

Kick

the Fossil Fuel Habit

10 Clean Technologies to Save Their World

Tom Rand



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Preface

Tom Rand

It is sometimes claimed that we cannot do without fossil fuels. *That is false.*

When I first began writing this book, I didn't think we could break the fossil fuel habit—not in one generation, and certainly not without a great deal of nuclear power and what is optimistically called “clean coal.” In exploring renewable technologies like large-scale solar, wind and geothermal, the engineer in me changed my mind. It is possible to change our energy use to 100% renewables. This book is a celebration of that idea.

But the pragmatic venture capitalist in me tempers that celebratory mood. To kick our fossil fuel habit, we'll need to deploy resources on a scale not seen since World War II, generate a degree of international political co-operation beyond anything we've yet done, and at the same time develop a new set of economic rules that finally put a prohibitive price on carbon.

These are daunting challenges. *Why do it?*

There are lots of reasons to kick the fossil fuel habit: energy security; the moral cost of supporting undemocratic regimes that sit on the oil we use; the military cost, both in blood and cash, to keep the supply lines open; and getting a leg up on the competition in the next industrial revolution. Each of these is reason enough to kick the habit.

Talk to a climate scientist, though, and it fast becomes clear that one reason stands above all others: *Severe climate change is coming, and it will not be pretty.* It won't just mean hotter summers, scarier storms and rising oceans—although that's all true—but we'll soon have trouble growing enough food to eat. The sense of

restrained panic you hear in the voices of these learned men and women reveals more than the legion of scientific papers published on the subject.

The scientific community has known about this problem for decades. Even former British Prime Minister Margaret Thatcher—not exactly a shill for the environmental movement—recognized climate change as the greatest emerging threat to civilization in a speech to the UN General Assembly back in 1989, saying “climate change...could alter the way we live in the most fundamental way. ...It is life itself that we battle to preserve.”¹ We are now in the final innings. This is our last stand, the river card.

Climate change is not a political issue. It is neither left nor right, liberal nor conservative, corporate nor anti-corporate. It is a serious, practical problem affecting everyone—and it needs to be solved.

That we must *eventually* break the habit is clear, because fossil fuels are a finite resource. They will run out. That we must break the habit *quickly*² is well established by the scientific community.

So, can we break the habit quickly? *That is what I hope to help establish in this book.*

I am not alone in this way of thinking. Dennis Bushnell, chief scientist at NASA Langley Research, says, “We have ways forward which... will work without...terribly time-consuming or expensive further technological developments. It's simply a matter of giving up our current teddy bears, which we love to clutch, which is the conventional hydrocarbons, fossil carbon fuels,

continued...

and [going] off into what we need to do to save ourselves.”³

When humankind really wants to do something, our ingenuity, resources and determination are breathtaking. We put a man on the moon! We unlocked the power of the atom! We routinely build devices for our entertainment that are mind-bogglingly complex, and our industrial civilization and economic infrastructure is a system of interlocking components that rivals the brain as the most complex structure in the known universe.

We stand on the shoulders of giants who came before us. This challenge represents our generation’s turn to carry the baton forward. It won’t be easy, but it is possible.

How do we do it?

The sun that hits just 1% of the area of the Sahara Desert contains enough energy to power the entire world. That same desert, irrigated with saltwater, could provide enough biofuel to replace all of the world’s energy needs. The wind that sweeps across the American Plains could power the entire United States. So, too, could the heat stored in the ground beneath our feet. An intelligent “energy internet” that manages and stores energy—much like the World Wide Web does data—lies just around the corner. There’s ample renewable energy; that’s not the problem.

But there’s no magic bullet. All renewables need to be developed on a massive scale. Enormous investments need to be made in transmission and storage, to deliver that energy where and when it’s needed. Conservation is an equal partner. Every watt of energy we don’t use

is a watt of energy we don’t need to produce.

Back when I was a software entrepreneur, my hard-nosed business partner would often exclaim in an exasperated voice: “It’s all economics!” He’d trot this expression out whenever I proposed something that relied on forces other than money—good-heartedness, idealism, moral fiber. He had a point.

Money makes the world go ‘round, and it’s money that needs to be deployed. So, how do we make the money flow *away* from fossil fuels? We can’t rely solely on goodwill or idealism.

One solution is to put a *price on carbon emissions*. Emitting carbon can no longer be free—it cannot remain, in the words of one economist, an “externality.” Then, and only then, will capital begin to flow to renewables. But this solution is long and slow. No one is willing to shock the economy with steep, sharp increases in the price of carbon.

A second solution is to *accelerate the capital flow*, ensuring that lots of cheap capital is made available for renewable energy production. Most renewable energy is pretty much free once you’ve built the plant to capture it—nobody pays to make the sun shine or the wind blow. What does it cost to build the plant? It depends on how cheaply you can borrow money. A government-backed Green Bond⁴—just like the Victory Bonds of World War II—is one way to engage all citizens in this project, not just venture capitalists like me and the bankers on Wall Street.

When the world’s banking system failed in 2008, governments around the world mobilized trillions of dollars almost overnight. The same

scale of investment is required just to help us *start* to kick the fossil fuel habit. To ignite our imagination, I ask in each chapter the *trillion-dollar question*: What would you get if you invested \$1 trillion? How many barrels of oil could you replace? What sort of infrastructure could be built?

This level of investment is not fantasy. The International Energy Agency predicts that the world needs to invest more than \$45 trillion in energy systems over the next 30 years, to both meet expected growth and reduce carbon emissions by half. The question is, *how* do we want to invest it? Do we continue to invest in melting tar for our energy, or do we harness the sun? Do we continue to rely on a 17th-century technology—coal—or do we greet the 21st century with a brand new start?

The third solution is to simply *walk away from the existing energy base*. We need to abandon our coal plants. It’s totally irrational from a free-market perspective, but necessary if we are to make this transition in time to save the planet. We could do that by drilling enhanced geothermal boreholes next to the coal plants, and replacing the boilers with heat-exchangers. It can be done.

When the microchip was invented, it changed the world. We are on the cusp of a similar economic and energy revolution. That revolution, though, will not come by itself. We need to stand up and make it happen. It will not come unless we want it badly enough, unless we work hard enough, unless we really commit ourselves to it.

To paraphrase the world’s most famous hockey hero, the great Wayne Gretzky: “Skate to where the puck is going to be, not to where the puck is.” By mid-century, our civilization must have broken the fossil fuel habit. *Kick the Fossil Fuel Habit* is a

celebration of where we’re going and a clarion call to start heading in that direction now.

“We [have been] burning coal and oil and gas heedlessly for almost two centuries, not suspecting that, in the long run, dependence on fossil fuels is a kind of suicide pact. And here is the little miracle that shows we still have more than our share of luck: At exactly the same time when it became clear that we have to stop burning fossil fuels, a wide variety of other technologies for generating energy became available.”

—Gwynne Dyer, *Climate Wars*, 2008

Endnotes

- ¹ Margaret Thatcher, Nov. 8, 1989, speech to United Nations General Assembly (Global Environment). See www.margaretthatcher.org/speeches for a full transcript.
- ² How fast do we need to do it? By 2030, we need to bring our carbon emissions down to near zero if we are to avoid some pretty scary positive feedback effects, like the melting of the permafrost and the release of the massive amounts of greenhouse gases it contains.
- ³ As quoted in G. Dyer, pg. 157
- ⁴ See “Cheap Money – Enter the Green Bond,” pg __, for just one idea on how to accelerate the movement of cheap capital.

“When it comes to the future, there are three kinds of people:
those who let it happen, those who make it happen, and those
who wonder what happened.”

—John M. Richardson, Jr.

