Matthew's Book Club Summary #16

By:	Matthew Klippenstein	**Date:**	April 9, 2010
Title:	A Thousand Barrels a Second		

The book club started as an informal, fun way to explore and consider business ideas relevant to our work with colleagues. The format consists of one person (usually Matthew) reading a book and writing a summary for discussion during team meetings. This allows the other team members to benefit from the book's insights, without carving time in their schedule to read the full volume.

The idea was to summarize ***an interesting part*** of each chapter in a paragraph or two, and where applicable, note how these could be relevant to the workplace. This provides the reviewer with practise condensing a mass of data into a few pieces of key information: an underappreciated skill. The reviews are meant to be accurate but light-hearted, on the assumption that people learn more when they're having fun.

Matthew's company gave permission for these to be distributed to non-employees as long as the employer-specific content was removed, for which he is sincerely appreciative.

- - - - - - - -

About the author:

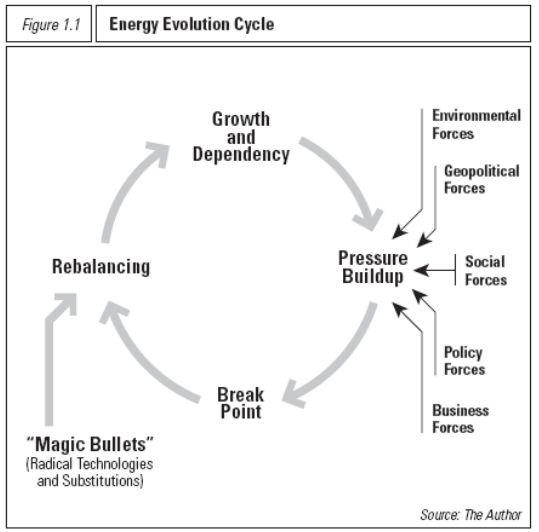
Peter Tertzakian is a geophysicist turned energy analyst (after a couple detours to get graduate degrees). His company, ARC Energy Financial, is essentially a venture capital company for the oil and gas sector.

A Thousand Barrels A Second is an introductory guide to the energy landscape. The title refers to the fact that humans now burn about eighty-five million barrels of oil a day (roughly a thousand barrels per second). This is equivalent to forty supertankers' worth.

Published in 2007, the book is now a bit outdated. It doesn't cover recent developments in the energy space, the biggest of which is "shale gas" methane. (Relative to shale gas, wind – by far the biggest of the renewables – is a footnote.)

Hydraulic fracturing technology has made previously-inaccessible methane available. If current trends can continue – admittedly a big if – US natural gas production could be high enough in ten years to displace half of their coal plants. That alone would reduce US CO_2 emissions by about 10%. (And reduce worldwide emissions 2%.)

Natural gas companies are now campaigning hard against Big Coal – and while the latter are pushing back, they're quietly buying up shale gas companies. That is, Big Coal is diversifying because they think the odds of an eventual ban on coal are good enough, that it's worth buying insurance! *Which is a tremendous positive.*

Ch	Title	Summary
I	Lighting the last whale lamp	This chapter is mainly about the whaling industry in the olden days. Whale oil was used for premium candles for a couple hundred years, but were then pushed out by kerosene (ie. paraffin, ie. oil) candles, which were in turn pushed out by electric lighting. The chapter also introduces the author's *Energy Evolution Cycle*. It says that after new energy resources are identified, consumption rises to meet supply, causing malaise until new energy resource is found. (He doesn't deal with the question of what happens if one isn't found…) 
II	The 33% advantage	A key decision for the British switching their navy from coal to oil, was that someone calculated there was a 33% advantage to using oil. Basically, oil ships didn't need any crew below-decks to shovel coal; everyone could be on-deck shooting guns. It was a big decision, not least because Britain had lots of coal, but almost no oil. So they started fiddling in the Middle East… Also, by his calculation, only 17% of the energy of a barrel of oil winds up pushing the wheels of a car. (Most of the losses come from combustion engine inefficiency.)
III	Not a wheel turns	This chapter could be titled "Not a wheel turns… without oil". It elaborates on his idea of **break points** (see diagram above) where old fuels become disadvantaged relative to alternatives. He goes in-depth on the break point in the 1970's where price spikes caused oil to become disadvantaged (economically) relative to alternatives. As a result, utilities shifted away from oil to coal and natural gas.

Ch	Title	Summary
		Oil is facing another break point now – but there are no magic bullets for transportation fuel. As covered in Energy Shift, only half the world's oil is used for transport, so there will probably be a shift away from oil in other sectors (power generation, petrochemicals, other fields) first. Not covered in the book, but mentioned in my introductory notes, is that coal is facing an even bigger break point: it's got a huge disadvantage to alternatives, for environmental reasons.
IV	To the ends of the earth	Even at "only" US$80/barrel today ($0.50/L) oil is historically expensive. In part this is because all the cheap oil has been extracted. We have to go "to the ends of the earth" to find the remaining oil, which is in smaller pockets or is harder to extract (e.g. tar sands). As a result, new deposits cost $40, $50, or $60 / barrel to bring online. That establishes the floor for the long term oil price, if demand increases. (Companies will halt development if prices fall below these levels, restricting supply and bringing the price back up. Prices could fall, though, if total demand drops… as happened in 2008-2009.) He mentions that *strong public support* is needed, for governments to be able to make the tough but necessary choices to move off fossil fuels. *The cleantech implication is that **we need to befriend our "fratricidal allies" in the 'green' space**. If environmentalists and cleantech partisans snipe at each other, public support will be harder to build, and they'll be vulnerable to divide-and-conquer messaging strategies from the fossil fuel sector. (Big Oil and Big Coal have largely circled their wagons, and are largely putting up a united front.)*
V	The technology ticket	The most important part of this chapter deals with Thomas Edison. The author argues Edison was a successful inventor not because he was creative – but because he made strategic alliances with big companies. To use the words of The Starfish and the Spider, he leveraged existing networks – in this case, business conglomerates. When it came to electricity, he was more a *fast follower* than a *pioneer*; a lot of his patent applications were later rejected because others had already invented them. But he largely won

Ch	Title	Summary
		out because he had the better hook-ups. Sort of like how Bill Gates used his relationship with IBM (the most trusted name in business, at the time) to outmanoeuvre Steve Jobs and Apple, despite Microsoft having a far-inferior product. Interestingly, Edison and GE lost out in the *DC vs. AC* battle, to Nikola Tesla… who probably only won because he partnered with Westinghouse (another corporate giant). The author stresses how difficult it is to dislodge an incumbent on their home turf, so new energy technologies will want to find niches where there are no incumbents, where possible.
VI	The next great rebalancing act	He argues that the break point + rebalancing process occurs in four phases: 1. complaining and paying up (2008?) 2. conserving and being more efficient (low-hanging fruit: largely ongoing) 3. adopting alternative energy resources (Europe + Ontario… unless they run out of cash) 4. making societal changes (see comment above) Interestingly for an economist, he argues that this transition is **"not something to be left for markets and business people"**. (That's a sub-section heading!) As a positive example of gov't policy, South Korea kept oil use constant from 1995-2004, despite phenomenal economic growth, and an increase in per-capita energy use.
VII	A golden age of energy opportunity	He predicts that: - fortunes will be made in the alternative energy space. (They already have been.) - the 2010's will see a lot of upheaval and oil price instability; natural gas will be the fastest growing energy fuel. *(This seems corroborated by more recent data – see my introduction.)* - low-cost producers (which generally means, producers who are most energy-efficient) will gain at the expense of high-cost (ie. less-efficient) producers.