

Do No Significant Harm Comments on the TEG report on EU Taxonomy

Response from the Zero Emission Technology and Innovation Platform (ZEP)
October 2019

The Zero Emission Technology and Innovation Platform (ZEP) is the technical adviser to the EU on the deployment of Carbon Capture and Storage (CCS), and Carbon Capture and Utilisation (CCU), a European Technology and Innovation Platform (ETIP) under the Commission's Strategic Energy Technologies Plan (SET-Plan).

Production of Electricity from Gas

#	Comment	Stakeholder(s)	Evaluation
6	<p>"(5) Pollution:</p> <p>As shown by the EEA, CCS can lead to important increases in emissions of certain pollutants such as NH₃, NO_x and PM.</p> <ul style="list-style-type: none"> - Particulate matter (PM) and nitrogen oxide (NO_x) emissions are expected to increase in line with the amount of the additional fuel consumed if no additional measures to reduce emissions are installed. - Ammonia (NH₃) is expected to increase significantly (factor 3) due to the degradation of the amine-based solvents used to capture the CO₂. Mitigation measures specific to these emissions shall be put in place in CCS facilities which enable the GHG emission threshold to be met. <p>Compliance with the BAT AELs (BREFs) should be required as soon as the Best Available Techniques Conclusion Documents are adopted (rather than after 4 years).</p>	ECOS	Technical Correction – But need to determine BAT and solicit Graeme Sweeney input.
ZEP Response			
	<p>Historically the trace emissions (e.g. NH₃, NO_x, PM) from gas fired power plants and gas based industry have decreased with improving BAT and regulation. The introduction of CCS will likely not change this decreasing trend in the long term perspective assuming BAT and regulation keep improving over time. That said, the NH₃ and other active nitrogen emissions may indeed increase if many large amine based post-combustion are constructed in the same period. Regardless, NH₃ emissions can be controlled by technology (e.g. acid wash), and it is expected that such technology is slowly included in BAT and regulation. It must also be noted that if oxyfuel CO₂ capture technology is chosen the NH₃, NO_x, PM emissions will be eliminated.</p>		

Carbon Capture

#	Comment	Stakeholder(s)
1	<p>For the safety of CCS, experiences from Europe and US are relied upon by TEG. IEA lists two projects in Europe, with 1.7 Mtpa capture rate (ref. 1). To put this to perspective, replacing the annual nuclear production in Germany (ref. 2) with 60 % efficient combined cycle gas turbines (emissions ref. 3) results in additional CO₂ emissions of 7.8 Mtpa. This is already 4.6-fold the capture rate of the two projects. At the global scale, IEA sustainable development scenarios rely on gigatons of additional CO₂ reductions both for CCS and nuclear (ref. 1). This is a rapid scale-up of CCUS deployment up to 76.6 times the current CO₂ capture rate by 2040.</p> <p>The TEG report doesn't clearly demonstrate empirical data on the safety of CCS at the required scale. Is there any? Instead, regulatory compliance is relied upon by TEG for the safety of scaling CCS. This is not equal treatment with nuclear where empirical data is demanded on final disposal, and compliance with regulation is not deemed enough.</p> <p>Either requirements on empirical results need to be increased here, or nuclear has to be accepted based on regulatory compliance as well.</p>	Private Individual
ZEP Response		
	<p>The regulation for the geologic storage of carbon dioxide, the 'CCS Directive' (2009/31/EC) outlines in detail the requirements for safe injection and storage site monitoring. This includes a significant monitoring requirement to provide the empirical data that the CO₂ storage reservoir is compliant. Furthermore, these CCS Directive also requires the storage site to be monitored for at least 20 years to ensure safe storage.</p> <p>European (including Norway) storage capacity is estimated to be over 134GtCO₂, which amounts to over 440 years worth of CO₂ storage at 300Mtpa CO₂, which the Commissions 1.5 TECH scenario predicts must be captured and stored in 2050. The storage capacity is orders of magnitude larger than the largest predicted CO₂ supply rates, with adherence to the CCS Directive (2009/31/EC), scale up safety will not be an issue.</p>	

Transport of CO₂

#	Comment	Stakeholder(s)
1	Do-no-significant harm analysis for eco-systems (6) should ensure that Environmental Impact Assessment (EIA) has been completed in accordance with EU Directives on Environmental Impact Assessment (2014/52/EU) and Strategic Environmental Assessment (2001/42/EC) or other equivalent national provisions or international standards (e.g., IFC Performance Standard) -- whichever is stricter in the case of non-EU countries, prior to significant activities. Impact assessment should confirm compliance with all relevant national and international laws and conventions related to the environment. It should also confirm that the	WWF European Policy Office

	project does not harm ecosystems of high ecological importance, notably nationally and internationally protected areas. In particular such impact assessment should, at the very least, identify, evaluate, and mitigate any potential negative impacts of the designated activities, projects, or assets on Key Biodiversity Areas (KBA) as defined by the UN Convention on Biological Diversity and or UNESCO World Heritage Sites, as recommended by the ISO 14030 standard in the making. Direct or indirect impacts on KBA should be identified using the World Database of Key Biodiversity Areas and related guidance provided by the KBA partnership.	
	ZEP Response	
	Pipeline construction and reuse of current gas assets will adhere to the same member state and EU environmental regulation as for current natural gas pipelines. Carbon dioxide transport by pipeline is not currently entrusted to a Transmission System Operator (TSO). In the future, it could be expected that a European coordinator for CO ₂ pipelines will be established and operate in a similar fashion to the European Network of Transmission System Operators for Gas (ENTSO-G).	

Permanent Sequestration of CO₂

#	Comment	Stakeholder(s)
1	Do-no-significant harm analysis for eco-systems (6) should ensure that Environmental Impact Assessment (EIA) has been completed in accordance with EU Directives on Environmental Impact Assessment (2014/52/EU) and Strategic Environmental Assessment (2001/42/EC) or other equivalent national provisions or international standards (e.g., IFC Performance Standard) -- whichever is stricter in the case of non-EU countries, prior to significant activities. Impact assessment should confirm compliance with all relevant national and international laws and conventions related to the environment. It should also confirm that the project does not harm ecosystems of high ecological importance, notably nationally and internationally protected areas. In particular such impact assessment should, at the very least, identify, evaluate, and mitigate any potential negative impacts of the designated activities, projects, or assets on Key Biodiversity Areas (KBA) as defined by the UN Convention on Biological Diversity and or UNESCO World Heritage Sites, as recommended by the ISO 14030 standard in the making. Direct or indirect impacts on KBA should be identified using the World Database of Key Biodiversity Areas and related guidance provided by the KBA partnership.	WWF European Policy Office
	ZEP Response	
	The development and operation of geologic storage sites must comply to the 'CCS Directive' (2009/31/EC). Within which are stringent guidelines for the environmentally safe development and operation of CO ₂ storage site, including the compliance with relevant national and international laws and conventions.	

	<p>The main environmental impacts associated with Sequestration of CO₂ are due to:</p> <ul style="list-style-type: none"> • the risk of leakage • The long-term PERFORMANCE of the reservoirs, central issues regarding the monitoring and the interrelation of CO₂ with physical, chemical and geological conditions in the reservoir is still IMMATURE TECHNOLOGY, however the safety of CO₂ storage may be assured with the implementation of specific rules and requirements. <p>CO₂ storage in saline aquifers is a mature technology which is in operation world-wide at >5 large-scale CCS projects</p>	Equinor
ZEP Response		
	<p>Clarification of the above marked below in red:</p> <p>The main environmental impacts associated with Sequestration of CO₂ are due to:</p> <ul style="list-style-type: none"> • the risk of leakage • Although the LONG-TERM PERFORMANCE of the reservoirs (issues regarding the monitoring and the interrelation of CO₂ with physical, chemical and geological conditions) is still IMMATURE TECHNOLOGY, the safety of CO₂ storage may be assured with the implementation of specific rules and requirements. <p>CO₂ storage in saline aquifers is a mature technology which is in operation world-wide at >5 large-scale saline aquifer CCS projects</p>	