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IN THE SHADOW OF WINDMILLS

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Walking toward the end of the peninsula, it is hard to miss Hull Wind 1: a 200-foot-tall light gray tower, its three sword-like blades rotating persistently in the on-shore breeze. Even though I'm still a quarter of a mile away, I can make out the *woosh woosh* of its blades. Less than a year ago, I would have regarded a pilgrimage to a windmill as peculiar. A lot can happen in a year.

Using the profits from his Oscar-winning film, *An Inconvenient Truth*, former vice president Al Gore founded a non-profit called The Climate Project, whose purpose was to train 1,000 volunteers to deliver the PowerPoint presentation he delivers in the film. Three months later, still in disbelief that my application was accepted, I landed in Nashville, Tennessee, along with 200 others from each of the 50 states. We volunteers paid our own airfare and hotel, but the two-day training program was free. In return, each of us pledged to give Mr. Gore's presentation a minimum of 10 times over the next year in our local communities, strictly on a volunteer basis. For someone who has kept an arm's length from terms such as "activist" and "environmentalist" his entire life, this was something altogether new.

What's in a Name?

As a recovering WASP, I was raised to be polite. As an eight year-old, I can vividly remember watching a black Zodiak raft on the evening news, dwarfed by a Goliath super-tanker, zig-zagging in front of the tanker's enormous bow in an attempt to stop it. The writing on the side of the raft said, "Greenpeace." I distinctly remember thinking to myself, "That's *rude*." With this single act of insolence, my mind closed to Greenpeace and it's objectives for decades.

Throughout my adult life, I saw this same dynamic play out over and over again: angry activists ending up recruiting the half of their audience that already agrees with them at the expense of thoroughly alienating the other half that does not. This strategy never seemed to make much sense to me. But what was I becoming now?

How about an "environmentalist"? To me, that term means "environmental fundamentalist." Once again, the words turn me off. I am continually struck by how fundamentalism, of any kind, only serves to build walls in a world that appears to be in dire need of the opposite. Am I willing to say that, in every situation, we should choose the environment?

When Mr. Gore first introduced himself to our volunteer group, he spoke about how he had been talking about global warming for 30 years. Each year he would say to himself, "Any minute now, the cavalry will come. Any minute now, from just over that hill . . ." He waited for 30 years. After a dramatic pause, he then announced that *we* were the cavalry. Despite the resulting thundering applause that enveloped me, I didn't feel much resonance with that term either.

A name for my new role was still left wanting.

The Kids Get It

The library of the Runkles Elementary School is beginning to fill. Three months have passed since Nashville. After a number of run-throughs with friends and family, this will be the third time I have presented to a "real" audience.

Only as the audience begins to show up, however, does it sink in that this group won't just be made up of adults. Easily half the audience is fifth and sixth graders. I wonder: Should I "dumb-down" my talk?

As I begin, I explain that I am not a climate scientist, and that while I have learned something about climate change in preparation for this presentation, it is my hope that an audience member will know more about some aspect of this complex issue than I do.

But my major learning in preparing for this talk hasn't been so much the *science* of global warming as the *psychology* of it. This was first brought to my attention by a friend, deeply concerned about the environment, who confessed that she hadn't seen the film yet because she wasn't "ready." I then share that, in my own family, there is someone whom I would describe as a global warming skeptic, and there is someone else who believes it's too late to do anything about it. Imagine the diversity of perspectives, values, and interest we need to make room for in any audience if we are to have a productive conversation on such a complex topic.

As I go through my slides, I explain that, during the last ice age, fresh-melt water from North America disrupted the Gulf Stream current that normally warms Europe. I ask rhetorically if there are any other large pieces of land-based ice in that part of the world that we might want to be concerned about. I'm taken aback when a 10-year-old in the front row blurts out the answer: "Greenland!" Later, as I discuss the loss of

TEAM TIP

Discuss how, in promoting new initiatives, your team might pay more attention to the *psychology* of change rather than focusing exclusively on the substance of the initiative.

coral reefs, a seventh grader excitedly points out that if the warming trend continues, permanent species loss is predicted into the tens of thousands. I guess I don't have to worry about dumbing anything down.

The kids get it. They're the ones who will have to live with the consequences of our generation's actions. What obstacles are there for the rest of us?

A Movement in the Making

A public library talk by Professor John Sterman of MIT entitled "Overcoming Public Complacency About Climate Change" is so full that the librarian has to tell the people standing at the back of the room to leave. They're not happy about it.

Dr. Sterman is discussing my favorite topic: how people's ways of thinking can be barriers to learning. In the case of climate change, one barrier is that human beings are chronically poor at understanding the dynamics of exponential growth, whether the growth is dollars in a savings account or the build-up of CO_2 in the atmosphere.

He observes that many people think about global warming as akin to the Manhattan Project. In this mental model, climate change is viewed as a problem that is so big that only the government can solve it by getting a bunch of really smart people together in one room to just "figure it out." Dr. Sterman then offers a different mental model: the civil rights movement. In this paradigm, a grassroots movement started by just a handful of people spreads through local action, until the government can no longer ignore the issue and passes legislation to enforce the changes that have been successfully prototyped.

In other words, global warming is something that was created by millions of individual actions over a long period of time. The only way to undo what we've done is to do the reverse—with the minor qualifier that we don't have quite as much time to undo it.

The most efficient energy solutions are those that are adapted to the local environment. Solutions imposed from a national level will never be as sustainable as those grown locally. The government is not going to save us; Washington can only learn from how local communities save themselves.

So how do we do that?

The Tides of Democracy

On a Saturday morning in Eastport, Maine—the "Easternmost City in the United States"—about 70 residents have chosen to spend the better part of a precious summer day to hear a series of presentations on tidal power generation. Sitting a stone's throw from Canada, Eastport is right next to the Bay of Fundy, famous for the most extreme tides in the world. In the last few years, these tidal currents have attracted attention as a possible source of renewable energy.

Two separate projects are proposing to submerge underwater turbines in the bay. The first is basically an underwater windmill with short, squat blades not unlike an enlarged outboard-motor propeller. The second device looks like the rotating cylinder of blades on an old-fashioned hand-pushed lawn mower. Multiple assemblies of these rotating cylinders can be stacked on top of one another to cover a larger and larger cross-section of the tidal current. Both projects are at the stage of installing a prototype turbine as proof-of-concept to generating electricity.

Tidal power. How simple. How elegant. How perfectly suited to the local environment. Could tidal power become the way that Eastport's depressed economy can finally shift its focus away from 4th of July tourists?

Beyond the innovative technology, though, what I am struck by most at this gathering is the pervasive civility. The audience is attentive. They raise their hands. They ask questions. People don't interrupt each other. They wait their turn. The presenters are open about the fact that these projects might not succeed, for either technical or bureaucratic reasons. There is real listening going on, followed by hot dogs and potato salad. From following the national news, it's sometimes hard to believe that democracy can actually work like this—let alone, at all.

Lessons Learned

Now nine months after Nashville, I have given my *Inconvenient Truth* slide show 13 times to about 350 people, in total. My audiences have ranged from four people in a huge room at the local library to 150 students in a high school auditorium.

So what have I learned?

To begin with, I've learned a new vocabulary. "Icequakes" are seismic events that occur on land-based ice-sheets as the ice shifts due to melting. A "localvore" is someone who only eats locally grown food to reduce the carbon emissions that would normally transport the average food item 1,500 miles to reach our supermarkets. "Green-collar" jobs are jobs that are part of the growing environmental sector, such as manufacturing and installing solar panels. "Carbon offsets" are donations to renewable energy projects designed to balance out carbon emissions from another activity, such as the use of your car or flying on an airliner.

I've learned a myriad of details about home appliances that I never would have imagined. I've learned that, for the average homeowner, the electricity required to power the clock on their microwave is more than the amount of electricity used to operate the microwave to heat food. This is because the clock is on continuously, while most people actually use their microwave for only minutes a day. I've learned that the only common appliance that can come close to the electricity consumption of a refrigerator is a plasma television. I've re-learned something that my grandparents already knew: It is possible to survive without a clothes dryer. All that stiff clothing from a clothesline magically becomes soft after just a few minutes of wear. I've learned that a drip-dry polyester shirt is more environmentally friendly than a cotton shirt—if you consider the energy required to iron the cotton shirt over its lifetime.

I've learned that reducing consumption is partly dependent on developing a new concept of beauty. At our Climate Project training, we were each given a three-ring binder with a brown corrugated-cardboard

cover. My automatic reaction to seeing it was, "Wow, that's ugly." But then I took a second look. Obviously, the typical plastic cover had been left off for environmental reasons, exposing the brown cardboard. But I also noticed that the metal binder mechanism was attached to the cardboard with screws rather than the typical rivets. As a result, all the metal could be removed to allow it and the cardboard to be recycled. Understanding this, my second reaction was, "How elegant!" Perhaps our new esthetic should be related to evaluating an object's relationship to its future rather than merely its appearance.

I've learned about the "climate dividend," the economic benefits of being more energy efficient. But this dividend is not merely limited to the monetary benefits of fighting global warming; there are other more intangible "dividends" as well. One is the renewed potential to develop a sense of community.

In my opinion, our national democracy is broken. It is broken, in part, by the fact that most citizens receive information about our country via a one-way medium: the television. The result is that when a politician says something nonsensical on the evening news and we yell at the television, he or she doesn't hear us. The epitome of democracy is not the act of voting: It is the creation of a vibrant marketplace of ideas that must precede an effective vote. The average citizen simply no longer has a regular venue for participating in this marketplace anymore.

But perhaps, with an issue that requires local problem-solving to determine the most effective local solutions, there is an opportunity to create a sense of community through engagement that has not happened in a long time. It might start through activities as innocuous as ride-sharing, community gardening, or making friends at a block party. I can attest to having met some pretty amazing people in the last nine months.

I've learned the value of "productive struggling." One of the most common criticisms of *An Inconvenient Truth* was that it did not spend enough time talking about what people should actually do. I disagree that this was a fault. The solutions that people will have the most ownership of are the ones that they figure out for themselves, that are connected to their own communities and way of life. As such, the film served as a giant conversation-starter to motivate local answers.

The truth is that no one has all the answers as to how we should "solve" global warming. All we know is that, ultimately, we must consume less. How we go about doing so is a deeply personal question that each of us must grapple with in our own way. Oh, and by the way, the sobering timeframe of this grappling is nothing less than the rest of our lives. There is no silver bullet. What we need is silver buckshot.

The first step is awareness. After that, you do what you can.

And I've learned that, when facing a problem the size of a planet, doing what you can is the only way to keep your sanity. It is downright oppressive to live with the awareness that virtually every act of consumption is damaging my niece's planet. Ron Heifitz of Harvard has suggested that the measure of success on complex issues should be progress.

Finally, having passed on "activist," "environmentalist," and "cavalry," I think I've finally found a name for my role that I can live with. I propose that the fundamental capacity that can generate progress amidst complexity is the capacity to *learn*. That's really all scientists are: professional "learners," desperately trying to learn about our ecosystem as it changes before our eyes. That's all a community is doing when its members engage in productive struggling with sustainability. They're trying to be good "learners." No doubt this will sound corny to some, but so far I have been unable to find another word that is more apt.

We create the world around us through our own actions. If we go about our lives in anger, one morning we will wake up convinced that the world is inherently defensive and belligerent. Conversely, if we start a conversation by doing more listening than talking, we increase the probability that at some point the other person just might ask, "So, what do *you* think?" Investing in understanding someone else increases the probability that they will invest in understanding you. I know of no better way to encourage learning.

Pilgrimage Complete

Finally standing at the bottom of Hull Wind 1, I have completed my pilgrimage. The base of the windmill tower is huge, as big around as a barn silo, bolted to a concrete slab with hundreds of hefty bolts in a neat circle. I arch my neck, look skyward, and squint. With one of the three, 75-foot-long blades passing by every second, the windmill is turning at about 20 RPM. Hull 1 can generate a maximum capacity of 660 kilowatts—but that's only a third the capacity of Hull Wind 2.

Built on the top of what used to be a landfill, Hull's second, much larger windmill a few miles away can produce 1.8 megawatts. Combined, these two windmills currently produce 15 percent of the total energy needed by this community of 11,000. And when Hull installs the four new windmills that they are planning, that will bring their total wind power output to 115 percent of the town's needs—in other words, they'll have excess power to sell.

The town of Hull has been able to undertake this initiative, in part, because it owns its own municipal utility company. As a result, local will has been free to innovate. And by innovating locally to exploit local resources—in this case an on-shore breeze—the resulting solution is eminently sustainable.

Sitting in the shadow of this windmill overlooking Boston harbor, I realize something else. In addition to clean energy and a little shade, this highly functional monument is capable of generating a third, potentially even more potent renewable resource: hope. ◘

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