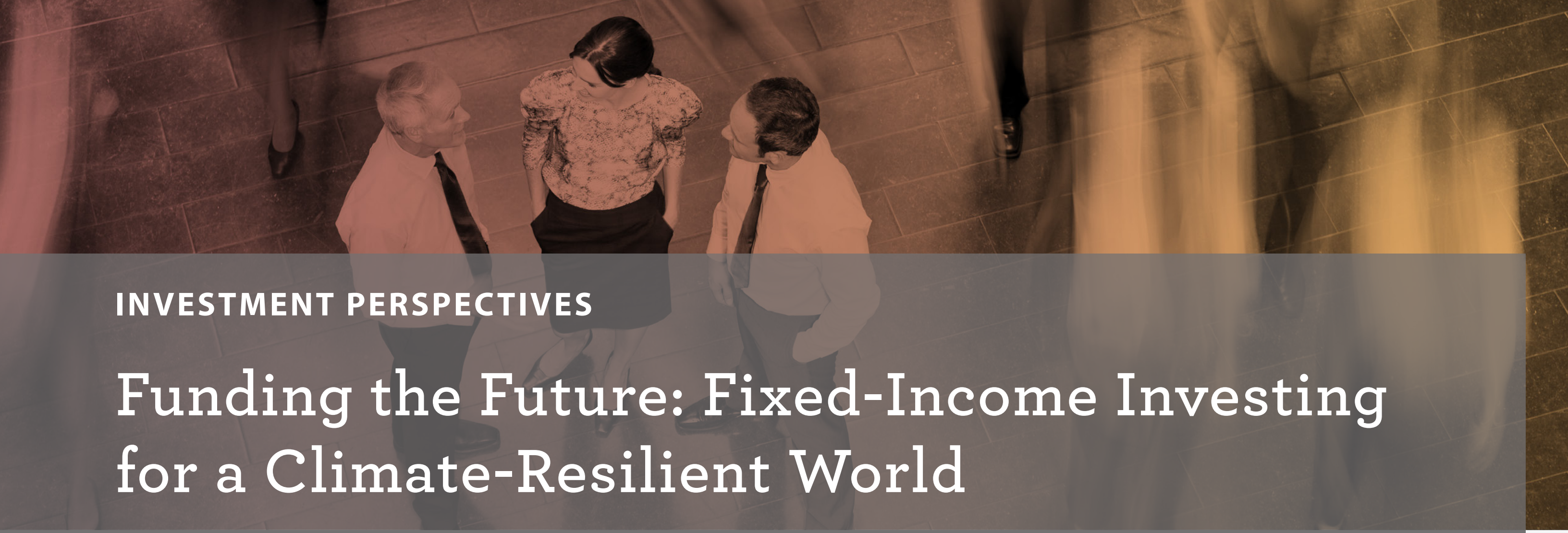

INVESTMENT PERSPECTIVES

Funding the Future: Fixed-Income Investing for a Climate-Resilient World

December 2018

What this means to investors:

- Fixed-income investing can create a direct link between investors' actions and efforts to address climate change.
- This includes funding transformational changes by the public and private sector that need investor capital.
- Our round table of fixed-income leaders discuss market opportunities that can help create a climate-resilient world.

Jessica Mann, CFA

Head of Environmental, Social, & Governance, WFAM

Climate change and the wide-ranging implications of rising global temperatures are among the biggest contemporary challenges facing society and investors.

Wells Fargo recently had the honor of sponsoring the first-ever climate summit in the U.S., the Global Climate Action Summit (GCAS) in San Francisco.

Representing Wells Fargo Asset Management, I was inspired to join more than 4,000 public and private sector participants from over 100 countries to discuss challenges, priorities, and initiatives to help mitigate climate change.

The transition to a low-carbon economy creates opportunities—not only from changing consumer behavior and demand patterns but also investment opportunities centered on climate solutions. This includes renewable energy, vehicle electrification, energy storage, climate-resilient infrastructure, energy and water efficiency advancements, and carbon capture and sequestration. Two converging factors add to these innovations' appeal:

- Advancement and widespread use of new technologies
- Growing adoption and escalation of climate change mitigating regulations, such as the price on carbon emissions

At Wells Fargo, we are committed to taking a leadership role in supporting the transition to a low-carbon economy and promoting environmental sustainability through our products and services, operations and culture, and philanthropy. To that end, we have committed to providing $200 billion by 2030 toward sustainable financing, with more than $100 billion going toward financing clean technology and renewable energy projects.

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Making a direct impact through fixed-income investing

GCAS served as an interim meeting between two milestones: the Paris Agreement and a formal five-year reevaluation that will take place in 2023, where participants will revisit progress and commitments. In part, this year's summit was an opportunity to assess whether climate-mitigating efforts thus far are making a significant enough impact and whether goals should be elevated even further before 2020.

When most investors think about investing in the context of climate change, the discussion often focuses on equities. For example:

- Which companies can profit from climate change or from the hard work underway to decarbonize the global economy?
- Alternatively, which companies are poorly positioned for the low-carbon economy transition, especially if it accelerates?

We believe fixed-income investing can create a direct link between investors' actions—buying bonds—and funding the transformational changes governments and businesses are undertaking that need investor capital.

I sat down with a round table of WFAM's fixed-income leaders to discuss what they consider are the ramifications of climate change and the investment opportunities arising within their investment teams' strategies. On the following pages, you'll see their ideas brought to life on how fixed-income investing can be a true catalyst for climate change action.

"We believe fixed-income investing can create a more direct link between investors' actions—buying bonds—and funding the transformational changes that governments and businesses are undertaking to address climate change—and that need investor capital to move forward.

The Paris Agreement refers to the 2015 United Nations Climate Change Conference, Conference of the Parties 21 (COP 21), resulting in 195 countries signing into a new international climate agreement, committing to keep the global temperature increase 2°C below preindustrial levels. This involved a focus on the goal of carbon neutrality by 2050.

With scientific consensus coalescing around the requirement of reaching net-zero emissions by 2050 in order to limit catastrophic warming, it is becoming clear that there remains a gap between ambition and action. Current consensus agrees that the voluntary but unbalanced commitments to date from the private sector and civil society more broadly will not be enough to mitigate a temperature increase that exceeds the 2°C commitment. The Paris Agreement included a "ratcheting mechanism" designed to increase climate ambition over time if necessary. The next formal five-year reevaluation of COP21 Paris Agreement, which will address existing progress and determine levels for ratcheting up commitments, will be in 2020.

The Principles for Responsible Investment believes that this trend invites a forceful and inevitable policy response to reduce emissions toward a 2°C trajectory. We agree and believe there likely will be policy intervention to speed the low-carbon transition.

Any companies or individual securities discussed are not intended to be recommendations.

Q&A with Niklas Nordenfelt, co-leader, WFAM U.S. High Yield team

Jessica Mann: Let's talk about funding the future of energy, since energy production is a major source of carbon emissions. At GCAS, over 100 leaders committed to carbon neutrality before or by 2050. A key driver of this achievement will be to have economies run on 100% clean energy within the next three decades. Examples of clean energy initiatives included the governor of New Jersey highlighting that the state is building the U.S.'s largest offshore wind farm. Niklas, how do you see U.S. energy companies in the high-yield space adapting toward a low-carbon future?

Niklas Nordenfelt, CFA

Co-Leader,
WFAM U.S. High Yield Team

27 years of
investment experience

A: We monitor legal changes that affect the electricity industry and the focus on mandating renewable electric generation. Indeed, our portfolios have historically had little to no exposure to coal-mining issuers and significant underweights to coal-powered utilities—on the view that the changing legal landscape would be a headwind for such companies. One company that we have historically been a significant lender to is TerraForm Power, a power generation company. It currently represents one of our larger portfolio positions. TerraForm has focused exclusively on environmentally friendly electricity production through solar and wind power generation. From a credit perspective, we like the fact that its power plants have historically had long-term revenue guarantees as well as superior, predictable operating cash flows. These plants are locked into government incentive payments and we believe should benefit from ongoing legal changes to mandate reduced carbon generation in the electricity industry. Although TerraForm's situation is locked in through long-term contracts, we actively watch its path forward to grow the business. We have played an important role in financing its ability to buy more renewable power plants both in the U.S. and internationally.

Q&A with Henrietta Pacquement, senior portfolio manager, WFAM European Investment Grade team

Jessica Mann: At GCAS, there were unprecedented commitments from major institutional investors to commit to low-carbon investments and divest from companies that derive revenue from the dirtiest source of all: thermal coal. For example, CalPERS (the California Public Employees' Retirement System) now has $12 billion in low-carbon assets and has phased out of thermal coal investments entirely, as of last year. CDPQ, Canada's second-largest pension fund, has committed to increasing its low-carbon investments by 50% by 2020, representing more than $8 billion in new investment. Meanwhile APG, the Dutch pension fund manager, will no longer invest in coal-related infrastructure. And New York City will double its investments in clean energy and climate solutions to $4 billion over the next three years. Do you believe energy companies are capable of making seismic transformation of their businesses to be sustainable and relevant in the long run?

Henrietta Pacquement, CFA

Senior Portfolio Manager,
WFAM European Investment
Grade Team

17 years of
investment experience

A: There are examples of this really happening in Europe. One example is Orsted, one of the world's leading players in offshore wind with 23% of global capacity and one of our core holdings in our investment-grade portfolios. The company has transformed itself from an oil and gas exploration and production company and thermal power generator into a clean energy company that is also active in bioenergy and distribution and customer solutions. The disposal of its upstream oil and gas business necessitated a name change from DONG (Danish Oil and Natural Gas) Energy to Orsted to reflect this evolution. The company continues to phase out its use of coal in thermal generation with a reduction of 73% since 2006. It will exit coal completely by 2023 when it also targets a 96% reduction of carbon dioxide emissions versus 2006 levels. In offshore wind, Orsted targets 11-13 gigawatts (GW) installed offshore capacity by the end of 2025, more than double the 5.1GW installed at the end of the first half of 2018.[1]

1. All figures from Orsted: http://www.orsted.com, 1H18 Report

Q&A with Scott Smith, head of WFAM's U.S. Investment Grade team

Jessica Mann: Green bonds—debt that funds positive, sustainable environmental projects—represent a very interesting and growing opportunity segment in the transition to a low-carbon economy. What are you seeing in this area, Scott?

Scott Smith, CFA
Head of WFAM U.S. Investment Grade Team

31 years of investment experience

A: The growth in issuances of green bonds has increased tremendously. In 2017, there was nearly $160 billion in green bond issues, up 78% from 2016, with issuances in 2018 expected to surpass $200 billion.[2] However, demand outstrips supply, with most of the issues oversubscribed. This creates valuation challenges and temptations for issuers to greenwash their labeling, so it is important to evaluate every bond carefully.

When investors think of green bonds, most think of credit instruments from well-known corporate issuers such as Apple, Bank of America, or Digital Realty or sovereigns such as the Republic of France. Corporations are the biggest issuers in the market. Part of the attractiveness is that green bond issuance can come with a public subsidy in the form of tax exemption or tax credits.

An interesting market that is less well known relates to structured products, commonly involving asset-backed securities (ABS) that are collateralized by hybrid or alternative fuel vehicles or residential solar systems. We see structured green bond issuances have become a growing segment of this market and believe they present attractive opportunities.

One green bond program of note is Fannie Mae's green mortgage-backed securities program, which helps fund reduced water or energy usage. Fannie Mae is the largest issuer of green securitized bonds. Its bonds must be backed by one multifamily loan/property that must meet at least one of two criteria:

- Possess a green building certification
- Make property improvements that target reductions in energy and/or water use

Property Assessed Clean Energy (PACE) ABS is an ABS sector that receives "green" designation. Started a decade ago, PACE programs provide financing for renewable energy or energy-efficient improvements to residential and commercial properties in several states. PACE property assessments rank senior to mortgages. This is one of the reasons the bonds typically receive AAA to AA ratings. To date, 22 public PACE ABS ($4.6 billion) collateralized by approximately 200,000 PACE assessments have been securitized. In May, a PACE bond issued by Home Energy Renovation Opportunity (HERO) priced at 4.10% for a five-year average life, equating to a 4.1% yield to maturity.[3] Compared with the investment-grade fixed-income universe, we believe these bonds may provide an attractive risk-adjusted yield in addition to the positive environmental outcomes they fund. This makes them an appealing addition to our strategy.

2. Climate Bonds Initiative, Green Bond Highlights 2017, January 2018
3. Kroll Bond Rating Agency, The PACE Evolution, 2018

Q&A with Jens Vanbrabant, senior portfolio manager, WFAM European High Yield team

Jessica Mann: Being on the right side of climate change is not just about funding projects. It can also mean not funding activities where adverse consequences outweigh other benefits being touted. Jens, are there examples of situations in which the level of management of environmental risks has led you to not lend?

Jens Vanbrabant, CFA

Senior Portfolio Manager, WFAM European High Yield team

19 years of industry experience

A: Yes, the Delphi Automotive example is a good one. Delphi Technologies PLC was formerly the powertrain segment of Delphi Automotive. It was spun out as an independent company, while the remaining electrical architecture and autonomous drive business of legacy Delphi was renamed Aptiv. Delphi Technologies' core competencies of fuel injection systems and valve train products will likely not exist in a few decades. This is because fossil-fuel-powered drivetrains will be increasingly replaced by electric vehicles and fuel cell vehicles. We foresaw material risk to investing in a levered business with such bleak prospects over the long term. By investing capital in a diesel powertrain business, we would indirectly support this highly nitrous oxide producing company, with adverse health effects to citizens, particularly in populous city environments.

By avoiding this investment, we also created value for our clients. The Delphi Technologies bond issued in September 2017 at 99.5 is currently offered at 90 in the secondary bond market. We also note that the company's equity, which had its initial public offering in November 2017 at $50, was priced at $20.28 one year later, creating a significant loss of value to shareholders.

Q&A with Thomas Stoeckmann, head of WFAM Municipal Research

Jessica Mann: The U.S. municipal bond market has been noted by some in the industry as being the original ESG-friendly market given its long history of directly funding infrastructure for the public good, such as hospitals, schools, universities, water and electric utilities, and transportation systems. Have you seen municipal issuers make proactive investment either to reduce greenhouse gas emissions or to adapt to the potential impacts of climate change?

Thomas Stoeckmann

Head of WFAM Municipal Research

25 years of investment experience

A: Yes, definitely. We have seen municipal power operators make significant investment over the past decade to decrease their carbon footprint through both pollution control and diversifying power generation. For example, we've invested in American Municipal Power, Inc. (AMP), which serves a region that has been very coal-dependent. AMP has increased generation from renewables nearly 300% since 2013. The results:

- Reductions of carbon dioxide emissions by 15%
- Reductions of volatile organic compounds by 7%
- Reductions of nitrogen oxides by 5% and carbon monoxide by 87%[4]

AMP, which has 135 member municipal electric systems, sees noteworthy carbon mitigation opportunity ahead as it educates and informs its members about two variables: emerging industry trends and preparing for further integration of distributed energy resources, including renewables. Fundamentally, the AMP credit profile has strong power sales contract agreements with geographically diverse municipal participants who also have compelling underlying credit characteristics. Coupled with strong management oversight, we believe AMP's movement toward carbon mitigation opportunities presented a good relative-value opportunity in light of its public credit rating.

Concerning the potential impacts on municipal credit, our risk framework identifies regions facing particularly acute climate-related risks. This includes predominantly coastal areas that have been identified as being most affected from sea level rise, as well as areas most susceptible to severe drought conditions—with demographic and, thus, tax base implications. While topical research and data availability is constantly evolving, our credit focus puts significant emphasis upon the proactive steps management teams are taking to establish mitigation plans within their long-range system design (20-year rehabilitation cycles) and capital expenditure budgets.

For example, the Massachusetts Water Resources Authority has designed system enhancements to address scientists' models, which suggest they'll see longer droughts as well as more intense flooding periods. We've also seen the authority consider climate change in new infrastructure. For example, the Deer Island Treatment Plant was designed to withstand a 100-year flood event plus 1.9 feet of sea level rise, allowing it to tolerate wave run-up of 14 feet under a hurricane-type event. Such considerations are being addressed system-wide for higher-risk, mission-critical assets, with a benchmark that is 2.5 feet above the FEMA 100-year floodplain levels.[5]

4. AMP, Sustainability and Today's Financial Markets, 2018
5. Massachusetts Water Resources Authority, conference presentation in Boston, MA (October 2018)

A: While we're seeing progress made to adapt to the potential impacts of climate change, questions still exist: What is the degree of certainty in the models being used? What is the cost to prepare based upon the severity of the model we choose? Is 40 inches of sea level rise over the next 50 years the worst-case scenario in which to plan? As active managers with strong fundamental research capabilities, we are well placed to consider these questions and evolve our thinking in line with the latest research and data.

Q&A with Henrietta Pacquement and Thomas Stoeckmann

Jessica Mann: Henrietta and Thomas, I'd like to come back to you regarding a climate change development that affects both of your investment areas. At GCAS, there were bold commitments made to policies that favor electrical vehicles that will expedite sunsetting the transportation sector's reliance on internal combustion engines. For instance, the Netherlands plans to require that all new cars that are sold must be emission-free by 2030. Meanwhile, the country's railway is already electric and fully powered on renewables. Henrietta, do you see companies that are really going all in to be sustainably relevant and navigate escalating public policies in this space? What do you focus on from a credit perspective when evaluating their debt offerings? And, Thomas, are there implications for the municipal sector in the U.S.?

Henrietta Pacquement: Yes, I'd highlight Automotive, a European fleet management and car leasing company that is wholly owned by the French Bank Société Générale. Automotive recently issued a €500 million four-year maturity positive impact bond that we invested in. This was not only its debut positive impact bond but also a first for the auto-leasing sector. Automotive used the proceeds for the "refinancing of eligible vehicles that contribute to the development of clean transportation and the transition to a low carbon future," applying the €500 million to finance 14,348 electric and plug-in hybrid vehicles.

The portfolio impact takes into account full vehicle life cycle from the production and end of life, electricity and fuel production, as well as tail pipe emissions and abrasion. While the eligible vehicles should reduce the amount of carbon dioxide (22% versus baseline) and the nitrogen oxides (58% of baseline), they will lead to an increase in the level of particulate matters emitted.

Thomas Stoeckmann: While the electric power generation sector often is viewed as being a large producer of greenhouse gas emissions, studies indicate that the combined gas emissions of commercial and private vehicles significantly exceeds that of electric power producers. As such, several municipal issuers, including power producers, have transitioned to hybrid vehicles with field testing activities begun for fully electric vehicles within the next decade. Some industry participants believe that the buildout of the electric vehicle power station grid and acceptance for consumers will come first from municipal and investor-owned utilities establishing stations for their own fleets.

Conclusion

The ability to positively effect change while managing risk may be enhanced by adding an environmental lens to traditional credit analysis. The wide range of public sector commitments and private sector initiatives around climate change make it a field ripe for active managers to explore opportunities and invest in a way that is aligned with the changes necessary to transition the world to a low-carbon economy.

ESG investing at WFAM

At WFAM, we have built our investment philosophy, policies, and processes around delivering on client and community expectations in a responsible and sustainable way. Considerations that extend beyond simple financial statement analysis, such as the potential effects of climate change, have been a core part of how our portfolio management teams have evaluated investment opportunities for more than three decades. Two key tenets underpin ESG investing at WFAM:

- *Successfully investing in a changing world.* Our investment teams integrate material ESG considerations into their investment processes, exploring opportunities and assessing risks in ways that are consistent with their asset classes and strategies.
- *Helping clients invest in the world they believe in.* Our commitment and experience with bottom-up issuer, market, and policy analysis is leveraged across the firm to understand the potential impact of ESG risks and opportunities while providing clients with portfolios better aligned with their preferences on ESG issues.

We want to help clients build for successful outcomes, defend portfolios against uncertainty, and create long-term financial well-being. To learn more, investment professionals can contact us:

- To reach our U.S.-based investment professionals, contact your existing client relations director, or contact us at WFAMInstitutional@wellsfargo.com.
- To reach our U.S.-based intermediary sales professionals, contact your dedicated regional director, or call us at 1-888-877-9275.
- To reach our U.S.-based retirement professionals, contact Nathaniel Miles, head of Defined Contribution at Wells Fargo Asset Management, at nathaniel.s.miles@wellsfargo.com.
- To reach our international investment professionals, contact your regional client relations or sales director, or contact Ben Foley at either ben.foley@wellsfargo.com or +44 20 7518 2947.
- To discuss environmental, social, and governance (ESG) investing solutions, contact Jessica Mann, head of ESG at Wells Fargo Asset Management, at jessica.mann@wellsfargo.com.

The views expressed and any forward-looking statements are as of December 10, 2018, and are those of Jessica Mann, Head of ESG, WFAM; Niklas Nordenfelt, co-leader, WFAM U.S. High Yield team; Henrietta Pacquement, senior portfolio manager, WFAM European Investment Grade team; Scott Smith, head of WFAM's U.S. Investment Grade team; Jens Vanbrabant, senior portfolio manager, WFAM European High Yield team; Thomas Stoeckmann, head of WFAM Municipal Research; and/or Wells Fargo Funds Management, LLC. Discussions of individual securities or the markets generally are not intended as individual recommendations. Future events or results may vary significantly from those expressed in any forward-looking statements; the views expressed are subject to change at any time in response to changing circumstances in the market. Wells Fargo Funds Management, LLC, disclaims any obligation to publicly update or revise any views expressed or forward-looking statements.

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