

GREEN CHOICE PHILIPPINES

NELP-GCP 2006009

CEMENT

ENVIRONMENTAL SCENARIO

Cement is a key constituent of concrete, the most common building and construction material in the world. Raw materials are predominantly limestone, together with silica, iron oxide and aluminum. The manufacture of cement involves heating these materials to high temperatures for long periods to produce clinker, which is then ground with gypsum to produce cement. Cement manufacturing is a capital and energy intensive process, relying on coal and gas as primary sources of thermal energy.

The potential for climate change as a result of increased atmospheric levels of greenhouse gases is major issue concerning the cement industry. Greenhouses gases are produced directly from the burning of fossil fuels and indirectly from the generation of electricity used. In addition, the cement production process itself releases carbon dioxide when the calcium carbonate in limestone is converted to calcium oxide. As this chemical reaction is an essential step in the cement production process, cement manufacture emits relatively large volume of greenhouse gases.

Among the greenhouse gases, CO₂ emission from the cement industry is significant. Study shows that with the total of 23.1 billion tons of human-induced CO₂ per year the global cement industry contributes 1.4 billion tons, which is about 6 % of the total man-made CO₂ emissions worldwide. An estimate of around 0.97 ton of CO₂ is produced for each ton of clinker produced. An average of 900 kg of clinker used in each 1000 kg of cement produced. There from, an estimate of 0.873 ton of CO₂ is being produced for every 1000 kilogram of cement. (R. McCaffrey)

In the Philippines, 2004 statistics shows that the total cement production was 13.057 million tons with a per capita consumption of 146.98 kilograms (CeMAP). As such local cement industry produced an estimate of 11, 398, 761 tons of CO₂ in the same year.

Though, efforts have been made to improve the production process and resources efficient through technologies and innovations, much has still need to be done among the cement industry to improve its energy efficiency and environmental performance practices specifically on CO₂ emission reduction.

DEFINITION OF TERMS

1. Cement – a powdery substance made by processing, at a high temperature, a mixture of clay and limestone producing lumps called “clinkers” which are ground into a fine powder consisting of hydraulic calcium silicates.
2. Cement clinker – a clinker, partially fused by pyro-processing properly proportioned mixture of finely ground raw materials (calcium carbonate, silica, alumina, and iron oxide) in a kiln to a temperature of about 2, 700 F, consisting predominantly of crystalline hydraulic calcium silicates.
3. Hydraulic cement, n – cement that sets and hardens by chemical interaction with water and that is capable of doing so under water.
4. Global warming - The progressive gradual rise of the earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns. An increase in the near surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is most often used to refer to the warming predicted to occur as a result of increased emissions of greenhouse gases.
5. Greenhouse gases – include these substances: 2 oxidation carbon (CO 2), methane, hypo-oxidation nitrogen, and flon, which cause the destruction of the ozonosphere. Especially the CO 2 has the biggest influence on the greenhouse effect, and it is discharged in large quantities with combustion of fossil fuel like oil and coal.
6. AFR – refers to Alternative Fuel and Raw Materials. A non-traditional fuel, such as waste materials, providing thermal energy in the production of cement. While alternative raw materials refer to non-traditional raw materials, such as waste providing minerals essential in the production of cement.

SCOPE

These criteria shall apply to cement.

PRODUCT CRITERIA

1. The product shall comply with the Philippine National Standards (PNS) 07: 2005, PNS 63, and PNS 69 Specifications.
2. The production process of the product shall meet the requirements of all applicable environmental laws and regulations.
3. The producer/manufacturer shall reduce the carbon dioxide emission of their product at 10 % per unit of output through the use of AFR/mineral components in the final product or through carbon dioxide sequestration program(s) like tree planting.

EVALUATION AND VALIDATION METHODS

1. Regarding criterion number one (1), the applicant shall submit a certified copy of the PS license of their products which include among others all the information such as the address of the licensee, and the brands covered by the license.
2. Regarding criterion number two (2), the application shall submit an environmental compliance certificates from the Department of Environment and Natural Resources and other concerned government agencies. Specifically, the manufacturer shall comply with the provisions of the laws on Mining Act, Clean Air Act, Clean Water Act, Regulation on Hazardous and Toxic Waste Substances Act, Ecological Solid Waste Management Act and Forestry Code of the Philippines.
3. Regarding criterion number three (3), the manufacturer shall submit its program on CO₂ reduction and/or sequestration. The program shall ensure a 10 % reduction of CO₂ per unit of output, which shall be evaluated and approved by the ELP Technical Committee.

EFFECTIVITY

These product criteria shall take effect for three (3) *years* from the date of its approval, and subject to change or withdrawal by the *Green Choice Philippines – Ecolabelling Programme Board*, if necessary at any period of time.

REFERENCES

Cement Manufacturing Association of the Philippines Website.

The Cement Industry's Role in Climate Change, by Dr. Robert Mc.Caffrey, Editor, Global Cement and Lime Magazine.

Philippine National Standards (PNS) 07: 2005, PNS 63, and PNS 69 – Specifications.