



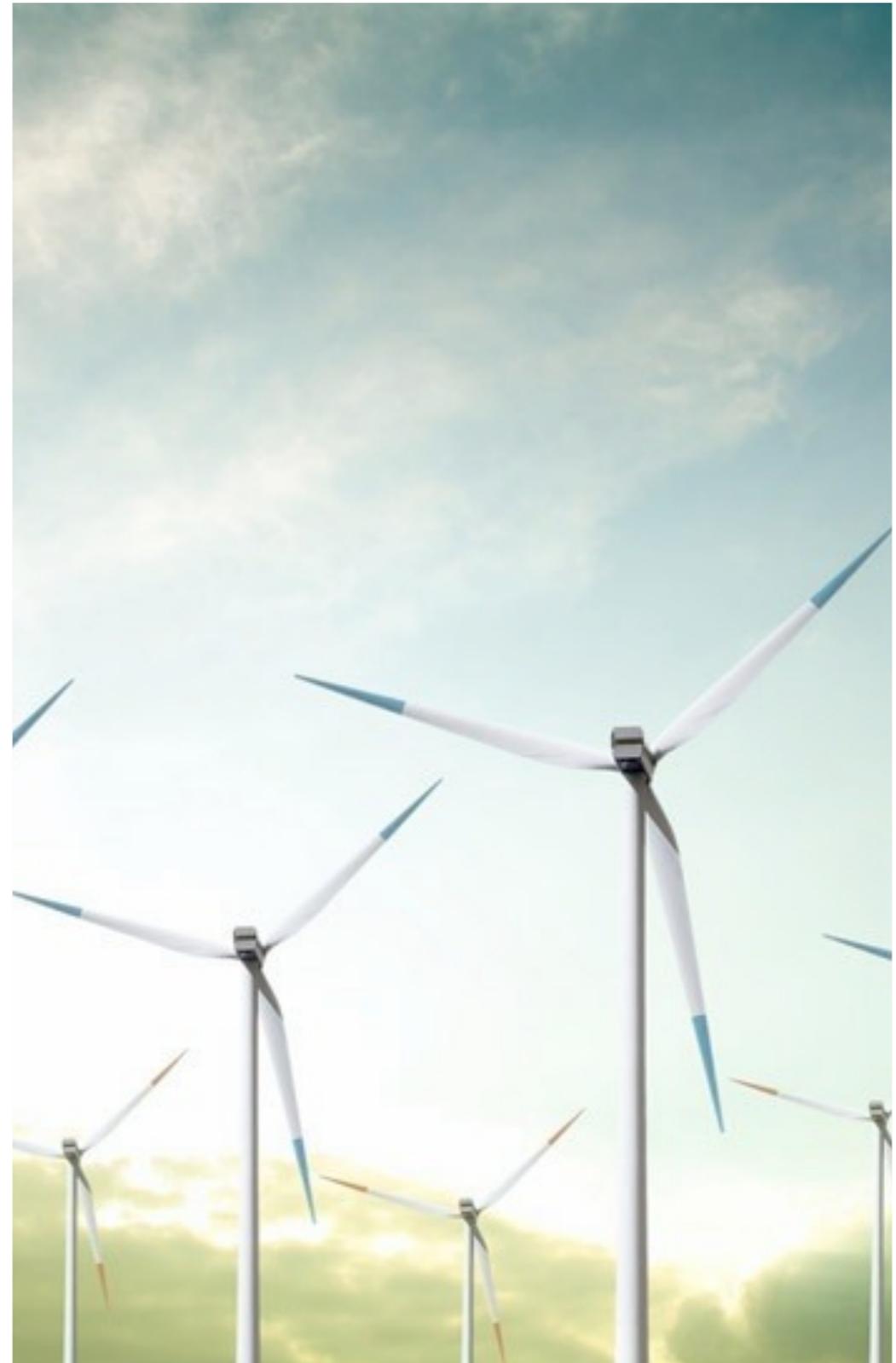
Permaculture Design 101

Regenerative Leadership Institute
www.regenerative.com

Chapter 1

Regenerative Design Will Save The World

"As the world's problems are growing ever more complicated, the solutions remain embarrassingly simple" - Bill Mollison, founder of permaculture



Many people are looking to nature for the answers to the problems mankind has engendered in our tenure on this planet. The result and heart of this movement is known as permaculture – a sustainable design science, rooted in nature.

We will discuss the guiding principles and ethos of permaculture in more detail later in this book. For now, let it suffice to say that permaculture lays out the basic tenets of sustainable living in harmony with one's environment.

Sustainable living simply means utilizing and mimicking naturally occurring systems, methods, and materials to foster an environmentally friendly, eco-conscious mode of living in which we not only halt the damage we as a species have wrought on our world, but actively work to undo it. More importantly, sustainable living is about creating truly

independent relationships with our surroundings – a truly regenerative presence of human beings.

Many might read the above statement and assume that sustainable living requires the wholesale abandonment of our current way of life. This is not the case. Flushing our entire culture and the technology we've developed down the proverbial drain is not a solution to the world's ills. The key to resolving this disparity between our way of life and nature is to begin looking to nature to guide us, and to develop technologies that mimic (and collaborate with) nature. We need to develop efficient technologies that permit us to retain our standard of living in an environmentally harmonious, responsible manner while eliminating pollution and food supply contamination.

Sustainable design means designing all of our technology, from cars to houses to the power we use on a daily basis, so that what we utilize creates a net benefit for our environment. This means designing buildings that clean the water and cars that actively clean the air while we drive; power supplies that do not rely upon precious and irreplaceable fossil fuels; and creating technologies that are inherently regenerative and healing to our environment. Most of the solutions we are seeking, nature has already evolved many centuries ago, while we haven't been paying attention.

It is critical to understand that sustainable solutions are ultimately unsustainable unless they are inherently regenerative. Not only have we caused tremendous damage to the basic life support systems of our planet, but there is a large question at play of going from simply surviving, a state commonly confused with real sustainability, to thriving, a state

where all human beings are able to reach their fullest potential and the planet thrives with us. Ultimately the question isn't growth or no growth, but rather what do we want to grow, because growth is an absolutely essential component of life itself.

When we talk about regenerative sustainability, we talk about a radical shift in our thinking that produces a dramatically higher standard of living for everyone while generating tremendous wealth. Consider the inevitable possibility that our laws will one day require not only that every new building makes a net positive impact on the environment, by filtering groundwater, cleaning the air, and generating far more electricity than is used by its inhabitants, but also that the designers of that building are required to actually maximize that net positive impact. This future is absolutely inevitable, and will be rapidly achieved through financial incentives, by the way. Capitalism got us into the

current mess, and capitalism is the only thing powerful enough to get us out (permaculture principle: problem is the solution). Do consider for a moment what our world will look like when these kinds of basic design specification become the required footprint for every new residential and commercial development? In other words, we're talking about creating a fundamentally regenerative human presence on this planet.

Regenerative design (which, by the way, is just another word for permaculture) is not about race, gender, creed, religion, or any other human difference. It doesn't matter whether you're left-wing, moderate, or right-wing. We all breathe the same air, drink the same water, and eat the same food. Sustainable design has nothing to do with one's affiliations or ancestry and everything to do with

embracing nature-inspired design that works to the benefit of everyone and everything on Earth. A Republican can get cancer from the toxins we ingest in corporate-farmed foods and tainted water just as readily as a Democrat, and a Democrat may enjoy hunting and fishing as much as a Republican. Creating an environment that will help to eliminate the dangers of modern living, while maximizing all its benefits, is the all-important first step in realizing the dream of a world where we can retain the conveniences we've become so reliant on without sacrificing the health of our world.

Sustainable living is not so much about striking a balance, but about giving back to our world while simultaneously maximizing our quality of life. It's humanity in harmony with nature, achieved through the often breathtakingly simple means nature utilizes. Taking our cues from nature to solve the problems plaguing mankind at the moment is known

as biomimicry, which we'll discuss further later in this book. Scientists are looking at spider webs with their incredibly high tensile strength to create everything from body armor for soldiers to adaptation and incorporation into building materials. This is an example of biomimicry, and it is one of the linchpins of sustainable design.

You've also probably heard people talking about reducing their "carbon footprint." While this is not a wholly undesirable outcome, the focus on the carbon footprint is really a way of avoiding the key issue.

What is really needed is not a reduction in the carbon footprint, but to adapt our footprints so they are truly sustainable by being inherently regenerative. If what you put into the environment on a positive level exceeds what you take out, you have created a regenerative footprint. The question to be asked is not how to have the least negative impact, but how to transform our current mode of

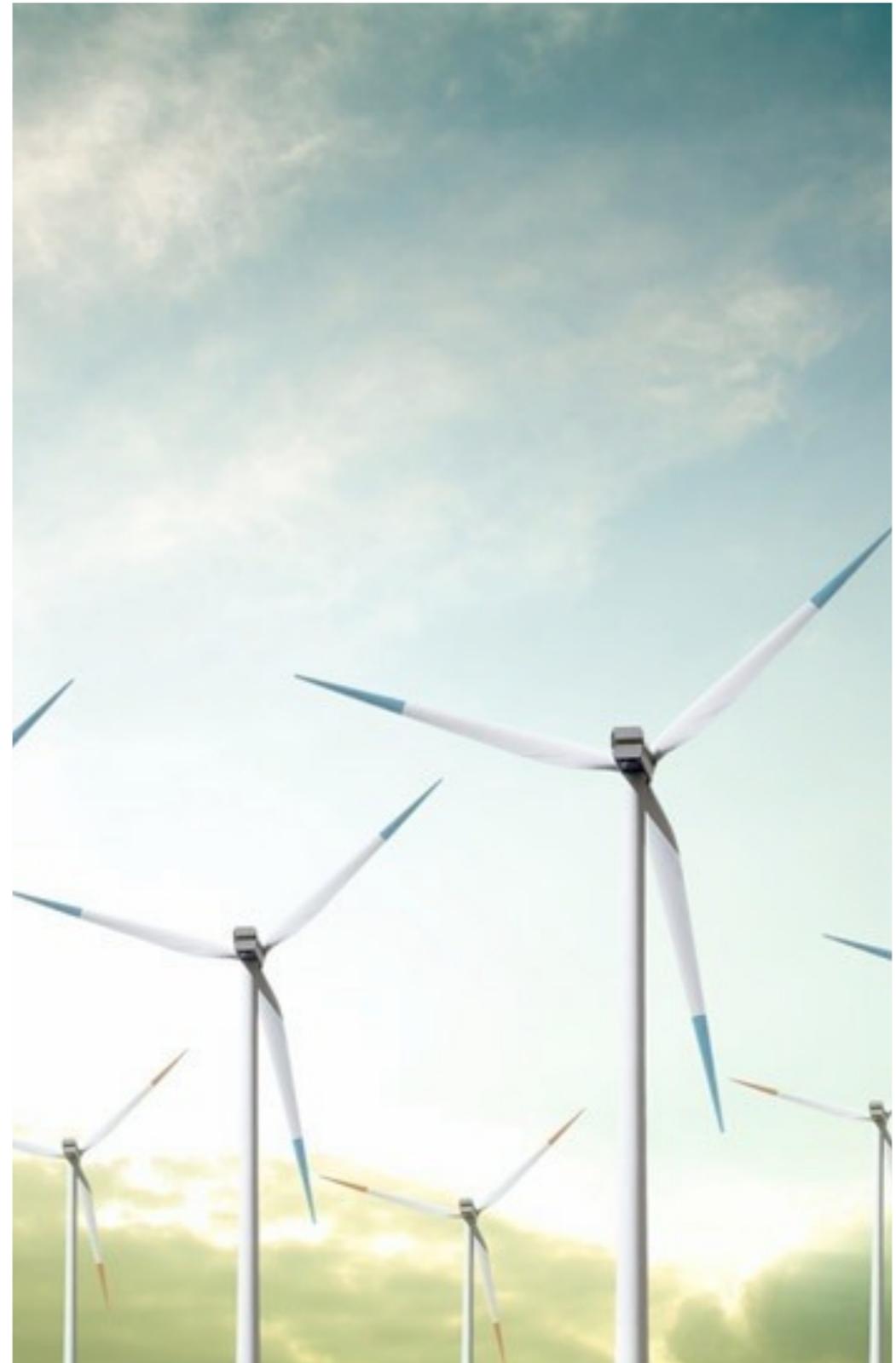
living into a net positive for our world. This is the premise behind regenerative sustainability.

Many people don't view nature as particularly sexy, but the fact is nature has already had and solved a large number of the problems we in our ignorance have created. After four and a half billion years, nature knows a thing or two about adaptation and taking care of itself. On that kind of time scale, we as a species are so newly-born we have yet to even open our eyes. Nature viewed as a whole entity has shaped itself to the benefit of everything, solving problems with ruthless efficiency. The first question people concerned with sustainable design inevitably ask is, "How does nature do this?" If we can duplicate the processes nature uses to create dwellings, power, and food, we'll be taking the first strides toward a truly sustainable culture. Death is not usually a desirable outcome, and in our newborn ignorance we as a species are in real danger of

crawling right over a cliff. The survival and continued thriving of our species as a whole, however, is very sexy indeed! We'll discuss the sexiness of nature and man's increasing disconnect from it in the next chapter.

Is It Simply Nature Deficit Disorder?

"The longest road you will every have to walk is the sacred journey from your head to your heart." Phil Lane, Jr.



How many times as a kid did you hear this: “Go outside and play!” As an adult, how many times have you said it to your own children? Odds are, not as much as you had it said to you!

Study after study shows that children don’t get outside nearly as much as they used to. With the Internet, sophisticated video games that far eclipse anything we had, and a mind-boggling array of TV programs and movies available at the touch of button, the great indoors has much more allure than it did when we were coming up. Add to this the constant need for caution, especially as parents, because we’re told every day about the dangers that await our children if they’re not kept under constant supervision. As a result, we as a society have become paranoid and fearful. We’ve sealed ourselves away in our so-called bastions of civilization, huddled in unthinkable numbers to maintain an illusion of

safety, all the while becoming more and more isolated from each other and our world.

As our psychological umbilical cord to nature has become knotted, tangled, and frayed, there has been a sharp upswing in the number and severity of recognized mental disorders, and new ones seem to be cropping up daily.

Children are more rambunctious and less easily managed, and psychologists and psychiatrists prescribe medications as if they were dispensing candy rather than mind-altering substances.

But the real disorder is not the natural playfulness and curiosity of children. The trouble is that we’ve made our habitat both sanctuary and prison for our children and ourselves. Without the ability to explore and discover the wider world around us, we deprive

ourselves of essentials we need to survive, such as vitamin D. The body synthesizes this vitamin naturally with the aid of sunlight. When we sit in a house, then a car, then a cubicle, and go back the other way all day, every day, we don't get the sunlight we require to flourish. Science has demonstrated that regular exposure to sunlight not only makes us feel better, but can actually alleviate illness.

As a society and an “advanced” species, we are very sick. At least in this regard, the psychologists are correct. But the cure is not found in a pill bottle, a hypodermic syringe, or a counseling session, and certainly not on their own. The underlying cause of these problems needs to be addressed, and that's the alienation from nature that living in modern environments, inundated with fearful stories of “what's out there” creates.

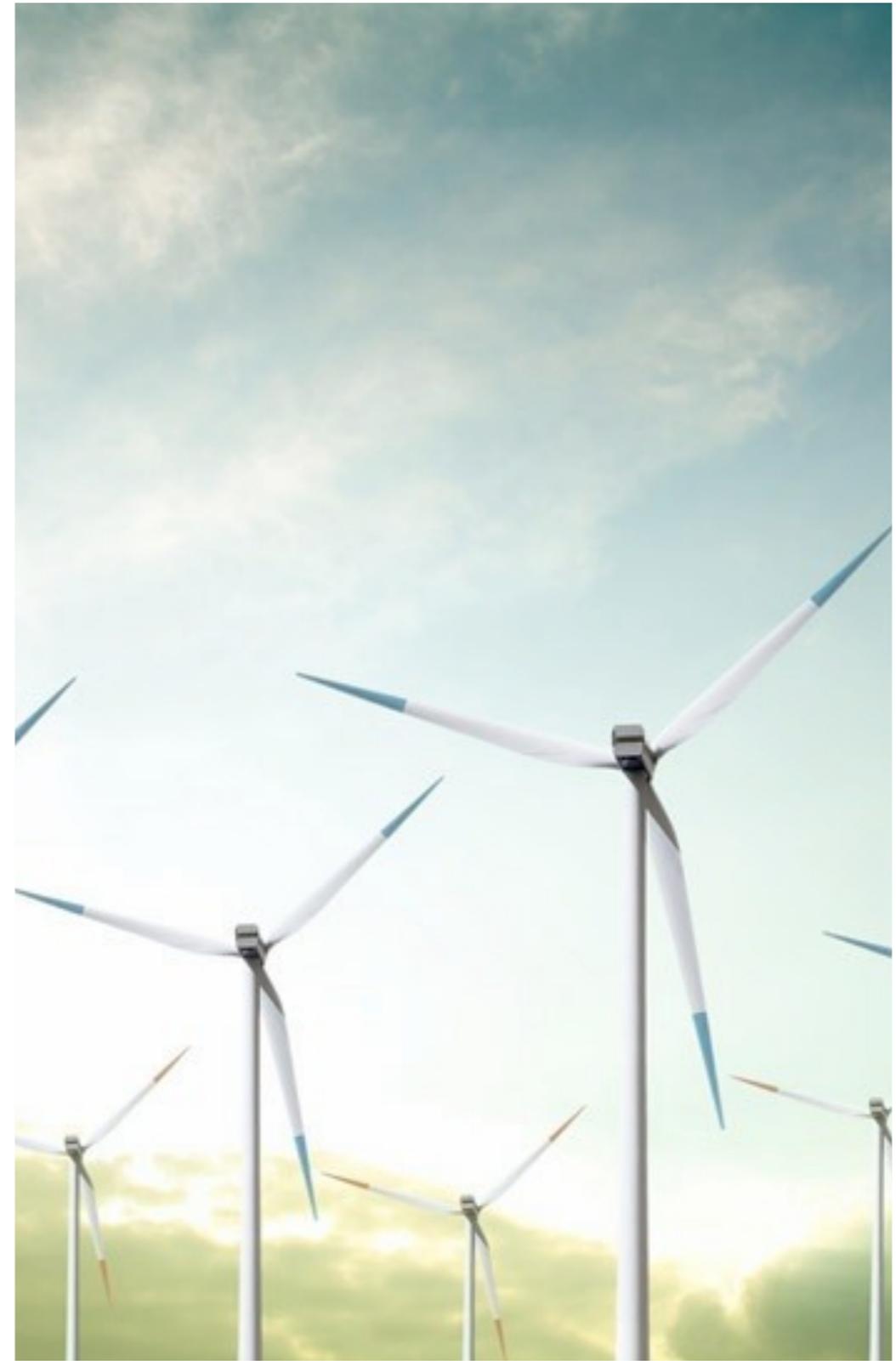
Sustainable living is not as much about using sustainable products and growing one's own food as it is about regaining that primeval connection with our world, while simultaneously maximizing the benefits of modern technology. Everything in nature is specifically adapted to its environment, and human beings at the most basic instinctual level require that feeling of interconnectedness to maintain their balance. By utilizing the tenets of permaculture and making a conscious effort to learn more about our world and what it has to offer us, our species is curable.

Mankind is capable of technological marvels. We've been proving it since before the pyramids. However, for us to survive, let alone flourish, we need to direct our energy and attention to the places it will do the most good for us and the world around us. Having advanced technology doesn't mean much if we're killing the planet and ourselves in the service of it.

The theories and practices are already in place and have been reliably shown to be effective. The impetus now becomes efficiency. By developing effective technologies that are environmentally positive and regenerative, we can correct the alarming trajectory of the tangent our species has spun off on. We're more than capable of doing the mental heavy lifting involved, but the real question is creating technology that helps undo the harm we've done and continue to do to our world while still maintaining our standards of living and civilization.

In the next chapter, we'll explore the myriad ways that looking to nature for the solutions to our problems can not only rejuvenate and replenish us, but offer new methods and means of achieving a truly sustainable manner of living.

If Design Is The First Signal Of Human Intention, What Are The Design Goals?



Nature is the ultimate architect. Nature does not permit a vacuum or wasted space, and is frighteningly efficient when it comes to balancing form and function. Even the most diehard arachnophobe will, when pressed, acknowledge that the arachnid form is one of the most practical and well-designed survival arrangements on the planet. On the other end of the spectrum is the amazing architecture of a nautilus snail's shell, which affords the nautilus both protection and shelter.

Mankind has turned our eyes to nature for millennia to determine the best courses of action for pursuing human civilization. Many cultures designed their home ground and villages in spiral arrangements to more effectively irrigate crops, for protection, and to symbolize the patterns they saw all around them in the natural world. In this way, they honored the Earth and nature, understanding in a way we are

regrettably divorced from in our modern world that we are all an intrinsic part of nature.

The overarching goal of permaculture is to reunite mankind with the world and in doing so heal our planet by creating a world where there is sufficient food, water, and shelter for all. Anything worth doing requires hard work and discipline, but if we as a species can manage that, there is a very real potential for an absolutely incredible, thriving, abundant world to emerge. It's important to note here that abundance is most certainly the natural state of our world in balance.

The core ethic of permaculture is, as so many things are, laughably simple and yet thought-provoking. There are three parts to this ethic, but to fully appreciate the scope and scale this ethic incorporates, let's look at each individually.

Care For The Earth: Without a thriving planet, we as a species have nowhere to go. Therefore, caring for the earth is the primary directive of permaculture.

Given the destruction we've wrought on our environment and our planet, it is no longer enough to simply replace what we take. We need to be proactive about developing technologies and regenerative practices that don't simply heal the world, but enhance it while meeting our current needs through abundant yields – remember, we're very much talking about maintaining . Ultimately, we must stand up and assume a guardianship role on our planet in which our every interaction with our world is governed by what is best for the entire body as a whole.

A fascinating thing happens when we recognize and take our rightful place as stewards – we come into right relationship with our lives by taking our rightful place and answering the endless questions human beings have been asking for hundreds of years about the meaning of our lives. The meaning is simple – we are the designers, and when we design in smart ways, we thrive by helping everything around us thrive. By coming into right relationship with the world, we find inner peace, meaning and a clear pathway towards leading profoundly fulfilled lives.

Human beings were meant to thrive in abundance, and our world very much needs us to take our place as stewards facilitating the natural state of extraordinary abundance.

Care For People: Permaculture is somewhat radical as an environmental philosophy in that it puts care

of the people front and center as one of the three primary design ethics. As a whole-systems life philosophy (yes, it is very much a profoundly interconnected philosophy of living), permaculture recognizes that human beings very much have a critical role to play on this planet, and when human beings thrive, the planet will thrive with us.

Human beings have ascended through millions of years of evolution to become the dominant species on the planet. As we have done so, we have branched out and populated the world to the edge of disaster, and it is clear that we're at a turning point where we mature to seek to design intelligent systems for everything to thrive, and the only way we can do that is by focusing on healing ourselves first and foremost – emotionally and physically.

Share The Surplus: While radical on its face, the third ethic of permaculture actually makes perfect sense when considered in the context of designing systems for incredible abundance and maximize our yields (profits) at the same time. By setting up ourselves to share the surplus throughout the system, we are seeking to design incredibly resilient systems.

A good way of looking at this is like this: growing sufficient food to keep one's own family and neighbors in good health is admirable; however, it must never be forgotten that one hard winter or late or early frost can easily undo much if not all of one's hard work. For this reason, even as we design for extraordinary abundance, we seek to create resilient systems that are based in relationships that ensure that when we do experience a shortage, we will have access to surplus from our larger community. Permaculture is fundamentally a philosophy of bringing all the elements into right relationship, and

social permaculture is absolutely critical to regenerative sustainability.

Everyone's been in a hard spot at some time or another and needed a hand to get out of it. This ethic acknowledges that although people in one area may be enjoying record-shattering yields from their food supplies, others not that far away may not be so fortunate. Therefore, it is desirable that where there is a surplus of food, that surplus should be shared with those who were not so fortunate in their own harvest, not because it's a nice thing to do but because we're all part of the same world and our own resiliency the next year may well depend on the today's less fortunate neighbors. This comes back to caring for people, as discussed above, as well as our world by creating resiliency through right relationship with the larger community.

The entire permaculture ethic, when put together, is "Care for the Earth; Care for People; Share the Surplus." This forms a cyclic ethos which emphasizes the earth above all, human beings in a stewardship role, and that our activities upon the earth and with one another directly help the world thrive, rather than harm it. In this way, we can help assure a world that we can bequeath to our children and grandchildren with pride, rather than with embarrassment.

By designing our way of life to be inherently regenerative, we'll be in a position to fully enjoy and appreciate our world. Right now, many of our buildings and vehicles are designed for very limited function rather than form, and their functions tend to create unthinkable damage to our world. To truly embrace permaculture on a meaningful level, it is imperative that we learn how to create designs,

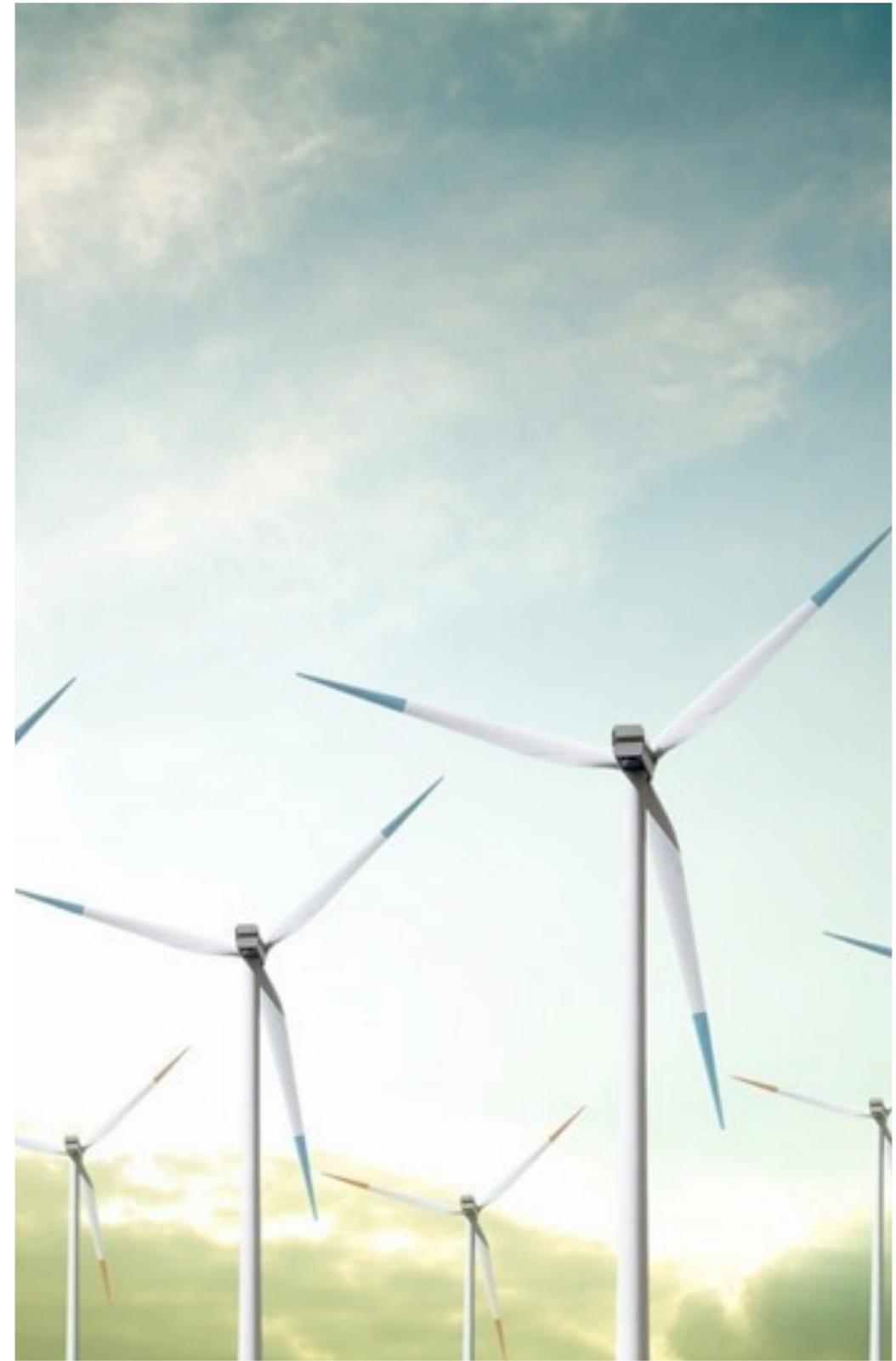
which harmonize, and work with rather than against nature.

Permaculture may not be the cure for every social ill, but each day it becomes more glaringly apparent that something needs to change, and quickly. Nearly every newspaper screams daily of tragedy and environmental catastrophes around the globe. By observing the principles of permaculture, which we'll discuss in detail in the chapters to come, we can break the cycle of madness that has resulted from doing the same thing the same way for centuries and expecting a different outcome.

Most importantly, permaculture is very much something one person can commit to and expect to make a very tangible difference in the world, thus giving a clear pathway towards personal empowerment. Let's take a look deeper into the

principles of permaculture and see how they can shape the world we as human beings have always longed for.

Learn To Observe, Please



By taking the time to engage with nature, we can design solutions that suit our particular situation.

Our world is abundant with varying landscapes, terrain, and climate. All of these offer unique opportunities and challenges. Nature prepares those who live in extreme climates with adaptations designed specifically for the area. Humans have proven ourselves to be supremely adaptable, but we are also destructive. We have irrevocably altered the landscape and the natural courses of potable water supplies to serve our needs. We have also become accustomed to modern conveniences which cannot be utilized effectively at this point in time without expensive and environmentally dangerous sources of power.

However, if we were to look at the world around us and study how the native organisms interact with

their environment, we would find many if not all of the solutions we require to survive and thrive. Igloos are a common running joke, but their domed construction makes them very efficient to heat and provide shelter from the worst storms the Arctic can dish out. This is an example of humans living in harmony with their home terrain, and the same design toolkit based on observation can be applied to every part of the world.

Every climate comes with different requirements and demands. However, every climate also offers the capacity to sustain life. In the desert, the challenges and prerequisites for survival are drastically different than they are in the Olympic Mountains of Washington. Similarly, a rain forest provides different options than the tundra. The creatures and plants indigenous to an area have much to teach us about the best ways to effectively utilize an area's resources sustainably.

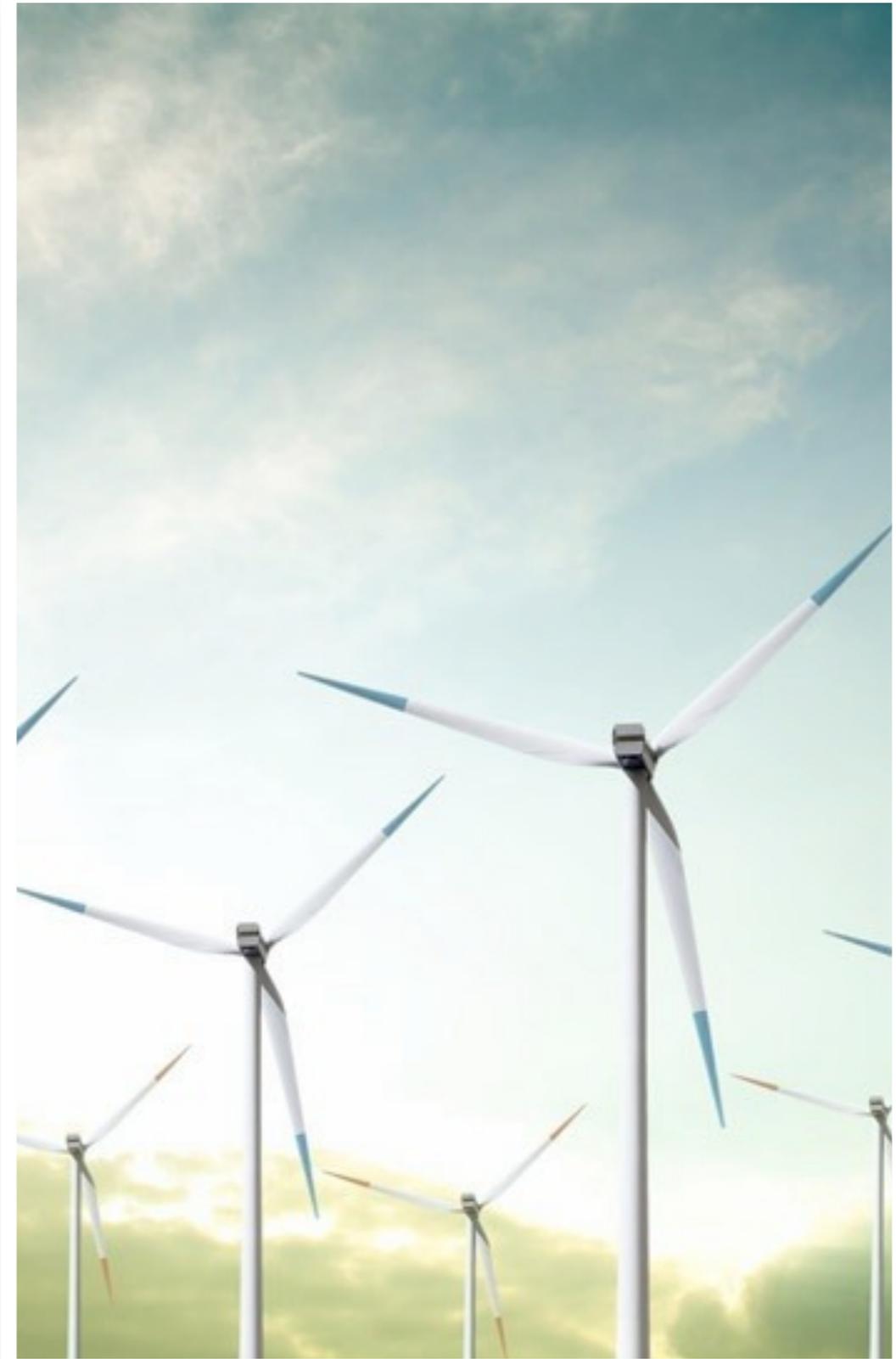
With the great strides we've made in nearly every discipline of the sciences, it is entirely possible to create sustainable living conditions nearly anywhere on the globe. The more we dedicate ourselves to a lifestyle that enhances rather than alters the natural environments we inhabit, the more healthy our world and our society will be. But the first imperative has to be understanding the area, and to do that, we must make a thorough study of how the native life forms in a given climate interact with their environment.

Once we know how it's accomplished, we then have to duplicate it for ourselves. This is where our science and technology come into play. It is possible to condition tracts of soil to make them more suited to farming, even in the harsh climates of Death Valley and the Mojave Desert. Plenty of edible native plants could easily become staples of the diet in such places (as those plants have been for

centuries, for the indigenous people who have inhabited there), creating a less intrusive and more balanced ecosystem in which humanity works side by side with nature to craft living conditions which benefit the whole.

This simple concept is the beating heart of sustainable living. Without knowing where we are and where we've been, we have no hope of being able to progress as a species or as individuals.

Catch And Store Energy



By developing systems that collect resources when they are abundant, we can use them in times of need.

Catching energy is not really a problem at this point. We have solar, wind, geothermal, and hydroelectric power readily available, and these technologies become more effective and cheaper all the time. The real problem is storage. Batteries only last so long, and cannot be kept for long periods of time like many foods can. Over time, the cells which store the power degrade and corrode, resulting in a loss of efficiency and ultimately a useless battery.

So harvesting energy is not really a concern. Finding a battery that can store electricity and stockpile it without significant losses even during long periods in storage is. The more we rely on electricity, the more important it is that we find ways to effectively store

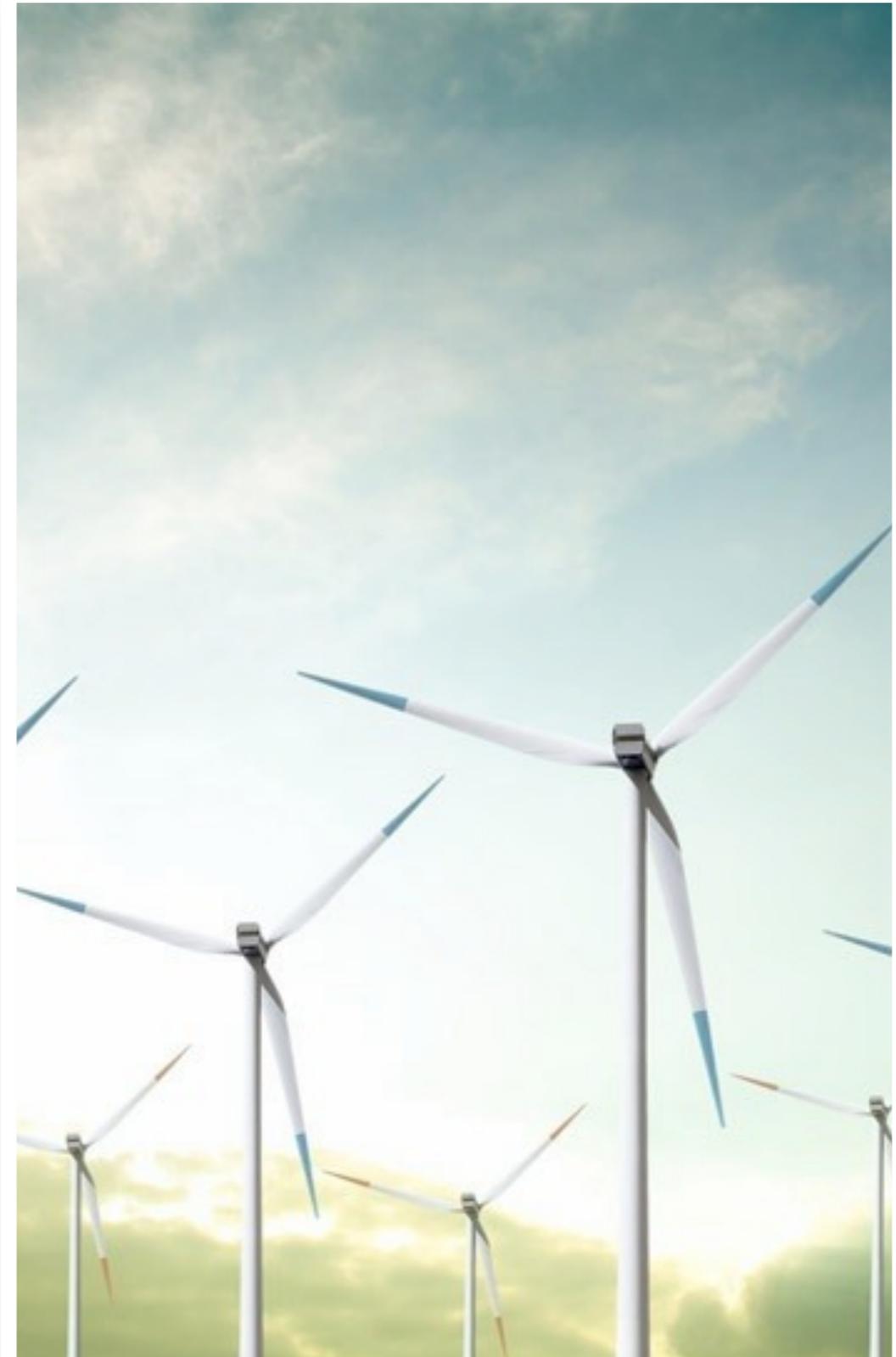
and use it without relying upon fossil fuels and other destructive power sources.

However, being able to use the electricity generated by ecologically intelligent means requires more efficient technologies, which can convert the power generated by various sources into usable household current. When there is a surplus of such energy, having a battery arrangement that can hold and maintain the surplus can keep a home comfortable and running even when tradition direct current is not available. In this way, even the coldest winter night need not be uncomfortable, and is wholly sustainable. This same energy can be applied to the care and maintenance of crops, powering irrigation machinery and light and heat for greenhouses.

Wind, rain, sun, and geothermal energy are all around us, in one form or another, most of the time.

Harnessing this energy when it's at its most abundant and being able to store it for use when it isn't can help make sustainable forms of energy more realistic and practical than ever before.

Obtain A Yield



Ensure that you are getting truly useful rewards as part of the work that you are doing.

If you went to work tomorrow and were told you'd be working for free from this point on, how likely is it you'd show up two days from now? Or what if they told you that you would be compensated for your time with a clock, rather than with money or another instrument of trade? Most people would be writing out their resume on their lunch break, and no wonder!

Permaculture doesn't offer easy rewards. Unlike most systems, you truly get out of it only what you put in. The lazy and those who don't want to put in the time and effort it takes to till the ground, prepare it for planting, tend the plants, and harvest them cannot expect to realize a good crop. But those who don't mind putting in the work and taking time to

learn how to optimize their crops will reap greater rewards in the form of food for their families.

However, the yield doesn't end with how many vegetables you can make grow in your garden. There is also the consideration of providing power and water to your home and the ability to make use of modern conveniences while still being ecologically viable. Permaculture is not intended to eliminate technology or to espouse a "primitive" mode of living, but to marry technology and ecology in a way that permits both to realize their maximum potential and benefits.

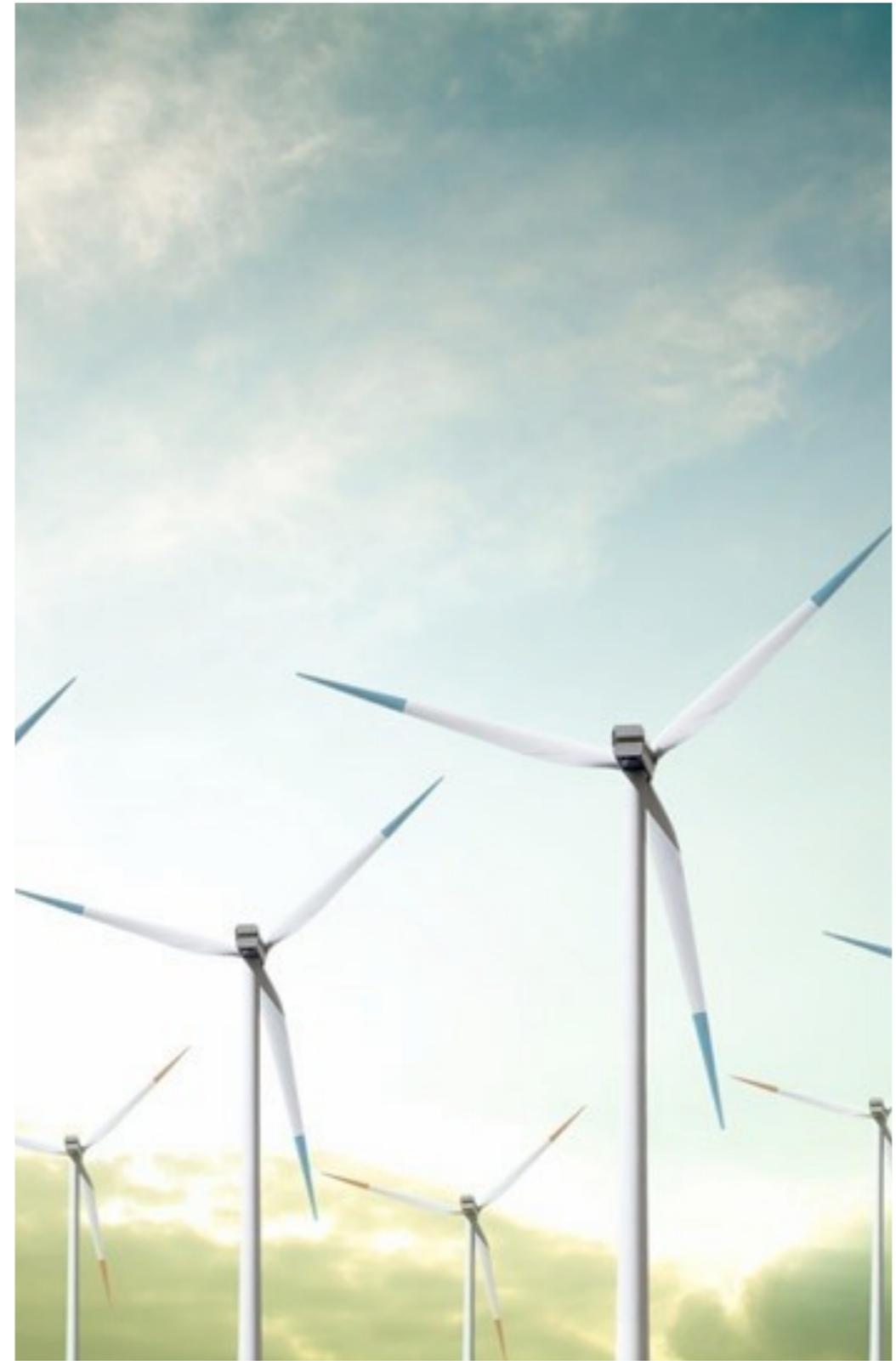
By establishing a yield adequate to maintain your own part of the ecosystem and creating a surplus, you become a producer. When you produce more food than you require, it offers opportunities not only to store food for the non-growing seasons, but

allows you another medium of exchange with which to barter for goods and services you cannot readily obtain yourself. In this way, a sustainable economy fueled and driven entirely by the labor of the individual is not only possible, but a highly practical mode of living.

In turn, the parts of crop plants not eaten can be used to compost and fertilize the ground for the next growing season. This cares for the earth. The food you create will go to sustain you and your family. This cares for people. And the surplus not required to take care of your own household can be stored or traded to others. This shares the surplus. In this way, every part of a sustainable life upholds the basic ethic of permaculture and creates a more stable society where everyone works, but everyone gets a fair share and a reasonable return on their labor. By doing this, an ongoing, self-sustaining cycle is created

which ensures the needs of all are met while still taking care of the earth properly.

Always Design For Feedback



We need to discourage inappropriate activity to ensure that systems can continue to function well.

Humans are a curious species. As population pressure and wanderlust overcame our species, we set out to explore the world around us. These first explorers returned to tell tales of the things they'd seen, the new people they'd met, and the startling new technologies they had encountered. Soon, others went out to make their own discoveries. In a relatively small time, the leisure classes caught onto the idea, and the concepts of tourism and trade were developed.

As these people went out to explore and find out more about their world, they inevitably altered the world around them. They intermarried with other tribes, diffusing and dispersing their DNA. They left refuse, trash, and destruction in their wake. As the

traffic increased and people began moving more actively from place to place, whole civilizations and ecosystems were destroyed as man's lust for conquest overwhelmed their connections to nature.

To this day, the trend continues. You can see it in bottles and cans discarded by the side of every major highway. It is glaringly apparent in the wholesale destruction and havoc being wrought in the rain forest, where "civilized" people systematically eliminate great swaths of natural growth for timber and to create more land for cultivating crops.

Anywhere two or more cultures collide, each will inevitably have an impact on the other or others. The natural world is the setting for these conflicts and negotiations, and humanity has been fairly cavalier in its regard for nature. The key is to understand that everything we do has an impact

upon our world. By self-regulating our behaviors and activities so they mesh naturally and logically with our environment, we can work toward regenerating what we have damaged.

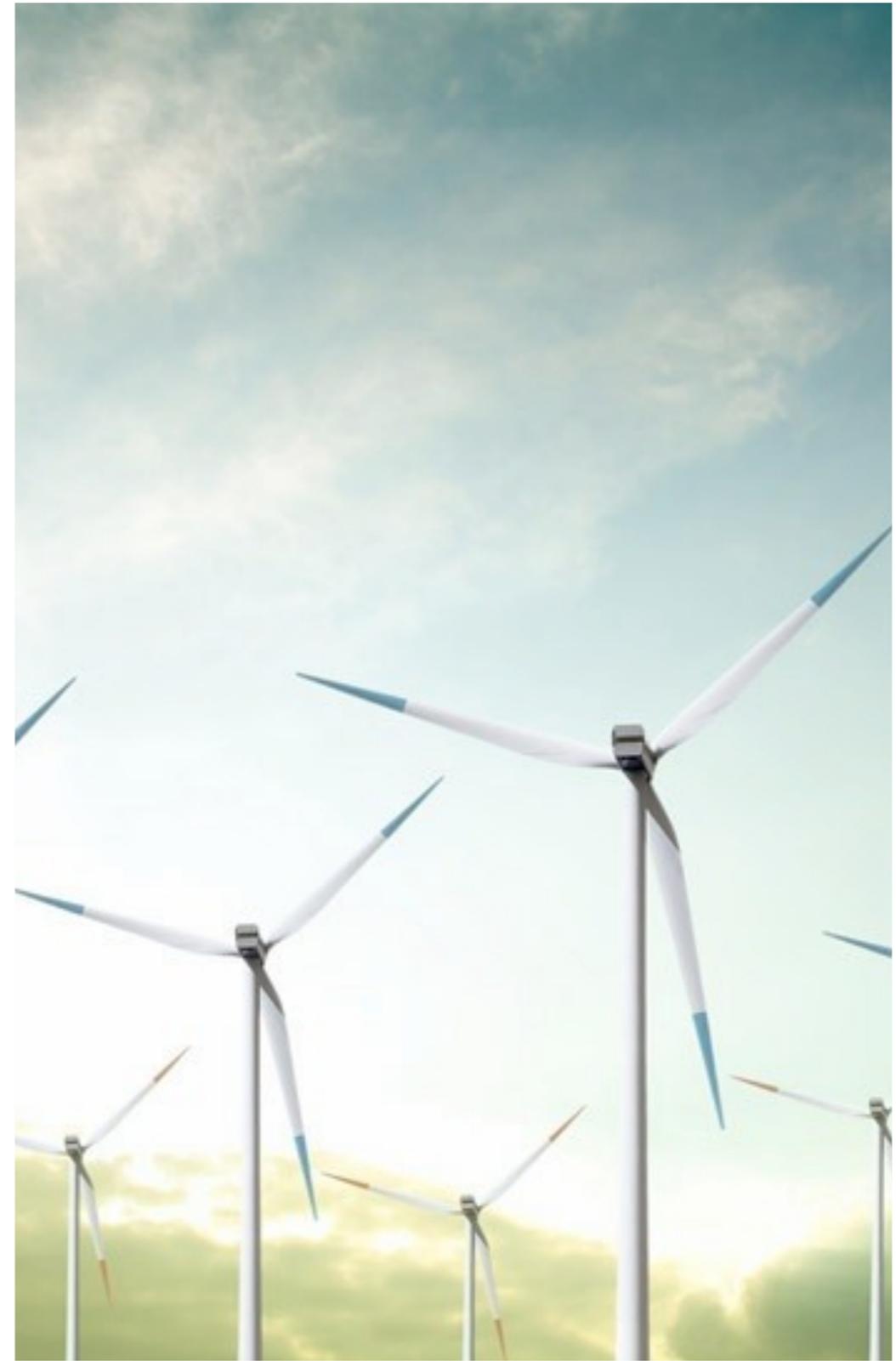
However, there is another aspect to this. Nature is generally quick to tell the dominant species in an area that all is not well. An example of this is deer and wolves. Where there is ample food, deer will breed. Too many deer in an area will deplete the greenery and prevent new growth. Hence the wolves come along and find unimaginable numbers of deer in the area. They will feed and breed in their own turn until the deer are reduced in population. Then the wolves will press on to new territories, leaving the plants to begin the cycle all over again.

When we accept feedback from our environment, it quickly becomes apparent a great deal of what we

do is not beneficial. Therefore, the feedback we receive from nature is a warning that we're on the wrong track and we need to change our behaviors accordingly. By doing this, we can reasonably expect to work in tandem with our world, rather than at cross purposes.

Even small changes in an area can herald dangerous times ahead. Nature doesn't waste time telling the indigenous species in an area all is not well. The trouble is that we're not listening. We need to regain our intuitive understanding of our world's unique language and hear what it's saying to us. This will help us to assure our future as a species which can genuinely care for our environment and ourselves.

Use and Value Renewable Resources and Services



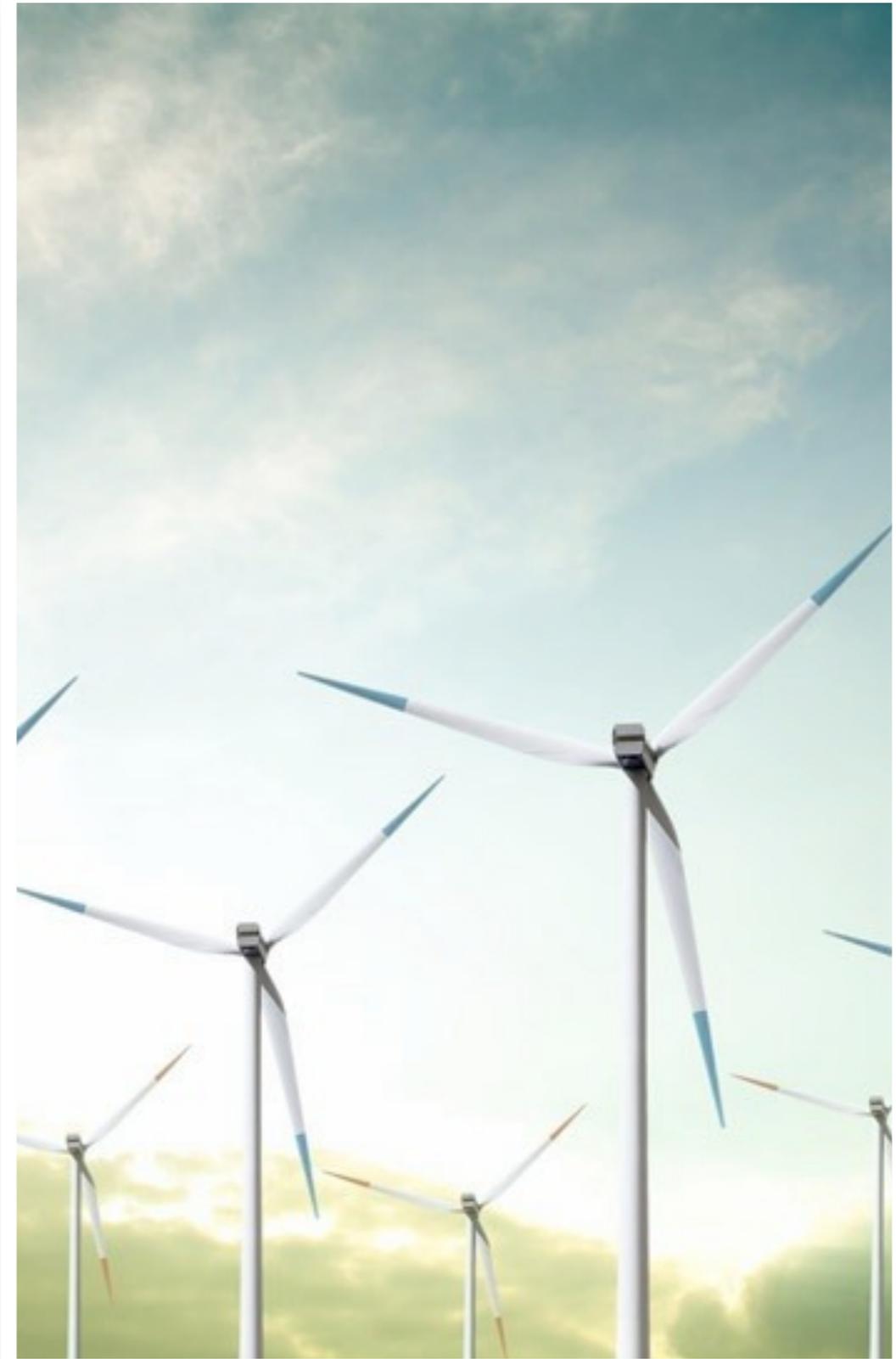
Choking fumes spewing from factories and power plants. Decimation of the rain forests and the myriad life forms which call them home. Wholesale slaughter and conquest as human beings struggle for limited reserves of oil, coal, and precious metals. All of these things stem from one source: Our modern reliance on non-renewable resources.

Nature has equipped man with everything we need to survive. Our minds are arguably the greatest tool for shaping and bending any environment we occur in to our own will. The difficulty is not in the fact that we use natural resources, but in the fact that we do nothing to replenish them or replace non-renewable resources with renewable ones which can accomplish the same outcomes.

Humans are designed to be the penultimate consumers on the planet, along with sharks, tigers,

and polar bears. None of these creatures have natural predators, which places all of them squarely at the top of their individual food chains. Where these food chains interface is where you hear about tiger, bear, and shark attacks. But with human beings, we have the option and capacity to alter our environment in ways that simply don't exist for any other creature on Earth. Because of this, we have a far greater responsibility to our world to utilize renewable resources and labor.

Produce No Waste



By valuing and making use of all the resources that are available to us, nothing goes to waste.

We have a lot to learn about recycling. We've made incredible strides, but our methods are crude, crass, and hopelessly primitive compared to the nuanced, subtle, and efficient methods nature has developed. Nature abhors a vacuum and goes to great lengths to assure that vacuums are filled. Even the alleged "empty" space of the exosphere is anything but. It only takes one molecule of Nobel gas in a parsec of space to render the concept of a vacuum meaningless.

Because nature does not permit waste, everything that comes out of nature is ultimately capable of being repurposed and recycled back into the environment. Urine and feces are considered "waste," but in actuality these byproducts of

digestion are excellent fertilizers, second only to blood. Because these byproducts are rich in nitrogen, which plants rely heavily upon to grow, they are very useful for crops.

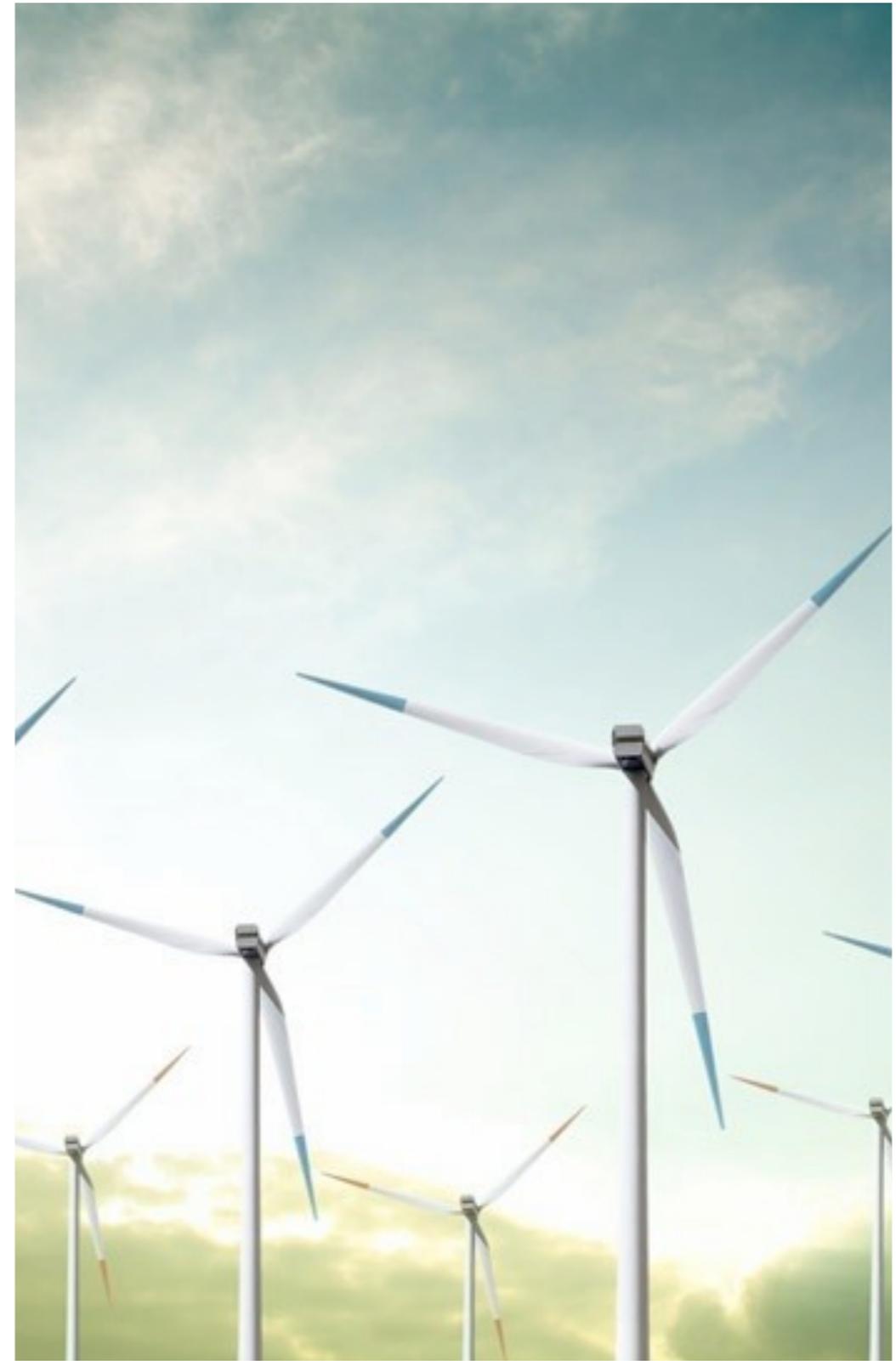
Our disposable lifestyle has led to an unnatural concept: that of waste. We vie desperately and often angrily to achieve more than we can practically use or really need. We throw away everything from paper cups to personal computers with no regard or thought for the damage these things can do to our environment. Some kinds of paper cups are produced using various toxins. Since these are intended to be disposable, our exposure is minimal. But what happens when they wind up in a landfill? These toxins are released to leach into the soil, where they intermingle with years of battery acid and other manmade contaminants. Over time, these commingled toxins can leach into the groundwater. Landfills are quite literally a slow and painful way of

poisoning the very wells we depend on for our survival.

Reducing our waste takes more than simply being able to recycle goods. It also means creating new technologies that do not require toxins and large inputs of power or chemical reactions in order to be viable. By studying nature's reactions to various forms of "waste", from the carcasses of animals to the casings of computers, we can learn a great deal about how best to deal with them and then adapt this natural feedback to the way we live.

Chapter 10

Design From Patterns To Details



Patterns are everywhere in nature, and each and every one serves a unique purpose. From the double-helix pattern inherent in the DNA of every living creature on the planet to the striated crimson and ochre patterns on the back of a coral snake to the arrangement of the seeds that comprise a pinecone, nature is virtually nothing but patterns.

One example of this is the strikingly complex architecture of the spiral shell of a nautilus snail. As the snail grows, it "builds" onto its shell. Because of this unique capability, the nautilus may well be the poster child for sustainable living. It creates precisely what it needs to grow and thrive, and no more.

Recently, engineering students from Tehran, Iran, created a building modeled after the nautilus' shell. They discovered that the building would not only offer shelter, but self-regulating temperature to a

degree previously thought highly improbable if not outright impossible. This achievement won them a prestigious sustainable design award and drew international attention. By observing the patterns inherent in the nautilus' shell and then adapting them to fulfill a very real human need, they created an engineering and social breakthrough.

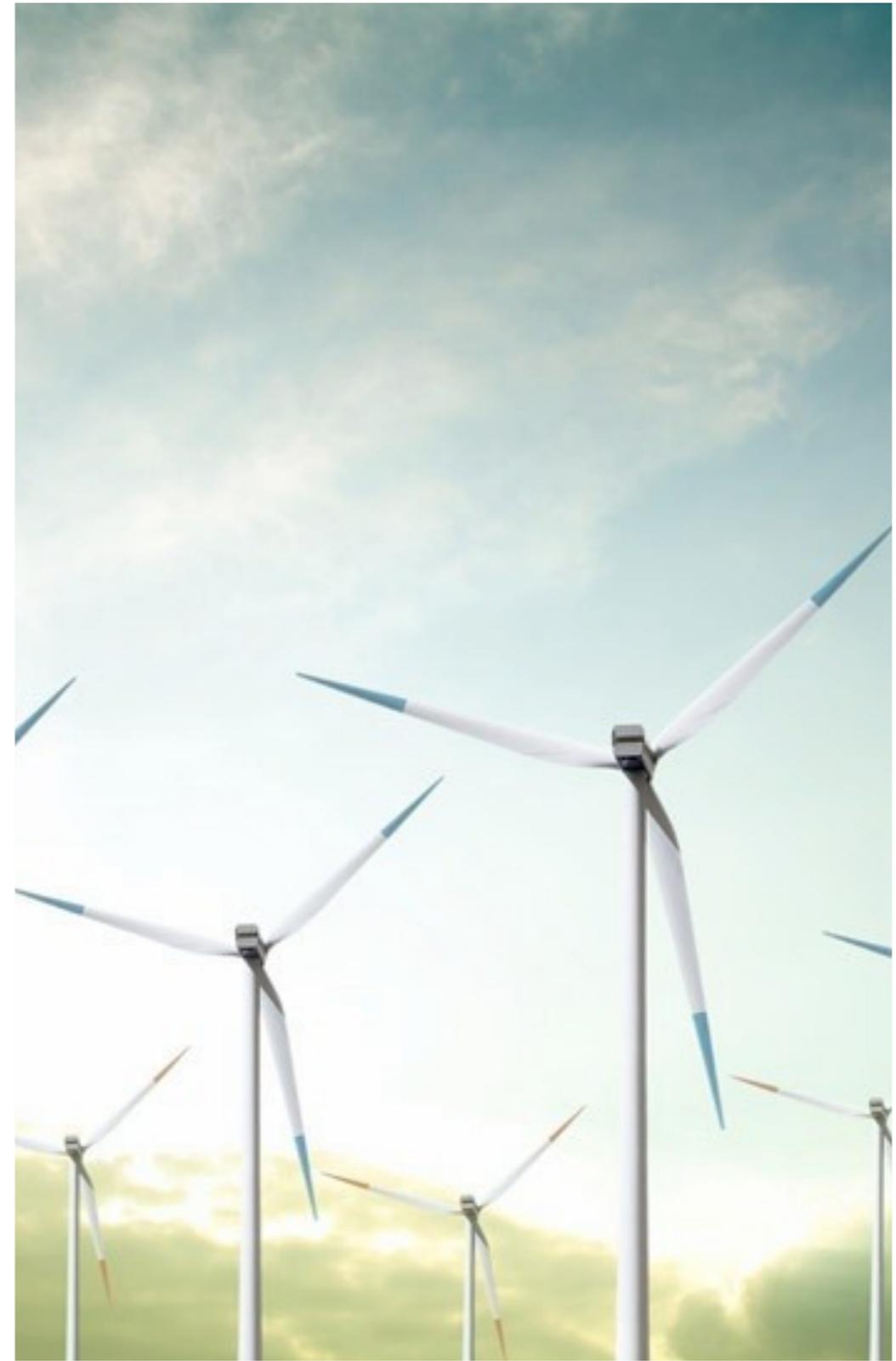
This kind of adaptation need not be limited to housing and other such prosaic concerns. Imagine, for example, if we could determine precisely how an ant's muscles work to give them such incredible strength relative to their size. Or perhaps we could adapt the patterns nature uses to break down "waste" material as discussed in the previous chapter. By using patterns to our own advantage, we've already determined that using crystalline matrixes for data storage may be much more efficient than the clumsy binary/magnetic systems we currently depend on. Learning about and understanding the

patterns nature has imposed is the first step to being able to work effectively within them.

However, understanding the patterns is only the first step. We must then of necessity change the patterns sufficiently to make them useful to human interests. A human cannot fit into a nautilus shell, no matter how expert a contortionist they may be. Therefore, although the basic pattern is effective in a number of circumstances, many of these patterns cannot be effectively used by humans without a certain amount of alteration. However, if we alter these patterns, we should not modify them more than is absolutely necessary to make them suitable for human usage. Otherwise, we risk sacrificing the base functionality of these patterns, creating a zero-sum or worse, a losing equation.

The patterns inherent in nature exist to give structure and form to every facet of our universe, from the endless dance of atoms to the majestic sweeping rotations of galaxies. By applying these patterns to human endeavor in a natural form, we can engineer sustainable modes and means of doing just about everything. The key here is to ensure we use the patterns as intended and originally designed to the utmost possible degree, thereby getting the best of both worlds.

Integrate Everything Rather Than Segregate



By putting the right things in the right place, relationships develop between those things and they work together to support each other.

Segregation is not typically a natural phenomenon. Things which are alike tend to group together, but there is a complex relationship between seemingly dissimilar things. What, for example, does a small black beetle have to do with a horse?

On the surface, the answer would seem to be very little. However, dung beetles use horse droppings as food, shelter, and a birthing place for their hatchlings. The same could be said of the relationship between some of the smallest creatures on Earth, the virtually microscopic shrimp known as krill, and the largest creature, the majestic blue whale. The blue whale has adapted very fine bony filters which allow it to scoop up and feed on krill by

the ton, making this pairing surely one of the oddest, at least on the surface, in the natural world.

A more prosaic example is that between humans and horses. Domesticated horses rely on humans to feed, care for, and exercise them. Humans rely on horses for companionship, work, transportation, and food. The reader can, with minimal effort, doubtless think of a multiplicity of other examples. The point to be gleaned is that when one puts seemingly disparate elements together in relation to each other, and the situation is one where both parties stand to realize a factual benefit, these apparently non sequitur elements complement one another and work to mutual advantage.

By studying the native environment carefully and then judiciously introducing elements that enhance, rather than destroy, the area, humans can create

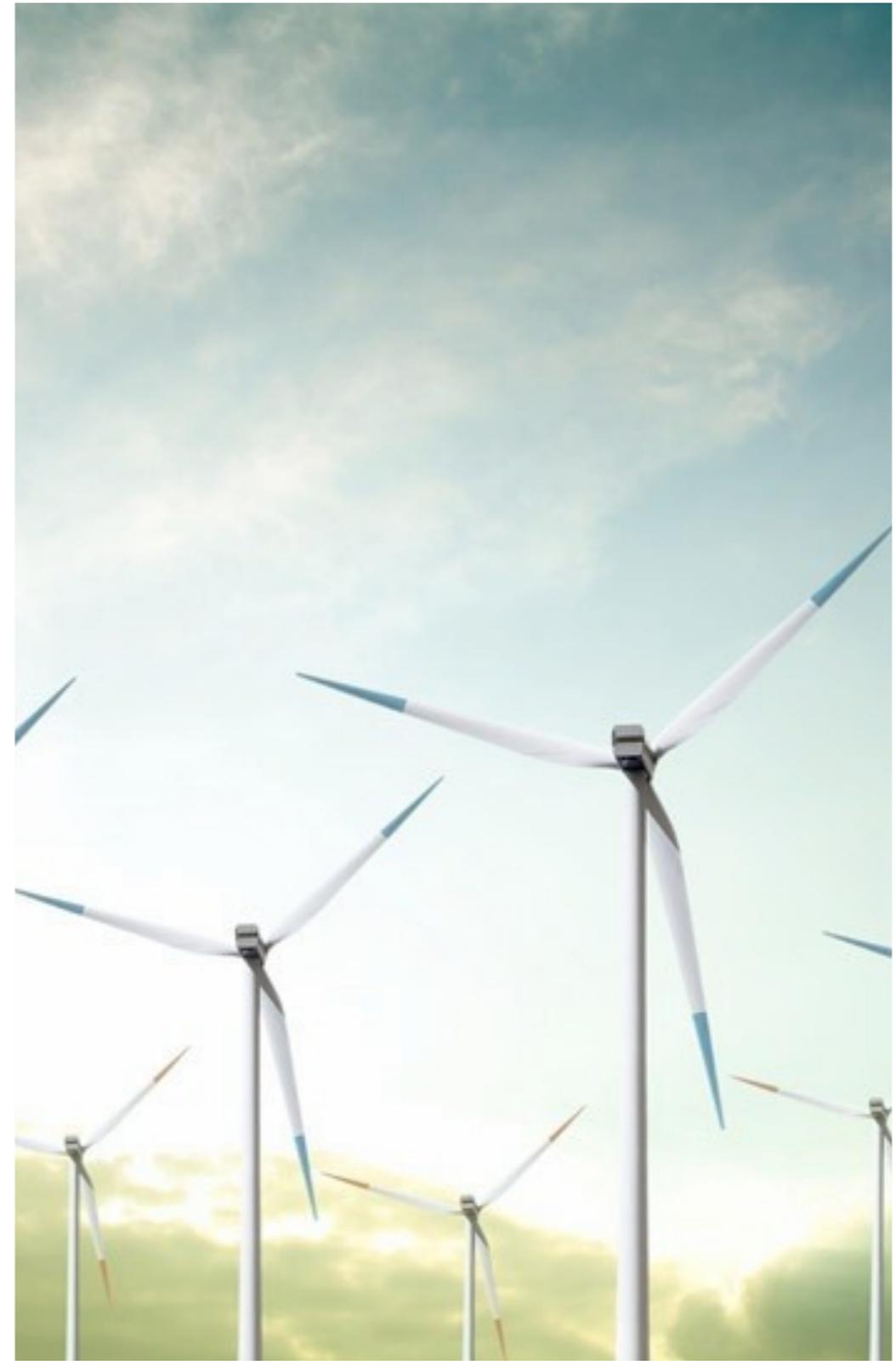
relationships that strengthen and bolster the area's diversity. History is replete with examples of times and situations where humans, either through carelessness, thoughtlessness, or simple ignorance, introduced non-native species into a biosphere only to have the interlopers spread like wildfire. A particular species of Japanese tree beetle is one of the more alarming examples. This pest came over aboard a ship and began to breed at an alarming rate once it reached American shores. Today, this beetle is directly responsible for millions of dollars' worth of damage to landscaping and naturally occurring trees annually. Without its natural predators to keep this beetle in check, humans have gone to increasingly desperate lengths to eradicate it.

The cycle of predator and prey, producer and consumer, is one of the most basic in nature. By fostering appropriate relationships and managing our own connections to our world, we in turn help

create a thriving, healthy ecology which can support not only us, but the various plants and animals we depend upon in so many different capacities.

Integration and working together for the common good is not merely beneficial in the short term, but in the long view as well. However, for that to be a practical solution, we must first understand how things interrelate. There is no benefit in putting things together willy-nilly and hoping the outcome is acceptable. Measured, reasoned, carefully controlled introduction and integration is far more sustainable than betting one's various food sources on a roll of the dice.

Use Small and Slow Solutions



Small and slow solutions are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes.

Americans are an interesting breed. We are impatient on a cultural level rarely ever approached in history. Instant gratification, high-speed absolutely everything, and bigger, faster, stronger, more consumptive ways of doing everything from generating an Internet connection to creating a venti mocha frappuccino with a triple shot, soy creamer, and six different kinds of artificial sweeteners. We marvel at the grandeur and sheer scale of Hoover Dam, but routinely ignore the architectural and engineering marvels which are the average anthill.

Because of these need for "more," we have effectively barred ourselves from nature and the slower pace and greater rewards of a simpler

lifestyle. Nature does not start out large when it puts a system into place. A hurricane begins with a simple eddy of warm air over cool water and grows. As was pointed out a few chapters back, nature does not permit waste. Therefore, nature is efficient in its solutions to problems, using the smallest, slowest, and simplest means of creating the desired effect.

Humans tend to think in terms of scale. Surely one snowflake or one seed can't have that great an effect, can it? But it only takes the weight of one snowflake too many to trigger an avalanche, and one seed can easily feed a village if nurtured properly and permitted to grow into the plant it has the potential to be. To achieve a sustainable result that is truly in line with the ideals of permaculture, we need to stop looking for the home run and be satisfied when we manage a single. Sooner or later, we can load the bases, but more players have struck out trying for "the big one" than those who have chosen simply to

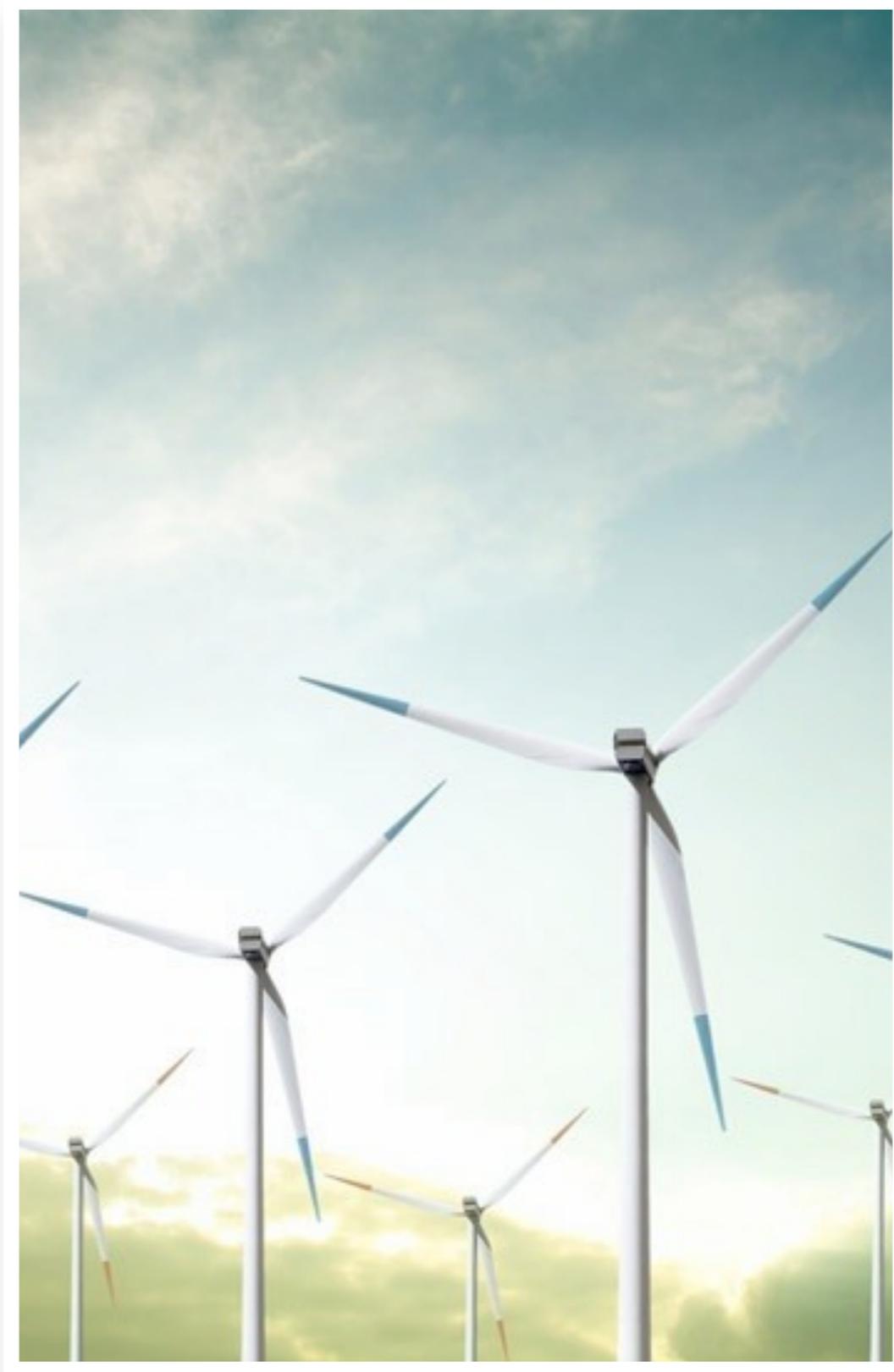
bunt. Small systems don't possess the imagination-firing impressiveness of large, noisy systems, but they work better and more efficiently overall.

The drip systems many farmers are turning to as an alternative to traditional irrigation emphasize this point in a uniquely immediate way. Unlike traditional irrigation arrangements which require large swaths of land to operate and which waste as much or more water than they give the crops, drip systems deliver water in carefully measured amounts right where it will do the most good, as opposed to large irrigation sprinklers. Because it works more slowly and targets the delivery of its payload, the drip system does not confer the immediate satisfaction of seeing one's crops being obviously watered. However, it does achieve a more satisfactory outcome in the long term when the plants grow healthier and the water table is not so

heavily taxed, leaving more water for livestock and human consumption.

Sustainability and conservation have come to be equated with the idea of a decreased standard of living. However, by taking our cues from the way nature solves the kinds of problems we face, we can learn how to use smaller and less obtrusive means of accomplishing a greater net benefit for us all.

Diversity Equals Stability



Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.

Biodiversity is a very hot topic right now. You can see, hear, and read about it being hotly contested on just about any news outlet if you listen long enough. When we think of diversity, we may think of such things as skin color, political affiliation, religious or philosophical persuasion, sexual orientation and gender, and a plethora of other real and perceived differences. However, in nature diversity has a somewhat different and more encompassing definition.

Consider for a moment if only one type of plant and one species of animal inhabited a given area. Within this area, there is still a natural balance to be kept. The plants must not grow too wild or they will crowd

each other out, killing themselves in their quest for survival. The animals must keep the plants in check, but without natural predators, they run the risk of overbreeding and wiping out their own food source, leaving themselves with no sustenance. Thus these animals must either forage farther afield or risk grazing themselves right into extinction.

For this reason, nature has developed the elaborate food chains and ecosystems which drive even the most seemingly barren areas. Plants feed on nutrients and bacteria in the soil and are in their turn fed upon by various animals, which are fed upon by still larger and more capable predators, which in their turn are fed upon either by even larger predators or bacteria. The biological diversity of an area can be as simple as three or four steps, or as complex as many thousand potential divisions and diversions. In either case, the end results will prove to be the same regardless.

Diversity is also nature's way of strengthening species and creating new strains which can resist disease and mishaps which would fell a creature's less well-adapted contemporaries. We see this in everything from bacteria which have developed a tolerance to penicillin to human beings who can eat, drink, and smoke seemingly anything without lasting ill effect. Predators in nature help cull herbivorous and minor carnivorous populations, ensuring that only the strongest and most genetically fit survive.

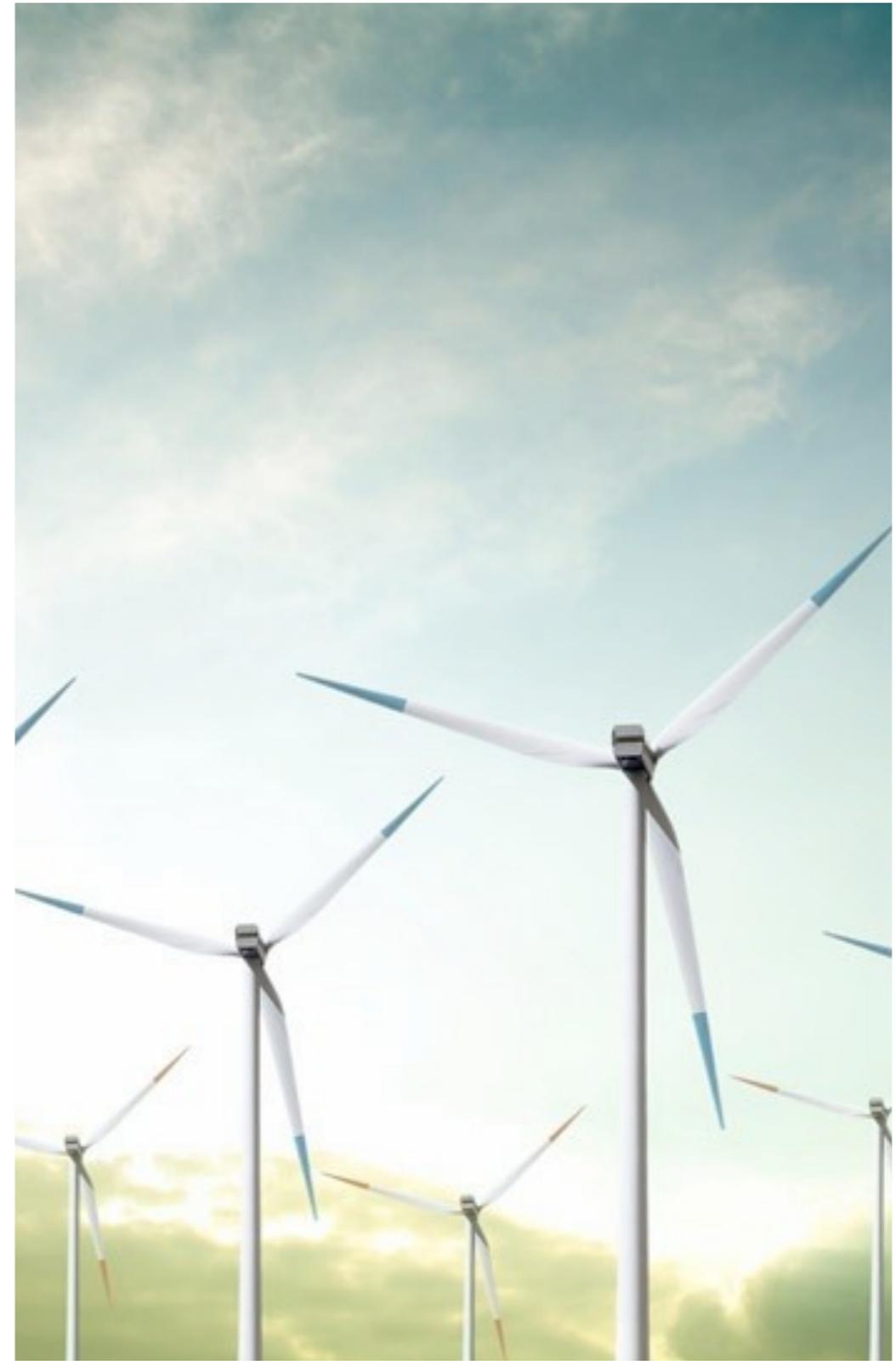
There is a story that some time ago, a group of scientists genetically engineered a strain of a type of grain which was supposed to offer yields vastly in excess of anything its conventional cousin is capable of. A number of farmers agreed to grow this particular crop in place of their usual plantings as an experiment. However, it turned out that this engineered grain was excessively attractive and vulnerable to a certain type of insect. The fields

were decimated in short order. However, the farmers who had not adopted the new grain but kept to their standard crops had no such difficulty. Variations of this tale have been told with corn, wheat, and various other grains, so it is likely you've heard at least some version of it. The moral of the story, no matter whether it's true or merely legend, is clear: diversity equals life, while uniformity can often mean death.

The more diverse an area and its indigenous species, the more likely it becomes that the area can continue to sustain life even under the most extreme conditions. Therefore, maintaining diverse supplies of food not only encourages a healthy ecosystem, but ensures that if a particular food source is wiped out by disease, pests, or predators, there will still be sufficient food available. Moreover, it is simply good husbandry and maintenance of our world and its inhabitants to ensure that healthy competition and

evolution can occur, whether with or without our intervention.

Use Edges and Value The Marginal



The interface between things is where the most interesting events take place. These are often the most valuable, diverse, and productive elements in the system.

If you've ever sat outside on a clear day and watched clouds pile atop one another on the distant horizon until they formed the unmistakable anvil shape of a thunderhead's leading edge, you can certainly attest that there are few things more awe-inspiring or fraught with potential menace. The dramatic cloud formations and steeply raked anvil shape are a direct result of an interface between rising warm air and falling cold. These types of storms can bring life-giving rain or floods and can either save or destroy a crop.

Where two things meet and interact, be they inanimate or otherwise, a change is apt to occur. If

you've ever met a person and instantly liked or disliked them, you were changed by the encounter. The edge between one being's space and another's is where objects, creatures, and people have the ability to act upon and influence one another for better or worse. Understanding how these reactions occur and how to make them sustainable is a major part of permaculture, simply because these reactions are where the greatest potential for change and energy occur.

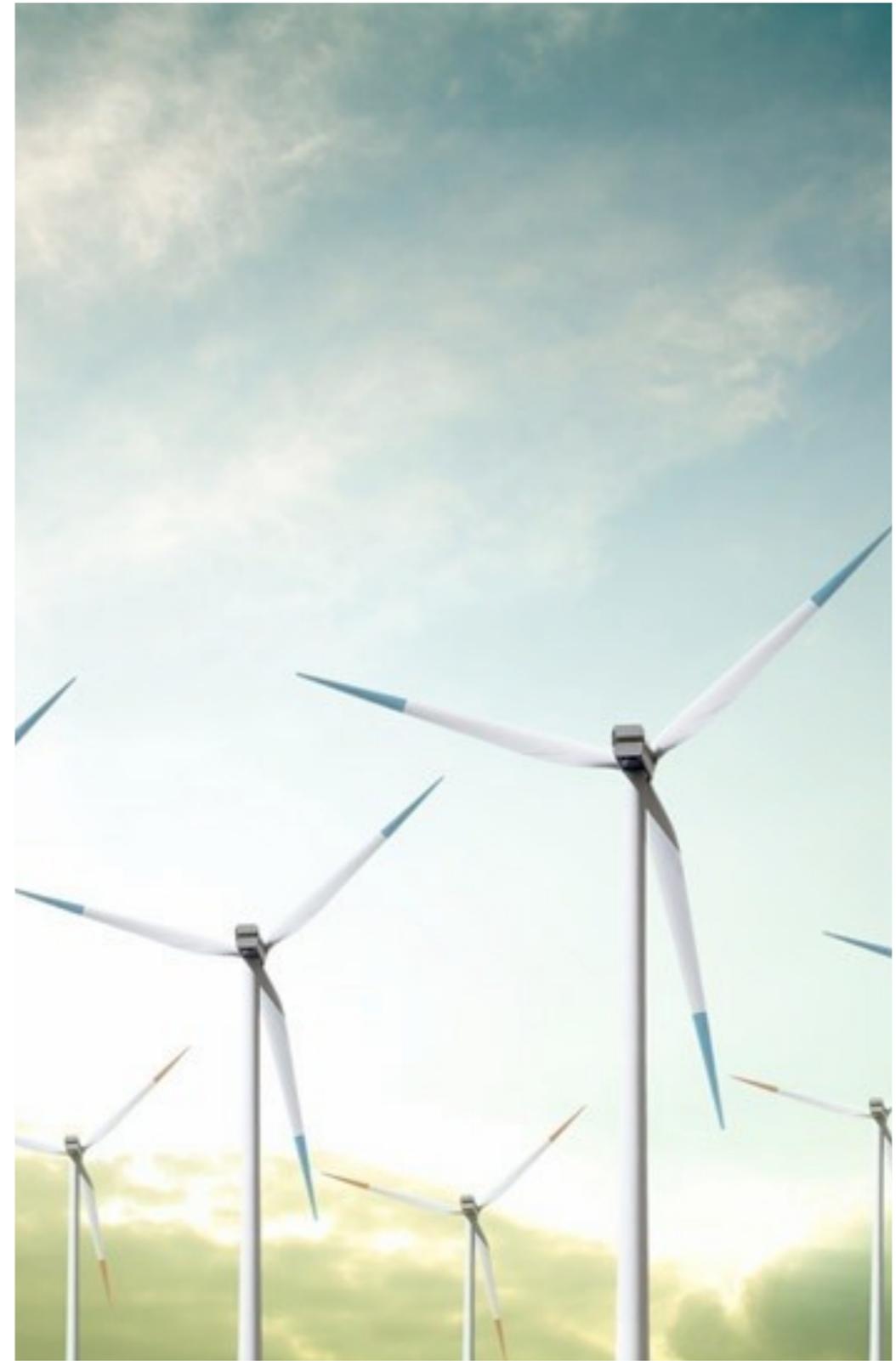
Wind meeting metal may not seem like much of an interaction at first glance. After all, in the short term, wind can't do much to metal, right? But when the metal is shaped properly and catches the wind at the correct angle, it can generate power for any number of applications, from milling grain to the electrical current required for you to read this book. The same applies to other means of producing power and harvesting food.

The edges and margins between things are where the dynamics shift. This is where farmers plant and harvest crops, where predator and prey determine which will live and die, and where various forms of energy are produced. By understanding the role the fringes and boundaries between things play in the complex relationships of nature, we are better equipped to produce our own changes. Used properly, our ability to be agents of change can help us shift the balance from our current destructive path to a sustainable, regenerative culture. But there is more to this understanding than simply its benefits to us.

By creating our own edges and interactions with the world around us, we can affect our world in profound and often unintended ways. It is important that whenever we begin to muck around with the edges of things, we are careful that we do not inadvertently rip away something that may

ultimately prove to be key to our survival. Knowing how to manipulate the edges and understanding the value of the things which are only possible on the margins between conflicting points is not a license to turn things this way and that just to see what will happen. As with any other point of contact between humanity and nature, we must not rush in and change things simply because we can. Instead, we must take a studious approach, using this knowledge lightly, sparingly, and only when necessary. Too often over man's history, we have rushed into "new" territories and biospheres, only to wreak untold havoc in the process. Sustainable living means understanding an area and how everything in it relates to everything else, and offers the chance to truly live on the edge in a way all but unthinkable in our current society.

Creatively Use and Respond To Change



We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

Just because we can do something does not necessarily grant us an unchecked license to do so. This particular tenet of permaculture is the logical result and inevitable conclusion of the other eleven, and as a result may be the most important of them all. However, all these concepts and notions link together as inextricably as any food chain. Remove any one link from the chain and you risk the entire system collapsing. Therefore, we must first realize that although we have the creativity and drive to remain the dominant species on Earth, there is no guarantee we will remain so, least of all if we continue with our present methods of doing things.

By achieving dominance, we also assumed responsibility as a species and as rational beings for what our species has wrought across the face of the planet. We have created breathtaking works of art and architecture, and have even managed to go beyond the surly bonds of our own atmosphere to travel to places which were utterly unattainable just fifty years ago. All of these changes are a simple and imminently predictable result of our innate curiosity about what our world holds and what lies beyond it.

Humankind has never shown any great difficulty in embracing change, whether or not it was good for us or our immediate domain, never mind the broader world beyond our individual spheres of conquest. But the entire point of sustainable living is to change only what must be changed, when and how it must be changed. Because of our failure to do this up to this point, it is estimated that thousands of plant and animal species are driven over the brink of

extinction daily. However, all need not be lost, if we can only assume responsibility and stop pretending that because someone else did the deed, we as a species are not all equally culpable.

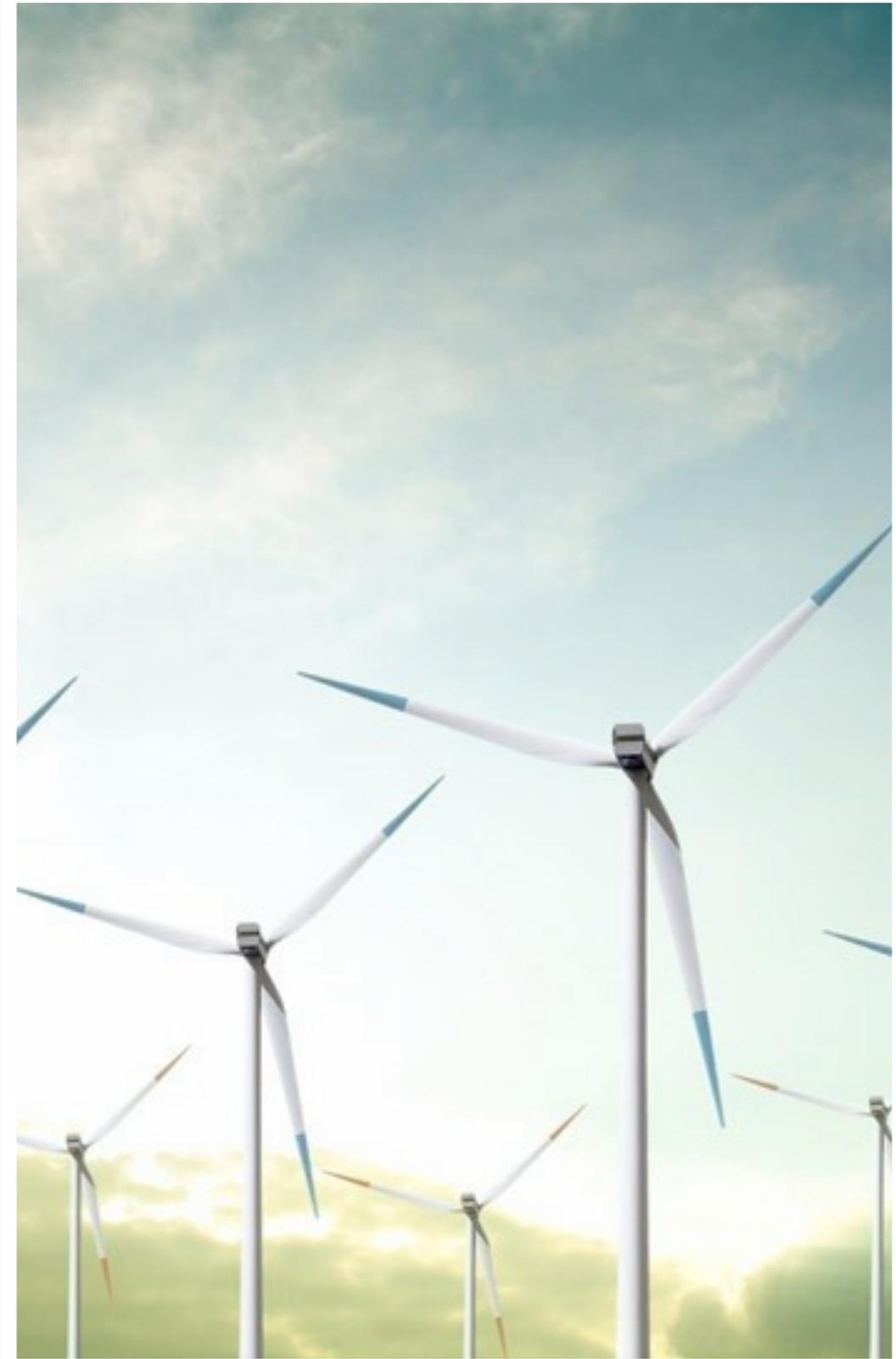
Studying and learning our environment is something every child indulges in. With dirty knees, scraped palms, and the occasional broken bone come an ability to respect and appreciate nature in a way far too many modern adults have all but forgotten. It would do few of us any real harm to release our inner child a little and reestablish our connection to nature and our world.

When we look at our world with the wonder and excitement of a child seeing all these familiar things for the first time, it offers us the opportunity to not merely see, but truly understand how precious these ordinary things are and how easily they can be lost.

We are also offered the chance to stand up and take a proactive stance by intervening only where and when we must, refusing to do so if it is not necessary for the preservation of human and other life. All of this and the awesome pleasures, responsibilities, and rewards it offers begin by simply observing your world. Take a look around and decide where and how it is appropriate to change your world. Then do so.

Chapter 16

Green Business Design



Green business has become an ever more popular catchphrase over the past two decades, and particularly within the last ten years or so.

Companies which are or wish to appear eager to assume a role of leadership and responsibility have engaged scientists, engineers, and a plethora of experts across virtually every discipline and field of scientific endeavor to make their business "greener."

This begins with more efficient and less environmentally hazardous ways of generating energy and constructing buildings in ways which are more sustainable and ecologically sound in the short and long term. Many companies have also established either voluntary or mandatory recycling programs amongst their employees and are actively seeking ways to make their businesses better able to function while remaining environmentally viable.

Some businesses, however, have taken these concepts a step further. These companies have made sustainability a driving priority, and pursue every possible opportunity to reduce pollution and waste from their operations. Many of them have even invested in the planting of trees and the safeguarding of nature preserves to ensure these areas remain unspoiled and beautiful for generations to come. And some have even gone so far as to utilize permaculturally compatible methods of constructing and powering everything from their corporate headquarters to the homes they build.

Clearly, these companies have seen which way the wind is blowing. Permaculture has established itself as a presence and a realistic alternative to the better-known and more harmful ways of doing things we've become accustomed to. Many skeptics believe these companies wish to ingratiate themselves to the more outspoken elements of environmentalist and

permaculture society alike. However, the trend has spread from construction to oil and power companies and even megalithic corporations such as Apple, all of which have adopted at least a version of permaculture ethics into the very fabric of their operations. When one considers the degree to which companies of all sizes and descriptions have embraced a more sustainable mode of operation, it becomes clear that this trend is not merely a passing fad or a ploy to gain business. Companies do not change their business models on a whim. Clearly, they must see a number of potential benefits or they would not be making such radical and sweeping changes.

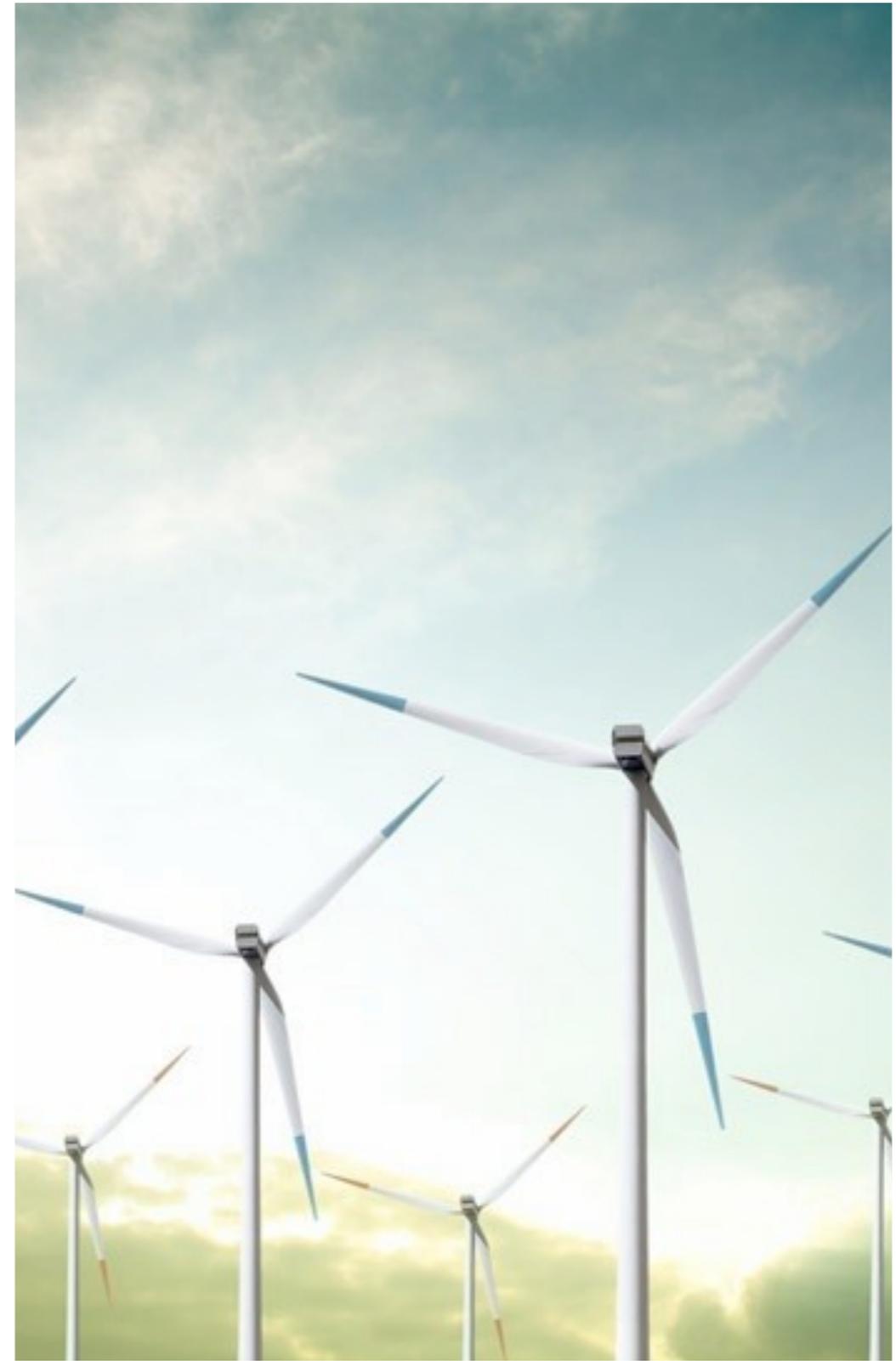
If the world's largest countries are adopting the guiding ethics of permaculture as a basis for their ongoing operations, it becomes obvious that there are real, tangible benefits and profits to be had. Regardless of what one's personal opinions about

big business are, the fact they are setting themselves up as leaders in the green revolution indicates that someone, somewhere, is taking responsibility for instigating the kind of change we need to see around the world.

These steps are in their infancy, and we still have a great deal to learn. However, companies which have adopted "green" policies tend to perform very well compared to those which refuse to change their ways of doing things. This may well be a metaphor for the results we can expect in our personal lives by seeking out more sustainable means of living.

Chapter 17

Towards a Regenerative Human Presence



There have been a number of great strides made in our cultural awareness of what mankind has done to our world, and we've made excellent progress at working to undo the damage. However, there's so much more to do that in comparison, we haven't even gotten properly started yet.

Deforestation and the resultant destruction of native species continues at an alarming rate. We are still reliant upon nonrenewable resources for far too much of our standard of living, and the depletion of these resources is ongoing. Our food supplies are tainted regularly with toxic chemicals and all manner of artificial additives to promote a longer shelf life, and our air and water are being poisoned daily.

Permaculture looks to nature for new solutions and ways to eliminate these and other crucial

environmental problems. Unlike pure environmentalism, however, permaculture is predicated on the idea of personal responsibility rather than sweeping social reform. As more people become familiar with the idea of permaculture and embrace a sustainable lifestyle, social reform becomes all but inevitable. In this way, we can unite and be the change we want to see for our world, our species, and our own loved ones.

Sustainable living is really nothing more or less than forming a partnership with nature and understanding our place within its framework. Once we do that, we can proceed with the greater work of not only putting our world back to rights, but ensuring the various injuries we've inflicted upon our world is not repeated in future generations.

To accomplish this, we must start now. We must begin to not only live the changes we wish to see reflected in the greater world, but also instill in our children and grandchildren an understanding of why this matters to them and their own children. By passing on the things we discover and already know to them, we can produce a new culture based upon responsibility to one another and our world. It will not be easy, but then nothing worth achieving ever is. But by adopting this spirit of guardianship early and maintaining it, we can expect to leave this world a better place by far than we found it, and know we've given our children a fitting and proper inheritance.

Sustainable living is not just about the present, or about fixing what our forebears broke. It is about forging a new alliance with nature in which humans are not only an integral part, but are using our status as the dominant species on Earth to protect and sustain other species. Ultimately, sustainable living

means sustaining our world and the human race at the same time. Permaculture and its associated ethos may well be humanity's last best hope for survival, and whether it works or not depends on each individual person to take a stand and realize that one person truly can make a difference. Will you choose to be that person?

Join us, and let's change the world. Visit www.regenerative.com for more information about life-changing trainings and next steps.