



500 Boylston Street, Suite 420
Boston, Massachusetts 02116
TEL: 781.890.5225 FAX: 781.890.5279
info@seamanscapital.com

Lessons Learned in Clean Energy (2013-2016)

June 29, 2016

Solar Market - Low Barrier to Entry and Chinese Competition

We were first attracted to the solar industry in March 2013 when solar power became cost-competitive with conventional power. At that time, the industry was consolidating and the average solar stock had declined 95% from its 2008 peak price. This led to more stable module prices and improved profits, as module costs were declining more than 10% annually. Solar stocks did produce strong returns for about a year through early 2014, but they lacked long-term stability because the industry has low barriers to entry. Solar panels are easy to construct and building additional capacity is relatively inexpensive. As a result, there is a significant amount of competition with the lowest cost manufacturers located in China.

Solar companies, needing a source of financing to fund their developments, created yieldcos, subsidiary companies that held completed projects and acted as a source of financing for their parent companies. While this approach appeared to offer greater stability, it proved illusory. Yieldcos were captives of their development company parents and many of their yieldcos had different financial structures. Yieldcos were supposed to produce a stream of rising dividends as their project portfolios grew, but their parent companies had different needs. For example, SunEdison had a high fixed cost structure that required aggressive development and needed to more than double its annual installations in order to become cash flow positive. Terraform and Terraform Global, SunEdison's yieldcos, were structured to pay an increasing share of their revenue as installations grew. This approach proved to be unsustainable, as competition for new projects lowered investment returns, leaving an insufficient spread between the investment return and the cost of capital. Without access to capital, SunEdison could not grow, failed to become cash flow positive, and filed for bankruptcy in 2016. While its yieldcos have avoided bankruptcy, investors have depressed the price of these stocks, realizing that SunEdison may need to sell its stakes in these companies in bankruptcy. Investors have now become more discerning about yieldco structures and the financial strength of the parent companies.

Wind Market - *High Barrier to Entry and No Chinese Competition*

There are fewer companies and less competition in the wind industry because of the high cost barrier to entry and a lack of participation from Chinese companies in the international markets. The wind industry is also benefitting from being the lowest cost producer of onshore energy projects and is competitive in offshore projects in Europe and other countries with high energy costs. There is already a large installed wind base in Europe, which supports a higher margined wind turbine service business. Also, there is an active replacement market, which provides more cost-effective upgrades for existing turbines.

Energy Efficiency - *Focus on the Right Part of the Value Chain*

At first glance, the energy efficiency sector appears to be quite attractive. Many energy efficiency investments can pay back their initial capital outlays within three years and future cost savings can be significant. However, it has proved to be a sector where it is important to be invested in the right part of the value chain, rather than in the industry as a whole. One of the leading energy efficiency technologies are LEDs, which provide a 90% energy savings over traditional lightbulbs. In addition, their costs have declined to the point where they are competitively priced with incandescent lightbulbs. However, LED manufactures have had difficulty making sustained profits because they are effectively producing a commodity. Companies that build and install energy efficient systems at the end of the value chain are the ones capturing the most profits in the energy efficiency sector.

Clean Transportation - *Niche Sectors, Parts and Material Suppliers*

Transportation, both public and private, is undergoing a radical transformation. The public transportation equipment sector, which produces electric trains and electric buses for state and local transportation systems, faces the least amount of competition. The auto industry, which is shifting from fossil fuel powered manually driven cars, to electric powered self-driving cars, faces competition. Car manufacturing has already evolved to the point where 30% to 40% of the cost of a car is in its electronics. This transformation has attracted competition from technology companies that supply the self-driving electronic systems and software, in addition to existing car manufacturers. Since there is already a significant amount of competition in the electric vehicle sector, it is important to focus on those companies that can capture higher margins through technological advantages. Another important factor to take into account is the significant amount of competition that will arise in the battery manufacturing business. There are already 12 battery factories worldwide, seven of which are in China, that are either under construction or expanding. While competition will reduce returns for battery manufacturers, there are profits to be made in supplying the raw materials that these companies need to produce the batteries, motors, and the lightweight components.

Water and Waste Management - *Stronger Than Expected Growth*

The waste management sector and the water and sewer system sector are two additional sectors which are evolving rapidly through technological innovation. In waste management, automation is taking over more functions, allowing fewer workers per truck. Lower costs, coupled with budget constraints, are causing municipal governments to get out of the trash hauling and waste management business, allowing the sector to be increasingly privatized.

Similarly, the water and sewer systems sector has seen a boost in growth from privatization. Many municipalities cannot afford to make the federally mandated technological upgrades to their water and sewer systems. Low returns and generous benefit packages have resulted in large and growing unfunded pension liabilities for governments, leaving no room in their budgets to afford any mandated changes. To remedy the situation, a growing number of municipalities are selling their water and sewer systems to private companies to fund their pension deficits and reduce their capital and maintenance costs paid by the general tax levy, making private water companies a growth business.

Please contact us at info@seamanscapital.com if you have any questions or would like to discuss our products in more detail.

This material is provided for informational purposes only and nothing presented herein is or is intended to constitute investment advice, and no investment decision should be made based on any information provided herein. References to companies are for illustrative purposes only and should not be deemed as a recommendation to buy or sell the securities mentioned. The information contained herein is based on internal research derived from various sources and does not purport to be statements of all material facts relating to the information mentioned, and while not guaranteed as to the accuracy or completeness, has been obtained from sources we believe to be reliable. There is no guarantee that this document is either private or confidential, and it may have been altered by unauthorized sources without your or our knowledge.

Nothing in the message is capable or intended to create any legally binding obligations on either party and it is not intended to provide financial advice. SCM accepts no responsibility for loss or damage from its use. The information contained in this document is intended only for the personal and confidential use of the recipient(s). If you are not the intended recipient, or the employee or agent responsible for delivering this communication to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please destroy it and notify SCM immediately. Thank you.