BREVET DE TECHNICIEN SUPERIEUR

Groupement 15

session 2003

ANGLAIS

Durée : 2 h

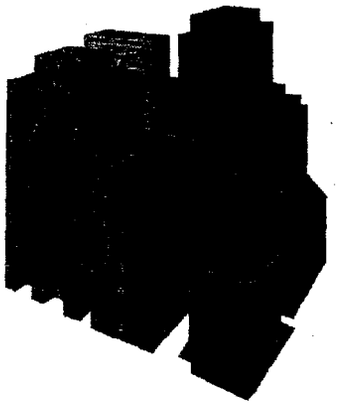
- SUJET -

L'usage d'un dictionnaire bilingue est autorisé.

Il sera tenu compte de la présentation et de la rédaction.

Spécialités :

Agencement de l'environnement architectural
Aménagement - finition
Bâtiment
Charpente - couverture
Constructions métalliques
Enveloppe du bâtiment
Études et économie de la construction
Géomètre topographe
Systèmes constructifs bois et habitat
Travaux publics



GREEN FOUNDATIONS

There is a way to make our city streets as green as the Amazon rainforest. Almost every aspect of the built environment, from bridges to factories to tower blocks, and from roads to sea walls, could be turned into structures that soak up carbon dioxide - the main greenhouse gas behind global warming. All we need to do is change the way we make cement.

John Harrison, a technologist from Hobart, Tasmania, reckons his alternative cement, based on magnesium carbonate rather than calcium carbonate, could reduce climate change without sacrificing modern living. It's a big claim, and Harrison has set about trying to convince the building industry to adopt his ideas.

Our modern world is largely built of Portland cement, invented almost 180 years ago by a Yorkshire stonemason called Joseph Aspdin. Portland cement proved cheap to make and immensely versatile, and soon became the basic ingredient of both concrete and mortar, the building blocks of every city on the planet. But there is a problem. The manufacture of Portland cement produces massive amounts of CO_2, partly because of the huge amounts of energy required to raise temperatures inside kilns to the 1450°C needed to roast the calcium carbonate, and also because the process of conversion itself creates CO_2.

Harrison's solution, being brought on to the market by his small company TecEco, is to replace the calcium carbonate in the kilns with magnesium carbonate –a rock that occurs widely on its own, as the mineral magnesite, or in mixtures with calcium carbonate, such as dolomite.

Harrison's magnesium carbonate-based "eco-cements" have a number of major environmental advantages. The kilns don't need to be run so hot. This means that emissions of CO_2 from the energy used to fire kilns are roughly halved.The roasting process for the manufacture of eco-cements produces more CO_2. But during setting and hardening, a process called carbonation reabsorbs most of this from the air. This means that eco-cements quietly carbonating in a tower block could be performing much the same atmospheric function as a growing tree.

Besides, carbonation is quicker and more efficient. Magnesium carbonate crystals are stronger than those of calcium carbonate, so they add to the material's strength.

Harrison estimates that we could eliminate over a billion tonnes of CO_2 each year. Perhaps, as the world tries to think up new ways of cutting back on its emissions of CO_2, eco-cement may have its day.

Adapted from NewScientist, 13 July 2002.

TRAVAIL DEMANDÉ

I - EXPRESSION en FRANÇAIS (10 pts)

Dans un compte-rendu en français de 150 mots environ, vous mettrez en évidence les idées essentielles contenues dans cet article.

II - EXPRESSION en ANGLAIS (10 pts)

Answer the following questions in English :

1. What can be done to fight pollution in cities? (100 words) *(6 pts)*
2. What makes Mr. Harrison's invention revolutionary? (80 mots) *(4 pts)*