



Developing sustainable  
technologies  
for future success



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Sustainability has long since moved from a corporate window dressing to a fundamental concern in business and in innovation. It is a logical progression as human impact is increasingly apparent and data indicators point toward the complicated truths of our global impact. As the human population explodes and Earth enters an age defined not by geologic activity or an ice age, but by human activity, the Anthropocene has truly begun. The defining changes in this age are not clearly defined rock strata which have been evident in the previous epochs; they are imbalanced of nutrient and hydrologic cycles, accelerating species extinction rates, greenhouse-gas-driven climate change, and the depletion of global resources.

Clearly, the solution is not for humankind to forgo development and return to small agrarian tribes. Likewise the solution cannot be to continue on the current trajectory of ecological destruction until resource scarcity is the primary driver of change. As a species, humans have become so technologically capable and advanced that the natural world cannot cope with the rate of change. Perhaps the most well established framework for viewing this problem is the IPAT model, where  $I = PAT$  or:

While criticized for its simplicity and inability to reflect actual scenario values, it is respected for illustrating the role that each of the primary human factors influencing environmental changes.

Now, however, with a focus on long-term sustainability, there exists an opportunity to perhaps rewrite the IPAT equation. Ray Anderson, CEO of Interface, set out to “rewrite that [IPAT] equation so that it read  $I$  equals  $P$  times  $A$  divided by  $T$ ” so that technology is now reducing impact as:

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$$\text{Impact Environmental} = \frac{\text{Population} \times \text{Affluence}}{\text{Technology}}$$

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## Impact

Environmental = Population x Affluence x Technology

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In the case of Ray Anderson and Interface, this change was achieved by adopting a cradle-to-cradle cycle, a shift to renewable energies, and other industrial changing resulting in having 'produced and sold 85 million square yards of climate-neutral carpet since 2004.' is change has not only impacted global sustainability, but also "sales increased by two-thirds and profits have doubled . "

Interface represents just one of many firms that are turning to sustainable technologies both to do "good" business (good for people and the environment, and good business (higher financial returns). In Harare, Zimbabwe, the Eastgate Building in draws on the design of termite mounds to create a temperature-stable architecture which uses 90% less energy to cool the building . At MIT researchers are developing new airfoils based on highly efficient whale fins for applications in wind energy and aviation. Apple, which has already defined itself for outstanding solar and ecological programs, has

stepped into cradle-to-cradle production through a newly developed robot to disassemble old iPhones so that the resources within (gold, copper, etc) can be reused in future products .

In each instance, researchers or firms have had to evaluate their own processes to determine which aspects needed revision, and what the best approach was to making that change. For now, this application of sustainable technologies is still very much in the innovation stage, but organizations around the world should be motivated by the positive changes in economic, environmental, and social considerations which are taking place, and should expect this revised IPAT approach to become a consumer demand and regulatory expectation in the future.

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