2	
		cummulative TARGET	ACHIEVED	cummulative TARGET	ACHIEVED
		Completed Surveys to explore the possibilities of the practical application of CCS in CR Indicator: Number of analyses and studies / methods PRG TARGET : 3		Increased knowledge of staff working in state/public administration on CCS Indicator: Number of awareness campaigns, events, methods and tools for transferring information PRG TARGET : 5	
003 ČVUT	Study of pilot technologies for coal power plants in the CR	2	0	--	--
005 VŠCHT	Research of high temperature CO2 sorption from flue gas using carbonate loop	2	0	--	--

006 ČGS	Preparation of a research Pilot Project on CO2 Geological Storage in the Czech Republic (REPP-CO2	6	0	4	3
004 MASARYK UNIVERSITY BRNO	Carbon Capture & Storage – Sharing Knowledge and Experience	--	--	4	15
TOTAL		10	0	8	18

The planned and achieved indicators are illustrated by particular projects as follows:

003- Study of CCS pilot technologies for coal fired power plants in the Czech Republic (Czech Technical University and partners – ÚJV Řež and SINTEF, Nor.)

The project was designed to provide a comprehensive techno-economic study on application of CCS approach on CO2 elimination from a coal energetic block in a power plant in CR and comparison of three basic methods (pre-combustion, oxyfuel and post-combustion) of CO2 treatment. In mid 2015 the project was significantly extended by an additional grant, more activities were provided and the deadline was prolonged till 31 December 2016 (just finished).

The scientific project shall contribute to the programme Output 1 with 2 completed surveys on practical use of CCS application in CR which shall be reported as fulfilled in the project completion report in 2017. However, the qualitative Outcome indicator “Increased knowledge of and transnational cooperation in CCS” shall be achieved via 19 planned available documents/deliverables, such as research reports, seminars, presentations at conferences, manuscripts/published articles, author SW etc. In the last reported period (till mid 2016) next 4 of them have been completed (3x presentation at conferences and 1x research report on WP2-activity) and thus 11 were delivered in total. The rest has been finished till December, however, with respect to delayed reporting shall be confirmed in 2017.- The project provided excellent publicity to the scientific results – they were publicized and presented at numerous seminars, workshops and conferences in the CR and abroad.

005 - Research of high temperature CO2 sorption from flue gas using carbonate loop (VŠCHT and partners – ČVUT, ÚJV Řež)

The scientific project had planned to support the programme Output 1 with 2 outputs consisting of completed protocols from laboratory testing and a Study of a pilot device for testing of CO2 sorption. These shall be declared as fulfilled by the end of the project in 2017.

Achievement of the results shall be confirmed by 15 research reports, seminars, a created database etc. During the reported period, next project outputs have been achieved (research articles presentations at conferences organizing a public seminar at the ICCT 2016 conference in Mikulov, a summary research report etc.), so 20 deliverables have been provided up to now in total and the target sum has been overcome. The project was extended by additional research activities and prolonged till 30 April 2017 so currently the finishing works are still in process, achievement of the outputs and contribution to the Programme Outcome shall be reported in mid 2017.

006 - Preparation of a Research Pilot Project on CO₂ Geological Storage in the Czech Republic - REPP-CO₂ (The Czech Geological Survey ČGS and 5 Czech partners and a Norwegian one – the International Research Institute of Stavanger (IRIS))

The 006 project is seen as a flagship in CCS because of its complexity, volume and sustainability. The project was designed to initiate the preparatory phase of a CO₂ storage research pilot project in the Czech Republic, following the rules set by the national law and the EU CCS Directive. The target storage structure is a small depleted hydrocarbon field in South-East Moravia, at ca. 900 m depth.

The project has finished by 30 November 2016. During the final project period works were finalized in all project activities and also presentation of the project results was done. Dynamic modeling of storage structures behaviors in the time and the simulations of CO₂ injection repository were completed. All project data were stored in a structured geodatabase. A risk assessment report on risks associated with the operation of the repository and final monitoring plan were prepared. The potential for geological storage of CO₂ over the eastern part of the Czech Republic, which belongs to the Carpathian system, was reappraised in a separate study and plans for further realization of experimental CO₂ storage on site LBR-1a have been drafted. Regardless the fact that the official reporting on achievements shall follow in 2017 it can be already confirmed that the project was successful and that the objectives were achieved and indicators fulfilled or even exceeded.

The project resulted into the important conclusion that the selected geological structure (Bearing LBR-1) is suitable for CO₂ geological storage and that preparations for the implementation of a research pilot project can continue in the future. The project results have been presented at a number of domestic and international professional seminars/conferences, e.g. in Venice within the conference CO₂GeoNet Open Forum, in Oslo and in Lausanne at the GHGT-13 conference. The final project conference was held in Prague on 7-8 November 2016. In the coming months the publication of results in scientific journals is expected.

The project shall contribute to both programme Outputs – to Output 1 by 4 comprehensive reports and to Output 2 by 6 methods of dissemination and publicity means (brochure, newsletter, seminar, website). Whereas the final research reports shall be confirmed after the project completion report in 2017, the particular steps (the 16 planned results - models, databases, maps) have been supported by significantly more ones, 25 of them have been delivered by the last reporting cut-off date. As to Output 2, 4 of the 6 planned publicity measures have been reported. Fulfilling all the indicators is expected and shall be confirmed from the project completion report in 2017.

004 - Carbon Capture and Storage - Sharing Knowledge and Experience (Masaryk University Brno and NTNU Nor.)

The project was focused mainly on dissemination of public knowledge on the CCS and on potential aspects of its application in the Czech Republic and is being implemented primarily via lectures to students and public and via expert workshops and seminars for state administration bodies in order both to highlight the mitigation potential of the CCS technology and to mention the current world situation and actual objective obstacles on way to broader deploy and utilize the technology (also in the Czech Republic).

The project was extended by more activities (establishing the laboratory, organizing a competition in knowledge on CCS etc.) for additional grant and slightly prolonged. It has duly finished by 30 June 2016. In the reported closing period the Promoter provided huge amount of successful activities (seminars, workshops, next installations of the mobile exhibition, lessons and teaching the new block subject on CCS at the University) including the final project conference in Prague (15 June 2016) with participation of representatives of other CZ 08 projects, the PP (MoE), the PO (MoF) and other stakeholders.

The project shall contribute to programme Output 2 by 4 planned deliverables (an exhibition, seminars, competitions etc) which should be supported by 106 particular actions. During the closing period, next 55 actions (seminars, presentations, series of lectures, exhibitions etc.) have been realized and in total, 131 actions were delivered. Although the official reporting on reaching the Output 2 indicators shall follow after the project completion report (in 2017), it may be already said that relevant indicators have been fulfilled and even exceeded in fact.

4. Reporting on Programme outcome(s)

The programme outcome was selected with regard to current national priorities and needs while investigating the possibilities of the practical application of CCS technology as an eco-innovative measure in the Czech Republic and the related education of the general and professional public in this area.

The single programme outcome is *Increasing knowledge and international cooperation on CCS*. The contribution to this outcome shall be provided by two Outputs :

- Completed surveys to explore possibilities of the practical application of the CCS technology in the CR, including methods for the capture, transport and storage of the CCS,
- Increased knowledge of staff working in the state and public administration and awareness of the public on CCS technologies (see section 3 above)

There are two Outcome indicators selected with respect to national priorities, i. e.

- Availability of documentation, data and information allowing a decision to be made on the practical use, capture and storage of CO₂ in accordance with the Directive on CCS, and
- Increased awareness among the general and professional public of CCS, improved knowledge and transnational cooperation in CCS

expressed by their qualitative value ("0 / 1").

Despite the advanced stage of programme implementation (3 of 4 projects have finished), the progress towards the Outcome can be still reported only by means of advancing Outputs so far and achievement of Programme Outcome indicators shall be confirmed on the basis of all project completion reports in 2017.

Outcome indicators

	Outcome	Indicator	Indicator value	
1	Increased knowledge	Availability of documentation,	Target	Actual

	of and transnational cooperation in CCS	data and information allowing a decision to be made on the practical use, capture and storage of CO ₂ in accordance with the Directive on CCS	1	0
		Increased awareness among the general and professional public of CCS, improved knowledge and transnational cooperation in CCS	1	0

The first Outcome indicator is supported by three of the four projects, in total by 35 values – the 003 project participates by 19 deliverables, the 005 project by 15 pieces of documentation and the 006 project by 1 comprehensive study on CCS application. To the second one, two projects contribute – the 004 project by 4 deliverables and the 006 project by 1 contribution. As evidence of all the indicator values shall be provided by comprehensive and composed parts, the fulfilment can be reported after the end of projects implementation and approval of completion reports in 2017. However, good progress at project level has been reported (see Outputs) in the 2016 and based on regular reporting as well as on protocols from on-the-spot controls at the projects the PO can estimate that the Programme Outcome indicators shall be fully achieved.

As to risks for achievement of the Programme Outcome, the estimated risky factors have been mitigated. The Open Call (2014) resulted in support of 4 quality projects, which started in 2015 and were in implementation in 2016. The rest of regranting means was mostly allocated to the running projects (3 of 4 asked for extension) via an addressed Call in mid 2015, the projects were extended and prolonged in order to reach extended goals. The very rests of the CZ08 regranting allocation were transferred to the Bilateral fund in 2016 via amendment of the PA (transfer between budget headings) . The allocation of the open Call for bilateral grants was increased and the means are still available till mid 31/7/2017.

The Outputs / the Outcome were strengthened by additional grants to running projects. However, the time risk was seen as the most significant risks of achievement of the Programme Outcome as the Programme has been delayed since its start and additional project activities have put more stress on the timing. Thanks to amendment of the PA from 24 November 2015, the project promoters could ask for prolongation of projects, and so they did (in case of 3 projects) in the 1st half of 2016. Three projects were prolonged (till November and December 2016 and April 2017). The time risk has decreased although the prolongation was related to extension of activities, too. All projects proved proper planning, keeping the tense time schedules and effective management – no problems occurred.

4.1. Progress on horizontal concerns

The horizontal concerns *Social inclusion for the Roma* and *Combating gender-based violence*, are not relevant to the programme

5. Project selection

This is to summarize previous steps towards project selection in the past.

The single open call was organized in 2014 (launched on 31 March 2014 with the deadline until 16 June 2014), 5 applications were submitted, assessed and suggested by the Selection Committee to grant support, however, 1 applicant withdrew from the grant in December 2014. The grants awarded to applicants were slightly lower than amounts requested as they reflected reductions related to the state aid rules and recommendations made by the Selection Committee. Due to this fact there was a saving in the re-granting item amounting 880 873 EUR in 2015. Following negotiations with the FMO, it was decided to apply the Art. 6.9 of the Regulation and to launch an addressed call towards promoters of the 4 supported projects for proposals of additional activities. The call was launched on 8 April 2015 with the deadline for submission of applications until 11 May 2015. The procedure was administered via the “amendment process” in the CEDR IT system, thus the highest transparency and audit trail has been maintained. Three projects applied and were supported by 21,5 MCZK in total after proper evaluation process and Selection Committee decision.

Finally, the still remaining balance of 115 902 EUR in the re-granting item was transferred to the Fund for bilateral relations (via amendment to the PA, in mid 2016) and the allocation of the rolling open Call for BFB was increased. The means are still available for applicants.

Currently, the only selection process of new projects in the CZ08 programme is running under the Fund for bilateral relations (BFB). Up to now, the project promoters have submitted 10 applications for grants amounting 3,7 mil. CZK in total and the Fund remains open till 31 July 2017 (or till its spending). The procedure is flexible and is administered via the CEDR system to maintain full transparency and proper audit trail.

6. Progress of bilateral relations

Although there is no official DPP in the CZ08 Programme, there are Norwegian project partners strongly involved in the projects, i.e. namely IRIS Stavanger (project No 006), SINTEF Energi (No 003) and NTNU (No 004). As reported in project monitoring reports, the Norwegian partners are duly collaborating in project activities, delivering high expertise, know-how and mutual knowledge exchange.

The CZ 08 has originally set aside 1.5% of the total programme budget for the Fund for bilateral relations at programme level. After re-allocation to the CZ09 programme, the Fund has proportionally decreased to 75 283 EUR and in mid 2016 increased again up to 191 184 EUR , absorbing unallocated rests from the re-granting item. The Fund supports bilateral activities at programme level (Measure “B”) with the aim to strengthen further bilateral relations of project promoters of running projects.

The funds became available via the Open Call to eligible applicants (project promoters) which has been announced on 11 February 2015 and remains open until spending the allocation or until the Fund deadline 31 July 2017 (pursuant recent revision of the Open Call from November 2016). The eligible initiatives were further extended (especially by mutual long term visits – internships to Norway /to CR).

The interest for support of bilateral relations within the CZ08 programme is high as the research community has established contacts and collaboration with foreign colleagues and deepens them continuously at any occasion – in total 12 applications were submitted since the open Call launch, 10 of them supported and realized. The newly introduced long term internships have been implemented in late 2016 - the staff from the CTU spent 2,5-month internships in Trondheim at SINTEF ER and the Norwegian colleagues visited CR. The participants cooperate in SW modelling and techno-economic methodologies for optimization integration of CCS into power plants under Norwegian mentors. The

internships resulted in technical reports/manuscripts (3) and organizing mutual meetings (3). The basis for future development of joint projects into other international research programmes has been set.

The project promoters collaborate in a very effective manner mutually and also with the PO/PP – on 13 November 2016 the 006 and 003 projects organized jointly with the PO (MoF) a half-day seminar at the GHGT-13 conference in Lausanne, where the CCS-community met at an excellent occasion of bi-annual international phorum (see more also in the section 10.). The projects representatives (promoters and partners from 3 projects) presented results of the projects, including mission of the CZ08 programme and Norwegian support to the CCS pilots. There were about 40 participants including PO, PP and CCS experts/panelists from GHGT.

Beside this, the most relevant bilateral activities include still mutual visits or participation at international conferences, promoting the project results and sharing knowledge with Norwegian stakeholders. Two initiatives are worth to mention – cooperation of the Promoter (006) with EAGE (the international association of geologists and engineers) and presentation of project/Programme results at the conference in Vienna (May-June 2016), and closer cooperation with CO2GeoNet (the worldwide excellence network) via participation of the 006 project and the Norwegian partner IRIS (2 staff) in the presentation at the GeoNet Open Phorum in Venice (June 2016).

The analysis of bilateral cooperation within the EEA / Norwegian grants in CR was launched by the Ministry of Finance (the PO) in November 2015 and was ready in early 2016. The evaluation was carried out by an external contractor who provided analysis via questionnaire survey and interviews with selected stakeholders. The analysis describes current experience and addresses potential for strengthening bilateral aspects in every programme and/or programme area in CR.

6.1. Complementary action

The Programme CZ08 budget includes a proportional allocation of 25 118 EUR (after reducing the programme total budget) for complementary action to strengthen cooperation between the PO and relevant Czech bodies (the MoE and its subordinated organisations and environmental institutions) and its counterparts in the donor states and in other beneficiary states implementing programmes focused on CCS.

With respect to a special position of the Czech CCS programme CZ08 when no other beneficiary state is involved in CCS issues within Norway grants, the PO has only limited opportunity to share experience and network with other relevant stakeholders and to organize particular events / meetings. However, during 2016 an excellent chance arose in relation to bilateral initiatives of research projects at the “13th Conference on Greenhouse Gas Control Technologies” (GHGT-13) in Lausanne, Switzerland (14-18 November 2016, see more in section 10. Publicity). The pro-active promoters negotiated organization of a joint half-day seminar in premises of GHGT adjacent to the international conference. The PO and PP acted as co-organizers with support of promoters of the 003 and 006 projects. The costs were covered partly from Complementary action (for PO and PP) and from the BFB (for projects representatives). The seminar hosted ca 40 participants including eminent international CCS experts/panellists from GHGT.

As to planned utilization of the funds for Complementary action which are still about 20 000 EUR at disposal, a similar seminar is envisaged for mid 2017 in Norway, Trondheim (still in negotiation only).

However, there will be a rest, which can be transferred to the Fund for bilateral relations if its absorption capacity shall prove evidence to absorb them till mid 2017.

7. Monitoring

The implementation phase of projects started by January 2015 and reporting proceeds in regular 4-month periods. Nevertheless, since substantial modifications of projects during awarding additional grants and extensions in 2015, which led to rather complicated re-adjustments in the CEDR system, the monitoring cycles are shifted and the monitoring reports were submitted later than planned. The projects have delivered their 4th reports (cut-off-date June 2016) and one of them the 5th one (by October 2016). The upcoming reporting shall enter into its closing phase – the final interim reports shall be followed by project completion reports in 2017.

Despite this formal delay in reporting, the PO is well aware about the status of implementation of particular projects as the promoters can communicate with the PO via a communication platform in the CEDR IT system on every-day basis, consulting adjustments, setting questions or requesting advice. Besides this, consultation by phone or e-mail are being provided whenever necessary.

The other powerful tool of PO monitoring consists in on-site controls at projects according to the Monitoring plan (see The Monitoring plan 2017 in Annex 2) which is set and updated with respect to current risks or important issues in particular projects. Finally, all 100% supported projects shall be checked. The controls are aimed at factual as well as financial matters. The control team consists of the leader (the PO representative) and by supporting experts (contracted AQE Co. auditors, specialists). As a result, a control protocol was completed.

Up to now, three of the four projects have been controlled on-spot. Following the first on-the-spot control at Masaryk University (004 project) in November 2015, two other projects were checked in 2016: the 003 project (Czech Technical University in Prague) on 9 June 2016 and the 006 project (Czech Geological Survey) on 5 October 2016. No negative findings were identified, on the opposite high quality results at both projects have been commended by the expert and excellent outputs highlighted with great impact on the CCS aspects in the CR and outreach into international CCS issues as well. – The last project to be on-the-spot controlled is the 005 (VSCHT in Prague), which runs till 30/4/2017 – the control is planned for mid March 2017 – see Annex 2.

As to monitoring of implementation on Programme level, the Steering Committee (SC) as well as contacts with the PP is to be mentioned. The SC of the CZ08 Programme including the Programme partner (MoE) met twice in 2016 – on 14 April, 7 December 2016. The Programme partner MoE participated also at the on-the-spot control at the 006 project as the Promoter – the Czech Geological Survey – is the institution directly established and managed by the Ministry of the Environment.

Review of the programme shall be carried out August/September 2017 by an external company that shall be contracted in January 2017. The programme shall be evaluated based on the five evaluation criteria (relevance, efficiency, effectiveness, impact, sustainability) with respect to its outcomes and outputs as specified in the Programme Agreement.

Each criterion will be scored using the five-grade grid. The score will be awarded based on objective and impartial expert opinion substantiated by verifiable and well-founded data, facts and evidence

The theory of change shall be developed for the programme, Outcome Harvesting shall be used as one of the methods for data collection, so as to exploit all effects of the programme, including unintended or unexpected ones. Achievement of bilateral indicators will be examined as well.

The review report will be subject to consultation process and debriefing with all relevant stakeholders prior to its publication in Czech and English.

8. Need for adjustments

In 2016, the last Programme modification has been completed. The final rest remaining in the re-granting item (about 3 mil. CZK – 115 902 EUR) was transferred to the Fund for bilateral relations based upon concrete plan of bilateral initiatives that was negotiated with the PP and project promoters, prepared and submitted by the PO to the FMO. The budget modification went along with extension of eligible bilateral initiatives – long term visits/internships (up to 2 months) were included as the potential applicants intended to visit and cooperate with their Norwegian partners and mutual meetings/workshops shall be accompanied with joint outputs of bilateral cooperation. The PA was amended in June/July 2016 and consequent steps completed (update of the Memorandum of Cooperation between MoF and MoE).

In 2017, the very last modification may occur. Based on final balance in the particular budget items, there may remain a rest in the Complementary action (about 20 000 EUR) which has been utilized up to now only for organization/participation at the joint seminar (PO, projects and project partners) in Lausanne, November 2016. In the Re-granting item also final rests may be identified as the 004 project finished in mid 2016 and has reported unspent funds of about 2 mil. CZK (ca 75 000 EUR). The rests can be finally transferred again to the Fund for bilateral relations, which can be utilized till September 2017, if viewed as efficient.

9. Risk management

The Programme realization entered into its closing phase and with respect to the successful implementation the monitored risks can be assessed as decreasing or eliminated at all. - The main risk in the CZ08 programme consists in the time delay. The programme has been delayed at its start, thus the implementation period for research activities is very tight and the threat of non-achievement of all objectives was identified. Moreover, the rests from re-granting funds were allocated to running projects in mid 2015, the projects had been extended by additional activities/results and the time schedules became more tight. However, in late 2015 and during 2016 the Programme as well as particular projects were prolonged (up to April 2017) and the time risk was mitigated. In fact, three of the four projects have duly finished in 2016, delivering all planned results /outputs without any serious problems. The time risk is still monitored with respect to the last running research project (004 VŠCHT).

The progress of implementation allows to re-assess the risks as follows:

- the time risk is lower thanks to prolongation till 2017
- risk of non-fulfilment of the outcome/output indicators is low – the reported results in projects are very promising or even proved to be reached and the on—the-spot controls have confirmed them. The lack of absorption capacity has been resolved by reallocation to the CZ09 programme at the very start in 2014 and further by application of Art. 6:9 of the Regulation and organizing an addressed call to running projects for additional activities / grants in 2015. The final reallocation of the balance (about 3 mil. CZK) from re-granting to the BF was done in mid 2016 and the risk for absorption capacity was transformed into the risk for absorption of bilateral means. However, the potential for bilateral cooperation and networking is very high in CZ08 and

the increase of funds in the BF was pre-negotiated and prepared by a concrete plan of bilateral initiatives in 2016/17, so the risk is quite low.

The specific PRG risk – i.e. the fact, that the projects contribute to quite different Outputs (raising awareness, research in capture, transport and storage of CCS) - had been minimized after the Open Call as projects contributing proportionally to both Outputs had been supported. However, monitoring the outputs indicators is still more demanding, especially with respect to different budget allocations to particular Outputs.

10. Information and publicity

The publicity measures related to promotion of the Programme CZ08 and of particular projects including cooperation with Norwegian project partners, differ on programme and projects level as the former one consists in promotion of Czech-Norwegian effort in CCS with outreach and application to conditions, public awareness and political background for CCS in the Czech Republic, whereas the latter one is based on presentation of results, outputs and deliverables from research projects and is targeted at professional public, experts, researchers and academic community. Thus, also the means and channels of information dissemination are different.

The Programme Operator, the Ministry of Finance, informs about the programme and activities related to it on its web pages <http://www.eegrants.cz>, specifically designed for the EEA and Norway Grants 2009-14.

Any news and updates are presented on the official Czech EEA and Norway Grants' Facebook profile <https://www.facebook.com/EHPaNF>.

Information on the Programme can be also found on web pages of the Programme Partner (Ministry of Environment)

http://www.mzp.cz/cz/financni_mechanismy_ehp_norska

The PO took advantage of organizing an adjacent event in relation to the international meeting of the CCS community in Switzerland (see section 6.1. Complementary action). In November 2016, the project promoters of 003 and 006 projects, in cooperation with the Programme Operator and PP, organised the bilateral seminar "Cooperation between countries in the field of CCS, example of cooperation between Norway and the Czech Republic". This event, which was organised in parallel to the "13th Conference on Greenhouse Gas Control Technologies" (GHGT-13) in Lausanne (Switzerland), was well attended and provided a good basis for the promotion of the Programme and particular projects, as well as for the discussion with key experts on the current stage and future perspectives of CCS. Taking all positive benefits from the event into account, a similar seminar jointly organized with the promoters and the PO at the 003 project partner SINTEF Trondheim, Norway is in negotiation for mid June 2017.

As to printed means of publicity, the Programme Operator plans to issue an article about the Programme in national newspaper in the 1st Q 2017.

The outstanding results of the Programme will be presented in an information brochure which will be developed and distributed at the final conference of the programme.

The Final Conference of the CZ08 Programme shall be held in Autumn 2017 (October). Starting with the Steering Committee meeting in December 2016, the draft agenda is being consulted with the Ministry of the Environment; an active participation of the project promoters and/or their partners from CR and Norway is expected. The conference shall be a one-day event and will be open to donors, other CCS stakeholders, involved bodies and expert public to share their experience, plans and ideas for future cooperation.

On the project level, the promotion is based on results achieved and on cooperation established between project partners across the CCS community far beyond the individual projects. The channels include scientific publications, presentation at seminars, conferences and international meetings, sharing with academic staff/students etc. Each of projects promoters, in line with the publicity rules, set up web pages for the project, on which information on the Programme, and especially on particular project, its activities, news, events, articles in press, photos and videos, and other relevant information is published – in particular:

006 - Preparation of a Research Pilot Project on CO₂ Geological Storage in the Czech Republic
<http://www.geology.cz/repp-co2>

004 - Carbon Capture & Storage - Sharing Knowledge and Experience <http://shake.sci.muni.cz/cs>

005 - Research of high temperature CO₂ sorption from flue gas using carbonate loop
<http://hitecarlo.vscht.cz/>

003 - Study of CCS Pilot Technologies for Coal Fired Power Plants in the Czech Republic
<http://czech-norway-pilotccs.cz/>

Three of the four projects have finished in 2016 and final project conferences were organized:

- 004 Masaryk University – completion by 30 June 2016, final conference held in Prague on 15 June 2016
- 006 Czech Geological Survey – completion by 30 November 2016, final conference held in Prague on 7-8 November 2016, together with the 003 project
- 003 Czech Technical University – completion by 31 December 2016, final conference held in Prague on 7-8 November 2016, together with the 006 project

The 005 VŠCHT shall finish by 30 April 2017, the final conference is planned for 7 April 2017.

The Programme and above mentioned particular projects were also promoted at the occasion of international meetings and bilateral cooperation events (5 events have been visited/organised in 2016) and covered by means from the Fund for bilateral relations at programme level and/or Complementary action.

11. Cross - cutting issues

Environmental considerations

The Programme CZ08 itself is focused on protection of the environment by studying the possibilities of the CCS capture, transport and storage. Activities relating to the projects are implemented in compliance with the applicable legal and administrative standards of the European Union and the Czech Republic. The aim of CCS technology is to reduce the burden of emissions, which has a clearly positive environmental impact..

Good governance

During programme implementation, including support and monitoring of individual projects, compliance with the principles of good governance is being taken into account. The grant awarding process succeeded by awarding additional grants to running projects and the procedure was highly transparent thanks to the operation of the CEDR IT system . The state aid issues were thoroughly analysed and reflected in all project documents. – In 2015, the on-spot monitoring visits were launched and in 2016

continued, as a tool of PO control feedback providing recommendations to quality improvement of project management.

Economic sustainability

The projects focus on the area of exploration, research or educational/promo activities, which in themselves cannot generate future economic profit to finance their subsequent implementation. The successful completion shall raise awareness of CCS technology and thus the demand for information on this issue from the general and professional public. At the same time, analyses and technical surveys enable the necessary data to be gathered to enable the evaluation of the practical application of CCS technology in the Czech Republic. This creates an environment for the potential self-financing of projects through the economic assessment of the application of CCS technology or through new grant programmes to support its application. The implementation of projects will enable the maintenance or creation of new jobs at project promoters or suppliers of materials and services, which will have a positive impact on economic development at a national, regional and local level.

Social sustainability

The implementation of individual projects assumes the involvement of various stakeholders, which necessarily entails constructive communication regarding the form and outcomes of the projects. Programme implementation may therefore indirectly also affect social dialogue between individual social actors. During project preparation/implementation, emphasis was/is put on cooperation at international level with subjects of Norway, which have extensive experience of using the technology in question, as well as to the other beneficiary countries implementing CCS programmes. This will deepen cooperation among the different entities not only at a national, but also at a European level.

Gender equality

The participation in the programme respects fully the gender equality. The projects are focused on research where the common principles of gender equality are duly applied.

During the course of the programme preparation and its implementation, equal access is given to all its participants to apply their job skills and expertise, regardless of differences in gender, ethnicity or age. The basic premise for staff participation in the programme is therefore their professional experience in the area, regardless of their gender. In the individual project applications, applicants demonstrated how they had ensured equality between women and men involved in projects, in terms of the type of activities making up the project and its main objectives.

The programme does not focus on projects that directly support activities to improve equality between women and men in society. Despite this, the implementation of individual projects that take account of equal access will contribute to a gender-positive society.

The sustainability of results (either further research or introduction of results in the industry) depends on future funding. This cannot be guaranteed, however it is expected that further funds may be provided by the European research programmes or domestic funding.

12. Attachments to the Annual Programme Report

Annex 1: Risk assessment of the programme

Annex 2: Monitoring plan 2017

Annex 3: List of projects for communication purposes or as examples of best practices

SIGNATURE:**For Programme Operator**

I certify that I am duly authorised to sign this Annual programme report and that I have thoroughly reviewed the progress of the programme, reporting on outcomes and outputs, risk management provided in this report and the information are correct and accurate.

				Optional second signature		
Name	Zuzana Matyášová			Martina Bečvářová		
Position	Head of the Department of International Relations			Head of the Monitoring Unit		
Organisation	Ministry of Finance of the Czech Republic			Ministry of Finance of the Czech Republic		
Signature						
Date	Day	Month	Year	Day	Month	Year
	8	2	2014	08	02	2014

For the National Focal Point

The National Focal Point certifies that the status of reporting of the programme described above is accurate.

				Optional second signature		
Name	Lenka Dupáková					
Position	Deputy Minister of Finance					
Organisation	Ministry of Finance of the Czech Republic					
Signature						
Date	Day	Month	Year	Day	Month	Year
	10	02	2017			

Annex 1: Risk assessment of the programme

Type of objective ¹	Risk	Description of risk in the reporting period	Likelihood ²	Impact ³	Importance ⁴	Mitigation planned/done
Cohesion (Programme) outcomes:	Programme absorption capacity	Programme absorption capacity	Low interest at applicants, the applications may not cover both the programme Outcomes	low	high	The risk is no more relevant as clear description of both Outputs in the Open Call, promotion and networking were properly done and the risk was eliminated. The 4 supported projects cover proportionally both the Outcomes The absorption capacity proved to be lower than estimated in 2014, the funds were reallocated from CZ08 to CZ09 and all rests from regranting utilized within the CZ08 (for additional grants and in the BFB)..
	Legislation changes	Legislation changes	The programme is not directly related to any current legislative measure, no one is in process, however, in the future some measures regarding the CCS are to be expected.	low	middle	Proper tracking changes in legislation on CCS, evaluation of their impact on CZ08.
	Time risk - delay in commitment and disbursement of	Time risk - delay in commitment and disbursement of funds	The delay of the programme launch led to delay at the start of	middle	high	All stakeholders involved are speeding the administrative processes as possible , the

¹ The risks should be categorised in one of 3 ways, depending on whether it poses a risk to the cohesion objective, the bilateral objective, or is more of an operational issue.

² Likelihood is described as Low, Middle or High according to its scoring gained in the risk analysis. (Low: 1-2, Middle:3-4, High:5)

³ Impact is described as Low, Middle or High according to its scoring gained in the risk analysis. (Low: 1-2, Middle:3-4, High:5)

⁴ Importance is counted as Likelihood multiplied by Impact and described as Low, Middle or High according to its scoring gained in the risk analysis (Low: 1-8, Middle: 9-15, High: 16-25).

Type of objective ¹	Risk	Description of risk in the reporting period	Likelihood ²	Impact ³	Importance ⁴	Mitigation planned/done
	funds		projects. The research nature of the projects provides risk of ability to reach all outputs /indicators in time. Moreover, additional grants from regranting rests led to extension of projects by more activities and need more time for implementation.			additional grants had been distributed via a simpler procedure (Art. 6.9, Reg.). The deadline for projects implementation was prolonged up to Apr 2017 according to particular requests so the projects had sufficient time space for proper completion. Three of the four projects have finished duly (in June, November and December 2016), thus the risk remains in the limited form, relevant for the last running project.
	Specific programme risk (risk identified in PP relating to PRG outcomes)	Specific programme risk (risk identified in PP relating to PRG outcomes)	The content of projects in combination with the time pressure – the projects should contribute to two Outputs (CCS research and public awareness) . The research projects require longer implementation period which is not available.	low	high	No more relevant – the selected projects cover both Outcomes. / Well designed time schedule in the projects. Proper planning of additional activities.
Bilateral outcome(s):	Bilateral relations	Bilateral relations	The research activities will require mutual expert cooperation between Czech and donor states institutions. – Three of four supported projects will be implemented in	middle	low	The set measures – I .e support to international cooperation, availability of additional funds dedicated to bilateral relation via the fund for bilateral relations (BFB) and for complementary actions proved to be effective

Type of objective ¹	Risk	Description of risk in the reporting period	Likelihood ²	Impact ³	Importance ⁴	Mitigation planned/done
			partnership with Norwegian partners.			The BF allocation was increased and the Fund remains available till 31/7/2017 (realization till 9/2017).
Operational issues:	Management and control structures, programme management	Management and control structures, programme management	The Control system to be duly incorporated into the PO Manual. Particular processes shall be designed in relation to implementation needs.	low	high	The control system and management system are well designed and incorporated into the PO Manual. The Manual of the PO was issued on 13 March 2014./Observing the rules and control at on-spot monitoring visits.
	Programme implementation set up	Programme implementation set up	All the manuals and guidelines are elaborated and regularly checked and updated.	low	middle	Check and update of manuals and guidelines. The updated versions were announced to project promoters / partners also in the CEDR system.
	Reports and irregularities within programme	Reports and irregularities within programme	No irregularities have been reported.	low	high	Consistent verification of monitoring reports and on-the-spot controls. – Three of four projects have been on-spot controlled in 2015, 2016, no findings identified, so the risk is felt as decreasing.
	Programme audits/controls	Programme audits/controls	The CZ08 underwent the AO audit in August 2014 – no findings identified, and in August 2015 the management costs were audited	middle	middle	Regular monitoring, on-the-spot visits and audits.
	Information system	Information system	The information and monitoring system CEDR is	middle	middle	Adjustments of the system are solved with the contractor.

Type of objective ¹	Risk	Description of risk in the reporting period	Likelihood ²	Impact ³	Importance ⁴	Mitigation planned/done
			in operation. Adjustments are ongoing.			Breakdowns and failures will be minimized by intensive cooperation with the contractor.
	Corruption risk	Management and control structures, programme management	The Control system to be duly incorporated into the PO Manual. Particular processes shall be designed in relation to implementation needs.	low	high	The control system and management system are well designed and incorporated into the PO Manual.

Annex 2: Monitoring plan 2017

Project no.	Name of the project	Planned date of on-site monitoring visit /review	Note
NF-CZ08-OV-1-005-2015	Research of high temperature CO2 sorption from flue gas using carbonate loop	3Q 2016	Promoter: VŠCHT Partners: ČVUT Praha, ÚVJ Řež, a.s;

Annex 3: List of projects for communication purposes or as examples of best practices

Project no.	Name of the project	Note
NF-CZ08-OV-1-006-2015	Preparation of a research Pilot Project on CO2 Geological Storage in the Czech Republic (REPP-CO2)	<p>Output 1</p> <p>Promoter: ČGS</p> <p>Partners: Centrum výzkumu Řež, s.r.o.; International Research Institute of Stavanger; Masarykova univerzita –Ústav fyziky Země, Miligal s.r.o; ÚVJ Řež, a.s; Vysoká škola báňská – Technická univerzita Ostrava</p>
NF-CZ08-OV-1-003-2015	Study of pilot technologies for coal power plants in the CR	<p>Output 1</p> <p>Promoter: ČVUT Praha</p> <p>Partners: ÚVJ Řež, a.s; SINTEF Energi AS (SINTEF Energy Research)</p>
NF-CZ08-OV-1-004-2015	Carbon Capture & Storage – Sharing Knowledge and Experience	<p>Output 2</p> <p>Promoter: Masarykova univerzita v Brně</p> <p>Partner: Norges Tekniks - Naturvitenskapelige Universitet (NTNU)</p>