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# Energy Investing and Climate Change: Recommendations for the Next U.S. President

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Discussion Paper | September 2016

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## Recommendations for the Next U.S. President

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## Abstract

Energy has traditionally been a focus of real asset investing, designed to enhance returns and balance against market risk such as inflation. But disruptive technologies and mounting climate change risks are presenting new challenges for energy-related investing. Fossil fuel commodity prices are increasingly volatile, and institutional investors are becoming more cognizant of the urgency to rebalance their energy portfolio to reflect climate change risk and the long-range transition to cleaner energy sources. Many U.S. pension funds and university endowments are also facing pressure from stakeholders to play a more proactive role in fostering climate change mitigation. However, multiple investment barriers remain. One barrier to the deployment of pension and endowment capital is the poor track record early efforts in clean energy investing have produced. Investor commitments to cleantech early adopters via venture capital and private equity funds produced mixed results in the 2000s. To sustain the flow of billions of dollars from long-term institutional investors into energy, new, innovative financial platforms will be needed. That's because the scale and scope of capital investment in energy infrastructure is very large, with long lead times to first earnings and a prolonged time scale for full returns. While institutional investors with patient capital could be the ideal source of finance for such long-lived asset investing, creative mechanisms are needed to overcome the hurdle of venture and technology risk. Regulatory uncertainty in the United States imposes an additional barrier to commitment of long-term capital.

Government has a role to play in promoting the regulatory and commercial conditions that allow energy cleantech developers to attract the needed capital to deploy new climate solutions. Additional financing structures and solutions are needed that can align direct opportunities in cleantech investing for long-term investors like pension funds, endowments and family offices with the long-term objectives of those institutions. What is needed is means to generate attractive risk-adjusted returns from investment in resource innovation companies and renewable energy projects in a manner that is vetted and verified by well-qualified parties.

For all these reasons, the next president should support the policies and improvements to existing oversight that enable the most successful financing mechanisms such as not-for-profit intermediaries, green bonds and tax-enabled off-balance-sheet-funding mechanisms. In particular, the next administration should

1. Strengthen Securities and Exchange Commission (SEC) oversight and rule making for the green bond market to improve disclosure, transparency and verification procedures, including for details of percentage of proceeds that will be used for new project funding versus refinancing, as well as expanding requirements regarding impact reporting.
2. Authorize and expand capacity for the U.S. Department of Energy Clean Energy Investment Center to develop public/private investment vehicles that leverage Department of Energy (DOE) loan guarantee programs and pilot projects for later-stage investment participation by institutional investors.
3. Expand the reach and budget of the Small Business Innovation Research Program (SBIR) and the Small Business Administration (SBA) Equity and Debenture programs to provide seed funding for clean energy startups that could create a larger pipeline of investable companies for institutional

investors over time. Add to the SBIR program a business plan–style competition conference bringing together early-stage companies and investors.

4. Use the purchasing power of the federal government for clean energy infrastructure projects, energy efficiency projects and advanced vehicles with tie-ins that could facilitate opportunities for private funding participation (e.g., via bonds or infrastructure investment vehicles), creating more clean energy investment opportunities with predictable, government-backed returns.
5. Lay the groundwork for achievable, visible U.S. national greenhouse gas emissions targets and policy initiatives that can put a more transparent price on carbon, sending a signal to markets that a transition in energy is not uncertain.
6. Begin the process early to extend the existing tax credits for renewables.
7. Add revenues from renewable energy production as a “qualifying” natural resource income under the IRS master limited partnership rules.

# Energy Investing and Climate Change

## Introduction

Energy has traditionally been a focus of real asset investing, designed to diversify portfolios with investable assets that are negatively correlated with financial products such as stocks and bonds.<sup>1</sup> In recent years, investors have sought energy asset holdings to generate income and improve performance during times when financial assets were not offering robust growth. Since the early 1990s, investors have believed that real assets provide a form of “inflation insurance” for other assets in the portfolio,<sup>2</sup> with real estate and energy commodities deemed particularly attractive in this regard.<sup>3</sup>

Real assets investing, in particular energy investing, is aimed to be income producing and hold its value over time. During the commodities super cycle from the early 2000s to 2014, investing in oil and gas ventures provided robust returns. More recently, energy prices have been volatile, rendering investment in this sector more risky.

As oil commodity prices collapsed from an average of \$98 in 2013 and \$93 in 2014 to \$48 a barrel last year, portfolio managers have been registering losses in value and returns for energy holdings.<sup>4</sup> The costs of renewables also dropped sharply – over 70 percent for solar panels since 2009 – while U.S. natural gas prices averaged not much more than \$2.25 million Btu in 2015, down from a peak of close to \$9.00 in 2008.<sup>5</sup> These changes in price translated into a substantial decline in resource benchmarks in 2015. As a proxy, the MSCI index for world natural resources benchmark shed 23 percent last year versus gains of 7 percent from 2005–2010. At the third quarter of 2015, the Cambridge Associated Private Equity index, which includes real assets, posted a negative return (-1.4 percent) for the first time in several years, mainly based on write downs in energy holdings. Cambridge reported that “energy write downs drove the losses and overwhelmed positive returns from other large sectors.” By late 2015, the largest vintage in the Cambridge Associated Private Equity index from 2007 had negative returns of 2.4 percent, largely due to energy which suffered a double digit decline of 12 percent, according to Cambridge Associates.

Returns on investments in low carbon energy, or so-called cleantech, have also been uneven in recent years. The losses in some of the large-scale biofuels investments are well known. But returns in other cleantech ventures were also patchy. Solar panel manufacturing gross internal rate of return (IRR) as of March 31, 2015, was negative at -2.4 percent, for example, as was smart lighting at -3.7 percent, while energy efficiency

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<sup>1</sup> Kenneth A. Froot, “Hedging Portfolios with Real Assets,” *Journal of Portfolio Management*, (Summer 1995): 60–77 (Revised from Harvard Business School Working Paper No. 95–045, September 1993) .

<sup>2</sup> Andrew Ang, “Real” Assets (working paper, Columbia Business School–Finance and Economics; National Bureau of Economic Research, 2012) accessed August 29, 2016,

[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2161124](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2161124); Noel Amenc, Lionel Martellini, and Volker Ziemann “Inflation-Hedging Properties of Real Assets and Implications for Asset Liability Management Decisions,” *Journal of Portfolio Management*, 35, no. 4 (Summer 2009): 94–110.

<sup>3</sup> Amenc, Martellini, and Ziemann, “Inflation-Hedging Properties.”

<sup>4</sup> U.S. Energy Information Administration, <http://www.eia.gov/forecasts/steo/report/prices.cfm>

<sup>5</sup> Ibid

and management only offered gains of 1.2 percent in contrast to winners such as energy storage, which offered 29.5 percent IRR on average, or smart grid, which offered 27.5 percent gross IRR, according to Cambridge Associates cleantech company performance sub-sectors benchmark.<sup>6</sup>

Going forward, disruptive technologies and mounting climate change risks will present new challenges for energy-related investing. Production costs for energy are falling because of technology advancements across the energy space, including emerging technologies like battery storage. Analysts believe lithium ion batteries could reach the critical \$150 Kwh tipping point in the next five to ten years. Oil and gas prices may also continue to fall over the long run based on foreign producer market share strategies and continued production cost improvements for unconventional drilling techniques in the United States and Canada. All this is translating into an increasingly volatile and uncertain outlook for energy investing.

Institutional investors are becoming more cognizant of the urgency to rebalance their energy portfolio to reflect climate change risk and the long-range transition to cleaner energy sources. Many U.S. pension funds and university endowments are also facing pressure from stakeholders to play a more proactive role in fostering climate change mitigation. The problem is that institutional investors must also ensure that sufficient returns are produced to meet ongoing and future obligations, which may include substantial payouts to retirees or cash for operating budgets of institutions and philanthropies. That means investments in cleantech must surmount an average annual returns hurdle of at least 7 to 10 percent, which has not been evident in early efforts in clean energy investing. Investor commitments to cleantech early adopters via venture capital and private equity funds produced mixed results in the 2000s.

In recent years, as mentioned above, cleantech subsectors have shown wide variations in returns. Solar panel manufacturing has been a losing proposition due to high competition in that sector. Investment in battery storage has provided attractive returns to date but carries high technology risk related to obsolescence in the event of a step change innovation. Water and wastewater are outperforming waste to energy, partly reflecting the still high cost of collecting and processing waste for the latter. Emissions control technology has yet to kick in to high returns but could improve over time as more countries regulate emissions using a price on carbon. This means that careful diligence will have to be done within the theme of clean energy investing, and creative partnerships will have to be developed to activate a pipeline of interesting opportunities that can generate the income requirements that will meet the targets for a real assets portfolio. And, for those committed to investing in climate solutions, there will be the worry that so many investor dollars will be chasing opportunities in renewable energy that values will become highly inflated.

## Government Has a Role to Play

To sustain the flow of billions of dollars from long-term institutional investors into energy, new, innovative financial platforms will be needed. That's because the scale and scope of capital investment in energy infrastructure is very large, with long lead times to first earnings and a prolonged time scale for full returns. While institutional investors with patient capital could be the ideal source of finance for such long-lived asset

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<sup>6</sup>Risks and Opportunities from the Changing Climate, Cambridge Associates, 2015 <http://www.cambridgeassociates.com/our-insights/research/risks-and-opportunities-from-the-changing-climate-playbook-for-the-truly-long-term-investor/>

investing, creative mechanisms are needed to overcome the hurdle of venture and technology risk and to generate the level of return that is needed to match earnings targets and payout obligations. Regulatory uncertainty in the United States imposes yet an additional barrier to commitment of long-term capital.

Government has a role to play in promoting the regulatory and commercial conditions that allow energy cleantech developers to attract the needed capital from institutional investors to deploy new climate solutions. Additional financing structures and solutions are needed that can align direct opportunities in cleantech investing for long-term investors like pension funds, endowments and family offices with the long-term objectives of those institutions. What is needed is means to generate attractive risk-adjusted returns from investment in resource innovation companies and renewable energy projects in a manner that is vetted and verified by well-qualified parties.

To date, to respond to these kind of challenges, the Obama administration, together with six institutional investors led by the University of California, has created an aligned intermediary (AI) that is structured as a not-for-profit, stand-alone benefit corporation that will seek investable ventures involved in climate infrastructure transactions such as clean energy, water infrastructure and waste to value.<sup>7</sup> The idea of this AI is to bring together a group of professionals who can function similarly to a private equity management firm, but without the fee and profit structure that often can misalign financial goals among participating investors who might have different time horizons on a transaction. Management fees in large funds in the hundreds of millions of dollars can provide considerable income, providing incentives to create and manage cleantech funds, regardless of prospects of whether the fund will ultimately deliver adequate performance in the long run. In the renewable energy space, this trend is accentuated by the fact that organizers of funds can capture significant federal subsidies and loan guarantees flowing into the sector, multiplying the impact of their initial capital and capturing the risk mitigation as cash flow. Such incentives and loan guarantees are especially attractive because they do not dilute investor equity. The AI structure is designed to capture the best aspects of this kind of investor platform but remove the high fees and potentially misaligned time horizons and incentives. By eliminating the financial incentives for deal managers to quickly resell their own interests after collecting high fees for themselves, sometimes to the long-term detriment of the selected venture, it is hoped that the AI can provide a larger universe of vetted of private, for-profit ventures for long-term investors who would be willing to stick with businesses to a later stage of their growth.

The next president should authorize and expand capacity for the U.S. Department of Energy Clean Energy Investment Center to develop public-private investment vehicles like the AI and facilitate those entities to better leverage the DOE loan guarantee programs and pilot projects for later-stage investment participation by institutional investors.

In addition to using public-private partnerships via DOE's Clean Energy Investment Center, the next president could reinvigorate the Small Business Innovation Research Program (SBIR) and the SBA Equity and Debenture programs and expand funding of these programs to provide seed funding for clean energy startups<sup>8</sup> that could create a larger pipeline of investable companies for institutional investors over time.

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<sup>7</sup> Ashby H.B. Monk, Sarah Wood Kearney, Alicia Seiger, Elliott Donnelley, "Energizing the US Resource Innovation Ecosystem: The Case for an Aligned Intermediary to Accelerate GHG Emissions Reduction" (June 12, 2015), accessed August 29, 2016, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2617816](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2617816).

<sup>8</sup> Andrew B. Hargadon and Martin Kenney, "Misguided Policy?: Following Venture Capital into Clean Technology," *California Management Review* 54, no. 2 (Winter 2012): 118–139.



This mechanism has the advantage of avoiding technological bias as the award process is small scale and decentralized across agencies and is based on evaluation of individualized technical merits as opposed to broad categories.<sup>9</sup> The SBIR program has also been found to be effective in moving technologies from academic-based laboratories to commercialization.<sup>10</sup> Utilizing the SBA Equity and Debenture program for cleantech venture capital could also play a similar role.

There might also be added benefits if a business plan–style competition conference was organized annually by the White House to bring together early-stage companies from the SBIR program and investors.

Previous administrations have used the purchasing power of the U.S. federal government for clean energy infrastructure projects, energy efficiency projects and advanced vehicle procurement. For example, the Obama administration has directed the U.S. military to deploy a total of 3 gigawatts of renewable energy by 2025. The projects will include wind, solar and biomass projects. In recent years, the Pentagon has begun building utility-scale solar farms in several locations in the United States, including Georgia and Arizona, to electrify bases in part to enhance national security by diversifying away from traditional electricity grids that can be subject to cyberattacks. The Navy is on track to produce a gigawatt of solar energy by 2020, enough to supply roughly half of the electricity supplies required at its domestic military bases. The next president should consider how future construction of federal clean energy infrastructure projects could be done with tie-ins that could facilitate opportunities for private funding participation via green bonds or infrastructure investment vehicles, creating more clean energy investment opportunities with predictable government-backed returns.

Tweaks to the tax code could also help propel more institutional private capital into the renewables sector. Master limited partnerships (MLPs) are publicly traded companies that are taxed as a partnership. To qualify for MLP status, a partnership must generate at least 90 percent of its income from qualifying sources, as stipulated by the Internal Revenue Service (IRS). The IRS code on statutory qualifying income includes oil and gas exploration, production and oilfield services, mining, midstream gathering, processing, transportation and storage, oil refining and processing, refined products transportation and terminaling, real property rent, timber processing and wood products, fertilizer production, and certain kinds of financial products. At present, energy generated by renewable energy infrastructure does not qualify for MLP treatment. MLPs allow businesses to avoid double taxation at the entity level and at the shareholder level. This is important because it means income is passed to shareholders who then only pay individual income taxes. In exchange for taking on this higher tax burden individually, investors typically receive high-yielding dividends (known as distributions) on a quarterly or monthly basis. The arrangement is one often favored by institutional investors. MLPs allow investments to potentially provide the kind of predictable, stable cash flows to institutional investors as dividend payments.

Because renewable energy ventures cannot use MLPs, other financing structures are used to limit the penalty of double taxation. Recent problems in the solar industry, for example, have stemmed from the use of so-called “yieldco” structures that allow these firms to reduce or eliminate entirely their corporate tax liabilities by using renewable asset depreciation and expenses to net out income earned from their assets. Although straightforward in theory, a number of firms have overexpanded their generating assets to maximize the

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<sup>9</sup> Josh Lerner, “The Government as Venture Capitalist: The Long Run Impact of the SBIR Program,” *Journal of Business* 72, no. 3 (1999): 285–318.

<sup>10</sup> C. Wessner, ed., *An Assessment of the SBIR Program* (Washington DC: National Academies Press, 2008).

number of qualifying expenses and they could potentially bear heavy debt susceptible to changes in interest rates as a result. To alleviate this problem, the next president could work with the Congress to add clean energy resources and infrastructure projects as qualifying for MLP tax treatment. Ventures using onshore and offshore wind, solar energy, biomass, geothermal, waste to value and fuel cells could be added to the list of qualifying resources, with possibly other kinds of investments such as large-scale energy efficiency upgrades for buildings, electricity storage and carbon sequestration, and storage projects.

The next president should also seek to improve oversight of other emerging cleantech financing vehicles being actively used by institutional investors such as the “green bond” market. A green bond is a fixed-income instrument whose proceeds finance projects that generate significant environmental benefits, including greenhouse gas emission mitigation. Standards for issuers of green bonds should be tightened and codified to ensure that bonds given the green distinction are generating funds whose use is predefined and transparent to the investor on projects that verifiably contribute positive net benefits for the climate or environment. Early issuances in the green bond market have, on occasion, fallen suspect to verifiable standards, thwarting the pace of market development despite strong investor interest in the concept. The green bond market allows institutional investors to incorporate environmental objectives in the normal course investing along the lines of fiduciary responsibilities associated with fixed-income investing.

The Securities and Exchange Commission should look for opportunities to enhance credibility and confidence in the green bond market by improving rules surrounding disclosure, transparency and verification procedures. Tightening standards for disclosure related to green bonds would allow investors to better compare offerings between issuers. In particular, investors are interested in knowing what percentage of bond proceeds are being used for new project funding versus refinancing, especially for projects that were already financed prior to the start of the issuer’s green bond program. Investors would also like to see better transparency, where issuers are encouraged to declare their plans for reporting project impacts, which will be publicly available and include annual reporting on beneficial climate, environmental and other impacts of their projects. Expected results should be disclosed based on estimates developed when projects are being designed and implemented.

Finally, clean energy investing is hindered when the regulatory environment surrounding climate change is lacking clear targets and direction. California’s model of enunciating visible and tangible achievable greenhouse gas emission targets has successfully signaled the private sector to dedicate substantial capital and expertise to clean energy goals. It will be important for the next president to signal markets that a transition in energy is not uncertain. Stating upfront, clear aspirational objectives is a first-order action that lays the groundwork for all other actions. What is needed is a transition “by design” as opposed to a haphazard patchwork of partial approaches. Stability is important, and uncertainty regarding the renewal of the investment tax credit (deemed essential to investment in renewable energy) will dampen the thriving market for solar in 2016 as projects were taken out of the purchasing power agreement (PPA) pipeline, awaiting final word on the tax credit’s fate in Congress.

Failing to account fully for the damage, and thereby the costs, that large-scale carbon emissions impose on the public through long-term climatic effects mean the country’s largest emitters of carbon are – in effect – shifting the burden of their emissions onto the public. By extension, that means ultimately the U.S. taxpayer is paying for the emissions by industry since public funds are used to finance climate-related expenditures such as disaster relief and public works like levies and infrastructure repair. Pricing the carbon being

produced by high-emitting entities based on the volume per ton of carbon they are emitting reallocates this “social cost” back proportionately onto the very entities now benefiting from the undervaluation of their polluting operations. Currently, the social cost of carbon is not adequately reflected in energy prices and manufacturing processes for carbon-intensive materials like cement and steel. This situation inadvertently disincentivizes businesses from making investments to reduce carbon emissions and promote energy efficiency by allowing businesses to escape the financial consequences of damage to the public commons.

Markets currently run the risk that carbon will be more accurately repriced in the future, adding to the other challenges facing long-term investors in the energy sector. Failing to provide a concrete, transparent national system that prices carbon leaves institutional investors without a means to determine the size of the climate risk they are facing or without insights into the timing regarding when a related risk might arise. Fears exist that a sudden steep drop in the valuation and pricing of carbon-intensive assets could create dislocations that could cascade through the economy. The decapitalization of U.S. coal mining firms over the past year is a harbinger of what such a problem could look like. Major U.S. coal firms went bankrupt despite the lingering need for coal supplies in the United States. Sudden bankruptcies leave no funding for costly environmental cleanup that might be needed from the facilities that are sunsetting.

The next president will need to lay the groundwork for achievable, visible U.S. national greenhouse gas emissions targets and policy initiatives that can bring more transparency and planning to how carbon will be priced in our economy on a forward-looking basis. That action would allow companies to make more economically efficient decisions regarding their use of fossil fuels and to create a larger market for renewable energy. Once that important signal reaches the market, it will promote the efficient allocation of capital to infrastructure and energy production projects that are more in line with long-term environmental preservation. It will also reduce the chances that substantial capital will be squandered or large-scale projects will be built that could become stranded prematurely. If market signals are better aligned with long-term needs, the opportunities for institutional investors to deploy more capital in energy investing would expand, lowering risk and facilitating the important role we can play in promoting a better future for the country and our stakeholders.