

A Sustainable Environment: Our Obligation to Protect God's Gift

by
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Toward a More Sustainable World Through Creative Destruction

Earlier this month, the United Nations' Intergovernmental Panel on Climate Change declared with a 90% confidence level that global warming does exist and it has been caused by human activity. The big question now is what can we do about it. The obvious answer is to reduce the quantity of fossil fuels for energy by employing more efficient systems. But what else can we do?

Scientists and engineers have developed processes and products that are very innovative and utilize much less energy. In some cases, however, these products are not accepted by the major markets because they would destroy an existing system or infrastructure – thus creative destruction. An example is the auto industry which along with electric power generation is the largest contributor to global warming.

The energy required to power an automobile is used primarily to move the vehicle itself which accounts for about 95% of the total weight. This means that only five percent of the fuel is used to move the driver from one location to another. The simple answer is to manufacture lighter automobiles. Several years ago, the Rocky Mountain Institute developed an automobile made from high-tech ultra-light materials, which are stronger than steel, and the resulting car can achieve over 100 miles per gallon. This technology has been rejected by Detroit because it would eliminate the assembly plants as they exist today. The investment in the auto assembly plants is too great to change to a new technology. Is there any alternative?

The answer may be to look at the base of the economic pyramid. Economists have described the global pyramid as consisting of three layers. At the bottom, or base of the pyramid, are the four billion people earning less than \$1,500 per year. In the center are the 1½ billion people in the emerging middle class earning between \$1,500 and \$15,000 per year. At the top of the pyramid are the 800 million “wealthy” people earning over \$15,000 per year. Most manufacturing companies market their product to the top of the pyramid where the “wealthy” consumers exist. But should we be looking at the base of the pyramid.

The entire world that has electricity and light uses either incandescent or fluorescent bulbs. But now we have an alternative with LED (light emitting diodes) lights that consume considerably less electricity and last much longer than incandescent or fluorescent bulbs. The problem is that the current lighting infrastructure throughout the developed world cannot accept LED lights, so they are used only for some niche applications. However, we can introduce LED lights to the base of the pyramid because they do not have any lighting systems – so there is no existing system to destroy. A

combination of inexpensive solar batteries coupled with LED lights is a technology that can be introduced to a four billion people market. Once this market is fulfilled, the strategy is to introduce it up the pyramid.

In 1993, only two percent of the Chinese had microwaves. Galanz, a company in China, used local labor and materials to produce inexpensive microwaves just for China. By 2000, the company increased its market share to 76%. The company then started to export its microwaves to the top of the pyramid and now has 35% of the world market.

For many years, transportation for the base of the pyramid was typically with bicycles. A company decided to add small motors to the bicycles to make them more useful. After it grew in size by serving the base of the pyramid, it entered the motorcycle market and then the automobile market. This was the genesis of Honda.

We have seen innovative products like iPods introduced at the top of the pyramid, but this is a case of creating both the market and the product. There may be more opportunities to drive innovation from the base of pyramid when you can serve the unmet needs of these four billion people.

Note: In last month's issue, I stated that the Public Health Service had suggested a regulation to the U.S. EPA in 1962. A reader correctly pointed out that the EPA was not formed until 1970. I should have stated that the Public Health Service had proposed an arsenic limit in water in 1942 and then suggested to lower the limit in 1962. These limits were later considered by EPA in 1974.