If we want a positive future…we need to solve two issues: sustainable energy and climate change. We use most of our energy and produce most of our atmospheric CO₂ to overcome friction. I learned in school that the shortest distance between two points is a straight line, so if we want to move air, water, or energy with the greatest efficiency, we should do it in a straight line. But I also saw as a boy that nature, which minimizes friction far more efficiently than human technology, never uses straight lines to move anything. Instead, nature consistently uses the same spiraling shape that you see when you pull the plug from your bath.

If nature uses one set of curving shapes and sips energy, but humans use straight lines and guzzle energy, what happens if we apply nature’s flow algorithms to industrial equipment?

I decided to find out, by freezing a vortex. I modeled it on shapes like seaweeds swirling in ocean currents, seashells, and horns. The results were phenomenal. One of our products is a three inch by six inch mixer that can circulate a ten million gallon tank of water – that’s the size of a football field, 30 feet deep. It’s changing the way more than 1,500 cities and towns are now keeping their drinking water fresh. Fans use 22% of global electricity. By applying nature’s geometries, we can reduce that dramatically, like our computer fan that uses 47% less energy than its best competitor.

Nature has solved virtually every problem facing humans, and it evolves, survives, and thrives, while not using up or endangering its base resources. By constantly creating conditions conducive to life, with zero waste and unbeatable energy efficiency, nature is clean, green, and sustainable. And all over the world, across dozens of industries, people are applying biomimicry or bio-inspiration and finding profitable solutions to seemingly intractable problems by partnering with nature.

Examples range from adapting hippopotamus sweat molecules to reduce skin cancer to developing better road systems by studying the tracks of slime molds seeking food. Lifesaving pharmaceutical breakthroughs have been based on the biology of lizards and businesses are improving both their impact and profits by operating more like hickory forests. Even the Velcro you undoubtedly have somewhere in your closet is a prime example of biomimicry in action.

Only named as a discipline 20 years ago, biomimicry is rapidly catching on. A study by the Fermanian Institute at Point Loma Nazarene University found that biomimicry patents, scholarly articles, and research grants have increased by more than 500% since 2000. With fastest impact expected in industries such as architecture, industrial chemistry, waste management, and medicine, estimates are that biomimicry could account for $425 billion of US GDP and $1.6 trillion of global GDP by 2030.

The world’s leading educational organization for biomimicry is the Biomimicry Institute. Its Biomimicry Taxonomy organizes nature’s key functions as a hierarchy of eight groups and 30 sub-groups that contain more than 160 functions. The taxonomy acts as a guide to help designers or engineers define design challenges. They can then consult AskNature.org, a growing database of thousands of scientific case studies.
studies, to identify nature’s champion adapters that have solved a similar challenge. The Institute also offers free courseware and links to national and international regional groups.

As a biomimicry inventor, I’m often asked where I get my inspiration. I sometimes get the sense that the questioner thinks I must be wired differently, that I can magically think more creatively than they ever could. Absolutely not, I tell them. My inspiration is all around us – it’s nature, and its genius is freely available to anyone curious enough to look, listen, and ask. Following nature’s design mastery, I’m confident we can all achieve greater wealth and economic sustainability, without sacrifice and while protecting our planet. The possibilities are enormous.

To learn more, go to biomimicry.net; zqjournal.org; or sharkspaintbrush.com.