Life After Carbon: What's Next?

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The Earth is 4.55 billion years old, give or take 50 million years. The first commercial oil well came on line in 1859 near Titusville, Pennsylvania. Today, we, the people on this planet, consume about 85 million barrels of oil per day, and consumption is projected to rise to 119 million barrels/day by 2025 (http://www.eia.doe.gov). Like economists talking about the national debt, geologists love to throw big numbers around: billions of years, millions of barrels. So, the question that matters is "how much oil is there?" Like anything difficult to measure, estimates vary widely. Since s/he was born, most people agree that Earth produced about 6 trillion barrels of oil. Where much of the disagreement lies is in how much of this oil is recoverable. Optimists say that we will continue to get better at extraction, so that in the end, we will be able to recover about half the oil, or 3 trillion barrels. Pessimists, think that about 2 trillion barrels is more likely. So what does this mean? It took us about 150 years to use the first trillion barrels of oil (we passed that landmark late last year); therefore, we have at least a trillion barrels left. That's the good news. The bad news is that we will blow through the next trillion barrels in 30 years if consumption trends continue. Will consumption trends continue? Economists point to the magic hands of free markets and suggest that as oil gets more expensive thanks to scarcity, we will move on to the next best thing. Well, many suggest that we are already there. That is, oil prices are going up because production is barely keeping up with demand, and that we are about to reach, or may have already reached, peak oil production. Once the peak is reached, and demand outstrips supply, at best, oil prices will rise sharply. The worst-case scenario sounds like a bad B-movie where countries, corporations, and neighbors slug it out over a dwindling and ever more expensive resource.

Up to this point, I deliberately focused on oil because it is the poster child of easy energy. Before oil, and its carbon-based relatives like coal and natural gas, energy was hard to come by. People burned wood to heat and cook, and used water to turn the wheels of industry. Can you imagine today's economy functioning on chopping down trees? No, because it would be impossible. The point is, our way of life, including the privilege of working at Carleton with some of the brightest minds on the planet, depends on easy energy. The problem is, the days of

easy carbon-based energy are coming to a close. As a geologist, I tend to take the long view. Earth will still be here in 100 million years, and by that time, who knows what our decedents will look like, or what they will do for a living? As a member of the Human species, I am interested in what my direct descendents will do for energy. What will be the next best thing? Surely easy carbon is on the way out, I just hope the economists are correct in suggesting that we will figure it out.