



PREQIN SPECIAL REPORT: CONVENTIONAL AND RENEWABLE ENERGY

JUNE 2017

FOREWORD

The energy industry has faced sustained challenges in recent years: primarily, the fall in the price of oil has affected the viability of projects and companies along the supply chain, which has negatively affected the performance of energy vehicles and consequently investor sentiment towards natural resources as a whole. Despite this, unlisted energy funds primarily targeting non-renewables have generated a median net IRR of 10.3%, with the boundary of the top performers starting at 23.7%, illustrating that these funds can still generate the high absolute returns that institutional investors expect from energy investment.

Other challenges to conventional energy's hegemony of the natural resources asset class include the emergence of economically viable renewable energy assets. While unlisted fundraising for renewables is smaller than that of conventional energy, and renewable funds have generally underperformed non-renewable funds, the signing of the Paris Agreement illustrates the commitment of major nations to the development and implementation of renewables and their corresponding technology. Furthermore, institutional investors seeking to establish environmental, social and governance policies within their portfolio are increasingly turning to renewables vehicles, while some of the largest vehicles raising capital in recent times are now pursuing a mixed energy mandate, investing in both non-renewable and renewable energy assets.

There are still technical challenges to overcome to increase the competitiveness of renewable energy assets, as well as political discourse that will shape the future of the entire energy industry. Meanwhile, in the short term, OPEC's decision to curb oil production should stabilize companies operating in the conventional energy space and help unlisted funds investing in the sector to generate returns for their investors. What is for certain is that global energy demand will continue to grow, particularly among emerging economies that are undertaking large-scale projects to enhance living standards in their nations. To meet this demand, investment in energy-related projects, technology and companies will increase in both the renewable and conventional energy markets, creating opportunities for fund managers looking for investable assets and institutional investors looking to deploy capital.

We hope you find this report useful, and welcome any feedback you may have. For more information, please visit www.preqin.com or contact info@preqin.com.

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FUNDRAISING

ENERGY IN CONTEXT

The fundraising market for unlisted energy vehicles is by far the largest of all natural resources strategies, representing 69% of funds closed since 2008 and 84% of aggregate capital raised. However, advances in technology, investors' scrutiny of environmental policies and global trends towards sustainable energy production have resulted in changes to vehicles being brought to market. Fund managers are now eschewing private equity's beginnings in the energy industry – of investment in non-renewable energy assets – in favour of renewable energy sources.

As such, fundraising for conventional energy vehicles – funds with an energy investment remit focused on oil, natural gas, coal, oil field services or a combination of these – declined significantly (-41%) from the record levels seen in 2015 (Fig. 1), in line with the fall in global oil prices. However, as a crucial aspect of the evolution of natural resources as a distinct asset class, the sub-sector still represents the largest proportion (46%) of energy fundraising since 2008.

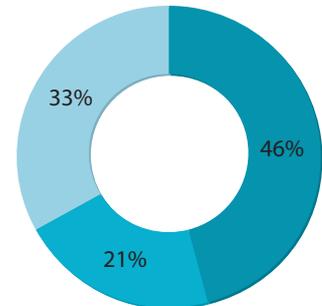
Conversely, solely renewable energy fundraising – funds with an energy investment remit focused on biomass, geothermal, hydroelectric, solar or wind

power, or a combination of these assets – has increased over recent years, with \$14bn and \$13bn raised in 2015 and 2016, above the average \$8bn raised annually in the preceding seven years (Fig. 2).

However, the largest growth in energy fundraising has come from those vehicles following a mixed energy mandate. Despite declines in the number of mixed energy funds reaching a final close in recent years, the amount of capital secured has increased to \$24bn in 2016 and \$19bn as at May 2017 (Fig. 3). Much of this growth is the result of recent fundraising trends across alternative assets, with investors increasingly looking to place more capital with fewer fund managers which are generally larger firms with the longest track records, as well as both managers and investors seeing value in greater levels of diversification within their portfolios. Larger funds generally have a broader investment mandate than smaller vehicles, which has helped drive the growth in mixed energy fundraising.

The fall in oil prices has had little effect on the rising size of energy vehicles: both conventional and renewable energy funds have seen the average size of funds closed in 2015 and 2016 surpass any other year since 2008 (Fig. 4). However, this trend is occurring in two contrasting environments: one in which conventional

UNLISTED ENERGY CAPITAL RAISED, 2008 - 2017 YTD (AS AT APRIL 2017)



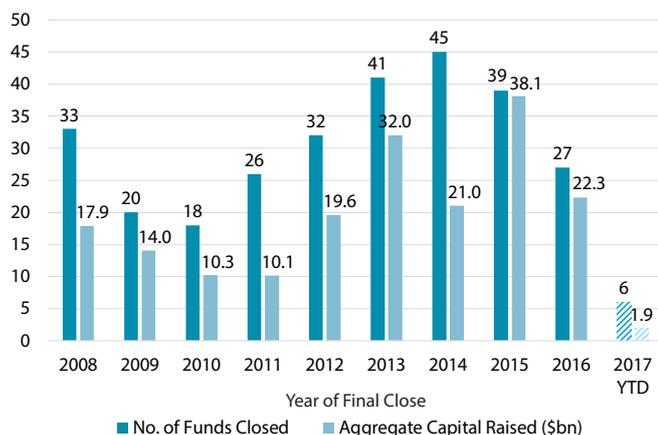
- Conventional Energy
- Renewable Energy
- Mix

fundraising has declined and the other in which renewables fundraising has increased. Furthermore, conventional energy assets are more established, generally larger and more expensive than renewable energy assets which has led to the average size of conventional energy funds surpassing that of renewable funds for each year examined except 2017 YTD, in which only six conventional funds have reached a final close.

FUNDRAISING TARGETS

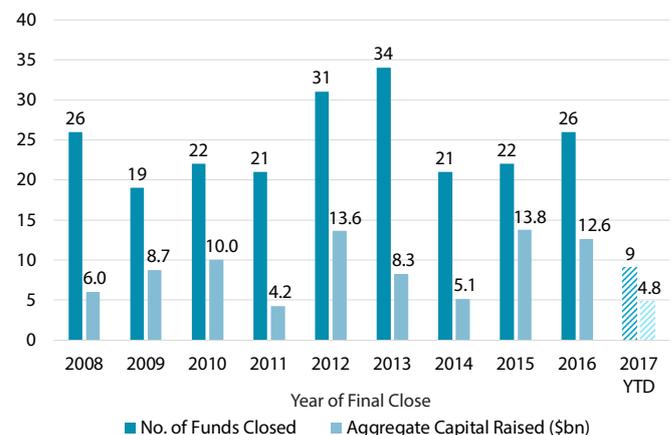
Of funds closed since 2008, conventional energy funds were the most likely to meet or surpass their initial target size: 64% of non-renewable energy funds reached a

Fig. 1: Annual Unlisted Conventional Energy Fundraising, 2008 - 2017 YTD (As at April 2017)



Source: Preqin Natural Resources Online

Fig. 2: Annual Unlisted Renewable Energy Fundraising, 2008 - 2017 YTD (As at April 2017)



Source: Preqin Natural Resources Online

final close on 100% or more of their target, compared with 54% of mixed energy funds and 43% of renewable funds. However, energy funds following a mixed investment mandate are the most likely to surpass their initial target size (51% of funds closed), while the majority (57%) of renewable energy funds closed have failed to meet their target.

Furthermore, conventional energy funds have reached a final close faster than other energy fund types, with managers spending an average of 11 months on the road, compared with 17 and 21 months for mixed and renewable energy funds respectively.

INVESTMENT PREFERENCES

Unsurprisingly, as one of the most developed regions for alternatives and a major energy market, the vast majority of energy funds closed since 2008 focus on

investment in North America. However, as seen in Fig. 5, it is mainly vehicles targeting conventional energy assets or a mixture of non-renewable and renewable energy assets that lead to the region's dominance in the energy sector.

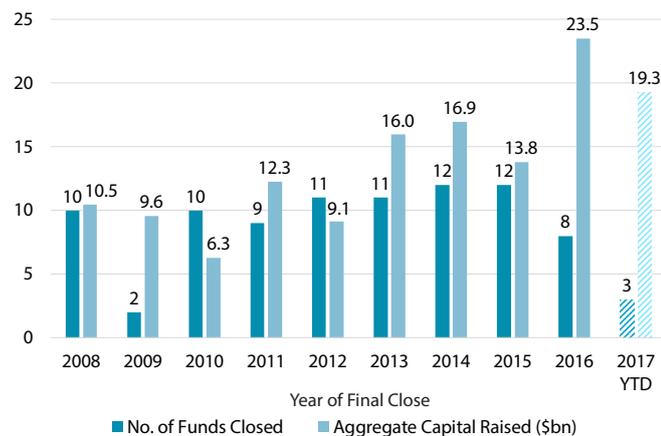
Contrastingly, renewable energy funds are more geographically diverse than their non-renewable counterparts, with Europe-focused funds representing the largest proportion of funds closed since 2008, in part due to the EU's Renewable Energy Directive which aims to have 20% of the bloc's total energy output from renewable sources by 2020. More Asia-focused renewable energy funds have also closed than for conventional and mixed energy investment mandates.

OUTLOOK

There are 140 unlisted energy funds in market as at April 2017, seeking \$71bn

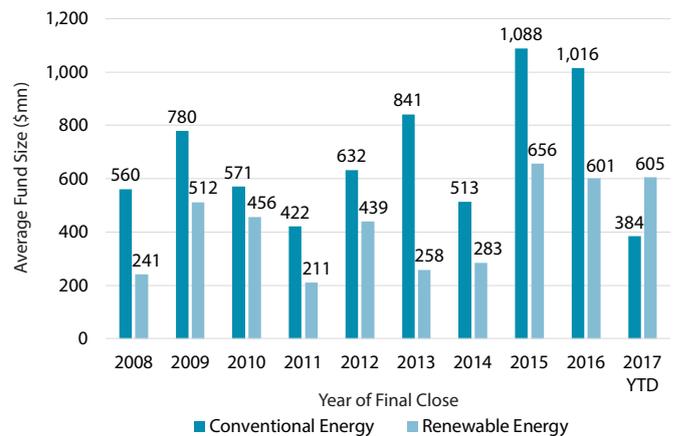
in institutional capital commitments (Fig. 6). Interestingly, the constituent funds appear more specialized in specific energy markets than historical fundraising trends, with fund managers seeming to shift to a renewable energy focus: renewable energy funds represent 50% of capital targeted, compared with 40% for conventional energy funds. Unsurprisingly, the majority (85%) of conventional energy funds in market target North American assets, while the majority (56%) of renewable energy funds are targeting Europe. However, greater geographic diversification could be seen in the near future as a result of the Paris Agreement, ratified at the end of 2016. Notably, with commitments from major energy markets in China and India to mitigate greenhouse gas emissions' starting in 2020, Asia-focused fundraising could represent a greater share of overall energy fundraising.

Fig. 3: Annual Unlisted Energy Fundraising with a Mixed Energy Mandate, 2008 - 2017 YTD (As at April 2017)



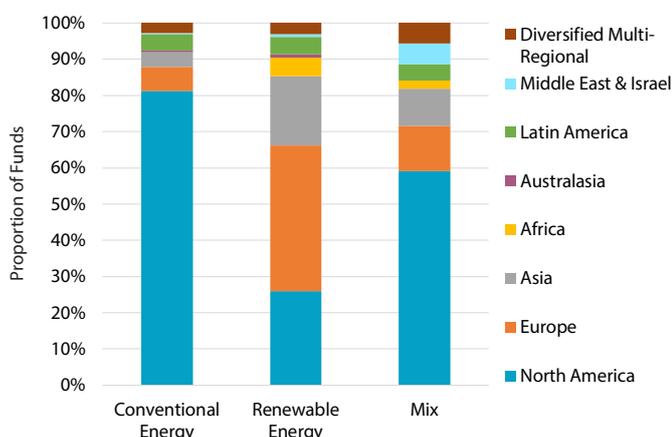
Source: Preqin Natural Resources Online

Fig. 4: Average Fund Size: Conventional vs. Renewable Energy Funds, 2008 - 2017 YTD (As at April 2017)



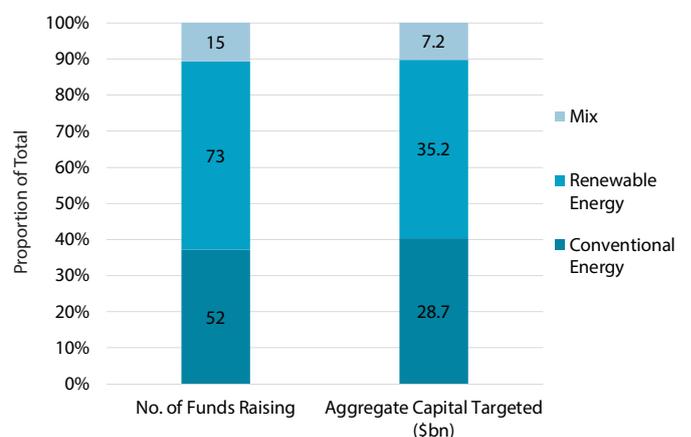
Source: Preqin Natural Resources Online

Fig. 5: Unlisted Energy Fundraising by Type and Primary Geographic Focus, 2008 - 2017 YTD (As at April 2017)



Source: Preqin Natural Resources Online

Fig. 6: Unlisted Energy Funds in Market by Type



Source: Preqin Natural Resources Online



INVESTORS

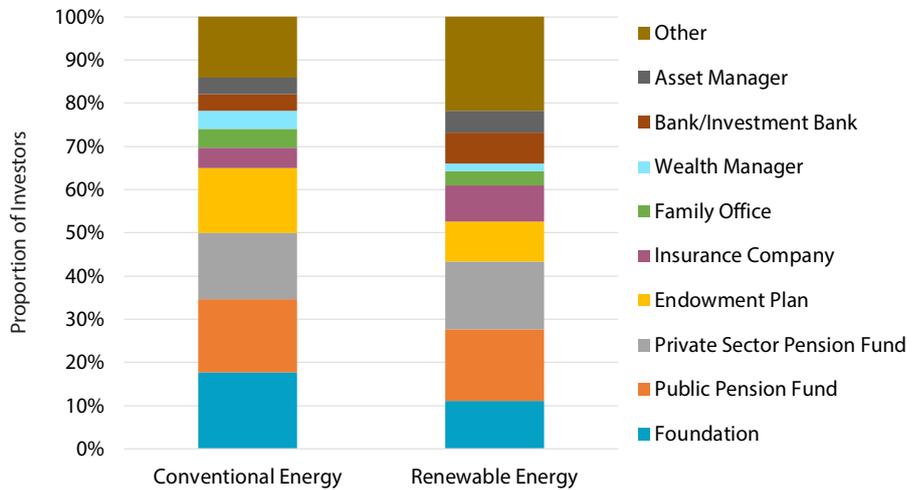
Preqin's **Natural Resources Online** contains detailed profiles on 1,994 investors with a preference for energy investment. While many institutional investors active in the natural resources asset class will consider both conventional and renewable vehicles as part of their energy investments, some differences do emerge in the make-up of each group (Fig. 7).

Foundations represent the largest proportion (18%) of investors that include conventional energy as an investment preference, while investors that include a preference for renewables are predominantly public pension funds (17%). This is likely due to public pension funds being larger and more sophisticated investors which can therefore more comfortably take on the risks inherent in this developing industry, as well as their propensity to consider environmental, social and governance factors when making investment decisions.

Endowment plans are more prevalent in the conventional energy (15%) investor pool than they are in renewables (9%), while the reverse is true of insurance companies (5% vs. 8% respectively) and banks (4% vs. 7% respectively).

Conventional energy investors are more likely than renewable energy investors

Fig. 7: Institutional Investors in Conventional vs. Renewable Energy by Type



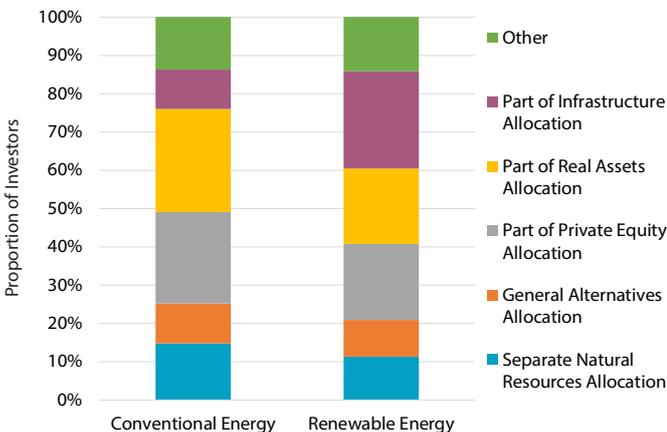
Source: Preqin Natural Resources Online

to have a separate natural resources mandate, a proxy for an institution's level of experience in the asset class (Fig. 8). As conventional energy investment is more established, institutions with such a preference may have been in the asset class for longer and therefore allocate through a distinct bucket. However, when examining the assets under management (AUM) of these two samples, institutions that include a preference for renewables are typically larger: 36% of renewable energy investors have more than \$10bn in AUM, including 17% that hold more than \$50bn, compared with 28% and 11% of conventional energy investors respectively.

INVESTMENT PREFERENCES

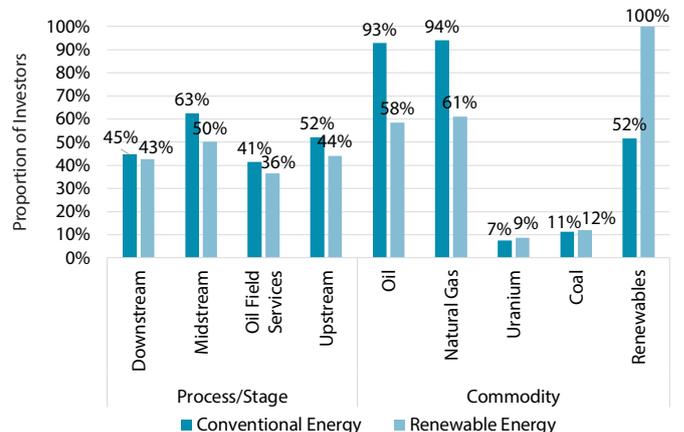
In terms of the process or stage of an asset, the largest proportion (63%) of investors with a conventional energy preference seek funds that target midstream assets, although large proportions still seek downstream (45%) and upstream (52%) assets (Fig. 9). Also shown is the crossover between the two pools, with 52% of conventional energy investors also targeting renewables and 58% and 61% of renewable energy investors targeting oil and natural gas funds respectively.

Fig. 8: Institutional Investors in Conventional vs. Renewable Energy by Source of Natural Resources Allocation



Source: Preqin Natural Resources Online

Fig. 9: Investment Preferences of Institutional Investors in Conventional vs. Renewable Energy



Source: Preqin Natural Resources Online

Fig. 10: Sample Investors in Recently Closed Unlisted Conventional Energy Funds

Fund	Firm	Fund Size (mn)	Energy Preference(s)	Sample Investor(s)
Riverstone Global Energy and Power Fund VI	Riverstone Holdings	5,089 USD	Oil, Natural Gas	Employees' Retirement System of Baltimore County, Markle Foundation, MetLife Insurance Company, Stonetree Capital Management
Kerogen Energy Fund II	Kerogen Capital	676 USD	Downstream, Midstream, Oil Field Services, Upstream, Oil, Natural Gas	University of Texas Investment Management Company
Carlyle International Energy Partners I	Carlyle Group	2,500 USD	Midstream, Oil Field Services, Oil, Natural Gas	Alaska Permanent Fund Corporation, United Guaranty, Michigan Department of Treasury
Simmons Private Equity II	Simmons & Company International	127 GBP	Oil Field Services, Oil, Natural Gas	Nationwide Insurance
Angelo Gordon Energy Credit Opportunities Fund	Angelo, Gordon & Co	650 USD	Oil, Natural Gas	Contra Costa County Employees' Retirement Association, Medtronic Employee Pension Fund

Source: Preqin Natural Resources Online

Fig. 11: Sample Investors in Recently Closed Unlisted Renewable Energy Funds

Fund	Firm	Fund Size (mn)	Energy Preference(s)	Sample Investor(s)
BlackRock Renewable Income UK Fund	BlackRock Capital Partners	637 GBP	Renewables, Wind, Solar	BBC Pension Trust, Nuclear Liabilities Fund
Equis Asia Fund II	Equis	1,006 USD	Renewables, Solar	Thailand Government Pension Fund, Netherlands Development Finance Company (FMO), Kumpulan Wang Persaraan
Fondi Italiani Per Le Infrastrutture II	F2i SGR	1,243 EUR	Renewables, BioMass, Solar, Wind, Hydroelectric, Geothermal	BNP Paribas Cardif, China Investment Corporation, National Pension Service, Fondazione Cariplo
Wastewater Opportunity Fund	Equilibrium Capital Group	184 USD	Renewables, BioMass	Church Pension Group, Contra Costa County Employees' Retirement Association
QIC Global Infrastructure Fund	QIC Global Infrastructure	2,350 AUD	Renewables	Employees' Retirement System of Texas, HOSTPLUS

Source: Preqin Natural Resources Online

Fig. 12: Sample Investors Targeting Unlisted Conventional Energy Funds in the Next 12 Months

Investor	Location	Type	Investment Plans for the Next 12 Months
Kemnay	New York, US	Family Office	Will look to invest in unlisted energy funds globally that target investments in upstream, midstream and downstream oil & natural gas assets.
Morgan Stanley Alternative Investment Partners	West Conshohocken, US	Private Equity Fund of Funds Manager	Likely to invest across its current strategic and geographic preferences in the year ahead which include oil & gas funds at all processes/stages.
New China Life Insurance	Beijing, China	Insurance Company	Will focus on oil, renewable energy and water vehicles primarily in China, although it will look at the US, Europe, ASEAN and emerging markets.

Source: Preqin Natural Resources Online

Fig. 13: Sample Investors Targeting Unlisted Renewable Energy Funds in the Next 12 Months

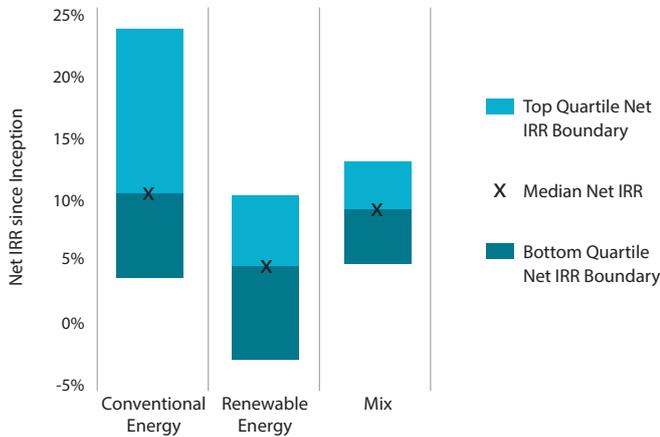
Investor	Location	Type	Investment Plans for the Next 12 Months
Guolian Capital	Jiangsu, China	Investment Company	Targeting unlisted renewable energy funds focused on China, ASEAN and emerging markets.
University of Dayton Endowment	Dayton, US	Endowment Plan	Renewable energy is a key focus of the endowment plan's private equity-like investments, earmarking \$25-40mn for investment directly and in unlisted funds in the year ahead.
KEB Hana Bank	Seoul, South Korea	Bank	Considering South Korea-focused renewable energy funds, including those that target solar, wind and biomass assets.

Source: Preqin Natural Resources Online



PERFORMANCE

Fig. 14: Median Net IRR and Quartile Boundaries of Unlisted Energy Funds (All Vintages)



Source: Preqin Natural Resources Online

Fig. 15: Risk/Return of Unlisted Energy Funds by Type (Vintage 2004-2014)



Source: Preqin Natural Resources Online

Fig. 16: Top Performing Unlisted Conventional and Renewable Energy Funds

Fund	Firm	Vintage	Fund Size (mn)	Energy Preference	Firm Headquarters	Net IRR%	Date Reported
Aravis Energy I	Aravis	2009	47 EUR	Renewable	Switzerland	448.0	Mar-17
Quantum Energy Partners II	Quantum Energy Partners	2000	225 USD	Conventional	US	138.0	Mar-17
WLR Recovery Fund II	WL Ross & Co	2002	400 USD	Conventional	US	78.8	Jun-16
Natural Gas Partners VI	NGP Energy Capital Management	2000	370 USD	Conventional	US	73.0	Mar-17
HitecVision Private Equity III	HitecVision	2002	690 NOK	Conventional	Norway	72.0	Mar-17

Source: Preqin Natural Resources Online

Fig. 17: Unlisted Conventional and Renewable Energy Funds to Watch (Vintage 2014-2016)

Fund	Firm	Vintage	Fund Size (mn)	Energy Preference	Multiple (X)	Net IRR%	Date Reported
Japan Solar Fund	Equis	2014	721 USD	Renewable	1.97	n/m	Sep-16
Kerogen Energy Fund II	Kerogen Capital	2015	676 USD	Conventional	1.63	n/m	Sep-16
EverStream Solar Infrastructure Fund I	EverStream Energy Capital Management	2015	71 USD	Renewable	1.52	n/m	Mar-16
Post Oak Energy Partners II Co-Investment	Post Oak Energy Capital	2014	100 USD	Conventional	1.48	n/m	Sep-16
Environmental Capital Fund	Scottish Equity Partners	2014	135 GBP	Renewable	1.40	n/m	Sep-16

Source: Preqin Natural Resources Online



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