#88

COMPLETE

Collector: Web Link (Web Link)
Started: Tuesday, July 29, 2014 6:38:18 AM
Last Modified: Tuesday, July 29, 2014 6:59:30 AM
Time Spent: 00:21:12
IP Address: 91.183.239.101

PAGE 1: Introduction

Q1: Registration

Name:	Nicolas Kraus
Organisation:	EPPSA - European Power Plant Suppliers Association
Country:	Belgium
Email Address:	n.kraus@eppsa.eu

Q2: CCS-related experience:

	(no label)
Please select the relevant area of interest.	General CCS Interest

PAGE 2: A. Objectives of the Directive

Q3: A1. The original Impact Assessment for the CCS Directive described a number of objectives for it. Do you think that these objectives are appropriate?

Addressing safety concerns	Yes
Addressing environmental concerns	Yes
Addressing health concerns	Yes
Addressing public acceptance concerns	Yes
Helping to create harmonised procedures to ensure a common approach	Yes
Helping to increase the speed and scale of CCS uptake	Yes
Do you think there are other objectives not listed above?	No

Q4: A2. How well do you think the current Directive has performed against each of these objectives?

Addressing safety concerns	Don't know
Addressing environmental concerns	Don't know
Addressing health concerns	Don't know
Addressing public acceptance concerns	Don't know
Helping to create harmonised procedures to ensure a common approach	Don't know
Helping to increase the speed and scale of CCS uptake	Don't know
Other?	The Directive was adopted on 23 April 2009 and according to Article 39(1), Member States were required to bring into force the laws, regulations and administrative provisions necessary to comply with it by 25 June 2011. Article 27(1) of this Directive requires the Member States to submit to the Commission the first report on the implementation of the Directive by 30 June 2011. As a result, the Commission adopted in February 2014 a report (COM(2014) 99 final) focusing on the progress of the implementation of the CCS Directive. The report highlights the following aspects: 1) The Member States' reports were delivered to the Commission between July 2011 and April 2013; 2) By the transposition deadline (25.06.2011), only a few Member States had reported either full or partial transposition; 3) Only by By October 2013 had all Member States notified transposition measures to the Commission. 4) Six Member States have, however, not yet notified complete transposing measures. In view of the facts stated in the Commission's report and considering that research, development or testing of new facilities are not currently covered by this Directive (Article 2.2), EPPSA is not in the position of assessing whether the current Directive has performed against each of these objectives.

Q5: A3. Do you think some of the objectives of the CCS Directive would be better addressed by Member States (MSs) at the national level?

Addressing safety concerns Comment:	No An overarching framework for CCS is required at EU level. Safety, environmental and health requirements need to be set at EU level in order to ensure compliance and safeguard broader existing legal frameworks. These concerns nevertheless may only be specifically addressed at national level since they are highly dependent on e.g. location/geographical parameters, population density, infrastructure, fuel quality and CO2 purity.
Addressing environmental concerns Comment:	No See above.
Addressing health concerns Comment:	No See above.
Addressing public acceptance concerns Comment:	No See above.
Helping to create harmonised procedures to ensure a common approach Comment:	No See above.
Helping to increase the speed and scale of CCS uptake Comment:	No An overarching framework for CCS is required at EU level. However specific legislation pushing CCS forward e.g.: policy framework put in place by the UK (grant + Contract for Difference) gives investors the revenue visibility that is needed.

Q6: A4. What is your opinion of the following potential benefits of an EU level legislative framework for CCS?

Creates a framework to be tested by those MSs that are leading CCS development, that other MSs can adopt in the future (when they become involved).	Strongly agree
Creates a common approach to avoid market distortions.	Agree
Creates a larger market, giving Europe the potential to become a world leader in CCS.	Agree
Creates supra national guidance, which avoids each MS having to develop their own.	Neutral
Creates guidance which should be less at risk from national politics and therefore should be more technically objective.	Strongly agree

Q7: A5. A series of four Guidance Documents were developed to support a coherent implementation of the CCS Directive across the EU member States. What is your opinion on the contribution of these guidance documents:

They were helpful for the preparation of CCS projects	Don't know
They were helpful for the implementation of CCS legislation in MS's	Don't know
They have increased the impact of the Directive	Don't know

Q8: A6. Do you think that the development of a European standard in line with the CCS Directive objectives, on top of the guidelines, is desirable?

No,

Comment
The CCS ISO standards under development are sufficient

Q9: A7. If yes, what is your view on the following statements?

European standards can be best developed by upgrading the existing Guidance Documents	Don't Know
A dedicated European CEN standard for CCS should be developed	Don't Know
European standard should be based on/fully linked with the ISO CCS standard, which is currently being developed	Agree
No further standards are necessary	Agree
Independent industrial standards, like ISO, are sufficient	Agree
Comment	The CCS ISO standards under development are sufficient

Q10: A8. How important do you think developing common EU standards is to achieving the following?

Risk assessment – evaluation processes	Vital
Risk management protocol (how risk is assigned / treated)	Vital
CO2 stream composition	Very important
Environmental impact assessment	Very important

PAGE 3: B. Scope

Q11: B1. Do you think that the EU regulatory framework for CCS adequately takes the following issues into account?

Public concerns over safety and environmental impacts	No
Applying CCS to plants fuelled by biomass	No
The combination of Enhanced Hydrocarbon Recovery (EHR) with CCS	Yes
The uptake of CCS in the industrial sector (non power generation) for example, cement, refining, steel.	No
The utilisation of CO2 captured in industrial processes (in combination with CCS) (Carbon Dioxide Utilisation (CDU))	No
Transport of captured CO2 by ship	No
Comment	Although Member States are required to address these concerns there is no reference to concrete measures. The guidance documents do not address the issue either. Public concerns have been a major hurdle for the development and market uptake of CCS in Europe. Awareness campaigns should be developed and implemented. The results of the report Public Awareness and Acceptance of CO2 capture and storage (http://ec.europa.eu/public_opinion/archives/ebs/ebs_364_en.pdf) should be taken into account and should precede – not follow – the legislative proposal. It is crucial to acknowledge the contribution of CCS/Biomass as the only technology able to "remove" CO2 emissions. This is not taken into account by EU regulations. The EU regulatory framework for CCS adequately address EHR with CCS on the basis that it permits it as an activity and does not introduce any barriers to the development of projects. Despite this, in light of growing concerns around European energy security, and the potential of EHR to reduce Europe's oil import dependency, further policies and incentives to increase the deployment of EHR should be encouraged at the Member State level by the Commission. This could further increase the speed and scale of CCS deployment. The CCS Directive does not rule out industrial CCS as such, but is silent on the matter. Specific articles should be added and article 33 regarding CCS readiness should be expanded to industry. Utilisation of CO2 is not incentivised.

Q12: B2. The Impact Assessment completed by the European Commission when the CCS Directive was drafted concluded that the EU Emissions Trading System (ETS) was the right enabling policy for internalising climate change externalities and that there was little evidence of a need for additional measures (going beyond the carbon market). Given the slow rate of progress in CCS to date do you think the European level policy framework needs additional (or less) policy measures to enable the transition to CCS?

Yes - more,

If yes, what instruments and subsidies would you suggest?
Despite the ambition of the EU to have 12 large scale CCS demonstration projects in the EU in 2015, not one project has been able to take Final Investment Decision (FID) so far. The lack of progress on CCS in the EU, and the relatively faster progress being made else-where (US, Canada, and China) shows urgent action is needed. The European policy framework definitively needs to be strengthened. And critically, CCS should be treated on a level playing field with other low carbon technologies (i.e. Renewables), so that CCS is ultimately able to compete with other technologies when the market will be decarbonised. In 2030, CCS can cost effectively deliver at least 4% of the agreed GHG reduction on 1990 levels. This equals to a contribution from CCS of around 222 Mt CO2 in year 2030, shared for ¾ by the power sector (around 40 GW) and ¼ by energy intensive industries. This should be supported by the design of an EU CCS Roadmap. The EU should ask the Member States to develop a national strategy to prepare for the deployment of CCS technology, the implementation of this target and the related EU CCS roadmap. As CCS entails higher costs, its deployment depends on balancing these higher costs with a higher revenue stream for operators for CCS plants, especially in the absence of a strong EU ETS signal. While this could be a feed-in tariff for CCS-equipped plants, it must not necessarily be done in this way; what should be examined is whether there exists any kind of policy measure which would be able to balance the added costs and monetise the added climate value for the operator. Support at Member States level is needed. CCS should be eligible for State Aid covering both investment and operating phase as put forward in the recent adopted State Aid guidelines for environment and energy. These guidelines acknowledge CCS can benefit from State Aid both for investment and operation up to 100%. However, in this regard, the text remains extremely limitative as it only foresees support for the incremental costs of CCS, not the whole new CCS project value. In the case of CCS, it is crucial to consider projects as a whole, not only as the addition of a conventional plant (which may not benefit from State Aid) and CCS equipment.

Q13: B2.1. What is your view of the following potential policy mechanisms to be established at EU level?

A CO2 price ramp – driven by a tighter cap.	Support
Public grants to subsidise capital costs	Support
Public grants to subsidise operating costs of CCS plants	Support
Public grants to subsidise capital and operating costs of CCS plants	Support
CCS certificates	Possible
Emission Performance Standards	Possible
Other? E.g. Feed in tariff support for CCS enabled plant (for national level)	Feed-in premia can provide investors in the short and medium term with the needed visibility on the price of electricity, and therefore clarity on their return on investment.

Q14: B3. The CCS Directive is intended to work alongside a number of other European level policies and programmes. How well do you think the objectives and content of the CCS Directive fit with the following EU policies and tools? A good fit would be where the policies and programmes have complimentary objectives and there are no apparent contradictions in how they have been implemented. A poor fit would be where this is not the case.

The ETS mechanism Comment:	Reasonable fit (but no contradictions) The ETS aims at reducing emissions in a cost effective manner while incentivising developments of low carbon technologies including CCS. However, over-supply on the market has led to a situation when the carbon price signal is insufficient to trigger these investments. In addition, this situation has also massively reduced the amount of money available under the NER300, hence the funding for CCS large scale demonstration projects.
Support to R&D and demonstration (FP7 and Horizon 2020 and NER300 type of programme) Comment:	Reasonable fit (but no contradictions) Funding available under FP7 and H2020 is much too short to support development of CCS. There is only one call for CCS R&D in the current Work Program for Horizon 2020 with a pot of €35M to be shared with 2 other calls. This is too small to ensure several technologies are tested and developed (at R&D and large scale demonstration stages).
Support for Renewable Energy Sources Comment:	Some contradictions Renewables have benefited from a sup-portive policy framework: a binding target in the 2020 package and its deployment at Member States level, which have conse-quently put in place support schemes such as feed in tar-iffs. A level playing field is needed be-tween CCS and other technol-ogies such as renewables. While the share of renewables will increase in the coming decades, fossil fuels will re-main an essen-tial part of the en-ergy mix. Only a balanced portfolio of technologies will allow the EU to reach its decarbonisa-tion objectives, taking into account na-tional energy mixes (93% of Polish elec-tricity is pro-duced from coal), and policies. CCS and renewable energy tech-nologies are by no means mu-tually exclu-sive. On the contrary, CCS complements the renewables' intermittency by providing flexible low-carbon back-up power, ensur-ing a constant and secured energy supply, in line with the objectives of security of supply, environmental sustainability and affordable electricity.
Support for Energy Efficiency	Reasonable fit (but no contradictions)
The Waste Directive	Don't know

Q15: **B4 Are you aware of any scientific evidence that environmental risks associated with the transport of CO2 should be further regulated, on top of the existing legislative framework?**	No

Q16: B4.1 Is the combination of the CCS, Industrial Emissions and EIA Directives sufficient to regulate CO2 capture?

At EU level?	No
Comment:	No, CO2 capture is not sufficiently regulated at EU level. Once CCS has been demonstrated technically, and market conditions have been established to make the technology commercially viable, operators should have the incentive to implement CCS as part of their new projects involving fossil-fuels. Until then, measures to ensure CCS-readiness could be apply to both fossil fuel power plants and carbon-intensive industrial installations. Without CCS, power plants and industrial installations risk becoming stranded assets as the economy is decarbonised. The revision of the Directive should clarify the following points: - Investors and authorities need further clarity on what is required to fulfil the conditions set to avail-ability of storage, the feasibility to establish transport and the requirements to capture readiness. - Some power plants may be tailored to operate as peak-shavers, with correspondingly low load-factors. To the extent that both investors and the relevant authorities recognise such an operational mode for the plant, CCS-readiness should not be made necessary.
At MS level?	No
Comment:	No, CO2 capture is not sufficiently regulated at EU level. Once CCS has been demonstrated technically, and market conditions have been established to make the technology commercially viable, operators should have the incentive to implement CCS as part of their new projects involving fossil-fuels. Until then, measures to ensure CCS-readiness could be apply to both fossil fuel power plants and carbon-intensive industrial installations. Without CCS, power plants and industrial installations risk becoming stranded assets as the economy is decarbonised. The revision of the Directive should clarify the following points: - Investors and authorities need further clarity on what is required to fulfil the conditions set to avail-ability of storage, the feasibility to establish transport and the requirements to capture readiness. - Some power plants may be tailored to operate as peak-shavers, with correspondingly low load-factors. To the extent that both investors and the relevant authorities recognise such an operational mode for the plant, CCS-readiness should not be made necessary.

Q17: B5. Technologies have emerged for the utilisation of CO2 that could play an important role in decarbonising industrial processes. These technologies could also help improve the business case for CCS. The two main groups of technologies are Enhanced Hydrocarbon Recovery (HER) and innovative Carbon Dioxide Utilisation (CDU). Should additional regulatory measures and/ or incentives be considered to support CDU technologies in combination with CCS?	Yes

Q18: B5.1 If yes, what is your opinion of the following measures:

Targeted R&D grants, e.g. a Horizon 2020 call, and NER300 type programmes	Strongly support
Incentives via emissions trading	Possible
Extend / adjust CCS Directive to include HER and CDU	Strongly support

Q19: B5 Are there any challenges which have been identified for CCS and Enhanced Hydrocarbon Recovery (EHR) projects under development?	Yes, If yes, how could these be overcome? Insufficient characterisation of HER CO2 to qualify as permanently stored.

Q20: B6. What is your opinion of the following statements on why additional regulatory measures to support CDU should not be supported?

Low CO2 abatement potential in comparison to CCS on electricity generation	Disagree
Comment:	CCS on electricity generation and CDU are by no means mutually exclusive unless CCS deployment is prevented by the CDU technology current lack of maturity.
High cost of abatement	Don't Know

PAGE 4: C. Progress – with the Directive and CCS in general

Q21: C1. How much do you think knowledge of the potential costs of the different elements of the CCS chain in Europe has developed over the last five years (since the Directive came into force)?

CO2 Capture	Good development
CO2 Transport	Don't know
CO2 Storage	Some development

Q22: C1. How much do you think knowledge of the potential costs of the different elements of the CCS chain in Europe has developed over the last five years (since the Directive came into force)?

CO2 Capture	Good development
CO2 Transport	Don't know
CO2 Storage	Some development

Q23: C2. How much do you think knowledge of the technical feasibility and performance of the different elements of the CCS chain in Europe has developed over the last five years (since the Directive came into force)?

CO2 Capture	Good development
CO2 Transport	Don't know
CO2 Storage	Some development

Q24: C3. Looking forward in time, how do you expect the potential costs of the different elements of the CCS chain in Europe to develop between now and 2030?

CO2 Capture	Some development
CO2 Transport	Don't know
CO2 Storage	Some development
Other?	This is providing a sufficient number of CCS large scale demonstration projects take of in the coming years, and hence that the supportive policy framework is implemented. Only through large scale demonstration projects will we be able to reduce the costs, improve knowledge on technical feasibility and performance and optimise the whole chain.

Q25: C4. Looking forward in time, how do you expect knowledge on technical feasibility and performance of the following aspects of CCS in Europe to develop between now and 2030?

CO2 Capture	Good development (improving knowledge)
CO2 Transport	Don't know
CO2 Storage	Good development (improving knowledge)
Other?	This is providing a sufficient number of CCS large scale demonstration projects take of in the coming years, and hence that the supportive policy framework is implemented. Only through large scale demonstration projects will we be able to reduce the costs, improve knowledge on technical feasibility and performance and optimise the whole chain.

Q26: C5. One of the key objectives of the CCS Directive is to help expand the understanding of the technology and improve public acceptance of the technology. Do you think the CCS Directive has helped improve public acceptance of CCS?	No, Comment The CCS Directive has not helped to expand understanding or knowledge of the technology, nor improved the public acceptance. Positive actions have been led at Member State level, in relations with demonstration projects (UK, Spain…). But unfortunately, lots of a priori remain linked to CCS technologies.

Q27: **C6. Do you think the EU legal framework for CCS helped remove legal barriers to CCS deployment in the EU?**	No, If no, which legal barriers do you feel remain? Legal barriers were not sufficiently addressed when member States transposed the Directive into national law.
Q28: **C7. Have any other legal barriers been identified via project experience that were not apparent when the Directive was prepared?**	Don't Know
Q29: **C8. Do you think that the CCS Directive could do more to support an increase in the number of storage permits?**	Yes, Comment Be more precise for easier transposition into national legislation.
Q30: **C9. Are you aware of the regulatory approach to CCS in other parts of the world?**	Yes, If yes do you think there is anything that should be learnt from the approach elsewhere? The GCCSI 'Global Status of CCS' http://www.globalccsinstitute.com/publications/global-status-ccs-2013 report has highlighted the role the United States, Canada, Australia and the EU have taken in leading the development of legal and regulatory responses to support and enable the technology; as well as the activities of a newer, emerging group of jurisdictions who have started to consider law and regulation of the technology. These tracking activities, together with extensive surveying of large-scale integrated CCS projects have revealed that legal and regulatory issues remain a priority issue for governments and industry around the world. The role of the IEA CCS Regulatory Network is also critical to draw comparison between the legislative framework enabling CCS http://www.iea.org/workshop/ccs6thregulatorynetworkmeeting.html
Q31: **C10. How do you think progress on the uptake of CCS technology in Europe compares with the rest of the world?**	Europe is well behind

Q32: C11. Do you think this position will influence the ability of Europe to export CCS technology in the future?	Reduces prospect, Comment The EU is at a critical moment when it comes to demonstrate innovative low carbon technologies at large scale and cannot afford a stop and go policy, particularly at a time when Europe is lagging behind other regions of the world on CCS, and lagging behind its own objectives to have up to 12 projects in operation by 2015. - The world's first two power sector projects with CCS will begin operation in North America. Boundary Dam is due to start operating in Saskatchewan this summer. The Kemper project in Mississippi is due to start operating next year. - The big 5 Chinese utilities are all working on CCS pilot and demo projects. - The Middle East has the world's first large-scale CCS project in the iron and steel sector moving into construction. - The UAE continues to develop, through Masdar, a CCS network linking CO2 emitters to users, for enhanced oil recovery (EOR).

PAGE 5: D. Capture and Transport

Q33: D1. What is your view on the following statements on CO2 acceptance criteria and procedures from Article 12 of the Directive?

The criteria are not strict enough and need to be tightened. Comment:	Disagree The criteria should be made precise, not stricter.
The criteria strike a good balance and are ok. Comment:	Disagree The criteria should be made precise, not stricter.
The criteria are too rigid and could be important constraints on CCS take up. Comment:	Don't know The criteria should be made precise.
The criteria need to be adjusted to allow for greater variability and acceptance of certain additional substances.	Don't know

Q34: D2. Under the current CCS framework, the operator of the capture installation gains the emissions trading benefit (by not having to surrender emission allowances). This means there is no direct emissions trading benefit to the CO2 transporter and storage operators. Is this arrangement causing (or could it cause in the future) problems for developing CCS project business cases?	No

Q35: **D3. Do you think the Directive (Article 33) adequately supports the future implementation of "capture ready" plants in a harmonised way across Europe, e.g. fossil fuel power plants built with the assurance of a future proven CCS retrofit option?**	No, Comment No, CO2 capture is not sufficiently regulated at EU level. Once CCS has been demonstrated technically, and market conditions have been established to make the technology commercially viable, operators should have the incentive to implement CCS as part of their new projects involving fossil-fuels. Until then, measures to ensure CCS-readiness could be apply to both fossil fuel power plants and carbon-intensive industrial installations. Without CCS, power plants and industrial installations risk becoming stranded assets as the economy is decarbonised. The revision of the Directive should clarify the following points: - Investors and authorities need further clarity on what is required to fulfil the conditions set to avail-ability of storage, the feasibility to establish transport and the requirements to capture readiness. - Some power plants may be tailored to operate as peak-shavers, with correspondingly low load-factors. To the extent that both investors and the relevant authorities recognise such an operational mode for the plant, CCS-readiness should not be made necessary.
Q36: **D4. In light of the slow progress of CCS demonstration in Europe, do you think is it needed, practicable and justifiable to establish mandatory Emission Performance Standard (EPS) requirements for fossil fuel power plants?**	Don't Know, Comment An Emission Performance Standard should not be considered, unless coupled with an appropriate mechanism that incentivises CCS; without financial incentives, an EPS system would only divert or delay investment in CCS and would likely be counterproductive, particular for early deployment. Prior to finalisation of CCS demonstration in Europe, only fuel-specific CO2 emission limit values should be considered, and may be introduced through the LCP BREF Review within the Industrial Emissions Directive framework. EPPSA has worked on deriving suitable fuel-specific CO2 emission limit values associated with BAT, and would be happy to cooperate further in this matter. The introduction of fuel-specific CO2 emission limit values would promote the deployment of BAT, and the associated improvements in average efficiency of the EU power generation fleet would lead to lower CO2 emissions, more efficient resource use, and would also facilitate deployment of CCS, as the energy demands of CCS are better met by BAT power plants.
Q37: **D5. Do you think that mandatory EPS runs the risk of having conflicting objectives with emissions trading, which could in turn have negative consequences for CCS?**	Yes, Comment Depends on the objectives of these instruments.

Q38: D6. When do you think EPS should become mandatory for new large combustion electricity generating plants?	Don't know, Comments Depends on the level of EPS.
Q39: D 6.1. What could be a practical level of EPS (in g CO2 / kWh)?	<300

PAGE 6: E. Storage

Q40: E1. One of the original objectives of setting up the EU regulatory framework for CCS, was to ensure that this novel technology would be deployed in an environmentally safe way (Recital 9 of the CCS Directive). What is your view, on the following statements on whether geological storage of CO2 leads to permanent containment of CO2 in such a way as to prevent and reduce as far as possible negative effects on environment and human health, and any resulting risks for environmental and human safety?

There is a lack of consensus on the definition of "permanent" containment of CO2	Don't Know
The term 'permanent' should be replaced by a number of years like 500 or 1000 years	Don't Know
The Directive should make a distinction between the risk of minor leakage and major leakage.	Don't Know

Q41: E2. Article 18 of the CCS Directive relates to the transfer of responsibility for a storage site.

Do you think the criteria for the transfer of responsibility are sufficiently well defined?	Don't know
Do you think the criteria laid down under Article 18 effectively address the transfer of responsibility of a storage site?	Don't know
Are the criteria established for the transfer of responsibility workable, given the current level of knowledge on the performance of underground storage projects?	Don't know
Are the recommended default periods for the post-closure pre-transfer phase and for the absence of significant irregularities practicable?	Don't know

Q42: E2.1 Given that no CCS site has yet been transferred, is it possible to highlight any parts of Article 18 that would benefit from a revision – such as:

Definition of 'complete and permanent containment'	Don't know
Definition of 'minimum period'	Don't know
Contents of the transfer report	Don't know

Q43: E3. Do you have any experience of the application procedures for approving exploration permits for storage sites?	Don't know

Q44: E4. Are there any challenges associated with the application procedures for approving exploration permits for storage sites?	Don't know
Q45: E5. Do you have any experience of the application procedures for approving storage permits for storage sites?	Don't know
Q46: E6. Are there any challenges associated with the application procedures for approving storage permits for storage sites?	Don't know

Q47: E7. What is your view of using the criteria for the characterisation and assessment of the potential storage complex and surrounding area referred to in Article 4(3) and as outlined in Annex I of the CCS Directive?

The criteria are not strict enough and should be tightened.	Don't know
The criteria strike a good balance and are ok.	Don't know
The criteria are too rigid and could be an important constraint on CCS take up.	Don't know
The criteria need to be adjusted to allow for them to be practically enforceable.	Don't know

Q48: E8 What is your view on the following statements relating to the criteria for establishing and updating the monitoring plan referred to in Article 13(2) and for post-closure monitoring plans pursuant to Annex II of the CCS Directive?

The criteria are not strict enough and should be tightened.	Don't know
The criteria strike a good balance and are ok.	Don't know
The criteria are too rigid and could be an important constraint on CCS take up.	Don't know
The criteria need to be adjusted to allow for them to be practically enforceable.	Don't know

Q49: E9. In the last five years (since the entry into force of the CCS Directive), how well do you think knowledge has progressed on the following CO2 storage issues?

Data collection	Some progress
Three dimensional static geological earth models	Don't know
Characterisation of the storage dynamic behaviour	Don't know
Sensitivity analysis	Don't know
Risk assessment methodologies	Minor progress
Monitoring technology	Minor progress
Corrective measures	Don't know

Q50: E10. What is your view on the following statements relating to the provisions on the financial security and financial mechanism for the storage sites (Articles 19 and 20 of the CCS Directive)?

The provisions are not strict enough and should be tightened.	Don't know
The provisions strike a good balance and are ok.	Don't know
The provisions are too rigid and could be an important constraint on CCS take up.	Don't know
The provisions need to be adjusted to allow for them to be practically enforceable.	Don't know

Q51: E11. Which areas of the environmental risk management framework for CO2 storage as set out in the CCS Directive do you think need to be revised?

The threshold of 100kT for R&D projects	No
Risk assessment provisions	No
Monitoring provisions	No
Corrective measure provisions	No
Transfer criteria	Yes
Reporting provisions	No
Post closure provisions	Yes

Q52: E12. In light of the growing amount of knowledge and data on capacity estimates for CO2 storage in Europe and need for understanding the CCS upscaling potential, do you think there is a need to establish an improved EU atlas of storage capacity of CO2 across Europe?

Yes,

Comment / Justification
The Horizon 2020 Work Programme has foreseen a topic on Energy Storage Mapping and Planning. This study should compile detailed maps covering Europe and its neighbouring countries, and assess the potential of all existing and future storage sites in Europe, including underground storage of CO2.

Q53: E13. Guidance Document no 1 on the Storage Directive defines risk management as the identification, assessment, and prioritisation of the risks to secure storage, together with the application of resources to prevent, monitor, and correct leakages or significant irregularities throughout the project life cycle. Do you have any experience of the risk management framework for CO2 storage operators (e.g. via demonstration projects – as an operator or competent authority)?

If yes did you find the framework legally practicable?	Don't know
Has the interaction between competent authorities and operators worked well?	Don't know

Q54: D14.Are you aware that a procedure is in place for the Commission to review of draft storage permits (Article 10)?

Yes,

If yes - do you believe that this review can be effective in fostering a uniform implementation of the requirements of the Directive across the Community?
No, because it will slow down the whole process

Q55: D15 Do you believe that this procedure can help enhance public confidence in CCS?

Don't know

PAGE 7: Final Question

Q56: Do you have any other comments on the CCS Directive which you have not been able to express in this questionnaire? Please be as brief and specific as possible.	*Respondent skipped this question*