

**nuveen**

A TIAA Company

# Global fixed income impact report 2023

Intentional, direct and  
measurable outcomes



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# Overview

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# A message from Amy O'Brien



**Amy O'Brien**  
*Global Head of Responsible Investing*

## **In a year marked with climate disasters and social challenges around the globe, we face one of the greatest opportunities of our generation to transform the way we invest, the way we partner, and the way we drive impact.**

We know that it will take trillions of dollars of capital to effect change in the energy space and beyond, and we are already seeing the flow of assets begin to swing into motion. We maintain our conviction that impact investing in public fixed income markets is not only possible but integral to addressing many of the large-scale, systemic challenges we face.

The decades-long partnership between our Responsible Investing (RI) team and Global Fixed Income (GFI) teams remains tightly wound — working together to implement impact frameworks, develop practices in investment methodologies, and transparently report on outcomes and data across our impact portfolios.

In 2023, we believe there are two key forces at play beyond the immense movement of capital toward green energy initiatives based on regulatory changes: The rise of impact investing, and the importance of RI data and transparency.

### **The rise of impact investing**

Capital around the globe is increasingly directed to solve challenges and align investor values with investment tactics. The concept of impact investing — earning competitive investment returns alongside intended, positive impact — is not new, but its pace and volume of growth is nearly unmatched across capital markets.

According to The Principles for Responsible Investment, global expenditure of roughly \$3 trillion U.S. dollars annually is needed to deliver on the transition to a low-carbon economy — 75% of which is required outside of the world's seven largest developed economies.

We are pleased to be a trusted partner for clients seeking an impact-focused fixed income manager. Over the past decade, our relationships have expanded beyond our flagship Core Impact Bond strategy to similar mandates blending impact investing with peer-relative ESG leadership across various duration, quality and currency objectives. But over the

past two years, we've seen a material increase in interest and have funded portfolios for impact-only implementations. We believe this interest signals the next phase in investor acceptance of the philosophy and concepts that underpin impact investing in public fixed income markets.

The trust of our clients is hard-won, yet we are honored to capture peer-voted awards as well. In 2023, our global fixed income colleagues were recognized in two categories of the Environmental Finance Impact Awards: Investment team of the year — asset manager and Fund of the year — fixed income.<sup>1</sup> Previously, the inaugural version of this report garnered Impact report of the year (for investors) at Environmental Finance's Bond Awards 2022 and Pensions for Purpose: Best impact report 2022.<sup>2</sup> Our Responsible Investing and Global Fixed Income colleagues worked hard to compile the information on the following pages, hoping to live up to the high standard we set last time out!

### **The importance of RI data and transparency**

We commit the resources necessary to deliver comprehensive impact reporting because transparency and accountability are essential pillars of a healthy and vibrant impact investing landscape. With the rising need, use and access to impact investments comes a responsibility to provide relevant and transparent impact measurement. The past several years have witnessed increasing demands from regulators on how and where sustainable reporting should be provided and at what level. We believe the regulatory scrutiny and public debate over sustainable and impact

investing will only accelerate, and as a result, our measurement capabilities must continue to evolve and improve.

At Nuveen, we engage via industry working groups focused on credible and standardized measurement, and advocate for increased transparency between issuers and our clients. We believe that forthcoming regulation and voluntary frameworks will continue to provide a strong foundation for asset owners and asset managers utilizing impact strategies. We will continue to incorporate best practices from frameworks like the International Finance Corporation (IFC) [Operating Principles for Impact Management, which we adopted in 2019](#), and seek independent verification from organizations like BlueMark, which recognized our fixed income impact colleagues on their [Practice Leaderboard \(2023 edition\)](#).

I am proud of Nuveen's commitment and the strong and sustained partnership that exists across our platform to continuously evolve a leadership framework that drives client, investment and market impact. I am confident that impact investing in public fixed income markets is a viable solution for mobilizing the trillions in capital required to finance the green energy transition and myriad social initiatives related to the UN Sustainable Development Goals. At Nuveen, our hope is that the private and public sectors can continue to collaborate to transition capital in the most effective manner, allowing all of us to see progress and change in one of the largest generational challenges we have faced.



# Introduction



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

We are pleased to share our second global fixed income impact report. This report represents a labor of love for my team and a growing number of Nuveen colleagues who make it possible. The collection of impact reporting from hundreds of issuers, parsing of reporting for scalable and recurring metrics, analysis of outcomes, and the aggregation of data for each commingled fund and segregated client account takes months of effort each year.

## **The effort is worth it**

Our clients collectively invested \$7.2 billion in impact securities as of December 31, 2022, and helped finance the positive social and environment outcomes detailed in the pages of this report. Some transactions, like the “rhino bond” detailed on pages 38–40, would not have come to market without the diligence of our team and the capital our clients have committed to impact investing in public fixed income markets.

The outcomes reported here exemplify the successes that can be funded at scale in the bond market. This is worth celebrating

and sharing not only with clients, but also with the investment community globally. Impact reporting like this is evidence of what can be achieved; it provides a roadmap for how issuers, industries, governments and geographic regions can finance beneficial societal and environmental outcomes. With each successive impact report — from issuers, asset managers and asset owners — there is new data validating achievements and pointing the way toward additional accomplishments. As active managers, we rely on the increasing granularity of impact data to inform our fundamental analysis of issuers in delivering more-stable free cash flow profiles.

Despite the importance of outcome measurement, impact reporting remains a highly bespoke exercise. Standardization of key performance indicators (KPIs) remains elusive, save for renewable energy generation, energy efficient and green building certifications, and some affordable housing metrics. This speaks to two key points. The first is that many investors and asset owners remain content to receive allocation reporting. We insist on impact

**The outcomes reported here exemplify the successes that can be funded at scale in the bond market. This is worth celebrating and sharing not only with clients, but also with the investment community globally.**

reporting tied to outcomes, not the initial allocation of capital. Second, the spectrum of outcomes financed via the public fixed income market is rapidly expanding. Bonds to support affordable housing and renewable energy have been around for a while, but we’re seeing innovation to finance terrestrial and marine conservation, vocational training and educational opportunities (increasingly with a gender focus), the circular economy and rural broadband (pages 33–35). The upshot is that a report like this is a massive manual undertaking; no commercial databases or third-party vendors yet exist to collate annual outcomes from the thousands of green, social and sustainable bond issues globally.



## **Our impact framework is inclusionary and intentional**

We often refer to our impact framework as direct and measurable, and it is designed to maximize our control over use of proceeds and the ultimate allocation of capital. We deliberately seek to include bonds that directly finance decarbonization, transition, access to clean water and basic health care, and myriad societal and environmental outcomes, rather than look for reasons to exclude securities or issuers. Our approach strives to identify impact investments for client portfolios, rather than create a process of elimination that backs into permissible holdings.

To address a controversial topic: we aren't going out of our way to exclude fossil fuel exposure in investment portfolios. Our impact approach contemplates the parent company and overall operations of the issuer. We aim to support genuine capital expenditure to decarbonize business models, reduce emissions, transition from fossil fuel usage to renewables, and invest in new technologies (e.g., batteries, green hydrogen/ammonia, and carbon capture, storage, and sequestration). But we will not invest in use-of-proceeds or labeled securities that help an enterprise elongate extraction or prolong the use of fossil fuels. There may be coal-burning generation assets within utility company operations, but we will not invest in general obligation bonds that finance broad operations.

To that end, we evaluate two criteria to qualify a bond as an impact investment: use of proceeds and measurable outcomes. One: each bond's use of proceeds must be clearly aligned with one or more of our four impact themes: affordable housing, community and economic development, renewable energy and climate change, and natural resources. Two: the reporting must be sufficiently transparent and granular that we can hold issuers accountable for achieving (or falling short of) the expected outcomes. Our approach dates to 2007 and has never relied on labels or index eligibility to define an impact security. This requires a heavy commitment to idiosyncratic evaluation and due diligence, but I feel it is the only way to extract accountability from issuers and to make us accountable to our clients — we can't point a finger at a rule or label when justifying an impact investment.

Owning the investment decision is more critical than ever, as the debate rages over what qualifies as a green bond. Regulators in various jurisdictions are attempting to define what is and what isn't a green bond, and we believe rigid nomenclatures will crowd out capital for innovation and as-yet-unproven technologies. A focus on use of proceeds is essential to understanding how capital will be deployed, the projects and programs to be supported and the outcomes targeted. This is the foundation for ICMA's Green Bond Principles, which I helped write as a two-term member

of the original executive committee. But the Principles don't go far enough in terms of requiring relevant and granular KPIs in impact reporting. We believe such detail is required above and beyond mere allocation reporting. It demonstrates how outcomes are achieved, which helps encourage the pursuit of similar results. The scale and efficiency of issuing securities in the public fixed income market should help marshal increasing amounts of capital toward those ends.

### **Marrying discipline with opportunity**

We're encouraged by the diversity of issuance we're seeing, as well as the blurring of the lines between social bonds and green bonds. Many deals support programs with elements of both, and are perhaps better classified as sustainable bonds. Affordable housing projects with strong energy efficiency standards have an environmental outcome for sure, but typically make heating and cooling cheaper — reinforcing affordability. The initial debt-for-nature swaps financed marine area conservation, and the market eagerly applied a blue bond label to them. But the 2022 Republic of Ecuador/Galapagos Islands deal leaned into sustainable fishing outcomes in addition to conservation efforts, and rigid preconceptions of what makes a blue bond began to fade. We envision debt-for-nature swaps that cover terrestrial protections or wildlife conservation. There's no rule that debt-for-nature swaps must be synonymous with blue bonds. The more our industry tries to build rigid definitional frameworks, the more challenging it becomes to just issue bonds and finance desired outcomes.

That's why we've operated under the guiding principles of our impact framework since 2007: direct and measurable. Use of proceeds to finance social and environmental outcomes. Reporting and disclosure that aligns with the outcomes and enables accountability. And this is why I am committed to leading-edge standards of practice. Our credibility depends on adopting the most robust standards, whether we invest in public or private markets. I believe the rigor of our impact investing approach, applied to a rapidly expanding yet complicated investment universe, is what sets us apart from other investors.

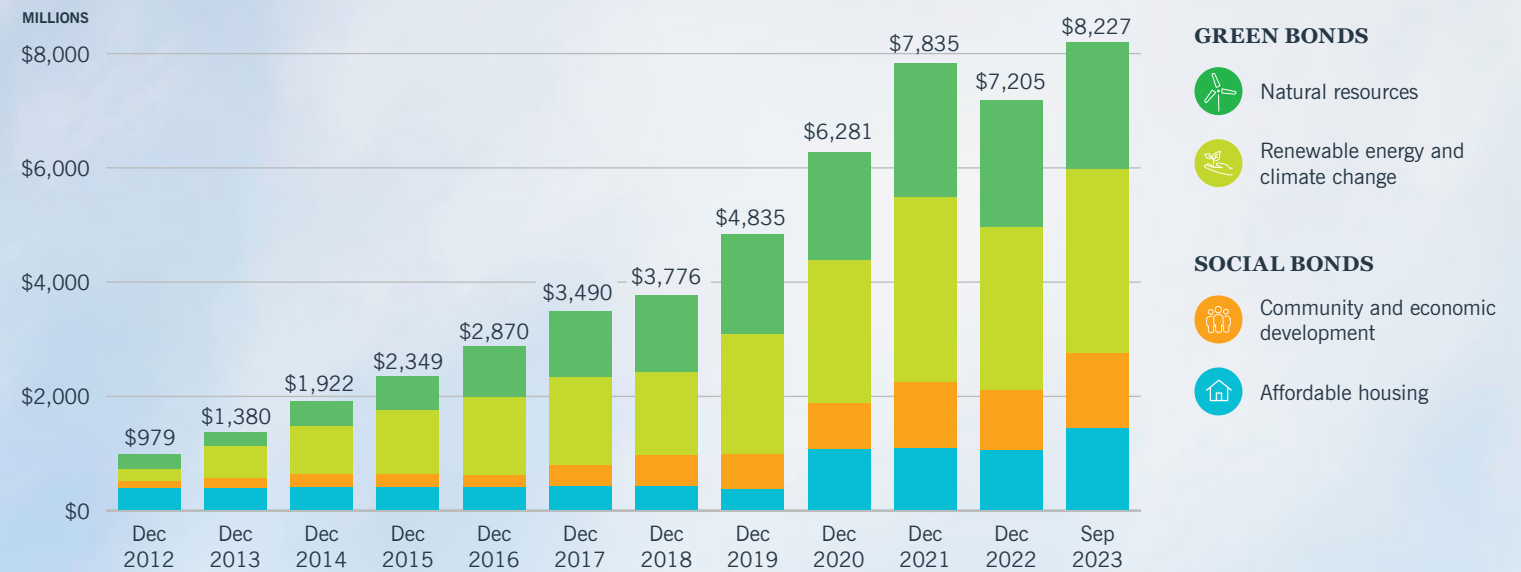
Our commitment to impact investing principles is evidenced by my team's inclusion on BlueMark's Practice Leaderboard (2023 edition). BlueMark provides third-party verification of adherence with Operating Principles for Impact Management, which was designed for private markets investors. I have to thank and credit my long-time collaborators, Jessica Zarzycki, Adam Guerino and Alan Papier, for buying into the approach and fulfilling their responsibilities with rigor and passion. I also would like to thank Brian Donnegan, Max Hass, Lucy Nussbaum and Fatima Konsouh for their contributions to this report. Their efforts to collect, aggregate and analyze impact data, and ready our reports for publication, are herculean.

The public fixed income market offers an opportunity to marshal capital efficiently and at scale, and we understand the fragile nature of trust and confidence in such a system. Whether it is third party validation from a respected verifier, peer-voted awards or verbal praise from our clients, we appreciate the affirmation of our approach. But we will never stop trying to set the bar higher in terms of supporting impact outcomes, engaging to further the development of innovative structures, advocating for better reporting and delivering the highest-quality impact reporting of our own.

# Impact assets under management by theme

The growth of Nuveen’s impact assets under management comes from several avenues: the impact allocations in Core Impact Bond, Short Duration Impact Bond and Global Core Impact Bond portfolios; impact-only portfolios spanning all four impact themes; and dedicated green bond or social bond mandates. The dip from year-end 2021 to year-end 2022 was driven by rising interest rates and falling bond prices throughout that calendar year. And despite a still-higher interest rate environment over the first nine months of 2023, consistent client demand and inflows, along with several newly funded impact-only and green bond mandates, pushed our team’s impact AUM above \$8 billion as of 30 September 2023.

*As of 30 Sep 2023*



Source: Nuveen.

# Our results

Our global fixed income impact strategy intentionally invests in securities across four specific impact themes: affordable housing, community and economic development, renewable energy and climate change, and natural resources.

Within these four themes, the Nuveen team clearly defines the impact objectives, eligible project types and outcomes to be expected. Through the framework, we are able to articulate how the investments in the strategy directly lead to positive outcomes for stakeholders.

Affordable housing ▶

Community and economic development ▶

Renewable energy ▶

Natural resources ▶

Making a global impact ▶



# Affordable housing

*Investing in direct and measurable societal outcomes*



**\$1,093.2**  
AUM \$mil

## ALIGNED SDGs



### Objectives

Increase the availability and access to affordable, sustainable and high-quality housing, and reduce the rent burden for low- to moderate-income populations, globally.

### Eligible projects

- Low- to moderate-income housing loans
- Transit-oriented development
- Walkable communities
- Mixed-use development projects

### Measurable outcomes

Impact metric	Impact for 2022	Equivalent to:
Number of affordable mortgages guaranteed or provided	2.2 million	Roughly the same number of housing units in Ireland <sup>3</sup>
Housing units built or supported	850,003 units	
Housing units built or supported with an AMI Below 80%	79,035 units	



# Community and economic development

## Investing in direct and measurable societal outcomes



**\$1,033.9**  
**AUM \$mil**

### ALIGNED SDGs



### Objectives

Create more inclusive and sustainable communities and increase availability of basic services for communities. Includes health care, education and financial services for small businesses; improving rural livelihoods; reducing food insecurity; and supporting recovery from disaster, conflict and crisis.

### Eligible projects

- Benefits underserved and/or economically disadvantaged communities
- Services: financial, hospital/medical and educational
- Urban revitalization: community centers, reconstruction activities
- International development and humanitarian activities: disaster relief, economic aid and agricultural support

### Measurable outcomes

Impact metric	Impact for 2022	Equivalent to:
Full-time jobs created	145,572 full-time employees	
Daily riders on public transit	4.3 million	More than the population of L.A. <sup>4</sup>
Farmers trained	1.7 million	
Farmers trained (women)	12,851	
People benefiting from access to basic products and services	245 million	About 75% of the U.S. population <sup>4</sup>
People benefiting from access to basic products and services (women)	90.1 million	
People reached through community programs	67.3 million	About 20% of the U.S. population <sup>4</sup>
People reached through community programs (women)	17.1 million	
People benefiting from broadband access	33,995	



# Renewable energy and climate change

## Investing in direct and measurable environmental outcomes



**\$2,201.0**  
AUM \$mil

### ALIGNED SDGs



#### Objectives

Increase the share and efficiency of renewable energy in the global energy mix, improve the availability of sustainable transportation and reduce greenhouse gas emissions.

#### Eligible projects

- New, expanding or existing renewable energy projects (including solar, wind and small-scale hydroelectric)
- Smart grid and other projects designed to make power generation and transmission systems more efficient
- Energy efficiency projects resulting in the reduction of greenhouse gas emissions

#### Measurable outcomes

Impact metric	Impact for 2022	Equivalent to:
CO <sub>2</sub> equivalent emissions avoided	171.4 million metric tons	The emissions from 46 coal-fired power plants in one year <sup>5</sup>
Air pollutants reduced	43,746 metric tons	
Energy saved	11.2 billion kilowatt hours (kWh)	The carbon sequestered by a forest more than twice the size of Hawaii in one year <sup>5,6</sup>
Total renewable energy capacity	209,698 megawatts (MW)	
New renewable energy capacity added	21,814 megawatt hours (MWh)	1.6 times the total installed solar capacity of California <sup>7</sup>
Renewable energy generated	480.6 million MWh annualized	66.3 million homes' electricity use for one year <sup>5</sup>



# Renewable energy

171.4 million metric tons of CO<sub>2</sub> equals...

38,141,690

*gasoline-powered passenger vehicles driven for one year<sup>8</sup>*



 = 1,000,000 vehicles

4.49 metric tons of CO<sub>2</sub> is equivalent to  
1 gas powered vehicle driven for a year



# Renewable energy

**CO<sub>2</sub> equivalent emissions avoided:**

**171.4 million  
metric tons**

*Equivalent to the emissions from **46** coal-fired  
power plants in the course of one year<sup>5</sup>*

# Natural resources

Investing in direct and measurable environmental outcomes



**\$2,877.4**  
AUM \$mil

## ALIGNED SDGs



### Objectives

Conserve natural resources and habitats; reduce deforestation; sequester carbon and reduce emissions; reduce waste, water usage and pollution; improve sanitation and access to clean water; support sustainable food production; sustain rural livelihoods.

### Eligible projects

- Land conservation and sustainable forestry, fishing and agriculture
- Certified green buildings
- Remediation and redevelopment of polluted or contaminated sites
- Improvement of clean drinking water supplies and/or sewer systems infrastructure, waste management projects

### Measurable outcomes

Impact metric	Impact for 2022	Equivalent to:
LEED <sup>12</sup> Gold certified buildings	68	
LEED <sup>12</sup> Platinum certified buildings	17	
BREEAM <sup>13</sup> Certified Buildings	13	
Land conserved	646,666 acres	More than 3 times the size of New York City <sup>6</sup>
Land restored or sustainably managed	372,886 acres	Roughly the size of Sequoia National Park, California <sup>9</sup>
Waste diverted from landfills	11.3 million metric tons	
People benefiting from clean water and wastewater projects	46 million	Greater than the population of California <sup>4</sup>
Water delivered	2.2 billion gallons/day	
Water saved	908 billion gallons	Average household water use in a year for 8.3 million homes <sup>8</sup>
Water treated	39.2 billion gallons	
Wastewater treated	5.7 billion gallons/day	
Conserved marine (square miles)	4,098	Equivalent to about half the area of Lake Ontario <sup>11</sup>



# Natural resources

AMERICAN FOOTBALL FIELD<sup>14</sup>

One acre equals...

One hectare equals...



# Natural resources

**PREMIER LEAGUE FOOTBALL PITCH<sup>15</sup>**

**One acre equals...**

**One hectare equals...**

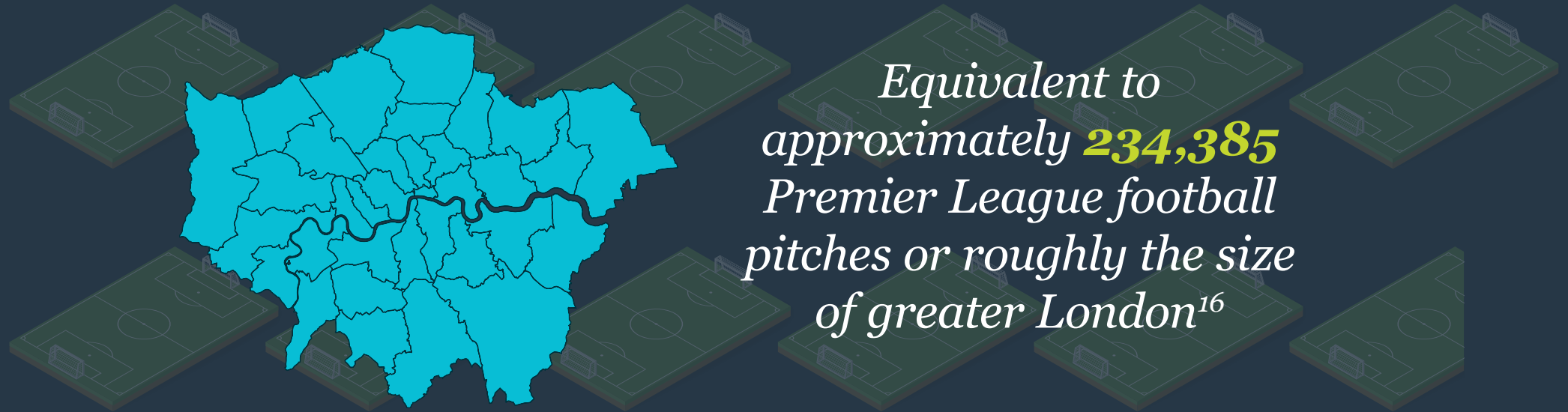




# Natural resources

Land restored or sustainably managed:

# 150,902 hectares



= 20,000 football pitches

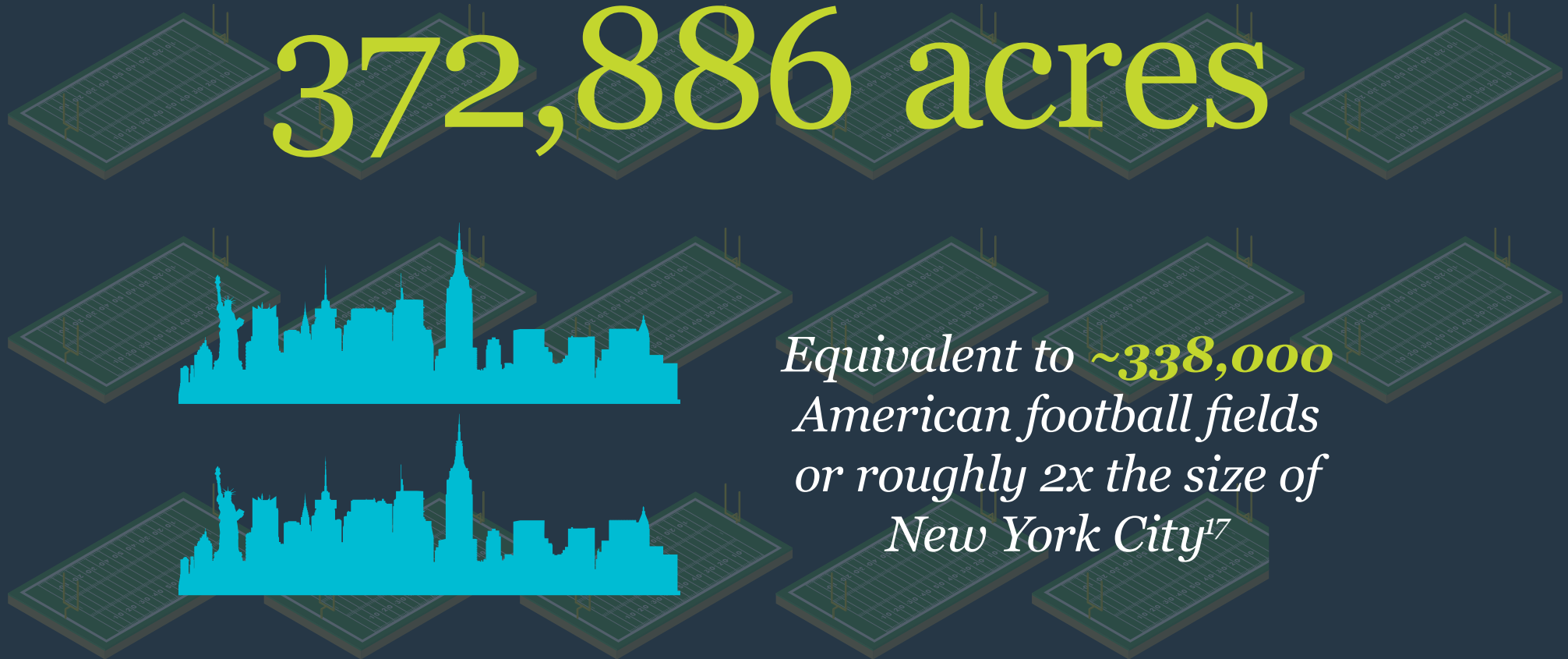
1 hectare = 2.47 acres



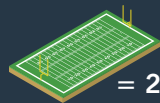
# Natural resources

Land restored or sustainably managed:

**372,886 acres**



*Equivalent to **~338,000**  
American football fields  
or roughly 2x the size of  
New York City<sup>17</sup>*

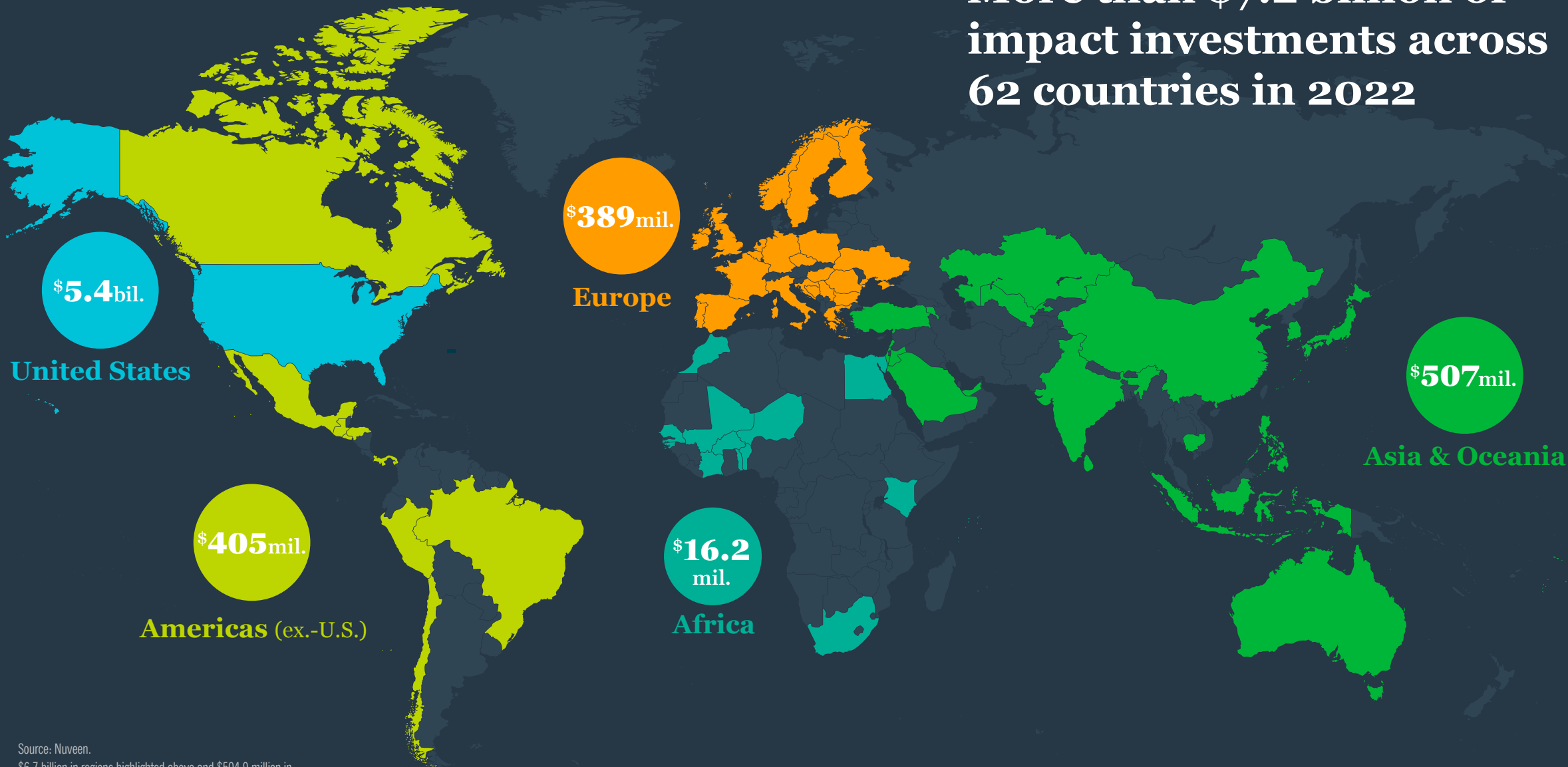


= 20,000 football fields

372,886 acres is equivalent to 150,902 hectares.

# Making a global impact

More than \$7.2 billion of impact investments across 62 countries in 2022

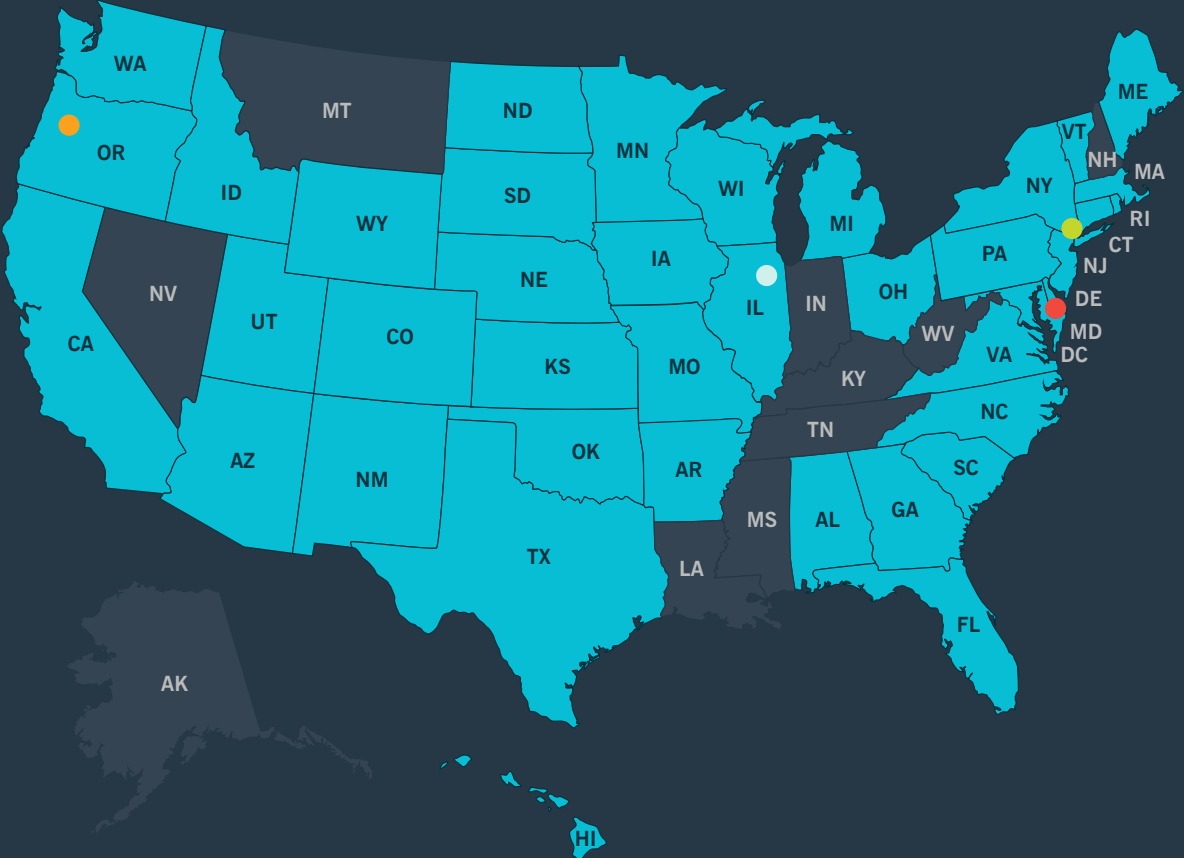


Source: Nuveen.  
\$6.7 billion in regions highlighted above and \$504.9 million in multiple regions or where exact locations are unknown.

# United States: \$5.4 billion in impact investments financing projects in 40 states and the District of Columbia

## EXAMPLES

Issuer	Enterprise Community Loan Fund	YMCA of Greater New York	Warm Spring Reservation of Oregon	Metro Water Reclamation District of Greater Chicago
Locations	Maryland	New York	Oregon	Illinois
Theme	Affordable housing	Community and economic development	Renewable energy and climate change	Natural resources
Use of proceeds	Finance low to moderate income housing	YMCA community programs	Finance hydroelectric projects	Environmental upgrades to water/sewer systems
Impact	Housing units built or supported: 76,000	People reached through community programs: 250,000	Total renewable capacity: 152 MW	Water treated: 1.2 billion gallons/day
SDG alignment	11 SUSTAINABLE CITIES AND COMMUNITIES	3 GOOD HEALTH AND WELL-BEING 4 QUALITY EDUCATION	7 AFFORDABLE AND CLEAN ENERGY 13 CLIMATE ACTION	6 CLEAN WATER AND SANITATION 11 SUSTAINABLE CITIES AND COMMUNITIES



Projects are financed in highlighted states.

# 2022 results from U.S.-based impact projects financed by the global fixed income team include the following:



## Affordable housing

Affordable mortgages guaranteed	2.2 million
Housing units built or supported	346,485
AMI below 80%	79,035



## Community and economic development

Daily riders on public transit	4.3 million
Full-time jobs created	52,303 FTE
People benefiting from access to basic products and services	29.7 million
Women benefiting from access to basic products and services	11.7 million
People reached through community programs	16.9 million
Farmers trained	141,942
People benefiting from broadband access	33,995



## Renewable energy and climate change

CO <sub>2</sub> equivalent emissions avoided (metric tons)	76.6 million
Energy saved	3.3 billion MWh
Total renewable energy capacity	43,514 MW
New renewable energy capacity	6,963 MW
Renewable energy generation	101.9 million MWh annualized














## Natural resources

LEED Gold certified buildings	53
LEED Platinum certified buildings	15
Land conserved	639,736 acres
Land restored or sustainably managed	349,659 acres
Waste diverted from landfills	6.8 million metric tons
People benefiting from clean water and wastewater projects	24.2 million
Water delivered	2.2 billion gallons/day
Water saved	845 billion gallons
Water treated	4.0 billion gallons
Wastewater treated	5.5 billion gallons/day

# Americas (ex-U.S.): \$405 million in impact investments financing projects in 9 countries<sup>18</sup>

## EXAMPLES

Issuer	Banco Nacional de Comercio Exterior	National Bank of Canada	Klabin
Locations	 Mexico	 Canada	 Brazil
Theme	Community and economic development	Renewable energy and climate change	Natural resources
Use of Proceeds	Finance employment generation, energy efficiency, and green buildings	Sustainability bond with most proceeds financing renewable energy projects	Finance sustainable forest management and conservation
Impact	Full-time jobs created: 15,312 FTE	CO <sub>2</sub> emissions avoided: 1.3 million metric tons  Total renewable capacity: 1,935 MW	Land conserved: 6,925 acres  Waste diverted from landfills: 20,616 metric tons
SDG alignment	  	 	  

Projects are financed in highlighted countries.



# 2022 results from Americas (ex-U.S.)-based impact projects financed by the global fixed income team include the following:



## Community and economic development

Full-time jobs created	17,172 FTE
People benefiting from access to basic products and services	104,539



## Renewable energy and climate change

CO <sub>2</sub> equivalent emissions avoided	2.8 million metric tons
Total renewable energy capacity	41,488 MW
Renewable energy generation	183.6 million MWh annualized
Energy saved	839.4 million kWh














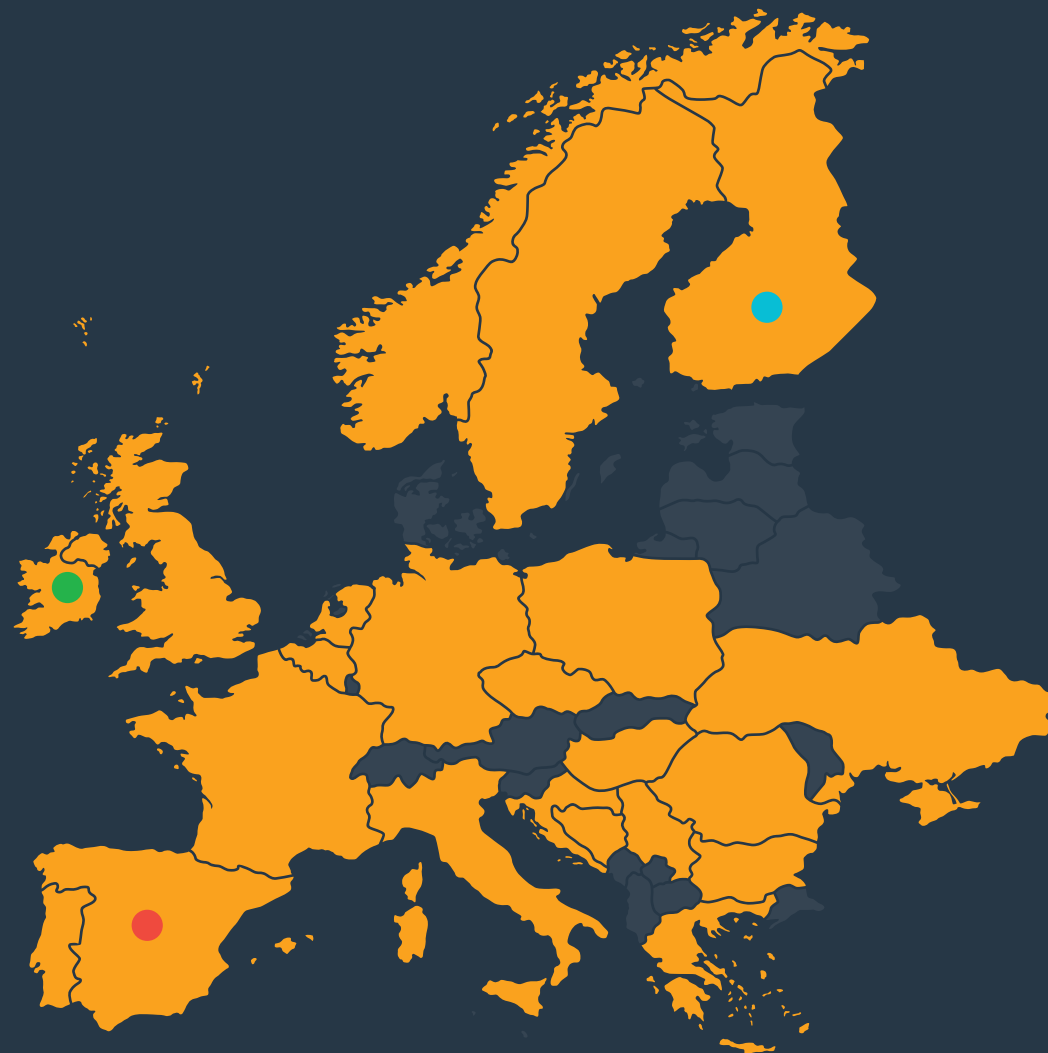
## Natural resources

Land conserved	6,925 acres
Waste diverted from landfills	1.36 million metric tons
People benefiting from clean water and wastewater projects	82,982
Water saved	23.5 billion gallons
Water treated	23.2 billion gallons
LEED Gold certified buildings	1

# Europe: \$389 million in impact investments financing projects in 22 countries<sup>18</sup>

## EXAMPLES

Issuer	The Autonomous Community of Madrid	Kuntarahoitus Oyj	Bank of Ireland Group
Locations	 Spain	 Finland	 Ireland
Theme	Community and economic development	Renewable energy and climate change	Natural resources
Use of proceeds	Finance social and economic inclusion	Finance renewable energy, green buildings and transportation projects	Finance investments in green buildings
Impact	<p>People reached through community programs: 479,692</p> <p>People benefiting from access to basic products and services: 1.9 million</p>	<p>CO<sub>2</sub> emissions avoided: 9,531 metric tons</p> <p>Energy saved: 3.6 million kWh</p> <p>Renewable energy generation: 17,444 MWh annualized</p>	<p>CO<sub>2</sub> emissions avoided: 126,046 metric tons</p> <p>Energy saved: 220 million kWh</p> <p>Total renewable capacity: 327 MW</p>
SDG alignment	  	 	  



Projects are financed in highlighted countries.



# 2022 results from Europe-based impact projects financed by the global fixed income team include the following:



## Community and economic development

People reached through community programs	479,692
People benefiting from access to basic products and services	70 million



## Renewable energy and climate change

CO <sub>2</sub> equivalent emissions avoided (metric tons)	40.1 million
Energy saved	647.7 million MWh
Total renewable energy capacity	74,751 MW
New renewable energy capacity	1,350 MW
Renewable energy generation (annualized)	155.8 million MWh












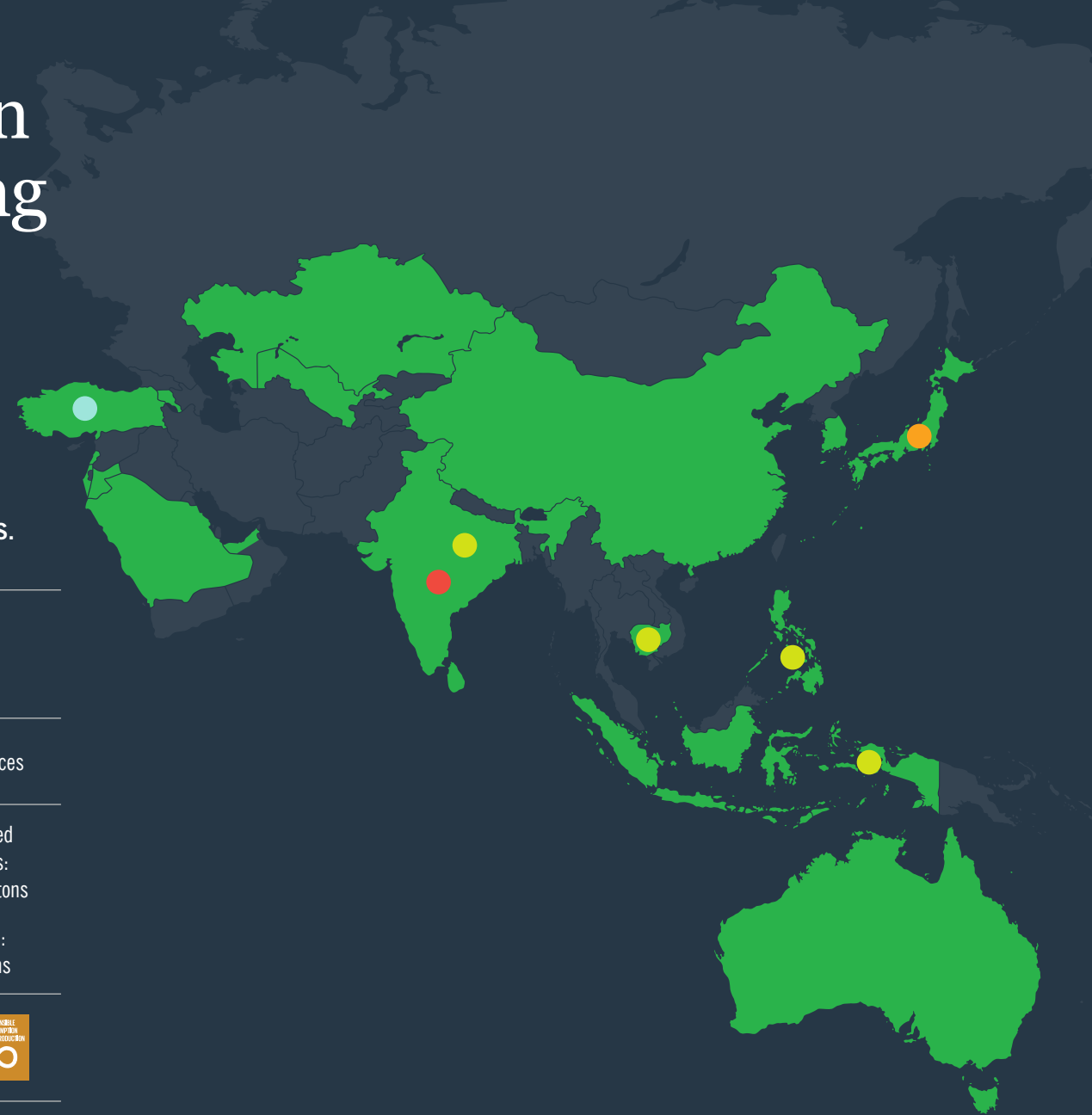
## Natural resources

Water saved	4.8 billion gallons
LEED Platinum certified buildings	2
LEED Gold certified buildings	14
BREEAM certified buildings	13

# Asia and Oceania: \$507 million in impact investments financing projects in 18 countries<sup>18</sup>

## EXAMPLES

Issuer	Housing and Urban Development Corporation (HUDCO)	Women's Livelihood Bond 4	Mitsubishi Financial Group	Arcelik A.S.
Locations	India	Cambodia, Indonesia, India, Philippines	Japan	Turkey
Theme	Affordable housing	Community and economic development	Renewable energy and climate change	Natural resources
Impact	Housing units built or supported: 349,308	Farmers trained (women): 1660 Women reached through community programs: 46,210	CO <sub>2</sub> emissions avoided: 411,056 metric tons Renewable generation: 3.4 million MWh annualized	Waste diverted from landfills: 14,284 metric tons Water saved: 31,701 gallons
SDG alignment	 	  	 	 



Projects are financed in highlighted countries.

# 2022 results from Asia- and Oceania-based impact projects financed by the global fixed income team include the following:



## Affordable housing

Housing built or supported	349,308 units
----------------------------	---------------



## Community and economic development

People benefiting from access to basic products and services	37,822
Farmers trained	12,851
Farmers trained (women)	12,851
People reached through community programs	100,839
People reached through community programs (women)	100,839



## Renewable energy and climate change

CO <sub>2</sub> equivalent emissions avoided	21 million metric tons
Energy saved	5.5 million kWh
Total renewable energy capacity	31,613 MW
New renewable energy capacity	4,510 MW
Renewable energy generation	16.8 million MWh annualized











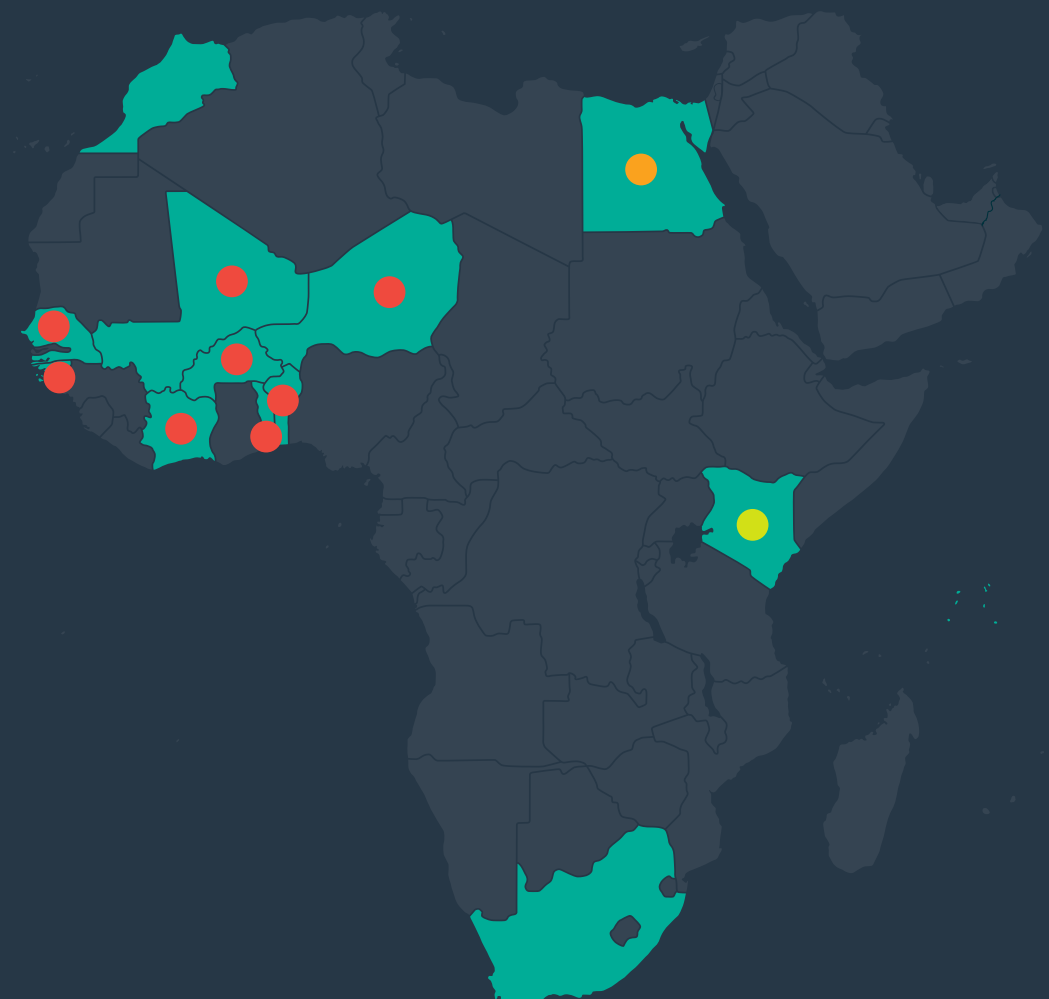
## Natural resources

People benefiting from clean water and wastewater projects	172,181
Water saved	33.6 billion gallons
Water treated	12 billion gallons
Wastewater treated	53 million gallons/day
Waste diverted from landfills	14,284 metric tons
Land restored or sustainably managed	23,228 acres

# Africa: \$16.2 million in impact investments financing projects in 12 countries<sup>18</sup>

## EXAMPLES

Issuer	Banque Ouest Africaine de Developement	Arab Republic of Egypt	Overseas Private Investment Corporation
Locations	Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, Togo	Egypt	Kenya
Theme	Community and economic development	Natural resources	Renewable energy and climate change
Impact	<p>People benefiting from access to basic products and services: 253,350</p> <p>People reached through community programs: 172,058</p>	<p>Wastewater treated: 96 million gallons/day</p> <p>People benefiting from clean water and wastewater projects: 5.7 million</p>	<p>Total renewable capacity: 100 MW</p>
SDG alignment	  	  	 



Projects are financed in highlighted countries.

# 2022 results from Africa-based impact projects financed by the global fixed income team include the following:



## Community and economic development

Full-time jobs created	425
People benefiting from access to basic products and services	253,350
People reached through community programs	172,058



## Renewable energy and climate change

CO <sub>2</sub> equivalent emissions avoided	2 million metric tons
New renewable energy capacity	92 MW
Total renewable capacity	392 MW
Renewable generation	300,143 MWh annualized



## Natural resources

People benefiting from clean water and wastewater projects	7.5 million
Water delivered	42 million gallons/day
Wastewater treated	96 million gallons/day

# Case studies

Freddie Mac ▶

Rural Broadband ▶

Tesla ▶

Rhino Bond ▶



## 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.

“

“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



## 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<sup>9</sup>

“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.





“

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.<sup>20</sup> 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<sup>21</sup> — almost double the percentage of the second worst city on the list (Harlingen, Texas at 34%).



## COMMUNITY AND ECONOMIC DEVELOPMENT

“

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.”<sup>22</sup>

—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<sup>23</sup>

#### 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



## COMMUNITY AND ECONOMIC DEVELOPMENT

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.

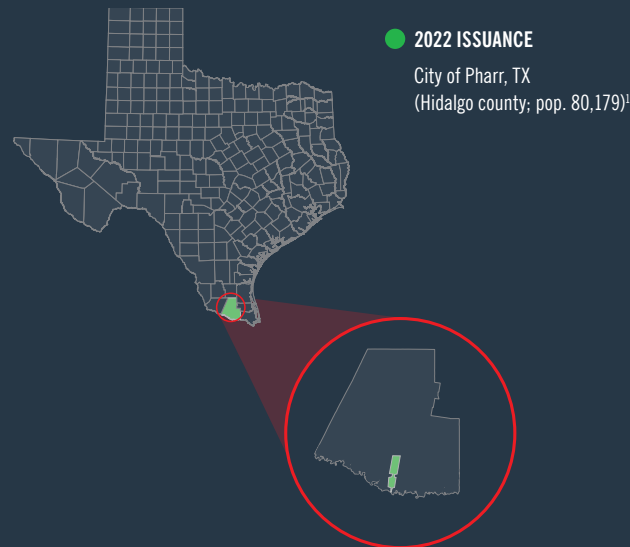
For calendar year 2022, using proceeds from both transactions, Bug Tussel added 2,400 broadband access customers. Proceeds from the 2021 issuance activated 57 tower sites and installed 330 miles of fiber conduit in five counties with an average population of 68,000 people. The seven target counties in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

### MAPPING RURAL BROADBAND<sup>24</sup>

#### Texas

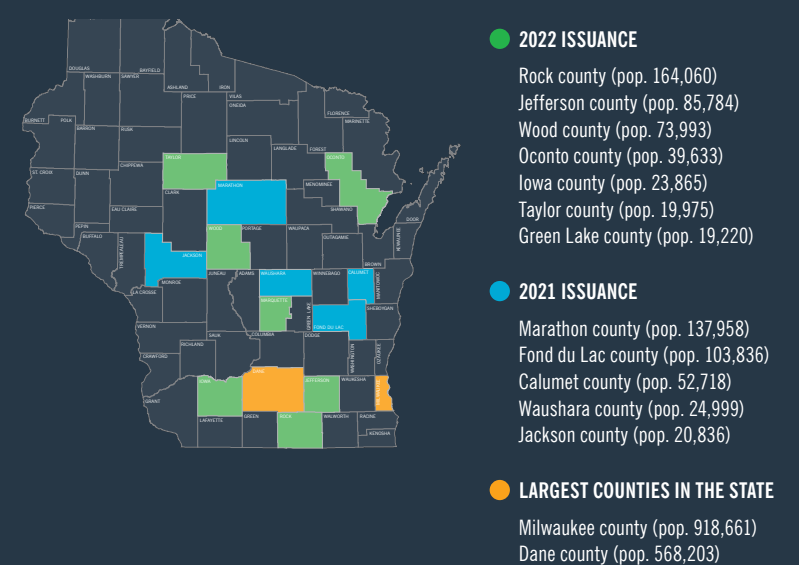


“

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.”<sup>24</sup>

—Dr. Ambrosio Hernandez, City of Pharr mayor

#### Wisconsin<sup>25</sup>





“

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<sub>2</sub> 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



## RENEWABLE ENERGY AND CLIMATE CHANGE



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.”

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.”

### LOWER COST OF TESLA’S VEHICLES REFLECTED IN ABS ASSET POOLS

#### Average weighted cost of Tesla model

2018 (inaugural pool)	<b>\$68,486</b>
2021	<b>\$47,883</b>

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.

**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<sub>2</sub>, the equivalent of providing electricity for over 2.6 million homes for one year.**

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.

Per Tesla’s 2022 impact report, the average mid-size vehicle in the U.S. emits approximately 400 grams of Co<sub>2</sub>/mile driven in its lifecycle. A grid-charged Model 3 emits fewer than 150 grams of CO<sub>2</sub>/mile driven and fewer than 100 grams for a Model 3 charged through renewables.<sup>26</sup>



Average mid-sized vehicle



**~400**  
grams per mile driven



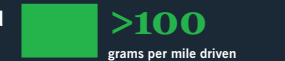
Grid-charged Tesla Model 3



**>150**  
grams per mile driven



Tesla Model 3 charged through renewables



**>100**  
grams per mile driven

“

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.



## NATURAL RESOURCES

**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



Watch the video  
“Antipoaching security”



Watch the video  
“Protecting our planet”





Scenes from the Rhino Bond





# How we invest in a changing world

Measuring direct, real-world outcomes ▶

SDG alignment ▶

Measuring impact ▶

# Measuring direct, real-world outcomes

Our impact investments finance positive social and environmental outcomes on six continents, help address critical global challenges, and transition economies and communities to a more sustainable future.

“

As we continue to see improvements in issuers' reporting and expansion of sustainable frameworks, we expect an upward trend in granularity and transparency.”

— *Maxmillian Hass and Lucy Nussbaum, Responsible Investing, Nuveen*

The number of impact bonds held continues to increase each year, which provides us with valuable insights into how different issuers report on their impact. This, in turn, helps us enhance our data collection and reporting methodology, including the addition of new metrics and improved granularity.

In the beginning of each reporting cycle, we review our impact metrics to ensure we capture the most current and relevant metrics. For example, we added a new metric to measure rural broadband access and captured more than 33,000 households who benefited from this critical infrastructure.

We also saw improvements in issuers' impact reporting, which allowed us to provide more granular details for certain metrics. For example, Freddie Mac reports their affordable housing units from 100% AMI down to 30%. We also saw this level of reporting from municipal issuers such as the Maine State Housing Authority, which broke out its affordable housing units from 60% AMI down to 30%. These details enabled our impact report to partition the affordable housing units built or supported metric by units designated for residents at or below 80% AMI.

Since we extract metrics from a wide variety of impact reports, we note reports that are particularly detailed and those that need improvement. This allows the team to use the best reports as examples when engaging with issuers to ensure they meet our high standards of direct and measurable outcomes for our impact investments. One of the reports that stood out this year was a social bond report issued by the Philadelphia Redevelopment Authority that funds the Neighborhood Preservation Initiative (NPI). In the report, each program/project has one or more indicators providing detail on the number of minority households, female-headed households, and senior citizens served.

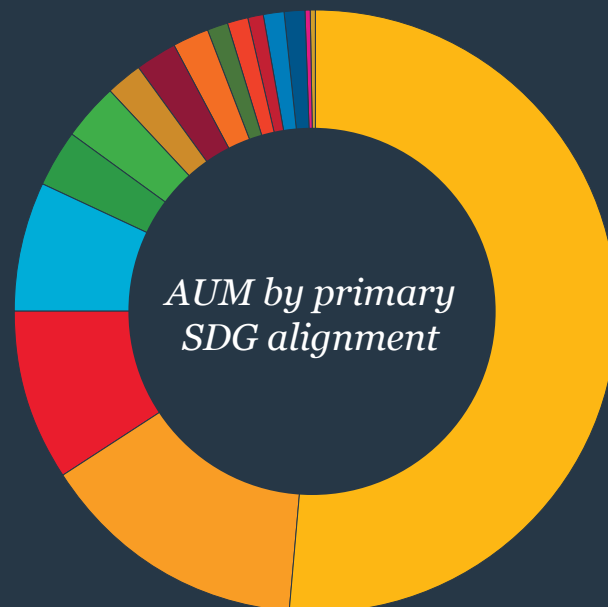
As we continue to see improvements in issuers' reporting and expansion of sustainable frameworks, we expect an upward trend in granularity and transparency.

# Aligning closely with the Sustainable Development Goals (SDGs)

In 2015, the Sustainable Development Goals were developed and agreed to by all 193 member states of the United Nations. The 17 goals outline a collective vision of what is needed for sustainable growth and development globally by 2030.

The impact objectives and four impact themes of our global fixed income strategies predate the development and adoption of the SDGs. However, given the global relevance and increasing stakeholder interest in understanding investors' contribution and alignment to these global goals, we expanded our impact framework in 2016 to clearly communicate and demonstrate how our approach aligns to the SDGs.

To do this, we developed a set of evidence-based logic models for the four impact objectives, expected outputs and outcomes — and how they map to specific SDG targets underlying the 17 goals. The logic models focus on the most direct impacts of the investments. For example, we hold bonds that expand access to financial services for underserved people. SDG targets 8.3 and 9.3 explicitly address access to finance, so in our reporting we identify those bonds as contributing to SDGs 8 and 9. While there may be additional, indirect outcomes that result from an individual or community having increased access to high-quality financial services, we do not claim contribution to additional SDGs for those bonds.



SDG alignment	AUM by primary SDG alignment <sup>27</sup>	Number of impact holdings <sup>28</sup>
<b>7.</b> Affordable & clean energy	<b>50%</b>	<b>492</b>
<b>11.</b> Sustainable cities & communities	<b>14%</b>	<b>227</b>
<b>1.</b> No poverty	<b>9%</b>	<b>147</b>
<b>6.</b> Clean water & sanitation	<b>6%</b>	<b>78</b>
<b>3.</b> Good health and wellbeing	<b>3%</b>	<b>31</b>
<b>15.</b> Life on land	<b>3%</b>	<b>28</b>
<b>12.</b> Responsible production & consumption	<b>2%</b>	<b>205</b>
<b>8.</b> Decent work & economic growth	<b>2%</b>	<b>50</b>
<b>9.</b> Industry, innovation & infrastructure	<b>2%</b>	<b>37</b>
<b>13.</b> Climate action	<b>1%</b>	<b>291</b>
<b>5.</b> Gender equality	<b>1%</b>	<b>11</b>
<b>4.</b> Quality education	<b>1%</b>	<b>20</b>
<b>14.</b> Life below water	<b>1%</b>	<b>8</b>
<b>16.</b> Peace, justice & strong institutions	<b>1%</b>	<b>3</b>
<b>10.</b> Reduced inequalities	<b>&lt;1%</b>	<b>3</b>
<b>2.</b> Zero hunger	<b>&lt;1%</b>	<b>12</b>

Source: Nuveen.  
As of 31 Dec 2022. Holdings are subject to change.

# Measuring impact: methodology and data collection

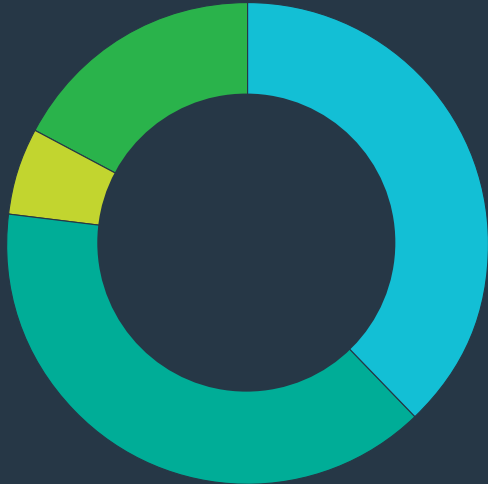
We collect social and environmental impact data annually directly from issuer disclosures. Our goal is to collect the most relevant and specific impact data related to the activities financed directly or indirectly by the investments. To that end, we use four types of issuer disclosures (listed in order from most preferred to least):

- 1. **Security-level data**  
sourced from bond-level impact reports for specific securities; most preferred
- 2. **Project-level data**  
sourced from project factsheets or other reports tied to a single project
- 3. **Program-level data**  
sourced from annual reports for specific programs run by the issuer
- 4. **Issuer-level data**  
sourced from annual reports covering all activities of the issuer; least preferred

From these disclosures, we extract and aggregate the most commonly reported metrics related to each impact theme for activities in the prior year.

It is important to note that we collect and report on impact for the entirety of the investments and/or the related project, not just the impact associated with Nuveen clients' capital alone. The reason we take this approach is because we do not consistently have access to total project costs relative to each bond issue. We know the percentage of each issuance we hold, but that may not reflect the total capital required to fund a specific project or program.

**SOURCES OF 2022 IMPACT DATA BY DISCLOSURE TYPE**



● Security level	<b>51%</b>
● Project level	<b>27%</b>
● Program level	<b>2%</b>
● Issuer level	<b>20%</b>

Source: Nuveen.

For more information, please visit us at [nuveen.com](https://www.nuveen.com)

#### Endnotes

- 1 Environmental Finance’s annual IMPACT awards seek to recognize and reward the work of impact investors everywhere and highlight emerging pockets of best practice, across all asset classes and all geographies. The awards were announced on 13 Dec 2023 and are based on information relevant from the period 01 Apr 2022 to 30 Sep 2023. An advisory panel consisting of industry experts chosen for their knowledge, objectivity and credibility along with the Environmental Finance editorial team, review the submitted entry material. Judges score each entry individually, any conflict of interest is removed, and the judge’s score is confidential. Score averages and average ranking position are used to identify the winner of each category. Judging criteria include but are not limited to: impact reporting, impact leadership, contribution to industry best practices and policy advances, case studies, and alignment with relevant industry groups and taskforces. For more information, visit <https://www.environmental-finance.com/content/awards/impact-awards-2023/>. Used with permission.
- 2 Pensions for Purpose Content Awards 2022: Best Impact Report. <https://www.pensionsforpurpose.com/knowledge-centre/thought-leadership/2022/02/25/Global-fixed-income-impact-report-2021-%E2%80%93Nuveen/>
- 3 Housing Units in Ireland 2,124,590 <https://www.cso.ie/en/releasesandpublications/ep/p-cpr/censusofpopulation2022-preliminaryresults/housing/>
- 4 Population equivalency:
  - US population: <https://www.census.gov/popclock/>
  - Population of California: 39,029,572 <https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html#v2022>
  - Population of Los Angeles in 2020 census 3,898,767: <https://www.census.gov/quickfacts/fact/table/losangelescitycalifornia/PST040222#PST040222>
- 5 CO<sub>2</sub> & energy equivalencies: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
  - Coal-fired power plant 3,735,944.2 tons of CO<sub>2</sub> in a year;
  - 6341.022342 kWh per gasoline-powered passenger vehicles driven for one year;
  - 7252.08 kWh per home per year for renewable generation;
  - 1,183.269 kwh of energy savings is the equivalent to the carbon sequestered by one acre of U.S. forests in one year
- 6 Area: Hawaii acres: 4,110,387.2 acres NYC acres: 192,288 acres <https://www.census.gov/quickfacts/fact/table/chicagocityillinois,austincitytexas,sandiegocitycalifornia,DE,RI,newyorkcitynewyork/PST045222>, <https://www.census.gov/quickfacts/fact/table/sanfranciscocitycalifornia,HI/PST045222>
- 7 Cumulative utility-scale solar PV capacity (MW), as of 2021 for U.S. states <https://emp.lbl.gov/capacity-and-generation-state>
- 8 4.49 metric tons CO<sub>2</sub> equivalent vehicle/year <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>
- 9 U.S. National Parks size - <https://nationalparkobsessed.com/national-parks-by-size/>
- 10 Water usage: <https://www.epa.gov/watersense/how-we-use-water>; Average U.S. households use approximately 300 gallons per day (109,500 gallons per year)
- 11 Marine area:
  - Lake Ontario 7,340 square miles <https://www.glerl.noaa.gov/education/ourlakes/lakes.html>
  - Lake Tahoe 191 square miles <https://www.kepttahoebblue.org/about-tahoe/#:~:text=Lake%20Tahoe%20is%2022%20miles,area%20covers%20191%20square%20miles>
- 12 LEED stands for Leadership in Energy and Environmental Design
- 13 BREEAM stands for Building Research Establishment Environmental Assessment Methodology
- 14 An American football field area of play is 300 feet in length and 160 feet in width <https://www.dimensions.com/element/american-football-field>
- 15 A Premier League Football Pitch can range between 69,300 and 86,400 square feet <https://www.networldsports.com/buyers-guides/soccer-field-dimensions-guide>
- 16 A Premier League Football Pitch is around 69,300 square feet (converted 0.64381807 hectares) <https://www.networldsports.com/buyers-guides/soccer-field-dimensions-guide>. The city of London is 1,572 sq km (converted to hectares is 157,200) <https://www.britannica.com/place/London>

- 17 An American football field without end zones is 48,000 square feet (1.1019284 acres) <https://www.dimensions.com/element/american-football-field>. NYC Area: 192,288 acres <https://www.census.gov/quickfacts/fact/table/chicagocityillinois,austincitytexas,sandiegocitycalifornia,DE,RI,newyorkcitynewyork/PST045222>
- 18 Highlighted country information was determined by issuer reporting or country of risk information.
- 19 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.
- 20 <https://www.census.gov/quickfacts/fact/table/pharrcitytexas/PST045222>
- 21 <https://www.digitalinclusion.org/worst-connected-cities-2019/>
- 22 <https://www.calix.com/press-release/2023/june/from-worst-to-best-in-18-months-city-of-pharr-leverages-calix-platform.html>
- 23 <https://www.fcc.gov/consumers/guides/broadband-speed-guide>
- 24 <https://riograndeguardian.com/pharrs-blazing-speed-broadband-is-being-expanded-into-san-juan-and-alamo/>
- 25 All county populations sourced from <https://www.census.gov/quickfacts/fact/table/US/PST045222>
- 26 [https://www.tesla.com/ns\\_videos/2022-tesla-impact-report.pdf](https://www.tesla.com/ns_videos/2022-tesla-impact-report.pdf)
- 27 Based on the market value of impact holdings by their primary SDG alignment. Each holding has one “primary” SDG.
- 28 Total count of SDG alignment across all impact holdings. An individual impact holding could be aligned with up to three SDGs: primary SDG, secondary SDG and tertiary SDG based on our proprietary impact framework. Therefore, the total count of SDGs is greater than the number of impact holdings.

The Nuveen Responsible Investing team developed this report to provide an indication of the aggregate social and environmental impact created by the projects and organizations financed in part by the Strategy. Given the difficulty of attributing impact in proportion to the size of the Strategy’s share of each bond issuance (which ranges from 0.015% to 100%), the data reflect total impact generated by the project, program, or issuer rather than the Strategy’s share alone.

The report represents bonds that are classified under the Strategy’s proprietary impact framework and for which relevant data are available. All impact data are sourced from publicly available issuer disclosures at the bond or project level when possible, or the program or issuer level if not. Metrics selected for each impact theme reflect the information most commonly reported by issuers and each metric includes data from between 2 and 46 issuers. In cases where the Strategy has a large position in a certain issuer, we prioritize selecting metrics reported by that issuer.

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Portfolios within each strategy are subject to certain risks, such as market and investment style risk. Please consider all risks carefully prior to investing. While risks are associated with investing in any strategy, some of the risks include, but are not limited to the following: Because its social screens exclude some investments, the strategy may not be able to take advantage of the same opportunities or market trends as strategies that do not use such criteria. Responsible investing incorporates Environmental Social Governance (ESG) factors that may affect exposure to issuers, sectors, industries, limiting the type and number of investment opportunities available, which could result in excluding investments that perform well.

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OVERVIEW

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