[PDF] Power to Save the World: The Truth About Nuclear Energy

Power to Save the World: The Truth About Nuclear Energy

Gwyneth Cravens
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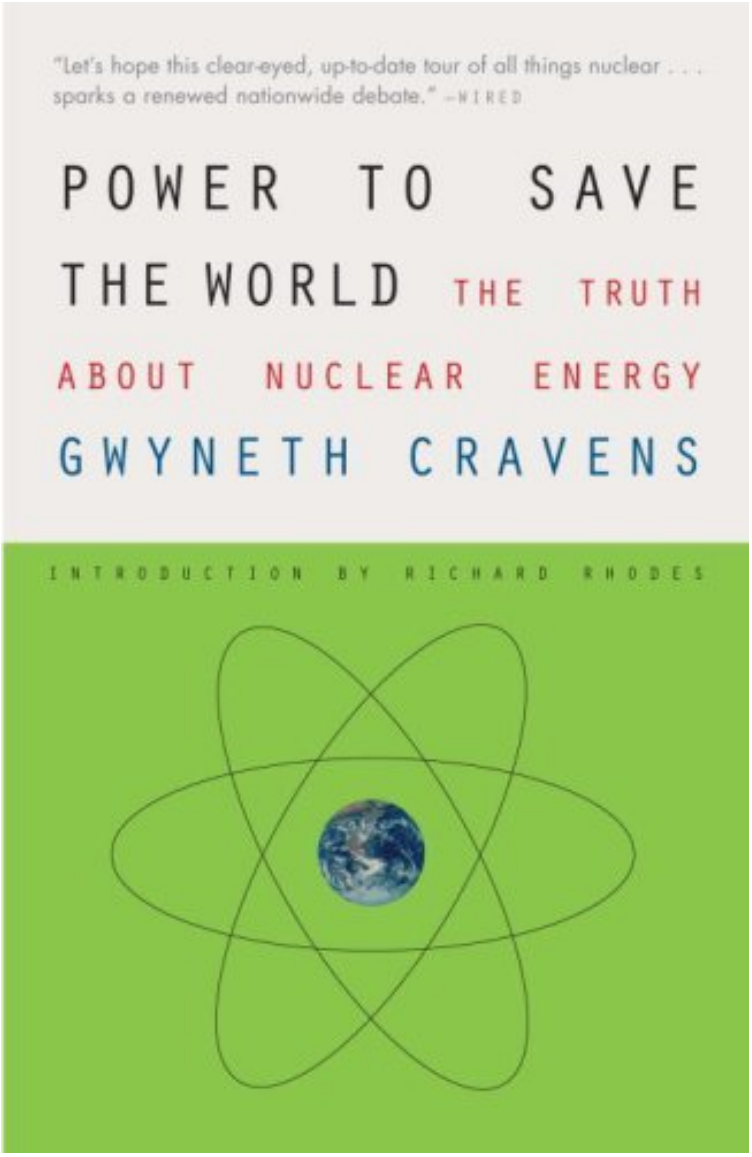

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Gwyneth Cravens : Power to Save the World: The Truth About Nuclear Energy before purchasing it in order to gage whether or not it would be worth my time, and all praised Power to Save the World: The Truth About Nuclear Energy:

4 of 4 people found the following review helpful. The Albuquerque connectionhellip;By John P. Jones IIILast March I was fortunate to be able to attend the ldquo;Einstein galardquo; which is the main fundraising event of the National Museum of Nuclear Science and History, here in Albuquerque, as a guest of the former Board Chair. Each year at the gala, they present the National award to a prominent individual or organization who has had an impact on nuclear

issues. After attending the event in 2012, I decided to read the recent book of the award winner, Dr. Lisa Randall Knocking on Heaven's Door: How Physics and Scientific Thinking Illuminate the Universe and the Modern World. Likewise, in 2015, I decided to read the book of the award winner, Gwyneth Cravens, a commitment I managed to fulfill in less than a year.During her acceptance speech, she spoke of her childhood in Albuquerque, playing in the arroyos in the desert, quite possibly where my house is now located. She also introduced Dr. Rip Anderson, who initially challenged her to reexamine her anti-nuclear bias, and was her guide around the nuclear world, and a rational ldquo;touchstonerdquo; by refuting many of the arguments, often ill-founded, that inhibit our development of a resource that is our best option for ldquo;saving the world.rdquo;The author commences with an epigram from Richard Rhodes, the author of (The Making of the Atomic Bomb) who in turn quotes Niels Bohr on the relentless goal of science being the ldquo;removal of prejudices.rdquo; In her text, in passing almost, she also quotes an equally apt passage from George Eliotrsquo;s Middlemarch (Penguin Classics): ldquo;Everyone liked better to conjecture how the thing was, than simply to know it; for conjecture soon became more confident than knowledge, and had a more liberal allowance for the incompatible.rdquo;In addition to ldquo;the brainsrdquo; of the Manhattan Project being in Los Alamos, NM, and the first atomic bomb being detonated at Trinity site, near Alamogordo, NM, the state was the source of substantial amounts of uranium. The first stop on her ldquo;nuclear tourrdquo; was Ambrosia Lake, west of Mt. Taylor. With clear and lucid explanations, she ties together the work of Madam Curie, the significance of the U-235 isotope of uranium, and the boom-and-bust cycle of uranium mining, with Navajo Indians playing a prominent role.With the help of Dr. Anderson, and with a considerable amount of hassles in the ldquo;post 9/11 erardquo;, she would manage to tour the Idaho site, where nuclear reactors were deliberately put to extreme tests, and ldquo;melted downrdquo; on occasion. One of the meaningful comparisons she was able to make was a tour of two Duke Power plants in the Carolinas, one nuclear, the other coal fired. She toured Three Mile Island, the site of the most famous nuclear mishap in the United States, and relieved my brain of some of the useless misconceptions I still carried about it. Vicariously, via Dr. Fred A. Mettler, Chair of the Radiology Department of the Univ. of New Mexico, she would ldquo;tourrdquo; the worst disaster in the history of nuclear power: Chernobyl. He was a major investigator of this event. She also toured WIPP, the operating nuclear waste depository in southeastern NM, as well as the non-operational money sink hole of Yucca Mountain in Nevada.Cravens provided numerous ldquo;takeaways.rdquo; These include the fact that ldquo;riskrdquo; in the nuclear field is still being measured by the ldquo;linear non-threshold hypothesisrdquo; (LNT). An apt comparison can be to having onersquo;s hand being burned in 212 degree F. water. Using LNT, if a million people placed their hands in 36 degree F. water, 500 would receive third-degree burns. In essence, small amounts of radiation are still considered dangerous, and are not related to the amount of radiation people receive naturally. For example, as Cravens points out, people will double the amount of background radiation by simply moving from Long Island, in New York to Albuquerque, because those living at higher altitudes receive more background radiation. She also relates a meeting of the Albuquerque Chamber of Commerce, in which the assessment was: isnrsquo;t the massive amount of safety redundancies in the nuclear field a waste of money compared to anything else we do, for example, the operation of coal-fired plants that spew far greater amounts of toxins into the environment?To some degree Cravens addresses the problem, but I feel it needs a much more thorough review, because it remains the ldquo;essential problem.rdquo; For example, she cites how additional radiation was detected by Duke Power, on workers coming from a site in Ohio, which, admittedly had a reputation as being poorly run. The response from the Ohio site: denial and defensiveness. Radiation IS an issue of which the public is poorly informed, and the images of Hiroshima and Chernobyl dominate. She speaks of tough regulators overseeing, and the honest and integrity of the workers in the nuclear field, of which, I am sure there are some, but what also dominates the public perceptions are the continued lies and inactions and cover-ups in widely disparate governmental (and yes, corporate!) areas from FEMA and Katrina, to the SEC and Bernie Madoff, through the Veterans Administration and HHS implementation of the ACA, Worldcom, Enron, and the latest outbreak of killing substances in the food industry, et al. And what can be done about putting the publicrsquo;s mind at ease about that?Overall though, despite some justified reservations, Cravens did convince me that a vigorous program to adopt nuclear power in the United States, as France has long done, is not merely an option that is 20% better, but rather an entire magnitude better. 5-stars for an essential read.45 of 45 people found the following review helpful. An eye opener to be read and re-read!By Kenneth W. ChristianI am quite sure that Gwyneth Cravens's highly readable book will be controversial. I can only hope that it will get the reading it deserves.Before I read it, I was certain that I knew that nuclear energy was highly risky and a threat to all. I now understand that I actually knew very little. Despite every good intention, I had been pulled into a mindless groupthink about Three Mile Island, Chernobyl and by the very green movement I love. What I learned by reading Cravens, for example, is that as a species we evolved at a time of far greater radiation than now occurs and that one gets more radiation from eating a single banana, or crossing Grand Central Station once, than one gets living next door to a nuclear plant for a year. We are swimming in a sea of radiation, and always have been, but effectively none of it comes from the use of nuclear power plants constructed in the West. And interestingly, radiation turns out to be one of those things for which dosage is crucial. Radiation at certain low doses appears even to produce positive effects.This book is a pleasure to read because it brims not with opinions, hyperbole or hysteria, but refreshingly, with

scientific facts. There are no conspiracy theories and no bad guys (except maybe for coal producers). New, fresh, interesting information appears on every page. As Cravens points out, at one time not that long ago, people feared the dangers of bringing electricity into their homes. And they weren't completely wrong. Dangers accompany electricity, fire and other powerful yet beneficial forms of energy. The key to benefitting from them lies in overcoming fear and learning how to use the proper precautions with each.I suppose that much of my own negative reaction to all things nuclear stems from my complete antipathy to nuclear weaponry. What is clear, however, is that if we want to provide electrical energy on the massive scale we consume, we already have the technology to do it cleanly. It turns out that to produce the kind of base load energy we need to have 24/7/365, we really have two choices: coal, on which we primarily rely, and nuclear energy. Cravens makes the irrefutable case that coal is by far the more dangerous, more polluting, more greenhouse-gas-producing choice. And its use is nearly unregulated.Nuclear energy is THE green alternative for producing the quantities of electrical power we need now. No other current alternative produces abundant energy at low cost while producing NO greenhouse gases. The future we must move to if we want to save the planet, is available now. We can act to save the world if we overcome prejudice and fear.Thank you, Gwyneth Cravens for producing such a timely, reasonable and well documented book!1 of 1 people found the following review helpful. Interesting, accurate and informative, yet original, entertaining and involving - a true jewel!By Bojan NicenoThe book gives an in-depth look in the role nuclear technology plays today, and should play in the future, should we want to continue to live in the modern society while reducing the emission of green-house gasses into earth's atmosphere.It is written from the perspective of a curious non-technical person (the author) on her quest to learn on the benefits and risks of nuclear technology, the style which I find quite refreshing. The book is divided into six chapters, called: 1. Origins, 2. The Invisible Storm, 3. The Hidden World, 4. The Kingdom of Electricity and 5. Closing the Circle. The first chapters gives a light introduction to nuclear physics, the second focuses on radiation, both natural and man-made, and its health hazards and impact on environment. Third chapter, my favorite, outlines the history of nuclear technology, starting from Marie Currie to the development and extensive testing of light water reactors, which took place in the States in the fifties of the last century. Fourth chapter gives merits of nuclear power as compared to fossil fuels (oil and gas), and to "renewables". Fifth chapter, as the title suggests, talks about nuclear waste repository, and final chapter wraps the book with conclusions and outlook.The first-person approach to the subjects Gwyneth writes about, gives this book a personal touch, the reader gets involved as if it were a novel. But it's not, it is a technical book, based on strong scientific facts, which even comes close to be useful as a reference. No claim she makes comes out of thin-air, all can be traced in peer-reviewed literature. I admit I spent many hours underlining sentences I found particularly important and interesting, and following the references she gives. The "Notes" she gives in the book's appendix, proved to be very useful in that regard.Although I can say without hesitation that it is one of my favorite books (I am sorry it doesn't come with hardcover, but I am hopeful for the next editions) I must say that it tends to be lengthy in some parts, and repetitive on occasions. Many topics covered in the book (like radiation hazards, Chernobyl disaster, green-house gas emissions from conventional sources, impact of different sources on environment) spread over many chapters, making it a bit more tricky to use the book as a reference. But then again, it is merely my personal opinion, I am pretty sure Gwyneth composed the book this way to make each chapter more self-contained.Strongly recommended to any environmentally-conscious individual, be it a technical person or not. Gwyneth's book is accessible, involving and interesting enough to everyone.P.S. Although I don't have a habit to criticize other's review's, for this book I must make an exception, because it is plain obvious that reviewers who rated the book with one star didn't even read it.

An informed look at the myths and fears surrounding nuclear energy, and a practical, politically realistic solution to global warming and our energy needs. Faced by the world's oil shortages and curious about alternative energy sources, Gwyneth Cravens skeptically sets out to find the truth about nuclear energy. Her conclusion: it is a totally viable and practical solution to global warming. In the end, we see that if we are to care for subsequent generations, embracing nuclear energy is an ethical imperative.

.com Gwyneth Cravens on Why Going Green Means Going Nuclear "Most of us were taught that the goal of science is power over nature, as if science and power were one thing and nature quite another. Niels Bohr observed to the contrary that the more modest but relentless goal of science is, in his words, 'the gradual removal of prejudice.' By 'prejudice,' Bohr meant belief unsupported by evidence." --Pulitzer Prize-winner Richard Rhodes, author of the introduction to Power to Save the World: The Truth About Nuclear Energy by Gwyneth Cravens "Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less." --Marie Curie My book is fundamentally about prejudice based on wrong information. I used to oppose nuclear power, even though the Sierra Club supported it. By the mid-1970s the Sierra Club turned against nuclear power too. However, as we witness the catastrophic consequences of accelerated global temperature increase, prominent environmentalists as well as skeptics like me have started taking a fresh look at nuclear energy. A large percentage of the heat-trapping greenhouse gases, especially carbon dioxide, that thaw Arctic ice and glaciers comes from making electricity, and we rely upon it

every second of our lives. There are three ways to provide large-scale electricitymdash;the kind that reliably meets the demands of our civilization around the clock. In the United States: 75% of that baseload electricity comes from power plants that burn fossil fuels, mainly coal, and emit carbon dioxide. Toxic waste from coal-fired plants kills 24,000 Americans annually. 5% comes from hydroelectric plants. Less than 1% comes from wind and solar power. 20% comes from nuclear plants that use low-enriched uranium as fuel, burn nothing, and emit virtually no CO2. In 50 years of operation, they have caused no deaths to the public. When I began my research eight years ago, I'd assumed that we had many choices in the way we made electricity. But we don't. Nuclear power is the only large-scale, environmentally-benign, time-tested technology currently available to provide clean electricity. Wind and solar power have a role to play, but since theyrsquo;re diffuse and intermittent, they can't provide baseload, and they always require some form of backup--usually from burning fossil fuels, which have a huge impact on public health. My tour of the nuclear world began with a chance question I asked of Dr. D. Richard ("Rip") Anderson. He and his wife Marcia Fernaacute;ndez work tirelessly to preserve open land, clean air, and the aquifer in the Rio Grande Valley. Rip, a skeptically-minded chemist, oceanographer, and expert on nuclear environmental health and safety, told me that the historical record shows that nuclear power is cleaner, safer, and more than any other form of large-scale electricity production. I was surprised to learn that: Nuclear power emits no gases because it does not burn anything; it provides 73% of America's clean-air electricity generation, using fuel that is tiny in volume but steadily provides an immense amount of energy. Uranium is more energy-dense than any other fuel. If you got all of your electricity for your lifetime solely from nuclear power, your share of the waste would fit in a single soda can. If you got all your electricity from coal, your share would come to 146 tons: 69 tons of solid waste that would fit into six rail cars and 77 tons of carbon dioxide that would contribute to accelerated global warming. A person living within 50 miles of a nuclear plant receives less radiation from it in a year than you get from eating one banana. Someone working in the U.S. Capitol Building is exposed to more radioactivity than a uranium miner. Spent nuclear fuel is always shielded and isolated from the public. Annual waste from one typical reactor could fit in the bed of a standard pickup. The retired fuel from 50 years of U.S. reactor operation could fit in a single football field; it amounts to 77,000 tons. A large coal-fired plant produces ten times as much solid waste in one day, much of it hazardous to health. We discard 179,000 tons of batteries annually--they contain toxic heavy metals. Nuclear power's carbon dioxide emissions throughout its life-cycle and while producing electricity are about the same as those of wind power. Nuclear plants offer a clean alternative to fossil-fuel plants. In the U.S. 104 nuclear reactors annually prevent emissions of 682 million tons of CO2. Worldwide, over 400 power reactors reduce CO2 emissions by 2 billion metric tons a year. I wanted to know if what Rip was telling me was true. He took me on a tour of the nuclear world so that I could learn firsthand its risks and benefits. I visited many facilities, talked to many scientists in different disciplines, and researched the conclusions of the National Academy of Sciences and various international scientific bodies. As I learned more, I became persuaded that the safety culture that prevails at U.S. nuclear plants and the laws of physics make them a safe and important tool for addressing global warming. Clearly many of my beliefs had originated in misinformation and fear-mongering. I've now met many people dedicated to saving the environment while supporting nuclear power as well as other green resources. This path is only logical. Nuclear power is the only large-scale, non-greenhouse-gas emitting electricity source that can be considerably expanded while maintaining only a small environmental footprint. If as a society we're going to reduce those emissions, we'll need every resource to do so, and we'll have to set aside our ideological blinkers, look at the facts, and unite to meet the greatest challenge humanity has ever faced. The power to change our world does not lie in rocks, rivers, wind, or sunlight. It lies within each of us. --Gwyneth Cravens From Publishers WeeklyNovelist and science reporter Cravens (The Black Death) begins this journey of discovery "through the Nuclear world" dubious of nuclear power's safety and utility: "I'd participated in ban-the-bomb rallies" but "never considered the fate of a retired weapon." Her trip begins with a casual conversation with nuclear physicist Dr. Richard "Rip" Anderson on the hidden warheads being dismantled outside Albuquerque, N.M.; as it turns out, the nuclear "pits" were to be used for fuel in nuclear reactors. Curiosity, and Rip's conviction that no other large-scale energy source is as "safe, reliable, and clean," drives Craven to spend 10 years with the scientist traveling to national laboratories, uranium mines and nuclear waste sites; reviewing accounts of Chernobyl and Three Mile Island; and examining modern reactor designs, the life cycle of uranium and studies on radiation's effects since 1945. Gradually convinced that "uranium is cleaner and safer throughout its shielded journey from cradle to grave than our other big baseload electricity resource, fossil fuel," Craven has submitted a thorough, persuasive report from the front lines of the world's energy and climate crises, illuminating for general readers the pros and cons of a highly misunderstood resource. Copyright copy; Reed Business Information, a division of Reed Elsevier Inc. All rights reserved. ldquo;There is by now a pretty long list of enviromentalists who used to be anti-nuke and are now in favor of it . . . If a new book called Power to Save the World is half as good as this Wall Street Journal review says it is, expect that list to get much, much longer.rdquo;-New York Times Freakonomics blog by Stephen J. Dubnerldquo;Illuminating . . . a picaresque, flat-out love song to the bad boy of the great American energy debatendash;as good a book as wersquo;re likely to get on a subject mired in political incorrectness.rdquo;-Wall Street Journalldquo;In a vividly descriptive, exhaustively researched, and unfailingly lucid narrative, Cravens tracks the life cycle of uranium, tours nuclear facilities, and asks tough questions . . . Cravensrsquo;

thorough inquiry dispels myths, clarifies science, and portrays an astonishing and ever more crucial hidden world.rdquo;-Booklist, starred reviewldquo;Letrsquo;s hope this clear-eyed, up-to-date tour of all things nuclear . . . sparks a renewed nationwide debate.rdquo;-Wiredldquo;Craven has submitted a thorough, persuasive report from the front lines of the worldrsquo;s energy and climate crises, illuminating for general readers the pros and cons of a highly misunderstood resource.rdquo;-Publisherrsquo;s Weeklyldquo;Her presentation of these arguments is lucid and convincing, and her prose is lively and colorful . . . this is a sensible and important contribution to the dialog.rdquo;-Library Journalldquo;Interesting and informative . . . if you are concerned about global warming and the damage caused by our consumption of fossil fuels, as Ms. Cravens is, you would do well to read this book . . . very readable . . . understandable to the lay person while remaining technically rigorous.rdquo;-East Hampton StarFrom the Hardcover edition.