



Q4 2019 Quarterly Report: WilderHill Clean Energy Index[®], December 31, 2019

The Clean Energy Index[®] (ECO) began 4th Quarter 2019 around 60, and it ended Q4 around 70, up roughly +17%. 2019 began near 44 so there's been volatility over the year, up about +59%. Or since 2017 when ECO Index[®] was about 38, for last 3 years it's risen approximately +84%. An independent tracking fund back at start of 2017 was about 18.5, at start of 2018 was about 25.5, at start of 2019 was about 21.5, and for start of the year 2020 was around 34.

Since 2017 there's been sizeable gains up some +84%. Yet ECO passively captures an emerging, volatile theme so it can & does at times also 'drop like a rock.' Big gains have occurred here - as well as bigger declines. Plus we offer a mere observation: it's counter-intuitive perhaps, yet this ECO theme spiked much up at times in a George Bush Jr. & in a Trump Presidency - though neither one greatly promoted green energy - meanwhile, some very large drops down were seen over 8 years of an Obama Presidency that instead had favored this sector.

Looking back at benchmark ECO Index[®] live since 2004, & the first for climate solutions, last 5 years it's up 'more modestly' near +35%. Yet this, too, is notable as well; the same 5 years the 'dirty energy' themes are all negative and by a lot as all the fossil fuels plunged. Coal is off some -30% so trails ECO badly, an oil story off roughly -30% too, natural gas off some -70%. Coal, oil, & gas are thus very far behind 'green' energy last 5 years. Looking back 10 years, there's been drops in energy widely, the fossil fuels again down most. In just concluded 2019 this has continued with green clean themes - especially solar - having the strongest gains.

Clean energy as seen *worldwide* by WilderHill[®] New Energy Global Innovation Index (NEX) - and by a 2nd global clean energy index (not ours) with fewer constituents - have traded places last 1, 5, 10 years, since inception etc. Yet these 2 have 'outperformed' last 5 years too, relative to dirty energy themes. Hence key benchmark ECO along with global green themes are all now well positive last 5 years - in sharp contrast to fossil fuels, all far down.

Performances since 2004 strongly indicate that the traditional fossil fuels, coal, oil, & natural gas, arguably no longer cover a broadening energy story: we thus hypothesize clean energy has become much more than 'niche.' Well-respected ECO Index[®] is 'outperforming' in the last 3 years too and like NEX & OCEAN, all deliver carbon-free 'climate solutions' to boot. Benchmarks ECO, NEX & OCEAN provide robust non-correlation, and they better embody new 'ESG thinking' vs. old polluting fossil fuels, which can help diversify a model portfolio.

A notable event in Q4 was live launch of the Clean Ocean Index (OCEAN) on November 18th. In sum ECO Index[®] that's the oldest best-known clean energy benchmark was up +59% in 2019; was up around +84% last 3 years and is now positive last 5 years. Volatile as usual sometimes moving several percent in a day, here is Clean Energy Index[®] ECO to late 4th Quarter:

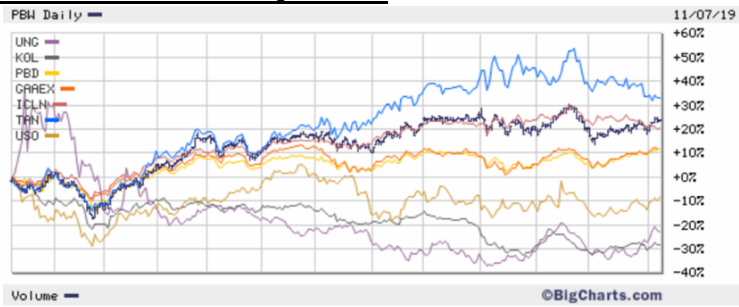


Next as usual we look at ECO in Rolling Past 12 Months chart, Nov. 2018 to Nov. 7, 2019 along with several clean/green - as well as dirty/brown energy themes. Over this 1-year period we see coal, a CO2-laden story is at bottom via passive Index/ tracker with that theme down some -27%. Just 'above that' *yet still much down* after a gap is natural gas, another fossil fuel and it's down via tracker off about -23%. Down too, so negative as well is an oil theme, third and here 'best' amongst this fossil fuels trio, off here though 'only' around -7%.

Next up and now into positive territory after a gap, is an active-managed fund for alternative greener energy worldwide, that's up near +10%. Just above it roughly tied is an independent tracker for global clean energy mainly outside the U.S. as captured by passive NEX Index and tracker, unlike the dirty traditional fuels this too is positive up some +10%.

Moving up and higher into positive territory is a different passive tracker for global clean energy (not ours) up some +20%. Higher next is an independent tracker for clean energy ECO (bold) up some +25%. Highest is an important tracker for Solar-only which after a 2019 jump is well up some +33%. A side-observation long seen, is that these passive, transparent clean energy Indexes generally are all 'beating' an active-fund for global alternative energy.

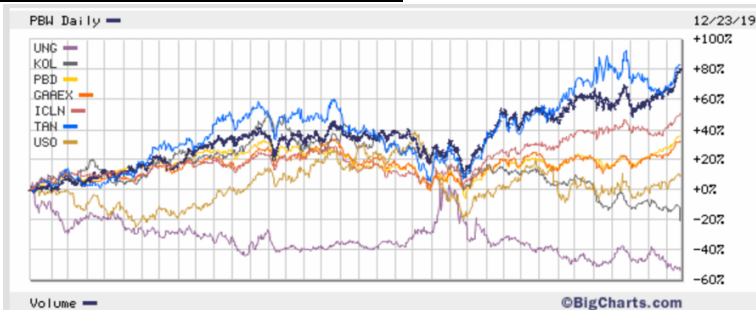
Last 1 Year to mid-Q4 2019:



Source: bigcharts.com

Rolling 3 years decidedly well up some +84% (end of Year) is the ECO & a Solar-only tracker:

Last 3 Years to late-Q4 2019:



Source: bigcharts.com

Next we'll look farther back Rolling 10 years, roughly a decade from 2009 - to November 2019. Tangentially a Great Recession had happened just before this 2009 start, thundering over stocks dropping many to a nadir around Spring 2009. That made a bottom among many *non-energy* stories with many themes since rebounding up post-Spring 2009. But *not so energy*. As seen next, many energy themes fell even years after 2009, no fast-rebound here.

 Unlike gains then in a rolling 3 years to 2019, instead this rolling 10 years below has all Down. Included are same clean themes, as well as CO2-laden fossil fuels and it's a tale of pervasive huge declines - the pain felt very broadly. All 3 fossil fuels (and here too now solar-alone) trail behind broader clean energy themes, again by inarguably large amounts.

Natural Gas is at very bottom rolling 10 years, down about -90%. 'Above it' albeit down deeply too is a passive Oil theme: even after some ongoing spikes up like in last Quarter, Q3, briefly spiking after a Saudi Refinery attack in latter 2019 oil is steeply down some -70%.

'Just above' those two is a passive Solar-only tracker, and despite recent gains in years of late - it's well down if seen over the past decade, off here roughly -65%. Near those 3 and far down too is a 4th, Coal, despite rising at times it's down similarly hard. That CO2-laden energy story had trailed by even more - but its tracker rose briefly, perhaps pinned on hopes for a recent Administration, despite coal facing much deeper basic economic headwinds.

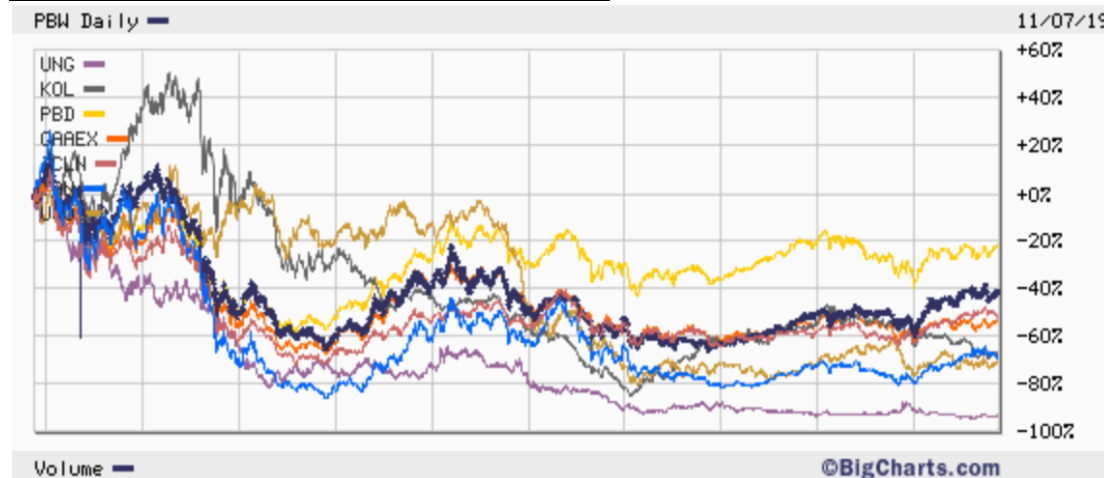
Unusually then, a focused clean green Solar-only theme joined along with Natural Gas, Oil & Coal - with all 4 down **if seen over a past decade**. Those four fell the most here.

Quite 'above' them is an active-managed fund for global alternative energy down some -50%. Nearby is a passive tracker for a global clean energy Index (not ours), that's down similarly. Above them, is an independent tracker for the first in clean energy: ECO, off some -40%.

After a sizable gap, and so 'above' those 6 stories - is Global clean energy highest via passive NEX; that said *it's still well down* some -20%. In sum ECO is down -40% in a decade, even *after* rising hard 2019. Yes, both ECO & NEX are here down, **less so** than Natural Gas, Solar, Oil, & Coal plus less than an active alternative energy fund - yet they are *still down*.

On the other hand in these themes, global/clean energy stories (NEX, ECO) did 'best' last 10 years - vs. other stories (especially dirty ones) that fell 2x & 3x more than did the NEX. We note too that these rolling long-term benchmark performances by ECO/NEX/and a 3rd global theme indicate once more, it's 'tough for active-managed funds to beat passive Indexes'.

Rolling Past 10 Years going to mid-Q4 2019:



Source: bigcharts.com

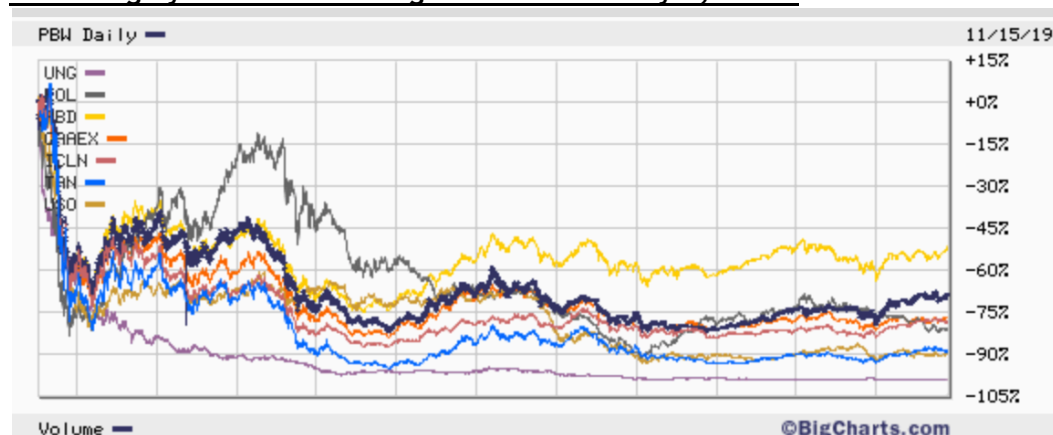
A problem ahead however using *rolling* Charts like 10 years above, is in a few years they *may* begin to show exceptionally strong returns for ECO & NEX. Once Charts leave a plummeting 2007 thru 2010, that is, starting 2021 and after - crash removed - results *might* show much stronger moves up. For that reason a view is also needed with steep declines: hence this new Chart below with set start mid-2008, as we move into and past 2021 ahead. While ECO's tracker could have allowed beginning farther back, say mid-2005, these other trackers didn't all commence until later - so earliest feasible start for all was mid-2008.

Over then some 12 years & growing, *non-rolling* chart, here are these green themes for clean energy & solar - as well as older-world fossil fuels coal, oil, natural gas. Much like above, it's again a tale of pervasive declines - the pain is felt very broadly. Unsurprisingly too, the fossil fuels once more are trailing far behind clean green energy by a large amount.

But, relative to a rolling past 10 years above, one big point standing-out here, is that a crash worldwide that was happening 2008/2009 has here been more strongly forever preserved.

So this shows greater(!) drops starting just after a steep run up mid-2000s. That prior bull run had been captured earlier by ECO which had increased rather a lot previously that decade. Starting here nearer highs 2008 (as other trackers commence) it is thus near peaks in what was about to be a late 2008/2009 global plunge in equities. That crash was similarly captured by countless themes globally; then a bog/mire is definitely seen in energy of all kinds:

Last Roughly 12 Years starting from a Fixed July 1, 2008:



Source: bigcharts.com

Most at Bottom here (like past 10 years) are fossil fuels, oil & natural gas - plus here is solar-only; they & coal all fell significantly. 'Just higher' is a separate global clean energy index (not ours), and then an active-managed alternative energy fund. 'Better still' is ECO Index; and as noted the 'highest' here is the Global clean energy NEX still very far negative.

Just parenthetically we again note broad Non-energy Indexes like S&P500, NASDAQ, MSCI - neither seen nor discussed since they capture far more than energy did far 'better' last 10 plus years. They're very different; energy may be say, 5% of an S&P500 etc. Plus prior years clean energy had spiked higher - and might conceivably do so someday again - or alternatively, clean energy may plummet soon in a correction after a run-up of 3 years to end 2019.

ECO live since 2004 has the longest record in clean energy, so a few things seen long ago may have a bit of relevance today. For instance, big gains Q1 of 2019, were maybe a bit like the gains Q1 of 2006 - 15 years of history implying a Q1 2019 jump +23% (up too +59% in a year) isn't the norm. One-sided volatility here up 2019, was maybe partly due too to mathematical coincidence, spotlighted by cut-off end of calendar year. As it followed after a *downwards* Q4 2018, prior falls maybe helped some 'regression to mean' up - 2019 began just after a late 2018 dip, perhaps amplifying gains especially in solar. (Conversely, gains like in late 2019 might set a stage for declines very soon ahead in 2020: it is all unknowable today).

2019's gains January/February, June/July, Nov./Dec. in ECO nonetheless are bound to be noticed going forward, in part as 'Year-to-Date' is so universal in measuring performance. (And as in some past years, gains here also were seen in semiconductor Indexes well up too). As we always stress, big downturns *Must be Expected at times in volatile ECO Index theme*, especially now after 2017-2019; the clean energy story does at times also fall 'like a rock'. Volatility in short, has long been a part & parcel of an emerging clean energy theme.

And yet a non-negligible 'indefatigable' 2019 was arguably grounded too in some real causes. Consider for instance these data may be part illuminated by elegant rotation of leadership as differing stocks were performing 'well' at differing times. At times it was say fuel cells, or EVs bouncing back, or solar microinverters with distinguishing performances helping 'drag' ECO up as on prospects of coming revenues, budget deals, or support being renewed for instance - even on days broader markets or other sectors otherwise went sideways or down. To be sure that's seen in retrospect only, never guessing ahead. Confounding investors is something that stock markets have done throughout history and will always do.

Of interest too in 2019 was robust non-correlation between 1) WilderHill Clean Energy ECO - vs 2) polluting oil, coal, and natural gas fossil-fuel stories. Unsurprising given pretty much a zero overlap as between 'very green' themes in clean ECO - vs. those in 'brown' Indexes for carbon-laden fossil fuels - they'd moved very differently right out the gate. Coal & natural gas both fell swiftly start of year. Oil at first rose a bit as did clean energy/acutely solar-only, but then oil paused and it was soon falling/ or going sideways by middle of year.

Early in 2019 then ECO essentially rather 'de-coupled' from falling dirty energy - by going higher, sharply so in Q1 and staying there. ECO+Solar saw further variance - advancing a bit or declining relatively little, as dirty energy was dropped back considerably. For the greener ECO+Solar, it was a 'Tale of Two Cities' vs. the brown Fossil Fuels over the year.

We'd again emphasize this volatile green theme may easily go an opposite direction, *Down*. Clean energy can go 'out of favor' and we'd expect ECO to then go sharply downwards in its mission to "capture & track" clean energy. ECO allows volatility, unlike active-Funds; as a passive-Index we don't seek defensive roles if a theme seems possibly 'over-valued' - or stocks relevant to theme seem maybe overburdened by debt, seeming maybe destined to fall.

That last point hasn't vexed; the record shows active funds trying to outperform by picking 'cheap' stocks or 'spotting a top' face thorny tasks in trying to outperform over time. Data amassed over many years show an overwhelming rationale for passive clean energy indexing. Plus the transparency, tax-efficiency and low-costs are always tough to argue with.

This 1 page briefly is for new Clean Ocean Index (OCEAN) that went live November 18, 2019; for more on this [Clean Ocean Index \(OCEAN\)](https://cleanoceanindex.com), see also <https://cleanoceanindex.com>

Clean Ocean Index:

A focus of the WilderHill Clean Ocean Index (OCEAN) is achieving healthy and clean oceans worldwide. It is about sustainability for the world's seas, too long harmed by human activities.

It's about Solutions.

Specifically, OCEAN is the first stock Index for publicly traded companies whose products, innovations and services better protect our global oceans, or lower greenhouse gases.

Encompassing new and better ways forward for healthy oceans and smarter action on climate change – it bridges the gap between Ocean Health – Sustainability — and Applied Solutions. It's transparent, science-driven, naturally reflects emerging Environmental, Social and Governance (ESG) concerns, and is intended to be understandable and of use to everyone.

This instrument (symbol: OCEAN) calculates live on stock markets, exchanges, and bourses globally.

Backtests show theoretical movements from 2016 to the live launch on November 18, 2019.

Together with an independent Tracker, they can help attract global attention to sustainable ocean solutions. These are the opportunities that can help improve marine ecosystems health, reduce coastal pollution, expand clean energy, and provide real climate change solutions.

Beyond making ecological sense these clean ocean and climate solutions can potentially appeal to the mainstream – as the topics gain importance. Sectors here include:

- Sustainable Fisheries,
- Renewable Energy,
- Greener Shipping,
- Better Energy Efficiency in Ports,
- Water Treatment,
- Pollution Prevention,
- Climate Solutions,
- Sustainability.

Backtest - from the start of 2017 to late 2018, after which OCEAN Index went live:



Conclusion:

The Clean Energy Index® (ECO) began 4th Quarter 2019 around 60 and it ended Q4 around 70, up roughly +17%. 2019 began near 44 so there's been volatility over the year, up about +59%. Or since 2017 when ECO Index® was about 38, for last 3 years it's risen approximately +84%. An independent tracking fund back at start of 2017 was about 18.5, at start of 2018 was about 25.5, at start of 2019 was about 21.5, and for start of the year 2020 was around 34.

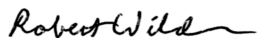
Looking back at benchmark ECO Index® live since 2004, & the first for climate solutions, last 5 years it's up more 'modestly' near +35%. Yet this too, is notable as well; the same 5 years the 'dirty energy' themes are all negative and by a lot as all the fossil fuels plunged. Coal is off some -30% so trails ECO badly, an oil story off roughly -30% too, natural gas off some -70%. Coal, oil, & gas are thus very far behind 'green' energy last 5 years. Looking back 10 years, there's been drops in energy widely, fossil fuels again down most. In just concluded 2019 this continued with green clean themes - especially solar - having the strongest gains.

A new Clean Ocean Index (OCEAN) launched November 18 is notably first for this theme.

There were No Additions to ECO to start Q1 2020; and 1 Deletion of PEGI. At the Global NEX 3 Additions for Q1 were: Eolus Vind (Sweden), Powercell (Sweden), Solaria Energia (Spain); there were 12 Deletions with a few due to buy-outs, others due to unending changes especially year-end as Index/es are ever-focused over time: Acuity (US), BCPG (Thailand), Clearway (US), Drax (UK), EF-On (Japan), Huaneng Renewables (China), Motech (Taiwan), Osram (Germany), Pattern Wind (US), PNEG (Germany), Tanaka (Japan), W-Scope (Japan).

As always, we welcome your thoughts and suggestions.

Sincerely,



Rob Wilder
rwilder@wildershires.com

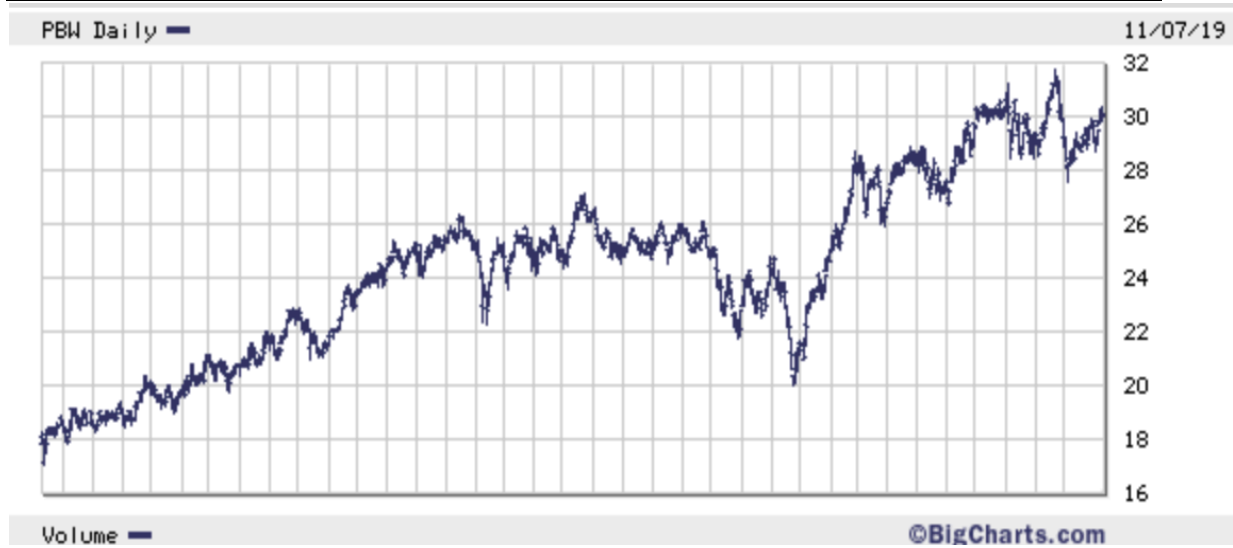
Disclaimer: The following is a reminder from the friendly folks at WilderHill® who worry about liability. Performance figures quoted represent past performance only, with no guarantee of future results. Views expressed are not investment advice and should not be considered as predictive in nature. Positions in ECO Index®, and NEX Index can & do change after rebalancings. Discussions of past performance do not guarantee, and are not indicative of, future performance. These Indexes aim to capture highly volatile sectors, & are volatile too, subject to well above-average changes in valuation. While these materials are intended to provide some very general information, nothing is offered as investment advice: it is believed to be mainly reliable, but we do not warrant completeness, timeliness, or accuracy. WilderHill Clean Energy Index® (ECO) & WilderHill Clean Ocean Index (OCEAN) are published & owned by WilderShares® LLC; and the NEX Index by WilderHill New Energy Finance LLC; no financial instruments or products based on them are sponsored or sold by these entities, and they make no representation regarding advisability of investing in product(s). Marks to WilderHill®, Clean Energy Index®, ECO Index®, and WilderShares® are all registered property; all rights reserved.

Appendix I:
ECO Index (via independent tracker PBW) Descending Weights latter-Q4 on 12/6/2019,
or about ~3 weeks before rebalance to start Q1 2020, 40 Stocks:

<u>Name</u>	<u>Symbol</u>	<u>Weight %</u>
Bloom Energy Corp	BE	4.2
Tesla Inc	TSLA	3.6
Renewable Energy Group Inc	REGI	3.1
Veeco Instruments Inc	VECO	3.1
Itron Inc	ITRI	3.0
Quanta Services Inc	PWR	2.9
Ballard Power Systems Inc	BLDP	2.9
MYR Group Inc	MYRG	2.9
Livent Corp	LTHM	2.9
Universal Display Corp	OLED	2.9
Plug Power Inc	PLUG	2.8
Ameresco Inc	AMRC	2.8
ESCO Technologies Inc	ESE	2.8
Woodward Inc	WWD	2.7
Advanced Energy Industries Inc	AEIS	2.7
Gentherm Inc	THRM	2.7
Atlantica Yield plc	AY	2.6
Air Products & Chemicals Inc	APD	2.6
Ormat Technologies Inc	ORA	2.6
NIO Inc ADR	NIO	2.6
JinkoSolar Holding Co Ltd ADR	JKS	2.6
Pattern Energy Group Inc	PEGI	2.5
Vivint Solar Inc	VSLR	2.4
Hexcel Corp	HXL	2.4
SolarEdge Technologies Inc	SEDG	2.3
Albemarle Corp	ALB	2.3
Workhorse Group Inc	WKHS	2.3
Enphase Energy Inc	ENPH	2.3
Daqo New Energy Corp ADR	DQ	2.2
TPI Composites Inc	TPIC	2.2
Sociedad Quimica y Minera	SQM	2.2
TerraForm Power Inc	TERP	2.1
Cree Inc	CREE	2.1
Canadian Solar Inc	CSIQ	2.1
Willdan Group Inc	WLDN	2.0

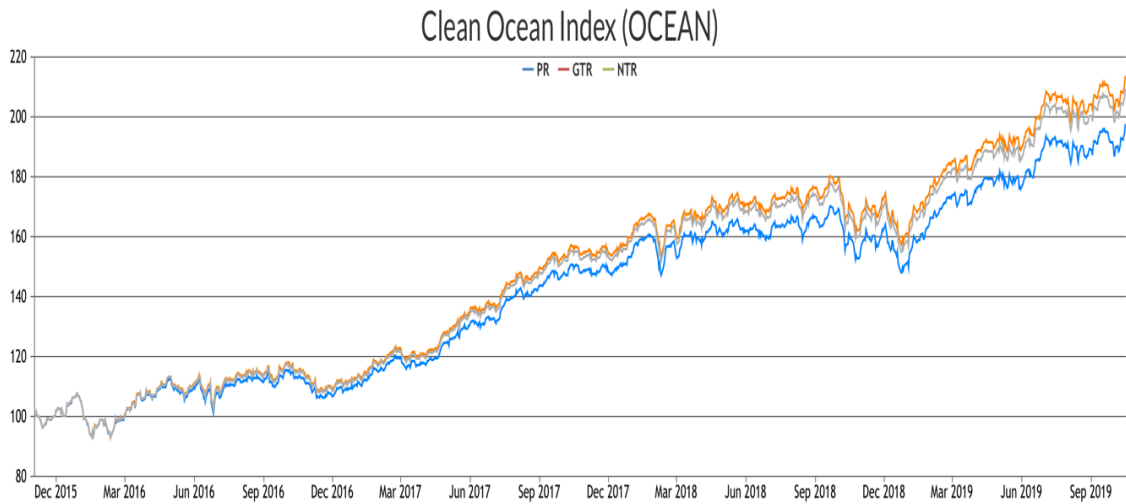
Sunnova Energy International Inc	NOVA	2.0
First Solar Inc	FSLR	2.0
Sunrun Inc	RUN	1.9
SunPower Corp	SPWR	1.3
American Superconductor Corp	AMSC	0.5

ECO via Independent Tracker (PBW) Past Rolling 3 Years to Nov. 2019, here one sees a fall in late 2018 just before start of 2019, perhaps 'amplifying' past Year 2019 Returns:



Source: bigcharts.com

And a new WilderHill Clean Ocean Index (OCEAN) Backtest for late-2014 to late-2019 (for info / data on OCEAN Index live since Nov. 18, 2019, see Appendix VII below); See also, <https://cleanoceanindex.com>



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

INDEX (ECO) SECTOR & STOCK WEIGHTS FOR START OF Q1 2020. 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 - 21% weight (8 stocks @2.62% 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 (8 stocks @2.62% each)

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

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

Bloom Energy, BE. Stationary fuel cells, not-yet cleanest/renewable fuels.

Cree, CREE. Power electronics, moved into power devices including for EVs.

ESCO Technologies, ESE. Power management, shielding, controls, testing.

Gentherm, THRM. Thermoelectric, waste heat energy, battery management.

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 @2.78% plus one *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.

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

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

Greener Utilities - 13% sector weight (5 stocks @2.60% each)

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

Sunnova, NOVA. Solar provider, operating fleet for residential plus storage.

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

TerraForm Power, TERP. Owns and operates solar/wind, a yieldco.

Vivint Solar, VSLR. Solar, residential plus storage, long-term contracts.

Energy Storage - 20% sector weight (8 stocks @2.50% each)

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

Chemical & Mining Co. of Chile, SQM. Lithium, energy storage, large producer.

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

Livent, LTHM. Lithium, and compounds for batteries in energy storage.

NIO Inc, NIO. Electric vehicles, China-based startup but loss-making so far.

Tesla Motors, TSLA. Electric vehicles, solar; pure-play EVs & energy storage.

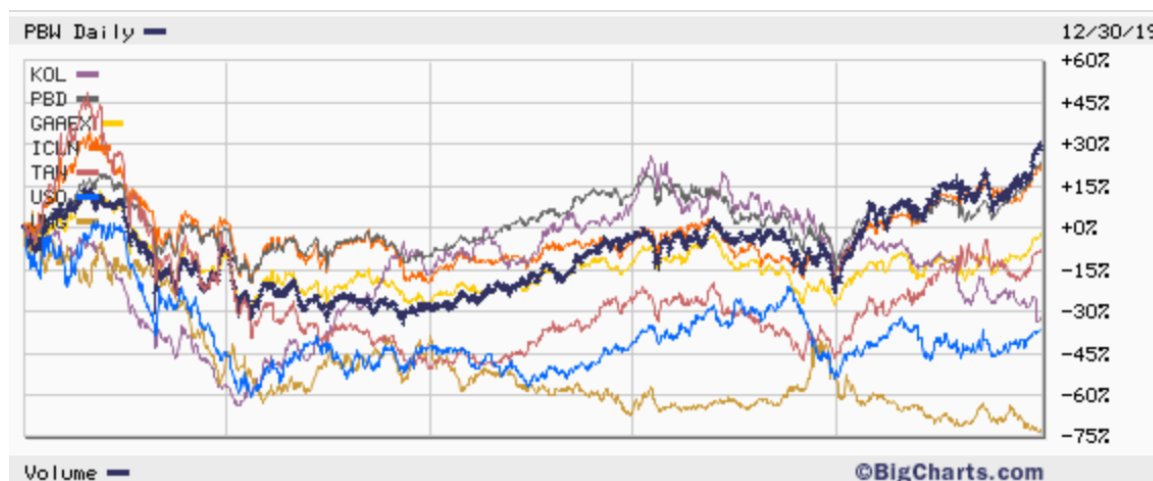
Woodward, WWD. Converters, controls for wind power and energy storage.
Workhorse, WKHS. Electric Vehicles, electric delivery trucks early-stage.

Cleaner Fuels - 5% sector weight (2 stocks @2.50% each)

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

Renewable Energy Group, REGI. Biodiesel, natural fats, oils, grease to biofuels.

ECO tracker & NEX tracker plus varied clean energy & fossil fuels themes for the past Rolling 5 years late-2014 to late-December 2019; What were once ‘tough times’ in energy widely Rolling 5 years, is increasingly differentiated lately as clean has outpaced dirty:



Source: bigcharts.com

For several years past, ECO, NEX & others rolling 5 years widely across Energy were all down. That is changing, a lot. Consider this latest Chart above. Last 5 years are +Up for clean energy - vs. fossil fuels, for firmer divergence at least here as this picture changed in 2019. For example last 3 years 2017-2019 non-rolling, have ECO, NEX, OCEAN, and Solar all now very much up. Clean themes that fell 2014/2015/2016, have now risen to be positive 5 years to end 2019 at least. ECO & NEX - increasingly diverged here from oil, gas, coal trackers, though that might end soon, after 2019, as clean energy could always soon plummet. That said this rolling 5 years moving portrait shows clean well-positive (again just to 2019: the clean themes may yet Drop very hard/harder ahead!) - with all fossils here down a lot.

Consider too with ECO, NEX (and 3rd tracker for global cleaner energy) up noticeably, and ECO more up not-so-modestly +35% last 5 years, it's conceivable a *rolling* 5-year Chart may scroll along so past big Declines in clean energy *might* in time be in part displaced. Even should all these go mainly sideways - then clean *may* show relatively better 5 years - the 'tough times for all' moniker then no longer applicable (but it should be remembered).

Moreover it was noted not all themes fell hard if stepping outside energy-only ... major Indexes like S&P500, NASDAQ did much 'better' last 5 years vs. passive clean energy. Conceivably that too *may*, just *potentially*, change. Past big drops could scroll out; it's impossible to know and this clean energy theme could see huge drops soon in 2020, especially after gains 2017-2019; but it is certain a Rolling 5 years will begin soon closer to 2017.

Appendix III: WilderHill New Energy Global Innovation (NEX) descending weights late-Q4 via independent tracker (PBD) 12/6/19 or ~3 weeks before Rebalance for Q1 2020. 100 stocks:

Name	Symbol	Weight
Bloom Energy Corp	BE	1.51
eRex Co Ltd	9517	1.45
CropEnergies AG	CE2	1.37
Tesla Inc	TSLA	1.30
Epistar Corp	2448	1.28
RENOVA Inc	9519	1.24
Tilt Renewables Ltd	TLT	1.23
Caverion Oyj	CAV1V FH	1.21
Nordex SE	NDX1	1.21
Nibe Industrier AB	NIBEB SS	1.18
West Holdings Corp	1407	1.18
Falck Renewables SpA	FKR	1.18
SMA Solar Technology AG	S92	1.17
Vestas Wind Systems A/S	VWS DC	1.17
W-Scope Corp	6619	1.15
Sino-American Silicon Products Inc	5483	1.15
GS Yuasa Corp	6674	1.14
Everlight Electronics Co Ltd	2393	1.14
Renewable Energy Group Inc	REGI	1.14
Landis+Gyr Group AG	LAND SW	1.12
Tanaka Chemical Corp	4080	1.12
VERBIO Vereinigte BioEnergie AG	VBK	1.12
Kingspan Group PLC	KSP	1.11
Ballard Power Systems Inc	BLDP	1.11
Meidensha Corp	6508	1.10
CS Wind Corp	112610 KS	1.09
Ricardo PLC	RCDO LN	1.09
Audax Renovables SA	INVALID	1.08
Novozymes A/S	NZYMB DC	1.08
TransAlta Renewables Inc	RNW	1.08
Veeco Instruments Inc	VECO	1.07
Lextar Electronics Corp	3698	1.07
Gurit Holding AG	GUR SW	1.06
Signify NV	LIGHT	1.06
Innergex Renewable Energy Inc	INE	1.06
Credit Suisse Real Estate Green Property	GREEN SW	1.06
Northland Power Inc	NPI	1.06

Huaneng Renewables Corp Ltd	958	1.06
PNE AG	PNE3	1.06
Greencoat UK Wind PLC/Funds	UKW LN	1.06
GCP Infrastructure Investments Ltd	GCP LN	1.05
Plug Power Inc	PLUG	1.05
Boralex Inc	BLX	1.04
Siemens Gamesa Renewable Energy SA	SGRE	1.04
Clearway Energy Inc	CWEN	1.03
Encavis AG	CAP	1.03
Itron Inc	ITRI	1.02
Drax Group PLC	DRX LN	1.01
Atlantica Yield plc	AY	1.01
Renewables Infrastructure Group Ltd	TRIG LN	1.00
Xinyi Solar Holdings Ltd	968	1.00
Meyer Burger Technology AG	MBTN SW	0.99
Ormat Technologies Inc	ORA	0.99
Takuma Co Ltd	6013	0.99
Neoen SA	NEOEN FP	0.98
EDP Renovaveis SA	EDPR	0.98
EF-ON INC	9514	0.97
Universal Display Corp	OLED	0.97
Ameresco Inc	AMRC	0.96
OSRAM Licht AG	OSR	0.96
Pattern Energy Group Inc	PEGI	0.96
Hannon Armstrong Sustainable Infra.	HASI	0.95
Meridian Energy Ltd	MEL	0.95
Orsted A/S	ORSTED	0.95
Gigasolar Materials Corp	3691	0.94
Mercury NZ Ltd	MCY	0.93
Seoul Semiconductor Co Ltd	046890 KS	0.93
Kandi Technologies Group Inc	KNDI	0.93
Canvest Environmental Protection Group Co	1381	0.93
Acuity Brands Inc	AYI	0.92
China High Speed Trans.	658	0.91
Albioma SA	ABIO FP	0.91
JinkoSolar Holding Co Ltd ADR	JKS	0.90
Samsung SDI Co Ltd	006400 KS	0.89
Ecopro Co Ltd	086520 KS	0.89
SolarEdge Technologies Inc	SEDG	0.88
BCPG PCL	BCPG-R TB	0.88

BYD Co Ltd	1211	0.87
Vivint Solar Inc	VSLR	0.87
Contact Energy Ltd	CEN	0.85
Verbund AG	VER AV	0.84
Xinyi Energy Holdings Ltd	3868	0.84
Xinjiang Goldwind Science & Technology Co Ltd	2208	0.84
TPI Composites Inc	TPIC	0.84
Sociedad Quimica y Minera de Chile SA ADR	SQM	0.83
TerraForm Power Inc	TERP	0.82
NEL ASA	NEL	0.82
Sunnova Energy International Inc	NOVA	0.82
Enphase Energy Inc	ENPH	0.82
Daqo New Energy Corp ADR	DQ	0.81
Cree Inc	CREE	0.80
United Renewable Energy Co Ltd/Taiwan	3576	0.80
NIO Inc ADR	NIO	0.79
Motech Industries Inc	6244	0.79
Scatec Solar ASA	SSO	0.78
Canadian Solar Inc	CSIQ	0.75
First Solar Inc	FSLR	0.74
Sunrun Inc	RUN	0.72
Willdan Group Inc	WLDN	0.71
SunPower Corp	SPWR	0.45

*NEX Index Methodology: After early 2019 Market Consultation & Announcement, NEX constituents have gone from Large and Small weightings - to a straight-equal-weightings method starting Q3 2019; additionally all NEX Sector Weights are assigned starting Q3 2019 according to # of Constituents in each NEX Sector (rather than by external Surveys); these changes were effective Q3 2019.

** Effective 2019, WilderHill New Energy Global Innovation Index (NEX) is being calculated solely in \$ U.S. Dollars. (Previously also calculated in theoretical way in Euros, Yen, and GB Pounds; it is now only in \$ USD).

Appendix IV:

WilderHill New Energy Global Innovation (NEX) - start of Q1 2020. 91 Stocks.

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

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

<u>Name</u>	<u>Description</u>	<u>Sector</u>	<u>Currency</u>	<u>Activity</u>
Albioma SA	Biomass, sugarcane, hybrid combustion, cogeneration.	RBB	EUR	FRANCE
Ameresco	Energy savings, performance contracts, in renewables.	EEF	USD	US
Atlantica Yield plc	Yieldco, Contracted renewables, also transmission.	RSR	USD	SPAIN
Audax Renovables SA	Wind power, in Europe and the Americas.	RWD	EUR	SPAIN
Ballard Power Systems	Fuel cells; R&D, used in transportation and more.	ECV	CAD	CANADA
Bloom Energy	Stationary fuel cells, distributed but non-renewable.	ECV	USD	US
Boralex	Renewables generation, operates wind, hydro, solar.	RWD	CAD	CANADA
BYD Co.	Batteries, potential use in EVs, rail, solar farms, more.	ENS	HKD	CHINA
Canadian Solar	Solar, vertically integrated solar manufacturer, China.	RSR	USD	CANADA
Canvest Environmental	Waste to Energy, China-focused.	RBB	HKD	CHINA
Caverion OYJ	Energy efficiency, buildings, infrastructure, Europe.	EEF	EUR	FINLAND
China High Speed Trans.	Wind power, turbine gear boxes & transmissions.	RWD	HKD	CHINA
Contact Energy	Electric Utility, offers power from geothermal, hydro.	ROH	NZD	NEW ZEALAND
Cree Inc.	LED manufacturer power-saving, efficient lighting.	EEF	USD	US
CropEnergies AG	Bioethanol, from cereals and sugarbeet, Germany.	RBB	EUR	GERMANY
Credit Suisse Real Est. Grn.	Sustainability in buildings, real estate.	EEF	CHF	SWITZERLAND
CS Wind	Wind power, both onshore, also offshore.	RWD	KRW	S. KOREA
Daqo New Energy	Solar, high-purity polysilicon for solar wafers, China.	RSR	USD	CHINA
EcoPro	Battery materials, Pollution Control catalysts, S. Korea.	ENS	KRW	S. KOREA
EDP Renovaveis SA	Wind power, among largest producers in world, Iberia.	RWD	EUR	SPAIN
Encavis AG	Solar, large solar park operator, also wind, Germany.	RSR	EUR	GERMANY
Enphase	Inverters, micro-products for solar panels, storage.	RSR	USD	US
Eolus Vind	Wind power, also consulting services for wind.	RWD	SEK	SWEDEN
Epistar	LEDs, large LED manufacturer in Taiwan.	EEF	TWD	TAIWAN
eRex Co. Ltd.	Power generation, bus/residential, biomass, Japan.	RBB	JPY	JAPAN
Everlight Electronics	LEDs, large manufacturer in optoelectronics, Taiwan.	EEF	TWD	TAIWAN
Falck Renewables SpA	Renewable wind, biomass, WtE, solar, Europe.	RWD	EUR	ITALY
First Solar	Thin film solar, CdTe low-cost alternate to polysilicon.	RSR	USD	US
GCP Infrastructure	Trust invests in renewables, based in Jersey U.K.	RSR	GBP	JERSEY
Gigasolar Materials	Solar, conductive pastes in PV panel manufacturing.	RSR	TWD	TAIWAN
Greencoat UK Wind plc	Infrastructure fund, invested in U.K. wind power assets.	RWD	GBP	BRITAIN
GS Yuasa	Battery technologies, also Lithium for EVs, Japan.	ENS	JPY	JAPAN
Gurit Holding AG	Composite Materials in wind, lightens cars, planes.	RWD	CHF	SWITZERLAND
Hannon Armstrong	Energy efficiency, capital & finance for infrastructure.	EEF	USD	US
Innervex Renewable	Renewable power, run-of-river hydro, wind, solar.	ROH	CAD	CANADA

Itron	Meters, Utility energy monitor, measuring & manage.	EEF	USD	US
JinkoSolar	Solar, wafers through solar modules, China OEM.	RSR	USD	CHINA
Kandi Technologies	Electric Vehicles, focus on battery electric vehicles.	EEF	USD	CHINA
Kingspan Group plc	Efficient Buildings, insulation for conservation, Ireland.	EEF	EUR	IRELAND
Landis+Gyr Group AG	Advanced meters, modernizing grid, Switzerland.	EEF	CHF	SWITZERLAND
Lextar Electronics Corp	LEDs and efficient displays and lighting.	EEF	TWD	TAIWAN
Meidensha Corp	Energy management, power generation & transmission.	EEF	JPY	JAPAN
Mercury NZ	Clean power, 100% renewable hydro, geothermal.	ROH	NZD	NEW ZEALAND
Meridian Energy	Hyrdoelectric power stations, some wind, New Zealand.	ROH	NZD	NEW ZEALAND
Meyer Burger Tech	Solar, manufacturing equip., Switzerland, worldwide.	RSR	CHF	SWITZERLAND
Nel ASA	Hydrogen, fuel cell vehicles, renewably, Norway.	ECV	NOK	NORWAY
Neoen SA	Renewable energy mainly solar, some wind.	RSR	EUR	FRANCE
Nibe Industrier AB	Heating & cooling, sustainable technologies, Sweden.	EEF	SEK	SWEDEN
Nio	EVs, design, manufacture, and sale including SUVs	EEF	USD	CHINA
Nordex SE	Wind turbines, based in Germany/Europe, worldwide.	RWD	EUR	GERMANY
Northland Power	Wind, solar, biomass; power producer, Canada.	RWD	CAD	CANADA
Novozymes A/S	Biofuels, enzymes used in partnerships, Denmark.	RBB	DKK	DENMARK
Ormat	Geothermal, works too in recovered heat energy.	ROH	USD	US
Orsted A/S	Sustainable wind, also biomass, thermal, Denmark.	RWD	DKK	DENMARK
Plug Power	Small fuel cells, e.g. in forklifts; drop in replacements.	ECV	USD	US
Powercell Sweden	Fuel cells, transportation, marine, stationary uses.	ECV	SEK	SWEDEN
Renewable Energy Group	Biodiesel, natural fats, oils, grease to biofuels.	RBB	USD	US
Renewables Infrastructure	Wind Farm & Solar Park revenues assets, U.K.	RWD	GBP	GUERNSEY
Renova	Wind, Solar, Biomass, power generation in Asia.	RWD	JPY	JAPAN
Ricardo plc	Global Engineering, energy, environment, transport.	EEF	GBP	BRITAIN
Samsung SDI	Batteries, innovative energy storage, EVs, South Korea.	ENS	KRW	S. KOREA
Scatec Solar ASA	Solar power parks worldwide.	RSR	NOK	NORWAY
Seoul Semiconductor Co	Lighting, automotive, LEDs, South Korea	EEF	KRW	S. KOREA
Siemens Gamesa	Wind, onshore & offshore, turbines, gearboxes, Spain	RWD	EUR	SPAIN
Signify NV	Lighting, systems increasing efficiency, Netherlands.	EEF	EUR	NETHERLANDS
Sino-American Silicon	Solar, semi-conductor silicon wafer materials, Taiwan.	RSR	TWD	TAIWAN
SMA Solar Technologies	Inverters for solar, industrial scale storage, Germany.	RSR	EUR	GERMANY
Sociedad Quimica Chile	Lithium, a key element in advanced batteries, Chile.	ENS	USD	US
Solaria Energia	Solar, renewable power generation, Iberia.	RSR	EUR	SPAIN
SolarEdge	Inverters, panel-level solar optimizers, micro-inverters.	RSR	USD	US
Sunnova	Residential solar and energy storage installation.	RSR	USD	US
SunPower	Solar, efficient PV panels with rear-contact cells.	RSR	USD	US
Sunrun	Residential solar, leasing, PPA or purchase rooftop PV.	RSR	USD	US
Takuma	Thermal Plants, biomass, corn, wood wastes.	RBB	JPY	JAPAN
TerraForm Power	Owns runs solar/wind in developed nations, yieldco.	RSR	USD	US

Tesla	Electric vehicles, solar; in EVs & energy storage.	ENS	USD	US
Tilt Renewables	Wind Farms, Australia and New Zealand, some solar.	RWD	NZD	NEW ZEALAND
TPI Composites	Wind Blades; also light-weighting for transportation.	RWD	USD	US
TransAlta Renewables	Renewables, operating wind power, some hydro.	RWD	CAD	CANADA
United Renewable Energy	Solar, aiming to be vertically-integrated, Taiwan.	RSR	TWD	TAIWAN
Universal Display	Organic light emitting diodes, efficient displays.	EEF	USD	US
Veeco instruments	Thin film equip LEDs, energy efficient electronics.	EEF	USD	US
Verbio Vereinigte BioEn.	Biofuels, manufacturer supplier to Germany, Europe.	RBB	EUR	GERMANY
Verbund AG	Electricity supplier, hydro, a large provider for Austria.	ROH	EUR	AUSTRIA
Vestas Wind Systems A/S	Wind, wind turbine manufacturing & services, Denmark.	RWD	DKK	DENMARK
Vivint Solar	Solar, one-stop installer direct to homes sales model.	RSR	USD	US
West Holdings	Solar, Japan-focused residential and commercial PV.	RSR	JPY	JAPAN
Willdan Group	Energy efficiency in infrastructure, engineering.	EEF	USD	US
Xinjiang Goldwind	Wind, large turbine manufacturer, China.	RWD	HKD	CHINA
Xinyi Energy Holdings	Solar Farms, a spin-off from Xinyi solar glass, China.	RSR	RSR	CHINA
Xinyi Solar Holdings	Solar, ultra-clear glass products, China.	RSR	HKD	CHINA

Changes to NEX Index for Start of Q1 2020:

3 NEX ADDITIONS for the start of Q1 were:

Eolus Vind (Sweden), Powercell (Sweden); Solaria Energia (Spain).

12 NEX DELETIONS for start of Q1 were:

Acuity; BCPG; Clearway Energy; Drax; EF On; Huaneng Renewables; Motech; PNE; Osram; Pattern Energy; Tanaka; W-Scope.

WEIGHT EACH COMPONENT

91 stocks/100 = Individual Weights for Q1 2020

1.09890109%

Appendix V: NEX Sector Weights for start of New Quarter Q1 2020

91 Stocks for Start of Q1 2020.

<u>NEX SECTOR WEIGHTS for Q1 2020:</u>	<u>SECTOR</u>	<u>QUANTITY</u>	<u>% Sector Weight</u>
Energy Conversion	ECV	5	5.5%
Energy Efficiency	EEF	21	23.1%
Energy Storage	ENS	6	6.6%
Renewables - Biofuels & Biomass	RBB	8	8.8%
Renewables - Other	ROH	6	6.6%
Renewable - Solar	RSR	25	27.5%
Renewable - Wind	RWD	20	22.0%
		91	100.0%

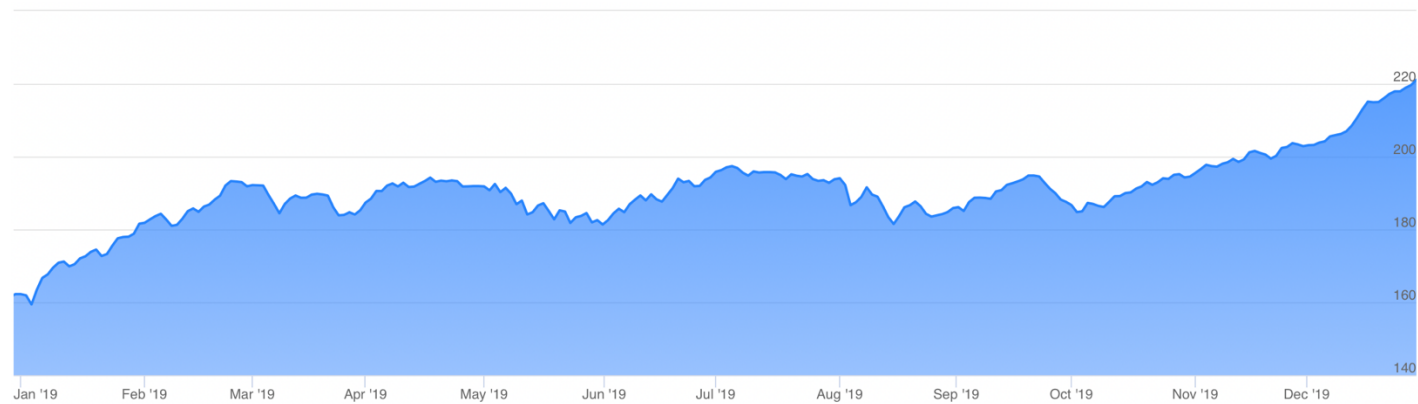
 Glancing globally, these are NEX Constituents in a past 52 weeks - late 2018 to November 7, 2019:
Global NEX Constituents ranked Past 52 Weeks late 2018 to November 7, 2019 (showing some themes that have done rather 'well' over these 12 months – and those that did more 'poorly'):

<u>Company Name</u>	<u>Past 52 weeks % Change</u>
<u>Summary of all 100 Constituents:</u>	<u>20.6%</u>
Enphase Energy Inc	219.1%
Solaredge Technologies Inc	106.2%
Universal Display Corp	103.7%
Ballard Power Systems Inc	100.0%
Falck Renewables SpA	87.3%
Nel ASA	82.5%
CropEnergies AG	82.1%
Verbio Vereinigte Bioenergie AG	76.2%
Scatec Solar ASA	74.2%
Veeco Instruments Inc	71.7%
eREX Co Ltd	61.6%
Landis+Gyr Group AG	61.0%
PNE AG	59.6%
Xinyi Solar Holdings Ltd	56.2%
JinkoSolar Holding Co Ltd	55.0%
Meridian Energy Ltd	45.5%
Gurit Holding AG	44.7%
Nibe Industrier AB	44.7%
Ormat Technologies Inc	44.6%
Tilt Renewables Ltd	44.5%
Encavis AG	43.6%
Mercury NZ Ltd	43.4%
Itron Inc	43.1%
Albioma SA	42.0%
TerraForm Power Inc	39.3%
Xinjiang Goldwind Science & Technology	38.7%
Plug Power Inc	37.8%
Sino-American Silicon Products Inc	34.1%
Innergex Renewable Energy Inc	31.5%
SunPower Corp	31.5%
Pattern Energy Group Inc	30.7%
Vestas Wind Systems A/S	30.5%
Orsted A/S	30.4%

EDP Renovaveis SA	30.1%
Meidensha Corp	29.8%
Daqo New Energy Corp	29.6%
Nordex SE	28.5%
Huaneng Renewables Corp Ltd	28.3%
Neoen SA	28.0%
Hannon Armstrong Sustainable Infra.	27.7%
Gigasolar Materials Corp	26.1%
Contact Energy Ltd	25.0%
Northland Power Inc	24.8%
TransAlta Renewables Inc	24.6%
Boralex Inc	24.0%
Signify NV	23.7%
SMA Solar Technology AG	23.1%
West Holdings Corp	22.2%
Cree Inc	22.1%
Vivint Solar Inc	22.0%
Caverion Oyj	21.6%
CS Wind Corp	19.2%
First Solar Inc	19.2%
Canadian Solar Inc	17.2%
Osram Licht AG	16.2%
Credit Suisse Real Estate Green Property	15.6%
Atlantica Yield PLC	14.5%
Greencoat UK Wind PLC	14.4%
Renewables Infrastructure Group Ltd	13.8%
Motech Industries Inc	13.6%
Verbund AG	12.1%
Sunrun Inc	12.0%
Kingspan Group PLC	11.4%
Audax Renovables SA	9.6%
Epistar Corp	8.2%
Everlight Electronics Co Ltd	3.8%
Siemens Gamesa Renewable Energy SA	3.6%
GCP Infrastructure Investments Ltd	3.3%
Samsung SDI Co Ltd	1.1%
Ameresco Inc	0.3%
United Renewable Energy Co Ltd	0.0%
Lextar Electronics Corp	-0.3%
Acuity Brands Inc	-1.0%

Clearway Energy Inc	-1.3%
BCPG PCL	-2.2%
Tesla Inc	-3.6%
Novozymes A/S	-4.5%
Takuma Co Ltd	-5.9%
Ricardo PLC	-7.0%
Kandi Technologies Group Inc	-8.4%
GS Yuasa Corp	-9.1%
Tanaka Chemical Corp	-12.1%
Renova Inc	-16.1%
Willdan Group Inc	-20.8%
Canvest Environmental Protection	-21.7%
Byd Co Ltd	-25.0%
EF On Inc	-29.2%
Seoul Semiconductor Co Ltd	-31.2%
Renewable Energy Group Inc	-31.8%
Drax Group PLC	-32.1%
China High Speed Transmission Equip.	-36.3%
Sociedad Quimica y Minera de Chile SA	-39.3%
W-Scope Corp	-39.5%
Meyer Burger Technology AG	-39.8%
TPI Composites Inc	-41.3%
Ecopro Co Ltd	-46.2%
Nio Inc	-69.3%
Bloom Energy	-76.1%

NEX Index for 2019 Year to December 30, 2019:



Source: Solactive.com

Appendix VI:
Historical Weights: WilderHill New Energy Global Innovation Index (NEX).

Sector Weights Start Of Each Quarter*	ECV Energy Conversion	EEF Energy Efficiency	ENS Energy Storage	RBB Renewables - Biofuels & Biomass	ROH Renewables - Other	RSR Renewable - Solar	RWD Renewable - Wind
Q4 2019	4.00%	23.00%	8.00%	10.00%	6.00%	26.00%	23.00%
Q3 2019	3.77%	22.64%	9.43%	9.43%	5.66%	26.41%	22.64%
Q2 2019	1.40%	29.72%	9.11%	6.13%	4.41%	21.75%	27.49%
Q1 2019	1.42%	30.07%	9.36%	8.48%	4.49%	20.72%	25.46%
Q4 2018	1.05%	30.25%	9.00%	7.94%	3.63%	21.78%	26.34%
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%
Q4 2012	1.50%	33.93%	2.97%	14.50%	14.50%	19.59%	13.04%
Q3 2012	2.32%	28.30%	6.70%	14.22%	8.35%	21.17%	19.00%
Q2 2012	1.34%	28.14%	4.16%	14.61%	13.98%	22.00%	15.96%
Q1 2012	1.60%	28.01%	4.01%	13.85%	14.70%	20.83%	17.00%
Q4 2011	1.14%	25.06%	4.12%	12.13%	11.63%	26.48%	19.45%
Q3 2011	1.28%	22.72%	6.24%	10.17%	10.49%	24.60%	24.32%
Q2 2011	1.50%	23.34%	8.06%	10.69%	9.53%	25.76%	21.04%
Q1 2011	1.50%	26.95%	6.99%	10.50%	9.46%	24.59%	20.00%

Q4 2010	1.79%	24.32%	8.80%	11.21%	6.02%	24.16%	23.71%
Q3 2010	1.97%	20.31%	8.86%	11.70%	6.59%	24.42%	26.16%
Q2 2010	1.90%	17.29%	8.53%	12.36%	6.58%	24.29%	29.05%
Q1 2010	2.04%	16.93%	8.65%	12.25%	6.73%	25.03%	28.36%
Q4 2009	2.25%	15.20%	7.10% ¹	11.26%	7.10%	27.51%	29.58%
Q3 2009	2.59%	13.77%	5.38%	10.76%	6.81%	29.24%	31.45%
Q2 2009	2.42%	12.89%	4.79%	12.21%	6.49%	30.57%	30.63%
Q1 2009	2.77%	15.14%	5.29%	14.19%	8.25%	25.70%	28.68%
Q4 2008	2.25% ²	23.93%	3.57%	12.09%	6.48%	26.63%	25.05%
Q3 2008	3.31%	20.03%	3.33%	13.14%	6.54%	27.27%	26.39%
Q2 2008	3.81%	17.85%	2.81%	14.32%	6.47%	27.03%	27.71%
Q1 2008	3.93%	13.56%	2.94%	14.26%	6.99%	30.00%	28.34%

*To early 2019, NEX Sectors and Weights were based partly on dividing companies into large or small, and an external survey of companies deemed active in new energy: results adjusted for factors including exposure to new energy and some exchange restrictions. Subsequently, components generally were equally weighted, and respective sector weights made in accordance with number of Index components assigned to each NEX sector, components and sectors adjusted if necessary as determined by Index Provider and reviewed each quarter.

¹ PWS (Power Storage) changed it's name to ENS (Energy Storage) at the end of the 4th Quarter of 2009.

² HFC (Hydrogen & Fuel Cells) changed it's name to ECV (Energy Conversion) at the end of the 4th Quarter of 2008.

³ HF (Hydrogen And Fuel Cells) became HFC (Hydrogen & Fuel Cells) after 2007 and then changed it's name to ECV (Energy Conversion) at the end of the 4th Quarter of 2008.

⁴ DS (Demand Side Energy Savings) and GE (Generation Efficiency And Smart Distribution) were combined into EEF (Energy Efficiency) after 2007.

Below is the new **Clean Ocean Index (OCEAN)** past 1 year in a Backtest for Nov. 2018 to Nov 2019:



Source: Solactive.com

Appendix VII, Clean Ocean Index (OCEAN) live Starting Composition in Q4 2019:
INDEX (OCEAN) SECTOR & STOCK WEIGHTS Q4 (as of November 6) 2019. 65 STOCKS.

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

*Stocks all equal-weighted; for more on OCEAN, see <https://cleanoceanindex.com>

<u>Clean Ocean Components</u>	<u>Theme</u>	<u>Activity</u>	<u>Sector</u>
Alfa Laval AB	Fluid Handling, controls, on vessels.	Sweden	WT
American States Water	Water and Wastewater Services.	USA	WT
American Water Works	Water and Wastewater Systems.	USA	WT
AO Smith	Water Heating Systems globally.	USA	WT
Aqua America	Water and Wastewater Services.	USA	WT
Austevoll Seafood ASA	Seafood in Norway; also pelagics Chile, Peru.	Norway	SF
Badger Meter	Water Metering.	USA	PP
Ballard Power	Fuel Cells, mid-sized PEM.	Canada	CE
Beyond Meat	Plant-based meats, less impactful proteins.	USA	PP
Bollore SA	Ports, Terminals, Logistics, Transportation.	France	GS
California Water Service	Water and Wastewater Utility Services.	USA	WT
Canadian Solar Inc	Solar, panel manufacturer.	Canada	CE
Cargotec OYJ	Ports & Terminals, attention to Sustainability.	Finland	GS
Cia Pesquera Caman.	Fishing, aquaculture, sustainability, Chile.	Chile	SF
Clearwater Seafoods	Wild Caught Seafoods, Nova Scotia, Argentina.	Canada	SF
CREE	LEDs Lighting.	USA	PP
CS Wind	Wind, towers.	S. Korea	CE
EDP Renovaveis SA	Renewables, across wind, hydro, solar.	Spain	CE
Evoqua	Water, wastewater treatment.	USA	WT
First Solar	Solar, thin film panels.	USA	CE
Grieg Seafood ASA	Seafood, aquaculture with high ESG scores.	Norway	SF
High Liner Foods	Seafood, North America, wild-caught frozen.	Canada	SF
Intertek Group plc	Cargo and Trade services, quality assurance.	Britain	PP
Itron	Smart Grid Power and Water Management.	USA	PP
Kingspan Group PLC	Building Insulation.	Ireland	PP
Koninklijke Boskalis	Dredging for Ports, Maritime Transportation.	Netherlands	GS
Kuehne und Nagel	Shipping Logistics, clean cargo group.	Switzerland	PP
Kurita Water	Water Treatment, wastewater systems.	Japan	WT
Landis & Gyr	Smart Metering, Better Grid	Switzerland	PP
Meridian Energy	Power generation 100% from renewables.	New Zealand	CE
Metawater	Water purification, sewage treatment plants.	Japan	WT
Mowi ASA	Seafood, aquaculture with high ESG scores	Norway	SF
Nel ASA	Hydrogen, made from renewable resources.	Norway	SF
Neoen S.A.	Renewables, using wind, solar, biomass.	France	CE
Nibe Industrier AB	HVAC, other areas in sustainability.	Sweden	PP

Nomad Foods	Moving to 100% Certified-sustainable seafood.	USA	SF
Norway Royal Salmon	Fish farming, has low carbon footprint vs. beef.	Norway	SF
Orsted A/S	Wind, Offshore; also inbioenergy and thermal.	Denmark	CE
P/F Bakkafrost	Seafood, aquaculture with high ESG scores	Norway	SF
Pentair PLC	Water Efficiency and Treatment.	Britain	WT
PNE AG	Wind, both Offshore and Onshore.	Germany	CE
PowerCell Sweden	Hydrogen, fuel cells, reformers, marine uses.	Sweden	CE
Pure Cycle	Water, supply and treatment.	USA	WT
SalMar ASA	Seafood, aquaculture with high ESG scores	Norway	SF
Samsung SDI	Li Ion Batteries.	S. Korea	CE
Signify NV	LEDs, was Philips Lighting.	Netherlands	PP
Sino-American Silicon	Solar feedstock, wafers.	Taiwan	CE
SolarEdge	Solar MicroInverters	USA	CE
Solaria Energia y Medio	Solar, Wind, power from renewables plants.	Spain	CE
Sunnova Energy	Residential Solar and Energy Storage.	USA	CE
SunPower Corp	Solar, efficient panels manufacturer.	USA	CE
Sunrun Inc	Solar, residential Installer.	USA	CE
Tassal	Seafood, aquaculture with high ESG scores.	Australia	SF
Tilt Renewables	Wind Farms, Australia & New Zealand, solar.	New Zealand	CE
Tomra Systems ASA	Recycling wastes, materials recovery.	Norway	PP
TORM plc	Shipping tankers, bulk, CSR, exhaust reduction.	Denmark	GS
Veolia Environnement	Water and Wastewater Treatment.	France	WT
Verbio Vereinigte Bio	Biofuels, biodiesel and bioethanol.	Germany	PP
Verbund AG	90% of power from Hydro, Austria.	Austria	CE
Vestas Wind Systems A/S	Wind power, in both products and services.	Denmark	CE
Wartsila OYJ	Ports, Terminals, energy with sustainability.	Finland	GS
Watts Water Technologies	Water quality, rainwater harvest, flow control.	USA	WT
Xinjiang Goldwind Science	Wind, turbine manufacturer, also in services.	China	CE
Xinyi Solar Holdings Ltd	Solar glass, has spun off solar farms.	China	PP
Xylem	Water Technologies.	USA	WT

Equal Weight = 65/100 = 1.5384615 each.

<u>SECTOR</u>	<u>#</u>	<u>Approx %</u>
GREENER SHIPPING (GS) =	5	8%
CLEAN ENERGY (CE) =	21	32%
WATER TREATMENT (WT) =	14	22%
SUSTAINABLE FISHERIES (SF) =	11	17%
POLLUTION PREVENTION (PP) =	14	22%
TOTAL CONSTITUENTS =	65	

Guidelines: Clean Ocean Index (Oct. 2019),
<https://cleanoceanindex.com/wilderhill-clean-ocean-index-guidelines>

To be eligible for potential Index inclusion, each financial instrument must have:

1. a primary listing in one of the countries that are part of the Developed Markets as defined by the Solactive Country Classification, plus South Korea, Taiwan or Chile; and
2. a Total Market Capitalization of at least USD 150 million.

Based on the Index Universe, the initial composition of the Index as well as any selection for an ordinary rebalance is determined on the Selection Day in accordance with the following rules:

For a company to be reviewed for consideration for inclusion in the Index, it must pass a screen by achieving an internal score of 3 or better out of 5 for oceans and sustainability. The scores are assigned based on recommendations of an Advisory Committee with experts in marine science and related fields.

The scores are qualitative emphasizing impacts for ocean health, biodiversity, preventing pollution, or lowering greenhouse gases. Sustainability & environment are emphasized. In determining the scores, there is a strong bias in favor of purer-play companies focused on products, goods, services for

- (i) clean healthy oceans;
- (ii) robust marine ecosystems;
- (iii) renewable energy and efficiency;
- (iv) sustainability;
- (v) water treatment;
- (vi) greener ports;
- (vii) better efficiency in shipping;
- (viii) pollution prevention upstream such as greener alternatives, eco-thinking such as in agriculture, non-meat substitutes; or
- (ix) climate change solutions.

Companies in emerging related fields ahead may be considered too with respect to their advancing or reflecting this clean ocean sector. In addition, the purer-play companies need to derive significant value from their environmental-relevant activities. There is a clear focus on companies providing more sustainable solutions with a particular focus on advancing healthy oceans. These include for example companies reflecting certified fishing practices, low-carbon renewable energy, and prevention of coastal pollution in the first place.

In addition, external ESG scores of B- (or equivalent) or better for E (Environmental) criteria are generally required to be held by at least 90% of those companies reviewed for consideration for inclusion in the OCEAN Index that do have an ESG score. Scores for the ESG filter process are derived from recognized ESG data providers.

Owing to the fact attention to oceans is in early stages, with sustainability an emerging theme, smaller-cap and mid-sized companies may have a leading role in Index composition. High volatility is expected. Sustainability is 'baked in' here. So too is attention to environment among Environmental, Social, and Governance (ESG) considerations, and concern for climate solutions, and impact investing.

On each Selection Day, each Index Component is assigned equal weight.

Philosophy Behind the WilderHill Clean Ocean Index

As the world's first for healthy marine life, vibrant seas and climate change solutions, a priority of WilderHill® Clean Ocean Index (OCEAN) is to define and track this new sector: specifically, businesses that stand to benefit substantially from a societal transition towards more robust healthy seas, use of cleaner energy, renewables, and conservation.

The [Precautionary principle](#) which aims to avoid harms in the first place, is noted. We emphasize new solutions that make both ecological and economic sense, and aim to stay the leader in this field. Visit the website of the Calculation Agent, [Solactive](#), for specifications, history, [developed](#) countries/exchanges list, and other information for live calculations of this WilderHill Index. Investors who wish to trade the clean ocean and climate solutions sector as defined by this WilderHill Index — via an independent fund — can contact their Broker. We note that Exchange-Traded Funds (ETFs) generally carry the characteristics of intra-day trading and transparency.

We subscribe to modern portfolio theory and believe that advantages of a passive transparent indexing approach are persuasive. We pursue qualitative, analysis-based stock selection according to ecological and technical considerations. Notably we don't change composition more often than Index rebalancings. We don't try to 'beat the market', nor try to pick perhaps 'under-valued' stocks. **Guidelines** for the Index are above and [here](#).

We do not take defensive positions within the Index when markets decline, appear over-valued, or the Index is experiencing unusual volatility. Rather than try to select Index components based on futuristic predictions or potential financial or market data, we robustly look at clean healthy oceans and climate solutions broadly conceived, and review stocks and sectors on their ecological, environmental and technical criteria. We judge our performance by how well the Index tracks the movements of a still-emerging clean healthy oceans & climate solutions sector – downwards and upwards – and anticipate significant ongoing volatility and risks in this new sector.

We apply qualitative analysis to determine OCEAN Index components, equal-weighted at the rebalances for start of each Quarter. Criteria include importance of the stock and sector to clean healthy oceans, relevance to climate change solutions, to pollution prevention, technological significance, intellectual property rights, salience to preserving marine biodiversity, ecosystems structure, function, integrity, and other non-financial criteria. The Index may be a diversification tool. Given inherent volatility of this sector with many small companies and strong price changes both down or up, this WilderHill Index is expected to be notably very volatile as well.

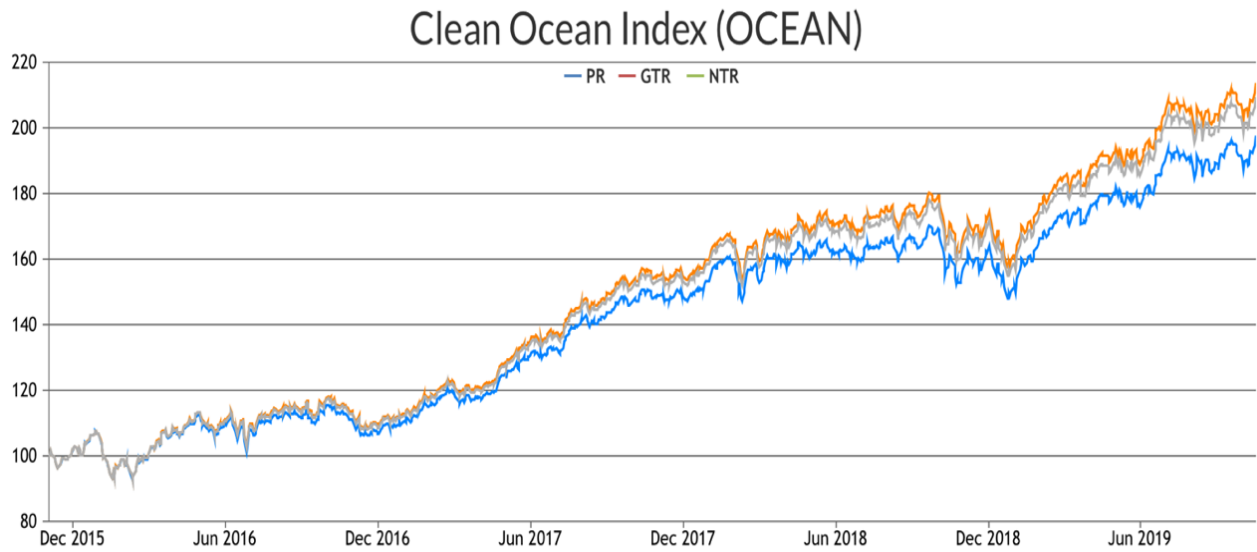
Companies in emerging related fields will be considered with respect to impact upon marine biodiversity, carbon impact, and the degree to which they advance or reflect the clean ocean sector. While private, non-public companies cannot be included in the Index – we look forward to considering emerging public companies in exciting areas ahead such as sustainable alternatives to plastic, vegan seafood, alternate foods & processes with much lower-carbon footprint, ocean related apps, and marine eco-tourism.

Innovators in Environmental Themes

Now a well-known benchmark, the original [WilderHill Clean Energy Index®](#) (ECO) founded in 2004 was an antecedent and derived in part from acute attention to ocean health. Notably it was the first-ever for climate change solutions. Following that, the [WilderHill New Energy Global Innovation Index](#) (NEX) launched 2006 since has focused on climate change solutions worldwide, mainly outside the U.S. In the years since, these WilderHill Indexes (and independent trackers for them) arguably have helped catalyze dozens of subsequent products and attention for clean energy and climate. This fresh theme of healthier oceans, coupled with bold climate solutions, arguably now merits attention as well.

Backtests for Clean Ocean Index (OCEAN): to late 2019 - prior to live launch Nov. 18, 2019:

From late 2015 to October 2019 - with the three OCEAN variants:



YTD 2019: From start of 2019 to October 2019:

