

Major new study shows that green investors are spoilt for choice but need more consistent returns

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An extensive new study from Trove Research shows that financial institutions have a huge range of options to invest sustainably, with over 430 funds available worldwide.¹ These funds manage some \$140bn of assets, covering listed equities, private equity, venture capital, bonds and infrastructure. But with this choice comes complexity and risk, with large variations in financial performance and green attributes both across and within asset classes. However, with a deeper understanding of the fundamentals and risk profiles of sustainable investments, more robust green portfolios can be created.

These findings are the culmination of an extensive research project undertaken by Trove Research and a team of graduates from London Business School throughout 2016.² The study, has for the first time, examined the financial performance of sustainable investments across all the main asset classes, including listed equities, fixed income, private equity and venture capital, and direct investments in clean infrastructure. The period of analysis was over 1, 3 and 5 years Q3 2011 to Q3 2016.

For listed equities and fixed income asset classes the study makes an important distinction between two types of funds: those that invest in the broad stock market but where allocations are based on Environmental, Social and Governance criteria (“Screened ESG funds”), and those that invest in the sectors that help improve the environment and should benefit from a shift towards a cleaner economy, such as water, waste, clean industrial processes, and clean energy (“Thematic funds”). Private equity and venture capital funds (PE/VC), and direct investment in clean infrastructure are all thematic. PE funds invest in corporate equity or infrastructure.

Across these asset classes and sectors the research team identified 430 professionally managed investment vehicles from around the world, representing \$138bn of funds under management. 170 of these are screened funds, while 260 take a thematic approach, of which 150 are PE/VC vehicles. Most of these 430 funds are based in the established markets of Europe and North America, but new funds are being created to serve clients in China and SE Asia. The research team also examined the returns from over 100 direct investments in renewable energy projects from developing and developed countries including UK, US, France, Ghana, India and Kenya. Overall, the study yields a rich insight into how to invest sustainably and where the best risk-return performance lies for institutional investors.

Guy Turner, founder of Trove Research, said *“our detailed research shows that the world of sustainable investing comes in many shapes, sizes and colours, but this diversity also brings complexity and risks. Investors need to understand how the sustainable investment industry works in order to navigate the pitfalls and find consistent returns.”*

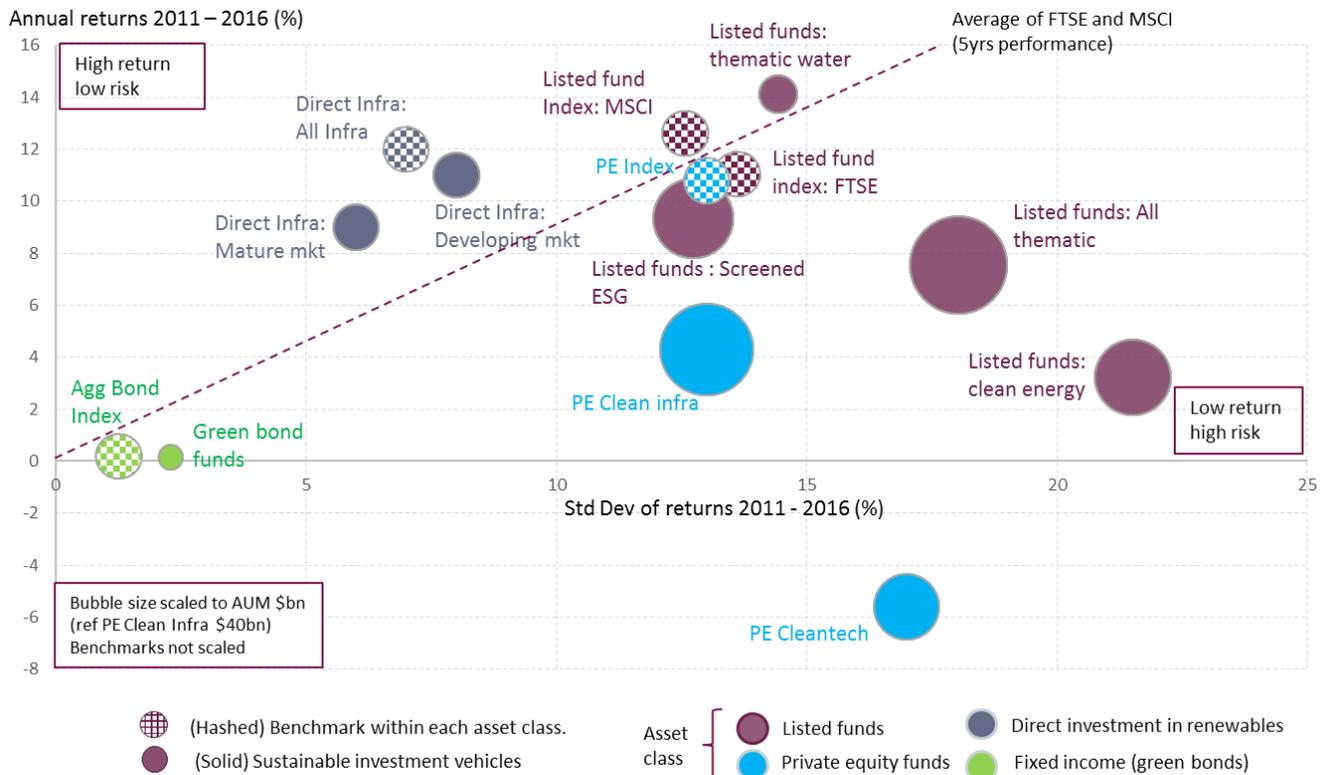
“While this analysis looks back over the past 5 years, we are also able to identify long term patterns that can be used to guide future investments in the sustainability sector. For example, screened ESG funds are fundamentally different to thematic funds with very different risk return profiles, but both get lumped

¹ This figure excludes multiple versions of the same fund, for example where the same fund might be denominated in several currencies or split into different share classes.

² Team members: Guy Turner, Gilles Heyberger, Jash Rugani and Zue Leong

together as ethical or sustainable funds. And within the thematic sector, the water, waste, industrial efficiency and renewable energy markets have different drivers and operate with very different cycles. Investors need to understand these differences to create optimal sustainable portfolios”.

Figure 1. Risk Return Profiles of Sustainable Investments Relative to Asset Specific Benchmarks (median fund performance 2011 - 2016)



Key conclusions are:

Strong and out-performing sustainable asset classes

- Water, waste/recycling and clean industry equities.** Thematic funds investing in water utilities, and technology companies supplying these businesses, have significantly out-performed the FTSE and MSCI World benchmarks over both 3 and 5 years. Investing in water funds five years ago would have delivered a compound annual return of 14.1% compared to the FTSE all share of 11% and the MSCI World Equity index of 12.6%. There are 12 funds worldwide focussed exclusively on the water sector, and although no funds focus uniquely on waste, recycling and clean industrial processes, these stocks feature in several diversified environmental technology funds which because of this exposure have performed well. Some of the best-performing general environmental technology funds are: Quest Cleantech Fund, Lux (17% IRR), Vontobel Clean Technology 1, Lux (12% IRR), Fund Partner Solutions, part of Pictet, Switz (13% IRR), and Impax Asset Management Ltd Environmental Markets Ord, UK (13% IRR).³
- Direct investments in renewable energy infrastructure.** Infrastructure investments vary greatly depending on the project (size, technology, country, location), but typically these projects are stable and provide good equity returns. On average, mature markets provide around 6% project level IRR (9%

³ IRRs over 5 years to Q3 2016.

equity), while developing countries typically offer yields of 18-19%.⁴ These returns are in line with those seen in infrastructure projects of similar risk profiles, such as toll roads (8 - 12% equity IRR), regulated utilities (8 - 10% equity IRR) and contract power generation (6 – 10% equity IRR). Once constructed renewable energy projects carry relatively little risk.

Neutral-performing sustainable asset classes

- **Screened ESG funds.** While these funds have slightly under-performed the main benchmarks in terms of returns – median screened fund return of 9.4% compared to 11% for the FTSE and 12.6% for MSCI World Equities - they have a better risk profile than the FTSE All Share index. The Sharpe ratio, which measures returns relative to the risk-free rate per unit of volatility, is significantly higher for these funds at 0.67 compared to the FTSE of 0.51 over the past 5 years, and 0.3 compared to 0.23 over the past 3 years. The Sharpe ratio for the MSCI World Equity index is higher than the FTSE at 0.34 for 3 years and 0.7 for 5 years.
- **Wind equities.** Although no funds invest specifically in the wind industry sector, wind equity indices covering the main turbine suppliers have performed well over the past 5 years broadly tracking the FTSE. Wind stocks on aggregate, increased by 60% Q32011 to Q32016, compared to the FTSE All Share of 68%, and MSCI World of 81%.
- **Green bonds.** Green bonds are tradable debt instruments – corporate or project related – where the capital is used specifically for environment investments. By the end of 2016 we estimate there will be around \$150bn of green bonds outstanding globally, representing 0.17% of total tradable debt instruments worldwide. While these offer comfort for investors that their money is being used for specific purposes, our analysis shows they perform no better or worse than conventional bond instruments yielding around 0.15 – 0.2% p.a.⁵

Under performing sustainable asset classes

- **Private equity/venture capital.** These funds invest in a broad range of clean technologies as well as clean energy infrastructure projects. Whilst some funds in this sector have performed well, the average sustainable fund across these sectors has under-performed relative to the PE average of over 600 firms.⁶ The median clean technology fund returned an annualised IRR of -4.5%, and with clean infrastructure at around 5.6%. This compares to the PE sector average IRR of 10.8% (2008 vintage). The 5.6% median return for clean infrastructure is less than returns to equity of direct investment of around 9%. The difference is accounted for by (i) fund management fees and (ii) funds will absorb unsuccessful projects as well as successful ones. Two events have dragged down performance of the sector: exposure to (i) the Spanish renewable energy market, where policy changes dramatically reduced revenues, and (ii) US and EU ethanol biofuels market where the combination of variable support mechanisms, high corn prices and low gasoline prices made several investments unprofitable resulting in large capital write-downs on bio-ethanol plants.
- **Solar equities.** On aggregate, solar industry equities fell by 40% between Q32011 and Q32016. Although solar stocks had recovered by 2014 from the post-recession lows in 2009, the industry has since been hit again by falling margins profitability under intensive price competition. The solar industry includes

⁴ These figures exclude the internal transaction and management costs, as well as projects which might be aborted before commissioning. Including both these would lower the averages.

⁵ The analysis compared the 5 year performance of the Bank Of America ML Green Bond Index to the Bloomberg Barclays Global Aggregate Bond Index. The results show no statistical difference in returns over this period.

⁶ PE/VC performance data taken from PreQin and Bloomberg.

equipment suppliers, developers and the owner/operators of large solar farms. Financial performance has been poor across all these stages of the value chain: the world's top ten solar manufacturers had a combined sales margin of -1% in 2015, while the six largest solar developers posted an aggregate margin of -33%. Eight of the world's largest solar owner/operating companies had combined margins of only 3% in 2015.

Table 1. Median returns and volatility of returns

Asset class	Type of Fund	Time period of analysis	Volatility (%)	IRR (%)
Listed equity funds	Thematic - Water	Q32011 – Q32016	14.4	14.1
	MSCI World benchmark	Q32011 – Q32016	12.6	12.6
	FTSE All share benchmark	Q32011 – Q32016	13.6	11.0
	Screened ESG	Q32011 – Q32016	12.7	9.4
	Thematic - All	Q32011 – Q32016	18.0	7.5
	Thematic - Clean energy	Q32011 – Q32016	21.5	3.2
Fixed income	Green bond index	Q32011 – Q32016	2.3	0.2
	Barclays Agg Bond Index	Q32011 – Q32016	1.3	0.2
Private equity and venture capital	PE Benchmark	2000 – 2016	13.0	10.8
	Infrastructure	2000 – 2016	13.0	4.3
	Clean technology	2000 – 2016	17.0	-5.6
Direct investment in infrastructure	Infrastructure Benchmark	2006 - 2012	7.0	12.0
	Developing countries	2006 - 2012	8.0	11.0
	Mature countries	2006 - 2012	6.0	9.0

Table 2. Median annualised returns of listed sustainable funds over 1, 3, and 5 yrs to end Q3 2016 (%)

1 year		3 year		5 year	
Thematic water funds	28.8	Thematic water funds	12.4	Thematic water funds	14.1
FTSE all share index	16.8	Screened low-carbon funds	9.6	Screened low-carbon funds	13.2
All thematic funds	14.2	MSCI world equity index	7.7	MSCI world equity index	12.6
MSCI world equity index	10.8	Screened funds	6.6	FTSE all share index	11.0
Thematic clean energy funds	10.2	Screened ESG funds	6.6	All screened funds	9.4
Screened low-carbon funds	9.3	FTSE all share index	6.6	Screened ESG funds	9.3
All screened funds	8.6	All thematic funds	6.3	All thematic funds	7.5
Screened ESG funds	8.6	Thematic clean energy funds	4.8	Thematic clean energy funds	3.2

Sustainable investments tend to be pro-cyclical

Sustainable funds (thematic and screened) tend to move in the same direction as the rest of the stock market. The funds we studied generally had higher correlations with the FTSE All Share index at 0.7 to 0.76, than other thematic sectors, such as healthcare (0.44), aerospace & defence (0.58), construction (0.58) and technology (0.6). The exceptions are renewable energy yieldcos, solar funds and carbon allowances which all have low correlations of < 0.5. These markets could provide opportunities for portfolio diversification, however the reason for the low correlation is their relatively poor performance at a time of bull equity market.

Active management reduces risks but does little for returns

75% of thematic funds and 66% of screened funds are actively managed, with the rest investing on an index-tracking or algorithmic basis. Thematic funds that are actively managed have significantly lower volatility and slightly lower returns than passive funds. Volatility is reduced by 6.8% (680bp) but IRR is reduced by 1.8% (180bp) over 5 yrs. Screened funds that are actively managed also have lower volatility than passive index-tracking funds, and marginally improved IRR. Active management improves IRR by 0.6% (60bp) and reduces volatility by 1.7% (170bp).

About Trove Research

Trove Research was founded in 2015 by Guy Turner to help investors make better decisions in allocating capital in the sustainability sector. Guy has over 20 years' experience in analysing sustainable investments, and was most recently Chief Economist of Bloomberg New Energy Finance. Over the course of 2016 Guy assembled a team of graduate researchers from London Business School to investigate the performance of sustainable investments from the perspective of institutional investors. Following publication of these initial results, Trove will work with clients to help structure sustainable investment strategies, using leading edge data and financial analysis.

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