

# ACKNOWLEDGMENTS

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*Alcohol Can Be a Gas!* would not be in your hands if not for the contributions, help, cooperation, and peer review of scores of colleagues from around the globe. In covering this wide breadth of material, I have relied on the work of so many others.

It isn't possible to provide space for full citations of all the references I've used in research. I have chosen to cite, in endnotes, the references that I thought would be most important to the reader. Every effort has been made to have peers review and check all the facts in this manuscript; any errors are my responsibility alone.

In the four years I spent assembling this book, I was supported by the financial contributions of nearly three dozen primary funders and the hundreds of members of Alcoholics Unanimous. Since not a penny was provided by corporations or other institutions, I had the luxury few authors enjoy: the ability to explore and say what I thought should be said, without fear of loss of a patron or publisher. For that, I am deeply grateful.

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Wendy Stegall did a super job indexing the book, so that you have a detailed map at your disposal to find darned near anything.

SINCE NOT A PENNY WAS PROVIDED BY CORPORATIONS OR OTHER INSTITUTIONS, I HAD THE LUXURY TO EXPLORE AND SAY WHAT I THOUGHT SHOULD BE SAID.

Graphic artist Ron Harper, who had laid out the original *Alcohol Can Be a Gas!* in 1982, was on board again with this new book. He did the cover artwork and the lovely drawings between the sections. With his ability to see things sideways, he was also able to look at what I had written and create humorous and instructive illustrations and cartoons. His whimsical, illuminating work speaks for itself.

A special thanks to the cartoonists: Ken Alexander, Khalil Bendib, Phil Frank, Mike Keefe, Guemsey Le Pelley, Dan O'Neill, Mike Peters, Bill Schorr, Andy Singer, and Matt Wuerker. All of the cartoons scattered throughout the book were donated by the artists, as were all the photographs, tables, and illustrations not created specifically for this book.

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# ABOUT THE AUTHOR

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David Blume started his ecological training young. He and his father Jerry grew almost all the food their family ate, organically—on a city lot in San Francisco in the mid-60s!

Dave taught his first ecology class in 1970. After majoring in Ecological Biology and Biosystematics at San Francisco State University, he worked on experimental projects, first for NASA, and then as a member of the *Mother Earth News* Eco Village alternative building and alternative energy teams.

When the energy crisis of 1978–79 struck, Dave started the American Homegrown Fuel Co., an educational organization that taught upwards of 7000 people how to produce and use low-cost alcohol fuel at home or on the farm.

KQED, San Francisco's Public Broadcasting System station, asked Dave to put his alcohol workshop on television, and together they spent two years making the ten-part series, *Alcohol as Fuel*. To accompany the series, Dave wrote the comprehensive manual on the subject, the original *Alcohol Can Be A Gas!* Shortly after the first show aired, in 1983, oil companies threatened to pull out their funding if the series was continued. KQED halted the distribution of the series and book (see this current book's Introduction for the whole story.)

In 1984, Dave founded Planetary Movers, an award-winning social experiment and commercial venture, well known for productive activism (e.g., on behalf of Nicaragua's Sandinistas), as well as for pioneering practices of progressive employment, green marketing, and the sharing of a percentage of profits for peace and the environment.

In 1994, he started Our Farm. This community-supported agriculture (CSA) farm was also a teaching farm, based on sustainable practices, that hosted over 200 interns and apprentices from all over the world, and held regular tours for thousands of people. Our Farm grew as much as 100,000 pounds of food per acre, without a tractor, using only hand tools, on a terraced, 35-degree slope.

DAVID BLUME IS THE EXECUTIVE DIRECTOR OF THE INTERNATIONAL INSTITUTE FOR ECOLOGICAL AGRICULTURE. HE HAS BEEN AN ALCOHOL FUEL PIONEER SINCE THE SEVENTIES, AND HAS CONSULTED FOR A WIDE ARRAY OF CLIENTS, INCLUDING GOVERNMENTS, FARMERS, AND COMPANIES INTERESTED IN TURNING WASTE INTO VALUABLE AND PROFITABLE PRODUCTS.



The International Institute for Ecological Agriculture (IIEA), founded by Dave in 1993, is dedicated to healing the planet while providing for the human community with research, education, and the implementation of socially just, ecologically sound, resource-conserving forms of agriculture—the basis of all sustainable societies. The IIEA teaches permaculture, an ethical system of ecological land design, which incorporates the disciplines of agriculture, hydrology, energy, architecture, economics, social science, animal husbandry, forestry, and others.

Dave and his IIEA associates are establishing a biofuels station in Santa Cruz, California, that will offer alcohol fuel in a driver-owned cooperative, as detailed in this book. Dave is currently Executive Director of the IIEA.

He has consulted for a wide array of clients, including governments, farmers, and companies interested in turning waste into valuable and profitable products. Recent work includes a feasibility study for a macadamia growers' cooperative in Mexico, and a water harvesting/reforestation project in Antigua, West Indies. He is working with

a farming college connected to the government of Ghana to develop alternative fuels, to train agricultural extension agents in organic farming, and to design an ecological strategy to stop the Sahara Desert from advancing. He also recently inspired the city of Urbana, Illinois, to hold a conference between builders, lenders, developers, municipalities, building inspectors, architects, and engineers, to coordinate the mainstreaming of natural building technologies. He has helped the Ford Motor Company demonstrate alcohol-fuel-powered vehicles at a series of U.S. events.

"Farmer Dave" is often called upon to testify before agencies on issues related to the land and democracy. He is a frequent speaker at ecological, sustainability, Peak Oil, and agricultural conferences in the Americas, and has appeared in interviews over 1000 times in print, radio, and television. Dave firmly believes in Emma Goldman's view of, "If I can't dance, I don't want to be in your revolution," and he can frequently be found on the dance floor when he isn't flagrantly inciting democracy.

# PREFACE

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I am often accosted by people whom I would normally consider my colleagues. They are typically environmental activists informed by what they read on the Internet, people who watched *An Inconvenient Truth*, people who are aware of Peak Oil, sustainable agriculture, and climate change.

They say “Dave, don’t you know that fossil fuels, (and fossil-fuel-based fertilizers) are beginning to run out and ‘There Is No Alternative’? [My acronym for this is “TINA”.] The only thing we can do is stop driving, stop using energy, walk to our green jobs in the new localized economy, and go back to farming by hand. Power down.”

They also say, “The reason we are in this mess—polluted air, lung cancer, melting ice caps, drowning polar bears, food traveling 10,000 miles from farm to eater, horrible wars for oil, MTBE-poisoned groundwater, massive monoculture farms growing animal feed to be shipped to other countries to feed their rich people’s cattle, requiring billions of gallons of pesticides—is all because of the internal combustion engine and cheap fossil fuels. Why are you writing a book which is all about making it possible for American soccer moms to drive their massive SUVs while the rest of the world starves for basic energy and food?”

They say, “Don’t you get it?!”

Believe me, I get it. I agree that we, particularly in the United States, are using and wasting a disgustingly huge quantity of energy. My fellow ecologists have a deep knowledge of natural systems, and we find ourselves every day walking through a world of horrible environmental wounds that we cannot help seeing.

Conservation and, more importantly, good design are the basic foundations on which to plan our energy future.

This book is not about providing unlimited clean fuels for SUVs. It’s about shaping energy policy now with our own individual and group actions, to make sure the energy future we get is the one we

THIS BOOK CHARTS A CLEAR, ATTAINABLE PATH THAT WILL  
WORK—AND THAT IS, IN FACT, ALREADY IN MOTION.  
THIS PATH, IN THE BEST TRADITIONS OF MARTIAL ARTS,  
TURNS THE FORCES DESTROYING OUR PLANET BACK  
AGAINST THE PLUNDERERS, AND PUTS BOTH THE POWER  
AND THE RESPONSIBILITY FOR IMPLEMENTING THE  
SOLUTION IN THE HANDS OF ORDINARY PEOPLE,  
WORKING TOGETHER AT THE LOCAL LEVEL.

want and not the one the Oilygarchy is planning for us. This book is about maintaining your power and hope in the face of “this mess.” It charts a clear, attainable path that will work—and that is, in fact, already in motion. This path, in the best traditions of martial arts, turns the forces destroying our planet back against the plunderers, and puts both the power and the responsibility for implementing the solution in the hands of ordinary people, working together at the local level.

This is why I refuse to give in to a philosophy of despair, why I refuse to surrender to those who plunder the planet, although so many of us have given them our permission to destroy the Earth under the banner of TINA. TINA allows the powerful to decide which energy we will use to pollute our planet.

And while people in developed countries may practice a little well-meaning conservation, they will not be willing to return to a world where the basic unit of energy is their human labor. The multinational energy corporations know this, and they are planning their transition to fuels that make petroleum look like Mr. Clean (see Chapter 4). A dying planet is of secondary importance to these people.

In many ways, my strident colleagues are correct when they say that the central cause of our planet's woes can be characterized by our use of engines and fossil fuels. But they are wrong about TINA. The central solution, which ripples out to every corner of the planet, is to replace those fuels with available solar-based fuels all over the planet. As you will see, even in a cursory examination of this book, this alternative is powerful, inexpensive, fast, and effective—and will regenerate ecological systems, if done properly.

As I point out in this book, it is possible to make ethanol using a badly designed industrialized model, one that corporate agribusiness currently employs. In this system, biofuels production would amplify the abuses to our environment.

But this book shows how a permaculturally designed ethanol system provides us with surpluses of local food, energy, community, and power—all while deepening our topsoil, eliminating the use of toxic agrichemicals, and reversing global warming.

It's about doing things on a human scale and as you will see, the human scale has virtually all the advantages in this struggle. Our energy/food production system can either affirm our living environment or treat the Earth as one big strip mine to exploit.

Yes, there is an alternative to a chaotic post-petroleum world. But it will take your help, blood, and sweat to make it happen. In fact, it's going to take a revolution.

Share. Organize. Win.

# 1983 FOREWORD

BY R. BUCKMINSTER FULLER

*What follows was originally the foreword for the 1983 version of this book. I was greatly honored that my colleague R. Buckminster Fuller felt that my project was important enough to take time out of his busy schedule to write something to my readers to communicate just what it might mean to have a solar-powered future.*

*Unlike a lot of solar visionaries of the day, Bucky had been around long enough to witness and understand the interlocking corporate/governmental structure, and in his last book, *The G.R.U.N.C.H. of Giants*, he talked about how it would all end. The acronym stood for "Gross Universal Cash Heist." He prophesied that not only would corporations grow bigger than giants, but that predatory transnational capitalism was leading us to a very bad end indeed. Bucky always inspired me and millions of others with his emphasis on direct positive action as a strategy for rapid change. This perspective is a source of what he refers to as the change from a world based on weaponry to one based on livingry.*

*During the press conference marking the premiere of my television series, *Alcohol As Fuel*, Bucky said that he had been in charge of America's alternative energy research for the military during World War II. He himself had run an engine on alcohol for two years during his war research. In a very thinly veiled comment, he noted that his voluminous notes and research done within the military-industrial establishment are now missing, apparently stolen from military archives in 1970.*

*Shortly after the series went on the air in 1983, Bucky's wife passed away. They were so joined at the heart that he, too, passed away a few days later. I still miss him and wish somehow he could see this book finally published—finally out doing its intended work.*

PHYSICISTS, ASTROPHYSICISTS, ASTRONOMERS,  
CHEMISTS, AND ENGINEERS EMPLOY ... STANDARDS  
OF MEASUREMENT TO DISCOVER HOW THE PHYSICAL  
UNIVERSE IN WHICH WE LIVE OPERATES. SUCH  
METHODICAL MEASURING HAS DISCOVERED A COMPLETE  
INTEGRITY OF ENERGY ACCOUNTING IN THE UNIVERSE.



**Fig. f-1** R. Buckminster Fuller and David Blume. At the KQED San Francisco press conference for the launching of Dave's PBS alcohol how-to series.

The area of the surface of a sphere is exactly four times the area of the sphere's great-circle disk, as produced by a plane cutting through the center of the sphere. The surface of a hemisphere is, then, twice the area of the sphere's great-circle plane. When we look at the "full" Moon, we are looking at a hemisphere's surface which is twice the area of the seemingly flat, bright, circular disk in the sky. The total surface of the Moon's invisible other side plus the visible hemisphere is exactly four times that of the flat disk area of the full Moon as our optical illusion views it.

All of Earth's operational energy comes from the stars, but primarily the star Sun. It comes either as radiation or as inter-astrogravitational pull. One half of Earth's 200-million-square-mile surface is always sunlit. Twenty-four hours a day the Sun radiation is drenching the outside of the aurora and cloud-islanded biosphere's 100-million-square-mile hemispherical surface. The planet Earth's total biospheric mantle, which travels with it through space, has a depth of 400 miles. Forty billion cubic miles of Earth's Sun-radiation-impounding biosphere is always exposed to Sun, while the other 40 billion cubic miles of Earth's biosphere is always in Earth's night shade.

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*All of humanity's world-around energy uses are so inefficient that 95% of it is wasted. Despite that wasting, the total amount of energy consumed by humanity as of 1982 amounts to less than one five-hundred-thousandth of 1% of our daily energy income from the Sun...*

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While its thermosphere mantle is 400 miles deep, its mesosphere 50 miles deep, its stratosphere 30, Earth's propeller-flyable atmosphere is only 10 miles deep. This gives us one billion cubic miles of wind turbulent atmosphere on the sunny (day) side, and one billion cubic miles on the shadow (night) side. The one billion cubic miles of atmospheric molecules in the hemisphere which is constantly saturated by Sun are kinetically accelerated, while simultaneously the one billion cubic miles of atmospheric molecules in the shaded night hemisphere are kinetically decelerated.

The shadow side of Earth consists of one billion cubic miles of contracting atmosphere, while the one billion cubic miles on the sunny side is sum-totally expanding. All around Earth, both yesterday's and today's Sun radiation impound-

ments countered by gravity pulsatingly perturbate the atmosphere by anti-gravity thermal columns and Sun-evaporated Earth surface water risings, here and there outwardly against gravity, from oceans and lands. The rotation of Earth brings about a series of high-low relative atmospheric pressure differentials and their world-around semi-vacuumized drafts, which altogether produce the "high" and "low" atmospheric pressures and the complex turbulence which we speak of as "the weather."

The combined two billion cubic miles of atmospheric kinetics continually and anew convert the solar energy into weather, which in turn differentiates into wind power and gravity-accelerated "rain" and highlands-landed water power. A fraction of the wind power again interacts with gravity to produce the great waves, rolling power-laden, onward across the 150 million square miles of surface of the oceans, lakes, rivers, and ponds, to pound thunderingly and grind ceaselessly with fury upon the rocks, producing the gravels, sands, and dusts of Earth's million miles of coastlines. Wind power is Sun power in its most abundant, day and night, anywhere and everywhere, by a relative energy abundance factor of better than 99 to 1 in contradistinction to any of the other known means of terrestrial impoundments of Sun energy.

Three-quarters of Earth's total surface is covered with water. Employing photosynthesis, the water-borne algae convert Sun radiation energy into hydrocarbon molecules which, in a complex succession of swallowings by progressively larger marine organisms, metabolically accomplish a vast impoundment of Sun-emanated energy within Earth's waters.

Since human lungs and other organisms are designed for initial success only on dry land, and since the development of boats capable of mastery of major life support through offshore fishing means required millions of years of development, we must first look to the dry land for comprehension of humanity's initial life support.

The water-free one-quarter of Earth's surface consists of land which is largely covered by deserts, ice and snow fields, and rugged mountains. Only about 10% of our planet's surface is blessed with a total complex of natural conditions suitable for humans' outdoor cultivation of animal and vegetable food products. This suitability occurs only where the properly watered and temperatured



topsoil vegetation can impound Sun's radiation by photosynthesis.

Among the solar-energy-impounding dry land vegetation species, none can now match sweet corn's performance efficiency. Sweet corn converts and stores as recoverable energy 25% of the received ultraviolet radiation, whereas wheat and rice average only 18 to 20%. Sustained by the initial botanical impounders of solar energy, animals and other creatures automatically proliferate the production of orderly hydrocarbon molecules in their own DNA-RNA-programmed cell growth.

Humans in turn consume the energy-rich hydrocarbons proliferated by creature and vegetation cell growth to sustain their own subconsciously (DNA-RNA) accomplished corporeal cell multiplication, as well as for sustaining their conscious expenditures of physical work or play effort. Objectively employing the cosmic principles discovered by human mind, human work can design and produce the extracorporeal tools which in turn produce the commercial alcohol, methane, gas, etc. Or humans can leave untampered-with the slow process of nature's energy production of solid and liquid fossil fuels produced through heat and pressure conditions accomplished by nature within Earth's crust.

The requisite pressures and heat that must be maintained continuously and steadily over the multimillenia involved in the natural production of liquid fossil fuels, when accounted at the kilowatt-per-hour prices charged to retail customers by the public utilities for that much energy for that vast span of time, amount to well over a million dollars per each gallon of petroleum. Kilowatts are energy units employed by scientists and engineers which are mathematically convertible into (and predicated upon) humans' prime measure of energy as work, i.e., the amount of energy expended to oppose gravity by lifting a given weight a given vertical distance in a given amount of time, which is expressed as foot-pounds-per-minute, or meter-kilograms-per-minute, or as centimeter-gram-seconds (cgs), etc., ergo kilowatt-hours. Physicists, astrophysicists, astronomers, chemists, and engineers employ these standards of measurement to discover how the physical Universe in which we live operates. Such methodical measuring has discovered a complete integrity of energy accounting in the Universe.

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Newton's discovery of the geometrical rate of interattractiveness variance, in respect to arithmetical change of celestial bodies' interdistancing, from which we derive the gravitational constant, plus the measurement of the linear speed of radiation in a vacuum (186,000+ miles per second) is compounded with quantation of photons radiated per second to provide the radiation constants. Nonsimultaneous-scenario Universe's eternally regenerative, 100%-efficient integrity is predicated upon the ever-energetic intertransformings of gravity vs. radiation—from matter to radiation and vice versa. Einstein's equation of  $E=mc^2$  (as eventually proven by fission) provided humanity with the competence to participate in the integrity of cosmic accounting.

All of humanity's world-around energy uses are so inefficient that 95% of it is wasted. Despite that wasting, the total amount of energy consumed by humanity as of 1982 amounts to less than one five-hundred-thousandth of 1% of our daily energy income from the Sun and only one 12-millionth of a percent of our daily energy income from both the Sun and our geothermal sources.

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*It is incontestably clear that it is now technologically feasible to harvest enough of our daily income of extraterrestrial energy ... generated at an inexorable, nature-sustained rate, to provide all humanity and all their generations to come with a higher standard of living and greater freedoms than ever have been experienced by any humans and to do so within ten years, while completely phasing out all further use or development of fossil fuels, atomic and fusion energies.*

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It is incontestably clear that it is now technologically feasible to harvest enough of our daily income of extraterrestrial energy as well as of the surface eruptive steams of internal Earthian infernos, all generated at an inexorable, nature-sustained rate, to provide all humanity and all their generations to come with a higher standard of living and greater freedoms than ever have been experienced by any humans and to do so within

ten years, while completely phasing out all further use or development of fossil fuels, atomic and fusion energies.

This means it is possible for Earthian humanity to live on its daily energy income as generated by star radiation and cosmic gravity—primarily that of the star Sun—rather than: (a) by exhaustion of the millions of years of celestial energy photosynthetically impounded by the terrestrial vegetation and deposited into Earth's crust as a cosmic savings account possibly to be used many billions of years hence to convert planet Earth into a star; or (b) by burning up the atoms of which Spaceship Earth is structured; or (c) by fusion's disruption of the biosphere's delicate hydro and thermal balancing, the incisive integration of which governs the comprehensive metabolic chemistries of terrestrially regenerative ecology.

Three-quarters of our planet Earth's surface is covered by water. Water constitutes about 60% of the physical substance of planet Earth's biological organisms. Sixty-five percent of the human body consists of water. The Earth's oceans contain 97%

of all our planet's water. The surface of the Earth's waters is being continually vaporized into clouds to be redistributed around Earth as rain or snow. Sum-totally, Earth's waters are being continually recirculated throughout its combined ecological and geological biospheric system. Water is the "blood" of Earthian life. The average depth of its oceans is less than one four-thousandth of the Earth sphere's diameter. It is a gossamer film so thin that it is proportionately less than the depth of the blue-ink printing of the oceans on a 24-inch Earth globe. This almost ethereal film is kept from instant evaporation by the Sun only through the energy-reshunting properties of the plurality of additional concentrically enshrouding chemical and electromagnetic spherical mantles of Earth's biosphere.

The entropic energy losses to Universe occasioned by our emergency-urged fortuitous exploitation of Spaceship Earth's inventory of integral atoms either by fission or fusion will probably violate the integrity of the complex cosmic design for successful maintenance of human life aboard Earth.

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*This means it is possible for Earthian humanity to live on its daily energy income as generated by star radiation and cosmic gravity ... rather than ... by exhaustion of the millions of years of celestial energy photosynthetically impounded by the terrestrial vegetation and deposited into Earth's crust as a cosmic savings account...*

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# INTRODUCTION

## FUELING A REVOLUTION

This book is the distilled essence of the most pertinent information ever assembled in one place on alcohol fuel—the technology that can help us finally become producers of almost limitless energy, instead of extractors of finite resources. How we produce our energy from here on out will determine how we govern ourselves and how we relate to nature and the environment; it will also create a sea change in where wealth concentrates. It will determine if the future is ruled by a small number of armed dictatorships backed by military and industrial interests (a cabal I like to refer to as MegaOilron or the Oilygarchy), or if energy, and therefore power, is held by a diffusion of democratic entities, based on their ingenuity and ability to gather a portion of their daily solar income.

How did I first learn about alcohol's ability to run vehicles? I can still remember, as clear as a bell, talking about brewing beer (which was still illegal in 1974) with Doc Sweeney, one of my ecological biology professors at San Francisco State. He was infamous for telling students outrageous tall tales with a straight face just to see their reaction, or better yet, to see if he could get away with it.

He said to me, "That beer you're brewing could even run your car."

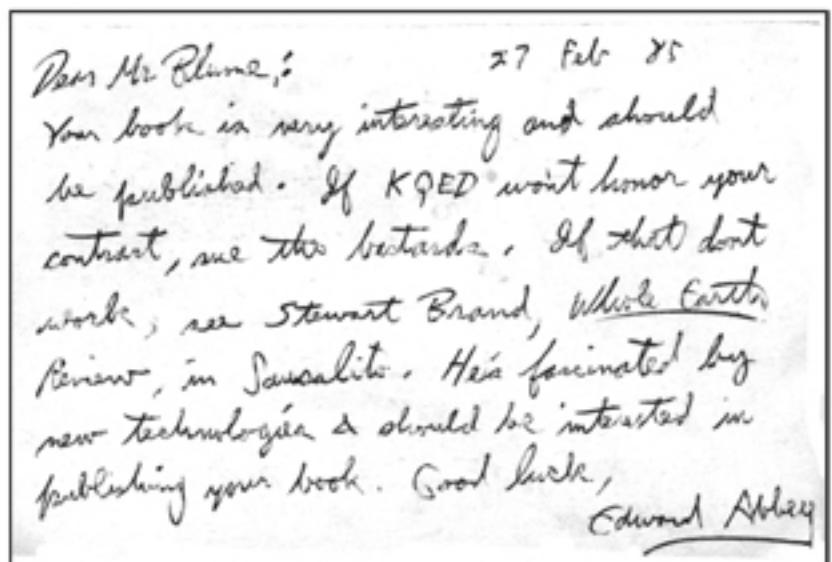
His deadpan expression was daring me. "You're lying," I said.

And, as any really excellent teacher would, he said, "Prove it."

So I went to the library, figuring this was going to be the needle in the haystack search of all time. Much to my surprise, I found more than 30 books from the early part of the 20<sup>th</sup> century. There was a whole hidden history of alcohol as a fuel that my friends and I had never known existed. Damn that Sweeney; he hooked me good.

A few years later, during the mid-1970s gas crises, the knowledge that I gained would hold me in good stead as I started making fuel alcohol,

IT TOOK OVER 25 YEARS TO FINALLY GET THIS BOOK TO YOU. IT REPRESENTS THE CONFIDENCE OF ALMOST 30 PEOPLE WHO COLLECTIVELY LOANED MORE THAN \$250,000 TO SEE THIS PROJECT THROUGH. IT'S THE MOST COMPREHENSIVE BOOK EVER WRITTEN ABOUT ALCOHOL FUEL. ITS PRODUCTION HAS BEEN A MASSIVE EFFORT THAT HAS DEPENDED ON THE COOPERATION OF HUNDREDS OF PEOPLE WHO CONTRIBUTED BOTH THEIR KNOWLEDGE AND, MORE IMPORTANTLY, THEIR EXPERIENCES. ALMOST EVERY SECTION OF THIS BOOK WAS REVIEWED BY COLLEAGUES AROUND THE WORLD....



**Fig. 0-1 Postcard from Edward Abbey.** The iconoclastic, irascible curmudgeon and author of *The Monkey Wrench Gang* suggested I sue KQED. Well, Ed, I tried.

and started working at the *Mother Earth News* Ecovillage research facility. *Mother Earth News* was a pioneering publication that was the guiding voice of the back-to-the-land movement, and its ecovillage was a seething hotbed of part-time and full-time inventors building all sorts of equipment, tools, and simple machinery that really defined appropriate technology in the U.S.

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*The MegaOilon full-court press was like a black cloud blotting out the sun. The reign of George Bush the Elder, first with Ronald Reagan as nominal president and then with himself as president, would eventually crush virtually all alternative energy programs everywhere.*

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In 1979, I started American Homegrown Fuel, an educational organization that would spread the word. Over the next few years, I taught nearly 180 workshops to over 7500 people on how to produce alcohol fuel and how to convert their vehicles and equipment to use it. At least 97 fuel-making cooperatives formed out of my workshops. I made over 700 press appearances and worked as a consultant all over the U.S., as well as in many small foreign countries that were reeling from the impact of spiking oil prices.

The late 1970s were an exhilarating time for those of us in the alternative energy movement. The Carter administration passed a windfall profits tax on the obscene oil industry profits that were made when OPEC embargoed oil to the U.S. and jacked up the price. Carter took the money from the oil companies and plowed it into alternative energy. He generated tax credits for alternative energy projects such as cogeneration, alcohol fuel, solar panel installation, and biomass energy equipment. Many states got into the act by matching or exceeding the federal credits with state tax credits. The state of California, under Governor Jerry Brown, established an alcohol fuel design competition and also put together a revolving loan fund for small farm-based alcohol plants. The federal government forced utilities to buy alternatively produced electricity from small producers at the "avoided cost" of what power would have cost from a new nuclear plant.

Those of us working in those heady days knew with an unfounded certainty that the solar revolution was happening and that we were going to take MegaOilon down to its foundations.

It was in this climate that, in 1980, I was approached by PBS station KQED in San Francisco to take my alcohol fuel seminar and put it into the format of a ten-part how-to television series. The



Fig. 0-2

original version of this present book was to be produced as the companion volume to the series.

At the time, I was concerned that since several corporations sponsored various PBS offerings, KQED could be pressured about the content of the show. I was assured that I had nothing to worry about, since most of KQED's funding came from the Corporation for Public Broadcasting, funded by the public's tax dollars; corporate grants were only a small part of the station's budget. In fact, PBS had recently aired something called *Death of a Princess*, the secret filming of the execution of a Saudi princess who was stoned to death for adultery. Oil companies had tried to pressure PBS not to air the show, but PBS had refused. I was reassured, and we went to work on the project, which took two years.

We filmed the series at my distillery in Napa and in the studio. We also took a 1000-mile road trip all over the West Coast and filmed my students who had built various distilleries and done car conversions, and got a lot of great footage telling folks about how it felt to be independent of big oil.

At that time, dark clouds were forming. MegaOilron had organized and funded political campaigns in 1980 to overtake the White House and sweep the progressives who were spearheading the solar revolution out of office. Its presidential candidate was a former actor and spokesperson for General Electric; the choice for vice president was an oilman born into wealth derived in part from fascist collaboration with Hitler.

According to the best evidence, MegaOilron colluded with the government of Iran to delay releasing American hostages held in that country until the day after the U.S. election, in exchange for weapons Iran could use in its conflicts with Iraq. It also manipulated oil prices and supplies to embarrass President Carter. The MegaOilron full-court press was like a black cloud blotting out the sun. The reign of George Bush the Elder, first with Ronald Reagan as nominal president and then with himself as president, would eventually crush virtually all alternative energy programs everywhere.

This was the climate in which, finally, in 1983, the PBS alcohol fuel series premiered on KQEC, KQED's smaller UHF station in San Francisco. The premiere press conference featured visionary R. Buckminster Fuller, author of the original

book's foreword; Ernest Callenbach, author of *Ecotopia*; and Bill Paynter, Ronald Reagan's private pilot and partner of astronaut Gordon Cooper in an alcohol aviation company.

KQED had already successfully marketed the series at the PBS convention, and approximately 120 stations nationwide had agreed to air it. During the first three segments, which aired in the San Francisco Bay Area, thousands of people called to order the book. I traveled to Portland, Oregon, with KQED's check and the layout boards in hand, to print the first 10,000 books. I stayed in town to be on hand in case any last-minute line changes or layout changes needed to be approved.

I got a call from the printer the day after the airing of the fourth segment. He told me that KQED had called him and told him to stop work and to send back the check. I raced down to the printer's, barely in time to retrieve my book before he boxed it up to mail to KQED. The station refused to take my calls from Portland.

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*"Cowardice asks the question, Is it safe? Expediency asks the question, Is it politic? Vanity asks the question, Is it popular? But conscience asks the question, Is it right? And there comes a time when one must take a position that is neither safe, nor politic, nor popular, but he must take it because his conscience tells him that it is right."*

—DR. MARTIN LUTHER KING, JR.

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I returned to San Francisco, and much to my dismay saw the last five segments of the show air without the book advertisement. KQED cancelled the distribution of the series, and when I tried to ask why, they stonewalled me for weeks, which finally resulted in my invoking the arbitration clause in our contract. Despite the arbitration clause, KQED was provided with a three-lawyer team of attorneys paid for by Chevron. To obfuscate the case, using a nifty legal maneuver, they claimed I breached the contract and countersued me. While they knew they had no case, they used the legal discovery process to put me through weeks of depositions and document requests, which they couldn't legally do in arbitration.

When we finally got to arbitration, they used the reams of material they generated in the lawsuit to turn what should have been a three-day arbitration process into weeks of hearings, which wore the volunteer arbitrators down and ran me into

substantial debt. In an understandable fit of frustration, the arbitrators called an end to the proceedings. KQED retained the rights to the video, with no obligation to air it, but I received the rights to my book back. (I estimate KQED outspent me ten to one.)

Just after Bush/Reagan were elected, they cut the funding for the Corporation for Public Broadcasting by two-thirds. Then MegaOilron went to the handful of PBS stations that did original productions at that time and stepped in to make up the lost government funding. This made the PBS core stations fully dependent on corporate funding. So when someone at Chevron heard about my series, it took a simple phone call. I was caught in the pacification of PBS without knowing it was going on.

I firmly believe that if the series had gone on in 1983, we would not have had the first Gulf War, and we would not have found ourselves in wars with Afghanistan and Iraq—because we wouldn't have been dependent on Middle East oil.

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*Remember ... ecologically, Nature favors creatures that cooperate; often, in situations of competition for the same ecological niche, both competitors become extinct. (Charles Darwin did not say "survival of the fittest"—that comes from right-wing economist Herbert Spencer, who created the crackpot theory of Social Darwinism.)*

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In designing this new version of the book, I had to make some choices early on. Various prospective publishers argued that putting all of this material into one large volume might scare off readers who just want a recipe book of how to make alcohol. They said, "All this history and politics is fascinating, but aren't you afraid that including it in your how-to book would scare away some buyers?" "Put it in a separate publication," their marketing experts said. But in the final analysis, I decided that this book should be a complete tool kit to revolutionize our transportation energy system, combining a broad, sweeping vision with intricate detail.

I spent four years working on this book with a small team of researchers. I traveled all over the United States in search of the most up-to-date information. In frozen South Dakota, I talked to Orrie Swayze and his farmer and VFW buddies who are taking on the oil companies, and to alcohol combustion engineer and alcohol aviation expert, Jim Behnken. I went to Decatur, Illinois, to see the

largest alcohol plant in the U.S., Archer Daniels Midland's 200-million-gallon-per-year plant. My travels also took me to Brazil to document the world's largest alcohol fuel program.

It took over 25 years to finally get this book to you. It represents the confidence of almost 30 people who collectively loaned more than \$250,000 to see this project through. It's the most comprehensive book ever written about alcohol fuel. Its production has been a massive effort that has depended on the cooperation of hundreds of people who contributed both their knowledge and, more importantly, their experiences. Almost every section of this book was reviewed by colleagues around the world to make sure that its contents meet the high standards of peer review.

You probably will not personally need all the parts of this book. If you don't, then that's good, because it means you recognize that you need other people with their particular interests and skills to work with you. Interdependence, not self-sufficiency, is the focus of this book, although those who like to do things on their own will relish the details I provide. Remember, though, that ecologically, Nature favors creatures that cooperate; often, in situations of competition for the same ecological niche, both competitors become extinct. (Charles Darwin did not say "survival of the fittest"—that comes from right-wing economist Herbert Spencer, who created the crackpot theory of Social Darwinism.)

So what might that cooperation look like? Farmers among your circle might produce an energy crop, and provide you a place to operate a distillery to produce the fuel. Or maybe you're a lawyer and can write up the limited liability corporation paperwork of this cooperative effort so the members can get the hefty tax credits usually lapped up by big corporations. You may be a mechanic, and your bowling buddy is showing this book to you so you can convert his vehicle, generator, lawn mower, or heater to alcohol fuel. You might be a truck driver who decides to get her own fuel truck to deliver alcohol to tanks people have at their homes, just like propane or fuel oil. Maybe you are a patriotic soccer mom/anti-oil-war activist who has decided that it's your role to organize the folks together because a barrel of oil is not worth a bucket of blood. Maybe you are someone who feels really sick every time you fill your tank with gas, knowing that you are part of the problem but

working two jobs just to stay even, and you realize that you need to be a member of a fuel co-op.

I want to say to all of you, it's okay that you yourself might not understand every part of this book. Relax, you don't need to. Share. Organize. Win.

There's a lot that goes on in the world of energy that you never see on the 11 o'clock news—things people really ought to know if they are to be informed participants in a democracy, or even savvy taxpayers. There's also a lot going on with our environment that is inextricably connected to energy, underreported news that affects our health as individuals and as a species. So you will find that I've liberally peppered facts, quotes, figures, and personal stories in bite-sized pieces throughout the book. I hope you find them informative, useful to start heated conversations with at parties, and maybe the source of motivation to write a few letters to Congress. I hope they inspire you if the going gets a little tough.

So after all that, what is this book about? Well, as I remind you in Chapter 2, it's not just about getting unlimited cheap, clean fuel for your SUV. It's also not just about having your own fuel when declining oil supplies mean that rationing becomes necessary. In raw terms, it's about power. After all, democracy is the quaint idea that the people ought to have the last say in how they are governed.

The energy corporations are the biggest in the world. They are larger in economic size than most countries. For years now, they and their ilk have acted as the government of the world—because the control of a country's energy is the ultimate control of its people.

As we reach a point where there isn't enough petroleum to go around, the battle for who gets the last barrels is already engaged. MegaOilron—that relatively small clan of government, military, and energy industry elites—is ready to govern at any cost—war without end, terrified and battered people, a world without civil rights. It has shown it is willing to kill large numbers of people in the pursuit of money and power. It is willing to lie, cheat, and steal from our treasury; willing to tax us and send our children to die in the fight for oil.

Nature, through ecological collapse, will fight back against the oil culture. Farmers are fighting back by refusing to sell their products for nothing and joining together to produce fuel. Whole nations, knowing that the Oilygarchy won't let

them near the last oil, are gearing up to harvest solar energy for biofuels.



But the most important resistance comes from you and me. Do we let MegaOilron take the world down into the hell it is creating, or do we withdraw our support in the way that capitalism knows best? If I don't give transnational corporations my capital and if you don't give them yours, then this corrupt Oilygarchy will stagger and fall. We can and we must do it together; there is no one else to do it but ourselves. We are more than strong enough to do this without our leaders if they won't follow us.

Share. Organize. Win.

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*"I say to you, this morning, that if you have never found something so dear and precious to you that you will die for it, then you aren't fit to live.*

*"You may be 38 years old, as I happen to be, and one day, some great opportunity stands before you and calls upon you to stand up for some great principle, some great issue, some great cause. And you refuse to do it because you are afraid.*

*"You refuse to do it because you want to live longer. You're afraid that you will lose your job, or you are afraid that you will be criticized or that you will lose your popularity, or you're afraid that somebody will stab you or shoot at you or bomb your house. So you refuse to take the stand.*

*"Well, you may go on and live until you are 90, but you are just as dead at 38 as you would be at 90.*

*"And the cessation of breathing in your life is but the belated announcement of an earlier death of the spirit.*

*"You died when you refused to stand up for right.*

*"You died when you refused to stand up for truth.*

*"You died when you refused to stand up for justice."*

—DR. MARTIN LUTHER KING, JR., *BUT IF NOT* (SERMON), NOVEMBER 5, 1967

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