

Investing in the Clean Trillion: CLOSING THE CLEAN ENERGY INVESTMENT GAP Executive Summary

A Ceres Report

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Authored by Mark Fulton, Ceres / Energy Transition Advisors Reid Capalino In order to limit global warming to 2 degrees Celsius and avoid the worst effects of climate change, "investments in low-carbon energy technologies will need to at least double, reaching \$500 billion annually by 2020, and then double again to \$1 trillion by 2030."

— International Energy Agency (IEA) —

"Energy Technology Perspectives 2012"

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Executive Summary

This Ceres report provides 10 recommendations for investors, companies and policymakers to increase annual global investment in clean energy to at least \$1 trillion by 2030—roughly a four-fold jump from current investment levels.

Mobilize Investor Action to Scale Up Clean Energy Investment

- 1. Develop capacity to boost clean energy investments and consider setting a goal such as 5 percent portfolio-wide clean energy investments
- 2. Elevate scrutiny of fossil fuel companies' potential carbon asset risk exposure
- 3. Engage portfolio companies on the business case for energy efficiency and renewable energy sourcing, as well as on financing vehicles to support such efforts
- 4. Support efforts to standardize and quantify clean energy investment data and products to improve market transparency

Promote Green Banking and Debt Capital Markets

- 5. Encourage "green banking" to maximize private capital flows into clean energy
- 6. Support issuances of asset-backed securities to expand debt financing for clean energy projects
- 7. Support development bank finance and technical assistance for emerging economies

Reform Climate, Energy and Financial Policies

- 8. Support regulatory reforms to electric utility business models to accelerate deployment of clean energy sources and technologies
- 9. Support government policies that result in a strong price on carbon pollution from fossil fuels and phase out fossil fuel subsidies
- 10. Support policies to de-risk deployment of clean energy sources and technologies

In 2010 world governments agreed to limit the increase in global temperature to two degrees Celsius (2 °C) above pre-industrial levels to avoid the worst impacts of climate change.¹ To have an 80 percent chance of maintaining this 2 °C limit, the IEA estimates an additional \$36 trillion in clean energy investment is needed through 2050—or an average of \$1 trillion more per year compared to a "business as usual" scenario over the next 36 years.²

These new investments in clean energy—including renewable energy such as solar, wind and geothermal, energy efficiency and energy smart technologies such as power storage, fuel cells and carbon capture and storage—will provide multiple benefits. In addition to cutting greenhouse gas emissions in half by 2050, such investment will yield significant returns in the form of reduced fuel costs. Total fuel savings are an estimated \$100 trillion between 2010 and 2050.³ Moreover, the greater job-creation potential of energy efficiency and renewable energy relative to fossil fuels makes clear that quadrupling annual global investment in clean energy will create millions of new jobs worldwide.

¹ For more information, visit UN Framework Convention on Climate Change (UNFCCC): http://unfccc.int/key_steps/cancun_agreements/items/6132.php

² International Energy Agency (IEA), Energy Technology Perspectives 2012: Pathways to a Clean Energy System, (Paris: OECD/IEA, 2012), 1,

http://www.iea.org/Textbase/npsum/ETP2012SUM.pdf

³ Assuming a 10% discount rate, such savings have a present value of \$5 trillion. IEA, Energy Technology Perspectives 2012, 147.

This paper refers to the necessary additional investment in clean energy as the "Clean Trillion." Current annual investment in clean energy falls far short of this goal. In 2012, global investment in clean energy (as defined by Bloomberg New Energy Finance) was \$281 billion—and in 2013 this figure is expected to be even lower.⁴ Simply put, there is a clean energy investment gap.

FIGURE 1: THE CLEAN ENERGY INVESTMENT GAP

Annual Investments in Clean Energy to Reach 2°C Goal:



CLOSING THE GAP BY MOBILIZING INSTITUTIONAL INVESTMENT IN CLEAN ENERGY

Today's leading providers of capital to clean energy are primarily commercial banks, national and multilateral development banks and electric utilities. But these sources alone are insufficient to double annual global clean energy investment by 2020 and quadruple it by 2030. Clean energy projects need new and additional sources of capital, and the largest potential providers are institutional investors such as pension funds, insurance companies, sovereign wealth funds, endowments, foundations and investment managers. Globally, these institutional investors collectively manage about \$75.9 trillion in assets.⁵



Note: Excludes \$3.9 trillion of assets held by sovereign wealth funds. Figures above have adjusted for double-counting by reducing assets of investment managers by \$15 trillion (i.e. to account for pension insurance contracts and pension assets potentially invested in mutual funds, ETFs, hedge funds and private equity funds). Of this total, analysts estimate roughly \$45 trillion to be assets devoted to long-term investment.

Source: Climate Policy Initiative (2013), based on data from OECD. Stat Insurance Statistics, OECD. Stat Pension Statistics, TheCityUK (2011a and 2012a), Investment Company Institute, Sovereign Wealth Fund Institute, McKinsey Global Institute (2011).

- 4 Bloomberg New Energy Finance (BNEF), *Global Trends in Clean Energy Investment*, October 14, 2013, 28, http://about.bnef.com/fact-packs/global-trends-in-cleanenergy-investment-q3-2013/. For discussion of differences between BNEF numbers on actual investment and IEA projections of required investment, see Appendix C of the full paper.
- 5 Climate Policy Initiative (CPI), The Challenge of Institutional Investment in Renewable Energy, March 2013, 7, http://climatepolicyinitiative.org/wpcontent/uploads/2013/03/The-Challenge-of-Institutional-Investment-in-Renewable-Energy.pdf

Current clean energy investment levels by these institutional investors are quite low, especially in regard to equity and debt for asset finance, a key lifeblood for clean energy infrastructure projects. The most recent annual *OECD Large Pension Fund Survey* found that less than 1 percent of institutional investor assets were allocated to infrastructure projects—and an even smaller share (~0.1 percent) was allocated to clean energy infrastructure projects (investors can, in fact, make investments either directly or through other vehicles in infrastructure projects).⁶ Analysts calculated that from 2004-2011, only \$22 billion of asset finance for clean energy came from pension funds and insurance companies—or less than 2.5 percent of total clean energy asset finance globally over this period.⁷

Boosting these capital allocations to clean energy is essential to meeting the "Clean Trillion" goal of doubling annual global clean energy investment by 2020 and hitting \$1 trillion per year by 2030. Elevating these levels, however, requires that key institutional investor considerations be met: investments must provide competitive risk-adjusted returns that suit their varying risk preferences, regulatory requirements and credit/liquidity constraints; they also must align with their long-term fiduciary duty to their beneficiaries.

Still, global clean energy opportunities are timely and potentially vast, especially as many pension funds seek to boost their infrastructure allocations. The Climate Policy Initiative estimated last year that more than \$800 billion of institutional capital is available for investment in renewable energy projects. Bloomberg New Energy Finance is forecasting a potential clean energy bond market of \$142 billion, with bond issuances of \$18-\$40 billion annually, up from roughly \$2 billion a year today. More insurance companies and pension funds are already buying up ownership stakes and securitized debt in large-scale renewable energy projects.

INVESTING IN CLEAN ENERGY CAN IMPROVE DIVERSIFICATION & MITIGATE RISK

Increasing investment in clean energy has the potential to yield two major benefits for investor portfolios. The first benefit is the potential to diversify investments and potentially improve portfolio performance. This applies especially to investment in clean energy infrastructure vehicles, whether via debt or equity. Such investments offer stable cash flows that have low volatility, low correlation to other assets, and often are indexed to inflation.

The second benefit is to minimize exposure to climate risk—including both physical risk and carbon asset risk. According to the IEA, more than two-thirds of the world's proven reserves of fossil fuels will be unusable prior to 2050 if necessary carbon regulations are enacted to limit global temperature increases to 2°C.⁸ The next wave of fossil fuel investment, potentially as much as \$7 trillion in the next decade alone,⁹ may lead to stranded fossil fuel assets that erode long-term shareholder value.¹⁰

Current and future action to mitigate climate change and improve energy efficiency will strongly affect the valuations of fossil fuel companies—perhaps by as much as 60-80 percent¹¹—and is already happening with U.S. coal companies whose valuations have dropped dramatically since 2011. Even companies not directly engaged in fossil fuel production or fossil fuel power generation could be negatively affected.

⁶ Kaminker, C. et al., "Institutional Investors and Green Infrastructure Investments: Selected Case Studies," OECD Working Papers on Finance, Insurance and Private Pensions, No. 35, OECD Publishing, 2013, http://www.oecd-ilibrary.org/finance-and-investment/institutional-investors-and-green-infrastructureinvestments_5k3xr8k6jb0n-en.

⁷ Kaminker C. and F. Stewart, "The Role of Institutional Investors in Financing Clean Energy," OECD Working Papers on Finance, Insurance and Private Pensions, No. 23, OECD Publishing, 2012, 20-22, http://www.oecd.org/environment/WP_23_TheRoleOfInstitutionalInvestorsInFinancingCleanEnergy.pdf

⁸ IEA, World Energy Outlook 2012, (Paris: OECD/IEA, 2012), 34-35.

⁹ Assuming that over the coming decade annual upstream capital investment in fossil fuels is at least equal to the IEA's 2012 estimate for upstream oil and gas capital investment of nearly \$700

¹⁰ CarbonTracker and the Grantham Research Institute, Unburnable Carbon 2013: Wasted capital and stranded assets, 2013, http://www.carbontracker.org/wastedcapital. Generation Foundation, Stranded Carbon Assets: Why and How Carbon Risks Should Be Incorporated in Investment Analysis, October 30 2013, http://genfound.org/library/.

¹¹ HSBC Global Research, Oil & carbon revisited—Value at risk from 'unburnable' reserves, January 25, 2013

As the investment consultancy Mercer has noted, certain climate-sensitive investments, particularly those that promote a low-carbon future, may reduce overall portfolio risk, creating "the prospect that institutional investors' interests can be aligned to both serve their beneficiaries' financial interests as well as help tackle the wider challenge of climate change by increasing investment in mitigation and adaptation efforts globally."¹²

It is in the collective interests of institutional investors to mitigate the substantial systemic economic risks posed by climate change, and investing in the necessary transition to a low-carbon, clean energy economy helps mitigate these risks.

KEY RECOMMENDATIONS

Drawing on an extensive review of published research and discussion with leading investors and clean energy practitioners, this paper outlines 10 recommendations for investors, companies and policymakers to create a landscape to achieve the interim goal of doubling annual clean energy investment by 2020, and to build the foundation for achieving the "Clean Trillion"—at least \$1 trillion in annual investment in clean energy by 2030.

Our primary audience for the paper is institutional investors, but it is also directed at electric utilities, large companies, utility and financial regulators, and policymakers. Most of the recommendations are direct investor activities, but several encourage companies, regulators and policymakers to pursue necessary policies and actions to accelerate clean energy investment.

We acknowledge at the outset that each investor has specific mandates, risk-return requirements and investment processes, and that the recommendations must be implemented in the context of these requirements.

The 10 recommendations fall into three categories. Below we highlight how each impacts the risk and return characteristics of portfolio investments:

MOBILIZE INVESTOR ACTION TO SCALE UP CLEAN ENERGY INVESTMENT

1. Develop capacity to boost clean energy investments and consider setting a goal such as 5 percent portfolio-wide clean energy investments

The heightened commitment resulting from a portfolio-wide goal would give investors the best chance of capitalizing on new clean energy-related opportunities across all asset classes, especially fixed income, as opposed to relegating this clean energy theme to just public equity or venture capital. Bolstering internal and external capacity for increased infrastructure investment, both directly and through other vehicles, will strengthen the potential to pair the necessary cash flows of clean energy infrastructure assets with investor liabilities and funding requirements.

2. Elevate scrutiny of fossil fuel companies' potential carbon asset risk exposure

In a 2011 report, Mercer warned that climate-related government policies could increase portfolio risks by 10 percent over the next 20 years. The potential for reduced demand for fossil fuels driven by non-policy factors such as increased renewable energy, energy efficiency and fuel switching, also creates risks for investors who own fossil fuel companies. Investors should be paying increased attention to carbon asset risks by engaging with fossil fuel firms, including oil and coal companies, on the potential of higher cost, carbon-intensive fossil fuel reserves becoming "stranded," thus creating long-term portfolio risks.

¹² Mercer, Climate Change Scenarios-Implications for Strategic Asset Allocation, February 15, 2011, 9, http://www.mercer.com/articles/1406410.

3. Engage portfolio companies on the business case for energy efficiency and renewable energy sourcing, as well as on the financing vehicles to support such efforts

Encouraging companies to aggressively pursue energy efficiency opportunities can help unlock projects with high returns, thereby creating shareholder value. By using more clean energy resources to reduce fossil fuel dependency and carbon emissions, companies will: 1) reduce vulnerability to volatile fossil fuel prices; 2) reduce exposure to future carbon regulations; and 3) identify new potential low-carbon business opportunities and customer solutions, leading to new revenues. All of these benefits underpin academic research showing that, over the long term, companies with leading environmental performance also deliver superior financial returns for investors.¹³

4. Support efforts to standardize and quantify clean energy investment data and products to improve market transparency

Standardizing definitions of key investment terms, such as what constitutes a "climate bond," will minimize the due diligence burden on investors and reduce transaction costs of investing in newer clean energy-related investment products. By reassuring potential buyers about what they are purchasing, standardization will also increase the liquidity of climate bonds and other products. Ultimately, better data on clean energy investment will foster easier, more precise benchmarking evaluation of potential deals.

PROMOTE GREEN BANKING AND DEBT CAPITAL MARKETS

5. Encourage "green banking" to maximize private capital flows into clean energy

Expanded issuance of climate bonds by multilateral banks will broaden the universe of highly-rated fixed-income products attached to clean energy, thereby making it easier for investors to increase allocations to clean energy within existing liquidity/creditworthiness constraints. Investment-grade credit ratings for project bonds, such as S&P's recent approval of SolarCity bonds, will enable investors to capture the relatively higher yield of these instruments, especially relative to sovereign debt. The \$2.5 trillion covered bond market offers attractive products for pension funds and insurers—extra yield relative to sovereign debt, but with less risk than unsecured bank debt or asset-backed securities—and expanding this market into clean energy will increase such opportunities.

6. Support issuances of asset-backed securities to expand debt financing for clean energy projects

Asset-backed securities (ABS) for energy efficiency and renewable energy projects offer long-term, low-volatility yields that match well with the liabilities of insurers and pension funds. To reach a scale that is attractive to these investors, however, this market must overcome growing pains that are common to any new capital markets product. Key steps for achieving scale include: 1) minimize the due diligence burden on buyers of clean energy issues by standardizing terms for power purchase agreements; 2) make future cash flows from such issues more stable; 3) enable more accurate rating and pricing of such issues by providing more detailed historical data; and 4) limit downside risk for buyers of early clean energy ABS issues through credit enhancement by public or private banks.

7. Support development bank finance and technical assistance for emerging economies

Expanded risk insurance for clean energy investments in developing countries removes a key red flag on otherwise attractive investments. More generally, one of the ancillary benefits from helping emerging economies to embrace a low-carbon future may be significant new investment opportunities for foreign sources of capital. It's worth noting that development bank financing creates \$3-15 of private investment opportunity for every \$1 of public funds deployed.¹⁴

¹³ DB Climate Change Advisors, Sustainable Investing: Establishing Long-Term Value and Performance, May 2012, https://www.dbadvisors.com/content/_media/Sustainable_Investing_2012.pdf

¹⁴ UNEP/SEFI, Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation, 2008, http://fs-unep centre.org/sites/default/files/media/uneppublicfinancereport.pdf

REFORM CLIMATE, ENERGY AND FINANCIAL POLICIES

8. Support regulatory reforms to electric utility business models to accelerate deployment of clean energy sources and technologies

With a combined enterprise value of trillions of dollars, relatively low volatility and predictable earnings, the debt and equity of electric utilities have long been a significant share of institutional investor portfolios. But many trends are eroding the viability of traditional utility business models, which have long been premised on selling more power rather than helping ratepayers use less electricity. As stewards of trillions of dollars of capital, investors have a strong interest in ensuring that electric utilities remain financially viable in a changing landscape, where energy efficiency and distributed renewable energy are becoming bigger factors. Supporting utilities' transition to new, more sustainable business models will preserve the electric utility sector as a viable place for investors to put their capital to work.

9. Support government policies that result in a strong price on carbon pollution from fossil fuels and phase out fossil fuel subsidies

Climate change has the potential to harm long-term investor returns via 1) physical impacts, such as rising sea levels and more pronounced storms and heat waves, which can severely damage individual companies and entire economies;¹⁵ and 2) the implementation of policies to reduce carbon emissions, which, especially if delayed for another decade or so, may come as a drastic and abrupt shock to company business models and economies at large. Adoption of economy-wide carbon prices now helps to prevent both of these risks, and enables investors to plan prudently for the transition to a low-carbon global economy. More broadly, the adoption of carbon prices and removal of fossil fuel subsidies will create supportive tailwinds across all asset classes for low-carbon investments and headwinds for high-carbon investments such as oil, gas and coal production.

10. Support policies to de-risk clean energy deployment

Policies that provide stable, long-term cash flows to clean energy projects that do not depend on unreliable and often complicated tax incentives will make clean energy significantly more attractive to institutional investors, especially as clean energy technologies approach cost competitiveness. Moreover, a focus on large-scale deployment will create investment opportunities of the size necessary for investors to justify building expertise in this new area. Finally, the lower project costs that come with increased clean energy deployment will stimulate more investment opportunities potentially worth trillions of dollars.

FOR MORE INFORMATION

To download a free copy of the Ceres report, Investing in the Clean Trillion: Closing the Clean Energy Investment Gap, please visit www.ceres.org/cleantrillion

15 Stern, N. Nicholas Herbert, ed. Economics of Climate Change: the Stern Review. Cambridge University Press, 2007.



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