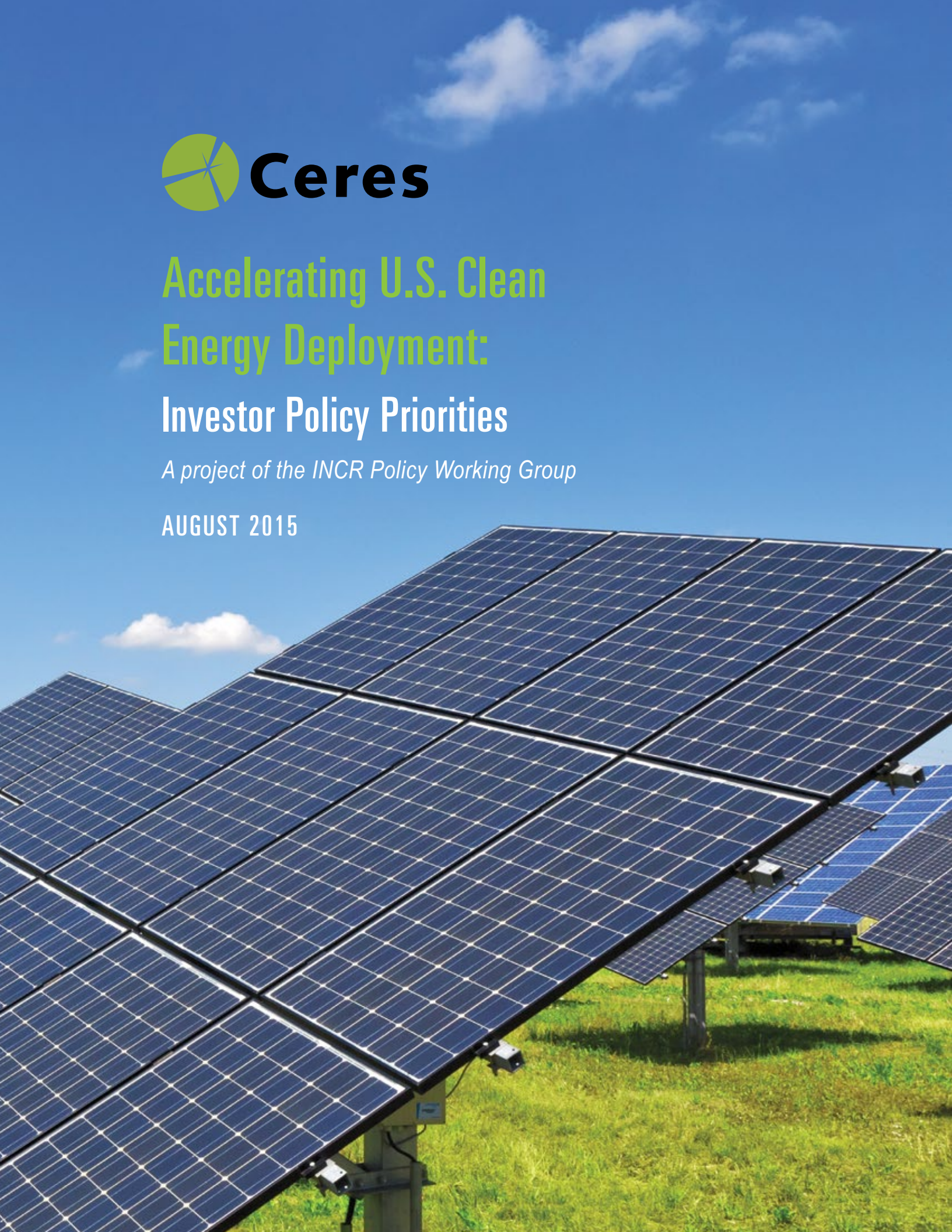

Ceres

Accelerating U.S. Clean Energy Deployment:

Investor Policy Priorities

A project of the INCR Policy Working Group

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EXECUTIVE SUMMARY

2015 is shaping up to be a pivotal year for climate policy internationally. In December, 192 countries will convene in Paris to finalize a climate agreement intended to keep global temperature increases below two degrees Celsius.

An agreement will come at a critical time. International investment to mitigate climate change is far below levels needed to reach the two-degree target. The International Energy Agency estimates that an average of an additional $1 trillion in incremental financing for clean energy is needed to meet the temperature target[1]—the "Clean Trillion." Currently, global clean energy investment levels are about 25 percent of what is needed: $321 billion in 2014.[2]

Institutional investors, and the corporations they invest in, are playing a growing role in financing the clean energy infrastructure needed to meet international climate goals. These investors and companies must support policymakers who seek an international agreement that will provide clearer market signals and greater certainty for needed clean energy investments.

In September 2014, over 350 investors representing $24 trillion in assets issued the Global Investor Statement on Climate Change, calling on governments to create an ambitious global agreement that includes a meaningful price on carbon.[3] Climate change poses portfolio-wide risks to institutional investors, while the technologies and business models needed to address climate change provide significant investment opportunities. Ceres has outlined recommendations for institutional investors, the companies they invest in, and policymakers to achieve the needed new investment of $1 trillion annually in its 2014 report, *Investing in the Clean Trillion: Closing the Clean Energy Investment Gap*.[4] Ceres and our U.S. and international investor network partners also recently released a guide for asset owners, *Climate Change Investment Solutions*,[5] as well as a web-based platform for identifying and recording climate, clean energy and decarbonization investments and commitments.[6]

This paper connects the Clean Trillion goal to the current United States climate and clean energy policy framework, which is a mixture of federal, state, and local initiatives. The paper outlines the 2015 U.S. policy priorities of the Policy Working Group of the Investor Network on Climate Risk (INCR), a network of more than 110 institutional investors primarily based in the U.S., focused on investment risks and opportunities associated with climate change.

Protecting and scaling policies that help to bring institutional investors' capital into clean energy will be key to achieving the pledge made by the United States to reduce emissions by 17 percent by 2020 and by 26-28 percent by 2025. Strong and credible U.S. targets will be key, in turn, to achieving an international agreement in Paris. With clear policy frameworks in place, institutional investors are poised to play a greater role in financing clean energy.

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1 International Energy Agency (IEA), *Energy Technology Perspectives 2012: Pathways to a Clean Energy System*, (Paris: OECD/IEA, 2012), 1, http://www.iea.org/etp/etp2012/

2 Bloomberg New Energy Finance, "Clean Power Investment Declines 0.2% to $73.5 Billion," July 13th, 2015, http://about.bnef.com/bnef-news/clean-power-investment-slumps-28-in-quarter-amid-market-turmoil/

3 Investor Network on Climate Risk et al, *Global Investor Statement on Climate Change*, September 18th, 2014, http://investorsonclimatechange.org/

4 Mark Fulton and Reid Capalino, *Investing in the Clean Trillion: Closing the Clean Energy Investment Gap*, Ceres, January 2014, www.ceres.org/issues/clean-trillion

5 Investor Network on Climate Risk et al., *Climate Change Investment Solutions Guide*, April 22, 2015, http://bit.ly/1cONmOM.

6 *The Investor Platform for Climate Solutions*, http://investorsonclimatechange.org.

Any policy framework that hopes to bring institutional investors' capital to financing clean energy infrastructure should consider impacts across a diversified portfolio, since institutional investors typically invest broadly across asset classes and industries. Already, investors (including pension funds, mutual funds, and insurance companies) are investing in green bonds, new instruments like YieldCos, private equity funds financing renewable energy projects, and a range of companies producing or using clean energy services and products.

SUMMARY OF U.S. POLICY PRIORITIES FOR 2015

Institutional investors are uniquely positioned to support the growth of a low-carbon economy, and we recommend that federal and sub-national policymakers support policies that enable the scaling-up of clean energy deployment that drives technology, business model, and financial innovation. Such policies should provide connections between needed clean energy technology in key sectors and the investment needs and portfolios of institutional investors in the United States. To this end, INCR's key policy priorities for 2015 include:

Enable clean energy scale and equity

1) Provide stability for the federal production tax credit for wind, investment tax credit for solar, and accelerated depreciation for renewable energy;

2) Expand Master Limited Partnerships and Real Estate Investment Trusts to include renewable energy; and

3) Adopt city building benchmarking and disclosure ordinances that provide transparency on the energy efficiency of the $800 billion Real Estate Investment Trust industry.

Enable the evolution of the electric utility business model

4) Maintain and expand state climate and clean energy standards (renewable energy, energy efficiency, AB32, RGGI, etc.);

5) Develop robust final rules for the Environmental Protection Agency's Carbon Pollution Standards for new and existing power plants and ensure strong implementation by states through proven policies, such as renewable portfolio standards and energy efficiency resource standards; and

6) Remove legal barriers that prevent companies and other electricity consumers from entering into third-party power purchase agreements with renewable energy developers.

Support the scaling of clean transportation technologies

7) Support the adoption of rigorous federal fuel economy and GHG emission standards for heavy-duty trucks;

8) Support the preservation of the Corporate Average Fuel Efficiency (CAFE)/GHG standards for passenger vehicles and light trucks; and

9) Adopt and expand state-level clean fuel standards.

This is a pragmatic and achievable agenda rather than a set of principles and ideal policy outcomes. Both the U.S. and international policy environments are falling short of the level of ambition needed to achieve the internationally adopted goal of limiting global temperature rise to no more than two degrees Celsius.[7] Ultimately, a key goal of INCR, as noted in the

7 Henry D. Jacoby and Y.-H. Henry Chen, *Expectations for a New Climate Agreement*, MIT Joint Program on the Science and Policy of Global Change, August 2014, http://globalchange.mit.edu/files/document/MITJPSPGC_Rpt264.pdf

Global Investor Statement, is a meaningful price on carbon in the U.S. and internationally. In the interim there is much that can be achieved with the pragmatic agenda outlined above and discussed at further length in this paper. Part of the pragmatism of this agenda is a recognition of both the current partisan divide in the U.S. Congress and many state legislatures on climate and clean energy issues, and the current investment practices of U.S. institutional investors and the limitations to – and opportunities for – greater investment in clean energy.

ENGAGING THE WORLD'S LARGEST INVESTORS IN CLEAN ENERGY INVESTMENT REQUIRES GREATER OPPORTUNITIES ACROSS INVESTMENT PORTFOLIOS

Institutional investors manage a massive pool of capital that could be tapped to scale up clean energy finance. Thus far, however, institutional investors have not been a leading source of capital for clean energy. Pension funds and insurance companies only accounted for $22 billion (or 2.5 percent) of clean energy asset finance globally from 2004-2011.[8] This is despite estimates that institutional investors could invest $819 billion globally, even after accounting for diversification, industry concentration limits, and other restrictions.[9]

Currently, there are a limited number of clean energy investment vehicles available for institutional investors. Institutional investors typically invest for broad diversification across multiple asset classes and primarily invest in publicly listed securities like stocks and bonds. It is in this area where investment opportunities have been particularly lacking. Indeed, when appropriate investment vehicles – such as rated "green" bonds – have been available, they have been met with institutional investor demand that far exceeds supply.[10]

A look at how institutional investors allocate their capital demonstrates the gap between the capital needed for clean energy and the investment needs and practices of the investors. Currently, renewable energy and energy efficiency infrastructure investment predominantly comes from private capital sources. Wind farms, solar generators, and energy efficiency retrofits are typically financed through corporate balance sheets, bank loans, and other forms of private equity and debt. Institutional investors, however, only have limited exposure to the entire set of private equity asset classes. While U.S. pension funds may invest in private equity funds that in turn invest in renewable energy infrastructure, private equity generally constitutes a relatively small portion of a pension funds' investments, and clean energy is only a small portion of that allocation. Furthermore, diversification requirements often dictate that energy investments only constitute a relatively small portion of those investments. Pension funds in the United States have, in aggregate, just 29 percent of their assets in private equity and other alternative

8 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_TheRoleOfInstutionalInvestorsiInFinancingCleanEnergy.pdf

9 Note that this estimate excludes investment managers. Climate Policy Initiative (CPI), *The Challenge of Institutional Investment in Renewable Energy*, March 2013, 18, http://climatepolicyinitiative.org/wp-content/uploads/2013/03/The-Challenge-of-Institutional-Investment-in-Renewable-Energy.pdf. CPI estimates $257 billion available for direct project investments, which it then breaks down into $66 billion for project equity and $290 billion for project debt. CPI then estimates up to another $562 of investment via pooled investment vehicles ($272 billion project equity and $290 billion project debt).

10 The Climate Bonds Initiative and HSBC, *Bonds and Climate Change: the state of the market in 2014*, July 2014, 6, http://www.climatebonds.net/files/files/-CB-HSBC-15July2014-A4-final.pdf

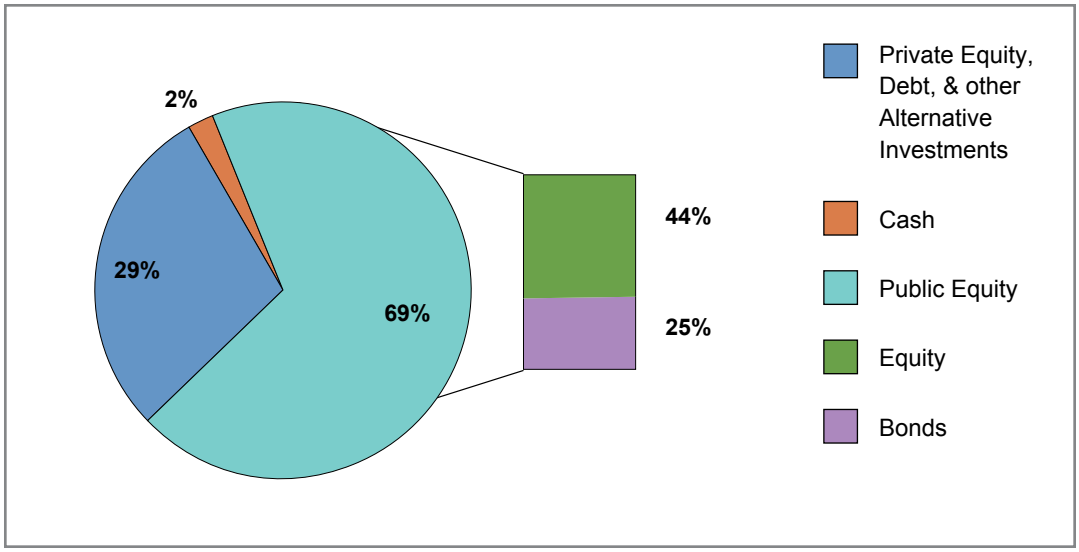

Figure 1: Typical U.S. Pension Fund Asset Allocation

investments. About 2 percent of assets are held as cash. The remaining 69 percent of a typical U.S. pension funds' assets are in public capital markets, primarily listed equities (stocks) and fixed-income (bonds).[11]

Given the disconnect between current capital sources for clean energy and the asset allocations of institutional investors, any policy framework should consider the impacts of policy not only on (1) **direct investment** by institutional investors, but also (2) **semi-direct investment** in funds and new, publicly-traded-vehicles for infrastructure investment, as well as (3) **indirect investment** in clean energy infrastructure through corporations in which these investors are shareholders. Table 1 provides an overview of the spectrum of categories of investment opportunities.

DIRECT INVESTMENT IN CLEAN ENERGY

Direct investment in renewable energy infrastructure

Among U.S. pension funds, mutual funds, insurance companies and other large institutional investors, equity investment in wind farms, solar power plants, energy efficient buildings and retrofit projects and other clean energy infrastructure is limited. As mentioned above, these investors generally do not participate in equity or debt financing of individual projects, let alone energy projects. However, while direct investment is constrained, it is nonetheless significant.

There has been some direct investment in renewable energy projects through project bonds. These project bonds raise debt based on the revenues of a single project. In 2013, $3.1 billion of project bonds were issued, including over $1 billion just to finance Berkshire Hathaway's Topaz Solar project.[12] While Bloomberg New Energy Finance predicts that such project bond financings could support $18-40 billion in annual project financing or refinancing by 2020,[13] most renewable energy projects are too small for project bond financing and require aggregation of numerous projects in order to be financed through bonds.

11 Towers Watson, *Global Pension Assets Study 2015*, February 2015, 7, http://www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2015/02/Global-Pensions-Asset-Study-2015

12 Bloomberg New Energy Finance, *Green Bonds Market Outlook 2014*, June 2 2014, 16, http://about.bnef.com/white-papers/green-bonds-market-outlook-2014/content/uploads/sites/4/2014/06/2014-06-02-Green-bonds-market-outlook-2014.pdf

13 Bloomberg New Energy Finance, *Green Bonds Market Outlook 2014*

	ASSET CLASS	VEHICLES FOR INVESTMENT
Direct investment	Private equity and debt	Principal in unlisted green infrastructure projects through equity, debt, or mezzanine financing
	Public debt	Project bonds
Semi-direct investment	Private equity	Investment in pooled vehicles such as: - infrastructure venture capital/private equity funds that invest in projects - private placement asset backed securities
	Publicly-traded debt or equity	Investment in pooled vehicles such as: - asset backed securities - Master Limited Partnerships - Real Estate Investment Trusts - YieldCos
Indirect investment	Private debt	Private placement corporate bonds
	Publicly-traded debt or equity	Debt: - Publicly listed equity or corporate bonds and other green bonds Equity: - Infrastructure venture capital/private equity funds that invest in companies - Increased shareholder value from companies diversifying into clean energy technology/services OR using technologies/services for their own operations

Table 1: Ways for Institutional Investors to Finance Clean Energy

In other parts of the world, institutional investors—such as the Netherlands' AP4, PensionDanmark, various Australian Superannuation funds, and the insurance company Munich Re—invest directly and substantially in clean energy projects. Research done by the Climate Policy Initiative suggests that more institutional investors, including those in the U.S., could invest in renewable energy projects if they have enough scale to justify having a dedicated energy project team. By their calculation, a pension fund with over $50 billion in assets has sufficient scale.[14] The universe of investors of this scale, however, is relatively small. According to Towers Watson's most recent ranking of the world's largest pension funds, fewer than 30 federal, state, and private pension funds in the U.S. have over $50 billion in assets.[15] Especially given this limited universe of investors, any policy framework that hopes to scale renewable energy investment by institutional investors must look beyond direct investment.

Direct investment in energy efficiency through real estate holdings

While it is rare for institutional investors to invest directly in energy generation projects, a number of U.S. institutional investors do own buildings directly. Through these buildings, investors have an opportunity to directly benefit from the financial returns associated with more energy efficient buildings.

Efficient buildings have consistently shown significant returns to property owners in terms of higher rents, building value increases, and higher occupancy rates, which can lead to increased value for investors. McGraw Hill Construction has analyzed a range of financial benefits from improving building efficiency. Among their findings: building values increase between 6 and 10 percent and rents rise by up to 6 percent.[16] Another large study examined 10,000 buildings

14 Climate Policy Initiative, 35

15 Towers Watson, *The World's 300 Largest Pension Funds- year end 2013*, September 2014, http://www.towerswatson.com/en-US/Insights/IC-Types/Survey-Research-Results/2014/09/The-worlds-300-largest-pension-funds-year-end-2013

16 McGraw Hill Construction, Green Outlook 2011: *Green Trends Driving Growth*, November 2010, http://aiacc.org/wp-content/uploads/2011/06/greenoutlook2011.pdf. Ranges result from differences between retrofits and new buildings.

Green Bonds: Defining an Emerging Asset Class

Green bonds are a rapidly growing but not clearly defined universe of investments. Pioneered by development banks nearly a decade ago, green bonds have grown dramatically. The market for labeled green (or "climate") bonds has been estimated at $38 billion[17] to a half-trillion dollars ($502 billion)[18] depending on definition. These bonds include financing for traditional investments that have the benefit of reducing greenhouse gas emissions, such as government bonds to finance public transportation. Green bonds also encompass more novel investments, such as corporate bonds that are "ring-fenced" to finance clean energy projects or solar asset-backed securities. Given the broad universe of green bonds, and the ambiguity around their definition, Ceres convened a number of large institutional bond purchasers to develop a set of "investor expectations" for green bonds. These Investor Expectations build on, and complement, the 2014 Green Bond Principles developed by banks that structure and sell bonds[19] by addressing four key areas that need greater definition and structure: 1) eligibility criteria, 2) disclosure of use of proceeds, 3) reporting on use of proceeds and impacts, 4) independent assurance.[20]

17 Bloomberg New Energy Finance, "Rebound in Clean Energy Investment in 2014 Beats Expectations," January 9 2015, http://about.bnef.com/press-releases/rebound-clean-energy-investment-2014-beats-expectations/

18 The Climate Bonds Initiative and HSBC, 2014, 3

19 Bank of America, Citigroup, Credit Agricole, et al. "Green Bond Principles Created to Help Issuers and Investors Deploy Capital for Green Projects," January 13, 2014, http://www.ceres.org/press/press-releases/green-bond-principles-created-to-help-issuers-and-investors-deploy-capital-for-green-projects

20 Ceres, "A Statement of Investor Expectations for the Green Bond Market," February 10, 2015, http://www.ceres.org/files/investor-files/statement-of-investor-expectations-for-green-bonds/at_download/file

evaluated for energy efficiency, comparing efficient buildings with buildings nearby that are similar in all other respects. This study found that buildings which have earned Energy Star or LEED ratings outperform their peers on a number of metrics including per-square-foot rental rates that are 3 percent higher, overall rents that are 7 percent higher, and selling prices that are 16 percent higher.[21]

Given the benefits of energy-efficient real estate, investors have been making properties they own more efficient. The California Public Employees' Retirement System (CalPERS), which has a real estate portfolio of over $25 billion, worked with core real estate investment managers to pursue a 20 percent energy reduction. CalPERS exceeded its goal. The California State Teachers Retirement System (CalSTRS) has, since 2003, directed real estate managers for its separate accounts to assess building sustainability annually. The result has been a dramatic improvement of the energy performance ratings of buildings in the portfolio. In 2007, less than half (46 percent) of the buildings in CalSTRS's portfolio had an Energy Star score above 75; by 2014, 86 percent of buildings achieved that rating.

Most institutional investors in the United States, however, do not own buildings directly, just as they do not directly invest in renewable energy infrastructure. There is therefore a need for semi-direct investment vehicles that can provide exposure to clean energy opportunities in renewable energy, efficient real estate, and beyond.

CONNECTING INSTITUTIONAL INVESTORS THROUGH SEMI-DIRECT INVESTMENTS IN INFRASTRUCTURE

Given the limitations to direct investment in clean energy infrastructure, indirect investment options open clean energy investment to a much broader universe of investors. New publicly-traded, semi-direct investment vehicles are emerging to fill this need. Such publicly traded vehicles are critical to attracting a broader universe of investors who need liquid investment opportunities, but want exposure to the attractive financial characteristics of clean energy projects, including their typical stable cash-flows that come from long-term contracts with energy offtakers.

21 Eichholtz et al., *Doing Well by Doing Good? Green Office Buildings*, The American Economic Review, December 2010

Indirect investments in renewable energy project equity and debt

The emerging equity option of choice for financing renewable energy projects is the YieldCo structure. YieldCos are publicly traded corporate entities that provide some of the benefits of investing directly in electricity generation projects while providing the liquidity of a publicly traded security. A number of YieldCos have been created just in the past two years, including Pattern Energy (PEGI), NextEra Energy Partners (NEP), TerraForm Power (TERP), and NRG Yield (NYLD).[22]

Though small in scale thus far, there are numerous debt instruments coming onto the market. These investments in clean energy infrastructure debt are part of a burgeoning green/climate bond market (see sidebar, "Green Bonds: Defining an Emerging Asset Class"). A portion of this financing is flowing to clean energy infrastructure through indirect investment vehicles, such as asset-backed securities. In 2013, Hannon Armstrong Sustainable Infrastructure issued $100 million in bonds backed by clean energy projects. SolarCity followed later in the year with an issuance of $54.4 million in bonds, and the company has subsequently sold bonds backed by additional pools of solar projects.[23] Expect to see additional clean energy bond issuances from more issuers in the future.

Indirect investments in energy efficiency retrofit financing

Indirect financing opportunities remain limited for energy efficiency, trailing behind renewable energy. This is despite the estimated $279 billion investment opportunity in retrofitting U.S. buildings.[24] Constraints on the institutional investment needed to realize this opportunity were outlined in Ceres' report, *Power Factor: Institutional Investors' Policy Priorities Can Bring Energy Efficiency to Scale*.[25] The key constraint is a lack of appropriate investment vehicles. Securitization and other forms of indirect investment will be needed so that numerous small projects can be aggregated for financing.

There have been a handful of energy efficiency securitizations, such as a $24.3 million issuance by the New York State Energy Research and Development Authority (NYSERDA)[26] and a private placement of bonds issued by Citi from Pennsylvania's Keystone HELP residential energy efficiency retrofit program.[27] Most notably, the Western Council of Governments' HERO program issued a rated bond, which was backed by property-assessed clean energy (PACE) loans made to numerous homeowners in California. A number of others look to be on the horizon, with Citi creating a $100 million credit facility[28] to finance projects developed by Kilowatt Financial, and Renewable Funding securing a $300 million credit facility to finance PACE-financed projects.[29] Kilowatt Financial and Renewable Funding both ultimately seek to securitize the loan portfolios financed by these funds.

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22 Giles Parkinson, "$1 trillion solar, wind finance to outstrip oil and gas industry," RE New Economy, July 20, 2015, http://reneweconomy.com.au/2015/1-trillion-solar-wind-finance-to-outstrip-oil-and-gas-industry-63176

23 Bloomberg New Energy Finance, *Green Bonds Market Outlook 2014*, June 5, 2014, http://about.bnef.com/white-papers/green-bonds-market-outlook-2014/

24 DB Climate Change Advisors and The Rockefeller Foundation, *United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models*, March 2012, http://www.rockefellerfoundation.org/

25 Ceres, *Power Factor: Institutional Investors' Policy Priorities Can Bring Renewable Energy to Scale*, May 2013, available at: http://www.ceres.org/resources/reports/power-factor-institutional-investors2019-policy-priorities-can-bring-energy-efficiency-to-scale/view

26 "NYSERDA Issues Energy Efficiency Financing Bonds", Breaking Energy, August 23, 2013, http://breakingenergy.com/2013/08/23/nyserda-issues-energy-efficiency-financing-bonds/

27 Anya Litvak, "Looking for loans with an energy angle," *Pittsburg Post-Gazette: Power Source Blog*, October 6th, 2014, http://powersource.post-gazette.com/powersource/companies-powersource/2014/10/06/Looking-for-loans-with-an-energy-angle/stories/201410060217

28 Stephen Lacey, "Energy Efficiency is About to Get a $200M Jolt from Wall Street", *Greentech Media*, January 22, 2014, http://www.greentechmedia.com/articles/read/Energy-Efficiency-Is-About-to-Get-a-200M-Jolt-From-Wall-Street

29 Jeff St. John, "PACE on the Rebound: Renewable Funding Closing $300M Credit Facility," *Greentech Media*, May 9, 2014, http://www.greentechmedia.com/articles/read/pace-on-the-rebound-renewable-funding-closing-300m-credit-facility

Case Study: Solar City Leverages Policy to Scale and Reaches the Public Capital Markets

SolarCity (SCTY) went public in December 2012, with an initial public offering on the NASDAQ stock exchange. However, its most interesting contribution to the public capital markets came in November 2013, when Solar City became the first company to issue bonds backed by revenues from the power purchase agreements they enter into with customers. The company issued a second round of bonds in March of 2014, and in October 2014, the company issued bonds that retail investors could purchase.

Like other companies in the solar space, SolarCity structures power purchase agreements or leases with customers that allow the customer to pay as little as $0 up front. It has done this by not only creating an attractive financing option for customers, but also by monetizing incentives for solar, particularly the investment tax credit and renewable electricity certificates that are associated with renewable energy standards. It has also taken advantage of net-metering, which allows its customers to sell their excess electricity back onto the grid.

SolarCity's success in bringing solar to the public capital markets brings new investment opportunities into asset classes accessible by a broad set of institutional (and now retail) investors. Its success also demonstrates how policy—particularly the Investment Tax Credit, renewable portfolio standards, and net-metering—scaled the industry to the point where cheaper sources of capital can now enter into the sector to drive down costs and contribute to the increasing competitiveness of renewable energy. Indeed, research suggests that securitization could further lower the cost of solar projects between 5 and 13 percent.[30]

30 Theresa Alafita and Joshua Pearce, "Securitization of Residential Solar Photovoltaic Assets: Costs, Risks and Uncertainty," *v*, 67 (2014), 488-498, http://www.sciencedirect.com/science/article/pii/S0301421513013098

	DESCRIPTION	EXAMPLES
YieldCos	A publicly traded company that provides some of the benefits of investing directly in electricity generation projects (e.g., stable cash flows) while providing the liquidity of a publicly-traded security	Terraform Power (TERP) NextEra Energy Partners (NEP) NRG Yield (NYLD) Pattern Energy Group (PEGI)
Asset backed securities (ABS)	A bond where the repayment of the bond comes through cash flows from a set of loans or other revenue streams and the rating of the bond is based on those cashflows rather the creditworthiness of the issuer.	Solar City issues bonds backed on solar power purchase agreements California HERO program issues property assessed clean energy (PACE) bond Toyota issues bonds backed on hybrid and electric vehicles

Table 2: Emerging Semi-Direct Investment Opportunities

Indirect investments in advanced vehicles

Unlike in renewable energy and energy efficiency financing, there has been a long history of securitizing loans for motor vehicles. Toyota was the first car company to modify this practice to enable clean vehicle investment. In March 2014, the company issued $1.75 billion of investment-grade bonds backed on loans for hybrid and electric vehicles.[31] It remains to be seen whether other car companies will follow Toyota's lead. However, new clean vehicle investments have been facilitated through indirect investments in car companies, like Tesla Motors, and other publicly traded companies that are building clean energy vehicles and infrastructure. Indeed, in transportation and beyond, indirect investment is likely to comprise institutional investors' greatest exposure to clean energy investment opportunities.

INDIRECT INVESTMENT IN CLEAN ENERGY INFRASTRUCTURE

The broadest opportunity for institutional investors to finance clean energy infrastructure may also be the least direct. As diversified investors, institutional investors hold equity in, and debt of, companies across sectors—from utilities, to oil and gas companies, clean energy companies, auto manufacturers and suppliers, consumer goods companies and beyond. There is an opportunity to mobilize a tremendous amount of capital through the balance sheets and operating expenditures of corporations not otherwise invested in clean energy. There is also significant risk from companies failing to adequately mitigate the impacts of climate change.

Those companies with the most shareholder value at risk are those with the most capital invested in carbon intensive fuels and infrastructure. In September 2013, an international group of 75 institutional investors representing more than $4 trillion in assets launched the Carbon Asset Risk Initiative—a coordinated effort to spur 45 of the world's largest fossil fuel companies to address the physical and financial risks posed by climate change. This effort builds on a strong history of U.S. institutional investors engaging with companies in their portfolios to improve performance related to climate change mitigation. In 2014 alone, 148 shareholder resolutions related to climate change and sustainability were filed with U.S. companies, resulting in 66 agreements for corporate action requested by investors. And in 2015, additional shareholder resolutions already have resulted in overwhelming shareholder votes in support of climate risk disclosure and actions by companies including BP, Shell and Statoil.

31 Allison Bisbey, "Toyota Debuts Green Auto Bond," *Asset Securitization Report*, March 26, 2014, http://www.structuredfinancenews.com/issues/2014_4/-248702-1.html

Evidence already exists that improved investment returns can come from improved corporate practices related to climate risk. The nonprofit CDP has found that corporations actively managing and planning for climate change achieved an 18 percent higher return on investment (ROI) than those that are not. These forward-thinking companies enjoy ROI performance that is 67 percent better than companies that fail to even disclose their emissions. [32]

Institutional investors are engaging companies in their portfolios on clean energy related issues with both the financial opportunities and risks in mind. They are focused on two key sectors – electricity and transportation – particularly in the context of U.S. policy developments.

Realizing opportunities and limiting risks in the electricity and transportation sectors

Any strategy aimed at reducing greenhouse gases requires significant focus on the electric power and transportation sectors. As Figure 3 shows, these two sectors alone constitute 60 percent of U.S. emissions. The capital expenditures electric and transportation companies make in the next few years will determine the trajectory of U.S. emissions for decades; poor decisions could lock us into a high-carbon future. At the same time, however, utilities and auto manufacturers can use their considerable balance sheets to finance clean energy and advanced technology deployment while protecting and enhancing shareholder value.

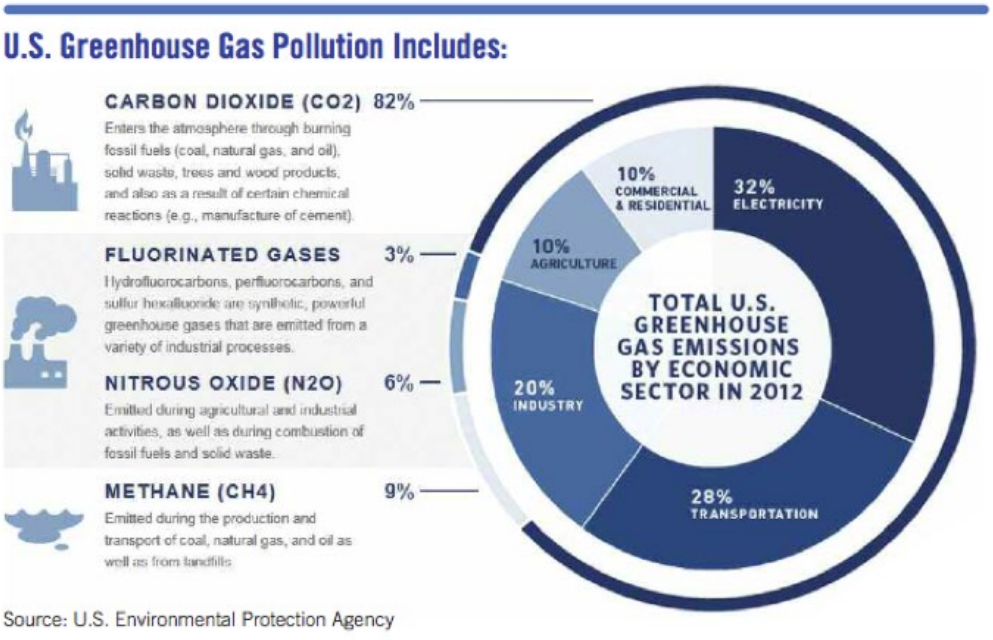

Figure 2: U.S. emission sources

32 CDP, *Climate Action and Profitability: CDP S&P 500 Climate Change Report 2014*, https://www.cdp.net/CDPResults/CDP-SP500-leaders-report-2014.pdf

Electric utility sector

Clean energy poses a risk to outdated utility business models. As energy efficiency has been deployed at greater scale, U.S. electricity consumption growth has flattened and in a number of markets is in decline, resulting in lost revenues from power sales for electric utilities nationwide.[33] At the same time, distributed resources not owned by utilities such as residential and commercial rooftop solar pose the risk of further reducing demand as customers receive an increasing amount of their energy needs through these distributed resources. In an extreme scenario, utilities could end up in a financial "death spiral" where the fixed costs of maintaining the electric grid is spread over shrinking customer bases and lower sales, resulting in higher rates, and subsequently an impetus for more customers to reduce demand through greater efficiency and self generation. This risk has led Barclays to downgrade the credit rating of the entire U.S. electric sector.[34] Another bank, UBS, has stated that with solar "on the edge of being a competitive power generation technology [and battery prices falling rapidly]…we expect transformational changes in the utility [sector]."[35]

In response to this challenge, some utilities and states have sought to limit competition through punitive charges to distributed energy resources, including limits to net metering, challenges to capacity market compensation for demand response, requests for above market power-purchase agreements for uncompetitive fossil and nuclear generation, and prohibitions against renewable energy contracts between non-utility companies and electricity customers. Others, like independent power producer NRG, are reconfiguring their business models to generate revenue from renewable energy, energy efficiency, storage, and other customer energy services. In addition, many utilities are recognizing the value of electric vehicles both as a way of compensating for decreased demand and of managing load. Given the increasing competitiveness of clean energy, investors have an interest in the utilities finding ways to generate revenue from clean energy rather than trying to limit its deployment. Failing to adapt could result in a loss of shareholder value as new market entrants claim market share from incumbent utilities.

As Ceres' report, *Practicing Risk Aware Regulation: What Every State Regulator Needs to Know*[36] demonstrated, the threats to utility business models from new technologies come at a time when much of the United States' electricity infrastructure is nearing the end of its useful lifetime. Given this aging infrastructure, it has been estimated that some $2 trillion in investment will be needed over the next 20 years, requiring annual investment roughly double recent levels.[37] This makes decisions about utilities' investments in long-lived infrastructure today critically important not only for the subsequent carbon emissions, but also the financial viability of the utilities. Beyond environmental regulations and the falling cost of alternative technologies, huge capital outlays, long construction times, and risk from natural disasters

33 U.S. Energy Information Administration, "U.S. electricity sales have decreased in four of the past five years", December 20, 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=14291

34 Michael Aneiro, *Barclays Downgrades Electric Utility Bonds, Sees Viable Solar Competition*, Barrons, May 23rd 2014, http://blogs.barrons.com/incomeinvesting/2014/05/23/barclays-downgrades-electric-utility-bonds-sees-viable-solar-competition/

35 John Vidal, *Big power out, solar in: UBS urges investors to join renewables revolution*, The Guardian, August 27, 2014, http://www.theguardian.com/environment/2014/aug/27/ubs-investors-renewables-revolution

36 Ceres, *Practicing Risk Aware Regulation: what every state regulator needs to know*, http://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation/view

37 Marc Chapuka et al., *Transforming America's Power Industry:The Investment Challenge 2010-2030*, The Brattle Group (Washington DC: The Edison Foundation, 2008), vi, http://www.brattle.com/_documents/UploadLibrary/Uplad725.pdf. Brattle"s investment estimates apply to the entire U.S. electric utility industry, including investor-owned utilities (IOUs), electric cooperatives, and government-owned utilities. From 2000-2005, overall annual capital expenditures by U.S. IOU's averaged roughly $48 billion; from 2006-2010 that number climbed to $74 billion; see Edison Electric Institute, *2010 Financial Review: Annual Report of the U.S. Shareholder-Owned Electric Utility Industry* (Washington DC: Edison Electric Institute, 2011), 18, http://www.eei.org/whatwedo/DataAnalysis/IndusFinanAnalysis/finreview/Documents/FR2010_FullReport_web.pdf

Figure 3: Cost and Risk of Electrical Generating Technologies

and water constraints provide further reason for utilities to move away from business models dependent on regulated returns on investment in capital-intensive thermal generation. Figure 3, taken from *Risk Aware Regulation*, demonstrates how different generation technologies compare through the lens of both cost and risk. One will notice that cleaner technologies are now competitive on a pure-cost basis. In addition, they typically have lower risk-profiles than their fossil fuel powered alternatives.

Institutional investors have significant exposure to utilities. In fact, market capitalization in shareholder-owned utilities was over a half-trillion ($504.4 billion) at the end of 2013.[38] With the aforementioned $2 trillion dollars of expected investment in new infrastructure, there is an opportunity to both ameliorate financial risks from utilities' current business models while driving significant investment in clean energy infrastructure.

Transportation sector

Like the electric sector, automotive industries face financial risks from carbon-intensive products. When General Motors and Chrysler entered bankruptcy at the end of the last decade, one oft-cited reason for their financial troubles was their over-reliance on sales of inefficient SUVs. As a result of the financial downturn and rising oil prices, SUV sales dropped precipitously. With the bankruptcy of GM and Chrysler, shareholders in the companies saw the

38 Edison Electric Institute, "Industry Data: statistical highlights", accessed 03/02/2015, http://www.eei.org/resourcesandmedia/industrydataanalysis/industrydata/Pages/default.aspx

value of their equity decimated. Going forward, shareholders face risks from companies that fail to meet global demands for greater efficiency and innovate, especially as formidable new participants like Tesla, Apple and Google enter the arena.

Unlike the 1970s, U.S. automotive manufacturers face a world where the bulk of future growth will be in foreign markets (particularly in China and other East Asian countries), which have tightening vehicle emission and fuel economy standards. Further, as more companies move toward global platforms in order to reduce fixed costs, it behooves them to develop and produce efficient vehicles. In turn, suppliers of advanced technologies, including those for electric vehicles, stand to benefit from the production of more fuel-efficient vehicles as well. Recent analysis by CDP suggests that as global vehicle standards rise, laggards are at risk of significant penalties that could impact shareholders. According to CDP's analysis, GM, Fiat-Chrysler, and Ford could face efficiency standard non-compliance fees of 33 percent, 15 percent, and 16 percent of earnings before interest and taxes (EBIT), respectively. These fees are significant and a competitive disadvantage vis-à-vis BMW, Volkswagen, Daimler, Hyundai, and Nissan, which are unlikely to face any fines.[39]

Corporate clean energy adoption

Within the past several years, new players have entered into utility-scale renewable energy procurement that was previously the exclusive domain of utilities. The country's 25 largest corporate solar buyers, including Walmart, Kohls, and Costco, have deployed over 445 MW of solar.[40] Companies like Microsoft, Mars, IKEA, Google, and Facebook have become major wind purchasers, each procuring hundreds of megawatts of wind power. These companies are becoming the norm: Ceres' *Power Forward 2.0* report showed 43 percent of Fortune 500 companies (and 60 percent of Fortune 100 companies) have a renewable energy target, energy efficiency target, and/or a greenhouse gas reduction target.[41]

While the reasons for pursuing corporate clean energy targets vary, they hold the promise of generating value for investors while creating a channel for indirect investment in clean energy infrastructure. Energy efficiency has clear cost saving benefits; generally, with very short payback periods as efficiency investments translate into enduring energy cost reductions. And as renewable energy becomes increasingly competitive, companies can not only lock in affordable clean energy, they can enter into long term contracts that take advantage of solar and wind's low operating costs and provide a valuable hedge against volatile energy costs. *Power Forward 2.0* showed that among Fortune 100 companies, over $1.1 billion in annual cost savings were achieved as companies pursued their clean energy targets. This frees up valuable resources that can be returned to shareholders or reinvested to grow the company.

Improved shareholder value through efficient real estate

Real Estate Investment Trusts (REITs) are one group of corporations that could benefit their investors through greater clean energy deployment. REITs are widely held by both institutional investors and individual investors as they are a substantial and liquid asset class, with REITs constituting over $800 billion in market capitalization and trading on exchanges just like other listed equities[42]. Given the financial benefits of clean energy adoption, investors are interested in

39 CDP, "No Room for Passengers: Are auto manufacturers reducing emissions quickly enough? (executive summary)", February 2015, 3, https://www.cdp.net/Docs/investor/2015/auto-report-exec-summary-2015.pdf

40 Solar Energy Industries Association (SEIA), *Solar Means Business,* October 15, 2014, http://www.seia.org/research-resources/solar-means-business-report

41 Ceres, *Power Forward 2.0*, 2014

42 REIT.com, "Industry Data & Research: Historical REIT Industry Market Capitalization: 1972-2014," accessed 02/23/2015 https://www.reit.com/investing/industry-data-research/us-reit-industry-equity-market-cap

efficiency of buildings owned by REITs. These investors have been requesting more information from REITs about their energy performance.

Members of Ceres' INCR are among the REIT shareholders filing resolutions seeking information on energy performance. Between 2012 and 2013, INCR members filed 17 resolutions that included specific requests for building energy efficiency information.[43] Five of these requests were directly targeted to real estate firms.[44]

The investors' filings with companies note the link between sustainability efforts and shareholder value, calling for comprehensive sustainability reports that outline sustainability-related risks, opportunities, policies, and practices. Studies show Energy Star and LEED buildings perform better; investing in more efficient buildings could increase REITs' profitability and therefore investor returns.

POLICY IMPLICATIONS AND RECOMMENDATIONS

Achieving increased investment opportunities in clean energy across asset classes – from direct investment in projects, to semi-direct investments via asset-backed securities, YieldCos and other vehicles, to indirect financing of clean technology through shareholder equity in corporate balance sheets – requires policies that support increased deployment of these technologies while also more directly enabling channels for investor and corporate financing of clean energy.

Enabling deployment of clean energy technologies is a key prerequisite to institutional investment. As deployment of clean energy technologies scales, innovation in the products, business models, and financing of those technologies takes place. This allows for greater opportunities for investment. It is through this process that a virtuous cycle of economies of scale and innovation takes place where greater deployment means further reductions in prices, which, in turn, enables more deployment and additional innovation. Policies supporting clean energy technologies create an opportunity for private capital to be put to work at a greater scale over time. Indeed, this is historically how the United States has supported new technologies. As highlighted in Figure 4, as technologies develop there are greater roles for new sources of capital,

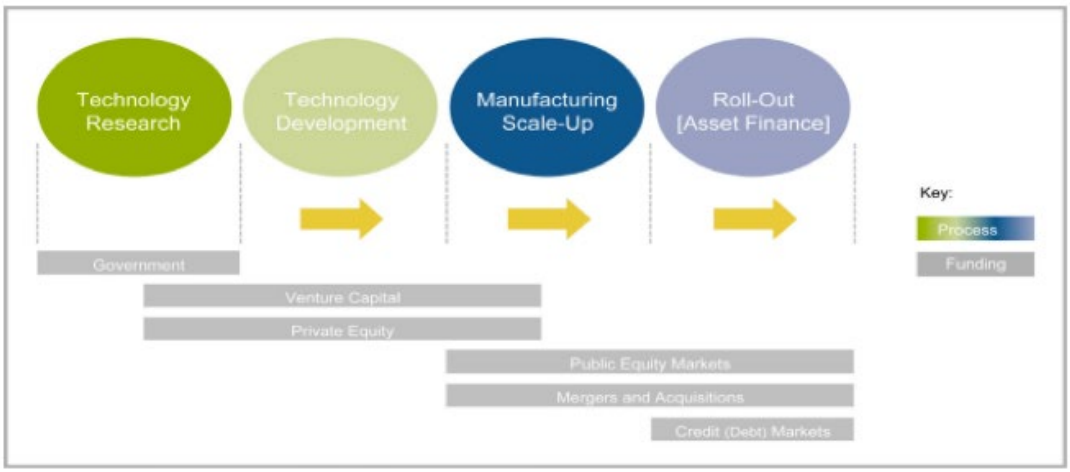

Figure 4: Technology Development and Capital Sources[44]

43 based on unpublished analysis of shareholder resolutions available at http://www.ceres.org/investor-network/resolutions

44 ibid

45 Figure from: Frankfurt School FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance & Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2014", http://www.unep.org/pdf/Green_energy_2013-Key_findings.pdf

first private equity (including venture capital) and then public capital markets (listed equity and debt). This is where the majority of institutional investors' assets are invested. Scaling technology and bringing it through this development cycle reduces investment risk, enables greater participation of institutional investors through a growing role for public capital markets, and will reduce the cost of capital for clean energy projects.

Throughout its history, the U.S. federal and state governments have used legislative and regulatory powers to foster the development of the United States' domestic resources. As the United States expanded in the mid- and late- nineteenth century, the federal government provided land grants to subsidize the settlement of the country. During the first half of the 20th Century, electrification was expanded from urban centers to rural communities through the Rural Electrification Act, which provided loans for rural electrification. More recently, the U.S. government supported the development of the shale oil and gas industry through $10 billion in tax incentives and millions more in government-funded research.[46] And following the 2008 financial crisis, the federal government committed substantial "stimulus" funding to clean energy deployment through various programs including over $31 billion in Department of Energy Funds allocated under the American Recovery and Reinvestment Act of 2009.[47]

Just one example of the value of policy helping to support the scaling of clean energy is the solar industry. Increasing solar deployment has led to dramatic decreases in the cost of solar energy. In fact, solar has seen a 99 percent decline in cost since the 1970s and an 80 percent reduction since just 2008[48] (Figure 5). As technologies have gotten cheaper, consumers – from homeowners to Walmart – have been able to adopt renewable energy and new business models.

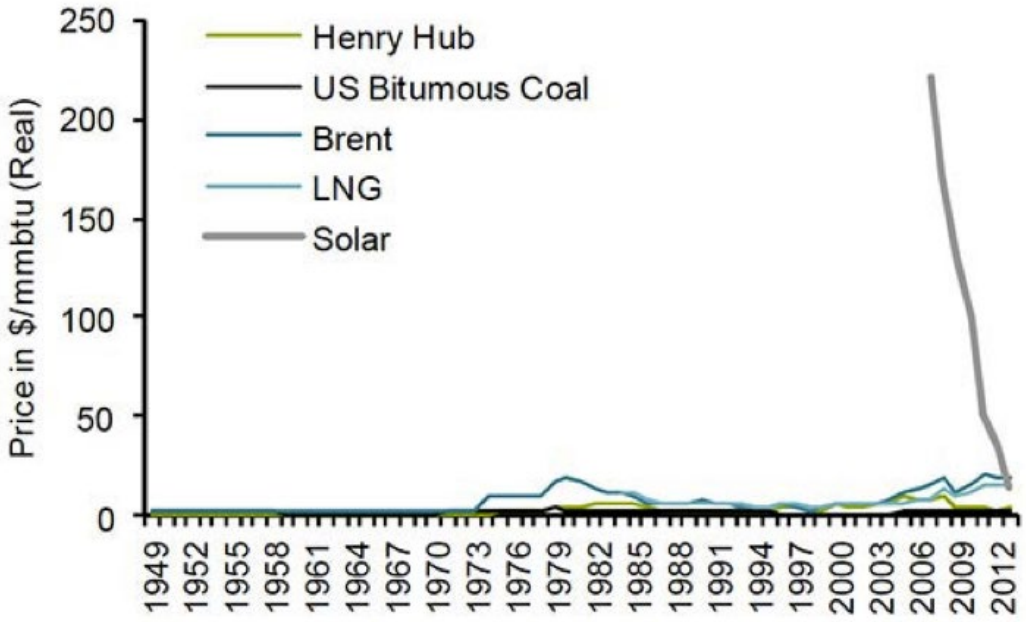

Figure 5: Cost reductions for solar[48]

46 American Energy Innovation Council, "Case Studies on the Government's Role in Energy Technology Innovation: Unconventional Gas Exploration and Production," http://americanenergyinnovation.org/wp-content/uploads/2013/03/Case-Unconventional-Gas.pdf (2013)

47 http://www.energy.gov/recovery-act

48 Business Council for Sustainable Energy and Bloomberg New Energy Finance, *Sustainable Energy in America Factbook 2014* , February 2014, 3, www.bcse.org/factbook/pdfs/2014%20Sustainable%20Energy%20in%20America%20Factbook.pdf

49 Tom Randall, "While You Were Getting Worked Up Over Oil Prices, This Just Happened to Solar," *Bloomberg Business*, October 29, 2014, http://www.bloomberg.com/news/articles/2014-10-29/while-you-were-getting-worked-up-over-oil-prices-this-just-happened-to-solar

Meanwhile, financial innovations – such as YieldCos and solar asset-backed securities – have further reduced costs and helped to grow the industry. Solar City is just one example of how policy has spurred business model and financial innovation and brought new sources of capital into clean energy financing (See Solar City Case Study on Page 8).

Enable clean energy scale and financial innovation

Supporting scaling clean energy technology means supporting policy instruments that are already in place and work. **The Production Tax Credit (PTC), Investment Tax Credit (ITC), and accelerated deprecation are the most important federal incentives for wind and solar deployment in the United States**.[50] Even though few institutional investors in the United States can utilize tax credits and depreciation directly by providing tax equity to projects (public pension funds are categorically excluded as they are tax-exempt entities), some can invest in other elements of renewable energy finance and in refinancing renewable energy projects once the tax credits expire. The scale provided by incentives in the U.S. tax code has been critical to developing the semi-direct and indirect investment vehicles described above, such as YieldCos and solar asset-backed securities.

While other sectors enjoy stable tax treatment, the wind industry in particular has experienced a policy-driven boom and bust cycle through multiple expirations and relatively brief reinstatements of the production tax credit. As policymakers consider comprehensive tax reform, they should provide near-term stability and investment predictability to the industry – which has seen the PTC again lapse at the end of 2014. Policy uncertainty and the expiration of the PTC has significantly depressed recent investment in wind projects.

As policymakers provide PTC, ITC, and depreciation certainty in short-term and comprehensive changes to the U.S. tax code, they should also expand provisions of the tax code that have provided investment vehicles for other types of infrastructure. **REITs and Master Limited Partnerships (MLPs) in particular are two investment vehicles that the tax code does not currently allow to be applied to clean energy; the relevant tax code provisions should be expanded to include clean energy infrastructure.**

In 1960, Congress created REITs to provide a liquid investment vehicle for real estate investment, with advantageous pass-through tax structures (i.e., no taxation at the corporate level). Historically REITs have been focused on commercial real estate, though both the universe of eligible infrastructure and the scale of U.S. REITs has expanded to finance billboards, cellular phone towers, prisons, and other infrastructure. The universe of 204 REITs registered with the Securities and Exchange Commission were together valued at a U.S. market capitalization of $719 billion as of January 2014,[51] making them a substantial and common investment. Despite providing similar characteristics to real estate— such as predictable and steady revenue streams and immovable infrastructure – renewable energy infrastructure has to date been excluded from REIT status. While the Internal Revenue Service recently moved to allow renewable energy on REIT owned buildings, there is considerably more scope for expanding REITs to act as an investment vehicle for renewable energy projects.

50 US Partnership for Renewable Energy Finance (USPREF), *Renewable Energy Policy, Finance, and Market Overview*, April 2014, http://uspref.org/images/docs/Renewable_Energy_Market_Overview_April_2014.pdf

51 REIT.com, "Industry Data & Research: Historical REIT Industry Market Capitalization: 1972-2014"

While clean energy REITs could take a common semi-direct investment for real estate and expand it to include renewable energy infrastructure, there are opportunities for indirect investment in clean energy through REITs as they are currently structured. Typical REITs, which own buildings, provide a tremendous opportunity for indirect investment in clean energy that could subsequently improve returns on investment in those assets. As referenced earlier, there are documented financial benefits to investors from improving the efficiency of buildings they own. However, most institutional investors do not own buildings directly, but instead hold REITs. Unlike the accessibility of information regarding the energy performance of buildings owned by investors, accessing information on the energy performance of REIT buildings is nearly impossible. If more cities adopted **energy benchmarking and disclosure ordinances** - like those in Minneapolis, Chicago, Boston, New York, and other cities- investors would have access to data on energy performance of REIT buildings. This data could be used to invest in REITs with better energy performance.

MLPs are similarly a tax-advantaged investment vehicle created by the U.S. tax code; they have been a key vehicle for financing mostly mid-stream oil & gas assets. MLPs are a corporate structure in which the partnership sells shares just as a corporation would sell stocks. Like REITS, MLP investments only face one layer of taxation, unlike a corporation where two layers of taxation exist: corporate taxes and taxes borne by investors for returns on their investments in the company. This tax-advantaged structure boosts yields and has made MLPs popular investments, particularly in the current low-yield investment environment. Like oil and gas pipelines, renewable energy projects create the steady revenue streams (via sales of electricity) that successful MLPs rely on. However, in an effort to limit overuse of the MLP structure, the last comprehensive reform of the federal tax code in 1986 limited energy-related MLPs to infrastructure for "depletable" resources. Reintroduced in June, 2015, the bipartisan *Master Limited Partnership Parity Act* championed by Senator Chris Coons allows renewable energy projects to qualify for the same tax treatment as midstream oil and gas projects. This bill would increase investment opportunities in renewable energy and lower financing costs. Congress should take up and enact the *Master Limited Partnership Parity Act*.

Scaling clean transportation

In the transportation sector, the **Corporate Average Fuel Economy and GHG Standards** for passenger vehicles, developed by the Environmental Protection Agency and the National Highway Transportation Safety Administration, provide the opportunity not only to create consumer fuel savings, but also drive increased profits for the auto industry. Indeed, a report authored by Citi Investment Research in collaboration with Ceres showed that the CAFE/ GHG standards will benefit automakers as a whole (a 5 percent increase in profits in 2020) and U.S. automakers even more (6 percent increase in profits in 2020).[52] In 2018, the agencies will determine whether the 2022-2025 standards will be strengthened, preserved or weakened; it is critical that they are at least preserved in order to spur innovation and enhance the global competitiveness of U.S. auto manufacturers.

52 Itay Michaeli, Christopher Reenock, Dev Kapoor, "Fuel Economy Focus: Perspectives on 2020,"April 3, 2012,http://www.ceres.org/resources/reports/fuel-economy-focus-industry-perspectives-on-2020/view

In 2015, the U.S. federal government released a proposed GHG **emissions/efficiency standard for heavy trucks** to meet in 2019 and beyond. Like its CAFE sibling, this standard holds potential for increased shareholder value for institutional investors. Improved heavy truck efficiency will reduce freight costs for a range of industries, reducing a significant operating cost and thus boosting net revenues. Research done by M.J. Bradley & Associates for Ceres and the Environmental Defense Fund found that strong standards could save sleeper truck operators $18,000-$38,000 the first year of service, and lower the per mile cost of heavy truck operation by 2.6% by 2030 and 6.8% in 2040.[53]

In addition to improving fuel efficiency, reducing the carbon footprint of the transportation sector also requires the development of alternative low carbon fuels, which provides another opportunity for institutional investors. California, Oregon and British Columbia have adopted clean fuel standards, which require fuel providers to gradually reduce the carbon intensity of vehicle fuels. Rather than prescriptively requiring particular technologies or fuels, the standard allows fuel suppliers the flexibility to choose how they meet emissions targets through various means, such as blending biofuels into gasoline, reducing emissions in production processes, or purchasing credits from utilities supplying low carbon electricity to electric vehicles. These standards drive investment in alternative fuels, which will diversify the fuel pool and reduce petroleum dependency. Such standards mirror the successful model of renewable energy standards employed in the electric sector, which have provided clean energy scale, innovation, and consumer choice in that sector. Analysis shows that this success can be replicated in fuels. In California, the standard has already driven investment in alternative fuels, and is expected to result in $1.4 - $4.8 billion in societal benefits by 2020.[54] As Oregon has also adopted a clean fuels standard, benefits would be multiplied under an integrated West Coast market; recent research shows that the clean fuel goals of the four jurisdictions of the Pacific Coast are simultaneously achievable.[55] These standards offer opportunities both across the economy and across investment portfolios.

Enable the evolution of utility business models to lower risk and enable clean energy adoption

As energy efficiency and renewable energy scale, utilities face competitive pressures and revenue loss. While building owners historically have been passive consumers of electricity, cost-competitive renewable energy and energy efficiency technologies mean that home and business owners can increasingly produce their own energy while using less. As shareholders in utilities, institutional investors risk that utilities will become unprofitable as their revenues erode. However, rather than supporting policies that make consumer adoption of clean energy technologies harder—such as limitations to net energy metering and limitations to third-party power purchase agreements—policymakers should enable these trends and spur utilities to adapt their business models and revenue sources accordingly. Indeed, doing so will enable these utilities to meet the demands of some of their largest customers.

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53 M.J. Bradley & Associates, *EPA/NHTSA Phase 2 Fuel Efficiency and Greenhouse Gas Standards for Heavy-Duty Trucks: project effect on freight costs*, May 2014, http://www.ceres.org/industry-initiatives/transportation/truck-standards-fact-sheet

54 ICF International, *California's Low Carbon Fuel Standard: Compliance Outlook and Economic Impacts*, April 2014, http://www.caletc.com/wp-content/uploads/2014/04/ICF-Report-Final-2.pdf

55 http://www.theicct.org/potential-low-carbon-fuel-supply-pacific-coast-region-north-america

As *Power Forward 2.0* found, corporate clean energy adoption is now the norm. As companies procure renewable energy they are looking for supportive policy environments as they choose where to locate their facilities. Many of these companies want to procure their renewable energy just as they would other commodities- through a contractual arrangement for the commodity rather than owning and operating the equipment (e.g., solar panels) needed to produce the commodity (i.e., electricity). In many cases, companies are entering into third-party power purchase agreements (PPAs) wherein a renewable energy company owns the electric generator and sells electricity to the customer at a fixed price over a long-term contact. However, in several states, including North Carolina, Florida, Virginia[56], and Georgia, it is illegal to enter into such energy procurement arrangements– making it difficult if not impossible for companies to participate in electricity markets. The need for third-party power purchase agreements (PPAs) to support clean energy purchases is part of a broader need for true markets for electricity, a sector historically dominated by monopoly utilities.

After federal tax credits, **state renewable energy standards** are the most important single policy driver for renewable energy deployment;[57] they are also a key mechanism for creating markets for renewable energy. The standards, currently in place in 29 states and the District of Columbia, require utilities to procure a certain amount of their energy from renewable energy resources by a certain year (e.g., 20 percent by 2020). Combined, these standards will require nearly 10 percent of U.S. electricity consumption to come from renewable energy resources by 2020.[58] Likewise, some states have created targets for utilities to increase their procurement of energy efficiency resources either through long-term standards, energy efficiency resource standards, integrated resource plans, or through energy efficiency provisions in renewable energy standards. As of 2015, 24 states had energy efficiency resource standards.

As documented in *Power Forward*, companies are looking to locate in several states with renewable energy standards. These states are attractive markets for deploying renewable energy. The presence of these standards helps create markets for renewable energy by building the ecosystem of service and product suppliers. At the same time, companies often use these standards as a way to participate in energy markets. By selling renewable electricity certificates produced by their renewable energy facilities, companies generate revenue and help utilities meet state renewable energy goals.

The **Clean Power Plan (aka, the EPA Carbon Pollution Standards)** is expected to be an additional catalyst for scaling clean energy deployment and enabling policies that support corporate clean energy deployment. The final rules allow states considerable flexibility to reduce emissions on a state-wide basis through a combination of "building blocks": improved efficiency of fossil generation plants, increased utilization of low-carbon generation plants, and use of new no-carbon generation (e.g., renewable energy). EPA developed a "Best System of Emissions Reductions" (BSER) based on the building blocks, and allows states to use a range of additional approaches, including energy efficiency, to achieve compliance.

56 Note: Virigina has a small pilot program for third-party PPAs

57 USPREF, 2014

58 Climate Policy Initiative, "What's Working and What's Not in State Renewable Portfolio Standards," July 7th, 2013, http://climatepolicyinitiative.org/2013/07/11/whats-working-and-whats-not-in-state-renewable-portfolio-standards/

Support strong EPA rules to limit methane emissions from the Oil & Gas sector

In the near-term, the Clean Power Plan will result in a shift of baseload generation from coal- to natural gas-fired power plants. However, this will only result in a net reduction of greenhouse gas emissions if methane emissions from the natural gas sector are kept to a reasonable level. Methane is a powerful greenhouse gas - at least 84 times more powerful than carbon dioxide over a 20-year time period. About 30 percent of the warming we are projected to experience over the next two decades in a business-as-usual scenario can be tied to this year's greenhouse gas emissions from methane alone. The oil and gas sector is the largest industrial source of methane emissions in the US, and recent studies have concluded that methane emissions from the US natural gas supply chain are nearly double the official estimates. Fortunately, they can be meaningfully reduced in a cost effective manner, and the EPA is working on regulations, to be released later this year, which will limit methane emissions for the first time. Ceres is working with its investors to encourage EPA to take the strongest possible approach to regulating this powerful greenhouse gas.[59]

CONCLUSION

2015 is a pivotal year for climate policy, both globally and in the U.S. Negotiations in Paris come at a time when investment in clean energy technologies is falling short of the additional trillion dollars of investment that is needed annually to avoid the worst impacts of climate change. The United States will play a pivotal role not only in securing an international agreement, but also in driving much of the needed clean energy investment to reduce domestic and international GHG emissions. Institutional investors provide a massive pool of capital that could be tapped to help meet these goals, but currently their clean energy investments are relatively limited. While a sufficiently strong price on carbon is the ultimate policy solution to drive direct, semi-direct, and indirect investment by institutional investors into clean energy infrastructure, this paper has suggested a pragmatic near-term approach that can scale investment through existing policy instruments in need of continued support or expansion.

59 https://www.ceres.org/press/press-releases/investors-worth-1.5-trillion-support-white-house2019s-methane-emissions-reduction-plan

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