Template for comments

Tool to calculate baseline, project and/or leakage emissions from electricity consumption and generation

Date: 24 July 2015	Document: CDM-MP67-A17

TABLE FOR COMMENTS

Name of submitter: Mark Bonner

Affiliated organization of the submitter (if any): Global CCS Institute

Contact email of submitter: mark.bonner@globalccsinstitute.com

0	1	2	3	4	5	6
#	**Para No./ Annex / Figure / Table**	**Line Number**	**Type of comment** **ge =** general **te =** technical **ed =** editorial	**Comment** **(including justification for change)**	**Proposed change** **(including proposed text)**	**Assessment of comment** **(*to be completed by UNFCCC secretariat*)**
1	**3**		**Ge**	The application of carbon dioxide (CO_2) capture and storage (CCS) should be accounted for in the emissions factors used in both emissions baseline establishment as well as the monitoring tool for both power generation and consumption. Recommend that the technical credentials of this tool for the application of CCS be referred to the CDM's CCS Expert Group.	"The tool may be used in methodologies where electricity generated and supplied by the project power plant to the grid and/or consumers (including electricity consuming facilities); as well as where CO_2 is captured for the purposes of transport and geologically storage, are used to determine baseline emissions. In this regard, this tool provides procedures and monitoring provisions to determine the quantity of electricity generated and supplied to the grid or consumers; as well as for capturing and compressing the CO_2.	
2	**5.c**		**Ge**		Provide the necessary procedures to determine the most likely baseline scenario for electricity generated and supplied by the project power plant to the grid or consumers, including CO_2 capture transport and storage.	
3	**6 & 7**		**Ed**	Add "if at least"	The tool is only applicable if at least one out of the following three scenarios.	
4	**10.a**		**Ed**	Include a reference to the application of CCS	Tool to calculate the emission factor for an electricity system (including CO_2 capture, transport and storage)	
5	**10.b**		**Ed**	Include a reference to the application of CCS	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (including CO_2 capture, transport and storage)	

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6			**Ge**	While the presumed emission factor of 1.3tCO2 per MWh may be the standard for estimating a 'without CO_2 capture, transport and storage (CCS) project' emissions baseline; it clearly overestimates a 'with CCS project' emissions baseline. The latter is important for not only calculating the amount of "CO_2 captured" and/or "CO_2 avoided" by a CCS project; but also for comparing the emissions performance of renewable electricity projects to CCS electricity projects. The technical credentials of this tool as applied to CCS should be referred to the CDM's CCS Expert Group for further recommendations on how CCS might be considered within the cited equations, and specifically applied to the emissions factors used in those equations. Further discussion is needed in regards to whether 'CO_2 captured' or 'CO_2 avoided' and/or both metrics are adopted. Note: for a definition of "CO_2 captured" and "CO_2 avoided", refer to the IPCC Special Report on CCS: Summary for Policy Makers, page 4, Figure SPM.2		
7	**12**		**Ge**	Add capture for non-grid power consumption: • Off-grid fossil fuel power plant The consumption based emissions reductions associated with CCS would likely be accounted for in the emissions factors used in the equations for electricity consumption parameter ($PE_{EC,y}$) and baseline emissions ($BE_{EC,y}$).		

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8	**13**		**Ge**	Add capture for all power generation scenarios: • Fossil fuel power to grid • Fossil fuel power direct to consumers • Hybrid of above The generation based emissions reductions associated with CCS would likely be accounted for in the emissions factors used in the equations for baseline emissions from generation ($BE_{EG,y}$). Specifically, CCS should be accounted for in $EF_{BL,Grid,CO2,y}$ and $EF_{BL,facility,CO2,I,y}$		
9	**15**		**Ge**	Add CCS to definitions of what makes up baseline emissions from generation	The baseline emissions from electricity generated and supplied by the project power plant to the grid and/or to the consumers ($BE_{EG,y}$) is calculated using i) quantity of electricity generated and supplied by the project power plant to the grid in year y ($EG_{PJ,grid,y}$) or to the consumers/electricity consuming facility i in year y ($EG_{PJ,facility,i,y}$) and ii) Baseline CO2 emission factor (less the amount of CO_2 captured and/or CO_2 avoided for the purposes of geological storage) for the electricity generated and supplied by the project power plant to the grid in year y ($EF_{BL,grid,CO2,y}$) or to the consumers/electricity consuming facility i in year y ($EF_{BL,facility,CO2,i,y}$).	
10	**17**		**Te**	Add CCS reference.	Emissions from electricity consumption include CO_2 emissions from the combustion of fossil fuels (less the CO_2 captured or CO_2 avoided) at any power plants at the site(s) of electricity consumption and, if applicable, at power plants connected physically to the electricity system (grid) from which electricity is consumed.	
11	**20**		**Te**	Note that project emissions from power consumption ($PE_{EC,y}$) equation needs to reflect the capture &/or avoidance of any CO2 in the emissions factor ($EF_{EF,j,y}$) as measured in tCO_2/MWh	$PE_{EC,y} = \sum EC_{PJ,I,y} \times EF_{EF(CCS),j,y} \times (1+TDL_{j,y})$	

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12	**20**		**Te**	Note that baseline emissions from power consumption ($BE_{EC,y}$) equation needs to reflect the capture &/or avoidance of any CO2 in the emissions factor ($EF_{EF,k,y}$)	$BE_{EC,y} = \sum EC_{BL,k,y} \times EF_{EF(CCS),k,y} \times (1+TDL_{k,y})$	
13	**20**		**Te**	Note that leakage emissions from power consumption ($LE_{EC,y}$) equation may need to include an option for the additional power needed to compress the CO2 in the emissions factor ($EF_{EF,k,y}$)	$LE_{EC,y} = \sum EC_{LE,k,y} \times EF_{EF(CCS),l,y} \times (1+TDL_{l,y})$	
14	**21**		**Ge**	Need to add a section:	Section 6.2.1.1.2. Scenario B: Electricity consumption from an off-grid captive power plant that captures &/or avoids the CO_2.	
15	**27**		**Te**	Need to establish a CCS relevant emissions factor ($EF_{CO2,l,t}$) that is net of the CO2 captured and/or CO2 avoided	$EF_{ELj,k,l} = \sum_n \sum_l FC_{n,i,t} \times NCV_{i,t} \times EF_{CO2(CCS),l,t} / \sum_n EG_{n,t}$	
16	**30.a**		**Te**	Need to establish a CCS relevant emissions factor that is net of the CO_2 captured and/or CO_2 avoided – for one power source this could be:	$EF_{CO2\text{-}CCS,l,}$	
17	**30.b**			Need to establish a CCS relevant emissions factor that is net of the CO_2 captured and/or CO_2 avoided – for multiple power sources this could be:	$EF_{CO2\text{-}CCS,n,t}$ = average CO_2 emissions (captured or avoided of the fossil fuels fired in the captive power plant *n* in the time period *t* (tCO_2/ GJ)	
18	**38**		**Ge**	Document references the tool "Tool to calculate project or leakage CO_2 emissions from fossil fuel generation". As stated previously, an emissions factor of 1.3tCO_2 overestimates the emissions performance of a CCS power plant. This tool should also be tasked to the CDM's CCS Expert Group to review its appropriateness for how CCS might be considered within its general equations.		

Template for comments:
Tool to determine the mass flow of a greenhouse gas in a gaseous stream

Date: 24 July 2015	Document: CDM-MP67-A19

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1	**2**		Ge	The application of carbon dioxide (CO_2) capture, transport and storage (CCS) should be accounted for in the emissions baseline and monitoring tool for estimating the mass flow of CO_2 in both sub-critical and supercritical gaseous stream (i.e. for the purposes of transport and geological storage). Project boundaries include the capture phase, transport phase, and the injection phase into an appropriately sited geological storage formation. The technical credentials of this tool for the inclusion of CCS should be referred to the CDM's CCS Expert Group; as well as how the composition of a gaseous stream is to be evaluated.	Add under "PURPOSE" This baseline and monitoring tool also presents an approach for the estimation of the mass flow of carbon dioxide in a supercritical gaseous stream for the purposes of transport and geological storage.	
2	**6**		**Ge**	Instruments used to estimate the physical parameters capable of converting into mass flow, such as pressure, temperature and density, should be calibrated to national standards.		
3	**Appendix**		**Ge**	Application of a methodology for CCS could form a new Appendix.		