

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

FORM 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2023
OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____.

Commission file number: 001-37580

Alphabet Inc.

(Exact name of registrant as specified in its charter)

Delaware

61-1767919

(State or other jurisdiction of incorporation or organization)

(I.R.S. Employer Identification No.)

1600 Amphitheatre Parkway
Mountain View, CA 94043

(Address of principal executive offices, including zip code)

(650) 253-0000

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

| <u>Title of each class</u> | <u>Trading Symbol(s)</u> | <u>Name of each exchange on which registered</u> |
|--|--------------------------|--|
| Class A Common Stock, \$0.001 par value | GOOGL | Nasdaq Stock Market LLC (Nasdaq Global Select Market) |
| Class C Capital Stock, \$0.001 par value | GOOG | Nasdaq Stock Market LLC (Nasdaq Global Select Market) |

Securities registered pursuant to Section 12(g) of the Act:

Title of each class

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (\$232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

| | | | |
|-------------------------|-------------------------------------|---------------------------|--------------------------|
| Large accelerated filer | <input checked="" type="checkbox"/> | Accelerated filer | <input type="checkbox"/> |
| Non-accelerated filer | <input type="checkbox"/> | Smaller reporting company | <input type="checkbox"/> |
| Emerging growth company | <input type="checkbox"/> | | |

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C.7262(b)) by the registered public accounting firm that prepared or issued its audit report.

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements.

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b).

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

As of June 30, 2023, the aggregate market value of shares held by non-affiliates of the registrant (based upon the closing sale prices of such shares on the Nasdaq Global Select Market on June 30, 2023) was approximately \$1,331.2 billion. For purposes of calculating the aggregate market value of shares held by non-affiliates, we have assumed that all outstanding shares are held by non-affiliates, except for shares held by each of our executive officers, directors, and 5% or greater stockholders. In the case of 5% or greater stockholders, we have not deemed such stockholders to be affiliates unless there are facts and circumstances which would indicate that such stockholders exercise any control over our company, or unless they hold 10% or more of our outstanding common stock. These assumptions should not be deemed to constitute an admission that all executive officers, directors, and 5% or greater stockholders are, in fact, affiliates of our company, or that there are not other persons who may be deemed to be affiliates of our company. Further information concerning shareholdings of our officers, directors, and principal stockholders is included or incorporated by reference in Part III, Item 12 of this Annual Report on Form 10-K.

As of January 23, 2024, there were 5,893 million shares of Alphabet's Class A stock outstanding, 869 million shares of Alphabet's Class B stock outstanding, and 5,671 million shares of the Alphabet's Class C stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2024 Annual Meeting of Stockholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2023.

**Alphabet Inc.
Form 10-K
For the Fiscal Year Ended December 31, 2023**

TABLE OF CONTENTS

| | Page |
|---|-----------|
| Note About Forward-Looking Statements | <u>3</u> |
| PART I | |
| Item 1. Business | <u>4</u> |
| Item 1A. Risk Factors | <u>11</u> |
| Item 1B. Unresolved Staff Comments | <u>24</u> |
| Item 1C. Cybersecurity | <u>24</u> |
| Item 2. Properties | <u>25</u> |
| Item 3. Legal Proceedings | <u>25</u> |
| Item 4. Mine Safety Disclosures | <u>25</u> |
| PART II | |
| Item 5. Market for Registrant's Common Equity, Related Stockholder Matters, and Issuer Purchases of Equity Securities | <u>25</u> |
| Item 6. [Reserved] | <u>28</u> |
| Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations | <u>29</u> |
| Item 7A. Quantitative and Qualitative Disclosures About Market Risk | <u>45</u> |
| Item 8. Financial Statements and Supplementary Data | <u>47</u> |
| Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure | <u>88</u> |
| Item 9A. Controls and Procedures | <u>88</u> |
| Item 9B. Other Information | <u>89</u> |
| Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections | <u>89</u> |
| PART III | |
| Item 10. Directors, Executive Officers, and Corporate Governance | <u>90</u> |
| Item 11. Executive Compensation | <u>90</u> |
| Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters | <u>90</u> |
| Item 13. Certain Relationships and Related Transactions, and Director Independence | <u>90</u> |
| Item 14. Principal Accountant Fees and Services | <u>90</u> |
| PART IV | |
| Item 15. Exhibits, Financial Statement Schedules | <u>91</u> |
| Item 16. Form 10-K Summary | <u>94</u> |
| Signatures | |

Note About Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These include, among other things, statements regarding:

- the growth of our business and revenues and our expectations about the factors that influence our success and trends in our business;
- fluctuations in our revenues and margins and various factors contributing to such fluctuations;
- our expectation that the continuing shift from an offline to online world will continue to benefit our business;
- our expectation that the portion of our revenues that we derive beyond advertising will continue to increase and may affect our margins;
- our expectation that our traffic acquisition costs (TAC) and the associated TAC rate will fluctuate, which could affect our overall margins;
- our expectation that our monetization trends will fluctuate, which could affect our revenues and margins;
- fluctuations in paid clicks and cost-per-click as well as impressions and cost-per-impression, and various factors contributing to such fluctuations;
- our expectation that we will continue to periodically review, refine, and update our methodologies for monitoring, gathering, and counting the number of paid clicks and impressions;
- our expectation that our results will be affected by our performance in international markets as users in developing economies increasingly come online;
- our expectation that our foreign exchange risk management program will not fully offset our net exposure to fluctuations in foreign currency exchange rates;
- the expected variability of gains and losses related to hedging activities under our foreign exchange risk management program;
- the amount and timing of revenue recognition from customer contracts with commitments for performance obligations, including our estimate of the remaining amount of commitments and when we expect to recognize revenue;
- our expectation that our capital expenditures will increase, including the expected increase in our technical infrastructure investment to support the growth of our business and our long-term initiatives, in particular in support of artificial intelligence (AI) products and services;
- our plans to continue to invest in new businesses, products, services and technologies, and systems, as well as to continue to invest in acquisitions and strategic investments;
- our pace of hiring and our plans to provide competitive compensation programs;
- our expectation that our cost of revenues, research and development (R&D) expenses, sales and marketing expenses, and general and administrative expenses may increase in amount and/or may increase as a percentage of revenues and may be affected by a number of factors;
- estimates of our future compensation expenses;
- our expectation that our other income (expense), net (OI&E), will fluctuate in the future, as it is largely driven by market dynamics;
- our expectation that our effective tax rate and cash tax payments could increase in future years;
- seasonal fluctuations in internet usage and advertiser expenditures, underlying business trends such as traditional retail seasonality, which are likely to cause fluctuations in our quarterly results;
- the sufficiency of our sources of funding;
- our potential exposure in connection with new and pending investigations, proceedings, and other contingencies, including the possibility that certain legal proceedings to which we are a party could harm our business, financial condition, and operating results;
- our expectation that we will continue to face heightened regulatory scrutiny and changes in regulatory conditions, laws, and public policies, which could affect our business practices and financial results;

- the expected timing, amount, and effect of Alphabet Inc.'s share repurchases;
- our long-term sustainability and diversity goals;

as well as other statements regarding our future operations, financial condition and prospects, and business strategies. Forward-looking statements may appear throughout this report and other documents we file with the Securities and Exchange Commission (SEC), including without limitation, the following sections: Part I, Item 1 "Business;" Part I, Item 1A "Risk Factors;" and Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations." Forward-looking statements generally can be identified by words such as "anticipates," "believes," "could," "estimates," "expects," "intends," "may," "plans," "predicts," "projects," "will be," "will continue," "will likely result," and similar expressions. These forward-looking statements are based on current expectations and assumptions that are subject to risks and uncertainties, which could cause our actual results to differ materially from those reflected in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in this Annual Report on Form 10-K, including the risks discussed in Part I, Item 1A "Risk Factors" and the trends discussed in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations," and those discussed in other documents we file with the SEC. We undertake no obligation to revise or publicly release the results of any revision to these forward-looking statements, except as required by law. Given these risks and uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements.

As used herein, "Alphabet," "the company," "we," "us," "our," and similar terms include Alphabet Inc. and its subsidiaries, unless the context indicates otherwise.

"Alphabet," "Google," and other trademarks of ours appearing in this report are our property. We do not intend our use or display of other companies' trade names or trademarks to imply an endorsement or sponsorship of us by such companies, or any relationship with any of these companies.

PART I

ITEM 1. BUSINESS

Overview

As our founders Larry and Sergey wrote in the original founders' letter, "Google is not a conventional company. We do not intend to become one." That unconventional spirit has been a driving force throughout our history, inspiring us to tackle big problems and invest in moonshots. It led us to be a pioneer in the development of AI and, since 2016, an AI-first company. We continue this work under the leadership of Alphabet and Google CEO, Sundar Pichai.

Alphabet is a collection of businesses — the largest of which is Google. We report Google in two segments, Google Services and Google Cloud, and all non-Google businesses collectively as Other Bets. Alphabet's structure is about helping each of our businesses prosper through strong leaders and independence.

Access and Technology for Everyone

The Internet is one of the world's most powerful equalizers; it propels ideas, people, and businesses large and small. Our mission to organize the world's information and make it universally accessible and useful is as relevant today as it was when we were founded in 1998. Since then, we have evolved from a company that helps people find answers to a company that also helps people get things done.

We are focused on building an even more helpful Google for everyone, and we aspire to give everyone the tools they need to increase their knowledge, health, happiness, and success. Google Search helps people find information and make sense of the world in more natural and intuitive ways, with trillions of searches on Google every year. YouTube provides people with entertainment, information, and opportunities to learn something new. Google Assistant offers the best way to get things done seamlessly across different devices, providing intelligent help throughout a person's day, no matter where they are. Google Cloud helps customers solve today's business challenges, improve productivity, reduce costs, and unlock new growth engines. We are continually innovating and building new products and features that will help our users, partners, customers, and communities and have invested more than \$150 billion in research and development in the last five years in support of these efforts.

Making AI Helpful for Everyone

AI is a transformational technology that can bring meaningful and positive change to people and societies across the world, and for our business. At Google, we have been bringing AI into our products and services for more than a decade and making them available to our users. Our journey began in 2001, when machine learning was first incorporated into Google Search to suggest better spellings to users searching the web. Today, AI in our products is

used by billions of people globally through features like autocomplete suggestions in Google Search; translation across 133 languages in Google Translate; and organization, searching, and editing in Google Photos.

Large language models (LLMs) are an exciting aspect of our work in AI based on deep learning architectures, such as the Transformer, a neural network architecture that we introduced in 2017 that helped with language understanding. This led to the Bidirectional Encoder Representations from Transformers, or BERT, in 2019 that helped Search understand the intent of user search queries better than ever before.

Google was a company built in the cloud, and we continue to invest in our Google Cloud offerings, including Google Cloud Platform and Google Workspace, to help organizations stay at the forefront of AI innovation with our AI-optimized infrastructure, mature AI platform and world-class models, and assistive agents.

We believe AI can solve some of the hardest societal, scientific and engineering challenges of our time. For example, in 2020, Google DeepMind's AlphaFold system solved a 50-year-old protein folding challenge. Since then, we have open-sourced to the scientific community 200 million of AlphaFold's protein structures which are used to work on everything from accelerating new malaria vaccines to advancing cancer drug discovery and developing plastic-eating enzymes. As another example, AI can also have a transformative effect on climate progress by providing helpful information, predicting climate-related events, and optimizing climate action. Using advanced AI and geospatial analysis, Google Research has developed flood forecasting models that can provide early warning and real-time flooding information to communities and individuals.

As AI continues to improve rapidly, we are focused on giving helpful features to our users and customers as we deliver on our mission to organize the world's information and make it universally accessible and useful. With a bold and responsible approach, we continue to take the next steps to make this technology even more helpful for everyone.

Deliver the Most Advanced, Safe, and Responsible AI

We aim to build the most advanced, safe, and responsible AI with models that are developed, trained, and rigorously tested at scale powered by our continued investment in AI technical infrastructure. In December 2023, we launched Gemini, our most capable and general model. It was built from the ground up to be multimodal, which means it can generalize and seamlessly understand, operate across, and combine different types of information, including text, code, audio, images, and video. Our teams across Alphabet will leverage Gemini, as well as other AI models we have previously developed and announced, across our business to deliver the best product and service experiences for our users, advertisers, partners, customers, and developers.

We believe our approach to AI must be both bold and responsible. That means developing AI in a way that maximizes the positive benefits to society while addressing the challenges, guided by our AI Principles. We published these in 2018, as one of the first companies to articulate principles that put beneficial use, users, safety, and avoidance of harms above business considerations. While there is natural tension between being bold and being responsible, we believe it is possible — and in fact critical — to embrace that tension productively.

Enable Organizations and Developers to Innovate on Google Cloud

AI is not only a powerful enabler, it is also a major platform shift. Globally, businesses from startups to large enterprises, and the public sector are thinking about how to drive transformation. That is why we are focused on making it easy and scalable for others to innovate, and grow, with AI. That means providing the most advanced computing infrastructure and expanding access to Google's latest AI models that have been rigorously tested in our own products. Our Vertex AI platform gives developers the ability to train, tune, augment, and deploy applications using generative AI models and services such as Enterprise Search and Conversations. Duet AI for Google Cloud provides pre-packaged AI agents that assist developers to write, test, document, and operate software.

Improve Knowledge, Learning, Creativity, and Productivity

Things that we now consider routine — like spell check, mobile check deposit, or Google Search, Google Translate, and Google Maps — all use AI. As AI continues to improve rapidly, we are focused on giving helpful features to our users as we continue to deliver on our mission to organize the world's information and make it universally accessible and useful.

While we have been integrating AI into our products for years, we are now embedding the power of generative AI to continue helping our users express themselves and get things done. For example, Duet AI in Google Workspace helps users write, organize, visualize, accelerate workflows, and have richer meetings. Bard allows users to collaborate with experimental AI with new features that include image capabilities, coding support, and app integration. Dream Screen, a new experimental feature in YouTube, allows for the creation of AI-generated video or image backgrounds to Shorts by typing an idea into a prompt.

We also know businesses of all sizes around the world rely on Google Ads to find customers and grow their businesses — and we make that even easier with AI. With Performance Max, advertisers simply tell us their campaign goals and share their creative assets, and AI will automatically produce and run a highly effective ad campaign across all of Google's properties, to meet their budget. Product Studio brings the benefits of AI to businesses of all sizes, helping them easily create uniquely-tailored imagery featuring their products — for free. Additionally, we are experimenting with Search and Shopping ads that are directly integrated into the AI-powered snapshot and conversational mode in Search Generative Experience.

Build the Most Helpful Personal Computing Platforms and Devices

Over the years, our Pixel phones have incorporated AI compute directly into the device and built experiences on top of it. Our latest Pixel devices were built around AI, bringing the best AI-assistive experiences to our users, such as Best Take, Magic Editor, and Audio Magic Eraser. As we look ahead, we are designing our Android and Chrome operating systems with new AI-forward user experiences.

Moonshots

Many companies get comfortable doing what they have always done, making only incremental changes. This incrementalism leads to irrelevance over time, especially in technology, where change tends to be revolutionary, not evolutionary. People thought we were crazy when we acquired YouTube and Android and when we launched Chrome, but those efforts have matured into major platforms for digital video and mobile devices and a safer, popular browser. Our early investments in AI started out as moonshots but are now incorporated into our core products and central to future developments. We continue to look toward the future and to invest for the long term, most notably for the application of AI to our products and services, as well as other frontier technologies such as quantum computing. As we said in the original founders' letter, we will not shy away from high-risk, high-reward projects that we believe in, as they are the key to our long-term success.

Privacy and Security

We make it a priority to protect the privacy and security of our products, users, and customers, even if there are near-term financial consequences. We do this by continuously investing in building products that are secure by default; strictly upholding responsible data practices that emphasize privacy by design; and building easy-to-use settings that put people in control. We are continually enhancing these efforts over time, whether by enabling users to auto-delete their data, giving them tools, such as My Ad Center, to control their ad experience, or advancing anti-malware, anti-phishing, and password security features.

Google

For reporting purposes Google comprises two segments: Google Services and Google Cloud.

Google Services

Serving Our Users

We have always been committed to building helpful products that can improve the lives of millions of people worldwide. Our product innovations are what make our services widely used, and our brand one of the most recognized in the world. Google Services' core products and platforms include ads, Android, Chrome, devices, Gmail, Google Drive, Google Maps, Google Photos, Google Play, Search, and YouTube, with broad and growing adoption by users around the world.

Our products and services have come a long way since the company was founded more than 25 years ago. While Google Search started as a way to find web pages, organized into ten blue links, we have driven technical advancements and product innovations that have transformed Google Search into a dynamic, multimodal experience. We first expanded from traditional desktop browsers into mobile web search, making it easier to navigate on smaller screens. As new types of content surfaced on the internet, Universal Search made it possible to search multiple content types, like news, images, videos, and more, to deliver rich, relevant results. The introduction of new search modalities, like voice and visual search, made it easier for people to express their curiosity in natural and intuitive ways. We took that a step further with multisearch, which lets people search with text and images at the same time. Large language models like BERT and Multitask Unified Models, or MUMs, have made it possible to express more natural language queries, vastly improving the quality of results. Each advancement has made it easier and more natural for people to find what they are looking for.

This drive to make information more accessible and helpful has led us over the years to improve the discovery and creation of digital content both on the web and through platforms like Google Play and YouTube. People are consuming many forms of digital content, including watching videos, streaming TV, playing games, listening to music,

reading books, and using apps. Working with content creators and partners, we continue to build new ways for people around the world to create and find great digital content.

Fueling all of these great digital experiences are extraordinary platforms and devices. That is why we continue to invest in platforms like our Android mobile operating system, Chrome browser, and Chrome operating system, as well as growing our family of devices. We see tremendous potential for devices to be helpful and make people's lives easier by combining the best of our AI, software, and hardware. This potential is reflected in our latest generation of devices, such as the new Pixel 8 and Pixel 8 Pro, and the Pixel Watch 2. Creating products and services that people rely on every day is a journey that we are investing in for the long-term.

How We Make Money

We have built world-class advertising technologies for advertisers, agencies, and publishers to power their digital marketing businesses. Our advertising solutions help millions of companies grow their businesses through our wide range of products across devices and formats, and we aim to ensure positive user experiences by serving the right ads at the right time and by building deep partnerships with brands and agencies. AI has been foundational to our advertising business for more than a decade. Products like Performance Max and Product Studio use the full power of our AI to help advertisers find untapped and incremental conversion opportunities.

Google Services generates revenues primarily by delivering both performance and brand advertising that appears on Google Search & other properties, YouTube, and Google Network partners' properties ("Google Network properties"). We continue to invest in both performance and brand advertising and seek to improve the measurability of advertising so advertisers understand the effectiveness of their campaigns.

- **Performance advertising** creates and delivers relevant ads that users will click on leading to direct engagement with advertisers. Performance advertising lets our advertisers connect with users while driving measurable results. Our ads tools allow performance advertisers to create simple text-based ads.
- **Brand advertising** helps enhance users' awareness of and affinity for advertisers' products and services, through videos, text, images, and other interactive ads that run across various devices. We help brand advertisers deliver digital videos and other types of ads to specific audiences for their brand-building marketing campaigns.

We have allocated substantial resources to stopping bad advertising practices and protecting users on the web. We focus on creating the best advertising experiences for our users and advertisers in many ways, including filtering out invalid traffic, removing billions of bad ads from our systems every year, and closely monitoring the sites, apps, and videos where ads appear and blocklisting them when necessary to ensure that ads do not fund bad content.

In addition, Google Services increasingly generates revenues from products and services beyond advertising, including:

- **consumer subscriptions**, which primarily include revenues from YouTube services, such as YouTube TV, YouTube Music and Premium, and NFL Sunday Ticket, as well as Google One;
- **platforms**, which primarily include revenues from Google Play from the sales of apps and in-app purchases; and
- **devices**, which primarily include sales of the Pixel family of devices.

Google Cloud

Through our Google Cloud Platform and Google Workspace offerings, Google Cloud generates revenues primarily from consumption-based fees and subscriptions for infrastructure, platform, collaboration tools and other cloud services. Customers use five key capabilities from Google Cloud.

- **AI-optimized Infrastructure:** provides open, reliable, and scalable compute, networking, and storage to enable customers to run workloads anywhere — on our Cloud, at the edge, or in their data centers. It can be used to migrate and modernize IT systems and to train and serve various types of AI models.
- **Cybersecurity:** helps customers detect, protect, and respond to a broad range of cybersecurity threats, with AI integrated to further strengthen security outcomes, prioritize which threats to investigate, and identify attack paths, as well as accelerate resolution of cybersecurity threats.
- **Databases and Analytics:** provides a variety of different types of databases — relational, key-value, in-memory — to store and manage data for different types of applications. Our Data Cloud also unifies data lakes, data warehouses, data governance, and advanced machine learning into a single platform that can analyze data across any cloud.

- **Collaboration Tools:** Google Workspace and Duet AI in Google Workspace provide easy-to-use, secure communication and collaboration tools, including apps like Gmail, Docs, Drive, Calendar, Meet, and more. These tools enable secure hybrid and remote work, boosting productivity and collaboration. AI has been used in Google Workspace for years to improve grammar, efficiency, security, and more with features like Smart Reply, Smart Compose, and malware and phishing protection in Gmail. Duet AI in Google Workspace helps users write, organize, visualize, accelerate workflows, and have richer meetings.
- **AI Platform and Duet AI for Google Cloud:** Our Vertex AI platform gives developers the ability to train, tune, augment, and deploy applications using generative AI models and services such as Enterprise Search and Conversations. Duet AI for Google Cloud provides pre-packaged AI agents that assist developers to write, test, document, and operate software.

Other Bets

Across Alphabet, we are also using technology to try to solve big problems that affect a wide variety of industries from improving transportation and health technology to exploring solutions to address climate change. Alphabet's investment in the portfolio of Other Bets includes businesses that are at various stages of development, ranging from those in the R&D phase to those that are in the beginning stages of commercialization. Our goal is for them to become thriving, successful businesses. Other Bets operate as independent companies and some of them have their own boards with independent members and outside investors. While these early-stage businesses naturally come with considerable uncertainty, some of them are already generating revenue and making important strides in their industries. Revenues from Other Bets are generated primarily from the sale of healthcare-related services and internet services.

Competition

Our business is characterized by rapid change as well as new and disruptive technologies. We face formidable competition in every aspect of our business, including, among others, from:

- general purpose search engines and information services;
- vertical search engines and e-commerce providers for queries related to travel, jobs, and health, which users may navigate directly to rather than go through Google;
- online advertising platforms and networks;
- other forms of advertising, such as billboards, magazines, newspapers, radio, and television as our advertisers typically advertise in multiple media, both online and offline;
- digital content and application platform providers;
- providers of enterprise cloud services;
- developers and providers of AI products and services;
- companies that design, manufacture, and market consumer hardware products, including businesses that have developed proprietary platforms;
- providers of digital video services;
- social networks, which users may rely on for product or service referrals, rather than seeking information through traditional search engines;
- providers of workspace communication and connectivity products; and
- digital assistant providers.

Competing successfully depends heavily on our ability to develop and distribute innovative products and technologies to the marketplace across our businesses. For example, for advertising, competing successfully depends on attracting and retaining:

- users, for whom other products and services are literally one click away, largely on the basis of the relevance of our advertising, as well as the general usefulness, security, and availability of our products and services;
- advertisers, primarily based on our ability to generate sales leads, and ultimately customers, and to deliver their advertisements in an efficient and effective manner across a variety of distribution channels; and
- content providers, primarily based on the quality of our advertiser base, our ability to help these partners generate revenues from advertising, and the terms of our agreements with them.

For additional information about competition, see Item 1A Risk Factors of this Annual Report on Form 10-K.

Ongoing Commitment to Sustainability

We believe that every business has the opportunity and obligation to protect our planet. Sustainability is one of our core values at Google, and we strive to build sustainability into everything we do. We have been a leader on sustainability and climate change since Google's founding more than 25 years ago.

Our sustainability work is focused on empowering individuals to take action, working together with our partners and customers, and working to reduce our carbon footprint across our operations and supply chain.

In 2020, we shared our aspiration to help individuals, cities, and other partners collectively reduce one gigaton of their carbon equivalent emissions annually by 2030. This is an ambitious vision that we have set to push us to contribute meaningfully to helping with climate solutions beyond our own operations and value chain.

In 2021, we set an ambitious goal to achieve net-zero emissions across all of our operations and value chain, by 2030. To accomplish this, we aim to reduce 50% of our combined Scope 1, Scope 2 (market-based), and Scope 3 absolute emissions (versus our 2019 baseline) before 2030, and plan to invest in nature-based and technology-based carbon removal solutions to neutralize our remaining emissions. We have formally committed to the Science Based Targets initiative to seek their validation of our absolute emissions reduction target.

One of the key levers for reducing emissions from our operations is transitioning to clean energy. Since 2017, we have matched 100% of the electricity consumption of our global operations with purchases of renewable energy on an annual basis. However, because of differences in the availability of renewable energy sources like solar and wind across the regions where we operate—and because of the variable supply of these resources—we still need to rely on carbon-emitting energy sources that power local grids. That is why we set a goal to run on 24/7 carbon-free energy (CFE) on every grid where we operate by 2030.

Achieving net-zero emissions and 24/7 CFE by 2030 are extremely ambitious goals. We also know that our path to net-zero emissions will not be easy or linear. Some of our plans may take years to deliver results, particularly where they involve building new large-scale infrastructure with long lead times. So as our business continues to evolve, we expect our emissions to rise before dropping towards our absolute emissions reduction target.

To benefit the people and places where we operate, we have set goals to replenish 120% of the freshwater volume we consume, on average, across our offices and data centers by 2030 and to help restore and improve the quality of water and health of ecosystems in the communities where we operate.

We also aim to maximize the reuse of finite resources across our operations, products, and supply chains. Our circularity principles focus on designing out waste from the start, keeping materials in use for as long as possible, and promoting healthy materials—for our data centers, workplaces, and products.

More information on our approach to sustainability can be found in our annual sustainability reports, including Google's Environmental Report. The contents of our sustainability reports are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC. For additional information about risks and uncertainties applicable to our commitments to attain certain sustainability goals, see Item 1A Risk Factors of this Annual Report on Form 10-K.

Culture and Workforce

We are a company of curious, talented, and passionate people. We embrace collaboration and creativity, and encourage the iteration of ideas to address complex challenges in technology and society.

Our people are critical for our continued success, so we work hard to create an environment where employees can have fulfilling careers, and be happy, healthy, and productive. We offer industry-leading benefits and programs to take care of the diverse needs of our employees and their families, including opportunities for career growth and development, resources to support their financial health, and access to excellent healthcare choices. Our competitive compensation programs help us to attract and retain top candidates, and we will continue to invest in recruiting talented people to technical and non-technical roles, and rewarding them well. We provide a variety of high quality training and support to managers to build and strengthen their capabilities—ranging from courses for new managers, to learning resources that help them provide feedback and manage performance, to coaching and individual support.

At Alphabet, we are committed to making diversity, equity, and inclusion part of everything we do and to growing a workforce that is representative of the users we serve. More information on Google's approach to diversity can be found in our annual diversity reports, available publicly at [diversity.google](#). The contents of our diversity reports are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC.