



[REPORT TASK 0.7] ADDITIONAL STUDY ON LOW-CARBON OPTIONS IMPLEMENTED IN HOLCIM VIETNAM AND VICEM HATIEN COMPANY

EXECUTIVE SUMMARY

This working paper has been produced to get experiences from already on-going low carbon projects in Vietnam by local cement experts and consultant group. Besides desk studies about low carbon options, a site visit was conducted at Kien Luong cement plant (belonged to Vicem Hatien) and Hon Chong cement plant (belonged to Holcim Vietnam) from 28 to 30th of July, 2014.

The content of the document comprises of 5 sections as follows:

- Section 1 provides a general overview of the study, its background and context;
- Section 2 introduces an overview of cement productions in Holcim Vietnam and Vicem Hatien cement company;
- Section 3 presents some key findings of some low carbon options related to cement production process;
- Section 4 refers some key notes of low carbon option related to cement and material blending;
- Finally, Section 5 provides an explanation of some strong points of some low carbon options related to energy.

As described in Section from 3 to 5, 11 low carbon options were retrieved, described, assessed SWOT briefly, analyzed to extract their main findings, and calculated the ratio of CO₂ emission reduction per production unit. Of these, only the most general findings can be presented here and do not include any specific results. The findings are divided among three different groups, such as:

1. Thermal and electric efficiency: deployment of existing state-of-the-art technologies in new cement plants, and retrofit of energy efficiency equipment including waste heat recovery and renewable electric power where economically viable.
2. Alternative fuels: use of less carbon-intensive fossil fuels and more alternative (fossil) fuels and biomass fuels in the cement production process.
3. Clinker substitution: substituting carbon-intensive clinker, lower-carbon materials with cementitious properties.

Furthermore, there are some additional strong points could be introduced as follow:

- Cement is a key material for building society's infrastructure. Demand reduction and/or substitution are not realistic options given growth in developing countries, increasing urbanisation and climate change adaptation needs.
 - The high cost of reducing CO₂ emissions in the sector will require markets with long-term stability and resultant confidence in the pricing of CO₂ by those markets.
 - Raising awareness for a number of employees at all levels to commit CO₂ emission reductions, benefits and social responsibility in integrating the CO₂ emission reduction activities into actual production and business, especially when the customer are in growth trends towards sustainable development and environmentally protection, as well as to address the requirements of the Laws and upgrade of institution in the future.
 - Raising the technical skill for staff and equip adequate measurement equipments to conduct system audits itself, which assess the status and operational performance in each production steps and CO₂ emission reduction options
 - Completing national guidelines and standards to enhance and promote the use of additives and/or substitutions in cement, thereby reducing the amount of produced clinker for each type of final cement products
 - Existing options to reduce emissions in the sector, while helpful, are not sufficient to counteract growth in demand. New products and technologies are needed, including new cement types.
 - There should be a mechanism to widely apply a state-of-the-art production management system, data collection and CO₂ emissions inventory methods for all cement plants in Vietnam (eg CSI)
 - Encourage to develop a sustainable development strategy in term of CO₂ emissions reduction clearly at plant level; reform institutions and enhanced autonomy for the cement plant in the approval of projects to save energy and protect the environment
 - Along with existing policies, combined with the national and local programs such as energy efficiency as well as environmental protection, it should be to develop mechanisms to promote and replicate the experiences of cement plants, provide adequate technical supports and budgetary arrangements which encourages cement plants implementing solutions towards environmental protection and energy efficiency stronger
 - International collaboration and public-private partnerships must be attended to help speed up research, designs, development and application of necessary new technologies.
- Based on the report analysis and interview with relevant stakeholders , the table below shows a summary of total 08 factors how they influence investment decision making of the on-going low carbon options. The factors cover policy, savings, financial and technical issues. In each option, factors are indicated with its impact to the decision making from the Low impact to High impact.

#	Option	Legal regulation	Company policy	Production cost reduction	Awareness on environment protection	Guaranty of result	Budget	Return on investment	Technical issue ¹
1	Install 2 cooling fans to improve clinker cooler efficiency by 3%	Low	High	High	High	Medium	Medium	Low	Low
2	Reduce outlet PH elbows drop pressure and extension of in-line calciner	Low	Medium	Medium	High	Medium	Medium	n/a	High
3	Process audit looking for potential energy saving options	Low	High	High	High	Medium	n/a	n/a	High
4	Applying vertical ball mill instead of roll mill	Low	Medium	High	Low	Medium	High	High	High
5	Burning cashew husk replacing a part of anthracite coal	Low	Medium	High	Low	High	High	High	Medium
6	Reduction of clinker/cement ratio	Medium	N/A ²	High	N/A ³	High	n/a	n/a	High
7	Waste heat recovery for power generation	High	N/A ³	High	N/A ³	N/A ³	N/A ³	N/A ³	High
8	Using anacadium oil instead of fuel oil	Low	Medium	High	Low	High	Medium	Medium	High
9	Waste heat recovery drying coal	Low	Medium	High	Low	High	Medium	Medium	Medium
10	Using waste as alternative fuel	Medium	High	Low	High	n/a	High	n/a	High
11	Use recycle fuel oil as alternative fuel	Low	Medium	High	Low	High	Medium	Medium	High

¹ for example: constructions, operation, equipment, experiences, etc.

² High in Holcim Vietnam and Not Available in Vicem Hatien

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