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Global fixed income impact strategies

Case studies

What's inside

Affordable housing

Century Housing Corporation (century) ▶

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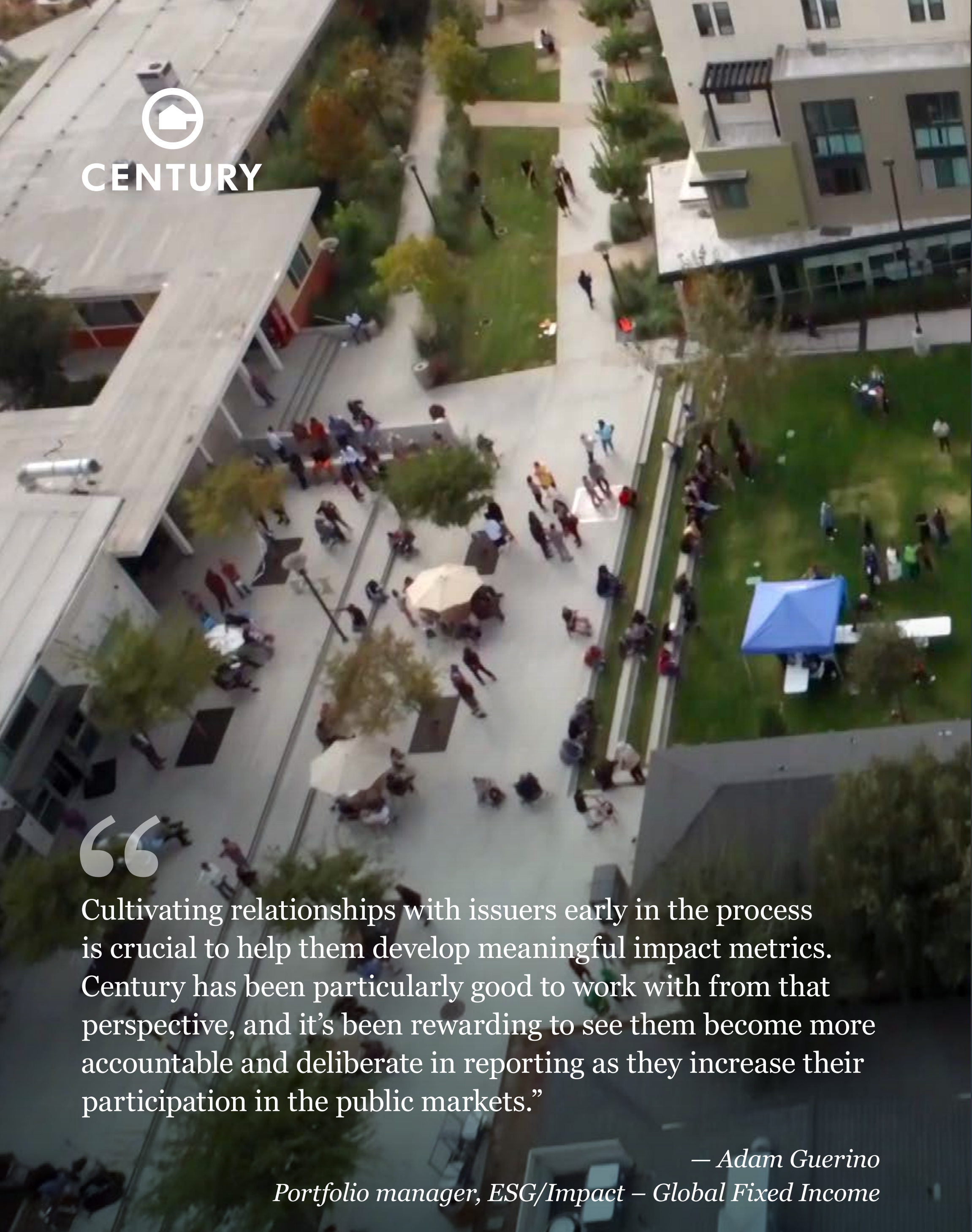


"Cultivating relationships with issuers early in the process is crucial to help them develop meaningful impact metrics. Century has been particularly good to work with from that perspective, and it's been rewarding to see them become more accountable and deliberate in reporting as they increase their participation in the public markets."

— Adam Guerino
Portfolio manager, ESG/Impact – Global Fixed Income

Affordable housing

CENTURY HOUSING CORPORATION (CENTURY)

ALIGNMENT WITH SDGS:

11 SUSTAINABLE CITIES AND COMMUNITIES

Mission and intended outcomes

- To finance, build and operate exceptional affordable housing so that the people Century serves may have "a dignified home, a healthy and hopeful future, and attain economic independence."[1]
- Offer innovative financing programs in California, partnering with state and local agencies, municipalities and other community development financial institutions.

Measurable impact

Proceeds from the Century bonds in which we invested were used to refinance loans for multifamily affordable housing development, including:

- 1,952 affordable housing units
- 843 supportive housing units (combining affordability with access to coordinated physical and mental health services)
- 1,515 senior housing units
- 381 workforce housing units (allowing moderate-income workers who would otherwise be priced out of local housing markets to live closer to their jobs)

Originally appeared in 2021 Global fixed income impact report

Watch the video "Make your impact"

CENTURY

Century Housing Corporation (Century) is one of more than 1,200 mission-driven financial providers in the United States that operate as certified community development financial institutions (CDFIs).

Established by the U.S. Congress in 1994, the CDFI Fund serves CFDIs with resources and programs that invest federal dollars alongside private-sector capital to support economically disadvantaged communities.[2]

Traditionally, CDFI funding has been provided by banks, largely as a way for them to comply with Community Reinvestment Act reforms implemented in the wake of redlining and other systemic practices that had disadvantaged low-income communities. Over the past few years, Century has been at the forefront of CDFIs beginning to diversify their sources of capital by issuing public debt.

"The public fixed income markets give issuers a practical tool for refinancing, which lowers their cost of capital," explains Stephen M. Liberatore, CFA, head of ESG/impact — Nuveen global fixed income. "In our impact portfolios, we're directing capital to help issuers achieve scale, improve borrowing efficiency and ultimately provide greater benefits to the community — all positive attributes of a capital market solution to a myriad social and environmental problems. CDFIs are an important organizational element for doing this."

"It can be more challenging to find impact investments in affordable housing that meet the criteria of our framework," says Adam Guerino, a portfolio manager on Nuveen's global fixed income – ESG/impact team. "An issuer's willingness and ability to report direct, measurable results is critical to our decision to invest, and we've found that many CDFI programs tend to emphasize anecdotal impacts, which can't be aggregated."

After the first of two deals we participated in with Century, we engaged with management to provide feedback on their impact reporting. Importantly, this engagement consisted of two-way dialogue in which they actively sought our guidance and were eager to listen and implement enhancements. The impact results of the two bonds are now quantified and reported on both an annual and cumulative basis and posted on a dedicated public web page.

"Cultivating relationships with issuers early in the process is crucial to help them develop meaningful impact metrics," Adam says. "Century has been particularly good to work with from that perspective, and it's been rewarding to see them become more accountable and deliberate in reporting as they increase their participation in the public markets."

Ultimately, the growth of impact investing into an instrument of societal improvement will not come from passive purchasing of bonds but active engagement that connects the desires and interests of investors with the capabilities and efforts of issuers. For its part, Century aims to continue expanding beyond its typical business model of providing short-term construction financing for affordable housing development and toward building a more permanent loan portfolio in this space. Meanwhile, the investment-grade ratings that Century has received from Standard & Poor's and Fitch may help it attract a wider investor base for future impact issuances.

"The availability of affordable and workforce housing is fundamental to sustainable communities since it provides the foundation for creating economic opportunity for residents and communities alike."

— *Freddie Mac Multifamily Sustainability Report 2022*

Affordable housing

FREDDIE MAC

Measurable impact

- Housing units built or supported: 69,320
- Units built or supported for residents with AMI <80%: 59,657

You'd be forgiven for thinking that all of the bonds under Nuveen's Affordable Housing impact theme were agency pass-through mortgages. In fact, there is considerable sector and issuer diversification in this theme. In addition to Ginnie Mae (GNMA) mortgage-backed securities (MBS), we support affordable housing outcomes through corporate bonds, government agencies, state and local housing authorities, municipal bonds, community development finance institutions (CDFIs), and multifamily commercial mortgage-backed securities (CMBS) – both agency and non-agency.

Agency multifamily CMBS

The Federal Home Loan Mortgage Corporation (Freddie Mac) is a government-sponsored enterprise (GSE) created by Congress in 1970, with a charter to expand the secondary market for home mortgages by providing liquidity, stability and affordability to the U.S. housing market. Freddie Mac purchases mortgages and loans, packages them into mortgage-backed securities — which carry Freddie Mac's guarantee of timely payment of principal and interest on the underlying mortgages — and sells them to investors.

Originally appeared in 2023 Global fixed income impact report

Freddie Mac

Nuveen's investment in Freddie Mac impact bonds helped support the development of nearly 20,000 multifamily properties for low-income tenants.

Freddie Mac may be best known for its charter goals supporting single family residential mortgages. But it is also responsible for meeting several annual goals related to facilitating low-income housing under the supervision of the Federal Housing Finance Agency (FHFA). These goals include a minimum number of rental units in multifamily properties affordable to households whose income is at or below specified percentages of "area median income" (AMI) — a metric the U.S. Department of Housing and Urban Development (HUD) uses to determine eligibility for certain federal housing programs.

Freddie Mac issues multifamily certificates under its impact bond program. The program includes green, social, and sustainability bonds. The sustainability bond framework focuses on combining housing opportunities for low-to-moderate income households, in locations that help advance economic opportunity for residents (e.g., located near mass transit) and may have certain environmental impact features (e.g., energy and water efficiency improvements). Specifically for housing under HUD's Section 8 program, eligibility is determined by three rigid tiers of renters by income:

Income band	Percent of AMI
Low-income	51–80%
Very low-income	31–50%
Extremely low-income	0–30%

As of 31 December 2022, Nuveen has invested over $50 million in Freddie Mac multifamily CMBS as follows:

- $29.6 million in sustainability bonds
- $14.2 million in social bonds
- $6.3 million in non-labeled bonds[3]

"Many of Freddie Mac's impact offerings tend to be smaller and very likely overlooked by public markets, if even offered publicly at all," says Adam Guerino, a portfolio manager on Nuveen's global fixed income — ESG/Impact team. "Typically, this means these projects would be forced into private credit and loan markets at higher rates, potentially curtailing overall affordability. However, Freddie Mac's scale and credit support provides enough liquidity to generate strong demand from public markets. This ultimately results in increased affordability to residents and demonstrates the ability of public markets to support impact in ways private markets cannot."

Guerino also notes that because of Freddie Mac's size and scale, it's able to provide unusual clarity on a bond's impact via its website, including measures of a home's water and energy usage, and greenhouse gas emissions. "In that regard, Freddie Mac stands out. An issuer's willingness and ability to report direct, measureable results helps drive our decision to invest and allows us to monitor the security's impact over time — a crucial element of our responsible investing framework."

That level of granularity is evidenced by one of the Freddie Mac multifamily bonds. The underlying pool includes five multifamily properties totaling 900 units — all of which are rented to residents earning 50%–60% AMI, which is considered very low income, per the definitions above. Three of the facilities have undergone energy and water efficiency improvements, and two of the facilities are located near mass transit.

Our framework considers Ginnie Mae MBS to be impact investments given the agency's explicit mission to provide low-cost financing under federal housing programs. These programs serve low- and moderate-income borrowers who have a harder time qualifying for mortgages or would pay higher mortgage rates through other channels. Most GNMA loans are insured by the Federal Housing Administration (FHA) or guaranteed by the Department of Veterans Affairs (VA). GNMA bonds also support loans to homeowners through the Department of Agriculture's Rural Development (RD) and the Department of Housing and Urban Development's Office of Public and Indian Housing (PIH).

Contrast that with Fannie Mae and Freddie Mac MBS, which support American homeownership more broadly, increasing affordability for sure, but not without targeting lower-income borrowers specifically.

> "Windsor is an example of a truly innovative approach that speaks to what's possible in the world of impact investing. The issuer's commitment to continually enhance housing affordability not only meets the needs of low-income residents but also helps sustain the cash flows investors are looking for — all while reducing the carbon footprint of the property. This is the kind of holistic forward thinking we hope and expect to see more of in the future."
>
> *— Adam Guerino*
> *Portfolio manager, ESG/Impact – Global Fixed Income*

Affordable housing

Renewable energy and climate change

WINDSOR MOBILE COUNTRY CLUB

ALIGNMENT WITH SDGS:

7 AFFORDABLE AND CLEAN ENERGY

11 SUSTAINABLE CITIES AND COMMUNITIES

Mission and intended outcomes

- To be a premier 55-plus manufactured home community offering an upscale but affordable standard of living in beautiful Sonoma County, California.
- To further lower the costs of housing and to benefit the environment by utilizing a solar power system.

Measurable impact

Of the proceeds from the 2020 taxable municipal issue in which Nuveen invested, $3 million (roughly 17% of bond principal) were used to construct and install an 890 kilowatt (kW) solar power system for the park in the first half of 2021, leading to:

- Up to 90% lower projected annual electricity costs for residents
- Environmental benefits of generating 1.3 million kW hours of solar power, enough to:
  - Provide electricity to the park's 336 homes for 2020
  - Displace 921 metric tons of carbon dioxide equivalents from the atmosphere
  - Achieve the comparable impact of taking 200 cars off the road for one year[4]
- 100% occupancy rate in the park
  - 44% of spaces are rented by very-low-income households (less than 50% of area median income (AMI))
  - 43% are rented to low-income households (defined as 80% of AMI)

Originally appeared in 2021 Global fixed income impact report

AFFORDABLE HOUSING

RENEWABLE ENERGY AND CLIMATE CHANGE

Windsor Mobile Country Club is a mobile home park located in Windsor, California, approximately 60 miles north of San Francisco in Sonoma County.

AFFORDABLE HOUSING SCARCITY

	Windsor, CA	California average
Median household income	$107k	$75k
Average rent for a two-bedroom apartment	$1,900	$1,400

Encompassing 336 manufactured homes, a clubhouse, pool and other amenities, the 43-acre park bears little resemblance to the traditional image of affordable housing stock as large, multifamily facilities either directly owned by public agencies or developed through public subsidies, such as Low-Income Housing Tax Credits (LIHTCs).

Manufactured housing typically costs 50% less per square foot to build than standard homes. And while residents of mobile home parks own the units they live in, they rent the land on which their homes sit, lowering their overall cost of housing even more. According to the Manufactured Housing Institute, 60% of U.S. households who live in manufactured housing are low income, earning less than $40,000 annually.

Manufactured homes and mobile home parks are therefore a viable affordable housing option for people who live in areas where average incomes and housing costs are high and traditional affordable housing programs are scarce.

Until Windsor Mobile Country Club, the town had been able to develop only 404 income-restricted units since 1986. With its 336 homes, the park nearly doubled the local affordable housing stock, and our investment helped lower financing costs via the municipal bond market.

To qualify for this cheaper source of credit, the mobile home park had to agree to rent at least 20% of its spaces to "very-low-income" residents (typically earning 50% of the area median income, or AMI).

Windsor Mobile Country Club also participates in a state program that provides a property tax rebate based on the percentage of low- and very-low-income residents. This financial incentive directly helps residents by reducing pressure to increase space rents.

A solar power system further lowers the cost of housing and benefits the environment

Under its current ownership since 2008, Windsor Mobile Country Club has made numerous investments in physical improvements, including replacing utility lines and transitioning to more drought-tolerant landscaping.

2

Commmunity and economic development

County of Fairfax, VA ▶

Rural Broadband ▶

Women's Livelihood Bond Series ▶

Community and economic development

CASE STUDY: COUNTY OF FAIRFAX, VA

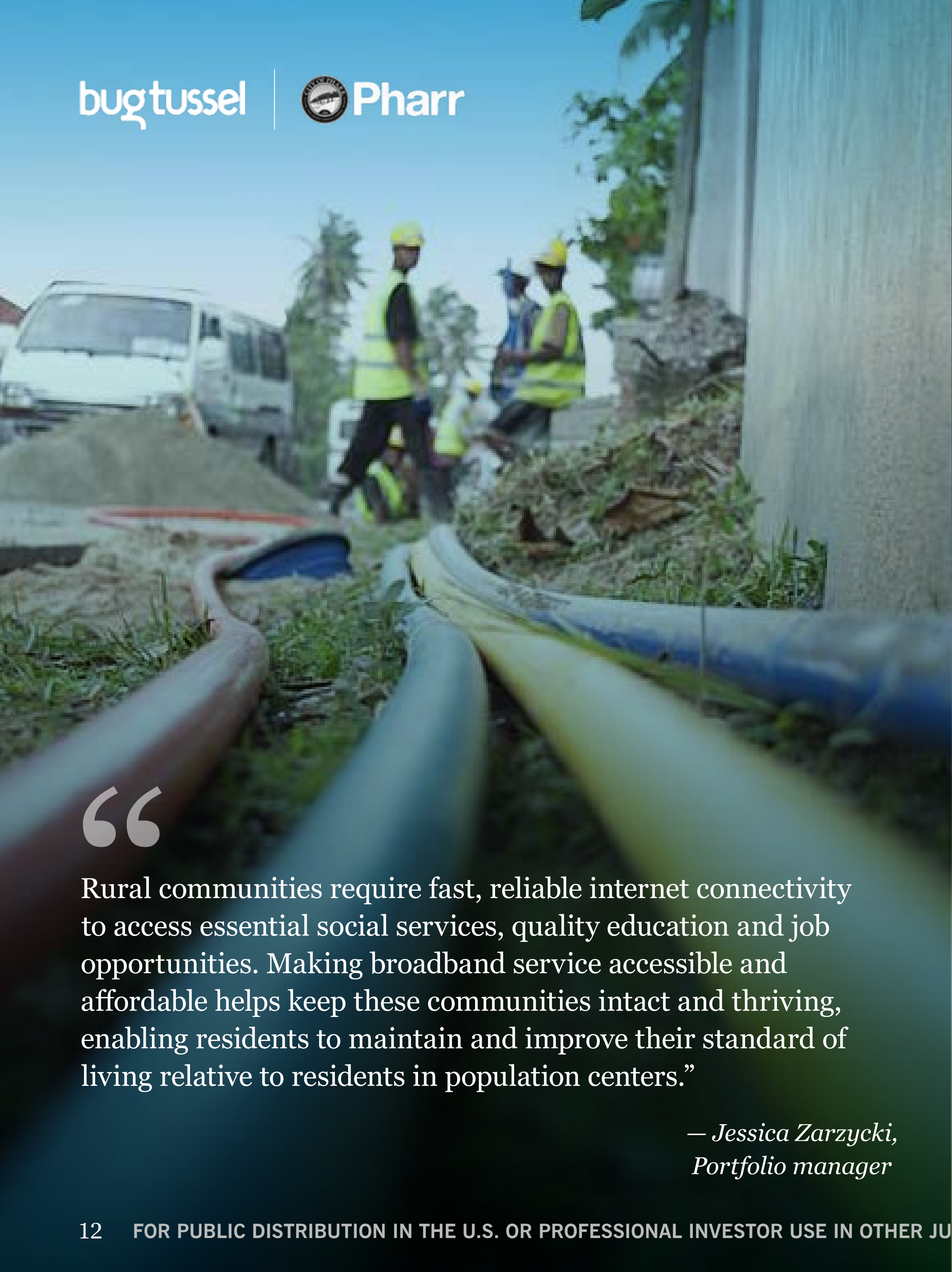
11 SUSTAINABLE CITIES AND COMMUNITIES

Creating community in Fairfax County

Fairfax County, located just outside of Washington, D.C., in northern Virginia, is the most populous county in the state. These bonds were issued for the construction of a 30,000 square foot, two-story community center integrated into the Dominion Square affordable housing project in Tysons, VA. The facility will include a gymnasium, kitchen, and a variety of multipurpose, meeting and community spaces. It will be available to all county residents, although it's anticipated that Dominion Square residents will be the primary users.

The Dominion Square project is the **first affordable multifamily housing development in Tysons** — a meaningful milestone in that Tysons is the 12th largest business district and the largest suburban business district in the country. To be built on the site of a former car dealership, the project will feature **more than 500 units targeting households earning 60% or less of the area median income (AMI)**. Integration of the community center is considered vital to the project's success, and the development process included three community engagement forums to receive feedback on the center and its role. Importantly, county programming for the center will likely be multigenerational, not exclusively youth-focused, to encourage broad participation. Fairfax County's Neighborhood and Community Services department maintains updated programming and activities for each of its community centers.

Originally appeared in 2024 impact insights report



“Rural communities require fast, reliable internet connectivity to access essential social services, quality education and job opportunities. Making broadband service accessible and affordable helps keep these communities intact and thriving, enabling residents to maintain and improve their standard of living relative to residents in population centers.”

— Jessica Zarzycki,
Portfolio manager

Community and economic development

RURAL BROADBAND

Rural communities have long struggled to obtain adequate cellular and internet service. This is primarily because large national carriers cannot justify the infrastructure expense for limited potential subscriber bases in sparsely populated areas; dense population centers provide a far higher return on investment. Those cold economic facts were put in stark relief as COVID shifted government services, business activity, and schooling online.

Nuveen invested over $30 million in three new-issue impact securities in 2022 to develop and improve broadband access in rural communities. Most impressive is the speed and efficiency with which projects have been launched and scaled, providing access to households and narrowing the digital divide.

Pharr is a city in southern Texas, located along the Rio Grande and the U.S./Mexico border, with a population of roughly 80,000.[5] The city owns and operates an important border crossing for commercial traffic. In 2022, the median household income of Pharr households was $45,016, and 30% of the population lived in poverty. Pharr was ranked the worst connected U.S. city by the National Digital Inclusion Alliance (NDIA) in 2019, among 625 U.S. cities or Census designated areas with populations of 65,000 or more. Nearly 60% of its households lacked broadband[6] — almost double the percentage of the second worst city on the list (Harlingen, Texas at 34%).

Originally appeared in 2023 Global fixed income impact report

> We were facing a huge digital divide and we needed to level the playing field or risk being left behind. The most sustainable solution was for us to take on broadband as a utility. That has allowed us to control the quality, reliability, and affordability of Wi-Fi services for residents."[7]
>
> *—Dr. Ambrosio Hernandez, City of Pharr mayor*

The city announced it would build its own fiber network in mid-2021 and issued a $54.6 million taxable municipal bond in late March 2022 to fund construction. Despite some delays in procuring equipment due to COVID-induced inventory shortfalls, the city had installed the fiber network by October 2022 and the mayor reported in January 2023 that the project was 72% complete citywide and "100% complete in south Pharr, which was the most disconnected area in the nation."

Our team was attracted to the bond, even though it was a smaller issue that wouldn't be index-eligible due to its size and not labeled as a social or sustainable bond. But the potential outcomes were clear and the proceeds were dedicated to the program. Moreover, the team saw a triple benefit from bond repayment backed by sales tax receipts, not by the broadband system itself. First, bondholder repayment was not tied to a start-up enterprise. Second, the higher credit rating associated with the security lowered borrowing (and project) costs. Lastly, and most importantly, the structure of the deal allowed the city to keep subscriber costs low to facilitate the twin goals of affordability and access. This is a model we support, and we will advocate for similar structures as we engage on future deals.

Affordability is a key outcome in another 2022 bond, this one from the memorably named issuer Bug Tussel, which is deploying capital quickly to scale its network in rural communities in Wisconsin. Nuveen invested in Bug Tussel's second social bond to develop broadband networks in seven of the state's rural counties. The company's first social bond, issued in late 2021, is funding similar initiatives in five other counties.

The August 2022 issue raised $92 million of capital and is expected to finance the installation of 66 towers. These towers will host a variety of telecommunications equipment anticipated to result in over 7,000 fixed wireless subscribers and over 16,000 fiber optic subscribers. As part of its arrangements with the seven counties, the issuer agreed to cap subscriber fees for high-speed service (minimum 25 megabytes per second, or Mbps), and offer a "lifeline" fee option for 10 Mbps broadband, a concept

MINIMUM BROADBAND SPEED NEEDED FOR COMMON INTERNET FUNCTIONS[8]

General usage

General browsing and email	1 Mbps
Streaming online radio	0.5 Mbps
Student work	5–25 Mbps
Telecommuting	5–25 Mbps
Downloading files	10 Mbps

Watching video

Streaming high definition (HD) video	5–8 Mbps
Streaming ultra HD 4K video	25 Mbps

Videoconferencing

HD personal video call (e.g., Skype)	1.5 Mbps
HD video teleconferencing	6 Mbps

Gaming

Game console connected to the internet	6 Mbps
Online multiplayer	6 Mbps

normally associated with water as an essential service. The vast majority of the land areas in those counties have internet service below 5 or 10 Mbps, and some communities have none at all.

Bug Tussel is a subsidiary of Hilbert Communications, a regional telecommunications company based in Green Bay, Wisconsin. According to its website, the issuer's goal is to deliver internet service in rural areas where larger carriers chose not to or were unable to provide service. Rural communities in general, including many in Wisconsin, have long struggled to obtain adequate cellular and internet service due to low population densities and limited potential subscriber bases. As a smaller, regional operator with lower overhead operating expenses, Bug Tussel partners with counties throughout the state to provide broadband service to residents. These partnerships and arrangements open up access to grants, low-cost loans and lower-cost financing via the bond market than would otherwise be possible.

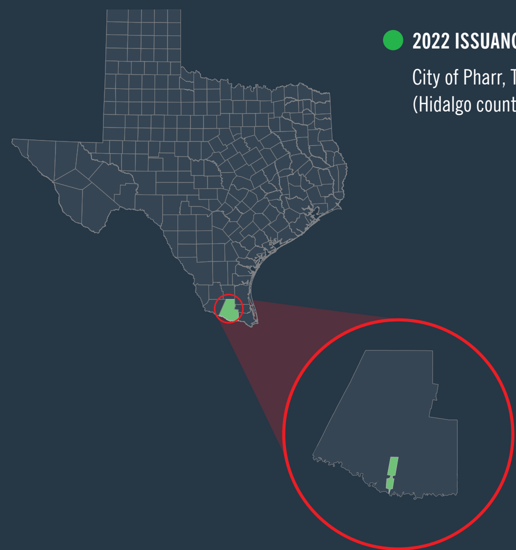
For calendar year 2022, using proceeds from both transactions, Bug Tussel added 2,400 broadband access customers. Proceeds from the 2021 issuance activated 57 tower sites and installed 330 miles of fiber conduit in five counties with an average population of 68,000 people. The seven target counties in the 2022 deal average 61,000 residents.

Both Pharr, Texas, and Bug Tussel issued in the taxable municipal market. Nuveen invested in a third 2022 community broadband deal (from National Rural Utilities Cooperative) in the corporate market and a 2023 Frontier Communications deal that came through the asset-backed securities (ABS) market. According to portfolio manager Jessica Zarzycki, this diversification indicates that issuers are seeking out the most cost-effective financing to provide affordable, reliable access in rural communities.

> "Reliable internet service went from being a luxury to an absolute necessity, a priority. Without it, many families lacked the ability to connect to schools, to their jobs, even looking for medical assistance, and for employment opportunities."[9]
>
> *—Dr. Ambrosio Hernandez, City of Pharr mayor*

MAPPING RURAL BROADBAND[5]

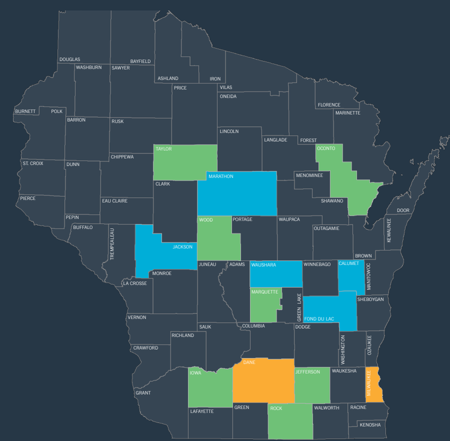
Texas



2022 ISSUANCE

City of Pharr, TX
(Hidalgo county; pop. 80,179)[1]

Wisconsin[10]



2022 ISSUANCE

Rock county (pop. 164,060)
Jefferson county (pop. 85,784)
Wood county (pop. 73,993)
Oconto county (pop. 39,633)
Iowa county (pop. 23,865)
Taylor county (pop. 19,975)
Green Lake county (pop. 19,220)

2021 ISSUANCE

Marathon county (pop. 137,958)
Fond du Lac county (pop. 103,836)
Calumet county (pop. 52,718)
Waushara county (pop. 24,999)
Jackson county (pop. 20,836)

LARGEST COUNTIES IN THE STATE

Milwaukee county (pop. 918,661)
Dane county (pop. 568,203)

"One of the most powerful aspects of these bonds is that they embed financial literacy and empowerment into community development. It's not just about individual women. There's also a multiplier effect on future generations of these historically underserved populations as they gain more understanding and agency over their financial lives."

Jessica Zarzycki, CFA
Portfolio manager, ESG/Impact – Global Fixed Income

Community and economic development

WOMEN'S LIVELIHOOD BOND SERIES

ALIGNMENT WITH SDGS:

Impact Investment Exchange (IIX), a Singapore-based financial institution whose mission is "to create an inclusive financial system where women, the environment and disadvantaged communities are valued and have a voice," developed an impact assessment framework that includes five primary outcomes for the bond's beneficiaries.

Mission and intended outcomes

The Women's Livelihood Bond provides private capital to microfinance institutions and social enterprises that, in turn, help low-income Southeast Asian women build credit histories and transition from subsistence to sustainable livelihoods. Long-term benefits, in addition to more successful women-owned businesses, include increased participation in the workforce, higher standards of living, and more education and health opportunities for women and children.

Measurable impact[11]

1. 21% more than the original target of 25,650 women have benefited
2. 27,500 women have taken advantage of micro loans to meet business-related needs
3. 21,690 have availed themselves of micro savings products
4. 2,700 have enhanced their knowledge and skills through training sessions
5. 1,775 women farmers are being sourced for agricultural goods

Originally appeared in 2021 Global fixed income impact report

In addition to the number of women supported, the bond's impact is measured by a metric known as Social Return on Investment (SROI), which assigns a dollar value to the outcomes. WLB2 met its SROI goal of 3.21, or $3.21 of social impact for every $1 invested.

Investors in WLB2 receive both public and private credit protection, with a 50% loan portfolio guarantee from the United States Agency for International Development (USAID) and first loss capital provided by The Rockefeller Foundation.

Watch the video “Make your impact”

WOMEN’S LIVELIHOOD BOND SERIES™

The Women’s Livelihood Bond (WLB) series consists of multi-country, gender-focused debt securities managed by Impact Investment Exchange (IIX). IIX believes “we are the pioneer in impact investing and the global leader in sustainability. We have transformed the financial system so that women, the environment and underserved communities are finally given a value and a voice in the global market.” IIX seeks to create a billion sustainable livelihoods by 2030.

The series was launched with the $8.5 million WLB1 in 2017, followed in 2020 by two separate issues, WLB2 ($12 million) and WLB3 ($30 million). Nuveen is a leading institutional investor in both of the 2020 bonds.

WLB2: Empowering women in developing countries to transition from subsistence to sustainable livelihoods

Proceeds from WLB2 provide capital to a total of six borrowers in Cambodia, Indonesia and Sri Lanka operating in three sectors: small- and medium-sized enterprise (SME) lending, renewable energy and sustainable agriculture. These borrowers, in turn, provide capital and low-cost financing to women working in these sectors.

WLB3: Putting women at the center of COVID-19 resilience

The third bond in the series is broadly similar to the second, but there are nuanced differences in structure and features. Relative to WLB2, WLB3 has:

1) A larger deal size ($30 million vs. $12 million); 2) More borrowers (eight vs. six); 3) More countries (four vs. three, with the addition of India and the Philippines, and Sri Lanka no longer included); 4) More industries (five versus four, with the addition of ethical garment making); 5) A higher social return on investment (SROI) goal (4.0 vs. 3.21).

Additionally, WLB3 has an intentional COVID-19 focus and is expected to benefit the lives of 180,000 women and women entrepreneurs in South and Southeast Asia as they respond, recover from and build community resilience during and after the pandemic.

Lastly, investors in WLB3 receive both public and private credit protection, with a 50% loan portfolio guarantee from the United States International Development Finance Corporation (DFC) and first loss capital provided by IIX’s recently launched Women’s Catalyst Fund.

The gold standard of impact reporting

Impact certification and reporting for the WLB series is aligned with the International Capital Markets Association (ICMA) and Association of Southeast Asian Nations (ASEAN) social bond principles. WLB investors receive both financial and impact reports on an annual and semiannual basis. Annual impact reports include data from the field collected directly from end beneficiaries, while ongoing monitoring of borrowers’ financial and impact performance during the lifetime of the bond provides risk mitigation and accountability to bondholders.

“The scope, detail and frequency of the WLB impact reports provide remarkable clarity for investors,” says Stephen M. Liberatore, CFA, portfolio manager and Head of ESG/impact – Nuveen global fixed income. “This transparency represents the gold standard of reporting.”

With its emphasis on SROI and transparent impact data collection, the WLB series offers a model for other issuers of impact bonds to follow.

3

Renewable energy and climate change

Continental Wind, LLC ▶

Hanwha Qcells ▶

Sunrun, Inc. ▶

Tesla ▶

Continental Wind, LLC

“This was one of the first times we were able to make an impact investment directly in a subsidiary. That’s a critical distinction because, at the time, the parent company was not part of our eligible universe. Here we could take advantage of the fact that impact issuance in public fixed income is possible at different parts of the corporate and capital structure.”

— Stephen M. Liberatore, CFA,
Head of ESG/Impact – Global Fixed Income

Renewable energy and climate change

CONTINENTAL WIND, LLC

ALIGNMENT WITH SDGS:

7 AFFORDABLE AND CLEAN ENERGY

13 CLIMATE ACTION

Mission and intended outcomes

To help finance the wind portfolio while clearly conveying to the parent company that we will be a source of capital for renewable projects but will not invest in its general utility operations, where fossil fuel inputs, emissions, and the overall pace of transition to renewable energy sources do not match our impact criteria.

To benefit from long-term contracts as well as diversity in technology, geography and offtakers. (An “offtaker” is a purchaser of power produced by a renewable energy asset, such as a wind farm.)

Measurable impact

In 2020, the ExGen/Continental Wind portfolio generated:

- 1,985,784 MWh of electricity
- Enough energy to power 169,470 average homes for a year[2]
- Displacement of 1.6 million tons of CO_2-equivalent emissions
- The impact of taking 306,057 cars off the road[2]

Originally appeared in 2021 Global fixed income impact report

Continental Wind, LLC

We invested directly in Continental Wind, LLC, a renewable energy project development company, as it aligned with our impact approach of directing capital to specific projects and outcomes.

We believe this is the optimal way to invest for impact in public fixed income markets. It allows us to determine the specific use of proceeds of our investments and exert an influence on reporting methodologies that provide transparency and accountability for science-based outcomes. This is particularly necessary in the utilities and energy industries, which are significant emitters of greenhouse gases and producers/consumers of fossil fuels. Through impact investing, we have the opportunity to finance the transition to greener energy production within these hard-to-abate sectors, even if we wouldn't lend to the general operations of the issuer or parent company via traditional corporate bonds.

Continental Wind, LLC is 100% indirectly owned by ExGen Renewables I, LLC (ExGen). ExGen itself is an indirectly wholly owned subsidiary of Exelon Corporation (EXC), a large U.S. producer and distributor of utility-scale power. Continental Wind is a diversified portfolio of 13 operating wind farms with a combined capacity of 667 megawatts (MW) located across six states (Idaho, Kansas, Michigan, New Mexico, Oregon and Texas); and Continental Wind receives 100% of the cash flows generated by these facilities. We view these cash flows to be stable and of high quality, given that 97% of revenues are from long-term purchase agreements from nine separate offtakers. Through this investment, we help finance the wind portfolio while clearly conveying to the parent company that we will be a source of capital for renewable projects but will not invest in its general utility operations, where fossil fuel inputs, emissions and the overall pace of transition to renewable energy sources do not match our impact criteria.

"Investing in the 2013 loan that initially financed the ExGen/Continental Wind assets was one of the first opportunities we had to make an impact investment in a subsidiary," recalls Stephen M. Liberatore, CFA, portfolio manager and Head of ESG/impact — Nuveen global fixed income. "The parent company was not part of our eligible universe."

ExGen was also among the first issuers Nuveen engaged with that was willing to provide unambiguous renewable energy impact metrics, primarily in the form of megawatt hours (MWhs) of electricity generated from the wind portfolio. This put the issuer on the leading edge of direct, measurable impact reporting — a requirement and centerpiece of Nuveen's approach.

Renewable energy and climate change

CASE STUDY: HANWHA QCELLS

7 AFFORDABLE AND CLEAN ENERGY

13 CLIMATE ACTION

Meeting the demand for solar energy

Hanwha Qcells, headquartered in Seoul, South Korea, is one of the world's top 10 producers of solar photovoltaic wafers and modules. These bonds were issued to finance the construction of a new 3.3-gigawatt (GW) solar panel manufacturing facility in the state of Georgia. It will produce essential components for developing the U.S. solar power industry. The new facility will be located near another Hanwha Qcells plant that opened in 2019 to manufacture 1.7 GW modules but recently expanded to 5.1 GW capacity. Together, the two facilities will be a significant driver of energy transition manufacturing in the southeastern United States.

According to the U.S. Energy Information Administration (EIA), U.S. **solar energy capacity is projected to grow 75% from 2023 to 2025**, placing it on par with wind power capacity, which is projected to grow only 11% over the same period. The growth in solar would equate to nearly **60 GW of new capacity over the next two years, representing a large percentage of global demand**. While Chinese solar manufacturing could potentially meet that demand, various political, legal and humanitarian considerations provide a strong incentive for the United States to "onshore" solar panel manufacturing. Between the 2019 plant opening, its expansion, and the new facility, Hanwha Qcells has demonstrated its commitment to the U.S. solar industry — especially considering that the original Georgia plant was built before additional solar manufacturing incentives became available under the Inflation Reduction Act (IRA) of 2022. The IRA is providing a catalyst to match EIA growth projections, and Qcells is positioning to meet that growth.

Originally appeared in 2024 impact insights report

sunrun

"Conventional wisdom says adopting renewable energy sources like solar isn't economically feasible for the average person. But with asset-backed security (ABS) structures like Sunrun's helping drive down costs, we can show that it actually saves people money. As perception catches up with reality, we think securitized assets will become an increasingly effective way to deliver positive environmental outcomes. That's why we always look across fixed income asset classes for impact opportunities."

— Stephen M. Liberatore, CFA,
Head of ESG/Impact — Global Fixed Income

Renewable energy and climate change

SUNRUN, INC.

ALIGNMENT WITH SDGS:

7 AFFORDABLE AND CLEAN ENERGY

Mission and intended outcomes

To create a planet "run by the sun" and provide distributed solar power generation, primarily through residential, rooftop solar panels.

Measurable impact

In 2020, Sunrun's systems generated 4 billion kWh of solar power — enough to:

- Provide electricity to 514,908 homes for one year
- Displace 3.1 million tons of carbon dioxide equivalents from the atmosphere
- Achieve the comparable impact of taking 616,000,497 cars off the road for one year[4]

Since 2007, Sunrun has cumulatively generated 11.4 billion kWh of solar power

Originally appeared in 2021 Global fixed income impact report

sunrun

Guided by its mission to create a planet "run by the sun," Sunrun Inc. is a provider of distributed solar power generation, primarily through residential, rooftop solar panels.

The San Francisco-based Sunrun has well over half a million customers and sells its solar service in 22 states, the District of Columbia and Puerto Rico. Unlike some residential solar companies, Sunrun owns the solar assets it installs. Instead of homeowners paying the capital costs upfront, the residential units hosting the solar system enter into lease agreements with Sunrun to purchase the solar power generated, with the excess generation net-metered to the grid.

The proceeds of the asset-backed securities (ABS) series in which Nuveen invested were used to finance Sunrun installations on more than 14,000 homes.

Total system size nearly	**88 MW**
Average per home	**6.14 kW**
Number of homes capable of powering annually	**19K**
Annual electricity generation	**154,176 MWh**

Traditional solar residential installers are typically able to provide only estimates of impact because, once the systems are installed, they no longer own or have access to the solar asset. Sunrun, however, owns, meters and monitors the assets, so it is able to provide updates on actual power generation. This includes an annual impact report detailing both yearly and cumulative totals. Sunrun's 2020 report listed 550,000 customers and 3,885 MW of installed capacity.

That's significantly more than the current installed capacity (245 MW) of the world's largest single solar farm, Bhadla Solar Park in India.[12]

"The potential impact of investments like Sunrun's is even more compelling when you think about extrapolating the approach on a larger scale," says Stephen M. Liberatore, CFA, portfolio manager and Head of ESG/Impact – Nuveen global fixed income. "With California now requiring solar installations on all new home construction, we could start to see a broader acceleration of the transition from fossil fuels to renewable energy sources. Not only would that be good for the environment, but it would also lower the cost of distributed solar as advances in technology and greater scale lead to new efficiencies."

The ABS market provides an ideal source of funding for this type of impact investment, Stephen adds. "Securitization is one of the primary reasons people can afford to buy houses and cars and have credit cards," he explains. "And now that model is making it more cost-effective for issuers — and individuals — to install solar technology in homes."

> "The ABS collateral pools are separate legal entities from the corporation, with excellent transparency. From a green bond perspective, we like that the ABS are financing EV purchases. From a credit quality perspective within ABS, we like the very high quality of borrowers in the pools."
>
> *— Stephen M. Liberatore, CFA, portfolio manager and Head of ESG/Impact*

Renewable energy and climate change

TESLA

Measurable impact

- Total CO_2 avoided (metric tons): 209,104

Tesla's mission is to accelerate the world's transition to sustainable energy. As a leader of clean technology practices in the automobile industry, Tesla pursues this goal primarily through the development and sale of all-electric vehicles. The company also develops storage and scalable clean energy generation products, such as solar roofs and panels.

Tesla supports the affordability and lease financing of its automobiles by issuing asset-backed securities (ABS). These all-electric vehicle (EV) collateral pools are a perfect fit for impact portfolios, as deal proceeds are helping to finance the consumer purchase of EVs and putting them on the road. Notably, the structure also mitigates governance concerns with the company itself. Our ESG/impact portfolios don't invest in Tesla corporate bonds/general corporate debt instruments, as we struggle to confidently predict the strategic decision-making of the founder-led enterprise. According to Stephen M. Liberatore, CFA, portfolio manager and Head of ESG/Impact, "The ABS collateral pools are separate legal entities from the corporation, with excellent transparency. From a green bond perspective, we like that the ABS are financing EV purchases. From a credit quality perspective within ABS, we like the very high quality of borrowers in the pools."

Originally appeared in 2023 Global fixed income impact report

In 2022, Tesla's global fleet of vehicles, energy storage and solar panels enabled customers to avoid emitting 13.4 million metric tons of CO_2, the equivalent of providing electricity for over 2.6 million homes for one year.

Nuveen began investing in Tesla EV ABS with the inaugural issue in 2018. That pool of loans consisted largely of leases on Tesla's higher-priced vehicles, such as the Model S and Model X. In contrast, the less-expensive Model 3 made up a majority of the 2021 pool. "This shift in allocation was a key part of our decision to participate in the (2021) deal," notes Liberatore. "Given the ability of electric cars to reduce greenhouse gas emissions, we felt it was essential to help reduce the cost of capital for financing them."

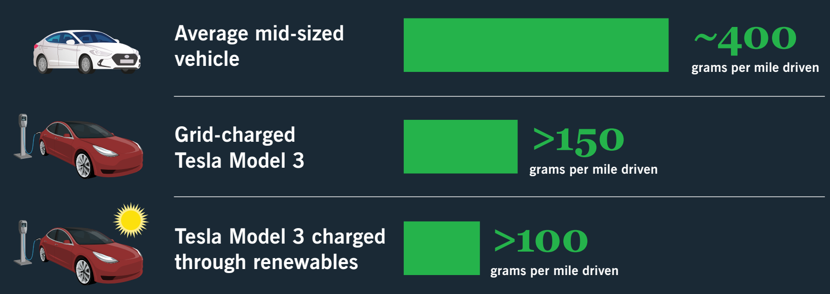
The ABS market provides an ideal source of funding for this type of impact investment. Consumer ABS has been a staple in high grade U.S. fixed income indexes for years, albeit at a much smaller sector allocation than the big three sectors of US Treasuries, US agency mortgage-backed securities (MBS), and corporate bonds. Beyond the agency MBS market, typical indexes include sufficiently large issues of consumer credit card, auto and student loan collateral. "Securitization is one of the primary reasons people can hold credit cards and buy homes. With Tesla offering more affordable options and the cost of electric vehicles declining as the technology advances and economies of scale are achieved, ABS will catalyze the rate at which EVs are purchased and driven," Liberatore explains.

While the average weighted cost of Tesla's cars in the ABS pools has fallen, the weighted average FICO score of borrowers in the pool has risen from 767 in 2018 to 789 in 2021, instilling greater confidence among lenders — and investors like Nuveen.

LOWER COST OF TESLA'S VEHICLES REFLECTED IN ABS ASSET POOLS

	Average weighted cost of Tesla model
2018 (inaugural pool)	$68,486
2021	$47,883

Per Tesla's 2022 impact report, the average mid-size vehicle in the U.S. emits approximately 400 grams of Co_2/mile driven in its lifecycle. A grid-charged Model 3 emits fewer than 150 grams of CO_2/mile driven and fewer than 100 grams for a Model 3 charged through renewables.[26]



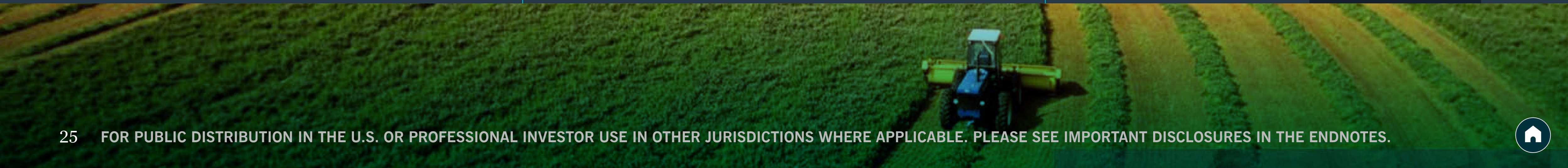
4

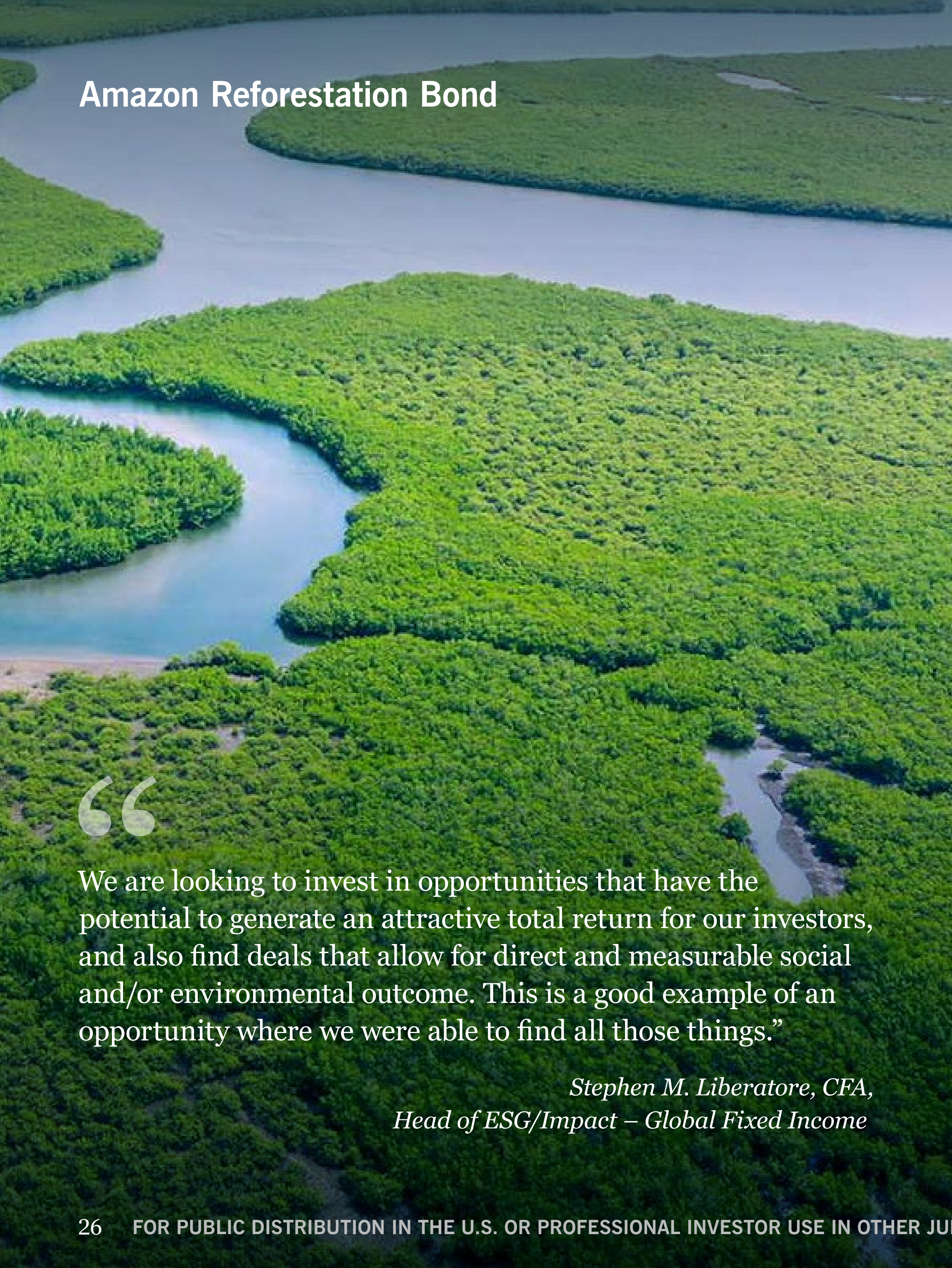
Natural resources

Amazon Reforestation Bond ▶

Republic of Seychelles Blue Bond ▶

Rhino Bond ▶





Amazon Reforestation Bond

> “We are looking to invest in opportunities that have the potential to generate an attractive total return for our investors, and also find deals that allow for direct and measurable social and/or environmental outcome. This is a good example of an opportunity where we were able to find all those things.”
>
> *Stephen M. Liberatore, CFA,*
> *Head of ESG/Impact – Global Fixed Income*

Natural resources

AMAZON REFORESTATION BOND

ALIGNMENT WITH SDGS:

15 LIFE ON LAND

Use of proceeds and intended outcomes

- Proceeds will help reforest up to 3,300 hectares of degraded and deforested farmland with native tree species — roughly the same size as 7,400 U.S. football fields or 5,200 Premier League football pitches
- Brazil-based Mombak will acquire or partner with landowners in the state of Pará (which is traversed by the lower Amazon River)
- The first bond to link the level of investors’ financial returns to the amount of carbon removed from the atmosphere via generation of carbon removal credits. Carbon removal (and reduction) credits are viewed to be more desirable and less controversial than carbon avoidance credits.
- Nuveen was lead order

Originally published in August 2024

Deal structure

- $225 million, 9-year World Bank outcome bond
- AAA rated issuer
- A portion of the coupon depends on the amount of CO_2 removed from the atmosphere by the reforested land until the bond matures
- Relative value assessed versus conventional IBRD 10-year debt: ~6 bps of downside versus ~40bps of upside
- Nuveen worked with Mombak to ensure impact reporting would include not just carbon sequestered, but also KPIs focused on forest health, biodiversity and community impact
- Nuveen was also anchor order for IBRD’s emission reduction-linked bond in 2023. Deal generates carbon reduction credits in Vietnam via ceramic water filters for potable water in schools, displacing biomass combustion to boil water.

Republic of Seychelles Blue Bond

> “What really stands out about the Seychelles bond is not only the direct, measurable impact it delivers, but also that it can serve as a template for future deals, helping to develop the fledgling blue bond market.”
>
> *Stephen M. Liberatore, CFA,*
> *Head of ESG/Impact – Global Fixed Income*

Natural resources

REPUBLIC OF SEYCHELLES BLUE BOND

ALIGNMENT WITH SDGS:

8 DECENT WORK AND ECONOMIC GROWTH

14 LIFE BELOW WATER

Mission and intended outcomes

- Part of a larger World Bank program known as SWIOFish3, designed to support a transition to sustainable fisheries in Seychelles.
- The largest portion ($12 million) of the $15 million in bond proceeds will go toward the Blue Investment Fund, a revolving loan fund for commercial projects with a specific focus on developing the country’s “blue economy” through diversification and sustainability activities that can generate a return.
  - Example: refitting vessels for longline tuna fishing, considered a more sustainable method than deep-sea trawling.
- The other $3 million in proceeds will be used to fund expanded sustainable use of marine-protected areas ($1.5 million) and to improve governance of priority fisheries ($1.5 million).

Measurable impact

- By the end of 2020, 30% of the Seychelles Exclusive Economic Zone was designated sustainable-use protected areas, with SWIOFish3 and the blue bond funding research and development plans for sustainable fisheries in these areas
- Ongoing related projects and studies include capacity building for small-scale fishing operators, assessing employment needs and developing a Seychelles seafood brand, among other priorities

Originally appeared in 2021 Global fixed income impact report

Republic of Seychelles Blue Bond

Issued by the Republic of Seychelles, an island nation off the coast of East Africa, this debt offering was the world's first sovereign "blue" bond — a pioneering financial instrument designed to support sustainable fisheries and other marine projects in countries whose economies depend primarily on the health of the ocean.

This issuance, a unique collaboration between the Seychelles government, the World Bank and the private sector, raised $15 million. It is supported by a $5 million guarantee from the World Bank and a further $5 million from the Global Environment Facility (GEF) that can be used only to cover the bond's coupon payments.

"The World Bank contacted us early in the development process, and we worked closely with a team of experts to structure the transaction," explains Stephen M. Liberatore, CFA, portfolio manager and head of ESG/impact – Nuveen global fixed income. "The bond's relative valuation, along with its partial backing from the World Bank and the GEF, make it an attractive investment opportunity. At the same time, its direct and measurable impact is exactly what we look for in our proprietary impact framework."

SWIOFish3, which is implementing the projects funded by the bond, provides both a quarterly report, which benchmarks progress against measurable outcomes and deadlines for the entire program, and an annual report focused on blue bond-supported impact. The most recent report documented the funding of four large and eight small grants to date.

Additionally, the SWIOFish3 project manager meets annually with Nuveen to review the overall program and the progress of blue bond-funded activities in particular.

"What really stands out about the Seychelles bond is not only the direct, measurable impact it delivers, but also that it can serve as a template for future deals, helping to develop the fledgling blue bond market," explains Stephen Liberatore, who in addition to his role at Nuveen serves on the blue economy investor advisory group of the UN's Joint Sustainable Development Goals Fund. "Whether the guarantor is the World Bank, the IFC, the Asian Development Bank or some other entity, there are many stakeholders with whom governments and investors can partner to structure, finance and issue blue bonds."

Nuveen's approach demonstrates to both potential issuers and large institutional investors — who otherwise might be hesitant to participate in smaller, less-liquid, non-index-eligible issues — that accessing public fixed income markets can be a powerful way to finance these innovative impact opportunities, he adds.

Rhino Bond

"The Wildlife Conservation Bond (WCB) has already made a meaningful impact for the parks and local communities in South Africa by providing essential and significant financing for rhino conservation and creating new jobs during a challenging economic period following COVID-19. The WCB has inspired the teams on the ground to deliver greater impact and serves as a template to transform how nature conservation is funded by channeling capital market resources towards sustainable development solutions in rural underserved areas of Africa and beyond. Nuveen's important contribution as the lead WCB investor was instrumental to make the WCB operation a reality."

—Elisson Wright,
Senior Environmental Finance Specialist, World Bank

Natural resources

RHINO BOND

Mission and intended outcomes

To protect and increase the rhino population, the World Bank issued a first-of-its-kind "Rhino Bond" — a five-year, AAA rated, $150 million outcome-based credit that directly links investors to the survival of an endangered species. Nuveen was the lead order in the deal, which priced in early 2022.

Measurable impact

- Between 1960 and 1995, approximately 98% of the black rhino population was wiped out, mainly because of poaching and habitat loss. Although rhinos have made a comeback because of intensive mitigation efforts — their numbers have since doubled, to about 6,000 — this "Big Five" safari animal remains critically endangered.
- As a keystone species, rhinos help other species that share their habitat, contributing to South Africa's national economy through tourism and job creation, while simultaneously reducing the incentives for poaching.
- Conservation efforts at Addo Elephant National Park and Great Fish River Nature Reserve strengthen ecosystem services like clean water and habitats for pollinators that serve the local citrus industry. The project is expected to lead to the improved conservation of 153 thousand hectares.

Originally appeared in 2023 Global fixed income impact report

Rhino Bond

To protect and increase the rhino population, the World Bank issued a first-of-its-kind "Rhino Bond" — a five-year, AAA rated, $150 million outcome-based credit that directly links investors to the survival of an endangered species. Nuveen was the lead order in the deal, which priced in early 2022.

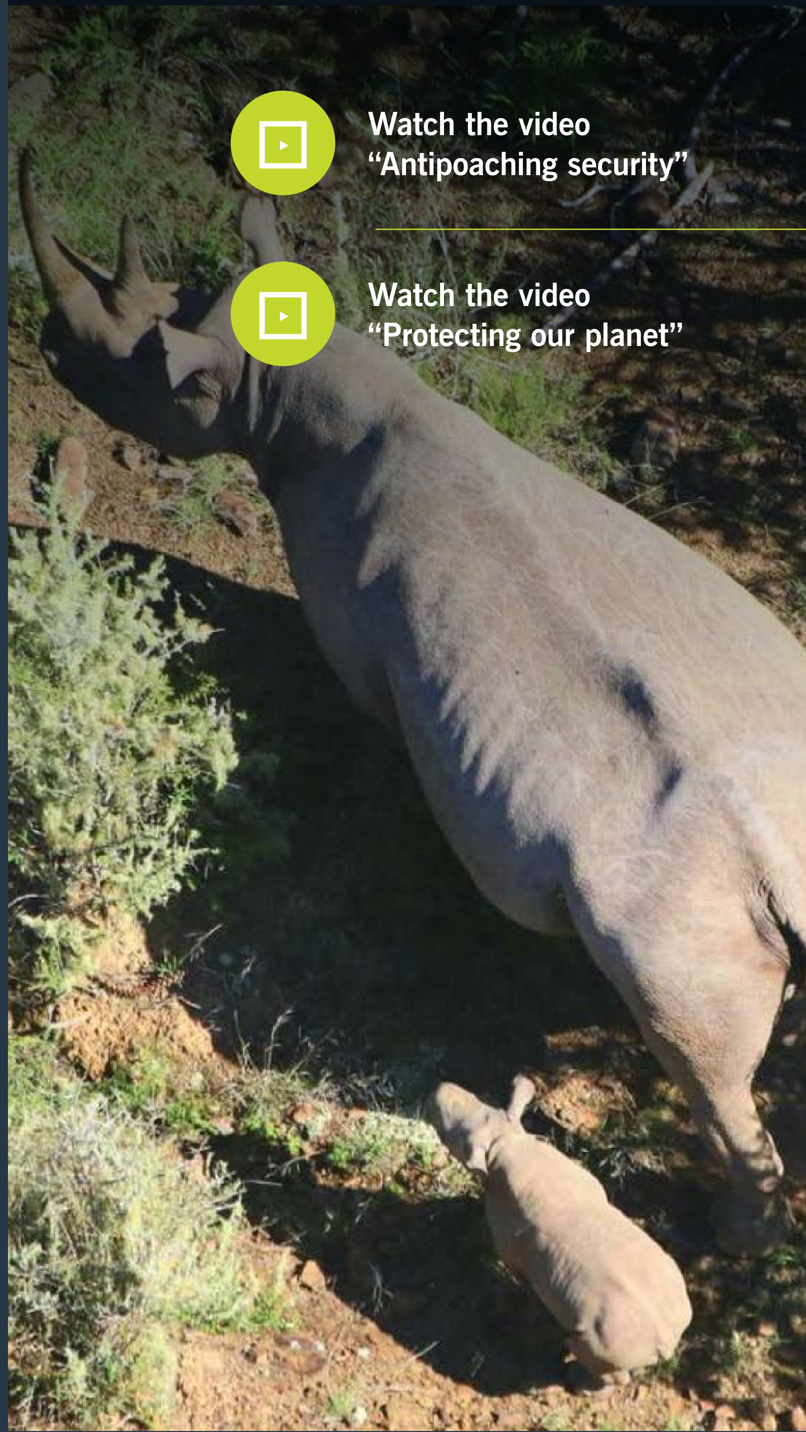
Proceeds from this bond (issued by the World Bank) are designed to help increase and protect the black rhino population in two protected areas in South Africa — the Addo Elephant National Park and the Great Fish River Nature Reserve. These parks were selected for this pilot transaction based on their ecological, managerial and financial capacity to achieve positive rhino conservation outcomes.

Because the bond is a zero-coupon security, investors won't receive coupon payments. Instead, those would-be periodic payments are used to support rhino breeding programs and conservation activities, increase staffing and training, and to invest in technology, infrastructure and equipment, among other projects. To date, proceeds have purchased new trucks and trailers, enabling park rangers to cover more ground and tag rhinos rather than rely on models to estimate the rhino population. Also, because South Africa often endures power outages of up to 10 hours a day, solar panels have been installed in the parks. All told, more than 50% of the bond proceeds have been spent.

Repayment of bond principal is guaranteed by the World Bank. If rhino population growth in the parks meets certain thresholds over the bond's five-year tenor, as measured independently by two conservation groups, investors will receive a success payment at maturity. The greater the rhino's population growth, the higher the payment. In year one, the rhino growth rate was over 7%, which exceeds the pace required to maximize the success payment.

This structure represents the positive alignment we look for in a transaction and contrasts with sustainability linked bonds (SLBs), which pay a coupon "step up" — a penalty for the issuer not meeting its target. While such a penalty payment is "good" for bondholders because of the higher coupon, it means the issuer failed to achieve its intended outcome/impact.

Nuveen was the lead investor in the offering, having assessed the potential return and relative value against outstanding, traditional, coupon-paying bonds issued by the World Bank. According to Stephen Liberatore, CFA, Head of ESG/Impact — Global Fixed Income, the Rhino Bond "provided attractive total return potential alongside the direct and measurable outcomes we look for under our proprietary impact framework. We are especially hopeful that this type of public-private partnership can serve as a template for future transactions to help improve biodiversity globally."



Rhino Bond








For more information, please visit us at nuveen.com

Endnotes

1 Century Housing Corporation, https://century.org
2 Community Development Financial Institutions Fund, https://www.cdfifund.gov
3 Proceeds used for climate-aligned projects and initiatives but issued without designation mentioned in offering documents or deals too small to make second-party opinions economically viable.
4 https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.
5 https://www.census.gov/quickfacts/fact/table/pharrcitytexas/PST045222
6 https://www.digitalinclusion.org/worst-connected-cities-2019/
7 https://www.calix.com/press-release/2023/june/from-worst-to-best-in-18-months-city-of-pharr-leverages-calix-platform.html
8 https://www.fcc.gov/consumers/guides/broadband-speed-guide
9 https://riograndeguardian.com/pharrs-blazing-speed-broadband-is-being-expanded-into-san-juan-and-alamo/
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11 Impact Investment Exchange, Women's Livelihood Bond 2 ("WLB 2") Summary Semi-Annual Impact Report Q1 – Q2 2020
12 Mercom India – Clean Energy News and Insights, March 2020

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