[REPORT TASK P-I.2.2] DATA SET GUIDELINES AND CALCULATION METHODOLOGIES

EXECUTIVE SUMMARY

Rationale

"Only what is measured can be managed and improved."

When countries, companies and sectors of industry and society want, need or must reduce their energy consumption and CO2 emissions they unavoidably must monitor and report those. Measurement and reporting is indispensable to know the historic and current status, the improvement potential and to manage progress.

Systematic energy and CO2 Monitoring, Reporting and Verification (MRV) is an increasingly important part of risk and opportunity management for industrial enterprises. Energy and CO2 emission are closely linked to the fundamentals of industrial production processes and form an excellent indicator of operational efficiency. MRV according to international sector standards enables benchmarking with competitors, thus enabling to quantify and improve competitiveness. On the other hand, unwarranted reporting entails significant risks for undue distortion of competition.

Reliable MRV forms also the basis of the success or failure of any regulatory energy and CO2 policy, and this equally for setting the baseline, the quantification of the reduction objective, to estimate the economic cost and benefit and develop an adequate economic incentive and finally to monitor and manage progress and compliance.

A reliable energy and CO2 information system requires a standardized Monitoring and Reporting as well as database system, preferably an international standard, ensuring that all stakeholders use, understand and report along the same parameters, definitions and methodologies.

Summary and key findings

This report provides a complete and precise description and explanation of the conceptual as well as the practical aspects of energy and CO2 monitoring, reporting, verification (MRV) and information systems for the cement industry.

The first chapter introduces a series of concepts and definitions, ranging from primary data measurement and collection at the installation's operations, over reporting systems at installation-, company- and sector–level to databases at national and international level. It also describes the business and regulatory contexts for energy and CO2 reporting.

The second chapter gives a complete overview of the unit operations, the material- and energy-flows and CO2 emissions from clinker and cement production. It also defines the system limits that are relevant for energy and CO2 monitoring and reporting.

The third chapter provides precise definitions, data requirements and calculation methodologies and formulas for all input data, reported output data, Key Performance Indicators and calculation formulas. It describes the "minimum" set of data and results that should be included in a cement-sector energy and CO2 information system as well as a "complete" or "ideal" system.

The fourth chapter explains how the data collection, monitoring and reporting at installation level can be expanded to company and cement sector level, as well as to national and international level. This chapter further gives an overview, definition and explanation of the different quantitative and statistical methodologies for the representation and analysis of the cement sectoral performance.

Finally, a number of examples with such reporting of production, use of fuels and minerals, energy-efficiency and CO2 emissions from different countries and regions worldwide illustrate how such systems can be used by the cement industry, the authorities and other stakeholders to foster progress and energy and CO2 efficiency of the cement industry.

Conclusion and recommendation

Energy and CO2 MRV systems start from primary operational input data that are normally measured and available in good operational practice. A globally standardized methodology and tool is available and utilized by a majority of cement companies worldwide.

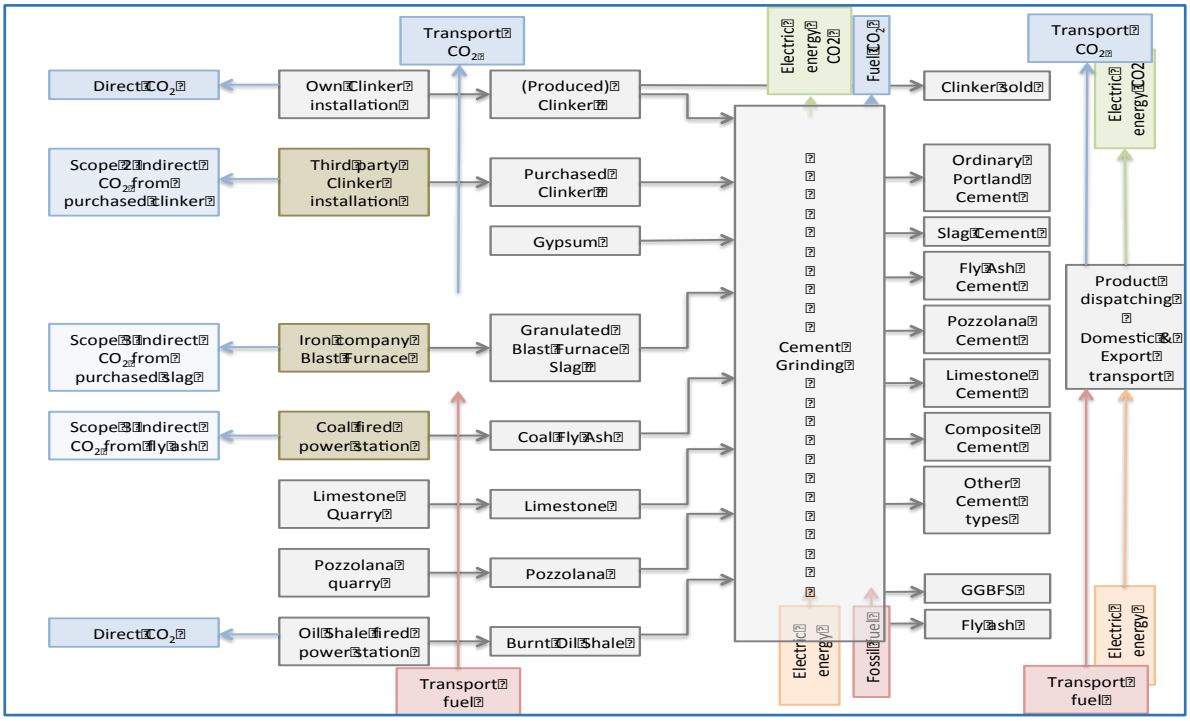
Reporting by means of a globally standardized methodology is relatively straightforward and has the potential to provide valuable knowledge and insights to the industry, investors, authorities and other stakeholders.

This report concludes with the recommendation that the Ministry of Construction, the Vietnamese cement industry and the consortium of consultants will utilize this global cement industry standard (provided adequate learning and training) or could develop a compatible but simplified version.

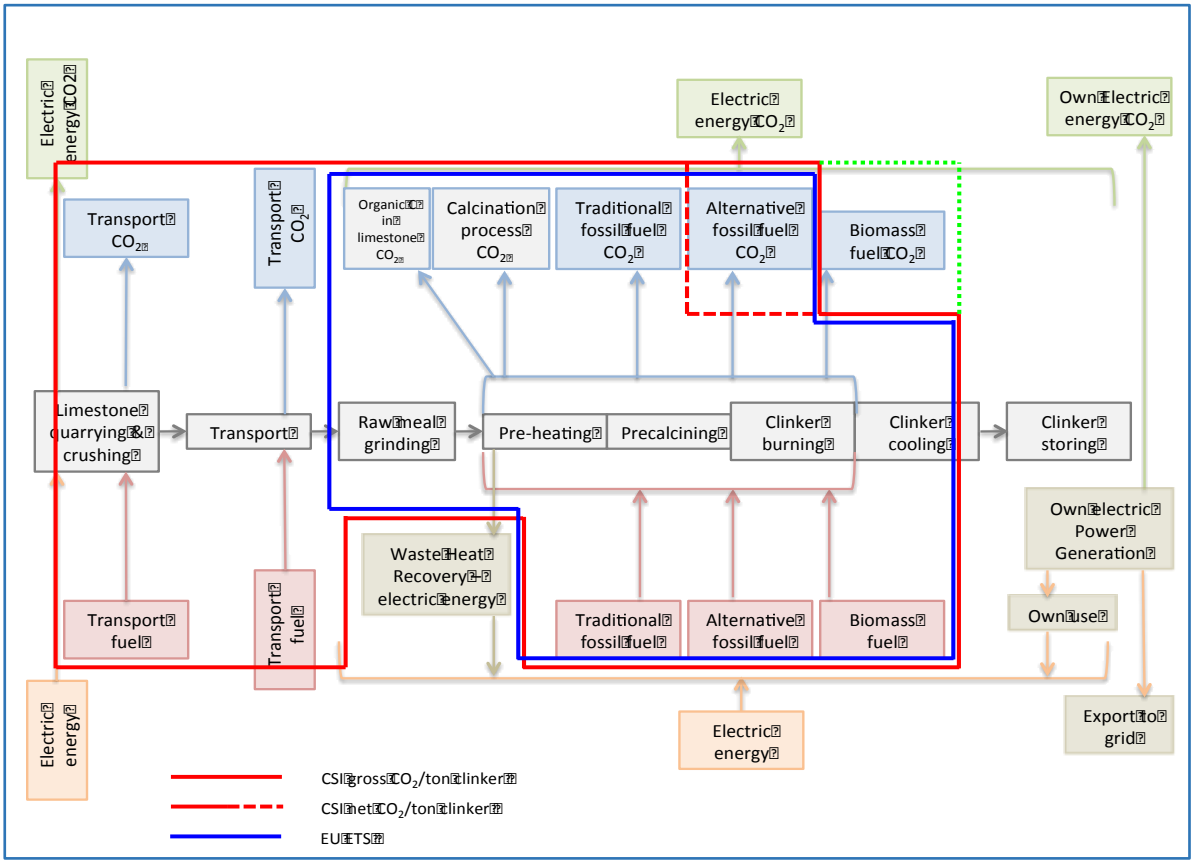
Provided that the Vietnamese system will be compatible with the international standard, valuable additional knowledge can be extracted through the international experience and comparison.

Annexes

Overview of raw material-, product-, energy- and CO2 flows related to cement production



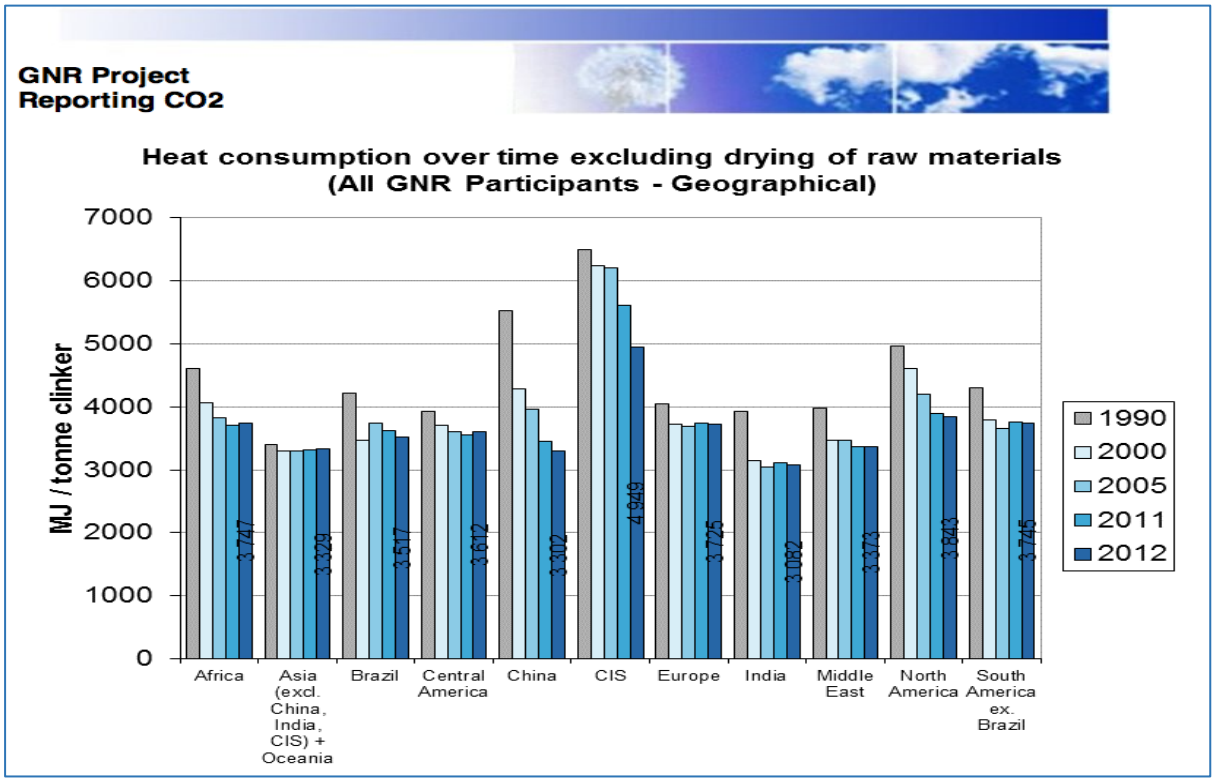
System limits for CSI – MRV gross and net direct CO2 per ton clinker (red line) and EU ETS CO2 emission (blue line)



Example of the selection of inventory system boundaries for inclusion and exclusion of certain process steps from the CO2 inventory with the CSI MRV Excel calculation tool

			WBCSD Cement Sustainability Initiative **Cement CO_2 and Energy Protocol, Version 3.1, CO_2 Emissions and Energy Inventory**				
			Date of latest update	**12/9/13**			
			INFORMATION				
			General Plant Information		**2013**	**2014**	**2015**
			Inventory Boundaries: Coverage of Main Process Steps	**[yes, no or n.a.]**	**2013**	**2014**	**2015**
	7a		Raw material supply (quarrying, mining, crushing)	no			
	7b		Preparation of raw materials, fuels and additives	no			
	7c		Kiln operation (pyro-processing)	yes			
	7d		Cement grinding, blending	yes			
	7e		On-site (internal) transport	no			
	7f		Off-site transport with company-owned fleets	no			
	7g		On-site power generation	yes			
	7h		Room heating and cooling	no			
	7i		(add other processes as appropriate)	no			
	7j		use of internal cement transfer for blending	no			
	7k		Select year to copy and apply inventory boundaries (7a - 7j)				
				Take last boundaries			
	7n		1.) Select calcination CO_2 method (A1; A2; B1; B2) B1=Standard (no seperate calcination sheet needed).		B1	B1	B1
			2.) For A1; A2; B2 check if appropriate calcination sheet (CalcA1; CalcA2 or CalcB2) is already availabe next to plant sheet.				
			3.) If not, press the 'create' button one time in order to create one new calcination sheet.	Create Calcination Sheet			

Thermal energy efficiency of clinker production in different regions worldwide



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