

## *What Would Nature Do?*

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Achieving a sustainable relationship with the Earth will require a fundamental revolution in the way we satisfy our basic human needs, to avoid compromising the ability of future generations to meet their own needs. In order to solve the great economic, ethical and environmental challenges of our generation and ensure a prosperous future for the offspring of all species on Earth, we will need to develop completely new ways of thinking and doing that are inherently sustainable. The question is, if so little about the human way of life is sustainable today, how can we learn to change?

Biomimicry (from bios, meaning “life,” and mimesis, meaning “to imitate”) is a new branch of science and engineering that suggests we can develop sustainable solutions by looking to natural world for inspiration. Officially introduced in Janine Benyus’s book, “*Biomimicry: Innovation Inspired by Nature*” (1997), biomimicry proposes that nature is the best model, the best measure and the best mentor we have for sustainability, because nature already provides rich examples of sustainable systems. Nature, taken loosely to mean the collection of non-human organisms and ecosystems on Earth, has been sustaining and improving itself since the dawn of single-celled life roughly 3.8 billion years ago. So, what key lessons can we take from this prolific natural scholarship?

In “*Biomimicry*,” Benyus proposes ten primary principles of natural sustainability: nature runs on sunlight and uses only the energy it needs. It fits form to function and recycles everything. Cooperation and diversity are rewarded in nature, which demands local specialization. It curbs excesses from within and taps the power of limits, choosing to optimize rather than maximize. And finally, nature is beautiful.

If we accept these as sensible Darwinian metrics of our own endeavors, humans have a long way to go indeed. Today, more than 90 percent of U.S. energy is from fossil fuels and uranium. Incandescent bulbs convert only five percent of electricity into light, and average cars convert less than one percent of gasoline energy into actual passenger movement. We care more about fads and fashion than we do about utility, and we boast about our ability to divert one-third of our waste from landfills. We can’t agree on an international climate plan, and we continue to Coca-Colanize and deforest, activities that destroy both cultural and biological diversity, while the average meal in the U.S. travels 1,500 miles to our plates. We’ve never been good at staying within our limits, instead seeing them as a challenge to our goal of infinite growth in a closed system.

Innovators around the world, however, are beginning to make great strides in mimicking nature's solutions to the very same problems we are facing in shelter, food, energy and other arenas.

Dolphins have a drag coefficient one-third that of a commercial airplane, and one-hundredth that of a Toyota Prius, making them one of the most efficient moving objects on Earth. Termite mounds are passively heated and cooled, without fossil fuels, to within one degree of 87°F, while outside temperatures range from just above freezing to over 100 degrees Fahrenheit. Migrating hummingbirds fly 600 miles non-stop over open water on two grams of renewable organic nectar. Ounce for ounce, a spider's dragline silk is stronger than steel, tougher than Kevlar, and more elastic than nylon, despite being made from digested cricket at room temperature. Nature is truly a master of design.

Humanity is just now beginning to take some of these natural solutions and use them to solve its own problems. The Aptera Typ-1, an innovative electric car coming to California later this year, will be the most efficient personal automobile in the world, with 300 mpg fuel economy, due largely to its aerodynamic dolphin-esque body. The Passivhaus building energy standard, which represents our best chance of fighting climate change in the building sector, relies on the same techniques termites use to condition their homes — solar heating, wind-driven cooling, and temperature dampening with thermal mass.

As these practical and theoretical examples show, when confronted with a design problem, the first question to ask should always be, "What would nature do?" Designs stemming from natural inspiration are more sustainable, more elegant and more beautiful than anything designed in a windowless office could ever be. Next time you're searching for inspiration, just take a look out your window, or a stroll around the lake. The natural world is full of ideas.

*Nick is wondering what nature would do when faced with three midterms. Send your ideas to [nick@positivesustainability.org](mailto:nick@positivesustainability.org).*

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