Comparison of the Registry's *draft* Cement Protocol and The Cement CO_2 Protocol from WBCSD

This document compares the California Climate Action Registry's (Registry) "*draft* Cement Protocol" and "The Cement CO_2 Protocol" developed under the umbrella of the Cement Sustainability Initiative of the World Business Council for Sustainable Development (WBCSD) – the CSI Protocol.[1] The overall purpose of this study is to illustrate similarities and differences between the two guidance documents. Both protocols are designed to provide instructions on calculating and reporting CO_2 emissions associated with manufacturing cement. The Registry's draft Cement Protocol is based on the CSI Protocol. The format of this analysis is taken from Appendix 6 of The CSI Protocol, which compares it to other GHG reporting schemes including the EU ETS Monitoring Guidance (EC 2004), the U.S. Climate Leaders Program (EPA 2004a-b, 2003a-b), and the Japanese GHG Reporting System (MoE 2003).

The analysis begins with a high-level explanation of the nature of the Registry's GHG emission reporting and certification program and the GHG Protocol Initiative, the overall program under which the CSI Protocol was created.[2] This provides context to the subsequent side-by-side comparison of the two guidance documents.

The Nature of the Registry's Program and the GHG Protocol Initiative

The Registry's GHG Emission Reporting and Certification Program. The Registry was established by the California Legislature as a non-profit voluntary registry for GHG emissions. It was created to run a GHG reporting and certification program, which companies volunteer to join and pay a membership fee. A purpose of the Registry is to help companies and organizations with operations in the state establish GHG emissions baselines against which any future GHG emission reduction requirements may be applied.

By joining the Registry companies do not simply gain access to the Registry's reporting and certification protocols, they agree to abide by the Registry's program rules. Several of the rules are defined by California State Statute (Chapter 6 of the Health and

[1] The exact documents used in this analysis include the Registry's June 8, 2005 "*draft* California Climate Action Registry Cement Protocol" sent to the review-group on June 8, 2005 with the file name of "CCAR Cement Protocol-draft.doc" (review-group members that joined the group subsequent to June 8 have received the same document); the Cement CO_2 Protocol from WBCSD is the CO_2 Accounting and Reporting Standard for the Cement Industry, v.2, June 2005.

[2] The CSI Protocol is classified as a GHG emission calculation tool within the GHG Protocol Initiative; see www.ghgprotocol.org.

Safety Code, sections 42800-42860), including the requirement, among others, that all GHG emissions reports undergo third-party certification by a State- and Registry-approved certifier.

The Registry's General Reporting Protocol (GRP) provides a description of the Registry's program rules as well as general methodological guidance on how to calculate GHG emissions from common emission sources. The GRP does not, however, provide guidance on how to calculate emissions associated with cement manufacturing. The *draft* Cement Protocol fills this gap;

- it serves as an appendix to the GRP;
- it only provides the methodological instructions for determining emissions from calcination;
- it does not revisit the Registry's program rules and provide exceptions for cement companies.

The GHG Protocol Initiative. The GHG Protocol Initiative aims to harmonize GHG accounting and reporting standards internationally to ensure that different trading schemes and other climate related initiatives adopt consistent approaches to GHG accounting. It operates under the umbrella of WBCSD and WRI.

Guidance documents produced by The GHG Protocol Initiative include The Corporate GHG Accounting and Reporting Standard (The GHG Protocol), which helps companies and other organizations to identify, calculate, and report GHG emissions, and Calculations Tools, which offer step-by-step guidance and accompanying Excel spreadsheets. In the context of the GHG Protocol Initiative, The CSI Protocol is a calculation tool. It functions like an appendix to the GHG Protocol, similar to the Registry's draft Cement Protocol and the GRP. Companies using calculation tools (such as the CSI Protocol) should also use The GHG Protocol in order to take a complete GHG emission inventory in accordance with the GHG Protocol Initiative.

The GHG Protocol Initiative is not a GHG reporting program, *per se*. The GHG Protocol and the CSI Protocol calculation tool are program neutral. Companies participating in the GHG Protocol Initiative have no requirement to report their GHG emissions to WRI or WBCSD, nor does the GHG Protocol provide a certification standard. However, its does offer certification guidance, which the Registry references in its certification guidance. The GHG Protocol anticipates additional reporting requirements by specific GHG reporting programs (e.g., the Registry) and recommends that companies check with the relevant programs to understand the additional requirements.[3]

The GHG Protocol and its calculation tools are a vital cornerstone of the Registry's reporting program. The Registry's practice is to "operationalize" these program neutral protocols into its program. The Registry's general reporting rules are based on the GHG Protocol and, in the case of cement companies, the guidance in the *draft* Cement Protocol adopts emission calculation methodologies from the CSI Protocol. The table below illustrates this point-by-point.

[3] GHG Protocol, p.4

Comparison of the CSI Protocol and the *draft* Registry Cement Protocol

Item	CSI Protocol, Version 2.0	Registry draft Cement Protocol
1) Coverage of sources, and parameters used for calculation:		
Clinker calcination (Process emissions)	**Clinker method** (recommended): > clinker produced- > site-specific EF, based on mass balance of CaO and MgO, or > default EF = 525 kg CO2/t cli, if no site-specific data available. **Carbonate (or cement) method** is mentioned as a possible alternative to the clinker-based method, depending on company's preference, but is not described in any detail.	**Clinker method** (recommended): > same as CSI Protocol, V2.0 **Carbonate (or cement) method**: > cement produced > clinker to cement ratio (defaults = 0.95 for OPC and 0.75 for blended cement) > raw material to clinker ratio (default = 1.54) > CaCO3 and MgCO3 content of raw material (default = 0.78)
Dust calcination (Process emissions)	Calculated based on: > vol. of dust leaving kiln system > EF for clinker > calcination rate of dust (default = 100% calcined)	**Clinker method**: Same as CSI Protocol, V2.0. **Carbonate (or cement) method**: Need to account for incomplete calcination of CKD is mentioned.
Organic carbon (TOC) in raw Materials	Calculated based on: > clinker produced > raw meal to clinker ratio (default = 1.55) content of raw meal (default = 0.2%). Automatic calculation, input of site-specific data is possible but not required.	> Registry protocol V2 updated to include guidance from CSI Protocol, V2.0 > quantification should be deminimis
Conventional kiln fuels and non-kiln fuels (Stationary combustion emissions)	Calculated based on: > fuel consumption (site-specific) > LHV of fuels (site- or company- specific) > EF of fuel (kgCO2/GJ); CSI/IPCC defaults except if more precise EF are available Oxidation factor for carbon is 100%.	Calculated based on: > fuel consumption (site-specific) > guidance provided in Registry GRP > generally, same as CSI Protocol, V2.0
Alternative fossil kiln fuels	Same as for conventional kiln fuels	Same as for conventional kiln fuels
Biomass kiln Fuels (Stationary combustion emissions)	Same as for conventional kiln fuels, but: > default EF of 110 kg CO2/GJ is used for solid biomass (IPCC 1996) > CO2 from biomass is not included in emissions totals, but reported separately as memo item	Same as CSI Protocol, V2.
Carbon in waste water	Quantification not required	> Registry protocol V2 updated to include guidance from CSI Protocol, V2.0 > quantification should be deminimis
Other GHG than CO2	Quantification not required	CH4, N2O emissions calculated from: > fuel consumption (site-specific) > default EFs provided in Registry GRP
Indirect CO2 from Purchased clinker	Calculated based on: > purchased clinker volumes (net) > default emission factor = 862 kg CO2/t cli	Included in a reporter's optional report

Item	CSI Protocol, Version 2.0	Registry draft Cement Protocol
Indirect CO2 from Purchased electricity	Calculated based on: > consumption of grid electricity > EF of grid electricity (preferentially obtained from electricity supplier, else use national default)	Same as CSI, except: > if supplier-specific EF is not available, defaults should be taken from U.S. EPA eGRID database for different U.S. sub-regions
CEMS	Not discussed	SILENT > updated draft protocol will refer companies to GRP and Power Protocol
2) Emission rights and credits:		
		Not applicable, since Registry guidance relates only to direct emissions.
3) Organizational boundaries, uncertainty and precision of estimates:		
Installations and processes covered	Emissions must be reported for the following process steps: > raw material supply > preparation of raw materials, fuel > kiln operation (pyroprocessing) > cement grinding, blending > on-site power generation > room heating, cooling	Guidance provided in Registry GRP > generally, same as CSI Protocol, V2.0 and GHG Protocol > all significant emissions from mobile, stationary combustion, process, and fugitive sources.
Consolidation rules	Following recommendations of WRI/WBCSD protocol (2004) with minor deviations	Guidance provided in Registry GRP > generally, same as CSI Protocol, V2.0 and GHG Protocol > the Registry offers 2 approaches: equity share or management control
Internal clinker transfers	Companies choose whether to report clinker transferred within the company, and associated emissions (see above for details on indirect emissions related to purchase clinker).	Not applicable, since guidance only pertains to direct emissions.
Baseline adjustments	Following recommendations of WRI/WBCSD	Guidance provided in Registry GRP
4) Other Aspects		
Denominator for performance indicators	Different denominators are defined for specific CO2 emissions and other performance indicators.	Same as CSI Protocol, V2.0 > relates CO2 emissions per ton of cementious product
Materiality Thresholds	No materiality thresholds. Small emission sources shall be quantified to the extent practical, but simplified calculation methods may be applied	Deminimis guidance in Registry RGP > companies allowed to claim source as deminimis if less than 5% of total emissions
Precision requirements, uncertainty assessments		Precision requirements and uncertainty assessments addressed in certification protocol