



Out of Gas: The End of the Age of Oil

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Our rate of oil discovery has reached its peak and will never be exceeded; rather, it is certain to decline—perhaps rapidly—forever forward. Meanwhile, over the past century, we have developed lifestyles firmly rooted in the promise of an endless, cheap supply. In this book, David Goodstein, professor of physics at Caltech, explains the underlying scientific principles of the inevitable fossil fuel shortage we face. He outlines the drastic effects a fossil fuel shortage will bring down on us. And he shows that there is an important silver lining to the need to switch to other sources of energy, for when we have burned up all the available oil, the earth's climate will have moved toward a truly life-threatening state. With its easy-to-grasp explanations of the science behind every aspect of our most urgent environmental policy decisions, *Out of Gas* is a handbook for the future of civilization.

Out of Gas: The End of the Age of Oil Details

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James Axtell says

Goodstein outlines the implications for reaching Peak Oil i.e. where (ever increasing) demand is not met by (historically ever increasing but from now on diminishing) supply. This is the point at which lifestyle choices on fuel consumption change forever. What will those uncomfortable about this do about it?

Julia says

I think I've just read too much of the green literature, because I'm getting very picky, and this wasn't a winner for me. It seems like a "for the love of sanity, listen to me!" plea written during George W. Bush's first term, before the oil price spike, before "An Inconvenient Truth." The author is very knowledgeable but doesn't frame his argument particularly well. More than 50% of the book is basic science, which is important but which isn't sufficient support for the argument he's trying to make. If you start off with the structure of the atom, proceed through the development of the steam engine, and then jump straight to peak oil, you haven't actually said much about where we are today or where we need to go.

Mostly, this book is just outdated, even though it was published in 2004. Much of what the author says about unconventional oil sources and about renewable energy technologies is not accurate today. (For example, tar sands and shale oil are more economically feasible than Goodstein allows.) Unfortunately, updated information would significantly change some of the conclusions of the book.

LibraryCin says

2.5 stars. We will run out of oil in the near future. In this book, Goodstein looks at the history and future of energy and alternatives to keep our lifestyle as is, once the oil is gone.

I am a bit mixed on this one. There were parts that I found interesting, but there were other parts that had a little too much science for me and lost me! A lot of it, he explained so that I could understand, but in some places, I just couldn't concentrate enough on what he was saying and my mind would wander. I think the parts I found most interesting were those in which he was talking about global warming and talking about the world running out of oil. I kind of got lost in the parts where he was explaining alternative energy sources and how they all work, and really getting into the details of it.

It might be slightly more interesting for those a little more science-minded.

Jef says

whether it's completely valid or not, this little volume is a good reminder of the damage we've already done to the planet, and projects dim prospects for the future, unless we do something soon. fact or fiction, it's food

for thought.

Ryan says

A great, albeit very short overview of Peak Oil from a technical stand point. Don't worry it is written for a general non-scientific audience, in fact I would say most of the scientific principles of energy, electromagnetism and thermodynamics are basic high school stuff. Still, to hear this coming crisis of humanity reaffirmed by a physicist lends the whole idea more credence.

In just a few chapters, the author examines the basics of energy, how combustion engines, electric motors and batteries work, then proceeds to outline the challenges in finding alternatives to the energy dense, low entropy fossil fuels we so flagrantly burn to power our industrial civilization. It is not completely bleak, he claims, as we already know the general principles of nuclear power that could theoretically replace fossil fuels some time in the future, when combined with exponentially more efficient batteries and motors to power electric vehicles. But he is not optimistic that it would save us in time because of the long lead times and massive scaling up required. I concur, and the situation is aptly summed up in the book's dedication "To our children and grandchildren, who will not inherit the riches that we inherit."

Itai says

This slim volume (131 pp) contains some interesting science background, but is poorly organized. The author's claim is that all energy (except for wave power) is nuclear, either from the sun or from the Earth's core and that we will soon change our collective tune about nuclear power plants - this, despite that he admits that uranium supplies are also finite. Didn't he have an editor at W.W. Norton?

John Kirk says

I'm concerned about oil dependency: it's a limited resource, and the faster we consume it the sooner we'll run out. So, I'm keen on encouraging alternatives (e.g. cycling) so that we can eke out our supply for a bit longer; we also need to plan ahead for when it's all gone. I expected this book to cover those topics in more detail, but it only touched on them briefly.

Instead, this is similar to *The Science of Discworld*: it covers a lot of "history of science". Some of it was familiar to me from A level Physics, but I had to struggle to keep up. It was interesting, and if you've been to university then you should be able to handle it, but I can't honestly describe it as a book that everyone should read. Goodstein explains what the problem is: in particular, it's a "fuel crisis" rather than an "energy crisis". He also describes various ways to generate energy, along with their pros and cons. For instance, switching to nuclear fission wouldn't be a long term solution; even if you ignore the problems of toxic waste, there's only a limited amount of fuel to power those stations, so it would simply delay the inevitable. He's not very optimistic about nuclear fusion, so he seems to advocate solar power as our best bet, possibly from satellites.

The key principle of the book is Hubbert's peak. This basically says that we'll be in trouble when we've used up half of the total oil that was ever available, because after that we'll be consuming it faster than we can pull it out of the ground. However, this book doesn't describe why that is the case; it simply says that Hubbert

made this prediction for the "lower 48 states" in the USA, and he turned out to be correct, so he's probably right about the rest of the world too. The bibliography refers to Hubbert's Peak: The Impending World Oil Shortage and I think I'll need to read that. If that the theory is correct, we're due to hit the peak very soon, i.e. within 5-10 years.

I've assumed that moving to electric power is a good idea, because that makes us "fuel agnostic", e.g. our computers and cars could be powered by oil today and then nuclear fusion later, without needing to change any wiring. However, Goodstein says that batteries are very inefficient, so it takes six times as much oil to power an electric car as it would for a petrol car. Using electricity immediately doesn't have that problem, so electric trains/trams are more efficient than battery powered buses.

I wouldn't recommend this book to everyone, but I'd hope that our elected MPs are aware of these issues. (Whatever else you say about Margaret Thatcher, she had a degree in Chemistry, and I think we need a few more influential scientists now.)

Mohannad says

The entire book revolves around the *Hubbert Peak Theory*, a theory which has no merit when used to analyze oil production on a global scale. Another attempt for oil pessimist to make us believe that oil will deplete in 10 days. Not recommended.

Emma Clement says

Depressing but really made me think about my career as an environmental engineer and how I want to help our planet and society. <https://www.goodreads.com/book/show/6...#>

Ryan Underwood says

I found this book very interesting as it sends out a very true and worrying warning. That without change our day-to-day lifestyle can not be sustained. I also enjoyed its clear descriptions of key physics theory's for example the law of thermodynamics, and also the range of possibilities for the future. Overall this is definitely something i can recommend especially for a A-level student.

Kev says

If you know nothing about "peak oil" or the reality hitting us in the face of 4 dollar/gal gas and rising due to global demand-driven oil scarcity and its prevasively chronic geo-political problems then read this. Dr. Goodstein is a physicist at Caltech and former Vice Provost of the institution. He knows what he is talking about.

Jason says

This is the shortest, most concise and easy to read book for anyone not familiar with the topic of oil, peak oil or energy. Its easy-to-understand description of difficult concepts makes it a great tool. Straight forward. The way it is. Read it.

Kevin says

I thought this was interesting. I already knew about Hubbert's peak theory, so this may have been preaching to the choir, but it's also hard to expect a book published in 2004 to have any new information for 2013. Also a brief course on heat engines and thermodynamics. Only 123 pages, and there are probably worse things one could be reading.

Mark says

I'm not sure why this particular title is getting so much attention, given that Rifkin's *Hydrogen Economy* is better documented and comes to the slightly less insane conclusion that renewables/alternative energies are the path to salvation while Goodstein argues that nuclear energy is the only way to prop up our energy regime. While I don't agree with his solution, he does undertake a layman's explanation of thermodynamic principles that should be of utmost importance to us all. But again, I think Rifkin tops him on this area as well. Worth a glance, but it shouldn't be the basis of a decision on where to take our society from where we are right now.

Zora says

The condensed version of the issue, at 123 pages of actual content. More optimistic than I am, but not goofily so. (He thinks that we can solve the problems of nuclear power, while I think we must go to nuclear power but accept that there will be a Chernobyl per year worldwide, and we just have to suck it up and live with the risk. He has hope people will act before it is too late, while I'd say "ha!" to that.) Otherwise matches what I have read elsewhere.

You know what this would be great for? A senior high school class in science or world issues.
