



## **2007 Q1 Quarterly Report: WilderHill Clean Energy Index®. March 31, 2007**

The First Quarter of 2007 opened with the Index ([ECO](#)) at 182.06, and it ended at 197.43. Q1 thus had a positive return of +8.4%. Following a second half 2006 unusually dominated by ‘sideways movement’, the robust volatility that’s more typical of clean energy has as expected returned: ECO showed sizable yet normal intra-Quarterly volatility over Q1.

### **Two-Year Anniversary since the ‘Tracker’ was launched for this Index (ECO)**

When the WilderHill Index (ECO) launched August 16, 2004 and as would be the case for any benchmark Index, there wasn’t any way to ‘sell or buy’ the clean energy sector that it was defining, absent a tracking fund. Thus the launch on March 3, 2005, of the very first exchange traded fund for this sector, PowerShares WilderHill Clean Energy Portfolio ([PBW](#)) was of some real note. After two-years remarkably, there is approximately \$800+ million in assets under management (AUM) in that ‘tracker’, indicating clean energy appears to be generating real interest. Yet assets under management is just one metric here.

A more common metric might be performance of an Index and/or tracker; here it’s clear throughout backhistory and in live action, this Index/tracker shows outsized movements – illustrating risk well – and the fact this sector and so Clean Energy Index® can at times ‘drop like a rock.’ Yet, it can also move upwards in robust manner. Results thus vary much, depending on one’s chosen starting and end dates. Looking back to March 3, 2005 when the tracker launched at \$15.60, it has closed two years later on March 3, 2007 at \$17.79, for a gain of 14.0%. That modest amount arguably masks non-negligible sector action – down and up – over this period (which some clearly prefer). Helpfully too this Index strongly shows low-correlation with major Indexes, often a sought characteristic.

Risk is very significant here, but it also has been noted that risk & reward may go hand in hand. Clean energy itself hasn’t gone unnoticed and some new attention has come to our sector/ Index in the past year. Greater publicity for clean energy, higher oil costs, the technological advances in clean energy – and especially AUM growth in the tracker for ECO – have led perhaps not surprisingly to a number of Indexes being introduced.

### **Another ‘tracker’ launches in Q1**

While WilderHill Index (ECO) began in 2004 as being the original and arguably benchmark Clean Energy Index®, it’s no longer the only one. A sizable number of roughly overlapping Indexes aiming to define clean energy launched in 2006 and we welcome that as a useful development, one that reflects substantial growth and escalating interest towards this sector. To varying degrees those entrants often largely replicate the components in the WilderHill Clean Energy Index® (ECO) – but there are differences making the launching of those additional trackers useful for investors and the public. Just as there are many Indexes & ETFs for fossil fuels, so should there be excellent choice in clean energy.

We briefly mention here one well-executed Index/tracker that went live in February, since it presents subtle contrasts with ECO. While that Index is strictly-speaking a 'competitor', we believe it's well conceived and adds useful albeit subtle differences in approach.

Perhaps most significant is that the other Index and hence tracker's performance has, as expected correlated closely with WilderHill Index/tracker. Since a start of that tracker little over a month ago, it has moved closely with the ECO tracker day to day showing modestly little difference. Why so close? First the components themselves making up that Index, like most recent Index entrants have largely replicated the stocks already in ECO. (We take this as a vote of confidence in our own approach, while of course we also think well too of their independent stock selection!) Given the overlap, as expected that new tracker has so far not been straying awfully far day-to-day from the ECO tracker.

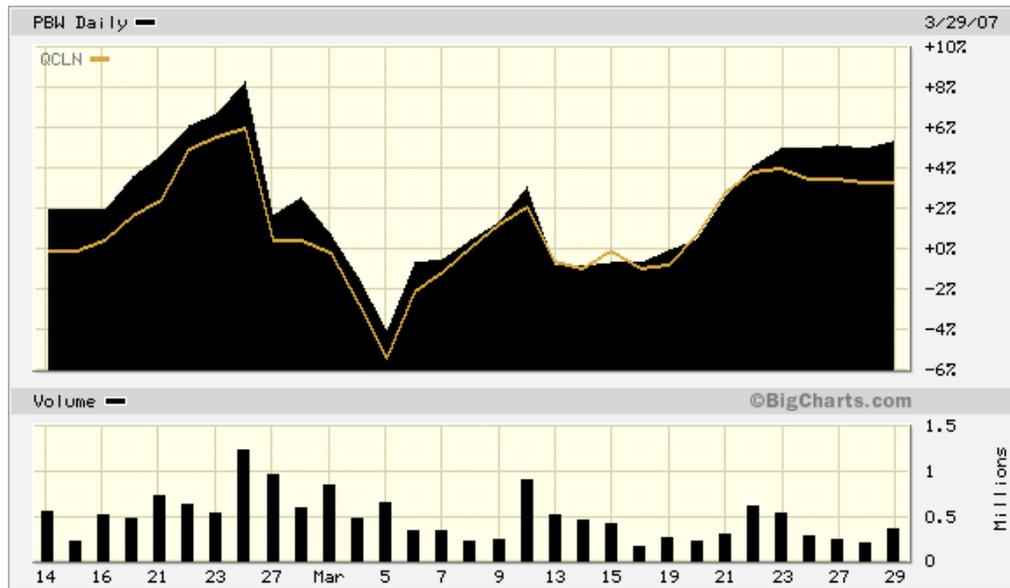
On the other hand that recent Index isn't exactly the same as ECO – so what are a few contrasting differences? Having just over one month history is clearly insufficient to tell much about relative performance long term – but some interesting differences can be seen at the start. For instance one notable thin-film solar stock that's in ECO, but was not in the other Index initially moved up considerably the first 2 months of 2007. That performance was captured by ECO, but not the other Index – although had this stock moved the other way (down) that too would impact ECO only. Even temporary discrepancy among component stocks may add up to some difference if compounded over time.

This solar thin-film PV maker had only recently had an IPO. So assuming that any Index aims to add a stock (as it later added this stock in March), the fact an Index may reconstitute its stocks 2X times per year – as compared to the 4X times per year for ECO, presents just a slight difference in that ECO rebalances twice as often. Of course as passive instruments not too much should be made of this – but it helps illuminate where two similar Indexes and hence trackers might differ a bit though in a pretty subtle way.

A much less subtle, really more interesting difference is that the other Index is based on modified market cap weighting – in contrast to the modified equal weighting that we have chosen for ECO. While modern portfolio theory indicates that modified equal weighting style *may* outperform a modified market cap style over time, it is uncertain and we feel this contrast can be a fascinating practical test for academic theory, especially since components in that recent Index have to such a degree replicated our own.

We'd emphasize these are all stylistic choices in Index philosophy and so mainly 'artistic differences' in our view. For more divergence consider that for ECO we seek rough parity among all stocks through our Rule of a 4% cap at the rebalance, so top-weight stocks don't influence total performance to a great degree compared to bottom weight ones. Hence the top 5 stocks by weight in our ECO may 'only' constitute a total of roughly 20% of the Index. By comparison the top 5 stocks by weight in that other Index might come to roughly 35%, a noticeably higher figure. There's thus greater concentration at top in that other Index; it should do especially well when those stocks top-weighted there by market cap do well – conversely it may be more impacted down when those decline. And so too small cap stocks in ECO have relatively larger impact, than those in the other Index. There's nothing 'wrong' with either approach; they helpfully offer choice in clean energy.

Over a brief period since that other index tracker's recent (February) launch through March 31<sup>st</sup>, our own ECO's tracker closed up +3.9%, while that other tracker was up +3.4%. In sum while our ECO's tracker has outperformed that other tracker slightly over this Q1 period, the point isn't a small gain over the other, but how very closely these two trackers are daily moving. Below is a chart showing the tracker for our own Index in black (PBW), and other tracker in brown where a close similarity of movement can be seen:



### ECO Index: The Addition of EuroTrust (EURO) in Wind Power, and Deletions

For Q2 2007, we've added EuroTrust A/S (EURO) to the Index: this Denmark-based firm has moved into wind power in a significant way; it has and is developing more wind farms across Europe as a conglomerate newly focused on renewables. We're pleased to be Index leaders with this addition. Deletions from the Index for Q2 were DESC, HYGS, and QTWW. A list of the new Q2 (ECO) stocks, weightings and sectors are below in Appendix II.

### Website for the WilderHill Index (ECO)

Our own website at <http://www.wildershires.com> is in continuous refinement and we monitor for glitches as this website develops and grows. Years of experience posting live data on websites has taught us that glitches happen, given soft/hardware issues that inevitably arise. It's thus worth repeating as always that the WilderHill Clean Energy Index (ECO) is always calculated independently and totally apart from our own website by the American Stock Exchange. And of course the exchange traded fund (PBW) tracking this Index is calculated in robust fashion too, totally independently of our own website. Data on the Index (ECO) and the fund (PBW) can also be found at the site of the American Stock Exchange: <http://www.amex.com> Lastly we continue to upgrade our site with the aim of robust uptime and providing ample information: we welcome your suggestions.

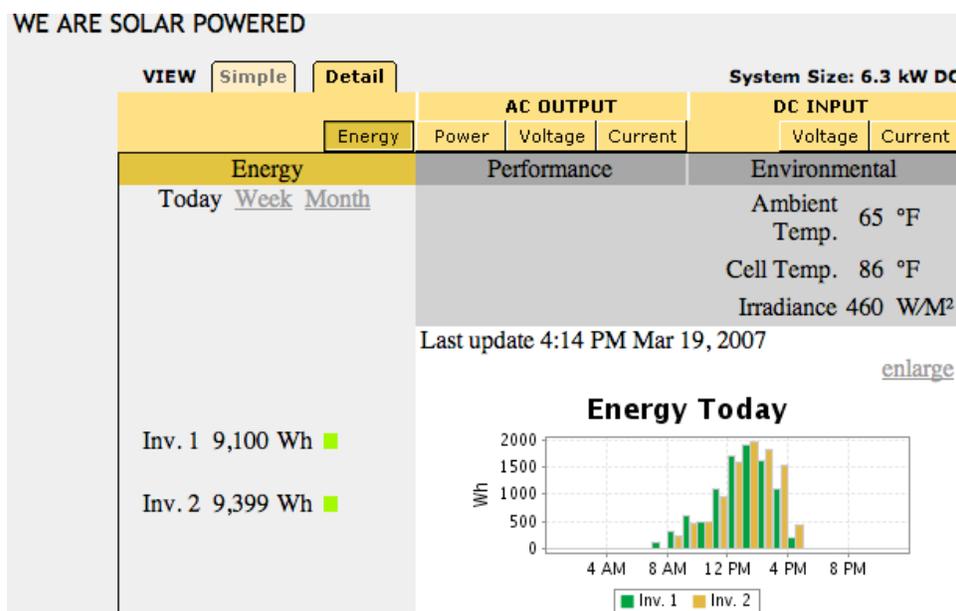
## Growing Practical Experience with Clean Energy

As noted previously we predicted that gaining some practical, applied experience with the actual clean energy technologies might help too in our ongoing Indexing for this sector. We've found this hypothesis amply proven and thus we've gained over the past 4+ years quite beneficial working knowledge of solar PV for instance. More recently we added live monitoring to display exact performance for a second new array of 24 polycrystalline solar panels with 2.5 kW Inverter added in 2006 – the PV and live read-outs are in addition to our original 21 monocrystalline PV panels and 3.5 kW Inverter installed in 2003.

Having two different crystalline PV types is a bit interesting to us, as is comparing their genuine performance in the **Detail** tab, at [We Are Solar Powered](#). (Ground-mounted poly panels are in **green** at Inverter 1, the roof-mounted higher-efficiency panels are in **brown** at Inverter 2; together this system is rated some 6.5 kilowatts and is performing well along with two solar thermal water heating systems; we can observe varying solar irradiance, PV cell temperatures and ambient temperatures, plus building demand all of which [we are displaying live](#) on the website for anyone interested).

Perhaps of interest too on the demand side is we're gaining real experience with everyday energy efficiency. Items include white Light Emitting Diodes (LEDs), daylight-spectrum compact fluorescent bulbs and ballasts, energy efficient ICs, displays, use of an Earthenr clay that 'breathes' on interior walls, white foam atop a flat roof that reflects sunlight and keeps us better insulated on cold or hot days, passive interior cooling that replaces traditional air conditioning, active motorized shading, and in future passive outside shading as we've planted many young deciduous fruit trees in an organic garden on the building's Southwest side (replacing water-thirsty grass lawn) to offer shade in summer – while allowing the sun in during Winter. We even have an electric (and thus mostly solar-powered) bike here as well, which has been a fun and healthy experience.

Below is one sample readout on the **Detail** tab view from a normal February day showing the two systems making some 20 kW/h with live data at <http://wildershares.com/solar.php>

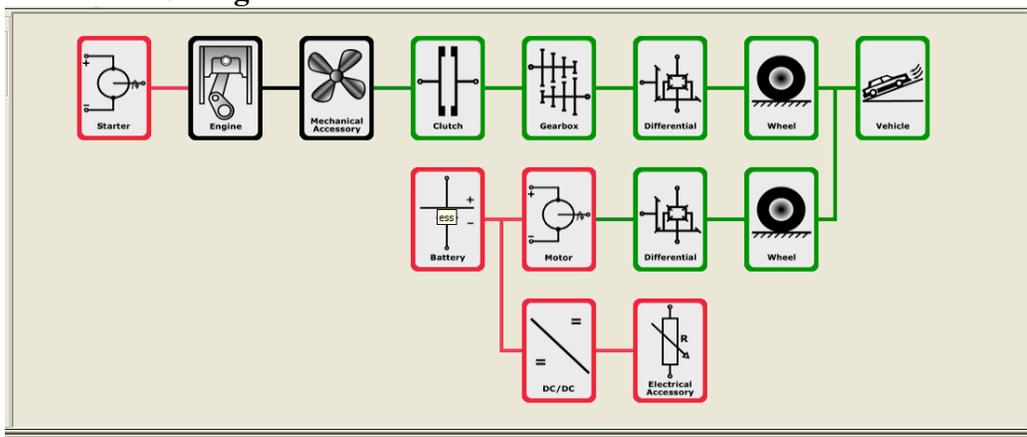


Besides our experiences gained in generating clean energy, energy efficiency and reducing demand there's other areas notably emerging for the sector broadly including alternative fuel vehicles, plug-in hybrids, cellulosic biofuels, battery electric cars, etc. Recognizing this fact and seeking to learn rather more in practice about hybrid and other technologies of the near future, we began last year a Plug-in Hybrid Electric Vehicle (PHEV) project for a hybrid 4-seater car. Partnering with engineers who are now building this car for us, we've gained some useful practical understanding of many technical matters here too.

We're hopeful these engineers can complete the PHEV project in summer. By its design this plug-in car should run roughly 24 miles on electricity alone. Thus for shorter trip days the car will run without using gasoline – on 'solar fuel' alone if charged in daylight with 'green electrons' from the 6.5 kW solar on our building. Otherwise it runs on 'brown electrons' from the grid if charged at night but that too is more efficient than fossil fuel gasoline. This car has an AC controller, two small AC motors, regenerative braking, and it can use its small but sufficient 1-liter internal combustion engine for longer range.

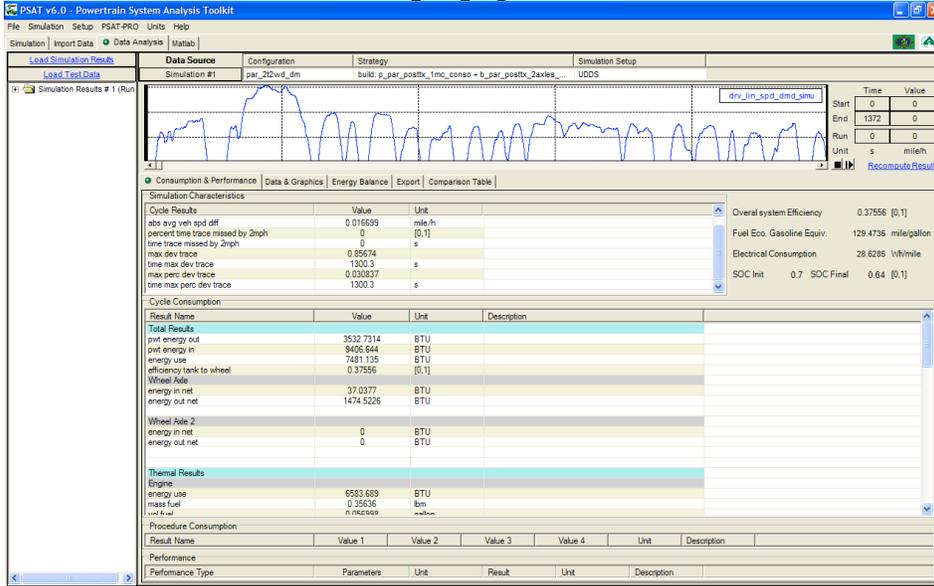
Interestingly those kinds of innovative technology and techniques may also be anticipated to receive rather greater attention too, since the President is emphasizing alternatives and automakers may go current 'weak' gasoline-based hybrids to 'strong' plug-in cars. For those interested below is a schematic of this hybrid configuration: a hybrid electric drive is being added to what was originally a lightweight 1,500 pound 4 seat production car.

### Drivetrain Configuration



In practical use we project achieving over 100 MPG in its charge depleting mode using both ('solar' green fuel) electricity & gasoline (a fossil fuel). Nicely too this PHEV doesn't have to be slow, or utterly dependent on gas like an ordinary gasoline-powered car. However given our budget (under \$30,000 total) for this project, engineers deleted items such as planned flex-fuel capability that might impact actual range. Simulations have been done (eg below) for twin AC motors/+ 1-liter engine configuration and we'll post hard data on actual results on the web once completed for those who may be interested. Although this project has been unlike day-to-day work of Indexing, just as with our solar PV system it has been a useful experience that adds to our knowledge of clean energy technologies, and to 'real world' comprehension of possibilities in this emerging sector.

# PSAT Simulation Results sample page



## Summary

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Sincerely,

*Robert Wilder*

Robert Wilder  
rwilder@wildershires.com

Disclaimer: The following is a reminder from the friendly folks at the WH Index who worry about liability. Performance figures quoted represent past performance only, and are no guarantee of future results. The views expressed here are those of just one of the managers of the WH Index. Views are not meant as investment advice, and should not be considered as predictive in nature. Any descriptions of a holding, applies only as of March 31, 2007. Positions within the Index can and do change thereafter. Discussions of historical performance do not guarantee, and are not indicative of future performance. The Index covers a volatile sector, and thus is volatile too, subject to well above-average changes in valuation.

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### Appendix I: Q1 Components

Following are Q1 Index weightings, at roughly 2 weeks before Rebalancing to start Q2. After rebalancing every stock floats according to its share price over the Quarter.

#### Index Components as of: 03/19/2007. 42 stocks.

<b>Company Name</b>	<b>Symbol</b>	<b>% Weighting</b>
First Solar	FSLR	5.47%
Zoltek Cos	ZOLT	4.53%
American Superconductor	AMSC	4.08%
MEMC Electronic	WFR	3.87%
Evergreen Solar	ESLR	3.61%
Itron	ITRI	3.50%
Echelon	ELON	3.31%
Sunpower	SPWR	3.24%
Cypress Semiconductor	CY	3.22%
Ormat Technologies	ORA	2.95%
Suntech Power	STP	2.94%
International Rectifier	IRF	2.91%
Maxwell Technologies	MXWL	2.83%
Applied Materials	AMAT	2.80%
Kyocera Corp Adr	KYO	2.78%
Energy Conversion	ENER	2.67%
Cree	CREE	2.66%
Universal Display	PANL	2.65%
Emcore	EMKR	2.59%
Om Group	OMG	2.43%
Air Products & Chem	APD	2.43%
Praxair	PX	2.39%
Fuel Systems Solutions	FSYS	2.36%
FuelCell Energy	FCEL	2.35%
Puget Energy	PSD	2.32%
Andersons	ANDE	2.31%
Color Kinetics	CLRK	2.26%
Ballard Power	BLDP	2.22%
Pacific Ethanol	PEIX	2.17%
Medis Technologies	MDTL	2.10%
Idacorp	IDA	2.03%
MGP Ingredients	MGPI	1.97%
VeraSun Energy	VSE	1.90%
Plug Power	PLUG	1.80%
Diversa	DVSA	1.50%
Uqm Technologies	UQM	0.75%
Hydrogenics	HYGS	0.41%
Quantum Fuel Sys	QTWW	0.40%
Ultralife Batteries	ULBI	0.39%
Active Power	ACPW	0.35%
Capstone Turbine	CPST	0.33%
Distributed Energy	DESC	0.21%

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## Appendix II: Q2 Components

The following are Index stocks & sectors starting at the Rebalance for Q2:

### INDEX (ECO) SECTORS & STOCK WEIGHTINGS AS OF FIRST DAY OF Q2 2007. 40 STOCKS.

Each stock freely floats according to its share price after rebalance.

\* Stocks \$50-\$200 million in size at the rebalance are banded at a 0.5% weight.

#### **Renewable Energy Harvesting** - 36% sector weight (12 stocks @3.0% each)

*Applied Materials*, AMAT. Solar PV fabrication, growing both thin film and crystalline.

*Emcore*, EMKR. Solar, 28%+ ultra-efficient PV cells for satellites and terrestrial use.

*EuroTrust*, EURO. Wind, conglomerate is growing wind power assets across Europe.

*Evergreen* ESLR. Unique string-ribbon solar PV with more efficient silicon-use.

*First Solar*, FSLR. Maker of thin film, CdTe solar panels that reduce silicon need.

*Kyocera*, KYO. Solar PV, integrated manufacturer is doubling production.

*MEMC*, WFR. Producer of the polysilicon needed in many crystalline solar PV cells.

*Ormat*, ORA. Geothermal, works as well in recovered energy, biofuels.

*SunPower*, SPWR. Solar, Efficient PV panels with all-rear-contact cells.

*Cypress*, CY. (Parent firm of SPWR above, and owns major block of their stock).

*SunTech Power*, STP. Solar, fast-growing and major producer of PV based in China.

*Zoltek*, ZOLT. Wind, makes carbon fiber for wind blades and product 'lightening'.

#### **Power Delivery & Conservation** - 21% sector weight (7 stocks @2.93% each; +1 banded stock)

*American Superconductor*, AMSC. Both superconductors 2G HTS, and Wind Power.

*Color Kinetics*, CLRK. Light Emitting Diode LED lighting systems.

*Cree*, CREE. LEDs, makes efficient lights, power-saving electronics.

*Echelon*, ELON. Networking, for management of whole energy systems.

*International Rectifier*, IRF. Efficiency-enabling electronics producer.

*Itron*, ITRI. Monitoring, designs energy measurement and management systems.

*Universal Display*, PANL. Organic light emitting diode OLED panel displays.

\**UQM Technologies*, UQM. Hybrid vehicle electrics; motor & power systems.

#### **Cleaner Fuels** - 17% sector weight (7 stocks @2.43% each)

*Air Products & Chemicals*, APD. Hydrogen, a supplier of many industrial gases.

*Andersons*, ANDE. Biofuels and ethanol; highly diversified across agribusinesses.

*Diversa*, DVSA. Enzymes to convert biomass, cellulosic feedstocks to biofuels.

*MGP*, MGPI. Biofuels, ethanol and fuel alcohol.

*Pacific Ethanol*, PEIX. Aims to be a lead biofuels producer for Western U.S.

*Praxair*, PX. Hydrogen, a supplier of many industrial gases.

*VeraSun Energy*, VSE. Biofuels, is the 2nd largest corn ethanol producer in U.S.

#### **Energy Storage** - 12% sector weight (4 stocks @2.75% each; +2 banded stocks)

\**Active Power*, ACPW. Flywheel power storage, a firm power alternative to batteries.

*Energy Conversion Devices*, ENER. Very diversified: in batteries, solar PV, also H2 FCs.

*Fuel Systems Solutions*, FSYS. Gaseous fuels integrator for cleaner-fueled vehicles.

*Maxwell*, MXWL. Ultracapacitors, a battery alternative such as for hybrid vehicles.

*OM Group*, OMG. Produces cobalt & precursors in Li-Ion, rechargeable batteries, FCs.

\**Ultralife Batteries*, ULBI. Batteries, advanced lithium ion, polymer rechargeable.

#### **Energy Conversion** - 9% sector weight (4 stocks @2.12% each; +1 banded stock)

*Ballard Power*, BLDP. Mid-size fuel cells, PEM FCs such as for transportation.

\**Capstone Turbine*, CPST. Micro-turbines 30-60 kW, may be flexibly-fueled.

*FuelCell Energy*, FCEL. Large fuel cells are stationary high-temp. flex-fuel MCFCs.  
*Medis*, MDTL. Micro fuel cells, designed for liquid-fuels with unique electrolyte.  
*Plug Power*, PLUG. Mid-sized fuel cells for distributed generation, home power.

**Greener Utilities** - 5% sector weight (2 stocks @2.50% each)

*Idacorp*, IDA. Hydroelectric, Utility, significant hydro-electric; some small hydro.  
*Puget Energy*, PSD. Wind, Utility. PSD is growing its wind power.