



## Q4 2017 Quarterly Report: WilderHill Clean Energy Index<sup>®</sup>, December 31, 2017

For 4<sup>th</sup> Quarter 2017 the Clean Energy Index<sup>®</sup> (ECO) began near 49 and ended nearby 53 for a Quarterly rise of about +8%; ECO ended 2017 well up too, roughly gaining +37% for the year. Such big increases are likely not sustainable and were much more than broad market indices. Indeed look farther back say 4 years from 2014, and this clean energy theme & so ECO Index<sup>®</sup> at first gained but then fell; it didn't re-test highs that year with declines only broken by upturn late 2015; it fell 1<sup>st</sup> half 2016, went sideways 2<sup>nd</sup> half and climbed hard over all 2017 - for a clean energy theme that can drop hard (or rise) at times and that carries much risk. Yet it must also be said that fossil fuels have fallen far harder say these last 5 years than ECO. Oil, coal, natural gas all dropped *much* more the past 5 years than clean energy.

Quite different once again is Progressive Energy Index<sup>®</sup> (WHPRO) that generally excludes solar, wind & renewables: a separate WHPRO theme is for reducing the CO2 & pollution from - and for obtaining greater efficiencies in - dominant energy today. Over 2016, WHPRO went up strongly near +40% in a year ECO declined; in 2017 however, ECO did much 'better' as WHPRO was flat. So WHPRO can move quite unlike ECO (that 'can and does at times drop like a rock'); meanwhile this WHPRO theme is different too from the fossil fuel indexes.

For WilderHill<sup>®</sup> New Energy Global Innovation Index (NEX) capturing clean energy *worldwide* mostly outside the U.S., it rather 'underperformed' ECO in 2017. But seen longer-term over say last 5 years, we observe that NEX has done 'best' of the three WilderHill Indexes going up near +60%, while ECO is up near +25%, and Progressive is only just positive for this period. Interestingly then ECO & NEX are both up since 2013 - with WHPRO near nil - while fossil fuels are down strikingly as seen in charts below with big declines of some -30% to -70%.

Unrelated, but 4 items to note from Q4 include a [\\*reverse merger](#) in an independent tracker fund (PBW) for ECO Index splitting 1 for 5; next a back-office point is NEX is now a partnership of Josh Landess & Dr. Rob Wilder - co-jointly as WilderHill New Energy Finance (WHNEF); 3<sup>rd</sup> is the \*calculation Agent for NEX is now Solactive based in Germany; and 4<sup>th</sup> is a component in ECO & NEX (was TERP) had a merger with bit unusual results for [ECO](#) & [NEX](#). Returning to this clean energy Index theme, ECO as seen here for Q4 to late December shows upward momentum earlier this year is still somewhat present. Doubtless however, those gains of 2017 very easily could go into reverse ahead, if recent bullishness becomes pessimism:



Source: [bigcharts.com](#)

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Look next at 2017 to mid-December, for a wide variety of energy themes, including clean as well as dirtier traditional, and non-renewables - and some interesting tales appear.

As seen in a Chart below, starting from bottom, visibly Natural Gas in pink is again ‘trailing badly’ down here -33%. Prices for this energy has crashed many years now. Causes may include for example fracking that opens vast near to mid-term cheap, potential new sources of additional domestic gas. Despite OPEC’s attempts at putting in a floor, this glut keeps some damper on U.S. price rises, given wells can be re-opened and run inexpensively.

Also down most of the year, is Oil, that ends here near nil for 2017. And basically flat over an entire year too was Progressive energy Index, which ends near nil. Because WHPRO’s theme is partly for reducing CO2 and so has significant exposure to natural gas, as a replacement for much dirtier coal, it’s not surprising that this theme has faced head winds as well.



Source: Nasdaq.com

Finishing next positive, yet ‘only’ up some +10% here is an independent Index theme for Global clean energy (not ours) that’s near that +10% in the year. Finishing just above it is an active mutual fund for clean energy: it ends also near +10% to mid-December.

Next higher up after some gap, are 2 very different Indexing themes; both are up near +20%. One is coal: it previously had risen quite a bit last 2 years that included the candidacy & then the election of a very-pro coal U.S. Presidential candidate, along with rising coal demand outside the U.S. The other, separate theme is that for clean energy mainly outside the U.S. as captured and tracked by WilderHill New Energy Global Innovation Index NEX, & its independent tracker. Interestingly this performance of NEX continues to be rather different from another global Index just noted - despite both Indexes being in global clean energy.

Up next significantly YTD near +30% is Nasdaq QQQs, the technology stocks theme that’s long been tough ‘to beat’ especially since rising from a prior crash. Next, above and here up +33%, is WilderHill Clean Energy Index (ECO) as seen via its tracker. Then highest up is a Solar-only Index which is up significantly too by some +39%, along with robust volatility.

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As usual we'll now step back for a still-longer view, looking roughly 10 years from 2006 to late-2017 in a chart below. Included are fossil fuels and most dramatic is **Natural Gas (green)** which has crashed here by ~90%! Thus once again at bottom is the **Natural Gas tracker**. Just above it is a tracker for **Solar, brown**, also far down. 3<sup>rd</sup> up from the bottom is **Oil tracker**, that had fallen very hard but has lately risen. Hence the natural gas, solar, & oil themes are all strikingly down when viewed for the past roughly 10 years.

Next above them are two closely clumping themes: one is an active fund for alternative energy, in gray (long shows it's pretty hard for an active-fund to beat an Index); just above it is **ECO Index via an independent tracker, bold**. These two remain nearly-tied and yet both are doing 'better' (down less) than **Natural Gas, Oil**, and Solar. Next up after a large gap is Coal that was trailing; its tracker in **yellow** rose strongly 2016+2017 with a new Administration & coal's exports despite coal facing pretty dismal economics domestically. And roughly tied with it, is WilderHill Global New Energy, tracker in **orange**. Among all these varied themes above, \*global clean energy and \*coal here are the two doing 'best of late' - but that's still after some very big earlier falls hence finishing here still down around -60%.

Above all 6 after a gap at 'top' is \***WilderHill Progressive (WHPRO via PUW, red)** addressing CO2 & improving efficiency in major energy today. It ends here near nil, only energy theme doing 'so well' if starting early - note however most trackers don't begin ~10 years ago:



Source: bigcharts.com

So among energy themes above, all but Progressive are *far down* due to the energy crash last 10 years. But for more recent 2017, there's been upwards moves among several here.

Moving on, next we take brief note of a Reverse Split in an independent tracker for ECO Index, that was effective at close of markets on October 20, 2017.

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### **One for Five Reverse Split at the Independent Tracking Fund (PBW) during Q4 2017**

Noted was an Announcement early October of a 1-5 reverse split on October 23, 2017 for independent tracker (PBW) for ECO; following Text is re-posted here from Business Insider:

Excerpt from Business Insider, October 9, 2017 <http://markets.businessinsider.com/news/stocks/Invesco-Announces-Reverse-Share-Split-for-the-PowerShares-WilderHill-Clean-Energy-Portfolio-NYSE-Arca-PBW-1003521222>

#### ***Invesco Announces Reverse Share Split for the PowerShares WilderHill Clean Energy Portfolio (NYSE Arca: PBW). DOWNERS GROVE, Ill., Oct. 9, 2017***

*Effective at the close of markets on Friday, October 20, 2017, the Fund will affect a 1-for-5 reverse split of its issued and outstanding shares. Monday, October 23, 2017 is the first day of trading for the Fund on a split-adjusted basis. The split does not change the total value of a shareholder's investment. While the ticker symbol of the Fund will not change, it will receive a new CUSIP number. The Fund's new CUSIP is 73935X112.*

*Investors will receive one post-split share for every five pre-split shares owned. As a result, post-split shares would be priced five times higher than the pre-split shares. The table below illustrates a hypothetical 1-for-5 reverse split (actual net asset value, shares and market price may vary):*

*PRNewswire -- Invesco, a leading provider of exchange traded funds (ETFs), announced today a reverse share split for PowerShares WilderHill Clean Energy Portfolio (PBW).*

	<i># of Shares Owned</i>	<i>NAV</i>	<i>Value of Shares</i>
<i>Pre-Split</i>	<i>500</i>	<i>\$5.00</i>	<i>\$2,500</i>
<i>Post-Split</i>	<i>100</i>	<i>\$25.00</i>	<i>\$2,500</i>

*\*\*For Illustrative Purposes Only*

*This reverse split does not impact fund performance, however, investors should be aware of the adjustment in shares outstanding and per share NAV when comparing historical values or their monthly brokerage statements.*

*For shareholders who own a number of shares that is not an exact multiple of the reverse split ratio (in case of this reverse split, a multiple of five), the reverse split will result in the creation of fractional shares. As fractional shares cannot trade on an exchange, these shares will be redeemed for cash. With respect to the redemption of these fractional shares, this may cause a realization of gains or losses, which could be a taxable event for shareholders."*

....

*\*(As a minor addendum point, in past Index values very roughly might at times point to an independent tracker figure roughly around 'parity'. Hence an Index near 50, may mean tracker near-ish \$5 or so. Now after 1:5, that tracker may be nearer 5 times that: hence if the Index is say near 50, then the tracker's figure might be around say, \$25. This change is adjusted backwards in time in Charts).*

The impact of a 1-5 split, though it's a mathematical wash, with no real change to a holding's value, can be seen in a following chart here in a jump from about \$4.86/share (becoming 1/5<sup>th</sup> of a share) - to about \$24.38/share (for 1 share) on Monday October 23<sup>rd</sup>, 2017:



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Also 4<sup>th</sup> and minor note for Q4 is that one component in ECO had a rather unusual merger (it was TERP) in October, and an [announcement](#) about that was duly made:

Special Action Announcement for the ECO Index: Share Change effective date 10/17/2017 for Component TERP: New shares 220576.734. New Multiplier: 1. New Float Factor: 1.

That component (TERP) was also in NEX, where an [announcement](#) similarly was made:

Special Action Announcement for the NEX Index, the NEXEU, the NEXBP, and NEXJY: Share Change effective date 10/17/2017 for Component TERP: new shares 1384257. New Multiplier: 1. New Float Factor: 1.

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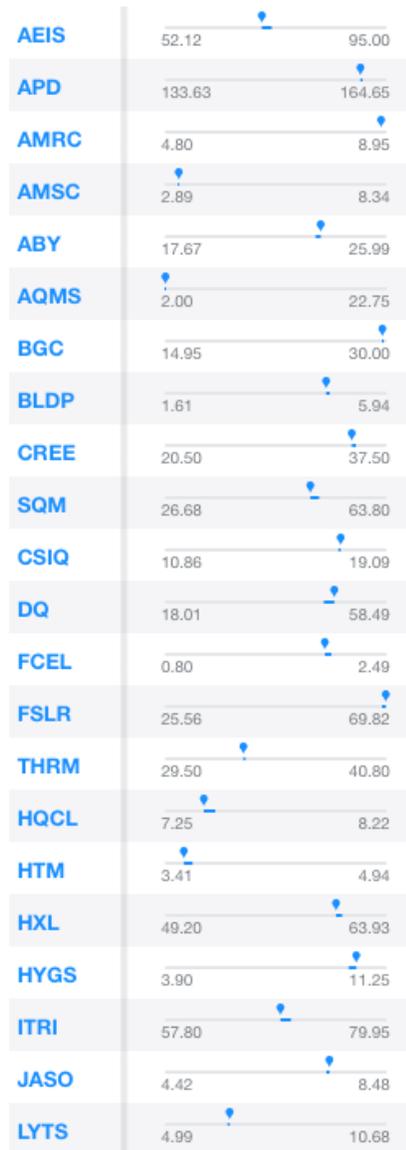
Returning to our theme of clean energy Indexing, tallying the known-past is always easier - than is predicting an ever-uncertain future. So for Clean Energy / Progressive themes in ECO & WHPRO - we'll glance back here from say, late Q4 to observe see how constituents in ECO & WHPRO fared last 52-weeks. Next is first a page for ECO components - then one for WHPRO - as to how individual component moved vs. their Lows & Highs.

Considering ECO individual components the past Year for relative Lows, Highs or somewhere in between to early-December 2017: we see here Top Performers for ECO for highs are spread over diverse themes including in: energy services (AMRC); the grid (BGC, a component that was bought out so this reflects a one-time action); thin film solar for Utility-scale use (FSLR); and again energy services (PWR); a polysilicon supplier for solar (DQ) isn't shown here as being near its high but it too gained sizably. Likewise at WHPRO the top names are also diverse on a following page, in efficient water heating (AOS), energy services (AGR), environmental technologies (GLW), biofuels (CZZ), and electric power services (EMR).

"Least' performers in ECO nearer 52-week lows were a diverse lot too. Again seen in Q4 (like Q3) is less-polluting water-based battery recycling (AQMS, though after a steep run-up); geothermal (HTM); once again global solar parks (SKYS); clean power Yieldco (TERP), and in thin film equipment though it faced IP disputes (VECO). WHPRO lows, like in Q3, were again Not very diverse with clumping in natural gas as declining prices have hit producers hard; also here were refrigerants (HDSN), biofuels (GPRE), and filtration (CECE).

First here's ECO:

**ECO Index Highs and Lows of Individual Components Past 52 weeks, to December 8, 2017:**



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Seen another way for the above, the most Up from their past 52-week lows - which includes many over +100% up - included: SEDG @+210%, OLD @+208%, BLDP @+191%, \*HYGS @+190%, FSLR @+165%, DQ @+160%.

Among those farthest down off their 52-week lows, these included: \*AQMS @-91% (although as a \*banded stock so starting at 0.50% it had just minor weighting), AMSC @-59%, SKYS @-57%, VECO @-56%, and \*banded LYTS @-35%.

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WHPRO Index Highs / Lows of Individual Components Past 52 weeks to December 8, 2017:

AIMC	34.80	50.00
ALB	85.60	144.99
ANDE	29.60	44.90
AOS	46.44	63.70
APOG	40.03	61.00
AGR	35.89	53.46
AYI	153.28	251.78
GTLS	32.04	48.78
CECE	4.71	14.82
CHK	3.41	8.20
CIG	1.95	3.84
CLNE	1.96	3.54
GLW	24.12	32.78
CZZ	5.63	9.53
CVA	13.00	16.50
ETN	66.60	82.34
ENS	61.33	84.74
EMR	55.40	67.79
ESE	50.30	65.95
FMC	56.35	95.25
GPRE	15.60	29.85

GLNG	19.32	29.18
HCCI	12.85	22.21
HASI	18.02	25.28
HDSN	5.40	10.40
KNDI	3.50	9.90
LXFR	10.82	14.95
LDL	45.45	64.85
MTZ	34.33	49.50
MDR	5.56	8.33
MEOH	39.48	55.10
NYLD	15.35	20.15
OC	50.77	91.40
PEIX	4.10	10.95
RRC	15.91	39.64
RBC	68.30	87.50
REX	76.10	107.87
SWN	4.90	12.82
TTM	28.97	40.34
TEN	51.54	70.96
WBC	102.39	156.08
WWD	65.22	82.94

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Seen another way for the above among the most Up from their past 52-week lows - though none are over +100% up - included: KNDI @+98% (though a \*banded stock so weighted less at 0.50%), OC @+68%, CZZ @+68%, ALB @+49%, AGR @+43%.

Among those farthest down off their own 52-week lows these included: CECE @-66%, PEIX @-56%, RRC @-56%, CHK @-52%, SWN @ -53%, and CIG @-50%.

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Conclusion:

For 4<sup>th</sup> Quarter 2017 the Clean Energy Index<sup>®</sup> (ECO) began near 49 and ended nearby 53 for a Quarterly rise of about +8%; ECO ended 2017 well up too, roughly gaining +37% for the year. Such big increases are likely not sustainable and were much more than broad market indices. Indeed look farther back say 4 years from 2014, and this clean energy theme & so ECO Index<sup>®</sup> at first gained but then fell; it didn't re-test highs that year with declines only broken by upturn late 2015; it fell 1<sup>st</sup> half 2016, went sideways 2<sup>nd</sup> half and climbed hard over all 2017 - for a clean energy theme that can drop hard (or rise) at times and that carries much risk. Yet it must also be said that fossil fuels have fallen far harder say these last 5 years than ECO. Oil, coal, natural gas all dropped *much* more the past 5 years than clean energy.

Progressive WHPRO went mainly sideways in 2017, as the NEX for clean energy *worldwide* somewhat 'underperformed' ECO this year - though outperforming WHPRO. Over say the last 5 years, this NEX global has done the 'best' of the three WilderHill Indexes, up here a notable +60%, with ECO's tracker up near +25%, and Progressive barely up for that period. Interestingly while NEX is quite up that period, ECO & WHPRO modestly so - traditional fossil fuels are all significantly down the last 5 years with declines of some -30% to -60%.

Lastly, one constituent was deleted from ECO to start Q1 2018, BGC; three additions to ECO Index for Q1 2018 were ALB to Energy Storage sector, ASYS to Energy Conversion, and JKS to Renewable Energy Harvesting. At a separate WilderHill Progressive Energy Index (WHPRO) to start Q1 2018, there was one deletion of ALB; there were no additions.

As always we welcome your thoughts and suggestions.

Sincerely,



Dr. Rob Wilder  
[rwilder@wildershires.com](mailto:rwilder@wildershires.com)

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Disclaimer: The following is a reminder from the friendly folks at Clean Energy Index<sup>®</sup> who worry about liability. Performance figures quoted represent past performance only, and are no guarantee of future results. Views expressed are those of just one of the managers of this WilderHill<sup>®</sup> 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 December 31, 2017. Positions in ECO Index<sup>®</sup> can and do change thereafter. Discussions of historical performance do not guarantee and are not indicative of future performance. The Index covers a highly volatile sector & is highly volatile too, always subject to well above-average changes in its valuation. WilderHill Clean Energy Index<sup>®</sup> (ECO) is published & owned by WilderShares<sup>®</sup> LLC. No financial instruments or products based on this Index are sponsored or sold by WilderShares, and Wildershires<sup>®</sup> LLC makes no representation regarding advisability of investing in such product(s). Marks to WilderHill<sup>®</sup>, to the Clean Energy Index<sup>®</sup>, to ECO Index<sup>®</sup>, to WilderShares<sup>®</sup>, and to Progressive Energy Index<sup>®</sup> are all registered and each is exclusive property; all rights reserved.

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**Appendix I:**

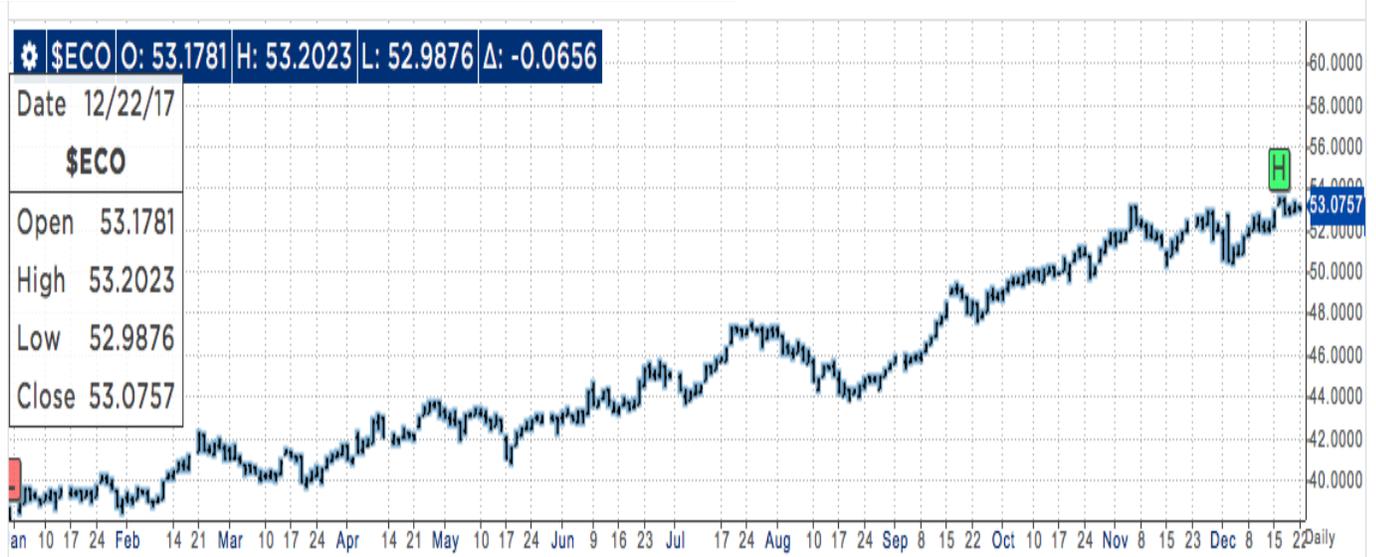
**ECO Index (via independent tracker PBW) Descending Weights & Components late-Q4 on 12/11/2017, or about ~2 weeks before rebalance to start Q1 2018. 38 stocks:**

<b><u>Name</u></b>	<b><u>Symbol</u></b>	<b><u>Weight</u></b>
Daqo New Energy Corp ADR	DQ	5.651
General Cable Corp	BGC	4.804
First Solar Inc	FSLR	4.692
Universal Display Corp	OLED	4.163
MYR Group Inc	MYRG	3.941
SolarEdge Technologies Inc	SEDG	3.919
Cree Inc	CREE	3.866
SunPower Corp	SPWR	3.684
Ameresco Inc	AMRC	3.485
Ormat Technologies Inc	ORA	3.429
Canadian Solar Inc	CSIQ	3.378
Hexcel Corp	HXL	3.317
Sunrun Inc	RUN	3.198
Quanta Services Inc	PWR	3.182
Atlantica Yield plc	AY	3.158
JA Solar Holdings Co Ltd ADR	JASO	3.104
Hanwha Q CELLS Co Ltd ADR	HQCL	3.05
Advanced Energy Industries Inc	AEIS	2.786
Ballard Power Systems Inc	BLDP	2.763
Itron Inc	ITRI	2.763
Gentherm Inc	THRM	2.755
Air Products & Chemicals Inc	APD	2.702
Plug Power Inc	PLUG	2.695
Sociedad Quimica de Chile	SQM	2.67
TPI Composites Inc	TPIC	2.604
Tesla Inc	TSLA	2.535
Pattern Energy Group Inc	PEGI	2.425
Renewable Energy Group Inc	REGI	2.201
TerraForm Power Inc	TERP	1.848
Veeco Instruments Inc	VECO	1.761
Hydrogenics Corp	HYGS	0.588
FuelCell Energy Inc	FCEL	0.519
Maxwell Technologies Inc	MXWL	0.499
LSI Industries Inc	LYTS	0.457
Sky Solar Holdings Ltd ADR	SKYS	0.453

US Geothermal Inc	HTM	0.415
American Superconductor Corp	AMSC	0.377
Aqua Metals Inc	AQMS	0.164

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### ECO Index for the Year to Date to December 25, 2017



Source: NYSE.com

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## Appendix II, ECO Index for Start of the New Quarter:

### **INDEX (ECO) SECTOR & STOCK WEIGHTS FOR START OF Q1 2018. 40 STOCKS.**

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

\*Stocks below \$200 million in size at rebalance are \*banded with a 0.5% weight.

#### **Renewable Energy Harvesting** - 31% weight (10 stocks @3.05% each; plus 1 \*banded)

*Canadian Solar*, CSIQ. Solar, vertically integrated solar manufacturer, China.

*Daqo New Energy*, DQ. Solar, polysilicon/wafer manufacturer; China-based.

*First Solar*, FSLR. Thin film solar, CdTe a low-cost alternate to polysilicon.

*Hanwha Q Cells*, HQCL. Solar, integrated from poly through modules.

*Hexcel*, HXL. Light composites, in wind blades & spars, aerospace, vehicles.

*JA Solar*, JASO. Solar, China-based sells PV modules in Asia, Europe, U.S.

*JinkoSolar*, JKS. Solar, wafers through solar modules, China-based OEM.

*Ormat*, ORA. Geothermal, works too in areas of recovered heat energy.

*SunPower*, SPWR. Solar, efficient PV panels have all-rear-contact cells.

*TPI Composites*, TPIC. Wind Blades; also light-weighting for transportation.

\**U.S. Geothermal*, HTM. Geothermal, operating & development-stage sites.

#### **Power Delivery & Conservation** - 16% sector weight (5 stocks @3.10%; +1 \*banded)

*Ameresco*, AMRC. Energy saving performance contracts, also in renewables.

\**American Superconductor*, AMSC. Wind, grid conditioning; superconductors.

*Itron*, ITRI. Meters, utility energy monitoring, measurement & management.

*MYR Group*, MYRG. Transmission and Distribution, includes solar & wind farms.

*Quanta Services*, PWR. Infrastructure, modernizing grid & power transmission.

*Universal Display*, OLED. Organic light emitting diodes, efficient displays.

#### **Energy Conversion** - 23% sector weight (7 stocks @3.07% each; +3 \*banded)

*Advanced Energy*, AEIS. Power conditioning: inverters, thin film deposition.

\**Amtech*, ASYS. Equipment Manufacturer, solar, LEDs lights, semiconductors.

*Ballard Power*, BLDP. Mid-size fuel cells; R&D, PEM FCs as in transportation.

*Cree*, CREE. LEDs, manufacturer in power-saving lumens, efficient lighting.

\**FuelCell Energy*, FCEL. Large fuel cells, high-operating temps, multiple-fuels.

*Gentherm*, THRM. Thermoelectrics, waste heat to energy, power harvesting.

\**LSI Industries*, LYTS. Lighting, LEDs, is vertically integrated U.S. manufacturer.

*Plug Power*, PLUG. Small fuel cells, for e.g. forklifts; drop in replacements.

*SolarEdge Technologies*, SEDG. Inverters: makes solar optimizers, inverters.

*Veeco*, VECO. Thin film equipment, for LEDs, energy efficient electronics.

#### **Greener Utilities** - 13% sector weight (4 stocks @3.12% each; +1 \*banded stock)

*Atlantica Yield*, ABY. Yieldco, Contracted renewables assets, also transmission.

*Pattern Energy*, PEGI. Wind farms, solar may be added too for GW sized PPAs.

\**Sky Solar*, SKYS. Solar farms, creating & operating utility-scale projects.

*Sunrun*, RUN. Residential solar systems, lease, PPA or purchase rooftop PV.

*TerraForm Power*, TERP. Owns operates solar/wind, developed nations, yieldco.

#### **Energy Storage** - 11% sector weight (4 stocks @2.62% each; + 1 banded stock)

*Albermarle*, ALB. Lithium & large producer of battery materials; energy storage.

\**Aqua Metals*, AQMS. Recycling lead acid batteries, eliminating toxic wastes.

*Maxwell*, MXWL. Ultracapacitors, an alternative to batteries as in hybrids.

Chemical & Mining Co. of Chile, SQM. Lithium, energy storage, large producer.  
 Tesla Motors, TSLA. Electric vehicles, solar; purer-play in EVs & energy storage.

**Cleaner Fuels** - 6% sector weight (2 stocks @2.75% each; +1 \*banded stock)  
 Air Products & Chemicals, APD. Hydrogen, is a supplier of industrial gases.  
 \*Hydrogenics, HYGS. Hydrogen, fuel and electrolysis for fuel cells, H2 storage.  
 Renewable Energy Group, REGI. Biodiesel, natural fats, oils, grease to biofuels.

**ECO (via independent tracker in bold) plus other key clean & fossil fuel themes over the past 5 years; 2012 to late 2017 was a period of 'tough times' with big declines:**



Source: Bigcharts.com

As seen by ECO (via tracker **bold**) plus several other themes above, these last 5 years have been very rough for many themes across clean, alternative energy & traditional fossil fuels. For example, despite ECO falling hard and ending this period 'only' up near +20%, this clean energy theme still is far above an oil tracker, as well as Natural Gas tracker that are at bottom down near -60%, plus a tracker for Coal that's down some -30%.

**Clean energy is 'only' up near +25%; yet fossil fuels are down around -30 to -60%.**

A tracker for Solar, once far at top, fell, has re-risen again going moderately over ECO. And moderately here below ECO, is Progressive energy WHPRO tracker sideways for 2017. Thus the last 5 years were remarkably tough across many energy themes, including the fossil fuels oil, coal & natural gas! But Not All Energy themes suffered so harshly...

Of some note for finishing positive & 'much better' here is the global new energy NEX Index with its tracker **in brown at** very top for this timeframe. The NEX is here up near +60% for past 5 years. (Mostly non-energy 'NASDAQ QQQ's did much better than that). It's interesting that Global clean / new energy as captured by NEX, did relatively 'better' than ECO since both are in clean energy, though the former's theme is mainly outside the U.S. The NEX also did quite 'better' than a separate, independent Index for global clean energy.

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**Appendix III: WHPRO Index via independent tracker PUW; component weights as seen in late-Q4 2017 on 12/11/2017 or about ~2 weeks before the rebalance to start Q1 2018. 42 Stocks:**

<b><u>Name</u></b>	<b><u>Symbol</u></b>	<b><u>Weight</u></b>
Owens Corning	OC	3.388
Cosan Ltd	CZZ	3.234
Chart Industries Inc	GTLS	3.2
Golar LNG Ltd	GLNG	3.069
Methanex Corp	MEOH	2.997
Eaton Corp PLC	ETN	2.88
Corning Inc	GLW	2.844
Andersons Inc/The	ANDE	2.792
MasTec Inc	MTZ	2.783
Avangrid Inc	AGR	2.781
FMC Corp	FMC	2.768
ESCO Technologies Inc	ESE	2.76
Covanta Holding Corp	CVA	2.736
AO Smith Corp	AOS	2.726
Apogee Enterprises Inc	APOG	2.725
Albemarle Corp	ALB	2.716
Heritage-Crystal Clean Inc	HCCI	2.715
Emerson Electric Co	EMR	2.704
Altra Industrial Motion Corp	AIMC	2.695
Lydall Inc	LDL	2.685
Tata Motors Ltd ADR	TTM	2.68
Acuity Brands Inc	AYI	2.676
McDermott International Inc	MDR	2.668
EnerSys	ENS	2.654
REX American Resources Corp	REX	2.639
Southwestern Energy Co	SWN	2.592
WABCO Holdings Inc	WBC	2.556
Tenneco Inc	TEN	2.553
Woodward Inc	WWD	2.53
Regal Beloit Corp	RBC	2.5
Chesapeake Energy Corp	CHK	2.434
Range Resources Corp	RRC	2.417
Hannon Armstrong	HASI	2.412
NRG Yield Inc	NYLD	2.378
Green Plains Inc	GPRE	2.372
Cia Energetica de Minas Gerais	CIG	2.001

Kandi Technologies Group Inc	KNDI	0.719
Luxfer Holdings PLC	LXFR	0.592
Clean Energy Fuels Corp	CLNE	0.417
Pacific Ethanol Inc	PEIX	0.379
Hudson Technologies Inc	HDSN	0.346
CECO Environmental Corp	CECE	0.284

**WHPRO for the Year to Date, to December 14, 2017**



Source: NYSE.com

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**Appendix IV: WHPRO Index for the start of the New Quarter.**

**Sectors & Stock Weightings: WilderHill Progressive Energy Index (WHPRO) for start of Q1 2018. 41 stocks.**

Each stock freely moves according to its share price after the rebalance; \*Banded stocks are those under \$400 million in size and weighted at 0.5%.

**Alternative Fuel - 25% Sector Weight (8 stocks @3.00% each +2 \*banded)**

*Andersons*, ANDE. Ethanol producer, corn-based; rail group is in fuel transport.  
*Chesapeake Energy*, CHK. Natural gas, one of larger U.S. independent producers.  
*\*Clean Energy Fuels*, CLNE. Natural gas fuel integration; for use in fleet vehicles.  
*Cosan*, CZZ. Biofuels, Brazil-based using sugarcane feedstock, ethanol exporter.  
*Green Plains Energy*, GPRE. Biofuel, ethanol; using U.S. domestic feedstock.  
*Methanex*, MEOH. Methanol, liquid fuel may be derived from fossil fuels or organics.  
*\*Pacific Ethanol*, PEIX. Biofuels, major U.S. producer of lower-carbon fuels.  
*Range Resources*, RRC. Natural gas, produces in Appalachian & Gulf Coast regions.  
*Rex American*, REX. Biofuels, with subsidiaries is a major U.S. ethanol producer.  
*Southwestern Energy*, SWN. Natural gas, U.S. producer, also midstream services.

**Conversion & Storage - 23% Sector weight (8 stocks @2.87% each)**

*Altra Holdings*, AIMC. Mechanical power transmission, electromechanical conversion.  
*Chart Industries*, GTLS. Natural gas, LNG; liquefied gas storage/transport, efficiency.  
*Covanta Holding*, CVA. Incineration, converts waste to energy (WtE); conglomerate.  
*EnerSys*, ENS. Battery maker, for telecommunications, utilities, motive power.  
*FMC*, FMC. Lithium producer for carbonate, metal, expanding hydroxide capacity.  
*Golar LNG*, GLNG. LNG, major independent carrier, gas transport, regasification.  
*MasTec*, MTZ. Engineering & construction, distribution of electricity, natural gas.  
*Wabco*, WBC. Mechatronics, better vehicle mechanical/energy/braking controllers.

**Better Efficiency - 18% Sector Weight (7 stocks @2.57% each)**

*Acuity Brands*, AYI. LED lights, OLEDs, and controls for indoor & outdoor lighting.  
*A.O. Smith*, AOS. Energy efficiency, innovations for water heating & monitoring.  
*Apogee*, APOG. Advanced glass, for better efficiency, green building designs.  
*Emerson Electric*, EMR. Broad work in energy efficiency, storage, lately biofuels.  
*Esco Technologies*, ESE. Power grid, advances 2-way metering & communications.  
*Regal Beloit*, RBC. Energy efficient motors, in commercial, industrial, homes etc.  
*Woodward*, WWD. Energy controllers, optimization, industrial turbines in generation.

**Emission Reduction - 13% Sector Weight (5 stocks @2.40% each +2 \*banded)**

*\*CECO Environmental*, CECE. End-of-pipe emissions controls and pollution reduction.  
*Corning*, GLW. Diverse, activity includes emissions reduction, filters, and catalysts.  
*\*Kandi Technologies*, KNDI. Developing small gasoline and urban electric vehicles.  
*Luxfer Holdings PLC*, LXFR. Advanced material, reduced emissions, gaseous storage.  
*McDermott*, MDR. Natural Gas; fewer emissions/CO2 vs. coal; EPCI in LNG facilities.  
*Tata Motors*, TTM. Smaller & 'nano' vehicles, India-based with worldwide sales.  
*Tenneco*, TEN. Automotive end-of-pipe emissions controls, catalytic converters.

**New Energy Activity - 10% Sector weight (4 stocks @2.37% each +1 \*banded stock).**

*Eaton*, ETN. Hybrids, better electric and fluid power in truck & auto applications.  
*\*Hudson*, HDSN. Refrigerant HFCs reclamation; reduces potent greenhouse gases.

*Heritage Crystal Clean*, HCCI. Oil re-refining, modern waste reuse and recycling.  
*Lydall*, LDL. Thermal and filtration separation; innovative energy efficiency.  
*Owens Corning*, OC. Materials lightening, building insulation composite materials.

Utility - 11% Sector weight (4 stocks @2.75% each)

*Avangrid*, AGR. Electricity & Natural Gas, generation, storage, distribution.  
*Companhia Energetica de Minas Cemig*, CIG. Brazil Utility, large hydroelectric.  
*Hannon Armstrong*, HASI. Energy efficiency, capital & finance for infrastructure.  
*NRG Yield*, NYLD. Contracted power generation and thermal, also some renewables.

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Chart for the **WHPRO Index** via an independent tracker bold for Past 5 years to late 2017 - versus the **ECO Index** as shown in gold via an independent tracker:



Source: Bigcharts.com

*WHPRO here in bold for last 5 years late 2012 - late 2017 as seen via tracker in bold, above. This includes a period of WHPRO rising moderately to Summer 2014 hitting a relative high - dropping strongly to February 2016 nadir - rising in 2016 - but goes mainly sideways since. Thus it finishes near nil - while ECO which had gone up farther, dropped more, risen in 2017 - here is up near +25% (past Quarterly Reports WHPRO finished up farther past 5 years).*

*Hence the WHPRO theme for less CO2/pollution from fossil fuels can move unlike the ECO basket, that dropped relatively much harder early 2014 through late 2016.*

That said all 3 WilderHill Indexes are late 2017 far below their own previous all-time highs. ECO is much, *much* lower - it having been in 2007 several-fold higher - that crash in some part due to a solar sub-theme having fallen so greatly from its peaks - and as noted the fossil fuels have fallen even more too). So Charts can differ greatly, depending on the starting point. Moreover as always, past movements are not an indication of future performance.

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**Appendix V: WilderHill New Energy Global Innovation Index (NEX)** seen late-Q4 2017 via independent tracker (PBD) on 12/11/17 or ~2 weeks before Rebalance to start Q1 2018. 97 in tracker:

<u>Name</u>	<u>Symbol</u>	<u>Weight</u>
Universal Display Corp	OLED	2.513
Cree Inc	CREE	2.413
Epistar Corp	2448	2.248
China High Speed Transmission	658	2.117
Meidensha Corp	6508	2.002
Xinjiang Goldwind Science	2208	1.983
Boralex Inc	BLX	1.9
Acuity Brands Inc	AYI	1.882
OSRAM Licht AG	OSR	1.882
Kingspan Group PLC	KSP	1.877
First Solar Inc	FSLR	1.808
Orsted A/S	OR....	1.786
Siemens Gamesa Renewable	SGRE	1.784
Saeta Yield SA	SAY	1.777
Hannon Armstrong Sustainable	HASI	1.745
Nibe Industrier AB	NIBEB SS	1.74
Huaneng Renewables Corp Ltd	958	1.722
NRG Yield Inc	NYLD	1.716
BYD Co Ltd	1211	1.715
Renewables Infrastructure Group	TRIG LN	1.674
Itron Inc	ITRI	1.671
Tesla Inc	TSLA	1.661
GS Yuasa Corp	6674	1.66
Philips Lighting NV	LIGHT	1.658
EDP Renovaveis SA	EDPR	1.654
China Longyuan Power	916	1.637
SolarEdge Technologies Inc	SEDG	1.628
TransAlta Renewables Inc	RNW	1.617
GCL-Poly Energy Holdings Ltd	3800	1.542
Pattern Energy Group Inc	PEGI	1.521
Sino-American Silicon Products	5483	1.422
SunPower Corp	SPWR	1.42
Meyer Burger Technology AG	MBTN SW	1.417
Nordex SE	NDX1	1.412
FDG Electric Vehicles Ltd	729	1.387
Atlantica Yield plc	AY	1.32

Vestas Wind Systems A/S	VWS DC	1.305
Canadian Solar Inc	CSIQ	1.302
Energy Absolute PCL	EA-R TB	1.256
SMA Solar Technology AG	S92	1.251
Xinyi Solar Holdings Ltd	968	1.208
Panda Green Energy Group Ltd	686	1.188
Takuma Co Ltd	6013	1.146
Veeco Instruments Inc	VECO	1.101
Superblock PCL	SU....	1.087
Canvest Environmental Protection	1381	1.037
China Everbright International Ltd	257	1.036
Novozymes A/S	NZYMB DC	1.007
Ormat Technologies Inc	ORA	0.852
Verbund AG	VER AV	0.808
Drax Group PLC	DRX LN	0.805
Green Plains Inc	GPRE	0.799
TerraForm Power Inc	TERP	0.774
Innergex Renewable Energy Inc	INE	0.759
Energy Development Corp	EDC	0.753
Kandi Technologies Group Inc	KNDI	0.744
Mercury NZ Ltd	MCY	0.737
Contact Energy Ltd	CEN	0.721
Ameresco Inc	AMRC	0.601
Ricardo PLC	RCDO LN	0.56
Maxwell Technologies Inc	MXWL	0.539
Wasion Group Holdings Ltd	3393	0.515
LSI Industries Inc	LYTS	0.513
China Power Clean Energy	735	0.509
Credit Suisse Real Estate Green	GREEN SW	0.503
Everlight Electronics Co Ltd	2393	0.501
Greencoat UK Wind PLC/Funds	UKW LN	0.485
China Titans Energy Technology	2188	0.477
Advanced Lithium Electrochem.	5227	0.462
Dialight PLC	DIA LN	0.456
Odelic Co Ltd	6889	0.452
Tanaka Chemical Corp	4080	0.436
NEL ASA	NEL	0.434
TPI Composites Inc	TPIC	0.43
Caverion OYJ	CAV1V FH	0.426
Senvion SA	SEN	0.402

Sunrun Inc	RUN	0.382
SPCG PCL	SPCG-R TB	0.368
Vivint Solar Inc	VSLR	0.367
Gigasolar Materials Corp	3691	0.367
JinkoSolar Holding Co Ltd ADR	JKS	0.366
Ballard Power Systems Inc	BLDP	0.36
Plug Power Inc	PLUG	0.353
Capital Stage AG	CAP	0.347
JA Solar Holdings Co Ltd ADR	JASO	0.342
China Singyes Solar Technologies	750	0.333
REC Silicon ASA	REC	0.331
Shunfeng International Clean Energy	1165	0.33
West Holdings Corp	1407	0.329
Neo Solar Power Corp	3576	0.323
GCP Infrastructure Investments Ltd	GCP LN	0.323
Motech Industries Inc	6244	0.313
Albioma SA	ABIO FP	0.291
eRex Co Ltd	9517	0.263
Renewable Energy Group Inc	REGI	0.24
CropEnergies AG	CE2	0.213
VERBIO Vereinigte BioEnergie AG	VBK	0.168

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**Sample past Sector Weightings in NEX. e.g. seen here for start of Q4 2017:**

Key	Sectors	Percentages	
		ECV	1.1%
ECV	Energy Conversion	EEF	29.3%
EEF	Energy Efficiency	ENS	6.7%
ENS	Energy Storage	RBB	8.2%
RBB	Renewables - Biofuels & Biomass	ROH	4.6%
ROH	Renewables - Other	RSR	20.5%
RSR	Renewable - Solar	RWD	29.2%
RWD	Renewable - Wind		

[http://www.nex-index.com/Constituents\\_And\\_Weightings.php](http://www.nex-index.com/Constituents_And_Weightings.php)

For Component values see, [http://www.nex-index.com/Constituents\\_And\\_Weightings.php](http://www.nex-index.com/Constituents_And_Weightings.php)

And for several variants, <https://www.solactive.com/?s=wilderhill>

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**Appendix VI:**

***WilderHill New Energy Global Innovation Index (NEX) for start of Q1 2018.***

**Grouped generally by NEX Index Sector:**

(subject to revision; see [http://www.nexindex.com/Constituents\\_And\\_Weightings.php](http://www.nexindex.com/Constituents_And_Weightings.php) )

Also Index Composition at, <https://www.solactive.com/?s=wilderhill&indexmembers=US96811Y1029>

<u>Name</u>	<u>Country</u>	<u>Weight</u>	<u>NEX Sector</u>
SHUNFENG INTERNATIONAL CLEAN ENERGY LTD	CAYMAN ISLANDS	0.35%	RSR
BYD CO LTD	CHINA	1.24%	ENS
CANVEST ENVIRONMENT PROTECTION GROUP WEST HOLDING	CAYMAN ISLANDS	0.29%	RBB
CHINA TITANS ENERGY TECHNOLO	JAPAN	0.35%	RSR
XINJIANG GOLDWIND SCIENCE & TECHNOLOGY	CAYMAN ISLANDS	0.46%	EEF
EVERLIGHT ELECTRONICS CO LTD	CHINA	1.59%	RWD
EPISTAR CORP	TAIWAN	0.46%	EEF
CHINA EVERBRIGHT INTERNATIONAL LTD	TAIWAN	1.60%	EEF
WASION GROUP LTD	HONG KONG	1.00%	RBB
NEO SOLAR POWER CORP	CAYMAN ISLANDS	0.46%	EEF
GIGASOLAR MATERIALS CORP	TAIWAN	0.35%	RSR
GCL-POLY ENERGY HOLDINGS LTD	TAIWAN	0.35%	RSR
TANAKA CHEMICAL CORP	CAYMAN ISLANDS	1.23%	RSR
ADVANCED LITHIUM ELECTROCHEMISTRY	JAPAN	0.36%	ENS
SINO-AMERICAN SILICON PRODUC	CAYMAN ISLANDS	0.36%	ENS
TAKUMA CO LTD	TAIWAN	1.23%	RSR
MOTECH INDUSTRIES INC	JAPAN	1.00%	RBB
MEIDENSHA CORP	TAIWAN	0.35%	RSR
CHINA HIGH SPEED TRANSMISSION EQUIPMENT	JAPAN	1.60%	EEF
GS YUASA CORP	CAYMAN ISLANDS	1.59%	RWD
PANDA GREEN ENERGY GROUP LTD	JAPAN	1.24%	ENS
ODELIC CO., LTD	BERMUDA	1.23%	RSR
FDG ELECTRIC VEHICLES LTD	JAPAN	0.46%	EEF
CHINA POWER CLEAN ENERGY DEVELOPMENT	BERMUDA	1.24%	ENS
CHINA SINGYES SOLAR TECHNOLOGIES HOLDINGS	HONG KONG	0.45%	RWD
CHINA LONGYUAN POWER GROUP-H	BERMUDA	0.35%	RSR
EREX CO LTD	CHINA	1.59%	RWD
HUANENG RENEWA-H	JAPAN	0.29%	RBB
XINYI SOLAR HOLDINGS LTD	CHINA	1.59%	RWD
ALBIOMA	CAYMAN ISLANDS	1.23%	RSR
AMERESCO INC	FRANCE	0.29%	RBB
ATLANTICA YIELD PLC	UNITED STATES	0.46%	EEF
ACUITY BRANDS INC	UNITED KINGDOM	1.23%	RSR
BALLARD POWER SYSTEMS INC	UNITED STATES	1.60%	EEF
BORALEX INC -A	CANADA	0.64%	ECV
CAPITAL STAGE AG	CANADA	1.59%	RWD
CAVERION OYJ	GERMANY	0.35%	RSR
CROPENERGIES AG	FINLAND	0.46%	EEF
	GERMANY	0.29%	RBB

CONTACT ENERGY LTD	NEW ZEALAND	0.65%	ROH
CREE INC	UNITED STATES	1.60%	EEF
CANADIAN SOLAR INC	CANADA	1.23%	RSR
DIALIGHT PLC	UNITED KINGDOM	0.46%	EEF
DRAX GROUP PLC	UNITED KINGDOM	1.00%	RBB
ENERGY ABSOLUTE PCL	THAILAND	1.00%	RBB
ENERGY DEVELOPMENT CORP	PHILIPPINES	0.65%	ROH
EDP RENOVAVEIS SA	SPAIN	1.59%	RWD
FIRST SOLAR INC	UNITED STATES	1.23%	RSR
GCP INFRASTRUCTURE INVESTMEN	JERSEY	1.23%	RSR
GREEN PLAINS INC	UNITED STATES	1.00%	RBB
CS REAL ESTATE FD GREEN PROP	SWITZERLAND	1.60%	EEF
HANNON ARMSTRONG SUSTAINABLE INFRA.	UNITED STATES	1.60%	EEF
INNERGEX RENEWABLE ENERGY INC	CANADA	0.65%	ROH
ITRON INC	UNITED STATES	1.60%	EEF
JA SOLAR HOLDINGS CO LTD	CAYMAN ISLANDS	0.35%	RSR
JINKOSOLAR HOLDING CO-ADR	CAYMAN ISLANDS	1.23%	RSR
KANDI TECHNO	UNITED STATES	0.46%	EEF
KINGSPAN GROUP PLC	IRELAND	1.60%	EEF
PHILIPS LIGHTING NV	NETHERLANDS	1.60%	EEF
LSI INDUSTRIES INC	UNITED STATES	0.46%	EEF
MEYER BURGER TECHNOLOGY AG	SWITZERLAND	1.23%	RSR
MERCURY NZ LTD	NEW ZEALAND	0.65%	ROH
MAXWELL TECHNOLOGIES INC	UNITED STATES	0.36%	ENS
NORDEX	GERMANY	1.59%	RWD
NEL ASA	NORWAY	0.18%	ECV
NIBE INDUSTRIE-B	SWEDEN	1.60%	EEF
NRG YIELD INC CLASS C	UNITED STATES	1.59%	RWD
NOVOZYMES A/S	DENMARK	1.00%	RBB
UNIVERSAL DISPLAY CORP	UNITED STATES	1.60%	EEF
ORMAT TECHNOLOGIES INC	UNITED STATES	0.65%	ROH
ORSTED A/S	DENMARK	1.59%	RWD
OSRAM LICHT AG	GERMANY	1.60%	EEF
PATTERN ENERGY GROUP INC	UNITED STATES	1.59%	RWD
PLUG POWER INC	UNITED STATES	0.18%	ECV
RICARDO PLC	UNITED KINGDOM	0.46%	EEF
REC SILICON ASA	NORWAY	0.35%	RSR
RENEWABLE ENERGY GROUP INC	UNITED STATES	0.29%	RBB
TRANSALTA RENEWABLES INC.	CANADA	1.59%	RWD
SUNRUN INC	UNITED STATES	0.35%	RSR

SMA SOLAR	GERMANY	1.23%	RSR
SAETA YIELD SA	SPAIN	1.59%	RWD
SOLAREEDGE TECHNOLOGIES INC	UNITED STATES	1.23%	RSR
SENVION SARL	LUXEMBOURG	0.45%	RWD
SIEMENS GAMESA RENEWABLE ENERGY	SPAIN	1.59%	RWD
SPCG PCL	THAILAND	0.35%	RSR
SUNPOWER CORP-CLASS A	UNITED STATES	1.23%	RSR
SUPERBLOCK PCL	THAILAND	1.23%	RSR
TERRAFORM POWER INC	UNITED STATES	1.23%	RSR
TPI COMPOSITES INC	UNITED STATES	0.45%	RWD
THE RENEWABLES INFRASTRUCTURE GROUP LTD.	GUERNSEY	1.59%	RWD
TESLA INC	UNITED STATES	1.60%	EEF
GREENCOAT UK WIND PLC	UNITED KINGDOM	0.45%	RWD
VERBIO AG	GERMANY	0.29%	RBB
VEECO INSTRUMENTS INC	UNITED STATES	1.60%	EEF
VERBUND AG	AUSTRIA	0.65%	ROH
VIVINT SOLAR INC	UNITED STATES	0.35%	RSR
VESTAS WIND SYSTEMS A/S	DENMARK	1.59%	RWD
DAQO NEW ENERGY CORP-ADR	CAYMAN ISLANDS	0.35%	RSR
ENPHASE ENERGY INC	UNITED STATES	0.35%	RSR
SAMSUNG SDI CO LTD	SOUTH KOREA	1.24%	ENS
QUIMICA Y MINERA CHIL-SP ADR	CHILE	1.24%	ENS
SALTX TECHNOLOGY HOLDING AB	SWEDEN	0.36%	ENS
SEOUL SEMICONDUCTOR CO LTD	SOUTH KOREA	1.60%	EEF
LANDIS+GYR GROUP AG	SWITZERLAND	1.60%	EEF
EF-ON INC	JAPAN	0.46%	EEF

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\*The Global NEX Index only is a Partnership of two entities from Q4 2017: Josh Landess of First Energy Research; and Dr. Rob Wilder of WilderHill - jointly making up the WilderHill New Energy Finance LLC (WHNEF): the NEX Index alone is owned & produced by WHNEF.

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