



The markets have recovered from their losses earlier in the year and are now operating in the black. The talk of the (investor) town is all about whether we are facing an V, W, or L-shaped recovery. Although it is a tempting conversation, I think I can add more value by discussing the green investor topic de jour: Smart Grid.

Efficiency is one of the pillars of the green economy and no greater efficiency improvement exists than the upgrade of the nation's grid. Today, our electricity infrastructure is essentially a bloated version of the system that was put in place 120 years ago. If Graham Bell had the opportunity to visit the 21<sup>st</sup> century he would not recognize telephony in its current format, but Thomas Edison would be entirely familiar with the electricity grid. Broadly defined, a Smart Grid is more efficient, interconnected, and less carbon-intensive, through computer intelligence & networking, integration with renewables, and infrastructure modernization.

According to Deloitte, Smart Grid sector revenues could reach \$25 billion in 2009 and growth rates have been stellar, with annual revenue growth of 50% and an increase in bookings of 80% towards the end of 2008. Government stimulus is not absent in this part of the green space either. On April 16, the Department of Energy outlined its Smart Grid Investment Grant Program, which plans to distribute \$3 billion in Smart Grid technology development grants as well as an additional \$615 million for Smart Grid storage. According to the International Energy Agency, the average efficiency of new generation grids is 60% vs. 33% for legacy grids. The opportunity of investing in the Smart Grid cannot be overstated, considering the potential to double our grid's efficiency.

Thematically, there are three areas of the Smart Grid to invest in: advanced metering, demand response, and infrastructure modernization. Governments in both Europe and the U.S have expressed interest in smart metering: The European Parliament agreed on a policy that would put smart meters in 80% of homes by 2020. It's expected to become law by the end of 2010. Additionally, the Obama Administration has floated the goal of installing 40 million smart meters. Two-way meters that communicate wirelessly back to the utility will be valuable for both providers and users of electricity. Utilities will be able to see the quantity and location of electricity demand in real time and pinpoint problems and blackout risks in the network. Our pick in the category is Echelon, which makes both meters and network infrastructure products.

Demand response allows electricity users to make automated adjustments in electricity consumption based on supply/demand information communicated by the grid in the form of real-time prices. It allows utilities to manage peak load better, with the ability to shut off appliances when demand is critically close to supply. This in turn reduces the need for extra capacity to be brought online. I can see utilities also liking the idea of charging more for peak demand, which may not work out well for customers who continue to operate with a "dumb grid" mentality.

The third theme is infrastructure modernization. The construction, operation & maintenance of high voltage transmission lines will be a challenging, yet important component of the improved grid. The challenge lies in the competing visions of transmitted versus distributed energy. The latter has a significant following, with the attractive premise of addressing electricity needs locally on a smaller scale without the need of new transmission lines. Though in many instances that might make sense, it is my view that we will also need to build some (ugly) transmission lines to move the utility scale solar and wind energy from the deserts of the Southwest and the sparsely populated wind corridor stretching from West Texas north to the Canadian border. We have not yet made an investment in this space but have looked at some of the companies in the Dow Jones Brookfield Transmission & Distribution Infrastructure Index.

A smarter grid goes hand in hand with renewable energy generation. Due to the intermittent nature of renewables, it is important that the grid can understand real time demand and that it can connect the clean energy to where it is needed. In the U.S. there are essentially three grid systems: Eastern, Western, and ERCOT (Texas). Electricity cannot freely flow between these systems. As such, it makes it very difficult for example, to get wind power out of Western Texas and into nearby states such as New Mexico or Arizona.

One issue I have not addressed is security, as it is outside of the green lens through which we look at the opportunities in Smart Grid. It is important to consider however, as it will be a key factor in determining the structure of a modern grid. A true smart grid will act more like an ecosystem (decentralized) and less like a flow chart. The blackout of 2003, which was not caused by malicious intent, should serve as a reminder of how vulnerable our system is. A series of domino-effect like failures put 10 million people in the Canadian province of Ontario and 45 million people in eight U.S. states. Certainly we saved some energy, but that's not the way to do it.

Our next State of the Green Economy web conference call will take place on Friday June 26th at 11:30 am PDT. The topic: Smart Grid (surprise!).

To sign up, please go to: <http://www.eventbrite.com/event/365292600>

As always, I invite you to contact me if you want to discuss any of the topics in this newsletter.

Best Regards,

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