

Alphabet

Sustainability Bond Impact Report 2021



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Introduction



Alphabet has allocated

\$3.47 billion

(61%) in Sustainability
Bond net proceeds.

Overview

At Google, operating our business in an environmentally and socially responsible way has been a core value since our founding in 1998. We build our products and services to improve the lives of people all over the world. As part of this, we recognize Google's tremendous responsibility to address some of the most pressing challenges of our time—climate change, housing, racial and economic inequity, and the global COVID-19 pandemic. We've made a number of significant commitments and major investments in these areas.

In August 2020, we issued [\\$5.75 billion in sustainability bonds](#), leading the way with the largest sustainability or green bond issuance by any company in history. The net proceeds fund new and ongoing projects that are environmentally or socially responsible and enable investors to join us in tackling critical issues. We believe that these investments benefit our communities, employees, and stakeholders, and they are an important part of fulfilling Google's mission and goal of creating value over the long term.

Sustainability bonds are an emerging asset class, and we are encouraged that our issuance last year contributed to the growth of this market. Sustainability bond issuance by U.S. corporations grew more than 300% year over year in the first half of 2021, exceeding the total for all of 2020.¹

One year later, we are pleased to report that we've put \$3.47 billion (61%) of the net proceeds to use, supporting our efforts across all eight of our green and social Eligible Project categories. This inaugural Impact Report covers the allocation to Eligible Projects that incurred expenditures or to which capital was contractually committed between January 1, 2019, and December 31, 2020. Our report also covers the associated expected sustainability impact of Eligible Projects included in our allocation (see Figure 1).

ALLOCATION OF NET PROCEEDS AND EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS

Total allocation \$3.47 billion

(61% allocated)

Environmental

ENERGY EFFICIENCY



\$640 million

1.08 PUE
at Belgium data center campus

CLEAN ENERGY



\$1.28 billion

14.9 million tCO₂e
emissions avoided by renewable energy PPAs

GREEN BUILDINGS



\$1.25 billion

415,000 m²
of LEED Platinum certified office space

CLEAN TRANSPORTATION



\$15 million

3,600 ports
installed for EV charging

CIRCULAR ECONOMY AND DESIGN



\$4 million

1.1 million kg
of pre-consumer food waste prevented in cafés

Social

AFFORDABLE HOUSING



\$70 million

1,800 units
of affordable housing enabled

COMMITMENT TO RACIAL EQUITY



\$81 million

2,700 loans
to small and medium-sized businesses focused on the Black community

SUPPORT FOR SMALL BUSINESSES AND COVID-19 CRISIS RESPONSE



\$133 million

13,500 loans
to small and medium-sized businesses

Our sustainability approach

We firmly believe that every business has the opportunity and obligation to protect our planet and support the communities where it operates. That's why we strive to build sustainability into everything we do.

Google's five-year sustainability strategy focuses on three key pillars that span both environmental and social initiatives (see Figure 2):

- Accelerate the transition to carbon-free energy and a circular economy
- Empower users with technology
- Benefit the people and places where we operate

We've been a leader on climate change since Google's founding over 20 years ago. These are some of our key achievements to date:

- **2007:** We became the first major company to become carbon neutral.
- **2017:** We became the first major company to match 100% of our annual electricity use with renewable energy, which we've now achieved for [four consecutive years](#).
- **2020:** We neutralized our legacy carbon footprint since our founding, making Google the first major company to be carbon neutral for its entire operating history.

Figure 2

FIVE-YEAR SUSTAINABILITY STRATEGY OVERVIEW

We strive to build sustainability into everything we do



Accelerate carbon-free and circular

Decouple business growth from the growth of carbon intensity and material use



Empower with technology

Tackle major sustainability problems and drive net-positive impact using Google technologies, platforms, products, and services



Benefit people and places

Share benefits with the communities of our facilities, users, partners, and suppliers

Now we're going even further: By 2030 Google is aiming to run our business on [carbon-free energy](#) 24 hours a day, seven days a week, 365 days a year. We're the first major company that's set out to do this, and we aim to be the first to achieve it.

We've also made a number of social commitments designed to benefit people and places where we operate:

- **2019:** We announced a [\\$1 billion Bay Area housing commitment](#) to support the development of at least 20,000 homes at a range of income levels throughout the region, of which at least 5,000 will be affordable.
- **2020:** We announced [commitments to racial equity](#) focused on building sustainable equity for our Black community, building products for change, helping create economic opportunity, improving education, and supporting racial justice organizations.
- **2020:** We responded to the devastating impacts of the COVID-19 global pandemic with an [\\$800+ million commitment](#) to support small and medium-sized businesses (SMBs), health organizations and governments, and frontline health workers.

For more information about our overall corporate responsibility initiatives, see our [Sustainability](#) and [Commitments](#) websites.

About our sustainability bonds



Our sustainability bonds

In August 2020, Alphabet issued \$5.75 billion in sustainability bonds, composed of three tranches (Table 1). The net proceeds (after deducting underwriting discounts and offering expenses) from this issuance have been and will continue to be allocated to expenditures, contractual commitments, and capital commitments in Eligible Projects, as defined in Alphabet's [Sustainability Bond Framework](#) ("Framework").²

Table 1

BOND DETAILS BY NOTES

Notes	Coupon	Issued amount (\$M)	Net proceeds (\$M)
2025 Notes	0.45%	\$1,000	\$996
2030 Notes	1.10%	\$2,250	\$2,235
2050 Notes	2.05%	\$2,500	\$2,457
Total		\$5,750	\$5,688

Our Framework defines "Eligible Projects" as investments in and expenditures for eligible green projects and/or eligible social projects made on the issuance date of the sustainability bond or in the 24 months prior. Each of our Eligible Projects meets one or more of the eight eligibility criteria defined by our Framework, which is aligned with the Green Bond Principles, the Social Bond Principles, and the Sustainability Bond Guidelines. Our green and social eligible project categories are described in Table 2.³ Notwithstanding our significant work and commitments supporting sustainability through Google.org, no net proceeds were allocated to such activities given their philanthropic nature. Our sustainability bonds are referred to collectively in this report as "2020 Sustainability Bond" or "Sustainability Bond."

Alphabet is a collection of businesses—the largest of which is Google. As used herein, "Alphabet," "the company," "we," "us," "our," and similar terms include Alphabet Inc. and its subsidiaries, unless the context indicates otherwise.

For a detailed overview of our allocation and expected impact by bond, see [Table 3](#) and [Table 4](#) in the appendix.

Table 2

ELIGIBLE PROJECT CATEGORIES

Green and social eligible project category	Eligibility criteria
<p>Energy efficiency</p> 	Expenditures related to design, construction, operation, and maintenance of energy-efficient facilities and infrastructure
<p>Clean energy</p> 	Expenditures related to the construction, development, acquisition, maintenance, and operation of renewable energy projects that are new to the grid, such as solar, wind, small-scale hydropower generation, geothermal, and biomass
<p>Green buildings</p> 	Expenditures related to design, construction, and improvements of office spaces and surrounding communities
<p>Clean transportation</p> 	Expenditures related to the procurement, maintenance, and operation of electric vehicles (EV), bicycles, and associated infrastructure
<p>Circular economy and design</p> 	Expenditures related to projects that are designed to increase waste diversion from landfill and design out waste
<p>Affordable housing</p> 	Expenditures related to the construction, development, acquisition, and maintenance of affordable housing
<p>Commitment to racial equity</p> 	Expenditures focused on advancing economic opportunity and equity for under-represented communities, including the Black+ community
<p>Support for small businesses and COVID-19 crisis response</p> 	Expenditures related to support for SMBs, including those impacted by COVID-19

Project selection and reporting

A committee consisting of representatives from Alphabet's Sustainability, Treasury, and Finance teams evaluated a broad array of projects from across the company to identify Eligible Projects. The final allocation of net proceeds to Eligible Projects was reviewed and approved by Google's Chief Sustainability Officer. Projects were selected based on the following factors:

- Consistency with eligibility criteria
- Alignment with our five-year sustainability strategy
- Magnitude of environmental or social impact
- Ability to track and audit project expenditures, contractual commitments, and/or capital commitments
- Allocation of funds within our reporting period (i.e., in Alphabet's fiscal years ended on December 31, 2019, and December 31, 2020)

To ensure transparency and alignment with our Framework, we committed to report annually on which projects have been funded from the bonds' net proceeds and their expected sustainability impact. Information contained in this Sustainability Bond Impact Report is not incorporated in, and is not part of, any report or filing we make with the U.S. Securities and Exchange Commission.

We've received an [Independent Accountant's Report](#) providing assurance of management's assertion of allocation of \$3.47 billion in net proceeds to Eligible Projects.

Looking ahead

From our 2020 Sustainability Bond, there are unallocated net proceeds of \$2.22 billion (39%), which we'll allocate to green and social Eligible Projects in the years to come. We remain committed to reporting annually, until full allocation of net proceeds.

Our Sustainability Bond helps us operate our business in an environmentally and socially responsible way. Our ultimate goal is to enable everyone—businesses, policymakers, and consumers—to create and live in a more sustainable world. We remain optimistic about our collective ability to come together and chart a more sustainable path forward.

We'll continue to lead and encourage others to join us in improving the health of our communities and our planet.

Featured projects and impact



Energy efficiency

For more than a decade, we've worked to make Google data centers some of the most efficient in the world by optimizing our use of energy, water, and materials. Our long-standing [data center efficiency](#) efforts are more important than ever because our data centers represent the vast majority of our electricity use. To reduce energy use, we outfit each data center with high-performance servers that we've custom-designed to use as little energy as possible.

In 2020, through tools and technologies such as advanced cooling systems, smart temperature and lighting controls, and machine learning, we've reduced the average annual power usage effectiveness (PUE)⁴ of our global data center fleet to 1.10, compared with the industry average of 1.59.⁵ This means that, on average, Google data centers use about six times less overhead energy—for things like lighting, cooling, and power distribution—than typical data centers use. Today, on average, a Google data center is twice as energy efficient as a typical enterprise data center.

We allocated a total of \$640 million in net proceeds from our Sustainability Bond to capital expenditures related to the expansion and improvement of energy-efficient facilities and infrastructure at our two data center campuses in St. Ghislain, Belgium, and Hamina, Finland. In 2020, the average annual PUE at these data centers campuses was 1.08 and 1.09, respectively.⁶



Spotlight

Keeping our cool in Belgium

Our St. Ghislain, Belgium, data center campus uses recycled water from a nearby industrial canal to cool its servers, eliminating the need for refrigerated cooling and making it highly energy efficient. This data center campus had an average annual PUE of 1.08 in 2020, one of the best in Google's fleet.

This site also has a track record of implementing novel energy ideas. It was the first data center in our fleet to run entirely without energy-intensive mechanical chillers. It's also the place where we've integrated our largest on-site [renewable energy installation](#)—more than 10,000 solar panels strong. We'll also soon install the first-ever [battery-based system](#) for replacing generators at a hyperscale data center. In the event of a power disruption, the system will help keep our users' searches, emails, and videos on the move—without the pollution associated with burning diesel.

These efforts have not gone unnoticed. In 2018, the European Commission recognized our St. Ghislain data center campus with an EU Code of Conduct for Energy Efficiency in Data Centers Award as a top performer over the previous 10 years in the large data center category.

Clean energy

Running our business requires us to use electricity to power our data centers, offices, and other infrastructure. And combating climate change requires the world to transition to a clean energy economy. So we've made it a top priority to become more energy efficient and to match 100% of the energy we consume at our facilities around the world every year with energy purchases from renewable sources, such as wind and solar.

Google is the world's largest annual corporate purchaser of renewable energy, based on renewable electricity purchased in megawatt-hours. From 2010 to 2020, Google signed more than 55 agreements to purchase nearly 6 gigawatts (GW) of renewable energy capacity that's new to the grid. This represents a commitment of approximately \$4 billion to purchase clean energy through 2034.

We're now working toward a [more ambitious goal](#) of sourcing [24/7 carbon-free energy](#) for all of our data centers and office campuses around the world. This means that we aim to evolve from matching our annual energy consumption with renewable energy to sourcing round-the-clock [carbon-free energy](#).

We allocated nearly \$1.28 billion in net proceeds from our Sustainability Bond to expenditures and contractual commitments to purchase electricity from renewable energy sources.⁷ This includes 42 renewable energy power purchase agreements (PPAs) across four continents with a combined capacity of approximately 4.4 GW. These are all long-term projects new to the grid that meet our [criteria of additionality](#). We estimate that these renewable energy PPAs combined will avoid nearly 14.9 million metric tons of carbon dioxide equivalent (tCO₂e) emissions.



Spotlight

Wind and solar: better together

Buying power from a range of renewable sources is one way that Google can fill gaps in our carbon-free energy supply.

In Chile in 2019, we agreed to purchase electricity from both a new 90 megawatt (MW) wind farm and a new 35 MW solar facility to match our growing load in South America. These projects, along with our existing 80 MW agreement with the El Romero solar farm, support our data center campus in Quilicura, Chile.

Because the sun generally shines at different times than the wind blows, the two projects complement each other and will help us match our data center with more than 90% carbon-free energy on an hourly basis.

Our Chile deal marks the first time we bought power in a hybrid technology deal that combines solar and wind. In the future, we expect to sign more blended resource deals as the energy industry develops technologies with differing production profiles, helping us move closer to round-the-clock carbon-free energy.

Green buildings

Our sustainability priorities for workspaces are guided by Google's company-wide sustainability values and are applied everywhere we operate—from our Bay Area headquarters to our offices in more than 180 cities spanning nearly 60 countries.

We start by applying a strong foundation of sustainability standards to the design, construction, and operation of our workplaces. These standards help us achieve sustainability at scale, while defining measurable metrics to track progress and success. We also leverage industry-leading green building certifications such as Leadership in Energy and Environmental Design (LEED) and the Living Building Challenge (LBC), a standard administered by the International Living Future Institute (ILFI).

By the end of 2020, over 1.5 million square meters (16.6 million square feet) of Google office facilities had achieved LEED certification, with 27% of our LEED-certified square footage achieving a Platinum rating.

We allocated nearly \$1.25 billion in net proceeds from our Sustainability Bond to capital expenditures related to the design, construction, and improvement of seven green building projects totaling nearly 415,000 square meters (4.5 million square feet) that are expected to achieve LEED Platinum certification once complete.



Spotlight

Scaling sustainable heights in Mountain View

We're building our new Bay View campus in Mountain View, California, to the highest sustainability standards. The campus is expected to achieve a LEED Platinum certification and be the largest facility ever to attain the ILFI LBC Water Petal Certification, both of which are the highest standards possible.

When completed, these buildings will feature a first-of-its-kind dragonscale solar skin, equipped with 90,000 silver solar panels and the capacity to generate nearly 7 MW of energy to supply up to 40% of the building's annual electricity use. They will house the largest geothermal pile system in North America to help heat buildings in the winter and cool them in the summer. Compared to a conventional, code-compliant baseline, we estimate this system will reduce carbon emissions by 48% and water used for cooling by 90%. We also estimate that we'll divert more than 90% of waste from landfill during campus construction.

Our commitment to sustainability also extends beyond the buildings themselves. Bay View backs up to the San Francisco Bay, so we're pursuing net positive water. The goal is to have no connection to a central plumbing utility or a sewer; all of the water on that site will come from a closed loop. We're working to restore 18 acres of open space on the site with native drought-resistant trees, and we're engineering native wetland habitat with natural collection ponds to capture and treat stormwater for reuse. In addition, unique on-site infrastructure will allow for future export of surplus non-potable water.

Clean transportation

We're working to mitigate carbon emissions and take cars off the road by setting ambitious goals for helping Googlers transition to shuttles, carpooling, public transit, biking, and walking. There is also a growing number of EVs in our Google-owned and -operated commuter program fleet, with the majority of the non-EVs using renewable diesel.

We have a target to provide EV charging stations for 10% of the total parking spaces at our Bay Area headquarters. To date, we've achieved this design standard for the majority of new development projects and continue to work toward achieving it for all parking spaces. We also have a long-term goal of reducing single-occupancy vehicle commuting at our Bay Area headquarters to 45%.

We allocated \$15 million in net proceeds from our Sustainability Bond to expenditures and contractual commitments related to four clean transportation projects, including two initiatives related to the electrification of Google fleet vehicles, operating expenses for our EV charging stations, and expenditures related to our bike programs. This allocation supported the operation of more than 3,600 EV charging ports in the United States and Canada.

Circular economy and design

We see the circular economy as a complex yet inspiring information challenge that, once unlocked, will lead to a world of abundance where human, environmental, and economic systems can thrive. That's why we're leveraging our scale, resources, technological expertise, and close partnerships to accelerate the transition to a circular economy and help the world meet its resource needs.

We're committed to maximizing the reuse of finite resources across our operations, products, and supply chains and to enable others to do the same. We're applying our circular economy principles to design out waste, keep products and materials in use, and promote healthy materials and safe chemistry. We strive to embed these principles across our infrastructure, operations, and products—from how we manage servers in our data centers to how we design our consumer hardware to the materials we select to build and furnish our offices.

We allocated \$4 million in net proceeds from our Sustainability Bond to expenditures related to six waste reduction and diversion projects. One such project is a software system that we use in our kitchens to track and reduce pre-consumer food waste. In 2019, this data-driven optimization helped Google prevent over 1.1 million kilograms (2.5 million pounds) of food going into the waste stream.

Affordable housing

We strive to be a good neighbor in the places we call home. In the San Francisco Bay Area, one issue stands out as particularly urgent and complex: housing. The lack of new supply, combined with the rising cost of living, has resulted in a severe shortage of economical housing options for long-time middle- and low-income residents. As Google grows throughout the Bay Area—whether it’s in our hometown of Mountain View, in San Francisco, or in our future developments in San José and Sunnyvale—we’re investing in developing housing that meets the needs of these communities.

To address the lack of affordable housing in the Bay Area, we made a \$1 billion commitment in 2019 to invest in housing. Over the next decade, this investment is expected to enable the development of at least 20,000 residential units, of which at least 5,000 will be affordable.

We allocated \$70 million in net proceeds from our Sustainability Bond through contractual commitments to affordable housing initiatives, including loans supporting the development of 16 affordable housing projects, such as The Kelsey Ayer Station. We expect our allocation will enable the development of approximately 1,800 affordable units.



Spotlight

Building a shared commitment to inclusion

Our \$1 billion commitment to affordable housing has enabled us to provide early and reliable capital to projects like The Kelsey Ayer Station. Based in San José, The Kelsey Ayer Station will offer 115 homes for people across a range of incomes with 25% of the community specifically reserved for people with disabilities.

Over 70% of people with developmental disabilities never move from their family home. This challenge is particularly acute in lower-income communities or communities of color. The Kelsey, the organization behind this project, advances disability-forward housing communities that open doors to homes and opportunities for everyone.

The entire space (including each unit) is designed to be accessible and inclusive to everyone. On-site amenities include a drop-off location for accessible transit, sensory garden, and space for support staff.

Google’s predevelopment capital will help secure permanent financing and philanthropic support to complete the project, demonstrating what’s possible when people, funding, and cities come together with a shared commitment to inclusion.

Commitment to racial equity

Google is committed to continuing to make diversity, equity, and inclusion part of everything we do—from how we build our products to how we build our workforce. Operating at our scale brings an elevated level of responsibility to all of our work—including a workforce that’s more representative of our users, and a workplace that creates a sense of belonging for everyone.

In June 2020, Google announced a series of [racial equity commitments](#) to build sustainable equity for Google’s Black community and make our products and programs helpful in the moments that matter most to Black users.

Internally, we’re doing more to ensure the Black community is well represented in leadership and throughout all levels and, even more importantly, creating the conditions where everyone can thrive once here. 2020 was our largest year ever for hiring Black+ Googlers in the United States—both overall, and in tech roles. We’re on track to meet our goals to improve leadership representation of underrepresented groups by 30 percent by 2025 and more than double the number of Black Googlers at all other levels by 2025.

We know that racial equity is inextricably linked to economic opportunity. Over the past year, we’ve committed more than \$320 million to organizations working to address racial inequities, including a \$175+ million economic opportunity package to support Black business owners, start-up founders, job seekers, and developers, in addition to the \$100 million [#YouTubeBlack Voices Fund](#) to amplify Black creators and artists.

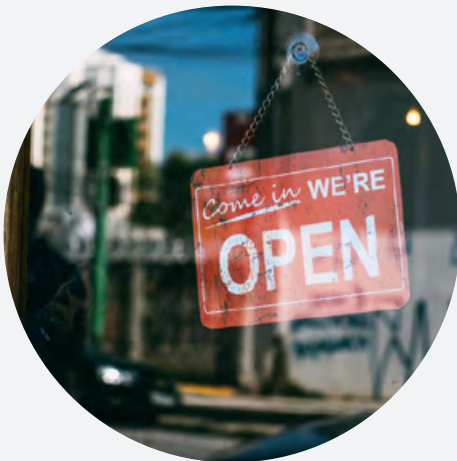
We allocated \$81 million in net proceeds from our Sustainability Bond to expenditures and contractual commitments focused on six initiatives that advance economic opportunity for the Black community. This includes \$45 million to finance loans for Community Development Financial Institutions (CDFIs) supporting SMBs focused on the Black community and in partnership with Opportunity Finance Network. We expect this capital commitment will result in approximately 2,700 loans closed to SMBs focused on the Black community. Our allocation also includes investment in Black-led capital firms, start-ups, and organizations supporting Black entrepreneurs, including increased investments in Plexo Capital. We’ve also contributed to the [#YouTubeBlack Voices Fund](#).

Support for small businesses and COVID-19 crisis response

Small businesses are the backbone of the global economy and at the core of many of Google's tools, services, and products. So when the COVID-19 pandemic hit last year, we announced a \$200 million investment fund as part of our \$800+ million commitment to support SMBs, health organizations, governments, and health workers on the frontlines.

We set out to partner with organizations who share our desire to empower small businesses in underserved communities, which are often overlooked by traditional lenders. One such organization is Opportunity Finance Network (OFN), a national association of CDFIs, which provides affordable loans to their member CDFIs, which in turn provide loans to small businesses in underserved communities in the United States.

We allocated \$133 million in net proceeds from our Sustainability Bond to contractual commitments that finance loans to small businesses. This includes [\\$125 million](#) from our U.S. Grow with Google Small Business Fund in partnership with OFN and [\\$8 million](#) in Latin America through a long-term partnership with the Inter-American Development Bank. We expect our capital commitment will result in approximately 13,500 loans closed to SMBs.



Spotlight

Helping small businesses “Grow with Google”

Google, in partnership with OFN, announced a \$170 million commitment to support historically underserved local businesses in the United States with affordable loans through the Grow with Google Small Business Fund. The \$170 million commitment is composed of \$125 million to support small businesses impacted by COVID-19 and, as a part of our commitment to racial equity, \$45 million to support small businesses focused on the Black community.

OFN's network of over 350 CDFI members lends to clients who are 60% people of color, 84% low-income, 28% living in rural areas, and 50% women, according to a 2019 member survey.⁸ One such client is Gem City Market, a new grocery cooperative that secured funding from Finance Fund Capital Corporation to help them provide affordable, quality kitchen staples to the Dayton, Ohio, community. For Bailiwick Clothing Company in Washington, DC, the onset of the COVID-19 pandemic led to a drop in retail apparel purchases. They received support from Washington Area Community Investment Fund, which enabled them to pivot to selling face masks and led them to win a large contract from a local hospital.

Google and OFN will continue to work together to underwrite and fund loans to additional CDFIs, which will then lend to thousands of small businesses. Through this partnership and program, we hope we can do our part to make sure small businesses remain the heart of the U.S. economy. We're proud to help small businesses meet a new challenge—accessing capital needed to recover and build resiliency for the future.

Appendix

Allocation by bond

Table 3 provides an overview of our allocation of net proceeds from our 2020 Sustainability Bond by bond tranche as of December 31, 2020.

We've received an [Independent Accountant's Report](#) providing assurance of management's assertion that \$3.47 billion in net proceeds were allocated to Eligible Projects. We have made this allocation of net proceeds on a pro rata basis from the 2025 Notes, 2030 Notes, and 2050 Notes. Amounts allocated are rounded to the nearest million. Due to rounding, amounts allocated by notes may not add up to the total.

Table 3

ALLOCATION BY BOND ACROSS GREEN AND SOCIAL ELIGIBLE PROJECT CATEGORIES

ELIGIBLE PROJECT CATEGORIES	AMOUNT ALLOCATED (\$M)			
	2025 Notes	2030 Notes	2050 Notes	Total
Energy efficiency	\$112	\$252	\$277	\$640
Clean energy	\$224	\$502	\$552	\$1,278
Green buildings	\$218	\$490	\$538	\$1,246
Clean transportation	\$3	\$6	\$6	\$15
Circular economy and design	\$1	\$2	\$2	\$4
Affordable housing	\$12	\$27	\$30	\$70
Commitment to racial equity	\$14	\$32	\$35	\$81
Support for small businesses and COVID-19 crisis response	\$23	\$52	\$57	\$133
TOTAL ALLOCATION FOR 2021 REPORT	\$607	\$1,363	\$1,498	\$3,468
<i>Net proceeds</i>	\$996	\$2,235	\$2,457	\$5,688
<i>Net proceeds allocated by tranche (%)</i>	61%	61%	61%	61%

Impact by bond

Table 4 provides an overview of the expected environmental and social impacts of Eligible Projects by 2020 Sustainability Bond tranche. Impact metrics for the 2025 Notes, 2030 Notes, and 2050 Notes are derived from the allocation of net proceeds provided in Table 3.

Table 4

EXPECTED IMPACT BY BOND ACROSS GREEN AND SOCIAL ELIGIBLE PROJECT CATEGORIES

ELIGIBLE PROJECT CATEGORIES	IMPACT METRIC(S)	IMPACT				
		Unit	2025 Notes	2030 Notes	2050 Notes	Total
Energy efficiency	PUE at Belgium data center campus ⁹	PUE	1.08	1.08	1.08	1.08
Clean energy	Emissions avoided by renewable energy PPAs ¹⁰	tCO ₂ e	2,607,500	5,851,500	6,433,000	14,892,000
Green buildings	LEED Platinum certified office space ¹¹	m ²	73,000	163,000	179,000	415,000
Clean transportation	EV charging ports installed ¹²	#	600	1,400	1,600	3,600
Circular economy and design	Pre-consumer food waste prevented in cafés ¹³	kg	198,500	445,500	490,000	1,134,000
Affordable housing	Affordable housing units enabled ¹⁴	#	300	700	800	1,800
Commitment to racial equity	Loans to SMBs focused on the Black community ¹⁵	#	470	1,060	1,170	2,700
Support for small businesses and COVID-19 crisis response	Loans to SMBs ¹⁶	#	2,350	5,300	5,850	13,500

Endnotes

1. According to a database of U.S.-domiciled issuers of sustainability bonds sourced from Bloomberg, as of June 30, 2021.
2. Alphabet's 2020 Sustainability Bond Framework is aligned with the Green Bond Principles, dated June 2018, the Social Bond Principles, dated June 2020, and the Sustainability Bond Guidelines, dated June 2018, as administered by the International Capital Market Association.
3. Consistent with Appendix A in our [Independent Accountant's Report](#), please see the following notes that apply to our eligibility criteria:

Note 1: For power purchase agreements executed during the Reporting Period, proceeds are considered allocated upon contract execution. The Allocated Amount is calculated as the net present value of future cash flows based on estimated annual production in megawatts and fixed power price over the contract term. For power purchase agreements executed prior to the Reporting Period, proceeds are considered allocated for services received during the Reporting Period, based on the amount invoiced.

Note 2: For capital or contractual commitments including investment funds or venture capital investments, proceeds are considered allocated upon contract execution based on the agreed upon amount within the contract.

Note 3: For all other expenditures, the Allocated Amount is calculated as the amount invoiced and proceeds are considered allocated when goods or services are approved for payment.
4. PUE is a standard industry ratio that compares the amount of non-computing overhead energy (used for things like cooling and power distribution) to the amount of energy used to power IT equipment. A PUE of 2.0 means that for every watt of IT power, an additional watt is consumed to cool and distribute power to the IT equipment. A PUE closer to 1.0 means nearly all the energy is used for computing. For more information, please see [Google Data Centers: Efficiency](#).
5. According to the [Uptime Institute's 2020 Data Center Survey](#), the global average PUE of respondents' largest data centers was around 1.59.
6. We expect that the construction of new or expanded facilities on data center campuses will support the maintenance or improvement of the campus-wide PUE, so we've reported the impact metric as the 2020 average annual PUE.
7. For PPAs signed in 2019 and 2020, our allocation reflects our contractual commitments based on the net present value of expected expenditures on renewable energy over the life of each renewable energy project, as of the time of contract execution.
8. [Inside the Membership - Fiscal Year 2019 Statistical Highlights from the OFN Membership](#), Opportunity Finance Network, April 2021.
9. See note 6 above.
10. For agreements signed prior to 2019, emissions avoided by renewable energy PPAs are estimated by multiplying the actual renewable energy generated (in megawatt-hours) in 2019 and 2020 by location-based GHG emission factors for each respective grid region. For agreements signed during 2019 and 2020, emissions avoided by renewable energy PPAs are estimated by multiplying the expected renewable energy generation (in megawatt-hours) by location-based GHG emission factors for each respective grid region over the expected lifetime of each PPA, considering projected year-over-year changes in emission factors due to grid decarbonization. U.S. emission factors were sourced from the U.S. Environmental Protection Agency's eGRID (Emissions & Generation Resource Integrated Database; 2018 data). Emission factors for all other countries were sourced from the International Energy Agency's CO₂ Emissions from Fuel Combustion (2019 edition). Reported emissions are rounded to the nearest 500.
11. Square meters of LEED Platinum certified office space are estimated by adding the expected gross square meters of the seven green building projects for which we plan to ultimately pursue LEED Platinum certification once complete. Reported square meters are rounded to the nearest thousand.
12. Number of EV charging ports installed are calculated by summing the total number of EV ports installed as of December 31, 2020, at our offices in the United States and Canada. Reported ports are rounded to the nearest hundred.
13. Pre-consumer food waste prevented in cafés is estimated by summing the difference between each café's change in food waste weight compared to its baseline set prior to implementing food waste reduction and behavior modification tools, for all Google offices participating in the Leanpath program combined. The total waste prevented includes data only from 2019, due to both limited operations and lack of reliable data in 2020 given COVID-19 office closures. Reported kilograms are rounded to the nearest 500.
14. Affordable housing units enabled are estimated by summing the total number of units expected from affordable housing projects with loans under contract as of December 31, 2020. Expected units are rounded to the nearest 50.
15. Loans to SMBs focused on the Black community are estimated by dividing our total amount committed to OFN for small businesses focused on the Black community by the average loan size as of December 31, 2020. Loans are rounded to the nearest 10.
16. Loans to SMBs are estimated by dividing the total amount committed to each respective investment partnership by the average loan size for that partnership as of December 31, 2020. Loans are rounded to the nearest 50.

Alphabet

Sustainability Bond Impact Report 2021
August 2021

On the cover:

Google Earth image of Zell am See, Austria

Introduction:

A Googler rides a GBike at the Googleplex in Mountain View, California.

About our sustainability bonds:

Our data center in The Dalles, Oregon, sits on the banks of the Columbia River.

Featured projects and impact:

Great Western wind farm in Oklahoma (225 MW for Google)

Green buildings:

Photo credit: C. McAnney of Heatherwick Studio

Affordable housing:

Photo credit: The Kelsey