

Open-Eyes Environmentalism

By John Charles Kunich[†]

I. INTRODUCTION: BETTING THE EARTH

Our biggest decisions must be made with our eyes open to as much information as possible. The concept is so obvious that it feels ridiculous even to state it explicitly. When we have much at stake, it only makes sense that we would want all our senses and all our resources working for us. Life-changing or even life-and-death decisions do not belong in the care of wild guesses, unfounded assumptions, or arrogant refusal to consider the facts. As a poker player, before I go all in and jam my chips toward the middle of the table, I like to look at my cards, both of them. It is not a superstition; it is simply logical.

We all know this, at least on an intellectual level, yet sometimes we make major life choices foolishly, either without regard to rationality or in direct conflict with it. When we disregard logic and reason, acting blindly on the basis of raw emotion, unquestioned assumptions, unexamined bias, or unheeded instinct, we and our loved ones often pay a terrible price in the form of heartbreak and personal tragedy.

The need for sound, logical decisions, supported by evidence and thoroughly analyzed, is infinitely greater when we move from the personal level to the global scale. Challenges facing the environment today are literally earth shaking in their magnitude, with the potential to affect the entire planet for hundreds of years to come. Unfortunately, we are, collectively, either ignoring these questions or attempting to answer them in the midnight dark with our eyes clenched closed covered by thick blindfolds. As a law professor, lawyer, and erstwhile law student, I know from long, excruciating personal experience how much time and energy we in the legal profession devote to the most minuscule and obscure fine points of law and policy. We are keenly aware of the overarching impact

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the decision of what rules of law to adopt and their application can have on our individual lives and on our society as a whole. How then, when the fate of the planet is at stake, could the most vital global decision-making be relegated to a level of carelessness more appropriate for a flip of a penny?

My thesis, seemingly unremarkable yet oft neglected, is that issues on this colossal scale require that we keep both eyes open as we look at them closely. We should be honest about the stakes and odds of the gamble, and recognize that our own bounded rationality may skew how we approach these issues. Logic tools such as my World Wager¹ and its accompanying decision matrix can help us decide the environmental issues upon which we should take a “might as well” stance and, alternatively, those which we should entrust to caution and take drastic actions only as a “last resort.” More specifically, in the context of climate change, the decision matrix shows that it would be irrational to make exorbitant and economically damaging changes to our societies and economies unless absolutely undeniable evidence of near-imminent disaster proves that this is our only hope. When mega-magnitude challenges such as the fate and survival of our planet demand our best bet, can we afford to blindly push all in?

II. THE PROBLEM OF BOUNDED RATIONALITY

The way we deal with environmental issues, or fail to deal with them, could determine the future to an extent that is difficult to overstate. Is anthropogenic climate change a formidable threat that demands swift and massive intervention by the world’s largest emitters of greenhouse gasses (GHGs)? Is a modern mass extinction in progress that calls for a major reworking of biodiversity conservation law and policy? These are among the most momentous questions that people have ever faced, in any culture, at any point in history. Unfortunately, our millennia-ingrained, reflexive response instincts to sudden threats, pinned against a background of the subtle and gradual nature of typical environmental challenges, stand in the way of our ability to address these fundamental issues.

1. A decisional device I have developed. It was originally named the Hotspots Wager because it was tailored specially to address the uncertainties associated with the potential for a modern mass extinction localized in the world’s key biodiversity hotspots habitats. However, the same general method can be adapted to fit the issue of global climate change, transboundary air pollution, population pressures, or any other scenario in which we must make a tough environmental choice, with a lot at stake, without the benefit of air-tight underlying factual certitude on one or more relevant factors. Therefore, we can acknowledge this tool’s fundamental flexibility and, in its more generalized form, give it the new name of “World Wager.”

Our lengthy history as a species has hard-wired us to be alert for sudden, clear, immediate dangers. In the wild, predators for hundreds of generations stalked our ancestors as potential prey, looking for opportunities to pounce. Our distant forebears had to be constantly on the lookout for the first signs of the next attack. There was no prolonged lag time between the sharp sound of a cracking twig and the lethal charge, and no room for leisurely human rumination over the various possible interpretations of the intruder's intentions. Life's cruel reality demanded a reflexive, not reflective, approach.

Our prototypical threat response—the classic primal fight-or-flight reaction to danger—evolved in that savage context, and so we became adept at watching for and reacting to the breed of obvious, fast moving, imminently deadly threat typified by our ancestral predators. For better or for worse, we have inherited that predisposition through generations of conditioning, and have been doing a very poor job of adapting to changed or changing circumstances. The problem with this is that our modern environmental hazards bear no resemblance to a bear, unless maybe it is one we stumbled upon while it was half-hibernating. Today, we have to grapple with threats of a vastly different nature. This is not the fight we were born to tackle.

Climate change and mass extinction are the complete opposite of the fight-or-flight imminent threats we are adapted to detect and confront. Unlike lions or wolves, these “environmental predators” of today are excruciatingly subtle, slow moving, incremental, and hard to see.² Gradual, creeping dangers are nothing like the roaring, sharp-fanged carnivores that hunted our forebears. They can take hundreds or even thousands of years to work their baleful damage, and the evidence before our eyes on any given day looks quite unremarkable. This is a textbook case of calamity masquerading as calm. Temperatures fluctuate, weather behaves much the way we are accustomed to, the ocean levels seem about normal, and instances of melting or spreading of ice cover are subject to varying interpretation. Likewise, the official International Union for Conservation of Nature list of recently extinct species remains quite short, and rarely grows, dwarfed by the ever-expanding roster of more than 1.7 million identified living species in the world today.³ There is life, and even exotic life, all around us. The zoos are full of spectacular

2. Michael H. Glantz, Creeping Environmental Problems, *Prototype Training Workshop on Water Affairs*, Hanoi, Vietnam (Dec.4–7, 2006), *proceedings available at* <http://ccb.colorado.edu/waf/docs/document.pdf>.

3. Press Release, Int'l Union for Conservation of Nature, Extinction Crisis Continues Apace, (Apr. 1, 2011) http://iucn.org/about/work/programmes/species/red_list/?4143/Extinction-crisis-continues-apace. The press release states that seventy nine of the world's 5,490 mammal species are “Extinct or Extinct in the Wild.”

charismatic megafauna. Is this a mass extinction? Where is the irrefutable dramatic evidence we are so hardwired to expect?

Despite the appearance of normality, there is considerable legitimate scientific evidence on the issues of both past and present climate change and mass extinction. This evidence, however, is of a decidedly different form. As explained in my latest book, *Betting the Earth: How We Can Still Win the Biggest Gamble of All Time*, these phenomena are now, and have always been, gradual and incremental in their progress and impact.⁴ Even historic mass extinctions like the K-T extinction spasm that wiped out the dinosaurs, although begun by a catastrophic asteroid strike, took thousands of years to inflict the vast bulk of its damage. The extinction was touched off by a single sudden Mesoamerican impact from outer space, but it was the slow-moving systemic aftershocks (increased volcanic activity and earthquakes, widespread fires, and planet-wide climate change induced by large amounts of smoke, dust, sulfur, and particulate matter added to the atmosphere) that destroyed most species far from the initial collision point. These impacts took centuries to manifest, in complete contrast to the abrupt, mostly localized, precipitating trigger event. The same is true for climate change, even when considering the most extreme examples from our planet's history. It is a gradual, insidious, easy-to-miss predator, as different from a spectacular and immediate crisis as an intestinal parasite is different from a lion, but not necessarily any less deadly in the final analysis.

When an environmental challenge is subtle and gradual, there is inevitably conflicting evidence, making avoidance of the problem all too easy. Depending on where we look and what types of evidence we credit or reject, we can arrive at very different conclusions as to the reality, the dimensions, the imminence, and the probability of harm. Moreover, there are gaps in our information, gray areas in our predictions, and question marks where we instinctively look for exclamation points. These gaps are variables and unknowns relevant to our decision making, and yet unfortunately may never be fully resolved.

Most people respond in one of two ways to subtle, gradual problems such as biodiversity loss or climate change. Many of us ignore them entirely, as if they did not exist at all, rather like disregarding our own weight gain, chronic fatigue, or even the early warning signals of cancer. We pay no attention to those ambiguous little symptoms and hope they will just go away or at least will not amount to any cause for alarm. In the alternative, if we are persuaded that the threats are genuine, we tend

4. JOHN CHARLES KUNICH, *BETTING THE EARTH: HOW WE CAN STILL WIN THE BIGGEST GAMBLE OF ALL TIME* (2010).

to exaggerate both the magnitude and the immediacy of the dangers in an attempt to shock our complacent friends (and our personal doctors) out of their deluded slumber. Well intentioned but misguided, we might inflate and distort the hazards in a type of propaganda campaign, making them appear to be the type of sudden, dramatic, short-fuse crises people are preconditioned to pay attention to and confront. Neither approach—neglect nor manipulation—is likely to earn us admission into the Rational Decision Makers' Hall of Fame.

A complex network of interlaced issues, facts, and gaps in information encompass our climate change and mass extinction dilemmas. Many of us are ignoring, or are ignorant of, the problems and are content to busy ourselves with myriad other things that appear to be more interesting, immediate, or important to our own lives. The rest of us are mostly confident we already know what we need to know, we understand what needs to be done, and that everyone else should listen to us and follow our lead. Regardless of our position, those who do not agree with us are ill informed at best and malevolent at worst.

This sad situation is a classic, thoroughly time-tested recipe for making awful decisions. Why are we doing this to ourselves and to our posterity? Why are we making fool's bets with our planet and squandering the opportunity to marshal vast informational resources to do all we can to choose wisely for the earth's future? Have we all somehow conspired to preserve our guesswork in as uneducated and deliberately ignorant a state as possible? As exemplified by the recent "Climategate" scandal,⁵ the world's leaders and citizens alike again are throwing away the chance to get it right on these colossal questions.

I do not pretend to know all the answers to these crucial questions facing our world. I only know that we must frame our questions correctly and be open to a logical, rational, and probability based assessment of all credible and relevant evidence, regardless of its source or implications. The sad truth is that some of the deadliest dangers in life, on both an individual *and* a global scale, sneak up on us stealthily instead of kicking in our front door, and this does not automatically render them any less real or any less lethal. These issues are far too important to trust to chance, unsupported assumption, or uneducated guesswork. If we try to gain a quick victory in the debate and skip to the happy ending by pretending the evidence is overwhelmingly on our side, without acknowledging any significant gaps or contradictions, we ultimately damage our own cause when the truth is revealed and we are exposed in our willing-

5. See Robert Mendick, *Climategate: University of East Anglia U-Turn in Climate Change Row*, TELEGRAPH (London), Nov. 28, 2009, <http://www.telegraph.co.uk/earth/copenhagen-climate-change-confe/6678469/Climategate-University-of-East-Anglia-U-turn-in-climate-change-row.html>.

ness to cry wolf, even endangered ones. Only a fair, honest assessment of all the facts, weaknesses and holes included, gives us a reasonable chance to get the right answer while at the same time persuading other fair-minded people.

Therefore, instead of expending substantial energy and resources debating whether we should follow the “hurry we must do everything we can” approach or the “it is all a bunch of lies” approach to vital environmental issues, we should focus our attention on analyzing the available, if incomplete, evidence to help our decision makers make momentous decisions that result in the best bet. When you are gambling with what you absolutely cannot afford to lose, you want every light on, every distraction shut out, and a careful analysis of expert advice from the best possible minds.

III. ANALYTICAL TOOLS AND THE WORLD WAGER DECISION MATRIX

How do we deal with the unknowns—those gaps in our required, essential information—so central to making the right judgments yet so persistently unclear? A methodical approach that uses the best and most sophisticated tools available from the discipline of Decision Analysis can help us make the correct decisions on such complex, subtle, nuanced, and glacier-paced issues even where there are variables that should be considered but yet remain maddeningly and even permanently elusive to definitive clarification. To that end, I have proposed a variation of Pascal’s Wager⁶ and the accompanying Decision Matrix to handle this daunting task—a separate version for each of the two most daunting contemporary environmental issues: climate change and mass extinction.⁷The Climate Change Wager⁸ and the Biodiversity Wager⁹ were derived from key insights in decision theory, including breakthroughs from intellectual titans such as Blaise Pascal, Kurt Gödel, and Edward Lorenz.

The main purpose of these tools is simple enough. They are designed, like Pascal’s Wager itself, to enable us to make rational decisions on momentous, life-and-death matters, even when there are some key

6. Pascal’s Wager is the argument that man should wager that God exists, and live in the mode that such existence dictates, despite the impossibility of determining such existence through the use of reason. Pascal’s Wager was groundbreaking as it had chartered new territory in probability theory and marked the first formal use of decision theory.

Pascal’s Wager is a framework for formulating a wise decision concerning a momentous matter when there are some major unknowns relevant to the equation. See Alan Hájek, *Pascal’s Wager*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY, (Apr. 1, 2010, 5:27 PM), <http://plato.stanford.edu/entries/pascal-wager/>.

7. KUNICH, *supra* note 4 at 127–210.

8. *Id.* at 213–23.

9. *Id.* at 207–10.

unresolvable unknowns relevant to making the correct choice. They equip us to place boundaries on the gaps in our evidence and to use reason to work through the upside and downside potential outcomes of our various options. Like a global game of *Deal or No Deal* or “the lady or the tiger,” our modern environmental dilemmas are forcing us to make the hardest of hard choices, in the foggy midst and mist of unending uncertainty. The Wagers and their Decision Matrices offer a solution that empowers us to make rational cost-benefit and best-case or worst-case analysis of the vast problems.

These methods are, at their core, a device for methodically and logically dealing with uncertainties and gaps in the key evidence, with full acknowledgement of pertinent probabilities. When all the permutations and combinations of possible but unknowable values of each variable tend to lead to the conclusion that we have more to gain and less to lose by selecting one option, and less to gain but more to lose from the alternatives, these tools allow us to realize this important reality and incorporate it into our decision making. This is a crucial contribution, as it provides a way for us to place the unknowns in a box and limit them to a manageable, confined space with which we can deal reasonably. By building boundaries around the fog and containing it, we have a better shot at making our judgments in clear air.

The Wagers and Decision Matrices assist us in distinguishing between situations in which being proactive should be our default option (Type R errors) and those in which we should tend to err on the side of caution (Type P errors). I introduced these two variations on the familiar scientific taxonomy of Type I (false positive)¹⁰ and Type II (false negative)¹¹ errors¹² in *Betting the Earth*. Type R mistakes are sins of commission, or failures related to aggressiveness. “R” stands for restless, and represents a preference for being proactive—for striking out swinging rather than with the bat on your shoulder.¹³ Conversely, Type P errors are sins of omission, or mistakes that follow from inaction. “P” stands for passive, and reflects a predilection for standing pat, erring on the side of

10. *Id.* at 329–35.

11. *Id.*

12. A simple hypothetical example of a man being screened for prostate cancer can help illustrate the concept of these two types of errors. Statisticians approach it like this: Begin with the null hypothesis, that the patient *does not* have prostate cancer; the alternative hypothesis is that cancer is present. If the null hypothesis is rejected when it is in fact true (the patient tests positive for cancer when the patient is well), this is a Type I error or “false positive.” If the null hypothesis is not rejected when it is in fact false (the patient tests negative when the patient’s prostate is cancerous), this is a Type II error or “false negative”.

13. KUNICH, *supra* note 4 at 335–44.

maintaining the status quo, and making no major change unless called for by clear and potent reasons.¹⁴

Neither Type R nor Type P errors are generally better or worse than the other under all circumstances. The effect of either hinges on the specific situation in an acutely context-dependent way. The variety of mistakes we should be more willing to accept when making decisions related to combating environmental problems such as mass extinction and climate change will vary based on the factors associated with the type of activity under consideration.¹⁵To state the matter in the simplest possible terms, everything turns on whether we are in a “might as well” or a “last resort” situation.

My Wagers look at all the possible permutations and combinations of the actual (but impossible to ascertain) values for each relevant variable.¹⁶ Then they let us compare what would happen under each of those situations if we decide to make one choice or another. Even though we cannot know the true value of each unknown, we can grasp whether we have more to gain and less to lose by making one choice, or vice versa. They allow us to distinguish between situations in which it would be “penny wise and pound foolish” not to intervene (my “might as well” category) and those where we might “act in haste and repent at leisure” by taking needless actions (the “last resort” syndrome). As in Pascal’s original wager, reason would suggest that we select the option that offers us the most benefit and the least risk for the lowest cost. To accomplish this, we must first determine the best and worst that could happen under all applicable alternatives and sets of circumstances. This is what the Wagers do.

Here is an example of this form of decision analysis to which most of us can relate. Whether we own a house or rent an apartment, we have some type of dwelling where we keep most our property and refer to as home. Each year, we need to decide whether to pay for fire insurance on our home and property. If we take on this decision rationally, our choice will turn on several factors, including the cost of the insurance premiums, the replacement value of what we own, the probability that

14. *Id.*

15. *Id.* at 207–223.

16. To use the climate wager as an example, say if we decide not to launch a major greenhouse gas control worldwide campaign, when the true amount of further abnormal temperature rise in future if left unchecked is high, the true extent of net harm from future temperature rise if left unchecked is high, and the true degree of human ability to shift climate adequately by design is high, the result of decision would be a first order grave error.

On the other hand, if we decide to launch a major greenhouse gas control worldwide campaign when indications of the three factors are low, then the result of decision would be a very costly insurance. See *Id.* at 221.

our home will be destroyed by fire in the next year, and what we would have to sacrifice either to pay the premiums or to replace our lost property ourselves. We can define each of these factors fairly well if we do a little checking. The one thing we cannot know for certain in advance is whether our home will *in fact* be burned down during the year just ahead. But if we use a variant of Pascal's Wager, as I have done for Climate Change and Biodiversity, we can incorporate that uncertainty and *still* make a reasoned decision.

If the premiums cost very little compared to our available resources, are much less than the value of what we stand to lose if there is a fire and we have no insurance, and we are persuaded that the insurance would actually pay off if we needed to make a claim, we are in a "might as well" situation. Even if there is a low (but not zero) probability of a fire hitting our home in the next year, it makes sense to spend the small amount of money to insure against what would be a far larger loss. But if the premiums are so expensive that we would have to make deep, life-changing sacrifices in order to pay them, or are not significantly less than the value of the property we own, or we are not confident the insurance would even pay off if we had to file a claim, then we are in a "last resort" situation. We still *might* find it prudent to buy the insurance, but it is a difficult and close call to be selected if it is essentially the only chance we have. Our "last resort" scenario is very different from the "might as well" scenario.

The "might as well" and "last resort" situations relate to Type R and Type P errors. In those sets of conditions that fit into the "might as well" mold, we should prefer to make Type R errors when we are in doubt as to what to do. It costs so little and could save us so much, we might as well be aggressive and proactive, and err on the side of taking the precaution, even if the probability that we will end up needing to avail ourselves of the protection is very low (but not zero). Despite that we cannot definitively know in advance the real situation or the value of each unknown or variable, our rational analysis tells us that it is generally better to pay for the insurance under "might as well" circumstances. Conversely, in "last resort" situations our default option should be to commit Type P errors. Not that we ever *want* to make errors, but in the face of uncertainty in "last resort" scenarios we usually should be conservative and cautious in our actions. This is so because we must give up so much to take the precaution, making very large, actual, immediate and long-term sacrifices for the possibility of averting a somewhat larger loss, that we should only exercise this option as a last resort, if all else fails.

I think we intuitively know the distinction between “might as well” and “last resort” situations, and the relationship between them and a reasoned preference for either Type R or Type P errors. Even if we have never actually thought about it in explicit terms, this resonates with us because at some level of ratiocination we have made this sort of judgment call many times in our own life experiences. We easily distinguish between circumstances in which it costs us only \$300 per year to reliably insure our life’s considerable accumulation of property and those in which we would have to pay \$20,000 a year for uncertain protection. Much like Supreme Court Justice Potter Stewart once wrote in a rather different context,¹⁷ we know a “might as well” scenario when we see it, and we understand that a willingness to tolerate a preponderance of Type R errors comes with that territory. Likewise, we know a “last resort” situation when we see it, and we understand that Type P errors should be our default option there.

IV. ADDRESSING CLIMATE CHANGE: TECHNOLOGICAL ADVANCEMENT AND ITS COMMERCIALIZATION MAY BE THE ONLY SOLUTION TO PROBLEMS FACING INTERNATIONAL COOPERATION

Many concerns caution us to place climate change in the “last resort” category. A combination of the uncertain efficacy of corrective measures, questions about the extent and imminence of harm resulting from the unaltered status quo, and immense expenditures and opportunity costs associated with intervention makes Type P errors the rational preference. This is so because the profound, multi-faceted, fundamental transformations necessitated by climate intervention are well beyond the level of expense and life-altering consequences associated with any ordinary form of life, health, or home insurance.

If we insist on adhering to the insurance analogy, engaging in climate intervention tactics would perhaps be most similar to an attempt to buy life insurance when we already have clear symptoms of a nearly incurable condition at an advanced age. When you try to buy life insurance with one foot in the grave it likely is not even available, and if it is, the price is enormously higher than if you were young and healthy. You would probably have to sell your car, mortgage your house, and make other major sacrifices to be able to afford the astronomical premiums. Similarly, instead of being fairly easy, painless, routine, affordable and accompanied by tangible positive side effects, the interventionist option under the climate issue is extremely difficult and expensive on several

17. See *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., Concurring).

levels, requiring multiple core-shifting reworkings of the pillars of modern society.

Through a messy and haphazard jumble of actions and inactions, the world has collectively stumbled toward this same conclusion. The United States never ratified the Kyoto Protocol¹⁸ because of concerns that its economy would be placed at a major disadvantage compared to its burgeoning competitive rivals, including GHG giants such as China and India. The United States' inertia is complemented by the reluctance of such developing economic powers to accept restrictions on their own emissions that could disrupt their progress towards achieving a level of prosperity, quality of life, and social stability similar to that of the United States. It is the longest and highest-stakes game of "Chicken" in history, with all key players daring the others to move first.

The difficulty of finding a core of shared interests to unite the world's nations on environmental issues can also be observed in the obstacles we face cobbling together international cooperation to create a successor to the Kyoto Protocol. As of this writing, the Kyoto Protocol will expire in less than two years. There is no international agreement ready to replace Kyoto. In fact, the most recent two Conferences of the Parties¹⁹ have come nowhere near to producing a successor. If the Kyoto Protocol expires with nothing to stand in its stead, it will be because the major GHG producers have concluded that it is not worth it, all things considered. Very different economic and social circumstances, risks from rising ocean levels, per capita emissions, aggregate emissions, and technological capacity have combined to render further agreement on climate change action extremely elusive.

Fortunately, this is where the real value of the Climate Change Wager and Decision Matrix presents itself. By framing the issue and its component parts in an easily examined context, these tools enable us to focus on the few elements of the problem over which we have any control. The Decision Matrix shows us that it would be irrational to make exorbitant and economically damaging changes to our societies and economies unless undeniable evidence of near-imminent disaster proves that this is our only hope. This points us in the right direction. If we are to engage on the issue of anthropogenic climate change, we must either

18. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change (UNFCCC). The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions. These reductions amount to an average of five percent below 1990 levels over the period 2008-2012. See http://unfccc.int/kyoto_protocol/items/2830.php.

19. UNFCCC parties meet annually in Conferences of the Parties (COPs). Both COP 15 in Copenhagen and COP 16 in Cancun failed to a binding agreement for long-term action. See http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf.

make intervention much less costly (or, even better, lucrative) or sweep away the scientific uncertainties that undermine our sense of urgency and approaching danger. That is what it would take to transform the issue of climate change intervention from a Type P “last resort” situation to a Type R “might as well.”

We have a very bad record of making deep and painful sacrifices absent impossible-to-miss signs of impending doom. Frankly, unless we make the scientific and technological breakthroughs necessary to take the weight of the world off our shoulders by making a response to climate change economically advantageous, it will be politically impossible to generate adequate support for climate change intervention. This political impasse could change if the costs were not so onerous, or if it were actually economically beneficial to do something meaningful about GHG emissions while still maintaining a competitive and productive economy, nation by nation.

Technological advancements in energy production and usage might make reduction in greenhouse gas emissions much less costly, or even profitable. When people can “do well by doing good,” the built-in incentives provide ample inducement for action with no attendant need for government to coerce anyone. The search for economically viable and efficient low-carbon, low-pollution sources of power can supply its own reward, even if motivated largely by the hunger for profits instead of noble altruism. Self-interest, in terms of economic gain, is a very potent motive force, often more powerful than even fear of punishment, and we would do well to try to harness it.²⁰ If we can shift the corrective action from onerous to prosperous, our climate change decision flips from “last resort” to “might as well” and we can eagerly embrace the minor Type R errors as a mere cost of doing good business.

The only other change that could conceivably move the big emitters to make huge sacrifices would be a quantum leap in scientific knowledge that irrefutably and incontrovertibly provides proof that the world will suffer vast catastrophes, and soon, unless action is taken now. Past experience tells us that international cooperation is likely only when such undeniable evidence of imminent disaster hits the world in its collective

20. All forms of energy are expensive, but as time progresses renewable energy generally gets cheaper, while fossil fuels generally become more expensive. There has been a continuing trend in commercialization of renewable energy. Global revenues for solar photovoltaic, wind power, and biofuels expanded from \$76 billion in 2007 to \$115 billion in 2008. New global investments in clean energy technologies—including venture capital, project finance, public markets, and research and development—expanded by 4.7 percent from \$148 billion in 2007 to \$155 billion in 2008. Globally, there are an estimated 3 million direct jobs in renewable energy industries, with about half of them in the biofuels industry. JOEL MAKOWER ET AL., CLEAN ENERGY TRENDS 2009, 1–4, available at <http://www.cleaneedge.com/reports/pdf/Trends2009.pdf>.

face. However, we are nowhere near that level of unmistakable certitude with regard to climate change today, and even specialists in the scientific community disagree vehemently about the nature, degree, and timing of any widespread effects of rising GHG levels. When the scientists themselves cannot agree, the politicians of the world are guaranteed *not* to intervene, but instead will keep their feet firmly on the brake, with the vehicle in park and the parking brake on for good measure. Politically, deep sacrifice is the ultimate “last resort” option and can only be implemented under circumstances of the clearest and most cataclysmic clear and present danger.

An eyes open approach to environmentalism must acknowledge these and other practical realities, including a few of the less noble but nonetheless widespread human traits such as selfishness, obstinacy, impatience, and shortsightedness. Since top-down, command-and-control regulation is not currently solving the climate change problem at its source (emission of GHGs from fossil fuel energy sources like coal and oil), a more incentives-based strategy might yield innovative solutions. These could include market-based countermeasures to mitigate some of the harms, such as rising ocean levels, that may flow from climate change.

However, although new, GHG-free sources of energy could eventually address the emissions problem, these can only supplement but not supplant fossil fuels if they depend on heavy government subsidies or regulatory mandates for their market share. Every form of alternative energy has its own problems, and coercion via subsidies and mandates is no substitute for self-advancement as an inducement to working through the difficulties. All variants of wind, solar, nuclear, geothermal, hydrogen, fusion, tidal, and other low-emission energy candidates for the replacement of fossil fuels will ultimately have to out-compete the GHG-laden sources, fair and square, or self-interest will trump good intentions every time. But we are not there yet. In fact, much effort is still being exerted in the other direction, i.e., an attempt to *force* a solution to fit, through imposition of legal mandates.

V. JUDICIAL ACTIVISM IN THE FACE OF CONGRESSIONAL INACTION

In the absence of either a workable, enforceable international agreement or unilateral legislative action, the legal power has shifted to the executive branch (specifically its administrative agency regulatory components), with an assist from the judiciary—at least in the United States. The U.S. Supreme Court’s landmark decision in *Massachusetts v. EPA* empowered the Environmental Protection Agency to decide wheth-

er it should regulate certain GHGs under the Clean Air Act.²¹The EPA, in turn, issued both an “endangerment” determination and a “cause or contribute” determination. Together, these findings essentially mandate that the EPA treat GHGs as “regulated pollutants” within the Clean Air Act’s far-reaching terms. Potentially, this gives the EPA immense power to regulate many thousands of sources of GHGs never before governed by the Clean Air Act, including requirements for Title V permits, New Source Reviews, Best Available Technology mandates, and other provisions. But with gasses like carbon dioxide and methane naturally occurring in large quantities, the Clean Air Act approach appears to be a poor fit,²² tailored as it is to small-quantity gasses like carbon monoxide, sulfur dioxide, and ozone.

The power vacuum left by the failure of the legislative process, domestically and internationally, has left the door open to the *Massachusetts v. EPA* brand of legal action. A new Congress with greater Republican representation may try to remove this unilateral regulatory authority from the EPA, while the Democratic leadership attempts to let the regulators handle the situation without the need for new legislation. But this legal scramble that threatens to send the United States’ GHG policy careening toward chaos could have been averted—and still might be averted—if decision makers consider all the facts and uncertainties within a rational and probabilistic framework. The Climate Change Wager and Decision Matrix can inject a dose of much-needed logic and objectivity if we are willing to step back and try a new approach. It might not be too late. The alternative is a politics-dominated status quo where most of us have one or both of our eyes tightly closed to inconvenient facts.

VI. CLOSING OBSERVATIONS

I chose the title of this article in order to highlight an alternative to the widespread and self-destructive practice of formulating our most Earthshaking environmental decisions with our eyes closed to the discomfiting nuances of reality. Of course, I do not claim in any way to eliminate risk from the equation. It cannot be done, in environmental law and policy or in any other enterprise involving life. Nevertheless, risk and uncertainty do not vanish just because we close our eyes and pretend they do not exist. What I do claim is this: like any good poker player, we have a better chance of winning if we get our chips into the middle of the table “with the best of it,” i.e., with the probabilities in our favor. The

21. 549 U.S. 497 (2007).

22. See Nathan Richardson, *Greenhouse Gas Regulation under the Clean Air Act: Does Chevron Set the EPA Free?* 29 STAN. ENVTL. L.J. 283 (2010).

element of risk is ever-present, but the best players learn how to *leverage risk*: how to use it, together with all they do and do not know, to gain an advantage. This only works if we keep our eyes and our mind open to absorb and analytically process as much of the available pertinent information as possible.

This requires a great deal of sustained hard work, attention to minute and nuanced detail, and patience, together with a resolute determination to maximize our resourcefulness and ingenuity. In poker, this includes looking carefully at our own cards, the other cards on the table, past tendencies, the amount of chips at risk, available to wager, and available to be won, and the relevant probabilities of various contingencies. It is fundamentally no different when we are betting the Earth. I created my decisional tools because I learned that we are not leveraging risk in making the weightiest decisions in the world; on the contrary, we are either blindly ignoring risk or lying about it to make the most audacious, and even reckless, all-in bluffs.

We can read a shelf of books devoted to global warming and endangered species, and come away from the experience more confused than we were before. Many books and law review articles, irrespective of whether they are environmentally activist or skeptical, oversimplify and omit key aspects of these momentous issues while depicting dissenting opinions as mere caricatures at best. There is far too little genuine debate or engagement on the issues, the gaps, the odds, and the actual evidence. As a result, our biggest environmental legal and policy judgments are treated like matters of religious dogma, to be accepted unquestioningly as articles of faith and shielded from genuine open-minded examination. With that as our paradigm, we cannot expect to make the correct decisions more often than we would through random chance.

We can and should avail ourselves of the most powerful tools of decision analysis when making these life-and-death judgment calls. With the planet at stake, we need to do a better job dealing with risk and making uncertainty, cost-benefit ratios, and probability work for us instead of against us. The thought experiment exercise offered by my *Wagers and Decision Matrices* can be helpful as an aid to cutting through the Gordian Knot of convoluted issues and distracters tangled all around our contemporary environmental dilemmas.

Some of the greatest minds in all history have given us these mechanisms, designed for the biggest of big picture issues. Pascal knew how to recognize a pivotal question, and he created a means for making wise choices involving them. We owe it to ourselves and to future generations to do the same. We must open our eyes and deal with all the circumstances, including the reality that while some of the most momentous

sentences end with an exclamation point, others end with a question mark.