

We provide comment on the first quarter of 2018 for Alternative Energy:

- Quarterly commentary
- Outlook
- Portfolio changes
- Performance
- Holdings

Quarterly commentary

The following factors supported alternative energy stocks over the quarter:

- Proposed Chinese renewable energy portfolio standards
- Growing public and government recognition of renewables' competitiveness versus fossil fuels
- Continued robust growth in electric vehicle demand, especially in China and Europe

The following factors weighed down on alternative energy stocks:

- Uncertainty around solar and wind equipment pricing
- Slow payment of subsidies to generators in China
- Concerns about low pricing from increased prevalence of auctions

Equipment manufacturers

Equipment manufacturers had mixed performance over the quarter with overall no positive or negative contribution. Daqo, a polysilicon producer, benefited from strong polysilicon pricing and an improving balance sheet. FirstSolar, a thin-film solar panel manufacturer, was a primary beneficiary of Trump's imposition of import tariffs on solar modules as its cadmium telluride panels are not subject to import tariffs. Xinyi, a Chinese solar glass manufacturer and solar installer, performed well as a result of much higher than expected levels of Chinese solar installations. Two of the polysilicon module manufacturer holdings, JinkoSolar and Canadian Solar, were weak over the quarter as their modules will be subject to Trump's import tariffs. JA Solar's share price was stable as it is awaiting confirmation of approval for a management buyout.

Although our wind turbine manufacturer holding, Senvion performed poorly over the quarter due to worries about oversupply and margin compression, our wind-blade supplier holding, TPI Composites, fared well following announcements of good fourth quarter results and a partnership to diversify to build trucks with composite tractor and frame rails.

Power Producers

The Chinese renewable energy power producers (China Longyuan, Huaneng Renewables, China Datang, Concord New Energy and China Suntien) did well over the quarter. China has announced

new rules that will further lower curtailment and its intention to introduce renewable portfolio standards and renewable energy certificates. All these potentially reduce the uncertainty of payment for renewable electricity production in China. These were supported by a quarter with high levels of wind generation.

Iniziative Bresciane's share price increased with the commissioning of several new hydro sites and with the prospect of good flows in 2018 following a winter with high levels of precipitation in the Alps. Mytrah Energy fared well as confidence grew in the company as a result of increasing wind capacity in the portfolio. Ormat, a vertically-integrated geothermal power equipment producer, developer and asset owner and operator, fell 11.85% as a result of weaker earnings guidance than expected. Good Energy, a UK-based green utility, was down 35.66% due to delayed revenue collection and missing investors' growth expectations.

Grid & Energy Management

Wasion and Boer Power fared well in the quarter. Wasion produces meters and Boer Power distributes and installs energy management equipment and systems. Wasion saw sales growth from new products and Boer Power's share price is finally beginning to benefit from the company restructuring.

Schneider Electric, a French power management and automation equipment and solutions provider, had a positive set of results, including higher than expected organic growth in its energy management division. Prysmian, an Italian cable producer, was down 3.39% due to worries around the telecommunication cable market and the premium in its acquisition of General Cable.

Electric Vehicles & Batteries

Ricardo, a predominantly automotive engineering consultancy, had a strong quarter following positive results. Tianneng Power, a Chinese bicycle battery and li-ion battery manufacturer performed particularly well this quarter following an increase in electric vehicle battery sales and increased volume for its electric bicycle sales.

LG Chem, a Korean petrochemical company and a leading lithium-ion battery manufacturer for electric vehicles, was down slightly due to worries in the Korean market and after a small miss versus consensus revenue estimates for FY 2017.

Building Efficiency

Acuity Brands was down 4.84% as the worry of decreasing LED pricing and potential margin squeezing is weighing on investor confidence. We believe these worries are overdone given the range of solutions Acuity Brands offers. Johnson Controls is in the midst of integrating its Tyco acquisition and is considering selling its Power Business to reduce capital expenditure and increase cash flow. Johnson Controls posted results that were in line with expectations, but did not increase its guidance, disappointing the market. Kingspan and Nibe fell slightly over the quarter.

Biofuel

Cosan was flat over the quarter in line with the Ibovespa Index.

Outlook

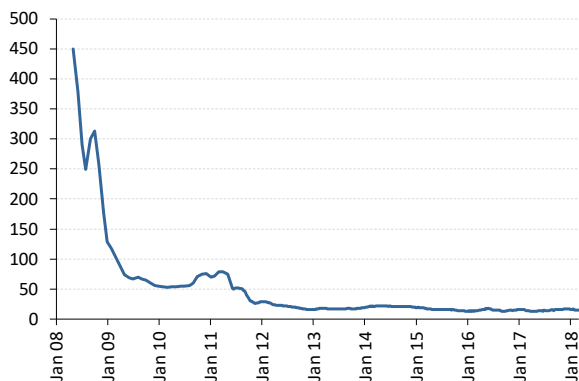
Solar PV

	2014	2015	2016	2017	2018e	2019e	2020e
World	46	56	75	98	111	138	148
Asia	26	35	48	74	78	86	90
North America & Caribbean	7	8	15	11	11	17	19
EU Europe	7	8	6	5	7	13	10
Central & South America	1	1	2	2	4	3	4
Oceania	1	1	1	2	4	5	6
Middle East & North Africa	1	1	1	1	3	7	8
Non-EU Europe	1	1	2	2	2	4	5
Africa (excl. North Africa)	1	0	1	1	1	3	4

Source: Bloomberg. Note: Sorted by 2018 forecast installations
 Forecasts are inherently limited and cannot be relied upon.

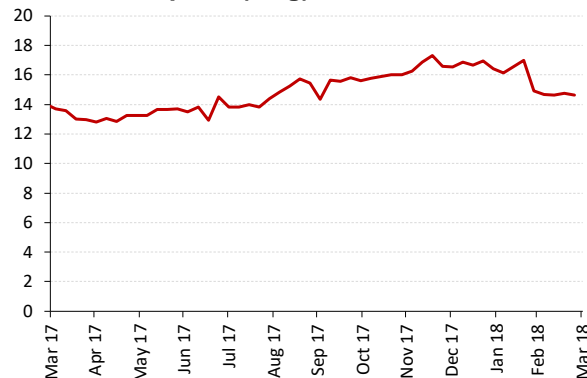
The solar sector continues to beat growth expectations. In 2017, China added 53GW of solar, comprising more than half of the global solar market. 2018 has similar hallmarks to 2017, with construction deadlines to meet before subsidies are reduced. The government announced tariff cuts for behind the meter systems that are not connected to the grid by June 30, 2018. A second deadline is at year end for the next set of subsidy reductions. We expect an installation rush in the run up to the middle of the year and the end of the year as developers try to lock in the highest tariffs possible before the cuts. The demand increase has resulted in the solar value chain showing less supply-demand imbalance than expected which is supportive of pricing at all levels.

Long-term Silicon price (\$/kg)



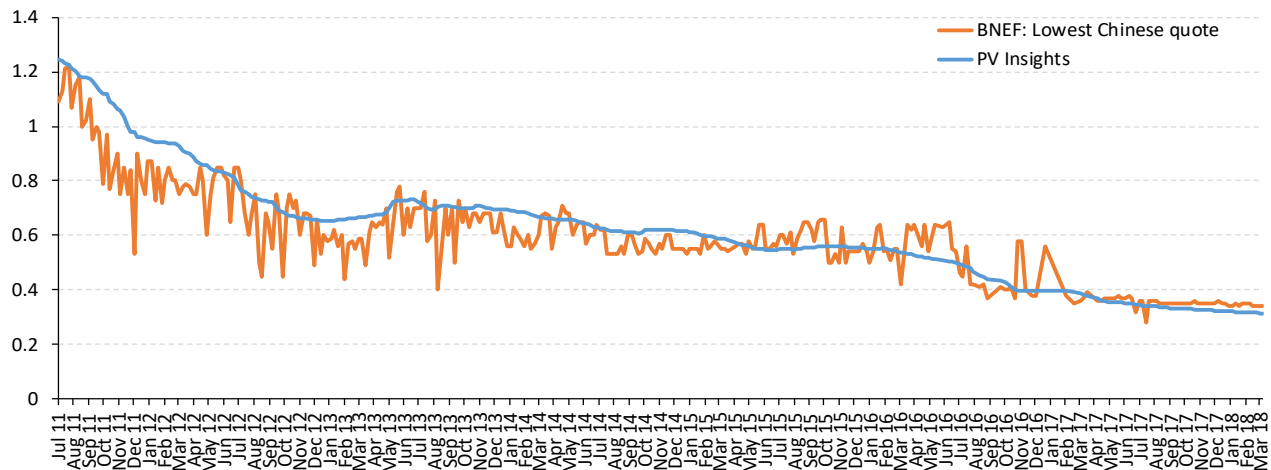
Source: Bloomberg

TTM Silicon price (\$/kg)



Source: Bloomberg

Module Price (\$/W)



Source: Bloomberg

Module prices decreased slightly in the first quarter of 2018, as the boom in China from 2017 subsides. As this demand increases throughout the year, we expect the module price to maintain a slower rate of reduction. There is a chance that demand growth will stabilize or even see an increase in module prices. Global solar demand forecasts continue to be revised upwards by analysts, mainly in response to demand from China and the increased competitiveness of solar over conventional power generation sources. China's appetite for new solar plants shows no sign of abating. China's air pollution levels remain high on the political agenda and GDP growth is driving an ever-increasing demand for energy. Most Chinese installations to date have been large, utility-scale projects, and now policy support is increasing for the rooftop solar market which provides a large additional unaddressed market to support continued growth.

The second-largest market for solar is the United States, where the Section 201 trade case brought forward by Suniva to the International Trade Commission resulted in 30% tariffs on imported modules and silicon cells, with a 5% step-down every year. Given that almost all low-cost silicon cells are manufactured outside of the US (over 80% in China), the ITC decision to back Suniva means that cheap solar modules will be harder to come by in the United States for the next few years which will have the effect of slightly reducing demand. However, since modules make up an increasingly small portion of the overall costs of solar installations, we only see a short-term effect of these tariffs on the US solar market.

It is worth noting that the US solar market is less than a quarter the size of the Chinese solar market, and only represents around 10% of the global solar market. Even a large drop in installations in the US would not translate into global solar demand decreasing significantly. Nevertheless, the US solar sector acts as a sentiment driver for many solar-related stocks.

India is now the third-largest solar market, overtaking Japan. India had set an ambitious goal of 100GW of total solar capacity by 2022, with 60GW coming from utility-scale plants and 40GW from

rooftop installations. The likelihood of the goal being reached may be low, but the ambition is there. The country installed 8 GW in 2017, double what was installed in 2016. Renewable energy policy and import duty disputes within the country could create headwinds to demand growth for the next year, but in the medium to long term India has characteristics that are very supportive for solar installation growth. The country has abundant sunshine, steadily growing electricity demand, high electricity prices, a weak grid and capable developers offering solar bids at or below coal power generation costs.

The rest of the world continues to see solar demand growth. In Europe, where several countries went through boom and bust cycles in the early 2000s, solar demand is returning. This is in part due to the 2020 renewable energy goals set for each country within the European Union, but mainly due to the competitiveness of unsubsidized solar – both rooftop and ground-mounted. There have been unsubsidized projects announced in many Mediterranean countries.

Southeast Asian countries are considering low-cost policy structures, i.e. auctions or feed-in tariffs capped at local generation costs. We view this region as having huge potential for solar installation growth.

The Middle East has disappointed many in the solar sector by announcing tenders and projects which ultimately did not result in as much installation as anticipated. We see this region as having the potential to support many countries with multi-GW solar markets and projects are now starting to move from the drawing board to rooftops (or the desert floor).

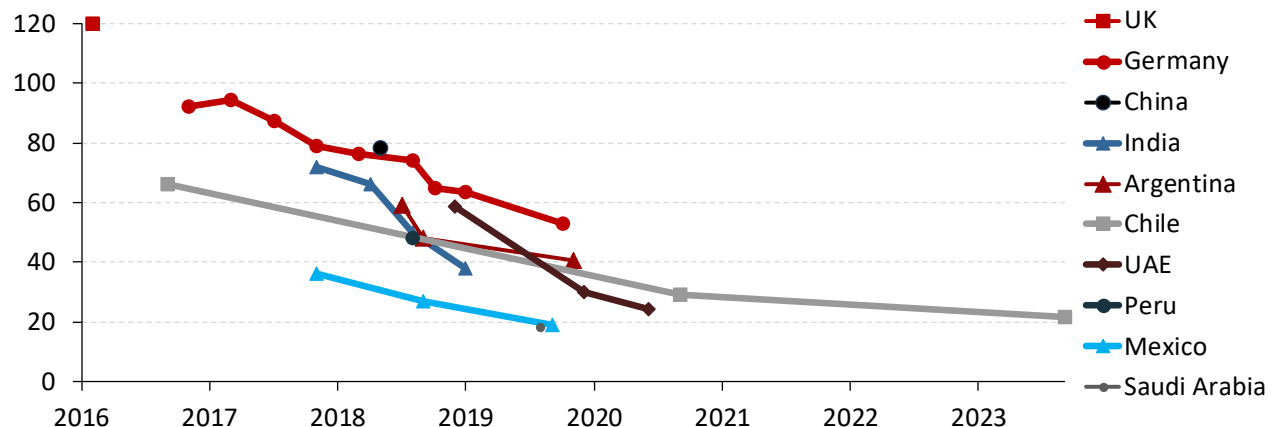
An increasing number of countries are embracing the potential for low cost domestically generated energy that solar affords and we expect to see growth from a more widespread range of geographies over the next five years, while China will remain supportive of its dominant solar industry.

Solar LCOE developments

There were no new record-low prices in Q1 2018. The records set in Chile, Mexico and Saudi Arabia in Q4 2017 still stand. Enel's Chilean subsidiary dominated the most recent power auction, with one solar bid as low as \$21.5/MWh, the second lowest ever recorded in Latin America. The lowest ever recorded in Latin America was in Mexico's most recent auction, coming in at \$19.2/MWh. The lowest ever recorded worldwide was a bid in Saudi Arabia's first auction at \$17.9/MWh, a bid by Masdar from the UAE and France's EDF. Both the projects in Mexico and Saudi Arabia are due to come online in 2019. Although module prices have fallen, the stability of the module price may impact the completion of these projects given the short time horizon. The Chilean bid of \$21.5/MWh is regarding a project that need not be commissioned until 2024. Although some may hail these projects as unviable, competitor bids were not too far off the winning project bids.

It is worth noting how far the industry has come in terms of competitiveness. In 2014 the tariff of \$58.5/MWh in Dubai was the lowest cost tariff for a solar project. Many analysts believed this to be an unviable tariff level that was awaiting some miraculous cost decline in equipment. Today such a tariff in a particularly sunny country such as the UAE would be ridiculed as too expensive.

PV bids by delivery date (\$/MWh)



Source: Bloomberg, Cleantechica, Guinness Atkinson Asset Management

Wind

	2014	2015	2016	2017	2018e	2019e	2020e
World (onshore)	48	59	53	47	54	66	63
Asia	24	32	26	22	26	33	32
North America & Caribbean	8	10	10	8	11	14	14
EU Europe	10	10	11	12	10	10	11
Central & South America	4	3	3	3	4	4	2
Non-EU Europe	1	1	1	1	2	2	2
Middle East & North Africa	0	0	0	0	1	1	1
Oceania	1	0	0	1	1	1	1
Africa (excl. North Africa)	1	1	0	1	0	0	1
Offshore	1	4	1	5	4	6	7

Source: Bloomberg. Note: Sorted by 2018 forecast installations.

Forecasts are inherently limited and cannot be relied upon.

Like the solar market, China remains an essentially closed market to non-Chinese manufacturers. China is also the largest source of wind power demand and annual level of installations have stabilized at around 20GW each year. Europe is 20% of the global wind market, with demand between 9 and 12 GW per year. North America comprises a similarly sized market, with good demand visibility through to 2020 as Production Tax Credits provide continuing albeit falling support. Although some projects in the United States may have been delayed as developers waited to see which version of the tax reform would be passed, there has not been meaningful demand destruction. Whether the tax reform will decrease appetite for tax credits from wind projects is yet to be seen, but they are just one way to finance a renewables project.

India has an ambitious target of 60GW of wind installations by 2022, but there is a lack of clarity as to how this target would be reached. India has seen several auctions and record-low wind prices this year, which should be good for overall demand. Latin America, despite its natural resources, simply does not have the energy demand growth to propel the global wind market to strong growth. Latin America, like India, has been particularly encouraging showing the world how low wind can go. The

rest of the world will likely be the source of growth, as economic competitiveness of wind convinces more countries' governments to put accommodating policy in place.

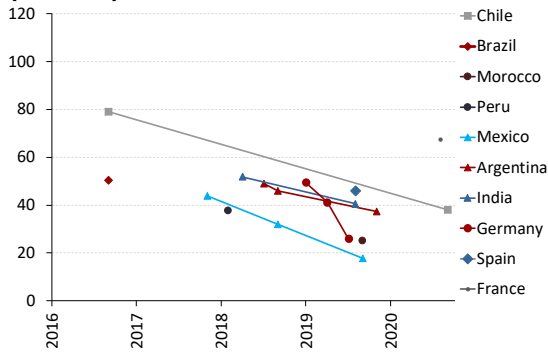
With the global wind market stabilizing, the global wind supply chain is in oversupply. Nevertheless, due to China being a relatively closed market, there is some hope that Chinese companies would not be eating into non-Chinese wind turbine manufacturers' market share.

Offshore wind updates

In the Netherlands, Vattenfall won the country's offshore wind tender based on project design and developer experience amongst other non-financial criteria. The tender was the first of its kind where there would be no direct subsidy per unit of energy. The project, should it be finished on time in 2023, will be the first zero-subsidy offshore wind farm to be constructed. Indirect subsidies include that the electricity grid operator, Tennet, will provide the grid connection. The project is in shallow waters and close to the shore, making it less expensive. However, cost of capital will be higher than for subsidized projects since the revenue streams of this plant are currently uncertain. Vattenfall could sign an offtaker agreement with corporates or sell its electricity to other utilities. It is encouraging that offshore wind projects continue to be built on a merchant basis.

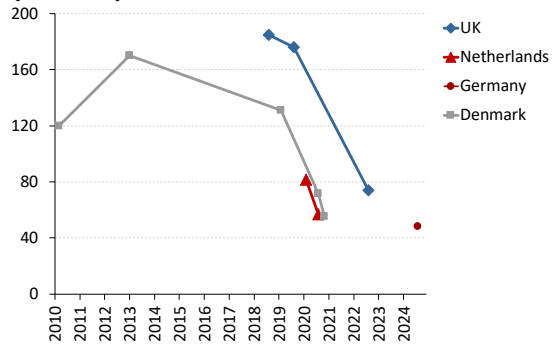
Wind LCOE developments

Onshore wind bids by delivery date (\$/MWh)



Source: Bloomberg, Guinness Atkinson Asset Management

Offshore wind bids by delivery date (\$/MWh)



Source: UK government, Government of the Netherlands, Windpower Monthly, Vattenfall, Guinness Atkinson Asset Management

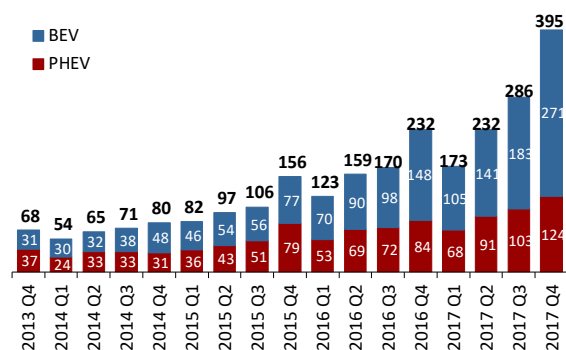
Note: Projects have not been standardized for plant lifetime or financing cost and so values may not necessarily be directly comparable.

Developers are reaping the benefits of increased competition in the manufacturing space by getting more power out of the newer turbines for less capex. However, the power auctions sweeping the globe are putting pressure on investor and developer returns. Nevertheless, the low \$/MWh cost of

wind and the predictability of the annual levels of output underpin investment returns in wind projects and show that there is a long-term opportunity for the wind power sector.

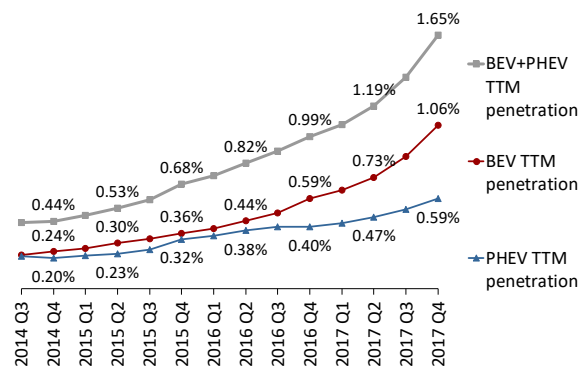
Electric Vehicles

Quarterly plug-in vehicle sales in selected countries (thousands)



Source: Bloomberg, Cleantechnica

Trailing 12-month plug-in vehicle penetration of new car sales in selected countries (%)



Source: Bloomberg. Note: TTM means trailing twelve months. Total EV sales across selected countries divided by total car sales in these countries show the penetration above.

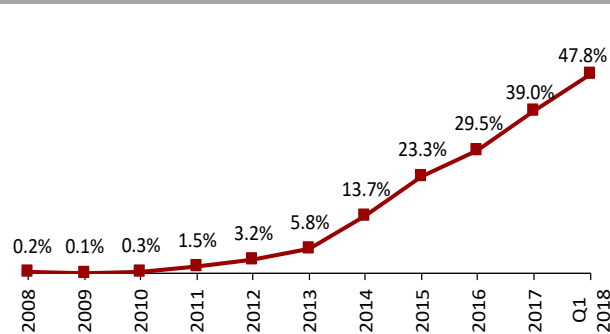
Note: Selected countries include Austria, Belgium, Canada, China, Denmark, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, UK and USA. These countries were chosen for data availability and represent three-quarters of all car sales globally.

Plug-in electric vehicle (EV) sales have increased substantially from 2016 to 2017. We expect 2018 will be another record year for plug-in electric vehicle sales. The CAGR since 2013 until Q4 2017 is 55% and the compound quarterly growth rate for the same period stands at 12%.

The trailing 12 months market share of plug-in electric vehicles has passed 1% in most developed markets and in China. The growth rate of fully-electric vehicles, i.e. battery electric vehicles (BEVs), has been greater than that of plug-in hybrid electric vehicles (PHEVs), which have smaller batteries with a shorter range and still have a combustion engine for when the battery is depleted.

Car manufacturers have introduced more fully electric models to market in 2017 than any year before and all the main vehicle manufacturers are now developing electric vehicle ranges to compliment or even replace their existing range of internal combustion engine vehicles.

EV Market Share in Norway continues to increase (% of passenger vehicles plug-in hybrid)



Source: ofvas.no

Norway, the bellwether for the potential electric vehicles in western countries, has effective subsidies that make plug-in electric vehicles as affordable as combustion engine vehicles. Overall, this gave Norway a market share of electric vehicles of 39% for 2017. In March 2018, electric vehicles in Norway had 56% market share as newer models of fully-electric vehicles arrived. In Q1 2018, plug-in electric passenger vehicles had a 48% market share for newly purchased vehicles. These numbers do not include the imported used electric vehicles, which are increasing in popularity in the country.

Portfolio changes

There were several switches in the fund this quarter. We sold Boralex, Senvion and JA Solar, replacing them with Acuity Brands, Vestas and Daqo.

We sold Boralex due to our belief that the stock was fully valued. The company operates in Canada and France, where favorable feed-in tariff levels for new projects are being replaced by competitive auction pricing. We purchased Acuity Brands based on its low valuation compared to historic valuation. The company provides lighting and building efficiency solutions, where evolving technologies including LEDs offer an attractive growth trajectory.

We sold Senvion based on relative valuation and market positioning. We had acquired the position in Senvion due to the large discount that it traded at compared to its peer group. We replaced it with Vestas which had seen stock price weakness despite a leading market position and scoring well in our screening.

JA Solar's management is buying out shareholders. With the deadline for closing of the deal approaching, upside on the stock is limited. We added Daqo, a Chinese polysilicon supplier, to the portfolio. The company has strengthened its balance sheet over the last two years with high levels of cashflow. The polysilicon market is focusing on the raw materials for mono-crystalline silicon solar cells, a subsector of the solar module market that is set to grow at a faster rate than the overall solar market and relies on higher purity polysilicon.

Guinness Atkinson
Alternative Energy Fund
 Managers Quarterly Update
 First Quarter 2018



Fund Performance (Q1 2018)

The Guinness Atkinson Alternative Energy Fund was up 0.66% for the first quarter of 2018. This compared to a fall in the Wilderhill Clean Energy Index of -1.49%, a decrease in the Wilderhill New Energy Global Innovation Index of -3.15% and a decrease in the MSCI World Index of -1.15%.

Performance contribution

Top 5 performing stocks	Q1 2018	Bottom 5 performing stocks	Q1 2018
Tianneng Power International	14.65%	Good Energy Group	-35.66%
China Datang Corp Renewable Power	14.01%	JinkoSolar Holding	-24.12%
Iniziative Bresciane	12.81%	China Singyes Solar Technologies Holdings	-15.45%
Huaneng Renewables Corp Ltd	10.96%	Ormat Technologies	-11.85%
TPI Composites	9.73%	Johnson Controls International	-7.53%

Total Returns as of 03/31/18

Calendar year returns	2013	2014	2015	2016	2017
Guinness Atkinson Alternative Energy Fund	61.54%	-14.29%	-11.40%	-17.16%	20.68%
Wilderhill New Energy Index	55.70%	-2.16%	1.51%	-6.43%	28.90%
Wilderhill Clean Energy Index	58.54%	-16.93%	-10.36%	-22.12%	39.81%
MSCI World Index	27.43%	5.58%	-0.28%	8.19%	23.10%

Total returns	Q1 2018	YTD 2018	CY 2017	1 year	3 year	5 year	10 year
Guinness Atkinson Alternative Energy Fund	0.66%	0.66%	20.68%	15.93%	-4.94%	3.24%	-12.78%
Wilderhill New Energy Index	-3.15%	-3.15%	28.90%	17.29%	2.74%	10.45%	-4.70%
Wilderhill Clean Energy Index	-1.49%	-1.49%	39.81%	26.37%	-3.14%	3.62%	-12.18%
MSCI World Index	-1.15%	-1.15%	23.10%	14.21%	8.60%	10.35%	6.55%

CY = Calendar Year

Expense Ratio: 1.99% (net); 2.60% (gross)

All return figures represent average annualized returns except for periods of one year or less, which are actual returns.

Performance data quoted represents past performance; past performance does not guarantee future results. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of

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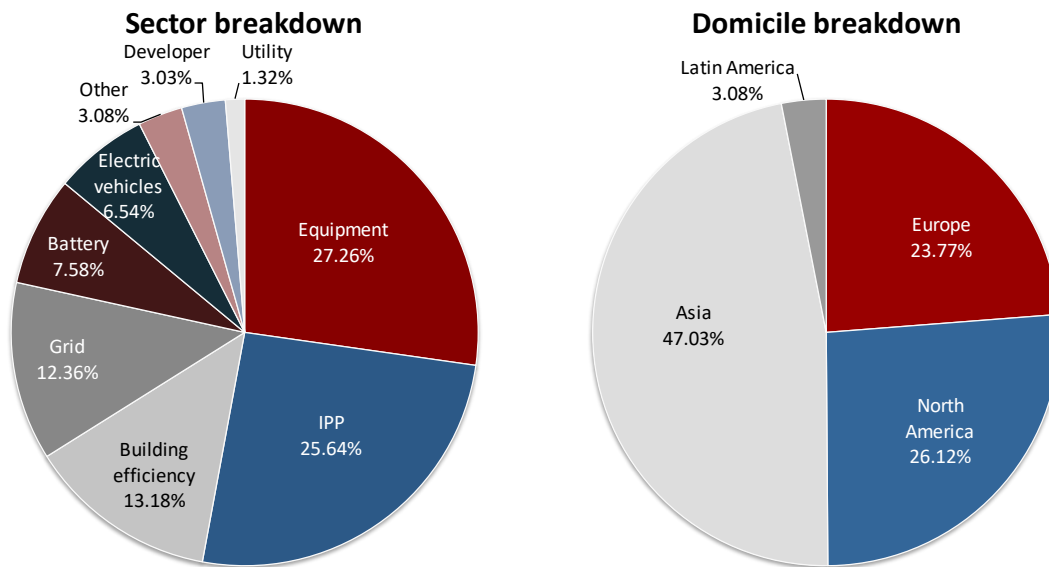


the Fund may be lower or higher than the performance quoted. Performance data current to the most recent month end may be obtained by visiting www.gafunds.com or calling 800-915-6566.

The Advisor has contractually agreed to reduce its fees and/or pay Fund expenses (excluding Acquired Fund Fees and Expenses, interest, taxes, dividends on short positions and extraordinary expenses) in order to limit the Fund's Total Annual Operating Expenses to 1.98% through June 30, 2018. To the extent that the Advisor waives its fees and/or absorbs expenses to satisfy this cap, it may recoup a portion or all of such amounts absorbed at any time within three fiscal years after the fiscal year in which such amounts were absorbed, subject to the 1.98% expense cap in place at the time recoupment is sought, which cannot exceed the expense cap at the time of the waiver. The expense limitation agreement may be terminated by the Board of the Fund at any time without penalty upon 60 days' notice.

Guinness Atkinson
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Fund Holdings



Sector holdings are subject to change

Top 10 holdings as of 3/31/18	% of assets
Tianneng Power International Ltd	4.27%
China Suntien Green Energy Corp Ltd	3.96%
SunPower Corp	3.81%
Huaneng Renewables Corp Ltd	3.76%
China Datang Corp Renewable Power Co Ltd	3.71%
China Longyuan Power Group Corp Ltd	3.62%
Daqo New Energy Corp	3.61%
Nibe Industrier AB	3.55%
Kingspan Group PLC	3.46%
Xinyi Solar Holdings Ltd	3.43%

Fund holdings are subject to change

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Commentary for our views on global energy and Asia markets is available on our website. Please [click here](#) to view.

Total returns reflect a fee waiver in effect and in the absence of this waiver, the total returns would be lower.

Opinions expressed are subject to change, are not guaranteed and should not be considered investment advice.

This information is authorized for use when preceded or accompanied by a prospectus for the Guinness Atkinson Alternative Energy Fund. The [prospectus](#) contains more complete information, including investment objectives, risks, charges and expenses related to an ongoing investment in The Fund. Please read the prospectus carefully before investing.

The Fund invests in foreign securities which will involve greater volatility and political, economic and currency risks and difference in accounting methods. The risks are greater for investments in emerging markets. The Fund is non-diversified meaning its assets may be concentrated in fewer individual holdings than diversified funds. Therefore, the Fund is more exposed to individual stock volatility than diversified funds. The Fund also invests in smaller companies, which will involve additional risks such as limited liquidity and greater volatility. Current and future portfolio holdings are subject to risk. The Fund's focus on the energy sector to the exclusion of other sectors exposes the Fund to greater market risk and potential monetary losses than if the Fund's assets were diversified among various sectors.

Fund holdings and/or sector allocations are subject to change at any time and are not recommendations to buy or sell any security.

The WilderHill New Energy Global Innovation Index (NEX) is a modified dollar weighted index of publicly traded companies which are active in renewable and low-carbon energy, and which stand to benefit from responses to climate change and energy security concerns.

The WilderHill Clean Energy Index (ECO) is a modified equal dollar weighted index comprised of publicly traded companies whose businesses stand to benefit substantially from societal transition toward the use of cleaner energy and conservation.

The MSCI World Index (MXWO) is a capitalization weighted index that monitors the performance of stocks from around the world.

One cannot invest directly in an index.

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