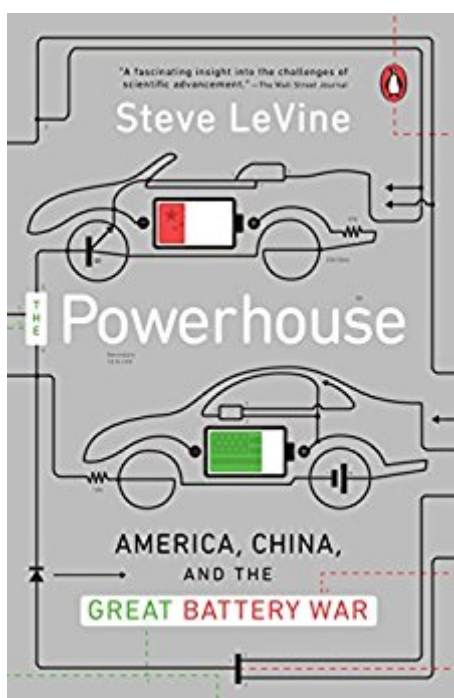


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# The Powerhouse: Inside The Invention Of A Battery To Save The World



## Synopsis

A Soul of the New Machine for our time, a gripping account of invention, commerce, and duplicity in the age of technology. A worldwide race is on to perfect the next engine of economic growth, the advanced lithium-ion battery. It will power the electric car, relieve global warming, and catapult the winner into a new era of economic and political mastery. Can the United States win? Steve LeVine was granted unprecedented access to a secure federal laboratory outside Chicago, where a group of geniuses is trying to solve this next monumental task of physics. But these scientists-- almost all foreign born--are not alone. With so much at stake, researchers in Japan, South Korea, and China are in the same pursuit. The drama intensifies when a Silicon Valley start-up licenses the federal laboratory's signature invention with the aim of a blockbuster sale to the world's biggest carmakers. The Powerhouse is a real-time, two-year account of big invention, big commercialization, and big deception. It exposes the layers of competition and ambition, aspiration and disappointment behind this great turning point in the history of technology.

## Book Information

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Electric

## Customer Reviews

Spoiler alert! This book would have been better if it were about half as long. I only made it through about 70% before I gave up. Instead I looked up Mr. LeVine's article on Quartz about the collapse of Envia. That article was a good read, but here he tried to wrap the Envia story up with the details of battery research at Argonne and make it into a fairly long book. It loses focus as it delves into needless detail on the interactions of a couple dozen major and minor players. I started to lose track of all the postdocs and bit players who pop in and out of the story. About 20% of the book is just about the process of writing a grant proposal, which is drudgery to do and not much fun to read about. This should be a good story. There is deception and institutional disfunction, politics and backstabbing. However, the author is too coy while building up to the big reveal about Envia. For the part of the book that I read, everything Envia claimed is presented with complete credulity.

Ultimately, the suspense is lost. I think a lot of people who read a book about car batteries will already know the Envia story, and the way it is presented here gives no additional insight into what happened there. As for Argonne - I think we are supposed to be rooting for them, but what comes through between the lines makes the institution seem like its own worst enemy. Mr LeVine's presentation of the material is dry and fact oriented. Maybe that's inevitable, given the subject matter: a large government laboratory. It was about as exciting as reading a book about the inner workings of the post office. Finally, there is the science aspect. I'm a physicist, but I don't know anything about battery science in particular. To me, the scientific explanations read like an author who doesn't understand the science trying to paraphrase people who do. He gets all the important details in accurately, but there was not a lot of scientific insight. This disappointed me, as I originally hoped this would be a light science book about battery technology. But again, the book was more about politics than science.

Interesting story of the history of lithium ion batteries, but not so much from a scientific standpoint, rather from a business perspective. Nice history. I felt the history provided was incomplete. Levine only spends a page or so on Elon Musk, CEO of Tesla Motors, and builder of the huge lithium battery factory in Reno, NV. A frustrating omission. Also, he did not mention at all the lithium ion battery fires in the Boeing 787's. A huge omission, in my view. This book was copy written in Feb, 2015, so there should have been more. Also, I would have appreciated more technical detail, a bit more of the physical chemistry, or whatever, so as to understand what to me is a black box. (I had

the kindle version) - I was frustrated by lack of some sort of pictorial representation of the cathode lattice microstructure the Levine spent too much time writing about. I did come to appreciate that lithium ion "battery" resembles a capacitor: they move ions from anode to cathode, without any chemical change - unlike a lead acid battery that involves actual chemical reactions. No wonder lithium ion batteries are so good at brief, large amperage discharges (like starting a car engine), but less good at deep storage capacity (like actually powering a car over about 40 miles). I also feel Levine did a good job describing why government subsidies are important for development of battery technology, and of reasons why development has gone so slowly to date. I do very much agree with the main premise of the book: battery technology is and will be very important for the future of our technical civilization. In that regard, the book is worth reading.

It is a good book, well written and thoroughly researched. It describes in great detail the efforts from 2008 to 2014 to find a viable energy storage solution for electric vehicles, mainly centered around US DOE Argonne National Lab. It focuses almost solely on the efforts within Argonne and Envia; and leaves out discussing countless other efforts around the world. The value of the book is in depicting the numerous forces at play within the large US government labs, the maze of subsidies and hype that supports them, and the complex licensing arrangements and public-private partnerships that became so popular during the financial crisis. It is particularly interesting for entrepreneurs sitting outside those heavily subsidized and centrally orchestrated efforts. The end of the book leaves you feeling unconvinced of the government sponsored leadership pursuing emerging technologies. It almost confirms that those efforts are better left to the markets and entrepreneurs; government intervention seems to pile up risk averse behaviours, consolidate bureaucracies and create unreliable business outcomes. The book also describes sources of compensation for employees of labs that seem excessive in light that those scientists should be regarded more as public servants than bona-fide entrepreneurs, no matter how much their efforts are incentivized through royalty sharing agreements. A good well written book.

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