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Keeping you informed about the eco-cement project. Issue 13 30th July 2001

Progress

TecEco Pty. Ltd. has developed a magnesium based sustainable cement system code named eco-cement that has diverse possible uses.

Eco-cements and eco-cement products:

- Can be made much more cheaply than any other competing cement.
- Utilize wastes as raw materials.
- Are sustainable and would reduce CO2 emissions by in the order of 10%.
- Are strong[1] and resistant to the chemical agents that attack Portland cement
- Are totally recyclable[2].

The eco-cement system has been endorsed by leading scientists around the world and has enormous medium and long term potential.

Eco-Cements for the Built Environment of the Future

This worries me and it should worry you.	The world population reached 6 billion in 1999. Remarkably to note, it took a century to grow from 1 billion to 2 billion people; 30 years (1930-1960) to reach 3 billion; 15 years (1960-1975) for the next billion; and 12 years to grow from 4 billion to 5 billion. At the current rate the world will have 7 billion people soon after the year 2010. The overwhelming share of world population growth is taking place in developing countries (89.9 % in 1970-80; 92.2 % in 1980-90, 95.2% in 1990-2000; 97.6% in 2000-10; and 98.4% in 2010-20). The population of developing countries has more than doubled in 35 years, growing from 1.89 billion in 1955 to 4.13 billion in 1990. Significant proportions of population increases in the developing countries have been and will be absorbed by urban areas (45.6% in 1970-80; 58.7% in 1980-90; 71.8% in 1990-2000; 83.4% in 2000-10; and 93.4 in 2010-20). Urban settlements in the developing countries are, at present, growing five times as fast as those in the developed countries. Cities in the developing countries are already faced by enormous backlogs in shelter, infrastructure and services and confronted with increasingly overcrowded transportation systems, insufficient water supply, deteriorating sanitation and environmental pollution.

[1] With fibre reinforcement eco-cements can be engineered to virtually any strength required in the built environment.
[2] Eco-cement products such as masonry units can be ground down to aggregate and fines and the fines easily reprocessed to make more cement. Cured OPC has not been reprocessed economically to make more OPC.

TecEco have found a way of sustainably creating the built environment Consider the ramifications of a recyclable building material Eco-cement products could be recycled using energy form the sun TecEco believe we have the answer to many of the problems expressed in this article – so if you can help us help the world please get in touch with us without	The Habitat Agenda states that "rapid urbanization, the concentration of the urban population in large cities, the sprawl of cities into wider geographical areas and the rapid growth of mega-cities are among the most significant transformations of human settlements... Urban areas will strongly influence the world of the twenty-first century, and urban and rural populations will be increasingly interdependent for their economic, environmental and social well being. Among the economic and social factors influencing this process are population growth and voluntary and involuntary migration, real and perceived employment opportunities, cultural expectations, changing consumption and production patterns and disparities among regions" (paragraph 99). By the year 2006, every second human being is expected to live in urban settlements, while in 1975 only 37.8% of humanity lived in towns and cities, this rate has risen to 45.3% in 1995 and projected to grow further. Recent estimations show urbanization level of 61.1% for the year 2030. A well managed urbanization has the potential to lead to improvements in the living standards of the world's population. The transition into an urbanized world has enormous implications for the world economy, for social conditions, as well as for the state of the world environment. An increasing number of cities have taken on significant roles in the globalization of the economy, particularly with regard to financial services, commerce, transport and telecommunication. The Habitat Agenda points out that "during the course of history, urbanization has been associated with economic and social progress, the promotion of literacy and education, the improvement of the general state of health, greater access to social services, and cultural, political and religious participation. Democratization has enhanced such access and meaningful participation and involvement for civil society actors, for public-private partnerships, and for decentralized, participatory planning and management, which are important features of a successful urban future. Cities and towns have been engines of growth and incubators of civilization and have facilitated the evolution of knowledge, culture and tradition, as well as of industry and commerce. Urban settlements, properly managed, hold the promise for human development and the protection of the world's natural resources through their ability to support large numbers of people while limiting their impact on the natural environment" (paragraph 7). Larger and larger proportions of the population live in 1,000,000+ cities. In the developed countries 26% of the total population lived in such cities in 1990, compared with 19% thirty years ago. This increase is more startling in the developing countries, where this proportion more than doubled from 5% in 1960 to 12% in 1990. The concentration of urban populations 1,000,000+ cities is becoming particularly characteristic for developing countries. In 1990, for example, 36 percent of the urban population of the developing countries lived in such cities, compared to 22% in 1950. In the developed countries these proportions changed from 29% in 1950 to 35% in 1990. Globally, there were 245 1,000,000+ cities in 1985, while twenty-five years earlier there were only 112 and a century ago there were only five. By the turn of the century, worldwide there will be 372 metropolitan cities and it is anticipated that this number may rise to 527 in 2015. In 1950, the industrialized countries had only 49 1,000,000+ cities. By 1975 that number had nearly doubled, and it is expected to have tripled by the year 2000, when the number will reach 117. In 1970, the developing countries had about the same number of metropolitan cities as the industrialized countries. However, it is forecast that, by the turn of the century, they will have twice as many as the industrialized countries. By the year 2015, it is expected that 22% of the world's total population and 41% of the world urban population will live in 1,000,000+ cities. The Habitat Agenda emphasizes that "increasingly, cities have a network of linkages that extends far beyond their boundaries. Sustainable urban development requires consideration of the carrying capacity of the entire ecosystem supporting such development, including the prevention and mitigation of adverse environmental impacts

delay.	occurring outside urban areas. The unsafe disposal of waste leads to the degradation of the natural environment: aquifers, coastal zones, ocean resources, wetlands, natural habitats, forests and other fragile ecosystems are affected, as are the homelands of indigenous people" (paragraph 105). Most countries of the developing world with high rates of urbanization in the last decade also experienced higher economic growth. The world has witnessed economic and social progress during the last decades. This is shown in, among others, higher life expectancy, lower infant mortality, higher literacy, and increased participation of disadvantaged groups. But economic and social gains are, however, unequally distributed. Back in 1960, the 20 per cent of the world's population living in countries with the highest per capita income had incomes 30 times greater than the world's poorest 20 per cent; by 1990, the richest 20 per cent were getting 60 times more. Poorly managed cities and towns contribute to unsustainable production and consumption patterns. They also generate unmanageable wastes, which negatively impact on land and water resources as well as on the atmosphere. Sustaining healthy environments in the urbanized world of the 21st century represents a major challenge for human settlements, development and management. Social gains have lagged behind economic gains. A large proportion of the world's population remains deprived of basic services such as water supply and sanitation. The marginalized population is particularly large in those countries of the South where economic progress was slow. Every day in a course of this decade, the developing countries have to accommodate 150,000 additional urban dwellers. For the next decade this figure will grow up to 180,000 inhabitants daily or more than one million people weekly. While large cities in some developing countries have been growing at rates of up to 5 per cent per annum, slums and squatter settlements in some of them have been growing as twice as quickly. Slums and squatter settlements dwellers present a significant part of population in many cities of the developing countries (for example, from 30 to 40% in Caracas, Dakar, Dhaka, Lima, Nairobi, Madras, Manila, Rio de Janeiro, Sao Paolo; 40-50% - Calcutta, Mexico City, Tunis; 50-60% - Bogota, Bombay, Delhi, Buenos Aires, Lagos, Lusaka; 60-70% - Dar es Salaam, Kinshasa; more than 70% in Addis Ababa, Cairo, Casablanca, Luanda). It has been estimated that, 17 per cent of the world's stock of housing consists of one-room shelter, of which some three quarters are to be found in the developing countries. Some 42 per cent of rural and 35 per cent of urban dwellings in Africa are single-roomed. The overwhelming shelter problem in the developing countries is the shortage of affordable housing for the low-income majority of households in urban areas. This has resulted in the proliferation of slums and squatter settlements. An assessment in 1991 suggested that around half the urban population in the developing countries had water piped into their houses while around a quarter were supplied through less convenient means - public standpipes, yard taps, protected dug wells and bore-holes/hand-pumps. The remaining 350 million urban dwellers did not have a safe, protected water supply. The latest estimates indicate that the number of urban dwellers without suitable water services had increased. At least one third of the Globes's urban population lacked provision for sanitation in 1991. Of those that had provision for sanitation, most had a simple latrine; only some 550 million had a house connected to a public sewer with around 220 million having a septic tank system. Estimates for 1994 suggest that the number of people lacking adequate sanitation in urban areas had increased considerably during the early 1990s, to 588 million up from 452 million in 1990. Projections to the year 2000 show that if the present rates of provision of sanitation services are maintained, the number of people without adequate sanitation will total 3.31 billion, that is more than half the world's population. This will include 846 million urban dwellers. Most cities in both developed and developing regions experience a polarization of their

	populations into affluent and poor neighbourhoods. Trends are often towards further segregation rather than social integration of the poor and marginalized urban population groups. Poverty is a growing problem worldwide both in the rural and urban areas and impacts negatively on human settlements. At least 600 million urban dwellers in Africa, Asia and Latin America live in "life-and-health threatening homes" and neighbourhoods because of the very poor housing and living conditions and the lack of adequate provision for sanitation, drainage, removal of garbage and health care. An increasing number of the urban poor are also homeless in both developed and developing countries, with current estimates of the homeless population being over 100 million. In many countries, the rates of urbanization exceed the capacity of national and local governments to plan and organize this transformation. As a result, new forms of urban poverty have emerged, manifested through poor housing conditions, insecure land tenure, urban crime and homelessness. Moreover, poorly managed cities have negative impacts on environmental conditions. In most countries in Africa, Asia and Latin America, the absolute level of resources available to local governments is seldom adequate to provide even the most minimal level of services.

Source: UNCHS (Habitat), Tools and Statistics Unit, http://www.unchs.org/habrdd/stat1prog.htm

New Breakthrough

We are now using waste fibres to reinforce eco-cements when strong materials are required with considerable success.

Any statistics out there on waste fibre volumes please? Some are very strong such as wool, cotton and wood fibres.

Web Page

Our web site went down with the demise of One-Tel as did our email and everything else. Our email should now be working at tececo@our.net.au.

Focusing Academics

TecEco have made the eco-cement technology an open science and will rely on our global patent application.

TecEco have a long list of small to medium sized research projects if anybody out there is interested in doing an honours/masters/Phd thesis based on our technology.

We are very hopeful shortly of receiving funding and we may be able to help.

Attendance a 6th Australasian Masonry Conference

TecEco managing director John Harrison has just returned from the recent masonry conference in Adelaide more convinced than ever that the TecEco technology is the world's best practice building technology.

At least two speakers advocated a return to lime mortars. John made a lot of contacts and hopes to initiate research into eco-cement mortars which theoretically should be stronger, less brittle and bond better.

Bye for now –John Harrison