

## **AN OPERATIONAL MODEL FOR ECOLOGICALLY SUSTAINABLE GROWTH**

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### **Contents**

1. Introduction
  2. The Natural Step
    - 2.1. The Funnel and the Future
    - 2.2 The Four System Conditions for Sustainable Human Society
  3. The Seven Fronts
    - 3.1 Eliminate Waste
    - 3.2 Benign Emissions
    - 3.3 Renewable Energy
    - 3.4 Closing the Loop
    - 3.5 Resource-Efficient Transportation
    - 3.6 Sensitivity Hook-Up
    - 3.7 Redesign Commerce
  4. The Prototypical Model
- Glossary  
Bibliography  
Biographical Sketch

### **Summary**

This article is focused on the concept of sustainable development and the description of a new business paradigm within which it is possible. From the perspective of at least one company, Interface, Inc., the basic principles of sustainability (and therefore products developed from them) are mostly absent from the industrial model practiced around the world today. As paraphrased from the book *The Ecology of Commerce* by Paul Hawken, the linear Take-Make-Waste dynamic of the 1<sup>st</sup> Industrial Revolution is flawed. It is flawed to the point that those who practice it most efficiently will not survive it over the long term.

Proposed here is a model whereby industry can “do well by doing good.” It is a call to shift today’s industrial paradigm to a gentler, more cyclical model that mimics nature and allows for economic growth without preventing future generations from meeting their needs. The model is based on the four system conditions of The Natural Step organization and is described in terms of seven fronts of a mountain higher than

Everest, called Sustainability. These fronts are the key problem areas of today's industrial system, and solutions to these are proposed as the model of a sustainable enterprise is developed. The model is called the "Prototypical Company of the Twenty-First Century".

## 1. Introduction

Global consensus on the basic concepts and principles defining sustainability, and therefore the rules and objectives for sustainable development, is slowly being achieved; however, not without heated debate.

One of the most publicized and controversial symptoms of our unsustainable industrial system is global warming. Though this issue will not be discussed in detail, the debate highlights many of the issues surrounding sustainability. For example, industrial, energy and transportation systems produce unimaginable amounts of CO<sub>2</sub> and other greenhouse gases and expel them into the atmosphere. The impact of these emissions is global, and it will exist for decades, unlike past environmental problems that have been acute but more limited to local regions and shorter time frames. The impact of global warming is recognized as a growing problem for future generations. Many atmospheric scientists have moved to a position of proposing strategies of adaptation realizing that significant climate change is inevitable. This further dictates caution and critical review of industrial paradigms; in particular the "Take-Make-Waste" industrial model which has no regard for the fact that the Earth is finite, both as a source (what it provides) and as a sink (what it assimilates without damage to natural systems). This model was developed in a time of relative scarcity of people and apparently limitless natural resources. Furthermore, it has become apparent that some resources and life support systems have no substitutes. While society has become used to the string of substitution of wood to peat to coal to oil to nuclear to gas to solar power, etc. it is now understood that oil cannot be substituted for clean water or clean water for breathable air, and food cannot be exchanged for warmth. Some things are complementary.

Similar concepts gleaned from various sources such as Paul Hawken's *The Ecology of Commerce*; Daniel Quinn's *Ishmael*; Donella Meadows' *Beyond the Limits* and Lester Brown's series on *Vital Signs* lead to other fundamental guidelines for a new industrial paradigm functioning within a society mindful of its vulnerabilities. Concepts such as:

Man was made for Earth, not the other way around, and the diversification of nature is crucially important in keeping the whole web of life going sustainably over geologic time. Relevant time frames are in fact geologic in scale. We must at least think beyond ourselves and our personal time on Earth. The right side of the brain, the caring, nurturing, artistic, subjective, sensitive, emotional side, (in business, the "soft side") is at least as important as the left side, and perhaps a good bit more important since it represents the human spirit. The market is opportunistic, if not outright dishonest, in its willingness to externalize any cost that an unwary, uncaring public will allow it to externalize. Technology must fundamentally change if it is to become part of the solution instead of continuing to be the major part of the problem.

What is meant here is that Paul and Anne Ehrlich's popular equation describing the

relationship between Population (P), Affluence (A) and Technology (T) and their Impact on the environment (I) is represented as:

$$I = P \times A \times T$$

This relationship shows that as the population increases and more people demand more affluence (stuff), the application of more technology using a current industrial model exacerbates the problem. The current industrial model is linear, based on “Take-Make-Waste”, and so is its technology. This model is extractive, wasteful, and driven by non-renewable fossil fuels. It is abusive and focused on labor productivity, i.e. more production per worker. In this case, more technology is worse because it increases the environmental impact.

A successful model for a sustainable society requires Technology (T) to be in the denominator where more technology actually reduces the environmental impact on the planet.

$$I = \frac{P \times A}{T_2}$$

This type of technology ( $T_2$ ) mimics nature. It is cyclical, relies on renewable resources, depends on resource productivity rather than labor productivity, is benign in its effects on this biosphere and is driven by solar energy in all its forms (including wind).

## 2. The Natural Step

The depletion of natural capital (resources) and the concentration of waste streams are at the heart of the problem. These are coupled with the systemic destruction of nature’s capacity to create quality (photosynthesis), and a universal disregard for human capital and the fair and equitable distribution of resources. These issues are addressed by The Natural Step organization in the development of four system conditions. When these concepts are applied to current industrial practices, there are, in the view of our model company, seven areas or fronts that must be attacked and changed to ensure a sustainable future for everyone.

The system conditions of The Natural Step teachings are rooted in four fundamental principles of science.

**The first principle** states that matter and energy cannot be created or destroyed. Practically speaking, the waste products of industrial metabolism do not disappear; the concept of waste disposal is an illusion. The billions of tons of resources consumed every year are not actually consumed, but rather, they are converted systematically into industrial and molecular waste.

**The second principle** says that matter and energy tend to disperse over time, becoming less concentrated and therefore less valuable. Natural resources mined and concentrated for societal needs eventually dissipate back into nature. As their structure and concentration are dispersed and lost, they become waste, and their value drops precipitously.

**The third principle** addresses consumption. Society consumes the quality, purity or structure of matter, not its actual molecules. The availability and maintenance of this quality of matter determines the prosperity of humankind. If societal metabolism is systematically increasing waste in the world, then the world is becoming not richer, but poorer.

**The fourth principle** is about wealth. On Earth, sun-driven processes produce increases in order or net quality, primarily through photosynthetic production. Since what is consumed (and needed) is material 'quality', the rate and capacity of the earth to provide quality depends on natural, not human-made processes.

In order to bring societal metabolism into alignment with natural cycles, two things must occur: create a balance between the amount of material 'quality' consumed and the amount of material 'quality' produced in nature; and confine the amount of waste produced to well within the capacity of the earth to usefully and safely re-absorb it. These objectives are inter-linked to form the fundamental basis for the cycles on Earth. Over-consumption of material quality causes an excess build-up of waste, which in turn compromises the conditions for life. Thus, cycles of production and consumption must be integrated into natural cycles, not the other way around. These laws of nature are unyielding, and not based on human thoughts, wishes or political preferences.

## 2.1. The Funnel and the Future

All institutions and businesses are violating the principles of a cyclical society. Waste is accumulating in all living systems in the world. Resources are being used up at a rate greater than they can be replenished, and unchecked population growth is increasing human impact on the environment.

Imagine a funnel whose walls close in as a measure of escalating demands on resources, growing population, and increasing metabolic waste. As the funnel narrows, there is less room to maneuver and fewer options are available. If this funnel describes the present long-term conditions facing the world, then a responsible corporation will direct its activities and investments toward the center of the funnel, rather than toward the wall, representing the limits described by scientific principles.

Institutions that continuously violate these principles will suffer economically. The walls of the funnel will continue to impose themselves in the form of environmentally concerned customers, stricter legislation, higher costs and fees for resources and waste, as well as tougher competition from companies who anticipate the narrowing limits and adjust accordingly. The failure of institutions and businesses to begin to address sustainability not only leads to hitting the funnel wall -- wasted effort, energy, money and resources -- but also further constricts the funnel itself in the long run. Interface sees the cyclical nature of ecosystems as providing a clear design for the company's future and it will use these principles as a guide to reduce the company's impact and footprint upon the planet. At the same time, Interface will actively and creatively design new means of manufacturing that will eliminate the waste that is now created. This is a long-term commitment, one that cannot succeed overnight. It took the modern textile industry two hundred years to come to where it is today. In its new life as a company dedicated to sustainable production, Interface is only six years old. There is much to do, but much to work with.

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### **Biographical Sketch**

**Ray C. Anderson** is a chairman of Interface, Inc. He graduated from Georgia Institute of Technology as an industrial engineer. Since graduation Ray Anderson has quietly gone about fostering an entrepreneurial spirit that has resulted in his building one of the world's largest interior furnishings companies. After founding Interface in 1973, Ray and his company have revolutionized the carpet and floorcovering industry. Now, Ray has embarked on a mission to make Interface a sustainable corporation by leading a worldwide war on waste and pioneering the processes of sustainable development.

Ray learned the carpet trade through 14-plus years at various positions at Deering-Milliken and Callaway Mills, and in 1973 set about founding a company to produce the first free-lay carpet tiles in America. He developed a partnership with Britain's Carpets International Plc. that year, set up operations in LaGrange, Georgia, took over Carpets International 10 years later, and today commands the world's largest producer of commercial floorcoverings.

From corporate offices in Atlanta, Ray oversees a globally positioned company whose core business is still modular soft-surfaced floorcoverings. Named one of Georgia's Top 100 Public Companies in 1997, Interface has diversified and globalized its businesses, with sales in 100 countries and manufacturing facilities on four continents. In addition to carpet tiles and broadloom carpet marketed under several brands, Interface also manufactures and markets specialty fabrics, architectural products such as raised access flooring, and a variety of chemicals used in commercial office installations.

While Interface is noted in its industry for its commitment to high quality design and innovation, the

company is fast gaining a reputation as a corporation carrying the banner for the environment. Inspired chiefly by Paul Hawken's treatise, *The Ecology of Commerce*, Ray has heightened the company's awareness and led changes in technology in an effort to become completely sustainable. Admittedly, Interface is not there yet; however, the company is investing in developing processes and technologies to get it there. What this means, primarily, is learning to harness solar energy and provide raw material needs by harvesting and recycling carpet and other petrochemical products, while eliminating waste and harmful emissions from its operations. Ray believes that if Interface can get it right, they will never have to take another drop of oil from the earth. The philosophy guiding Ray's passion for this cause is simply that it is not only the right thing to do, but the smart thing, too.

Because the commitment Interface has made is so unique, both in terms of the industry and business in general, the environmental community has embraced the company and lauded its efforts. Ray was named co-chairman of the **President's Council on Sustainable Development** in 1997, and received the inaugural **Millennium Award** from Global Green, presented by Mikhail Gorbachev in September 1996. He was also recognized in 1996 as the Ernst & Young **Entrepreneur of the Year** for the Southeast Region, and as the **Georgia Conservancy's Conservationist of the Year** in 1997. Interface, Inc., was named one of the **Top 100 Companies to Work For in America** by FORTUNE magazine in December, 1997 and 1998. In January, 2001, Ray was selected by the National Academy of Sciences to receive the prestigious **George and Cynthia Mitchell International Prize for Sustainable Development**, the first corporate leader to be so honored. His book, *Mid-Course Correction* (Chelsea Green 1998) describes his and Interface's transformation to environmental responsibility.

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