Workshop CDM in Industrial Processes

Example CDM Project in the Cement Industry

Indocement's Sustainable Cement Production Project

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Indocement's Sustainable Cement Production Project

Application of the baseline methodology (NM0048-rev) to Component 2 (Alternative fuels) of the project activity

Part I
Additionality Test

Project Component 2 - Step I.1: Project eligibility test

Indocement's Sustainable Cement Production Project will partly substitute fossil fuels currently used at the pyro-processing step of the production process with biomass and other alternative fuel types such as rice husks, saw dust, plastics, paper, textiles, used tyres, waste oil, industrial liquid, and solid waste. The project is therefore eligible to utilize the new methodology proposed in Annex 3B.

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Part II
Define plausible scenario alternatives

Project Component 2 –
Step II.1: Define plausible scenario alternatives

- **Using a mix of fossil fuels is common practice for heat generation in the cement sector in Indonesia. According to the Indonesia Cement Association, currently 100% of the heat required for clinker production is produced by burning fossil fuels. No cement kiln in Indonesia uses any form for alternative fuels.**
- **Cement facilities are not likely to change to alternative fuel for clinker production because it will only add to the cost of production. Thus, investment in alternative fuel is not attractive for cement companies in Indonesia. Since there are no legal obligations for cement companies to burn such fuels, companies are not likely to shift to alternative fuel use but will instead continue using fossil fuels as the only source for heat generation for clinker production.**

Project Component 2 –
Step II.1: Define plausible scenario alternatives

- **Also, based on analysis of those cement companies in Europe that are significant users of alternative fuel, it is evident that considerable use of alternative fuels coincides with a well developed public and private infrastructure for waste management. Internationally, there are strict environmental regulations when burning wastes in cement kilns, such as the recently adopted European Union directive for waste incineration (EU directive 2000/76/EU). In the case of Indonesia, there is neither an adequate waste management infrastructure nor stringent, enforceable waste management regulations that could increase the supply of waste materials. Therefore, the assumption underlying the baseline scenario for alternative fuel use in Indonesia's cement plants is that the share of alternative fuel use will remain zero during the project period.**
- **(Methodology Steps II.2 and II.3 are not applicable to Indocement's Sustainable Cement Production Project).**

Project Component 2 – Step II.4: Define plausible scenario alternatives – Additionality testing

- **The total value of the investment in the alternative fuel project component is around US$13 million, as given in the Table.**

Kiln	Total MUSD	2004	2005	2006	2007	2008	2009
P6	1.7	0.6	1.1				
P7	1.8	0.6	0.8	0.4			
P8	1.4				1.4		
P9/10	3.5	0.3	1.2	1.2		0.6	0.2
P11	2.1	0.2	0.5	0.9		0.5	
P12	2.2	0.3		0.7	0.6	0.6	
Total	12.7	2	3.6	3.2	2	1.7	0.2

Project Component 2 – Step II.4: Define plausible scenario alternatives – Additionality testing

- **As shown in the following Table the IRR for the alternative fuel use project component is only 4%. Clearly, this IRR is not attractive for Indocement to undertake this project component. Therefore, the alternative fuel use in Indocement is additional, and it would not occur in the absence of this CDM activity. Carbon financing will provide adequate financial resources to make the project financially viable for Indocement.**
- **Based on discussions with the Indonesia Cement Association, it is evident that due to the financial barrier in place at present there is no initiative to use alternative fuels in the cement sector. Additionally, the poorly developed infrastructure for waste management means serious supply risks. Therefore, the proposed CDM activity is not a common practice in the cement sector of Indonesia, in fact no similar projects are currently being implemented in Indonesia.**

Project Component 2 – Step II.4: Define plausible scenario alternatives – Additionality testing – IRR calculations

Year	Investment (MUS$)	Incremental cash flow (MUS$)	Depreciation	Taxable income	Tax	Net benefit	Cash flow without CER	Cash flow with CER
2004	2	0.57	0.00	0.57	0.17	0.40	-1.60	-1.55
2005	3.6	0.19	0.13	0.05	0.02	0.17	-3.43	-3.28
2006	3.2	0.33	0.37	-0.04	0.00	0.33	-2.87	-2.60
2007	2	0.48	0.59	-0.11	0.00	0.48	-1.52	-1.14
2008	1.7	0.49	0.72	-0.23	0.00	0.49	-1.21	-0.82
2009	0.2	0.71	0.83	-0.12	0.00	0.71	0.51	1.08
2010	0	0.74	0.85	-0.10	0.00	0.74	0.74	1.33
2011	0	0.94	0.85	0.09	0.03	0.91	0.91	1.64
2012	0	0.98	0.85	0.13	0.04	0.94	0.94	1.70
2013	0	1.29	0.85	0.45	0.13	1.16	1.16	2.16
2014	0	1.32	0.85	0.47	0.14	1.18	1.18	2.20
2015	0	1.32	0.85	0.47	0.14	1.18	1.18	2.20
2016	0	1.32	0.85	0.47	0.14	1.18	1.18	2.20
2017	0	1.32	0.85	0.47	0.14	1.18	1.18	2.20
2018	0	1.32	0.85	0.47	0.14	1.18	1.18	2.20
2019	0	1.32	0.85	0.47	0.14	1.18	1.18	2.20
2020	0	1.32	0.71	0.61	0.18	1.14	1.14	2.16
2021	0	1.32	0.47	0.85	0.25	1.07	1.07	2.09
2022	0	1.32	0.26	1.06	0.32	1.00	1.00	2.02
2023	0	1.32	0.13	1.19	0.36	0.96	0.96	1.98
2024	0	1.32	0.01	1.31	0.39	0.93	0.93	1.95
IRR:							4%	12%

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Part III
Compute emission rate for baseline scenario and project

Project Component 2 – Compute emission rate for baseline scenario and project – Basic Assumptions

Baseline assumptions:

- **Assumptions a), b), d) and f) already noted under Project Component 1 are also valid for Project**
- **Component 2, and the following additional assumptions are valid for Project Component 2 when carried out separately:**

  a) It is assumed that the total clinker to cement ratio for baseline and project activity is identical

  b) The heat consumption in the CDM project activity is higher than in the baseline because additional heat is required to dry and introduce alternative fuels into the kiln system.

Based on the conservatively selected baseline scenario (and using the formulae and steps detailed in Part III of the methodology proposed in Annex 3B for the alternative fuel component), the baseline and project emission rates for the project period of Project Component 2 are shown in the following tables (either all alternative fuels considered CO_2 neutral or only biomass-derived alternative fuels are regarded as CO_2 neutral).

Project Component 2 – Compute emission rate for baseline scenario and project

All Alternative Fuels Regarded as CO_2 neutral.

Year	CO_2 Baseline	CO_2 CDM	CO_2 emission reduction
2004	9305166	9278406	26759
2005	9843997	9758860	85138
2006	10429045	10277878	151167
2007	10628296	10412165	216131
2008	10901287	10679985	221302
2009	11203876	10880002	323874
2010	11605481	11269083	336398
2011	12022391	11601831	420560
2012	12462531	12024887	437644
2013	12925353	12352824	572529
2014	13152382	12569727	582655
2015	13176770	12594115.36	582654.8
2016	13201191	12618536.55	582654.8
2017	13184008	12601585.83	582421.8
2018	13184008	12601585.83	582421.8
2019	13184008	12601585.83	582421.8
2020	13184008	12601585.83	582421.8
2021	13184008	12601585.83	582421.8
2022	13184008	12601585.83	582421.8
2023	13184008	12601585.83	582421.8
2024	13184008	12601585.83	582421.8
Total	256329827	247130986	9198841

Only Biomass-derived Fuels Regarded as CO_2 neutral.

Year	CO2 Baseline	CO2 CDM	CO2 emission reduction
2004	9305166	9303087	2078
2005	9843997	9831603	12394
2006	10429045	10396473	32572
2007	10628296	10567596	60700
2008	10901287	10832368	68919
2009	11203876	11077296	126580
2010	11605481	11465273	140208
2011	12022391	11826734	195658
2012	12462531	12256248	206283
2013	12925353	12636804	288550
2014	13152382	12858638	293744
2015	13176770.1	12883026.5	293744
2016	13201191.3	12907447.7	293744
2017	13184007.6	12890497	293511
2018	13184007.6	12890497	293511
2019	13184007.6	12890497	293511
2020	13184007.6	12890497	293511
2021	13184007.6	12890497	293511
2022	13184007.6	12890497	293511
2023	13184007.6	12890497	293511
2024	13184007.6	12890497	293511
Total	256329827	251966569	4363258