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Session 1: Ecological Building

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Global material consumption doubles every 20 years, Mark Gorgolewski told participants. The developed world consumes over 80% of the world's fuel and material resources. It takes 20 kg of raw materials to produce one kg of bought goods. If the entire world population consumed at the rate of a typical European country, it would quickly run out of resources. The world is already running out of places to dispose of the vast waste created by the construction industry.

People spend 90% of their time indoors. Being in a building cut off from the natural world has physical, psychological, and spiritual impacts. Research shows people feel better and are healthier in buildings with stronger links to the outside world.

People are products of their built environment. Initially, they shape the buildings; later, the situation is reversed. People affect the design of buildings, which in turn have a huge impact on individuals, society, and culture. Buildings are not just another commodity; they are part of the longer-term culture and environment.

Buildings also have a huge impact on the environment. They use 40% of the world's energy, 50% of its fresh water, 24% of all harvested timber, and 65.2% of electricity. In Canada, construction accounts for 50% of natural resource use and 52% of water consumption. The production and transportation of building materials also creates a great deal of greenhouse gas.

The construction process itself is hugely damaging to the environment. Canadian construction and demolition creates 11 million tonnes of waste a year. Considering what goes into buildings, they might be regarded during demolition as assets for new buildings rather than waste. Maximizing reuse, refurbishment, and recycling may soon become a necessity. The Worldwatch Institute reports that by 2030 many areas of the world will run out of raw building materials and begin to rely on recycling and mining landfills.

The cultural component of buildings is important. They provide a familiar backdrop for everyday activities. People want to keep buildings they are familiar and comfortable with. Stuart Brand speaks of "blue jeans buildings"—buildings that age honestly and elegantly with time. It is important to recognize that a building is not finished the day it is built. Rather, it grows from day one, evolving, developing, and improving with age. The buildings that last are those that accommodate significant change.

Buildings can become obsolete due to technical failure, trends in fashion and design,

changing legislation, or simple economics. Most buildings today are made obsolete by economics or changing fashion. For the sake of sustainability, people should not try to push culture to change as quickly as fashion. It is better to strike a balance. The heritage movement can help guard against fashion driving change.

Some aspects of buildings themselves change more quickly than others. The space changes daily, while a space plan may last as long as 30 years. A building's skin or exterior lasts about 20 years and its structure or load bearing elements last from 30 to 300. A building's site or geographic setting is eternal.

A "long life, loose fit, low energy philosophy" will help design the buildings of today to become the heritage buildings of the future. Buildings that accommodate many uses over their lifespan will endure.

Reuse of existing buildings is an important factor in the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. The system sets out voluntary standards for developing high performance, sustainable buildings. It looks at factors such as sustainable sites, materials and resources, water efficiency, energy and atmosphere, indoor environmental quality, and design innovation.

The 1:5:200 rule brings into perspective the importance of a building to its occupants. For every dollar in initial construction costs, the lifetime operating and maintenance costs of a building are $5, while the lifetime value of all commercial activities in the building are about $200. Making the lifetime activity more efficient and productive can raise the level of interest in sustainable building. To ensure sustainability, people must construct buildings other people want to have.

In closing, Dr. Gorgolewski quoted architect Shigeru Ban: "Permanence is not a matter of the material you use; permanence is about whether people love your building."