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A Labor of Joy: Creating the WilderHill Clean Energy Index

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Because ETFs track individual indexes, one of the challenges in establishing an ETF is the creation and maintenance of the underlying index. This case study of the WilderHill Clean Energy Index may lend some insight into issues faced when creating an index.

INDEX CONSTRUCTION

For a stock to be included in the selection universe, the company must be identified as one that has a significant exposure to clean energy, or contributes to the advancement of clean energy, or is important to the development of clean energy.

- Companies in the Clean Energy Index generally 1) work to further renewable energy efforts and do so in ecologically and economically sensible ways; or 2) help prevent pollutants, such as CO₂, NO_x, SO_x, or particulates—avoiding carbon or contaminants that harm oceans, land, air, or ecosystems structure; or 3) de facto incorporate ideals of the precautionary principle or pollution prevention into their energy efforts.
- Companies in the Clean Energy Index generally will not have their majority interests in the highest-carbon fuels: oil or coal.
- Large companies with interests out-

side clean energy may be included if they are significant to this sector.

COMPANY EVALUATION

For a newsworthy item that helps illuminate some ways a company may be evaluated in the Index, consider Zoltek (ZOLT). Zoltek makes carbon fiber; notably they're a producer of the composite materials used in many large wind turbine blades. Their materials generally lighten and strengthen products. Zoltek was placed in the Index earlier in 2004, and is in the important "Renewable Energy, Harvesting" sector.

The issue that's of concern here arose when ZOLT announced in mid-May that they'd be late in filing their required 10-Q statement of quarterly finances. That immediately resulted in their being down-listed by the SEC, changing their symbol from "ZOLT" to "ZOLTE" to denote SEC review.

Seeing an "E" appended at the end of a stock symbol is a warning signal to market investors. Not surprisingly, there was an immediate downturn in stock valuation for Zoltek with an impact on Index valuation, although muted, since they were just one of the 38 stocks then in the Index. Until that time, ZOLT often moved upwards to a prominent weighting, usually being above 3% in the Index.

After speaking with the Zoltek CFO about their 10-Q filing, we were satisfied that these were likely resolvable issues of debt char-

acterization, and they could be fixed within 10 days. Unlike past dismal loss-making at ZOLT a decade ago, when the carbon fiber industry had collapsed with declining military orders, ZOLT was now booking orders. For the quarter ended March 31, ZOLT's net sales increased 37% to \$15.8 million; operating losses were \$2 million due in large part to capacity growth. One issue for Zoltek was delay restarting an Abilene, Texas facility idled due to prior lack of carbon product demand. That plant can produce 2,500 tons of carbon fiber. Another was expanding precursor acrylic production in Hungary. If done right, that can potentially help contain costs.

With the company delaying its 10-Q filing, their symbol temporarily "ZOLTE," and their price therefore declining, we gave thought to what action, if any, should be taken with regard to the Index. Of considerable importance, however, is the fact that this is purposefully designed as an indexing instrument, rather than an active-managed fund.

Importantly, indexes are passive-managed. That means that unlike turnover in an active-managed, say, technology mutual fund (which may have 100%+ turnover in a year)—the components in an index are more "sticky." Putting aside a decline in ZOLT stock, we had to ask ourselves whether the ZOLT issue is:

- Unrelated to its clean-energy relevance,
- Likely to be only temporary,
- Perhaps not uncommon for small firms in technology, and
- Not one creating bankruptcy concerns.

Our Index Rules generally do not allow intra-quarter removal of a stock, except in exceptional circumstances like bankruptcy.

Importantly too it's worth considering that historically, most active-managed funds do not outperform their comparable passive indexes. In part, this seems due to the rather higher transaction costs associated with more active management. It may also be due to difficulty predicting stock movement: hence those associated with the "random walk" school of thought may stress advantages of low costs, market, and tax efficiencies, and often prefer indexing. Plus there's risk that selling *after* price declines may mean buying near the top and selling near the bottom, with a consequence of poor absolute returns.

Because the problem seemed rectifiable within days, we didn't contemplate removing ZOLT at Index rebalancing. Indeed, the next week, their revised 10-Q filing

was accepted and their stock rebounded and with the full SEC compliance their symbol returned to ZOLT.

Magnetek (MAG) is a component of the Index in the "Power Delivery and Conservation" sector. That company sells their "Aurora" line of inverters changing photovoltaic solar DC power into AC such as for homes, business, etc. They also make wind and solar multi-input inverters as well as converters for wind; they sell small and large fuel cell inverters too, which may be interesting should that field ever come to fruition. They've sold some of the latter for use on UTC (United Technologies) approx. 200 kW fuel cells, and they make inverters for approx. 50 kW microturbines in military applications. All that renewables experience is notable, since inverters for alternative wind, solar, and fuel cell power must be especially sophisticated—for instance correcting extremes for variability and frequency. MAG is rather well suited to the universe of candidate clean energy companies for the Index.

However, an issue arose from a patent infringement case that was decided against MAG by binding arbitration on May 4. That \$23.4 million judgment against MAG was large. The outcome was unexpected by Magnetek's management, both for the decision going against them, and the large size of the award. Potential risks in litigation had been noted by the company, as is commonly done in prior annual reports. Yet this was very significant for the company. On the one hand, viewed optimistically, the case regarded a product that MAG no longer sold, wasn't core to its clean energy business, and MAG has sufficient size and options that bankruptcy wasn't an immediate concern.

But unlike the 10-Q filing issue at Zoltek, this problem for MAG can't go away as readily or soon. The company generally didn't keep sizable cash assets on its books, and MAG was unable to meet a 10-day payment schedule. The result was significant impact on MAG share price, still evident as of June. As an Index Provider, a major concern for us is that MAG must remain significant to clean energy. We've noted that problem wasn't directly related to their clean energy technology, and MAG is solvent. We do however monitor for the \$50 million market capitalization Index Rule; MAG stock must remain above that floor as a quarterly average. Any stock that does not is removed at rebalance. The issue is fluid at this rebalancing. It may resolve itself, should MAG announce a payment agreement among all parties—potentially, their share price may rebound. If this issue lingers through next quarter, it may be addressed in the Q3 Index Report.

RAPID INCREASE IN CAPITALIZATION

From Q4 2004 through Q2 2005, the market capitalization of index component Evergreen Solar (ESLR) rose notably. Some general and some technical factors may have contributed to this. A leading cause is that their sales increased rather a lot, especially in Europe (ESLR sells 2/3 of its modules in Europe) and Evergreen simply participated in this like other pure-play solar PV makers. A second factor unique to Evergreen is that its special string ribbon™ process makes laser-cut silicon wafers from Gemini II furnaces at half the thickness of competitors, under 150 micrometers. A result is that only one-third as much silicon is needed for their PV wafers processed into solar cells and panels. ESLR estimates they can produce about twice as many wafers, per ton of silicon, as competitors.

This is an issue in the solar industry globally now, because of shortages in the silicon that's needed to grow new facilities and production lines. Like when there's an absence of the tax credit for wind power, or when poor transmission capacity slows wind power, the lack of silicon has been an unneeded obstacle that's now hindering PV.

With its ribbon capability and desiring to open a European facility, ESLR contemplated whether to build a factory there at a cost of \$100 million, or find a partner in Germany. It chose the latter. In Q1/Q2 they announced a new joint venture with large German solar PV maker Q-Cells AG. This combines scaling-up skills, module efficiencies (suited to high latitude sites) of Q-Cells, with more efficient silicon manufacturing of ESLR.

Interestingly for the Index, ESLR share price had already risen so fast and reached such weight (at around 6%) in a quarter within the Index, there was some concern an inevitable regression to the mean and price correction at ESLR may unduly impact the whole Index. However, this highlights another facet special to indexing: all components must be left to reach their own level, without Index managers trying to guess an exact time to sell and so reduce position in that stock. Indeed rebalancing each quarter and a 3% cap helps prevent undue influence from any individual stock, which might otherwise reach double-digit weight in the Index. Ultimately, passive management tends to perform well.

INDEXING AND SINGLE STOCK RISK

In superconductivity, a recent story in *Science* (April 15, 2005, p. 348) aptly sums up much news in "New Wave of Electrical Wires Inches Closer to Market." Noting

that first-generation (1G) high-temperature superconductors (HTS) cost 100+ times more than copper wire, with little market penetration the result, it focuses on the developments in second-generation (2G) HTS. These hard-to-manufacture 2G wires are now made of yttrium barium copper oxide (YBCO), and a significant thing is that recent advances are starting to enable 2G HTS to be made around 100 meters long, much better than one meter for past 1G. To reach 100 meters, researchers are much closer to being able to produce whole spools of reel-to-reel YBCO wire in long lengths—and at costs below 1G.

Because readily available liquid nitrogen could be used, instead of costly liquid hydrogen for cooling the "high temperature" superconductors to 77 kelvin, 2G HTS may potentially find robust commercial uses, such as in special high-powered magnets like the magnetic levitation for trains, in powerful motors, and, as noted, in wires carrying great utility current without resistance. However, for desired broad use of HTS by utilities, a problem that's foreseen is that utilities are in an inherently conservative industry that does not seek first-mover advantage, nor experimental innovative technologies. (We note, though, a June announcement of HTS being sold to a large utility in Mexico, which moved AMSC.)

Should 2G costs ever be lowered enough to achieve real market penetration, and HTS grow to proven technology, then utilities may begin to move a bit towards adoption. The goal of the U.S. Department of Energy for 2G wire is to carry 300 amps over 100 meters by 2006, and carry 1,000 amps over 1 kilometer by year 2010. Citing the work by American Superconductor (AMSC), a component of the Index, that *Science* story points to nearly 30 meters of 2G HTS wire achieving 186 amps.

Interestingly, citing another company that's also a component of the Index, the story looks as well at SuperPower, a subsidiary of Intermagnetics (IMGC). Here it notes 100 meters of 2G HTS carrying 100 amps achieved by SuperPower. The latter recently built a YBCO factory in Schenectady, New York, for its wire production, and hopes to begin producing as much as 1,000 kilometers of 2G wire next year. AMSC has raised \$45 million towards a "pre-pilot" production plant in Ayer, Massachusetts.

There's no certainty at all that any of these products will ever achieve cost reductions to make them profitable, nor that the two companies can even stay afloat through costly R&D to come. Worryingly, there's also subtle lack of interest by utilities in the possible product. That said, one function of indexing is it helps to mitigate

for single stock risk. For instance, if only one of several companies thrives while all others fail, a misplaced single “bet” on unprofitable ones could be loss-making. But with an indexing approach—although here a tiny HTS basket of only two stocks—all are included in diluted form.

DEFINING YOUR INDEX

In developing the Index, a question early on was if a company that’s a leader in “green” power, like wind, should be in the Index if they also have nuclear-power exposure. For instance, should a leading U.S. wind power supplier like a utility with wind farms but that also owns nuclear plants be an Index component? Basically, the views expressed at our Board have fallen into three camps: one holds that nuclear power, whatever its faults, doesn’t produce carbon dioxide or conventional pollutants; thus incidental presence of nuclear shouldn’t prohibit a stock from the Index. Plus if climate change becomes of greater importance, then all zero-carbon options anyway should be reviewed anew.

A second viewpoint, also expressed strongly, stated that equities with any nuclear power at all absolutely should not be considered for the Index—even if incidental to a company with otherwise brilliant wind or solar assets. As Board members taking this view argued, reasonable expectations will be that there should be zero nuclear exposure in a “Clean Energy Index.” Further, they emphasized radioactive fuel security/terrorism concerns, the waste dilemma, and the fact that one catastrophe might render billions of dollars of capacity into costly liabilities. They pointed out how far removed costly nuclear plants are from distributed wind or solar generation that’s easily made renewably.

Basically, a third viewpoint was also highly skeptical of any nuclear within the Index, even if in a stock with exceptional wind-generating capacity as well. But rather than be as absolutist—they’d instead look at the matter on a case-by-case basis. This third view, mindful of scientific debate over nuclear and also strongly biased against it, characterized the consensus position taken in early decision-making for the Index.

Over time, however, and prior to launching the ETF fund tracking the Index, the Board’s consensus hardened against allowing any incidental nuclear power, even where the utility is America’s wind power leader. Thus Florida Power & Light (FPL)—the leading supplier of wind power in the United States (owning 3,100 MW and 40% of the installed wind base), an equity in the Index backtest history—was deleted (along with DTE) from the Index in 2004.

By Q2 2005, one equity remained in the “Greener Utilities” sector with nuclear exposure. This was Central Vermont Public Service (CV) and due to its partial (1.7%) ownership of one nuclear plant. In addition, however, nearly half the of the power supplied by CV was nuclear-generated, but it came from outside plants they didn’t own or manage. CV had severed other past nuclear ownership: they were in the Index mainly for their notable bio-fuels work including innovative “cow power” and for their subsidiary, Catamount wind, which was increasing its wind power while divesting non-wind assets. At the March 2005 launch of the ETF fund tracking the Index, that equity was the sole “nuclear” aspect in the Index.

We’d received many unsolicited comments regarding nuclear—both strongly for, and determinedly against it. After considering this matter at length, we decided by consensus that while their work at CV on biofuels and wind was pertinent, we should eliminate all exposure to nuclear by deleting the last equity. We did so for the Q3 2005 rebalance.

In sum, we will not include wind, solar, etc. components that also own nuclear power plants. Nuclear ownership has been excluded from the Index.

ENDNOTE

This article is based in part on the Q1/Q2 2005 Quarterly Report for the WilderHill Clean Energy Index (ECO). Thoughts expressed here are offered in that capacity only.

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