



Q3 2018 Quarterly Report: WilderHill Clean Energy Index[®], September 2018

For 3rd Quarter 2018 the Clean Energy Index[®] (ECO) began near 52, and late September was near 53 - so mainly unchanged this period; it began year 2018 near 53 so was sideways too Year to Date. Look back by almost 2 years, however, and at start of 2017 the ECO Index[®] was near 38 & so has gained roughly +40% in this period. (An independent ECO Index[®] tracker at the start of 2017 was around 19, start of 2018 was near 25, and late Q3 was near 25).

Last 5 years to mid-Q3 2018, clean energy as captured by ECO is moderately down some -7%. Yet it should be noted that 2 of 3 fossil fuels, oil & natural gas fell harder going much more negative the last 5 years than ECO: those two (but not so much coal) dropped much more last 5 years than clean energy. Coal rose steeply since 2016 to come almost back to ECO.

Quite different once again is Progressive Energy Index[®] (WHPRO) that generally excludes clean solar, wind & renewables: a differing WHPRO theme is for reducing CO2 & pollution from and gaining greater efficiencies in dominant energy today. In 2016, WHPRO gained near +40% after its prior falls (in a year when ECO declined). But in 2017, it was ECO that did 'better', while WHPRO was flat and it's been flattish since. We've seen that WHPRO can move quite unlike ECO's theme (that 'can & does at times drop like a rock'); also that a differing WHPRO for reducing the CO2 in major energy can be quite non-correlating with oil and coal.

For WilderHill[®] New Energy Global Innovation (NEX) capturing clean energy *worldwide* mostly outside the U.S., it 'underperformed' ECO somewhat again in Q3. Seen over the last 5 years, however, NEX has done 'best' of 3 WilderHill Indexes - up near +15% (or here 'up more' than many energy passive Indexes & active funds), with ECO/and WHPRO a bit down this period.

In contrast to NEX here a bit up, ECO/and WHPRO down a few percent - fossil fuels oil and natural gas are down strikingly as seen in charts dropping some -60% to -70%. Meanwhile the 3rd dirty energy, coal rose sharply from 2016 yet ends here just below ECO/WHPRO. So for fossil fuels in Q3, oil was elevated, and natural gas and coal were down somewhat.

Charts pages ahead show clean energy theme ECO performance the last Quarter, last 1 year, 5 years and 10 years. But first let's look at this clean energy theme as captured and tracked by ECO in Q3 to late Sept.; we can see it's flat to down/up just a bit over 3rd Quarter:



Source: NYSE.com

Next look last 12 Months to mid-Q3 2018 across varied themes in clean, alternative, as well as plain-old-dirty non-renewable energy - and some sizeable differences again stand out.

Starting from the bottom a Natural Gas tracker trails down some -7%. But it is showing some rebounding during Q3 and it/UNG here ends just as below a separate global clean energy Index (not ours) via its tracker, that is down roughly -5% in this 1-year period to mid-Q3:



Source: bigcharts.com

Next, just above those 2 is an independent tracker for global new energy mainly outside the U.S. as captured by WilderHill New Energy Global Innovation Index (NEX) down some -3%. Roughly tied, is another passive Index (not ours) via its tracker for a just-solar narrow theme; both NEX & solar themes along with most related others dropped some during Q3 in a same period here that ‘contrarian’ natural gas gained, almost alone among these themes.

Next up is an active mutual fund for alternative energy, ending here barely up by about +2%. Above it is a tracker for coal ending 12 months up some +7%. Then tied, though flat much of past year is Progressive Energy (WHPRO) up some +7% too last 12 months to mid Q3.

Above those all, after rather sizeable gap are 2 quite differing Index themes. One is WilderHill clean energy Index (ECO) that’s up some +17%. (Also well up by +27% though not seen in this chart that’s focused on energy, is the major Nasdaq Index, QQQ). Next after a gap at very top is Oil as seen via its Index theme and tracker, up rather sizably here by some +37%.

(A bit interesting, solar’s theme, like several in global/new/alternative energy, dropped more than ECO this period... it may be that a slight but differing exposure in ECO helped ‘inoculate’ it against narrower declines being so strongly manifested in a broader Index).

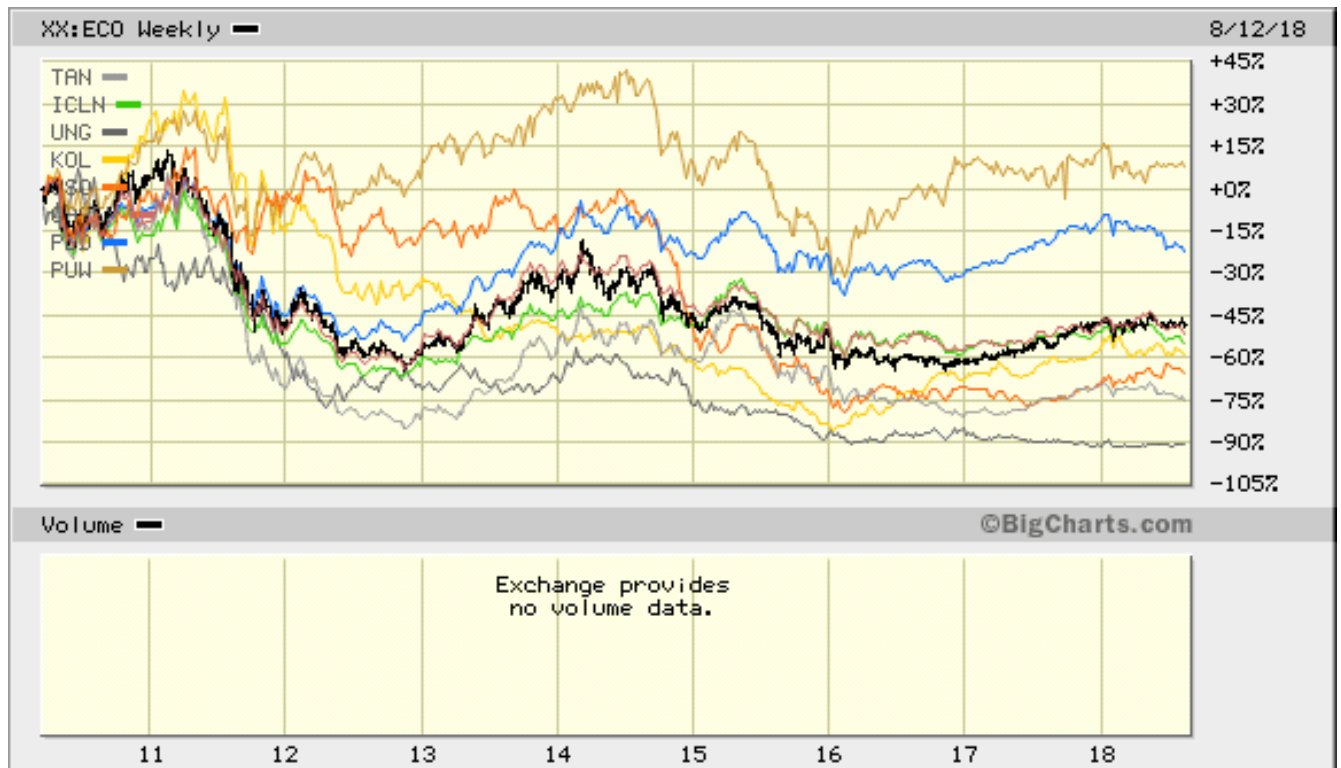
As usual we step back next, going back almost 10 years from around 2010 to mid-2018 in a chart below. Included again are the fossil fuels and dramatic for being far down at bottom is again Natural Gas, which crashed by some ~90%! We thus see when viewed from bottom, lowest is natural gas; then just above it a tracker for Solar, also down, by -75%. Next and less down is Oil that's fallen hard but it has lately 'risen' to be off -65%. Hence these themes for natural gas, solar, and oil are all very strongly down when viewed for near 10 years.

Next 'up' is Coal, though still well down some -60%, a theme that had once trailed badly; its tracker rose hard 2016/2017/early 2018, despite facing some pretty dismal economics.

Above those 4 stories for solar plus fossil fuels, we see as before 3 clumping themes: first a separate passive Index (not ours) for global clean energy. Just above it is an active fund for alternative energy. Then just above those is the ECO Index, via independent tracker (again showing it's pretty hard for an active fund to beat passive Index). While down some -50%, these 3 are all still doing 'better' (just down less) than Natural Gas, Solar, Oil, Coal.

Next up and visibly higher, is WilderHill Global New Energy NEX via tracker down -20 to -25%. Among these varied themes then global new/clean energy is doing somewhat 'better' of late - but after some big prior falls hence they're all still down some -25%, -50% and more.

Finally above those 7 after a big gap is WilderHill Progressive (WHPRO) via a tracker for reducing CO2 & improving efficiency in dominant energy today. It ends nearly 10 years up, by some +7%, and only energy theme here above nil in starting so early. Note however it's barely positive for last 10 years, and that many trackers don't even begin 10 years ago:



Source: bigcharts.com

How have Individual constituents within ECO & WHPRO fared the past 52-weeks?

Focusing next on some internals inside Clean Energy / Progressive Energy stories and so within ECO & WHPRO - we'll glance back from mid-August 2018 - to observe how *constituents within* both ECO & WHPRO fared last 52-weeks. Briefly glancing back at components a past Year for their own relative Lows, Highs etc to mid-Q3 (August 18th), we see the Top Performers in ECO are again spread out diversely as in last Quarter Q2. Not surprisingly some new leaders in Q3 also come from differing places too vs. Q2, and Q1 2018, for fresh 'winners / losers'.

Winners in ECO over the past 52 weeks to mid-Q3 include in *Energy Services, in *LED Lighting, in *Biofuels, in *Solar home residential installation, and in *Waste heat management. In past quarters, those winners within ECO have at times been more focused - say in solar cell equipment/ solar manufacturing - but that's not been the case for a while - especially as solar has been increasingly commoditized and selling prices per watt in downwards fall.

Also of minor note is some 'winners' in previous quarters such as wind power, or the makers of lightweight materials for wind blades, or in power grid/transmission, are not so present this period to mid-Q3. Some 'winners' these past 52 weeks near their own highs are:

ECO:

At mid-Q3 2018 individual constituents near their own 52-week Highs to August include:

AMRC: in energy services, it was near highs last Q4/Q1, backed off Q2, and now is here again;
(AMSC: in wind & grid 2 areas close to heart of clean energy theme and it was near its own highs back in Q2: it's a smaller company so is *banded at 0.50% - but backed off in Q3);
CREE: in LED lighting, is again near highs like Q1 & Q2 (though was not so near Q4 2017);
(FSLR: in thin film large scale solar had been near highs in Q4 2017 but it is not so close now);
(HXL: makes light composites as for wind blades & spars, had been near highs, but not now);
(MYRG: in grid transmission it had been nearby highs earlier in 2018 too but it is not now);
REGI: in biofuels, and it is pegging right near its past 52-week highs here at mid-Q3;
RUN: in solar home residential installations so is downstream in solar, here near highs;
THRM: in thermal management and waste heat to energy is here near its own highs in Q3.

Hence there's pretty strong diversity among Top Performers recently within ECO, above.

Next, let's take a look at those constituents within ECO near their own 52-week **Lows**:

ECO's constituents near their 52-week Lows were a diverse lot, too. (AQMS isn't here as strongly as Q4 2017+Q1/Q2 2018, it's in water-based battery recycling and is up just a bit);
AEIS: in power conversion is near 52-week lows but that's partly after a strong long run up;
ASYS: equipment for making solar cells & LEDs, it's more classic downwards move here;
(BLDP: in fuel cells, is not as strongly here near 52-week lows - like AQMS - as it was in 2018);
SQM: a miner of lithium, supply for advanced batteries, is here near its own 52-week lows;
FCEL: in fuel cells, struggling to reach profitability as is common for all fuel cell makers;
JKS: solar panel manufacturer in competitive commodity cells business is near its lows.
(ITRI: in energy meters had been here; as was LYTS in LED lighting: both are up from lows);
similarly OLED in LEDs and lighting; and ORA in geothermal are up from prior lows.

There's pretty strong diversity here among Worst Performers too, as seen above. Included are constituents in power conversion but here coming off strong runup so its presence is perhaps not strongly indicative in this case. Instead, we see *equipment making solar cells and LEDs as 2 constituents present where commoditization and relentless pricing pressure and competition have stymied putting in a floor for profitability growth, and lastly here like last Quarter *fuel cells are again present: one of the pure play fuel cell constituents is just off lows and a second one is pegging near long-period lows ... given their persistence, the rather unique small sub-theme of hydrogen and fuel cells merits brief mention here.

Unlike renewables solar or wind (that are also more relevant to this story), fuel cells aren't now renewable, nor as clean. One day conceivably, they may run on hydrogen (H₂) renewably-made like from water with solar or wind, but it isn't so today. They can be less-polluting (somewhat) than regular fossil fuel-use due to efficiency rather like microturbines - less dirty than much old-style combustion - but they're not yet renewable, nor clean in true sense.

And besides engineering hurdles, the business case for fuel cells has been rather dismal for decades. H₂ can be made by steam reforming natural gas, but is then vexing to transport, to store and specialized demand is sparse. True, higher-temperature fuel cells may use a range of fuels but are expensive to make, fragile, use costly materials, and firms making them have long struggled with huge & mounting debt - so are mainly failing to reach true profitability. That said fuel cells have been & still are relevant to this energy story so are included in ECO Index - and their fortunes, down or up are part of this unfolding, unpredictable story.

WHPRO:

WHPRO 'winners' for near 52-weeks Highs are less clumped around natural gas, than before:
(AGR: seen in Q4 2017 & Q1 2018 in natural gas, greener energy & grid has come off highs);
ANDE: in U.S. biofuels it's bumped up somewhat from largely sideways moves the past-year;
GTLS: across the LNG value chain for natural gas as one replacement for diesel and coal;
EMR: again seen here like past 3 Quarters it's in electric power services including natural gas;
ESE: in filtration and pollution controls it has been showing some growth for years now;
(GLNG: independent operator for marine-based liquified natural gas, has fallen from Q2);
LXFR: in high performance natural gas cylinders and containment, is here like it was in Q2;
(MEOH: methanol used for various industry, energy activities and needs, is here just off highs);
(NYLD: advanced conventional & cleaner power generation, is near its own 52-week highs).

WHPRO lows like Q4 of 2017, Q1 & Q2 2018 weren't tied to a single theme and we see fewer natural gas-related firms, which were nearer to lows last Quarters. In Q3 2018 we see:

AIMC: in mechanical power transmission, it is coming off some recent highs in early 2018;
(AYI in LEDs and lighting products, which had been here earlier in 2018, is now up off lows);
CZZ: biofuels and Brazil-based using sugar feedstocks, it is near its own 52-week lows;
(LDL in heat/thermal abatement and control is up off its earlier 52-week lows);
FCX: mining / supplying materials for advanced batteries, it has come off some prior highs;
KNDI: in low cost electric cars and China-based, it is near its own 52-week lows here);
(REX is in ethanol and up some off utter lows, as is TTM working on coming electric vehicles);
OC: in building materials for better energy efficiency, it is mainly just off its recent highs;

In sum several in WHPRO 'near lows' in Q1 or Q2 have moved off that list including a few in natural gas that's now nearer highs; meanwhile the Highs are a fairly diverse lot too.

Conclusion:

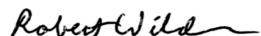
For 3rd Quarter 2018 the Clean Energy Index® (ECO) began near 52, and late September was near 53 - so was mainly unchanged this period; it also began year 2018 near 53 and so mainly was sideways too Year to Date. Looking back however near 2 years, since start of 2017, then ECO was near 38 & so gained roughly +41%. (For an independent ECO Index® tracker, back at start of 2017 it was around 19, start of 2018 was near 25, and late in Q3 it was near 25).

Last 5 years, clean energy as captured by ECO, as well as lower-CO2 within dominant energy as captured by WHPRO, are down somewhat; yet fossil fuels oil & natural gas are much more negative past 5 years: oil & gas (but not coal) have dropped *much* more than have clean/ progressive energy. Coal rose steeply from 2016 to come in just below ECO / WHPRO.

For WilderHill® New Energy Global Innovation (NEX) capturing clean energy *worldwide* mostly outside the U.S., these 5 years to mid-Q3 the NEX has done 'best' of 3 WilderHill Indexes up near +15% ('up more strongly' than many varied energy Indexes and active funds). In contrast to NEX as up, ECO & WHPRO as just down - fossil fuels oil / natural gas are down strikingly by some -70% for natural gas and -60% for oil - while coal is down 'only' around -15%. So nearly all of these energy themes are down, some significantly so, viewed over a past 10 years.

At the ECO Index 2 Deletions for start of Q4 2018 were HQCL & SKYS; and 2 Additions here were BE, WLDN; of minor note ASYS & VECO moved from the Energy Conversion Sector, to Power Delivery & Conservation Sector. There were no Deletions from, nor Additions to WHPRO Index for start of Q4, late Q3 one constituent's symbol & name changed from NYLD - to CWEN. As always, we welcome your thoughts and suggestions.

Sincerely,
Dr. Rob Wilder



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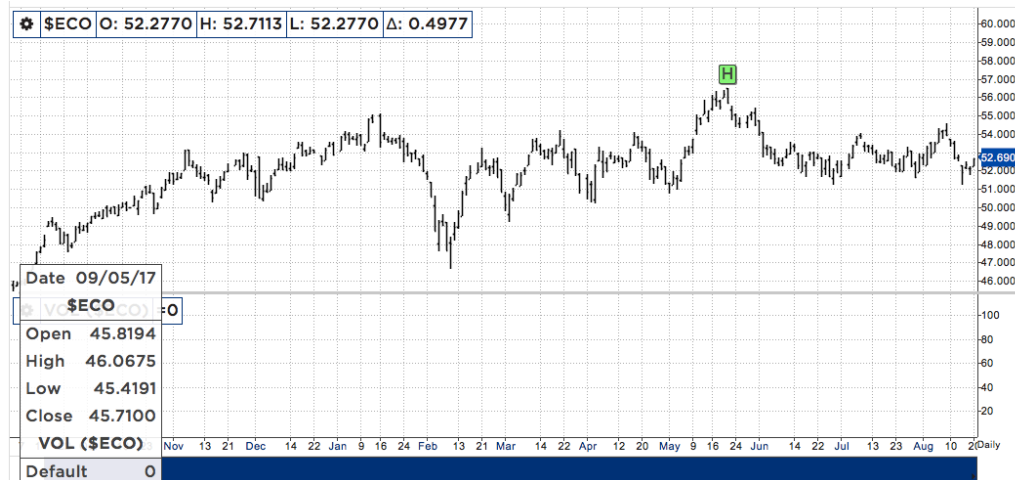
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Appendix I:
ECO Index (via independent tracker PBW) Descending Weights & Components seen
late-Q3 on 9/5/2018, about ~3 weeks before rebalance for Q4 2018. 39 stocks:

| <u>Name</u> | <u>Symbol</u> | <u>Weight</u> |
|--------------------------------|----------------------|----------------------|
| Hanwha Q CELLS Co Ltd ADR | HQCL | 4.33 |
| Universal Display Corp | OLED | 4.21 |
| Gentherm Inc | THRM | 4.02 |
| Renewable Energy Group Inc | REGI | 3.96 |
| Ballard Power Systems Inc | BLDP | 3.87 |
| Canadian Solar Inc | CSIQ | 3.60 |
| Ameresco Inc | AMRC | 3.40 |
| Daqo New Energy Corp ADR | DQ | 3.31 |
| Itron Inc | ITRI | 3.17 |
| Hexcel Corp | HXL | 3.10 |
| Cree Inc | CREE | 3.10 |
| First Solar Inc | FSLR | 3.07 |
| Ormat Technologies Inc | ORA | 3.06 |
| TPI Composites Inc | TPIC | 3.05 |
| Plug Power Inc | PLUG | 3.00 |
| Advanced Energy Industries Inc | AEIS | 2.99 |
| JinkoSolar Holding Co Ltd ADR | JKS | 2.93 |
| Pattern Energy Group Inc | PEGI | 2.91 |
| Albemarle Corp | ALB | 2.90 |
| SolarEdge Technologies Inc | SEDG | 2.89 |
| Quanta Services Inc | PWR | 2.86 |
| Air Products & Chemicals Inc | APD | 2.83 |
| Atlantica Yield plc | AY | 2.81 |
| Sunrun Inc | RUN | 2.70 |
| MYR Group Inc | MYRG | 2.69 |
| SunPower Corp | SPWR | 2.68 |
| TerraForm Power Inc | TERP | 2.62 |
| Tesla Inc | TSLA | 2.54 |
| Sociedad Quimica y Minera | SQM | 2.47 |
| Veeco Instruments Inc | VECO | 2.38 |
| Enphase Energy Inc | ENPH | 1.96 |

| | | |
|------------------------------|------|------|
| Maxwell Technologies Inc | MXWL | 1.81 |
| LSI Industries Inc | LYTS | 0.49 |
| FuelCell Energy Inc | FCEL | 0.41 |
| Amtech Systems Inc | ASYS | 0.40 |
| American Superconductor Corp | AMSC | 0.39 |
| Hydrogenics Corp | HYGS | 0.38 |
| Sky Solar Holdings Ltd ADR | SKYS | 0.37 |
| Aqua Metals Inc | AQMS | 0.37 |

ECO Index for roughly Past 12 months through mid-Q3 2018:



Source: NYSE.com

WHPRO Index for roughly Past 12 months through mid-Q3 2018:



Source: NYSE.com

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

INDEX (ECO) SECTOR & STOCK WEIGHTS FOR START OF Q4 2018. 39 STOCKS.

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

*Stocks below \$200 million in size at rebalance are *banded with a 0.50% weight.

Renewable Energy Harvesting - 27% weight (8 stocks @3.37% each)

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.

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

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.

Energy Conversion - 21% sector weight (7 stocks @2.85% each; +2 *banded)

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

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

Bloom Energy, BE. Stationary fuel cells, distributed, but not-renewable energy.

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.

Power Delivery & Conservation - 20% sector weight (7 stocks @2.71%; +2 *banded)

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

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

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

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.

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

Willdan, WLDN. Efficiency, distributed energy, renewables, engineering.

Greener Utilities - 12% sector weight (4 stocks @3.00% each)

Atlantica Yield, AY. Yieldco, Contracted renewables assets, also transmission.

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

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

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

Energy Storage - 14% sector weight (4 stocks @3.25% each; + 2 banded stocks)

Albermarle, ALB. Lithium, specialty materials in batteries; for energy storage.

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

Enphase, ENPH. Microinverters, also energy storage systems and software.

**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.

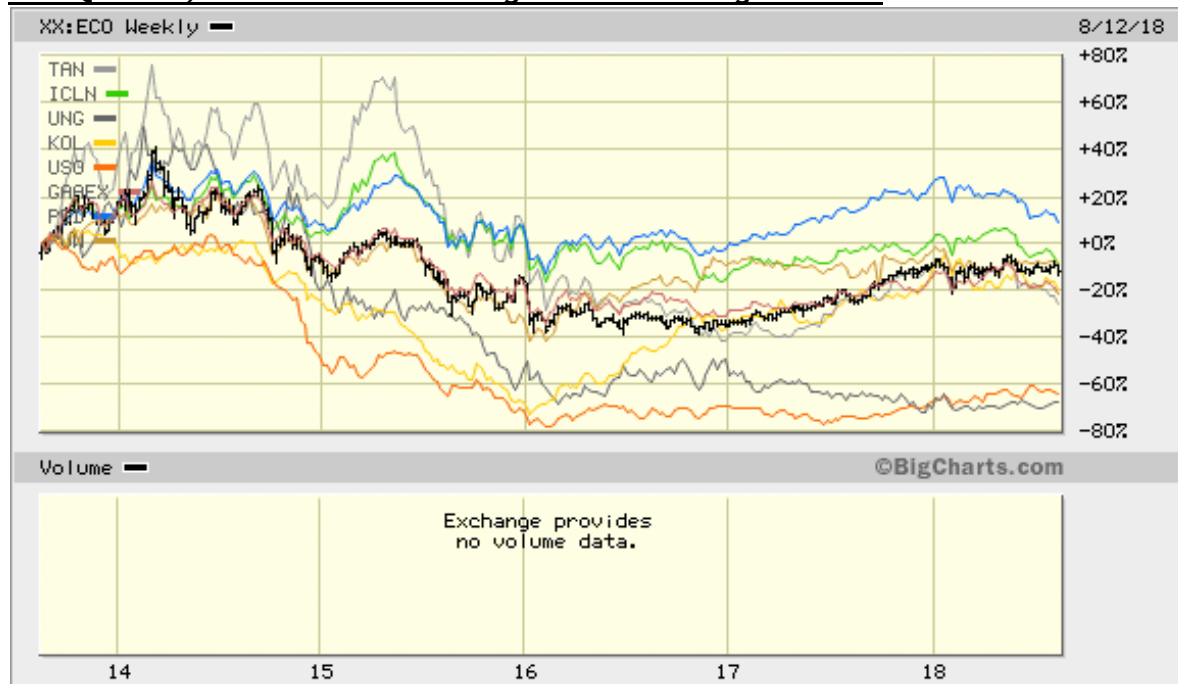
Cleaner Fuels - 6% sector weight (2 stocks @2.75% each; +1 *banded stock)

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 (in bold) plus other key clean energy & fossil fuel themes over the past 5 years to mid-Q3 2018; these were some 'tough times' with big declines:



Source: bigcharts.com

As seen by **ECO** (bold) plus several other themes above, these last 5 years were rough for several themes in clean and alternative energy & even traditional fossil fuels. For example despite **ECO** falling hard (and then rising) it ends the period down around -7%. Yet this clean energy theme still is well above an oil tracker, and natural gas tracker both negative by some -60% to -70%; meanwhile a coal tracker is still underwater/below **ECO**, but it has risen.

Clean energy **ECO** is 'a little' down, while 2 fossil fuels are down pretty significantly.

A tracker for Solar once was far at top; it fell hard and re-rose, it's here below **ECO**. Modestly here below **ECO**, is the Progressive **WHPRO** tracker that's been sideways mostly since 2016. These last 5 years were remarkably tough then across energy themes, including fossil fuels oil & natural gas! (Coal rose hard). But Not All Energy themes suffered so harshly...

Of some note for finishing positively & doing 'better' is global new energy **NEX** at very top in this timeframe. **NEX** is here up near +15% past 5 years. (Mostly non-energy and so not seen, the **NASDAQ QQQ** did much better than that - or than any of these energy themes).

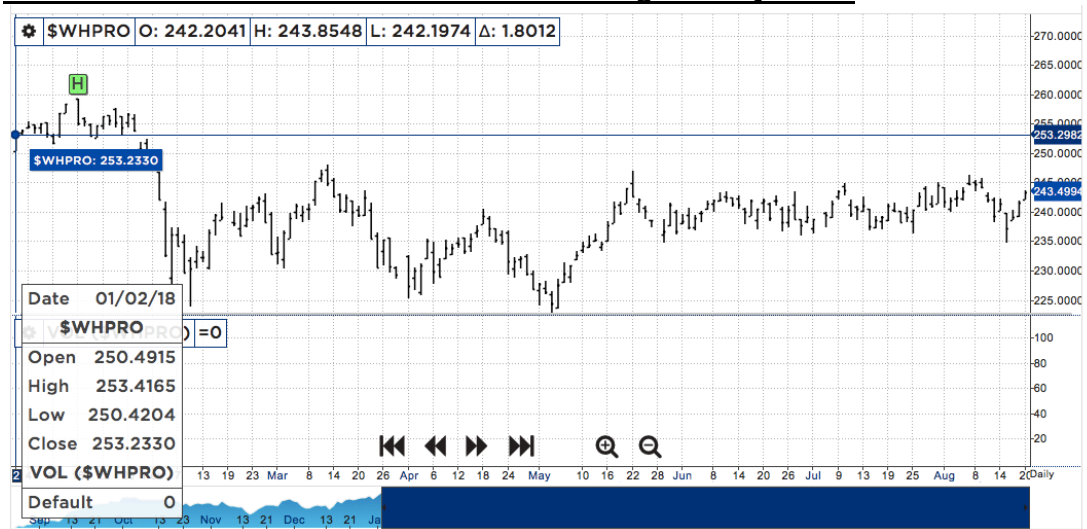
Appendix III: WHPRO Index via independent tracker PUW; component weights seen late-Q3 on 9/5/2018 or about ~3 weeks before rebalance for Q4 2018. 40 Stocks:

| <u>Name</u> | <u>Symbol</u> | <u>Weight</u> |
|------------------------------------|---------------|---------------|
| Andersons | ANDE | 3.31 |
| Acuity Brands Inc | AYI | 3.19 |
| Luxfer Holdings PLC | LXFR | 3.12 |
| Methanex Corp | MEOH | 3.03 |
| Southwestern Energy Co | SWN | 2.99 |
| Chart Industries Inc | GTLS | 2.98 |
| ESCO Technologies Inc | ESE | 2.95 |
| Heritage-Crystal Clean Inc | HCCI | 2.90 |
| Apogee Enterprises Inc | APOG | 2.85 |
| REX American Resources Corp | REX | 2.84 |
| Corning Inc | GLW | 2.83 |
| **NRG Yield Inc | NYLD | 2.79 |
| Emerson Electric Co | EMR | 2.78 |
| Range Resources Corp | RRC | 2.78 |
| Hannon Armstrong Infra. | HASI | 2.75 |
| EnerSys | ENS | 2.70 |
| Eaton Corp PLC | ETN | 2.67 |
| Woodward Inc | WWD | 2.64 |
| Regal Beloit Corp | RBC | 2.63 |
| WABCO Holdings Inc | WBC | 2.57 |
| Covanta Holding Corp | CVA | 2.56 |
| Chesapeake Energy Corp | CHK | 2.54 |
| Green Plains Inc | GPRE | 2.47 |
| AO Smith Corp | AOS | 2.47 |
| Lydall Inc | LDL | 2.43 |
| Cia Energetica de Minas Gerais ADR | CIG | 2.42 |
| FMC Corp | FMC | 2.40 |
| Cosan Ltd | CZZ | 2.35 |
| Avangrid Inc | AGR | 2.31 |
| Golar LNG Ltd | GLNG | 2.27 |
| Tenneco Inc | TEN | 2.23 |
| McDermott International Inc | MDR | 2.22 |
| Freeport-McMoRan Inc | FCX | 2.22 |
| Altra Industrial Motion Corp | AIMC | 2.20 |
| Clean Energy Fuels Corp | CLNE | 2.16 |
| MasTec Inc | MTZ | 2.14 |

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|------------------------------|------|------|
| Owens Corning | OC | 2.12 |
| Tata Motors Ltd ADR | TTM | 2.08 |
| CECO Environmental Corp | CECE | 0.68 |
| Kandi Technologies Group Inc | KNDI | 0.46 |

****late in Q3, NYLD became CWEN.**

WHPRO Index for the Year to Date 2018 through mid-Q3 2018



Source: NYSE.com

Global NEX Index for the Year to Date 2018 through mid-Q3 2018

Wilderhill New Energy Global Innovation Index (USD)



Source: Solactive.com

Note: the 3rd, and smallest Chart above displays these data instead since 2002.

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

Sectors & Stock Weightings: WilderHill Progressive Energy Index (WHPRO) for start of Q4 2018. 40 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 - 26% Sector Weight (9 stocks @2.88% each)

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.
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 (9 stocks @2.55% 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.
Freeport-McMoRan, FCX. Lithium producer; copper; also battery-grade cobalt JV.
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. New electric vehicles, mobility business line, India-based.
Tenneco, TEN. Automotive end-of-pipe emissions controls, catalytic converters.

New Energy Activity - 10% Sector weight (4 stocks @2.50% each).

Eaton, ETN. Hybrids, better electric and fluid power in truck & auto applications.
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 - 10% Sector weight (4 stocks @2.50% 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.
Clearway Energy, CWEN. Contracted power generation, renewables & conventional.
 (late in Q3, NRG Yield (NYLD) became CWEN).

5 Years to mid-Q3: the WHPRO Tracker - vs. ECO Index, vs. NEX Tracker



Source: bigcharts.com

WHPRO tracker in bold last 5 years to Q3 2018 vs. ECO (brown) and NEX tracker, blue, above. 3 differing Indexing themes/stories, each one presenting moves that are pretty unique. WHPRO/ECO finish down here some negative -7%, but they get here in very different ways. Following a modest rise for ECO to Spring 2014, and in 2015 to relative highs - it then drops strongly to early 2016 nadir - and ECO has mainly risen since. WHPRO by contrast, has gone mainly sideways through 2017 + 2018 YTD. Yet by coincidence they end this 5 years near one another - though no constituent in ECO is also in WHPRO at same time, & visa versa.

NEX Index's independent tracker in Global new/clean energy clearly outperforms this period. Yet for year to date 2018, for example, ECO does, and since 2017 it is up about +37%.

Despite that, all 3 WilderHill Indexes are now very far below their own previous all-time highs. ECO is much lower - having been in 2007 many-fold higher - (a crash in part due to the solar sub-theme falling so greatly from its peaks) - meanwhile, NEX and WHPRO too are well off their all-time highs. And fossil fuels have fallen even more greatly. So the various Charts can and will differ greatly, depending notably and in large part on their own starting point/s. Moreover as always, past movements are not an indication of future performance.

Appendix V: WilderHill New Energy Global Innovation Index (NEX) late-Q3 via independent tracker (PBD) on 9/5/18 or ~3 weeks before Rebalance to start Q4 2018. 114 stocks:

| <u>Name</u> | <u>Symbol</u> | <u>Weight</u> |
|---|----------------------|----------------------|
| Universal Display Corp | OLED | 2.27 |
| Acuity Brands Inc | AYI | 2.02 |
| Hannon Armstrong Infra. | HASI | 1.82 |
| Itron Inc | ITRI | 1.79 |
| NRG Yield Inc | NYLD | 1.78 |
| Nibe Industrier AB | NIBEB SS | 1.77 |
| Signify NV | LIGHT | 1.68 |
| Vestas Wind Systems A/S | VWS DC | 1.68 |
| Pattern Energy Group Inc | PEGI | 1.65 |
| Orsted A/S | ORSTED | 1.64 |
| Landis+Gyr Group AG | LAND SW | 1.63 |
| Cree Inc | CREE | 1.62 |
| Siemens Gamesa Renewable Energy SA | SGRE | 1.60 |
| Seoul Semiconductor Co Ltd | 046890 KS | 1.60 |
| Kingspan Group PLC | KSP | 1.58 |
| EDP Renovaveis SA | EDPR | 1.58 |
| GS Yuasa Corp | 6674 | 1.56 |
| Meidensha Corp | 6508 | 1.56 |
| TransAlta Renewables Inc | RNW | 1.52 |
| China Longyuan Power Group Corp Ltd | 916 | 1.51 |
| Renewables Infrastructure Group Ltd/The | TRIG LN | 1.51 |
| TPI Composites Inc | TPIC | 1.49 |
| Samsung SDI Co Ltd | 006400 KS | 1.48 |
| Tesla Inc | TSLA | 1.45 |
| Epistar Corp | 2448 | 1.45 |
| Nordex SE | NDX1 | 1.44 |
| Boralex Inc | BLX | 1.44 |
| Canadian Solar Inc | CSIQ | 1.38 |
| BYD Co Ltd | 1211 | 1.37 |
| BCPG PCL | BCPG-R TB | 1.36 |
| Huaneng Renewables Corp Ltd | 958 | 1.35 |
| OSRAM Licht AG | OSR | 1.33 |
| Xinjiang Goldwind Science & Tech. | 2208 | 1.27 |
| Veeco Instruments Inc | VECO | 1.27 |
| Sociedad Quimica y Minera de Chile SA ADR | SQM | 1.24 |
| Super Energy Corp PCL | SUPER TB | 1.22 |

| | | |
|--|-----------|------|
| Atlantica Yield plc | AY | 1.22 |
| China High Speed Transmission Equip. | 658 | 1.22 |
| GCP Infrastructure Investments Ltd | GCP LN | 1.21 |
| First Solar Inc | FSLR | 1.19 |
| Energy Absolute PCL | EA-R TB | 1.15 |
| SolarEdge Technologies Inc | SEDG | 1.15 |
| Drax Group PLC | DRX LN | 1.15 |
| TerraForm Power Inc | TERP | 1.14 |
| Sunrun Inc | RUN | 1.14 |
| JinkoSolar Holding Co Ltd ADR | JKS | 1.11 |
| Xinyi Solar Holdings Ltd | 968 | 1.09 |
| Novozymes A/S | NZYMB DC | 1.08 |
| Takuma Co Ltd | 6013 | 0.99 |
| SMA Solar Technology AG | S92 | 0.99 |
| SunPower Corp | SPWR | 0.98 |
| Verbund AG | VER AV | 0.90 |
| Green Plains Inc | GPRE | 0.86 |
| Meyer Burger Technology AG | MBTN SW | 0.85 |
| Sino-American Silicon Products Inc | 5483 | 0.84 |
| GCL-Poly Energy Holdings Ltd | 3800 | 0.84 |
| Innergex Renewable Energy Inc | INE | 0.71 |
| Ormat Technologies Inc | ORA | 0.71 |
| RENOVA Inc | 9519 | 0.70 |
| Mercury NZ Ltd | MCY | 0.66 |
| Contact Energy Ltd | CEN | 0.65 |
| Ameresco Inc | AMRC | 0.54 |
| PNE AG | PNE3 | 0.54 |
| Caverion OYJ | CAV1V FH | 0.53 |
| Ecopro Co Ltd | 086520 KS | 0.51 |
| CS Wind Corp | 112610 KS | 0.50 |
| Credit Suisse Real Estate Fund Green Prop. | GREEN SW | 0.49 |
| Gurit Holding AG | GUR SW | 0.48 |
| Willdan Group Inc | WLDN | 0.47 |
| Tanaka Chemical Corp | 4080 | 0.47 |
| Dialight PLC | DIA LN | 0.47 |
| LSI Industries Inc | LYTS | 0.46 |
| Voltabox AG | VBX | 0.45 |
| Odelic Co Ltd | 6889 | 0.44 |
| Lextar Electronics Corp | 3698 | 0.44 |
| Greencoat UK Wind PLC/Funds | UKW LN | 0.43 |

| | | |
|---|-----------|------|
| Renewable Energy Group Inc | REGI | 0.43 |
| Falck Renewables SpA | FKR | 0.43 |
| Kandi Technologies Group Inc | KNDI | 0.42 |
| Wasion Holdings Ltd | 3393 | 0.42 |
| EF-ON INC | 9514 | 0.40 |
| Unison Co Ltd/South Korea | 018000 KS | 0.39 |
| West Holdings Corp | 1407 | 0.38 |
| Ricardo PLC | RCDO LN | 0.37 |
| Everlight Electronics Co Ltd | 2393 | 0.36 |
| China Singyes Solar Technologies Holdings Ltd | 750 | 0.35 |
| SPCG PCL | SPCG-R TB | 0.35 |
| Shunfeng International Clean Energy Ltd | 1165 | 0.35 |
| Daqo New Energy Corp ADR | DQ | 0.35 |
| Scatec Solar ASA | SSO | 0.34 |
| Advanced Lithium Electrochemistry | 5227 | 0.34 |
| Ballard Power Systems Inc | BLDP | 0.34 |
| Encavis AG | CAP | 0.34 |
| Audax Renovables SA | ADX | 0.34 |
| Vivint Solar Inc | VSLR | 0.34 |
| FDG Electric Vehicles Ltd | 729 | 0.33 |
| China Power Clean Energy Development Co Ltd | 735 | 0.32 |
| Neo Solar Power Corp | 3576 | 0.32 |
| Senvion SA | SEN | 0.32 |
| NEL ASA | NEL | 0.32 |
| VERBIO Vereinigte BioEnergie AG | VBK | 0.32 |
| SaltX Technology Holding AB | SALTB SS | 0.30 |
| Canvest Environmental Protection Group | 1381 | 0.29 |
| eRex Co Ltd | 9517 | 0.28 |
| Albioma SA | ABIO FP | 0.28 |
| Energy Development Corp | EDC | 0.28 |
| Gigasolar Materials Corp | 3691 | 0.27 |
| Plug Power Inc | PLUG | 0.26 |
| Maxwell Technologies Inc | MXWL | 0.26 |
| Enphase Energy Inc | ENPH | 0.25 |
| CropEnergies AG | CE2 | 0.24 |
| REC Silicon ASA | REC | 0.24 |
| Motech Industries Inc | 6244 | 0.23 |
| Panda Green Energy Group Ltd | 686 | 0.22 |

Appendix VI:**WilderHill New Energy Global Innovation Index (NEX) in RECENT PAST - for start of Q3 2018.****This also contains brief Descriptors; also NEX Historical Sector Weightings Information is below:**

| COMPANY NAME | DESCRIPTION | COUNTRY | WGT. | SEC. | CUR. |
|-----------------------------------|--|---------------|-------|------|------|
| Ballard Power Systems Inc | Mid-size fuel cells; R&D, PEM FCs as in transportation. | CANADA | 0.26% | ECV | CAD |
| Plug Power Inc | Small fuel cells, e.g. in forklifts; drop in replacements. | UNITED STATES | 0.26% | ECV | USD |
| NEL ASA | Hydrogen, envisions powering fuel cell vehicles renewably, No | NORWAY | 0.26% | ECV | NOK |
| Tesla Inc | Electric vehicles, solar; in EVs & energy storage. | UNITED STATES | 1.58% | EEF | USD |
| Kingspan Group PLC | Buildings, innovative insulation for conservation, Ireland. | IRELAND | 1.58% | EEF | EUR |
| OSRAM Licht AG | Lighting manufacturer, also automotive, semiconductors, Germ | GERMANY | 1.58% | EEF | EUR |
| Nibe Industrier AB | Heating & cooling, also in diverse sustainable technologies, Sw | SWEDEN | 1.58% | EEF | SEK |
| Acuity Brands Inc | LEDs, OLEDs, controls for indoor & outdoor lighting. | UNITED STATES | 1.58% | EEF | USD |
| Universal Display Corp | Organic light emitting diodes, efficient displays. | UNITED STATES | 1.58% | EEF | USD |
| Cree Inc | LED manufacturer power-saving lumens, efficient lighting. | UNITED STATES | 1.58% | EEF | USD |
| Philips Lighting NV | Lighting, connected systems increasing efficiency, Netherlands | NETHERLANDS | 1.58% | EEF | EUR |
| Itron Inc | Meters, Utility energy monitoring, measuring & management. | UNITED STATES | 1.58% | EEF | USD |
| Landis+Gyr Group AG | Advanced meters, modernizing grid, Switzerland. | SWITZERLAND | 1.58% | EEF | CHF |
| Epistar Corp | LEDs, large LED manufacturer in Taiwan, much IP. | TAIWAN | 1.58% | EEF | TWD |
| Seoul Semiconductor Co Ltd | Lighting, automotive, LEDs, South Korea | SOUTH KOREA | 1.58% | EEF | KRW |
| Hannon Armstrong Sustainable Infr | Energy efficiency, capital & finance for infrastructure. | UNITED STATES | 1.58% | EEF | USD |
| Meidensha Corp | Energy management, power generation & transmission. | JAPAN | 1.58% | EEF | JPY |
| Veeco Instruments Inc | Thin film equipment, for LEDs, energy efficient electronics. | UNITED STATES | 1.58% | EEF | USD |
| Credit Suisse Real Estate Fund | Sustainability in buildings, real estate. | SWITZERLAND | 0.45% | EEF | CHF |
| Caverion OYJ | Energy efficiency, buildings, industrial infrastructure, Europe. | FINLAND | 0.45% | EEF | EUR |
| Ricardo PLC | Global Engineering, energy, environment, transportation. | BRITAIN | 0.45% | EEF | GBp |
| Wasion Group Holdings Ltd | Metering, integrated smart energy management, China. | HONG KONG | 0.45% | EEF | HKD |
| Everlight Electronics Co Ltd | LEDs, large manufacturer in optoelectronics, Taiwan. | TAIWAN | 0.45% | EEF | TWD |
| Ameresco Inc | Energy savings, performance contracts, also in renewables. | UNITED STATES | 0.45% | EEF | USD |
| Kandi Technologies Group Inc | EVs, developing small gasoline and electric urban vehicles. | CHINA | 0.45% | EEF | USD |
| Lextar Electronics Corp | LEDs and efficient lighting. | TAIWAN | 0.45% | EEF | TWD |
| EF-ON INC | Energy services, energy conservation, biomass, Japan | JAPAN | 0.45% | EEF | JPY |
| Odelic Co Ltd | Lighting, LEDs, residential, commercial equipment, Japan. | JAPAN | 0.45% | EEF | JPY |
| Willdan Group Inc | Energy efficiency in infrastructure, engineering. | UNITED STATES | 0.45% | EEF | USD |
| Dialight PLC | LED lighting, for industrial customers, U.K. | BRITAIN | 0.45% | EEF | GBp |
| LSI Industries Inc | Lighting, LEDs, vertically integrated U.S. manufacturer. | UNITED STATES | 0.45% | EEF | USD |
| BYD Co Ltd | Batteries, potential use in EVs, rail, solar farms, forklifts. | CHINA | 1.41% | ENS | HKD |
| Sociedad Quimica y Minera de Chil | Lithium, produces a key element in advanced batteries, Chile | CHILE | 1.41% | ENS | USD |
| Samsung SDI Co Ltd | Batteries, innovative energy storage, EVs, South Korea | SOUTH KOREA | 1.41% | ENS | KRW |
| GS Yuasa Corp | Battery technologies, also includes Lithium for EVs, Japan. | JAPAN | 1.41% | ENS | JPY |
| Ecopro Co Ltd | Battery materials, Pollution Controls, CO catalyst. | SOUTH KOREA | 0.40% | ENS | KRW |
| FDG Electric Vehicles Ltd | EV manufacturer including cars, buses, batteries, China. | HONG KONG | 0.40% | ENS | HKD |
| VOLTABOX AG | Lithium-ion batteries, energy storage. | GERMANY | 0.40% | ENS | EUR |
| Tanaka Chemical Corp | Battery technologies, positive electrode materials. | JAPAN | 0.40% | ENS | JPY |
| Maxwell Technologies Inc | Ultracapacitors, an alternative to batteries as in hybrids. | UNITED STATES | 0.40% | ENS | USD |
| Advanced Lithium Electrochemistry | Battery technologies, lithium cathode materials, LFP-NCO. | TAIWAN | 0.40% | ENS | TWD |
| SaltX Technology Holding AB | Energy Storage, uses salt to store thermal energy, Sweden. | SWEDEN | 0.40% | ENS | SEK |
| Novozymes A/S | Biofuels, enzymes used in partnerships, Denmark. | DENMARK | 0.98% | RBB | DKK |
| Energy Absolute PCL | Alternative energy power producer, biodiesel, Thailand. | THAILAND | 0.98% | RBB | THB |
| Drax Group PLC | Electric power company, biomass wood pellet thermal, U.K. | BRITAIN | 0.98% | RBB | GBp |
| Takuma Co Ltd | Thermal Plants, uses biomass, palm, corn, wood wastes. | JAPAN | 0.98% | RBB | JPY |
| Green Plains Inc | Biofuel, ethanol; using U.S. domestic feedstock. | UNITED STATES | 0.98% | RBB | USD |
| Canvest Environmental Protection | Waste to Energy, China-focused. | HONG KONG | 0.28% | RBB | HKD |
| Albioma SA | Biomass, sugarcane, hybrid combustion and cogeneration. | FRANCE | 0.28% | RBB | EUR |
| Renewable Energy Group Inc | Biodiesel, natural fats, oils, grease to biofuels. | UNITED STATES | 0.28% | RBB | USD |

| | | | | | |
|-------------------------------------|--|---------------|-------|-----|-----|
| CropEnergies AG | Bioethanol, from cereals and sugarbeet, Germany. | GERMANY | 0.28% | RBB | EUR |
| eRex Co Ltd | Power generation, for businesses and residential, biomass. | JAPAN | 0.28% | RBB | JPY |
| VERBIO Vereinigte BioEnergie AG | Biofuels, manufacturer and supplier to Germany and Europe. | GERMANY | 0.28% | RBB | EUR |
| Verbund AG | Electricity supplier, hydro, a large provider for Austria. | AUSTRIA | 0.70% | ROH | EUR |
| Mercury NZ Ltd | Clean power provider, 100% renewables hydro, geothermal. | NEW ZEALAND | 0.70% | ROH | NZD |
| Contact Energy Ltd | Electric Utility, offers power from geothermal and hydro. | NEW ZEALAND | 0.70% | ROH | NZD |
| Ormat Technologies Inc | Geothermal, works too in recovered heat energy. | UNITED STATES | 0.70% | ROH | USD |
| Innergex Renewable Energy Inc | Renewable power, in run-of-river hydroelectric, wind, solar. | CANADA | 0.70% | ROH | CAD |
| Energy Development Corp | Geothermal, one of larger in Philippines and world. | PHILIPPINES | 0.20% | ROH | PHP |
| First Solar Inc | Thin film solar, CdTe as a low-cost alternate to polysilicon. | UNITED STATES | 1.18% | RSR | USD |
| Xinyi Solar Holdings Ltd | Clear solar glass products, solar farms, EPC, China. | CHINA | 1.18% | RSR | HKD |
| SolarEdge Technologies Inc | Inverters, panel-level solar optimizers, micro-inverters. | ISRAEL | 1.18% | RSR | USD |
| Sino-American Silicon Products Inc | Solar, semi-conductor silicon wafer materials, Taiwan. | TAIWAN | 1.18% | RSR | TWD |
| SMA Solar Technology AG | Inverters for solar, industrial scale, storage tech., Germany | GERMANY | 1.18% | RSR | EUR |
| GCL-Poly Energy Holdings Ltd | Solar, polysilicon for upstream PV manufacturing. | HONG KONG | 1.18% | RSR | HKD |
| Atlantica Yield plc | Yieldco, Contracted renewables assets, also transmission. | SPAIN | 1.18% | RSR | USD |
| TerraForm Power Inc | Owens and runs solar/wind, in developed nations, yieldco. | UNITED STATES | 1.18% | RSR | USD |
| GCP Infrastructure Investments Ltd | Trust invests in renewables, based in Jersey U.K. | JERSEY | 1.18% | RSR | GBp |
| SunPower Corp | Solar, efficient PV panels have all-rear-contact cells. | UNITED STATES | 1.18% | RSR | USD |
| BCPG PCL | Solar and other renewable energy. | THAILAND | 1.18% | RSR | THB |
| Sunrun Inc | Residential solar, leasing, PPA or purchase rooftop PV. | UNITED STATES | 1.18% | RSR | USD |
| Superblock PCL | Solar, wind, and waste to energy, Thailand. | THAILAND | 1.18% | RSR | THB |
| Canadian Solar Inc | Solar, vertically integrated solar manufacturer, China. | CANADA | 1.18% | RSR | USD |
| JinkoSolar Holding Co Ltd | Solar, wafers through solar modules, China-based OEM. | CHINA | 1.18% | RSR | USD |
| Meyer Burger Technology AG | Solar, manufacturing equipment, Switzerland and worldwide. | SWITZERLAND | 1.18% | RSR | CHF |
| Encavis AG | Solar, large solar park operator, also wind, Germany. | GERMANY | 0.34% | RSR | EUR |
| Panda Green Energy Group Ltd | Solar plants, including "Belt and Road Route" in Asia. | HONG KONG | 0.34% | RSR | HKD |
| Daqo New Energy Corp | Solar, high-purity polysilicon for producing solar wafers, China | CHINA | 0.34% | RSR | USD |
| SPCG PCL | Solar, rooftops and solar farms, Thailand and Asia. | THAILAND | 0.34% | RSR | THB |
| Scatec Solar ASA | Solar power parks worldwide. | NORWAY | 0.34% | RSR | NOK |
| Enphase Energy Inc | Inverters, micro-products for each solar panel, storage. | UNITED STATES | 0.34% | RSR | USD |
| Vivint Solar Inc | Solar, one-stop installer of panels on homes in much of U.S. | UNITED STATES | 0.34% | RSR | USD |
| REC Silicon ASA | Silicon, large solar-grade silicon producer, Norway-and global. | UNITED STATES | 0.34% | RSR | NOK |
| Neo Solar Power Corp | Solar, aiming to be vertically-integrated, Taiwan. | TAIWAN | 0.34% | RSR | TWD |
| Gigasolar Materials Corp | Solar, conductive pastes in PV panel manufacturing. | TAIWAN | 0.34% | RSR | TWD |
| Motech Industries Inc | Solar, large producer of cells, modules, Taiwan. | TAIWAN | 0.34% | RSR | TWD |
| China Singyes Solar Technologies | Solar, also building integrated solar research. China. | HONG KONG | 0.34% | RSR | HKD |
| West Holdings Corp | Solar, Japan-focused residential and commercial PV. | JAPAN | 0.34% | RSR | JPY |
| Shunfeng International Clean Energy | Solar, large-solar in China, also growing elsewhere. | CHINA | 0.34% | RSR | HKD |
| Orsted A/S | Sustainable wind, biomass, largest energy company in Denmark | DENMARK | 1.52% | RWD | DKK |
| Vestas Wind Systems A/S | Wind, major pioneer wind turbine manufacturer, Denmark. | DENMARK | 1.52% | RWD | DKK |
| Siemens Gamesa Renewable Energy | Wind, onshore & offshore, turbines and gearboxes, Spain | SPAIN | 1.52% | RWD | EUR |
| Xinjiang Goldwind Science | Wind, large turbine manufacturer, China. | CHINA | 1.52% | RWD | HKD |
| EDP Renovaveis SA | Wind power, among largest producers in world, Spain. | SPAIN | 1.52% | RWD | EUR |
| China Longyuan Power Group Corp | Wind, also in solar, biomass, geothermal, tidal. | CHINA | 1.52% | RWD | HKD |
| Huaneng Renewables Corp Ltd | Large power plants, R&D into better efficiency upstream. | CHINA | 1.52% | RWD | HKD |
| NRG Yield Inc | Contracted power generation, thermal, some renewables. | UNITED STATES | 1.52% | RWD | USD |
| China High Speed Transmission | Wind power, turbine gear boxes & transmissions. | HONG KONG | 1.52% | RWD | HKD |
| TransAlta Renewables Inc | Renewables, operating facilities in wind power, some hydro. | CANADA | 1.52% | RWD | CAD |
| Pattern Energy Group Inc | Wind farms, solar may be added for GW sized PPAs. | UNITED STATES | 1.52% | RWD | USD |
| Renewables Infrastructure Group Ltd | Wind Farm & Solar Park revenues assets, U.K. | GUERNSEY | 1.52% | RWD | GBp |
| Boralex Inc | Renewables generation, develops, operates wind, hydro, solar. | CANADA | 1.52% | RWD | CAD |
| Nordex SE | Wind turbines, based in Germany/Europe and sells worldwide. | GERMANY | 1.52% | RWD | EUR |
| TPI Composites Inc | Wind Blades; also light-weighting for transportation. | UNITED STATES | 1.52% | RWD | USD |
| Greencoat UK Wind PLC/Funds | Infrastructure fund, invested in U.K. wind power assets. | BRITAIN | 0.43% | RWD | GBp |
| Senvion SA | Wind sector engineering services. | GERMANY | 0.43% | RWD | EUR |
| Falck Renewables SpA | Renewables wind, biomass, solar, waste-to-energy. | ITALY | 0.43% | RWD | EUR |

| | | | | | |
|----------------------------------|---|-------------|-------|-----|-----|
| China Power Clean Energy Develop | Wind, hydro, solar, waste to energy etc in China. | HONG KONG | 0.43% | RWD | HKD |
| CS Wind Corp | Wind towers onshore, also offshore. | SOUTH KOREA | 0.43% | RWD | KRW |
| Gurit Holding AG | Composite Materials in wind, lightens cars, planes. | SWITZERLAND | 0.43% | RWD | CHF |
| Audax Renovables SA | Wind power, mainly, in Europe and Americas. | SPAIN | 0.43% | RWD | EUR |
| RENOVA Inc | Solar, Biomass, Wind, Geothermal in Asia. | JAPAN | 0.43% | RWD | JPY |
| Unison Co Ltd/South Korea | Wind power generation, wind parks. | SOUTH KOREA | 0.43% | RWD | KRW |
| PNE Wind AG | Wind, both onshore and offshore globally. | GERMANY | 0.43% | RWD | EUR |

Historical Sector Weight Information, NEX over Past Quarters

| Sector Weights At Start Of Each Quarter* | Energy Conversion ECV | Energy Efficiency EEF | Energy Storage ENS | Renewables – Biofuels & Biomass RBB | Renewables – Other ROH | Renewable – Solar RSR | Renewable – Wind RWD |
|--|-----------------------|-----------------------|--------------------|-------------------------------------|------------------------|-----------------------|----------------------|
| Q3 2018 | 0.79% | 29.62% | 8.48% | 6.60% | 3.71% | 23.67% | 27.12% |
| Q2 2018 | 0.80% | 30.50% | 8.80% | 7.90% | 3.90% | 22.50% | 25.50% |
| Q1 2018 | 1.00% | 30.67% | 7.64% | 7.74% | 3.92% | 23.37% | 25.66% |
| Q4 2017 | 1.14% | 29.36% | 6.75% | 8.21% | 4.68% | 20.58% | 29.28% |
| Q3 2017 | 0.76% | 30.88% | 5.91% | 9.11% | 4.55% | 18.80% | 29.98% |
| Q2 2017 | 0.67% | 33.68% | 6.50% | 8.75% | 4.92% | 18.73% | 26.75% |
| Q1 2017 | 1.00% | 31.83% | 5.64% | 9.03% | 5.43% | 17.92% | 29.14% |
| Q4 2016 | 0.71% | 32.00% | 3.58% | 8.48% | 5.20% | 18.84% | 31.19% |
| Q3 2016 | 1.12% | 31.00% | 4.54% | 7.76% | 5.87% | 21.09% | 28.61% |
| Q2 2016 | 1.02% | 32.18% | 3.69% | 7.15% | 5.18% | 21.60% | 29.18% |
| Q1 2016 | 1.01% | 34.83% | 3.61% | 9.38% | 4.26% | 20.14% | 26.77% |
| Q4 2015 | 0.95% | 33.54% | 3.09% | 9.19% | 5.19% | 20.40% | 27.65% |
| Q3 2015 | 0.95% | 32.97% | 3.18% | 8.05% | 4.52% | 24.65% | 25.67% |
| Q2 2015 | 1.22% | 33.68% | 2.26% | 9.55% | 6.90% | 24.88% | 21.50% |
| Q1 2015 | 1.68% | 33.88% | 2.14% | 11.54% | 6.84% | 24.86% | 19.06% |
| Q4 2014 | 1.42% | 33.67% | 2.26% | 12.31% | 8.45% | 24.67% | 17.22% |
| Q3 2014 | 1.42% | 33.42% | 2.30% | 12.44% | 9.09% | 23.78% | 17.56% |
| Q2 2014 | 1.11% | 34.20% | 2.00% | 12.16% | 9.86% | 23.16% | 17.52% |
| Q1 2014 | 1.17% | 33.13% | 2.34% | 12.17% | 10.33% | 23.95% | 16.91% |
| Q4 2013 | 1.28% | 35.26% | 2.28% | 14.02% | 12.47% | 19.58% | 15.10% |
| Q3 2013 | 1.25% | 35.04% | 2.35% | 14.61% | 13.06% | 19.10% | 14.58% |
| Q2 2013 | 1.31% | 33.43% | 2.63% | 15.42% | 14.05% | 17.54% | 15.62% |
| Q1 2013 | 1.31% | 33.43% | 2.63% | 15.42% | 14.05% | 15.90% | 14.14% |

*NEX Sector Weights are based on a regularly-performed survey of market capitalizations of companies that are active in New Energy and that are quoted on non-OTC exchanges. The results are adjusted for several factors including exposure to New Energy and some exchange restrictions particularly limiting investability. If the results were not adjusted, the sector numbers would be significantly different.

See also, http://www.nex-index.com/Constituents_And_Weightings.php

https://nex-index.com/historical_sectors.php

For Component values see, http://www.nex-index.com/Constituents_And_Weightings.php

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

Appendix VII:

WilderHill New Energy Global Innovation Index (NEX) for start of Q4 2018. 109 stocks.

(subject to revision; see http://www.nexindex.com/Constituents_And_Weightings.php)

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

| Name | Country | Index Weighting |
|-----------------------------------|----------------|------------------------|
| SAMSUNG SDI CO LTD | SOUTH KOREA | 1.58% |
| UNISON CO LTD | SOUTH KOREA | 0.41% |
| SEOUL SEMICONDUCTOR CO LTD | SOUTH KOREA | 1.74% |
| CHINA HIGH SPEED TRANSMISSION E | CAYMAN ISLANDS | 1.42% |
| PANDA GREEN ENERGY GROUP LTD | BERMUDA | 0.35% |
| FDG ELECTRIC VEHICLES LTD | BERMUDA | 0.45% |
| CHINA POWER CLEAN ENERGY DEVEL. | HONG KONG | 0.41% |
| CHINA SINGYES SOLAR TECHNOLOGIES | BERMUDA | 0.35% |
| ECOPRO CO LTD | SOUTH KOREA | 0.45% |
| CHINA LONGYUAN POWER GROUP-H | CHINA | 1.42% |
| HUANENG RENEWA-H | CHINA | 1.42% |
| XINYI SOLAR HOLDINGS LTD | CAYMAN ISLANDS | 1.24% |
| CS WIND CORP | SOUTH KOREA | 0.41% |
| BYD CO LTD | CHINA | 1.58% |
| CANVEST ENVIRONMENT PROTECTION | CAYMAN ISLANDS | 0.31% |
| WEST HOLDING | JAPAN | 0.35% |
| XINJIANG GOLDWIND SCIENCE & TECH. | CHINA | 1.42% |
| EVERLIGHT ELECTRONICS CO LTD | TAIWAN | 0.50% |
| EPISTAR CORP | TAIWAN | 1.74% |
| WASION HOLDINGS LTD | CAYMAN ISLANDS | 0.50% |
| NEO SOLAR POWER CORP | TAIWAN | 0.35% |
| GIGASOLAR MATERIALS CORP | TAIWAN | 0.35% |
| LEXTAR ELECTRONICS CORP | TAIWAN | 0.50% |
| GCL-POLY ENERGY HOLDINGS LTD | CAYMAN ISLANDS | 1.24% |
| TANAKA CHEMICAL CORP | JAPAN | 0.45% |
| SINO-AMERICAN SILICON PRODUC | TAIWAN | 1.24% |
| TAKUMA CO LTD | JAPAN | 1.07% |
| MOTECH INDUSTRIES INC | TAIWAN | 0.35% |
| MEIDENSHA CORP | JAPAN | 1.74% |
| W-SCOPE CORP | JAPAN | 0.45% |
| GS YUASA CORP | JAPAN | 1.58% |
| EF-ON INC | JAPAN | 0.50% |
| EREX CO LTD | JAPAN | 0.31% |
| RENOVA INC | JAPAN | 0.41% |
| FALCK RENEWABLES SPA | ITALY | 0.41% |

| | | |
|--------------------------------|----------------|-------|
| ALBIOMA | FRANCE | 0.31% |
| AUDAX RENOVABLES SA | SPAIN | 0.41% |
| AMERESCO INC | UNITED STATES | 0.50% |
| ATLANTICA YIELD PLC | UNITED KINGDOM | 1.24% |
| ACUITY BRANDS INC | UNITED STATES | 1.74% |
| BCPG PCL | THAILAND | 1.24% |
| BALLARD POWER SYSTEMS INC | CANADA | 0.35% |
| BORALEX INC -A | CANADA | 1.42% |
| CAVERION OYJ | FINLAND | 0.50% |
| CROPENERGIES AG | GERMANY | 0.31% |
| CONTACT ENERGY LTD | NEW ZEALAND | 0.73% |
| CREE INC | UNITED STATES | 1.74% |
| CANADIAN SOLAR INC | CANADA | 1.24% |
| CLEARWAY ENERGY INC CLASS C | UNITED STATES | 1.42% |
| DAQO NEW ENERGY CORP-ADR | CAYMAN ISLANDS | 0.35% |
| DRAX GROUP PLC | UNITED KINGDOM | 1.07% |
| ENERGY ABSOLUTE PCL | THAILAND | 1.07% |
| EDP RENOVAVEIS SA | SPAIN | 1.42% |
| ENPHASE ENERGY INC | UNITED STATES | 0.35% |
| FIRST SOLAR INC | UNITED STATES | 1.24% |
| GCP INFRASTRUCTURE INVESTMENTS | JERSEY | 1.24% |
| GREEN PLAINS INC | UNITED STATES | 1.07% |
| CS REAL ESTATE FD GREEN PROP | SWITZERLAND | 0.50% |
| GURIT HOLDING AG | SWITZERLAND | 0.41% |
| HANNON ARMSTRONG SUSTAINABLE | UNITED STATES | 1.74% |
| ENCAVIS AG | GERMANY | 0.35% |
| INNERGEX RENEWABLE ENERGY INC | CANADA | 0.73% |
| ITRON INC | UNITED STATES | 1.74% |
| JINKOSOLAR HOLDING CO-ADR | CAYMAN ISLANDS | 0.35% |
| KANDI TECHNO | UNITED STATES | 0.50% |
| KINGSPAN GROUP PLC | IRELAND | 1.74% |
| LANDIS+GYR GROUP AG | SWITZERLAND | 1.74% |
| SIGNIFY NV | NETHERLANDS | 1.74% |
| LSI INDUSTRIES INC | UNITED STATES | 0.50% |
| MEYER BURGER TECHNOLOGY AG | SWITZERLAND | 0.35% |
| MERCURY NZ LTD | NEW ZEALAND | 0.73% |
| MAXWELL TECHNOLOGIES INC | UNITED STATES | 0.45% |
| NORDEX SE | GERMANY | 1.42% |
| NEL ASA | NORWAY | 0.35% |
| NIBE INDUSTRIE-B | SWEDEN | 1.74% |

| | | |
|---------------------------------|----------------|-------|
| NOVOZYMES AS CLASS B | DENMARK | 1.07% |
| UNIVERSAL DISPLAY CORP | UNITED STATES | 1.74% |
| ORMAT TECHNOLOGIES INC | UNITED STATES | 0.73% |
| ORSTED A/S | DENMARK | 1.42% |
| OSRAM LICHT AG | GERMANY | 1.74% |
| PATTERN ENERGY GROUP INC | UNITED STATES | 1.42% |
| PLUG POWER INC | UNITED STATES | 0.35% |
| PNE AG | GERMANY | 0.41% |
| RICARDO PLC | UNITED KINGDOM | 0.50% |
| REC SILICON ASA | NORWAY | 0.35% |
| RENEWABLE ENERGY GROUP INC | UNITED STATES | 1.07% |
| TRANSALTA RENEWABLES INC. | CANADA | 1.42% |
| SUNRUN INC | UNITED STATES | 1.24% |
| SMA SOLAR TECHNOLOGY AG | GERMANY | 1.24% |
| SOLAREEDGE TECHNOLOGIES INC | UNITED STATES | 1.24% |
| SENVION SA | LUXEMBOURG | 0.41% |
| SIEMENS GAMESA RENEWABLE ENERGY | SPAIN | 1.42% |
| SPCG PCL | THAILAND | 0.35% |
| SUNPOWER CORP-CLASS A | UNITED STATES | 1.24% |
| QUIMICA Y MINERA CHIL-SP ADR | CHILE | 1.58% |
| SCATEC SOLAR ASA | NORWAY | 0.35% |
| SUPER ENERGY CORP PCL | THAILAND | 0.35% |
| TERRAFORM POWER INC | UNITED STATES | 1.24% |
| TPI COMPOSITES INC | UNITED STATES | 1.42% |
| RENEWABLES INFRASTRUCTURE | GUERNSEY | 1.42% |
| TESLA INC | UNITED STATES | 1.74% |
| GREENCOAT UK WIND PLC | UNITED KINGDOM | 1.42% |
| VERBIO AG | GERMANY | 0.31% |
| VOLTABOX AG | GERMANY | 0.45% |
| VEECO INSTRUMENTS INC | UNITED STATES | 0.50% |
| VERBUND AG | AUSTRIA | 0.73% |
| VIVINT SOLAR INC | UNITED STATES | 0.35% |
| VESTAS WIND SYSTEMS A/S | DENMARK | 1.42% |
| WILLDAN GROUP INC | UNITED STATES | 0.50% |

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