

Reallocating Energy Investments?

Consider the Clean Energy Sector

June 2015



Executive Summary

Today, Clean Energy is an established sector, continues to grow, and offers an increasingly diverse set of investment options that can address a broad spectrum of investor objectives and portfolio allocation targets.

Over the past several years, many investors have begun to shift the mix of their energy portfolios to be less carbon intensive and are capitalizing on opportunities to invest in the Clean Energy sector.

— *This set of investors continues to grow rapidly and today includes Sovereign Wealth Funds, Public and Private Pension Funds, Insurance Companies, City Governments, Foundations, Endowments, Family Offices, and High Net Worth Individuals.*

Annual investment in the Clean Energy sector has grown from \$53Bn in 2004 to \$339Bn in 2014.¹ The sector is expected to attract an additional \$5Tn+ in investment by 2030,¹ without assuming any portfolio reallocations to favor Clean Energy.

Multiple investment options across asset classes are now available and more easily accessible by investors.

— *Private investment options include but are not limited to Venture Capital, Private Equity, Real Asset (project-level) Equity, Tax Equity, and Fixed Income. Investments are typically available to Institutional and Accredited Investors.*

— *Public investment options include, but are not limited to, Corporate Stock, YieldCos, Corporate Bonds, Green Bonds, Mutual Funds and Exchange Traded Funds (ETFs). These investments are accessible by both Institutional and Non-Institutional Investors.*

An increasing number of investors are seeking to rebalance their investments to optimize long-term portfolio performance, address future financial risks associated with being over-weighted to the fossil fuel sector, and capitalize on investment opportunities that offer attractive returns and are aligned with the trend towards a less-carbon intensive economy.

— *Since 2012, Clean Energy indices have performed favorably relative to S&P 500, NASDAQ, and fossil fuel indices.*

Source:

1. Global Trends in Renewable Energy Investment 2015, UNEP and Bloomberg New Energy Finance

Note: For purposes of this paper Clean Energy comprises of Renewable Energy, Energy Efficiency, and Low Carbon End-Use technologies / sectors

Optimizing An Energy Portfolio

Investment Considerations

- Some investors are reducing their investments in the fossil fuel sector to indicate support for climate change goals, along a spectrum of views:
 - Revising investment criteria to eliminate or reduce fossil fuel-related holdings
 - Eliminating or reducing coal-related investments (sometimes tied to a % of revenue or net asset value derived from coal-related activities)
 - Establishing investment criteria to reduce investment portfolio reliance on stocks with significant exposure to fossil fuel-related activities
- Investors are also re-allocating as a means to mitigate climate impact on investment portfolios and preserve performance (e.g., financial risks to fossil fuel companies from potential stranded assets, diminished returns on coal-fired generation investments if these need to be retired ahead of the end of their useful life, etc.).

Institutions Increasingly Adjusting Their Approach

- There are a diverse set of investors, including Governments, Pension Funds, Insurance Companies, Foundations, Endowments, Philanthropic Institutions, and NGOs. For example:
 - Rockefeller Brothers Fund
 - Stanford University
 - Scandinavian pension and sovereign wealth funds
 - Axa Insurance
 - Australian superfund Hesta
 - Multiple city governments across the US, UK, Sweden, and Australia

Clean Energy As An Investment Alternative

- Typically, reallocation does not explicitly require an investment in Clean Energy, but ~85% of such investors have stated an intention to do so.¹
- Clean Energy is an established sector where investors can deploy capital at scale. Total annual investment in the sector has grown from \$53Bn in 2004 to \$339Bn in 2014.²
- \$5Tn+ of new investment is forecasted over the next 15 years.²
- Multiple asset classes with a growing number of underlying investment options are available to meet a diverse set of investor objectives and portfolio allocation targets:
 - Fixed Income (Public & Private)
 - Private Equity
 - Venture Capital
 - Infrastructure / Real Assets
 - Public Equities (Company Stock & YieldCos)
 - Listed Funds (Mutual Funds & ETFs)
- Lower correlation and steadier yield: investments where the underlying asset has long-term contracted cash flows can potentially lower portfolio correlation to public markets / macro trends and provide more predictable yield.

Sources:

1. Arabella Advisors, 2014
2. UNEP and Bloomberg New Energy Finance – Global Trends in Renewable Energy Investment 2015

Private Clean Energy Investment Alternatives

Asset Class	Private Equity / Venture Capital	Project-Level / Infrastructure Equity	Debt / Fixed Income
Description	<ul style="list-style-type: none"> Platform-level investments in technology / equipment manufacturing, service, project development companies, etc. 	<ul style="list-style-type: none"> Equity investment in power generation or other Clean Energy infrastructure projects / assets 	<ul style="list-style-type: none"> Corporate bonds including Green bonds Single asset or securitization of project portfolios
Market Size	<ul style="list-style-type: none"> \$5.2Bn invested globally in 2014¹ 	<ul style="list-style-type: none"> \$240Bn in new asset finance (debt and equity) in 2014¹ \$5Tn in additional investment inflows forecasted by 2030¹ 	<ul style="list-style-type: none"> \$240Bn in new asset finance (debt and equity) in 2014¹
Sectors (including but not limited to)	<ul style="list-style-type: none"> Solar / Wind / Biomass / Biofuels / Hydro / Geothermal Energy Storage Transmission / Grid Energy Efficiency Low Carbon End-use (water, electric vehicles, transport, buildings, etc.) 	<ul style="list-style-type: none"> Solar / Wind / Biomass / Biofuels / Small Hydro / Geothermal Combined Heat and Power (CHP) Energy Storage Transmission / Grid 	<ul style="list-style-type: none"> Solar / Wind / Biomass / Biofuels / Small Hydro / Geothermal Energy Storage Energy Efficiency
Key Investment Characteristics	<ul style="list-style-type: none"> Illiquid Strong correlation to sector Back-ended returns predicated on exit Appeal to investors seeking higher risk / return investments 	<ul style="list-style-type: none"> Illiquid Low correlation to public markets / macro trends when cash flows are contracted Predictable cash yield Some inflation protection Appeal to investors seeking core / core plus infrastructure returns 	<ul style="list-style-type: none"> Illiquidity with some instruments Strong correlation to macro trends / interest rates Alternatives available across full spectrum of yield / risk preferences
Return / Yield Expectations	<ul style="list-style-type: none"> ~20%+ 	<ul style="list-style-type: none"> ~5% - 12% unlevered project returns (varies by project stage, technology, size, jurisdiction, etc.) 	<ul style="list-style-type: none"> Senior debt: ~ 4%-6% High Yield: ~6%-8% for high yield Mezzanine: ~8%+ corporate
Investment Considerations	<ul style="list-style-type: none"> Successful exit is key Potential to realize outsized returns Longstanding / traditional asset class in the sector 	<ul style="list-style-type: none"> Investment diligence can be complex and requires extensive industry expertise In the U.S., tax equity structures necessitate additional focus on certain legal, tax, and contractual aspects of the projects 	<ul style="list-style-type: none"> Competitive and cyclical market Excess capital can drive down spreads periodically
Access to Opportunities	<ul style="list-style-type: none"> Primarily available to Institutional and accredited Investors through fund or direct investments 	<ul style="list-style-type: none"> Generally available through industry relationships to Institutional (Pensions, Insurers etc.), Financial (e.g., Funds), and Strategic investors (companies in the sector) 	<ul style="list-style-type: none"> Access varies depending on instrument

Source:

1. UNEP and Bloomberg New Energy Finance – Global Trends in Renewable Energy Investment 2015

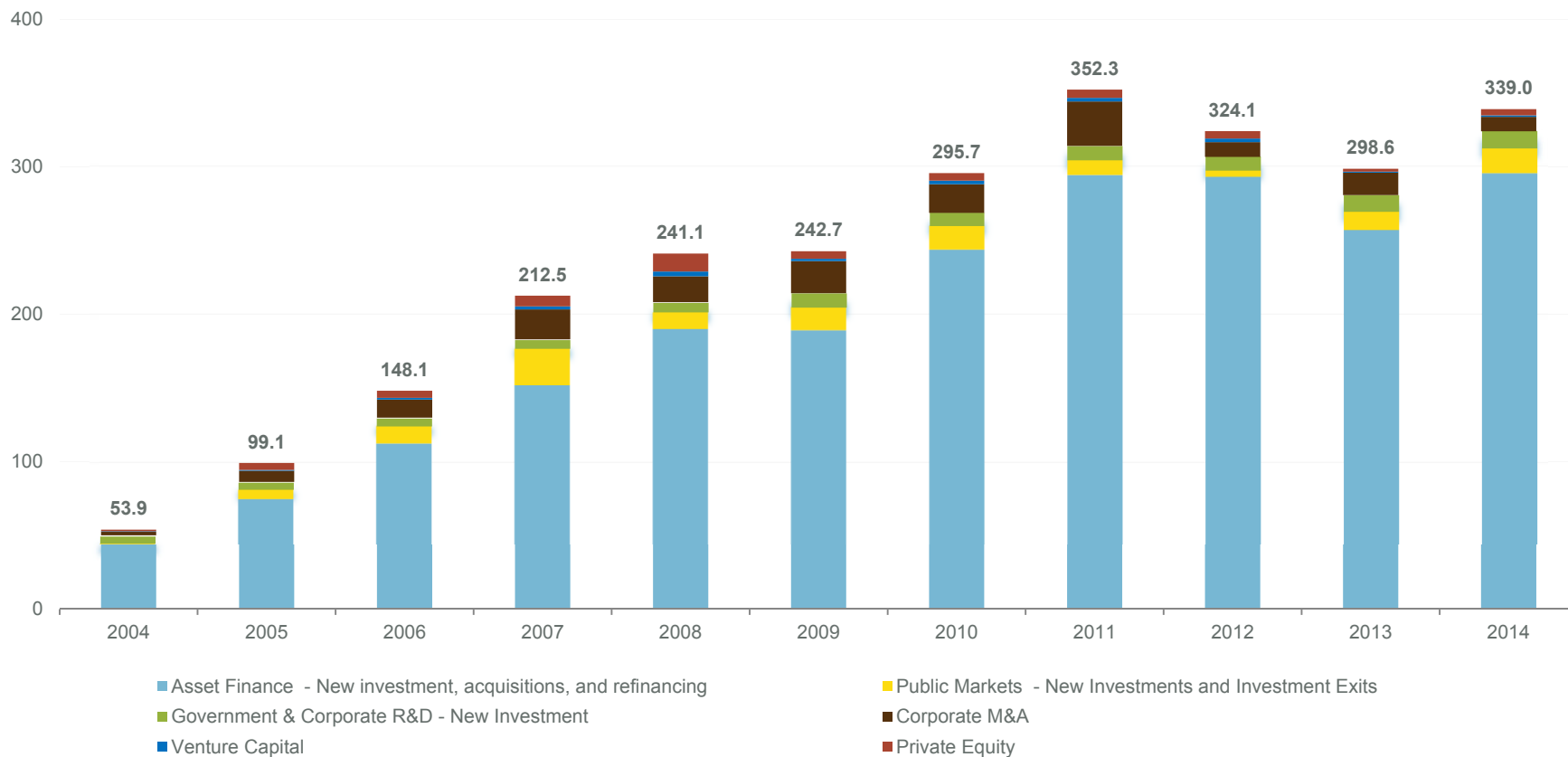
Public Clean Energy Investment Alternatives

Asset Class	Equities	YieldCos	Green Bonds	Mutual and Exchange Traded Funds
Description	<ul style="list-style-type: none"> Exchange listed stock Was predominantly technology / equipment manufacturers. Today there is a diverse set of listed companies 	<ul style="list-style-type: none"> Publicly traded company created to own power generation projects / assets and deliver yield in the form of dividends to investors 	<ul style="list-style-type: none"> Bonds whose proceeds are invested exclusively in projects that have environmental benefits and comply with the Green Bond Principles 	<ul style="list-style-type: none"> Several Mutual Funds include Clean Energy in their focus Multiple ETFs that track Clean Energy indices
Market Size	<ul style="list-style-type: none"> Clean Energy sector raised \$18.7Bn of equity in 2014¹ 	<ul style="list-style-type: none"> ~\$27Bn market value as of April 2015, expected to grow to \$100Bn² 	<ul style="list-style-type: none"> \$38Bn raised in 2014 and expected to grow to \$80Bn in 2015¹ 	<ul style="list-style-type: none"> 30+ Clean Energy Mutual Funds and ETFs³
Sectors (including but not limited to)	<ul style="list-style-type: none"> Solar / Wind / Biofuels Electric Vehicles Power Generation (developers, IPPs, etc.) Advanced Materials Information Technology 	<ul style="list-style-type: none"> Solar Wind Biofuels 	<ul style="list-style-type: none"> Clean energy generation, energy efficiency, agriculture, water and transportation 	<ul style="list-style-type: none"> Clean energy power generation, technology / equipment manufacturing, energy efficiency, agriculture, water, information technology, transportation, etc.
Key Investment Characteristics	<ul style="list-style-type: none"> Most mature asset class Large cap: high liquidity Small-mid cap: moderate liquidity Strong correlation to industry and macro trends Alternatives available for full spectrum of risk tolerance 	<ul style="list-style-type: none"> Liquid Correlation to macro / industry trends lowered by contracted cash flows from underlying assets Predictable cash yield Some inflation protection Appeal to investors seeking core infrastructure-like risk / return investments 	<ul style="list-style-type: none"> Comparable liquidity, credit, and pricing as regular bonds Correlation to macro trends and interest rate movements Follows use-of-funds guideline Attractive to SRI/ESG investors 	<ul style="list-style-type: none"> Redeemable / Liquid Subject to fees and other expenses Year-on-year returns can vary significantly Appeal to investors with a medium to high risk tolerance
Return / Yield Expectations	<ul style="list-style-type: none"> Large cap: ~8% Small / mid cap: ~10-12% 	<ul style="list-style-type: none"> ~3% - 7% Annual Yield 	<ul style="list-style-type: none"> Consistent with traditional fixed income 	<ul style="list-style-type: none"> Mutual funds delivered 5% return in 2014 and 28.1% in 2013³
Investment Considerations	<ul style="list-style-type: none"> Possibly greater volatility than mainstream equity indices 	<ul style="list-style-type: none"> Continued delivery of yield / dividends reliant upon growth of asset base 	<ul style="list-style-type: none"> Can have a broader focus than just Clean Energy 	<ul style="list-style-type: none"> Can have a broad focus Some subject to minimum investment requirements
Access to Opportunities	<ul style="list-style-type: none"> Accessible to all investors 	<ul style="list-style-type: none"> Accessible to all investors 	<ul style="list-style-type: none"> Accessible to all investors 	<ul style="list-style-type: none"> Accessible to all investors

Sources:

1. Bloomberg New Energy Finance – 10 Predictions For Clean Energy In 2015
2. Bloomberg New Energy Finance – YieldCos Seen Surging To \$100 Billion To Lower Clean-Power Costs
3. Roen Research Report – Alternative Energy Mutual Funds and Exchange Traded Funds

Total Annual Investment In Clean Energy Sector (\$Bn) – 2004 to 2014



Source: UNEP and Bloomberg New Energy Finance – Global Trends in Renewable Energy Investment 2015
 Note: Depicts total investment. New Investment for 2014 at \$270Bn.

Addressing Sector Exposure Risks By Increasing Clean Energy Investments

Swedish national pension fund, AP2

"Our starting point for this analysis has been to determine the financial risks associated with the energy sector. By not investing in a number of companies, we are reducing our exposure to risk constituted by fossil-fuel based energy. This decision will help to protect the Fund's long-term return on investment," said Eva Halvarsson, CEO of the Second AP Fund.

French insurance giant, Axa

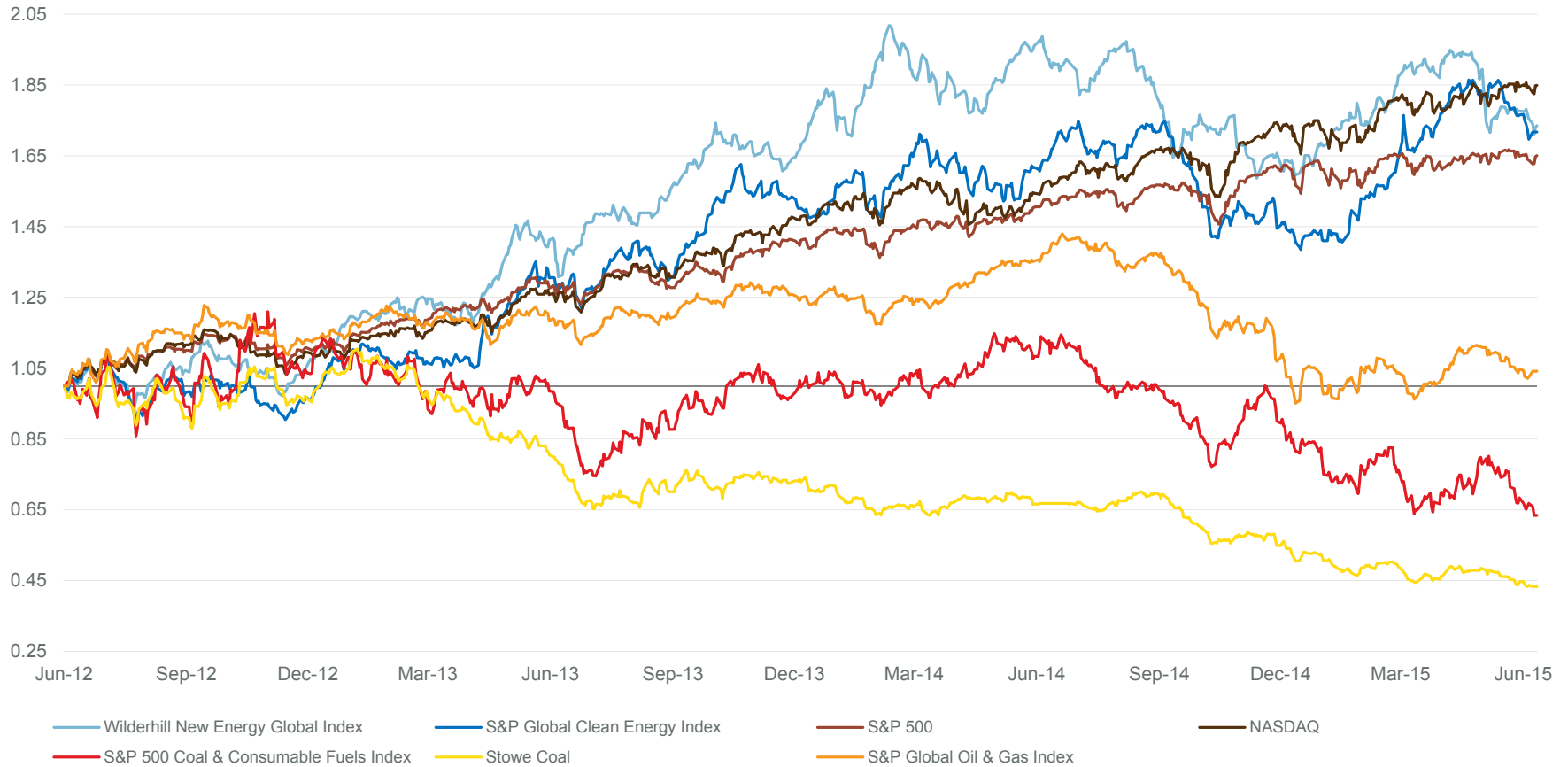
"It is often said that climate and carbon themes are not financially material risk factors in the short to medium term. [But] we believe that climate risk should not be neglected in the investment decisions that investors are making today. It should also be considered as an investment opportunity, with the potential to offer good financial returns...The opportunity now exists to consider the low-carbon-economy theme, thanks to economies of scale in the renewable sector," said Luisa Florez, senior responsible investment analyst at Axa Investment Managers.

Norway's Government Pension Fund Global (GPF)

"Our risk-based approach means that we exit sectors and areas where we see elevated levels of risk to our investments in the long term," said Marthe Skaar, spokeswoman for GPF. "Companies with particularly high greenhouse gas emissions may be exposed to risk from regulatory or other changes leading to a fall in demand."

Relative Performance – Clean Energy Indices Perform Favorably

3 Year Performance Of Selected Indices – As of June 11, 2015

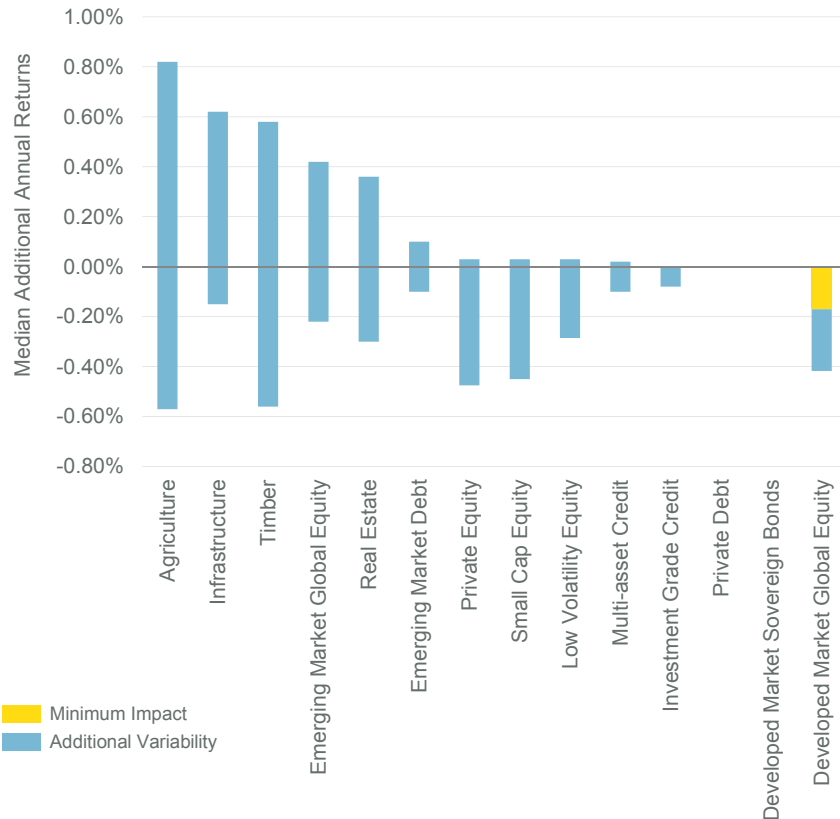


Source: Bloomberg Data, as of June 11, 2015

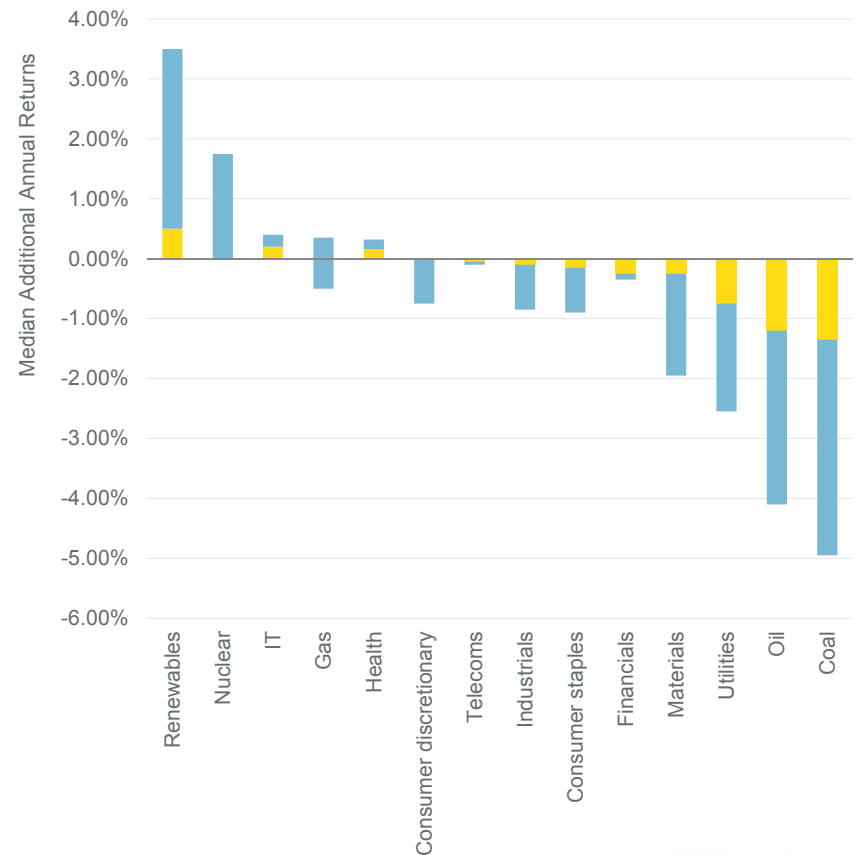
Evaluating Climate Risks To Optimize Investment Outcomes

Portfolio reallocation in certain industry sectors and asset classes could mitigate potential financial risk to investment portfolios over the long-term. Similarly, investment opportunities in industry sectors that are positively aligned with a low carbon-intensive economy may boost long-term portfolio performance.

Climate Impact on Returns by Asset Class (35 Years)



Climate Impact on Returns by Industry Sector (35 Years)



Source: Mercer – Investing in a time of Climate Change, 2015

Conclusions

Investing in Clean Energy presents an opportunity to deploy capital at scale in an established and growing sector.

Investors are increasing allocations to the Clean Energy sector to capitalize on investment opportunities that offer attractive returns and are aligned with the trend towards a less-carbon intensive economy.

Investors are considering reducing their focus on fossil fuel investments to underscore the importance of addressing climate change and to mitigate the potential for long-term portfolio performance degradation from future financial risks associated with companies or projects in the sector.

The range of Clean Energy investment opportunities is growing across all asset classes, becoming easily accessible to investors, and can meet a diverse set of investor objectives and portfolio allocation targets.

Since 2012, Clean Energy indices have performed favorably relative to S&P 500, NASDAQ, and fossil fuel indices.



ABOUT US PREF

US PREF is a coalition of senior level financiers who invest in all sectors of the energy industry, including renewable energy. US PREF members focus on increasing capital formation and investment in renewable energy and educate the public sector to assure policy impacts the market as efficiently and effectively as possible. US PREF is a program of the American Council On Renewable Energy (ACORE), a Washington, DC - based non-profit organization dedicated to building a secure and prosperous America with clean, renewable energy.

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ABOUT ACORE

ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE seeks to advance renewable energy through finance, policy, technology, and market development and is concentrating its member focus in 2015 on National Defense & Security, Power Generation & Infrastructure, and Transportation. Additional information is available at www.acore.org.