



Pollution Prevention Pays!

The EcoSmart™ Concrete Project **Raw Material Substitution/Construction Industry**

The EcoSmart Concrete Project is aimed at reducing carbon dioxide (CO₂) greenhouse gas emissions by encouraging the use of high-volume supplementary cementing materials in concrete. The EcoSmart Concrete Project received funding from the federal Climate Change Action Fund through the Technology Early Action Measures program, and in-kind support from industry and government partners.

DESCRIPTION OF PROJECT

Concrete is second only to water as the most consumed substance in the world. Every year, almost one ton of concrete is produced for every human on the planet, generating CO₂ emissions that contribute to the greenhouse effect. Cement is the principal ingredient in concrete. Producing one tonne of cement results in the emission of approximately one tonne of CO₂, created by fuel combustion and the calcination of raw materials. Cement manufacturing is a significant source of greenhouse gas emissions, accounting for approximately 7% to 8% of CO₂ emissions globally, and approximately 2.8% of CO₂ emissions in Canada. Over the years, the cement industry has made some progress in reducing CO₂ emissions through improvements in the production process and efficiency, but further improvements are limited because CO₂ generation is inherent to the calcination of limestone reaction.

EcoSmart concrete is produced by replacing cement in the concrete mix with a maximum amount of supplementary cementing material. Depending on the application, from 30 to 60 % of cement can be replaced with materials such as fly ash, blast-furnace slag, rice husk ash, and silica fume. Each tonne of cement replaced by an alternative cementing material reduces the CO₂ "signature" of concrete by approximately one tonne.

The EcoSmart Concrete Project was initiated to address the issue of greenhouse gas emissions in the Greater Vancouver Regional District in British Columbia. EcoSmart concrete is being used in a wide range of construction projects across Greater Vancouver and other parts of Canada, from residential developments to rapid transit stations. The Liu Centre at the University of British Columbia was the first project to use HVFC in the province and reports its use has resulted in a 1/3 less CO₂ emissions.

BENEFITS

Environmental: EcoSmart concrete offers significant environmental benefits, since each tonne of cement replaced by a supplementary cementing material reduces CO₂ emissions by approximately one tonne. There is a further environmental benefit in that most commonly used supplementary cementing materials (such as fly ash) are waste products and would otherwise end up in landfills.

Economic: Depending on the application, from 30 to 60 % of cement can be replaced with supplementary cementing materials such as fly ash, blast-furnace slag, and silica fume. Since these materials are industrial by-products, EcoSmart concrete is generally less expensive and can lower overall construction costs.

CONTACT

Linda Bily
Commercial Chemicals Division
Environment Canada
224 West Esplanade
North Vancouver, British Columbia
Tel: (604) 666-2732
Fax: (604) 666-6800
E-mail: Linda.Bily@ec.gc.ca
Website: www.ecosmart.ca

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