Goldman Sachs

GOLDMAN SACHS 2023 SUSTAINABILITY REPORT

Driving Long-Term Value: Our Client-Centric Sustainability Strategy

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1 The appendix was added to this report on June 28, 2024, and no other changes or updates were made to the content of the report.

David Solomon
Chairman and Chief
Executive Officer

Letter From Our Chairman and CEO

We have long been committed to addressing critical environmental issues, beginning in 2005 with our inaugural Environmental Policy Framework where we were one of the first financial institutions to recognize the scale and urgency of the challenges posed by climate change. We have always acknowledged that navigating climate transition would be complex and that as a financial institution, our central focus should remain on how we can deliver sustainability solutions for our clients and grow commercial capabilities to support them.

The challenges facing climate transition are multifaceted: Our economy is heavily dependent upon a well-functioning energy system. Today more than 80% of our global energy needs come from fossil fuels.[1] That coupled with the backdrop of rising energy demand and geopolitical conflicts in Ukraine and the Middle East has underscored the need for affordable and reliable energy. In addition, higher levels of inflation have been headwinds to decarbonization as input costs have increased and supply chains are more complicated to navigate. And the impact of emerging technology remains to be seen, with some sources indicating that electricity consumption from data centers, generative AI, and cryptocurrencies could double by 2026 compared with 2022 levels.[2]

Scrutiny of sustainability commitments, divergence in client preferences, and regulatory approaches to climate change across jurisdictions have also evolved. Our clients include pension plans and retirement funds, large and small businesses, investors, and governments across various sectors and geographies and with a diversity of investment strategies and business models. Regulatory regimes are also evolving across jurisdictions with different scopes and timelines. In 2025, we will be one of the first US banks to file a global firmwide sustainability report under the European Union's Corporate Sustainability Reporting Directive. This new requirement is expansive in scope, covering not only our financial exposure but also our environmental and social impact, and we are investing in our data management, measurement, and reporting capabilities to prepare for this shift in the regulatory landscape.

Despite all of these external forces and evolutions, central to our focus on the effects from climate change as well as decarbonization has always been our commercial capabilities and the insights that we can provide to our clients to help them invest in opportunities and manage risk. I also want to be clear about our role in supporting our clients in this area:

First, we will continue to finance and advise our clients in the energy sector, and we will also invest in innovative decarbonization technologies that can accelerate the transition. We need to do both. It's not an *or*, it's an *and*.

Second, we recognize that there is a gap between global climate ambition and the reality of where our energy system is today, and this gap will not be closed just by private sector voluntary commitments. Government has always and will continue to play a critical role in setting policy, providing incentives, easing implementation challenges, and balancing energy security and economic growth objectives with long-term climate ambition. There is no question that policy has a big impact on our clients' decarbonization goals and our ability to support them.

Lastly, the most meaningful role we can play in climate transition is developing the solutions our clients need to deliver on their decarbonization goals for their businesses. Over time, we have developed independent aspirational goals and commitments to measure our progress, evolve our practices, and provide transparency to our clients

1 Energy Institute: ***72nd Edition of the Energy Institute (EI) Review of World Energy***, 2023.
2 International Energy Agency: ***Electricity 2024: Analysis and forecast to 2026***, January 2024.

“We will continue to finance and advise our clients in the energy sector, and we will also invest in innovative decarbonization technologies that can accelerate the transition. We need to do both.”

and key stakeholders. This includes a long-term net zero financing commitment and three related interim goals where we see opportunities to support our clients’ decarbonization strategies in the Energy, Power, and Auto Manufacturing sectors. In addition, we set a $750 billion sustainable finance target by 2030, and we are approximately 75% of the way there after just four years. We are committed to continuing to invest in our capabilities so we can expand the range of sustainable finance solutions we can provide, and later this year, we plan to provide an update on our net zero sectoral targets.

Beyond our business, we continue to build partnerships globally to address market gaps. In 2023, we completed allocating $25 million in philanthropic capital to the Climate Innovation and Development Fund, a blended-finance facility we created with Bloomberg Philanthropies and the Asian Development Bank. Launched in 2021, the fund has catalyzed approximately $500 million in private and public capital to support seven climate solution projects in South and Southeast Asia.

In the US, our partnerships continue to promote sustainable economic growth through entrepreneurship. In 2023, we expanded our work supporting small businesses with the launch of *10,000 Small Businesses Investment in Rural Communities*, our $100 million commitment to bring our flagship business education program to 20 rural states over the next five years. We also have extended our *One Million Black Women: Black in Business* program, an education initiative to help Black women solopreneurs grow their businesses. More than 600 Black women from 40 states have participated so far.

There’s plenty of work ahead, and we’re ready for the challenge. By supporting our clients and working with our partners, we will continue to execute our sustainability strategy and create long-term value for our shareholders.

David Solomon
Chairman and Chief Executive Officer

SECTION 02

Introduction

At Goldman Sachs, we aspire to be the world's most exceptional financial institution, united by our shared values of partnership, client service, integrity, and excellence.

These core shared values have guided us over the years and have helped us develop our client-centric sustainability strategy, focused on helping our clients achieve their objectives. In this section, we provide an overview of Goldman Sachs, our sustainable finance strategy and our sustainability-dedicated client-facing teams and capabilities we bring to clients, and progress toward our $750 billion sustainable finance target.

In This Section

6 About Goldman Sachs

7 Historical Sustainability Milestones at Goldman Sachs

9 Our Sustainable Finance Strategy

14 Our Sustainable Finance Framework and Sustainable Finance Commitment

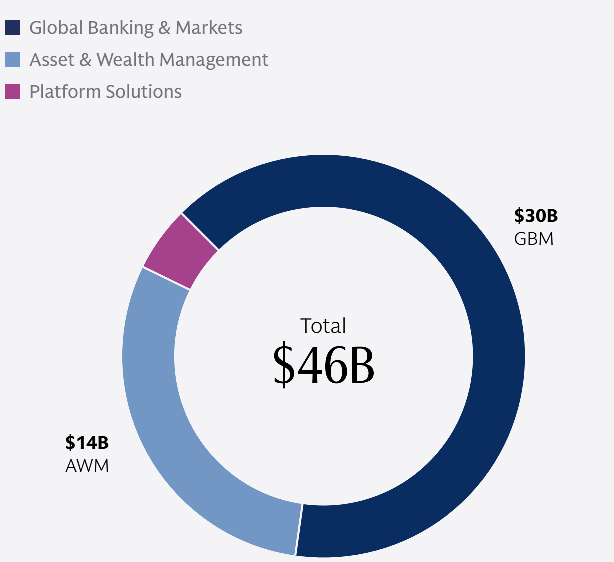
About Goldman Sachs

Goldman Sachs is a leading global financial institution that delivers a broad range of financial services to a large and diversified client base that includes corporations, financial institutions, governments, and individuals. We operate two primary businesses: Global Banking & Markets and Asset & Wealth Management.

Global Banking & Markets (GBM) provides financing, advisory services, risk distribution, and hedging for our institutional and corporate clients. GBM includes our Investment Banking, Fixed Income, Currency and Commodities (FICC), and Equities activities.

Asset & Wealth Management (AWM) provides investment services to help clients preserve and grow financial assets and achieve their financial goals. We manage assets across a broad range of investment strategies and asset classes, including equity, fixed income, and private markets. Goldman Sachs Alternatives activities, which are typically longer-term, include investments in private equity, private credit, real estate, and infrastructure assets. Within Private Wealth Management (PWM), we provide tailored wealth advisory services to clients.

2023 Financial Performance[1]
(Net Revenue, USD millions)



We aspire to be the world's most exceptional financial institution, united by our shared values of partnership, client service, integrity, and excellence.

1 Goldman Sachs: *2023 Goldman Sachs 10-K*.

Historical Sustainability Milestones at Goldman Sachs

Building on decades of experience from our commercial approach to sustainability, we anticipate the rapidly changing needs of our clients to develop and deliver new sustainable finance services and solutions that help them deliver on their most important sustainability priorities.

Our Long-Standing Commitment to Sustainability

We have been helping our clients and partners achieve their sustainability objectives for more than two decades, beginning with the launch of our Urban Investment Group in 2001 and our partnership with the Wildlife Conservation Society to form Karukinka Natural Park in 2004. In 2005, we became one of the first US banks to develop an Environmental Policy Framework. Over time, we have grown our sustainability-related expertise within our business segments and scaled our suite of sustainable finance capabilities and solutions to meet the growing demand from our clients.

2001
Launched Urban Investment Group, committing ~$19 billion to date

2004
Announced partnership with Wildlife Conservation Society to form Karukinka Natural Park to preserve in perpetuity more than 735,000 acres of land in Tierra del Fuego at the southern tip of South America

2005
One of the first US banks to develop an Environmental Policy Framework

2007
Launched GS SUSTAIN, which provides research and data tools to clients exploring how innovation, regulation, and implementation of environmental, social, and governance-related topics will impact sustainable investing and broader capital flows

2008
Launched *10,000 Women*, reaching over 200,000 women across 150 countries since inception

2009
Launched *10,000 Small Businesses*, serving over 17,000 entrepreneurs to date, representing more than 330,000 employees and $33 billion in total revenue

2012
Inaugural clean energy financing and investment target set

2014
10,000 Women and International Finance Corporation launched the Women Entrepreneurs Opportunity Facility, reaching more than 200,000 women entrepreneurs and unlocking ~$7.5 billion in loans to women-owned businesses since inception

2015
Reached carbon neutrality across operations and business travel

Acquired Imprint Capital Advisors

2019
Established the Sustainable Finance Group

Announced $750 billion Sustainable Finance Commitment by 2030

Launched *Carbonomics*, our flagship research series on the economics of decarbonization

2020
Created AWM's Sustainable Investing Group and GBM's Commodities Sustainable Solutions

2021
Launched *One Million Black Women* in partnership with Black women–led organizations to invest $10 billion in investment capital and $100 million in philanthropic capital to impact the lives of at least one million Black women and girls by 2030

Committed to aligning our financing activities with a net zero by 2050 pathway and expanded our operational commitment to target net zero for our supply chain

Issued $800 million inaugural Goldman Sachs benchmark Sustainability Bond

Announced Goldman Sachs Bloomberg Climate Finance Partnership, including the Climate Innovation and Development Fund alongside the Asian Development Bank

Launched Carbon Portfolio Analytics for clients in Marquee

Became founding US bank member of open source data non-profit OS-Climate

Launched ESG Beacon to source, model, and deliver sustainability data to our businesses

2022
Created GBM's Sustainable Banking Group

Acquired NN Investment Partners to benefit from combining its sustainability-related expertise and capabilities with ours

2023
Unlocked ~$500 million of blended private and public sector finance through the Climate Innovation and Development Fund

Raised ~$2.6 billion for climate transition–related Horizon strategies

Expanded Marquee's portfolio offering to allow clients to assess their portfolios' climate transition

Launched *10,000 Small Businesses Investment in Rural Communities* to expand business education and capital access programs to 20 rural US states over the next five years

Goldman Sachs Asset Management (GSAM) named Top 3 Sustainable Alternatives Manager by PEI Media

All to date figures are as of December 31, 2023, unless otherwise specified.

Recent Sustainability Milestones

We have achieved meaningful milestones across a number of key initiatives:[1]

Firmwide Sustainable Finance Milestone

~$555B
sustainable finance activity since 2019

~$2.5B
of Goldman Sachs sustainability issuances[2] since 2021

~$9.4B
private markets impact capital, ranking Goldman Sachs as the world's third-largest private markets impact manager[3]

Climate Transition

~$2.6B
raised for climate transition–related Horizon strategies[4]

~$77B
notional value of primary market climate-related debt issuance[5] in which Goldman Sachs participated

~$500M
private and public sector capital unlocked by Climate Innovation and Development Fund, including for some first-of-their-kind projects and solutions in areas of Vietnam and India

Inclusive Growth

+$19B
deployed since launch of the Urban Investment Group in real estate projects, social enterprises, and lending facilities for small businesses

+$2.3B
investment capital and $33 million in philanthropic capital committed since launch of *One Million Black Women*, building the foundation to impact the lives of over 200,000 Black women and girls

+$750M
committed to *10,000 Small Businesses* with a recent $100 million expansion of *10,000 Small Businesses Investment in Rural Communities*, expanding business education and capital access programs to 20 rural US states over the next five years

+$3B
philanthropic giving worldwide, benefiting over 10,800 non-profits in 140 countries

1 As of December 31, 2023, unless otherwise specified.
2 Represents gross issuance size.
3 AUM based on private impact capital raised over past five years through March 2023 by Goldman Sachs Alternatives, the Urban Investing Group, and External Investing Group (XIG). Impact capital is defined by GIIN's definition of impact, namely: Impact investments are investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return in private markets. PEI Media ranks Goldman Sachs as the world's third-largest manager of private markets impact capital in the latest New Private Markets impact 50. Paywalled, source: New Private Markets: ***Impact 50: The scale-up of impact continues***, June 2023.
4 Includes all capital closed as of 12/31/2023.
5 Total notional value of issuances on which Goldman Sachs had a role. Climate-related debt includes Green, Sustainability and Transition bonds as well as Sustainability-linked bonds per Bloomberg from 01/01/23 to 01/01/24.

Our Sustainable Finance Strategy

As a leading global financial institution with sustainability expertise across our organization, we are supporting $750 billion in sustainable investing, financing, and advisory activities by 2030, leveraging our commercial capabilities and solutions to help our clients achieve their sustainability goals.

Introduction to Our Sustainable Finance Strategy

As an investment bank, asset manager, corporate issuer, and risk manager, Goldman Sachs is uniquely positioned to help our clients achieve their sustainability objectives — from companies, institutional investors, and governments to individuals — each with their own distinct set of sustainability priorities. The three levers of our client-focused sustainable finance strategy help us drive long-term value for our shareholders.

1 Working With Clients

2 Managing Our Firm

3 Addressing Market Gaps

Working With Clients

Our sustainability strategy is centered on how we help our clients achieve their sustainability objectives. We have developed and continue to refine our firmwide *One Goldman Sachs* commercial model that leverages the full depth and breadth of our franchise, with the goal of bringing the best of Goldman Sachs and our sustainable finance capabilities to our clients.

Managing Our Firm

We provide our people with the tools, resources, and support they need to enhance the value of our firm by serving our clients. We also leverage these capabilities to protect value through managing our own global footprint. By tending to our operations and supply chain, we strive to lead through action to advance sustainable business outcomes over the long term. We also aim to actively manage climate and other environmental and social-related risks, while preparing for upcoming sustainability-related regulation.

Addressing Market Gaps

When we and our clients identify gaps in the marketplace, we seek to address them by leveraging our existing capabilities and those of our strategic partners. Our external partnerships and strategic philanthropy support our work to develop innovative solutions to help our clients. The lessons we learn further inform the development and execution of our sustainable finance capabilities and the solutions we bring to our clients and to markets.

As an example, we see policy shifts that are beginning to incentivize investment in critical minerals and battery production at scale, and we have identified opportunities in the marketplace to bring together the public and private sectors to support initiatives including blended finance; we work closely with our clients and strategic partners to help address these gaps.

Working With Clients

We continue to integrate sustainability-related expertise into our primary businesses and across the firm. Our growing suite of sustainable finance services and solutions, delivered through our *One Goldman Sachs* commercial model, allows us to bring clients the best of Goldman Sachs to help them achieve their sustainability goals.

Global Banking & Markets

Sustainability Advisory: Advisory, M&A, IPO, Activism, and Decarbonization strategies

Transition Capital and Financing With Sustainable-Themed Products: Early-stage growth equity, financing for legacy asset conversion, project financing for green CapEx initiatives, tax equity, sustainable urban development, and sustainable-themed products such as structured notes, custom baskets, and portfolio transition trades

ESG Financing and Investor Connectivity: Traditional and innovative debt and equity financing products, ESG investor connectivity

Sponsor/Client Coverage and Analytics: Coverage resources for ESG content and support for ESG-oriented investors and emerging energy transition companies, and bespoke investor analytics, including carbon, climate transition, and ESG portfolio analytics

Environmental and Raw Material Markets: Renewable energy and renewable energy certificates supply, procurement, and risk management, principal financing across environmental product and carbon markets, trading and risk management in raw material markets relevant to climate transition, e.g., battery metals

Asset & Wealth Management

Sustainability Advisory: Client advisory in developing organizational approach and portfolio, asset class, and thematic investing strategies

Research, Data, and Analytics: Analyses and tools to help clients analyze their portfolios, and climate intelligence to support investment decision-making

Client Products and Solutions: A growing range of products and custom capabilities for clients that include:

- Incorporation of climate and inclusive growth considerations across certain funds, as well as products dedicated to those themes
- Development of dedicated internally managed, comingled, and custom options spanning both public and private markets
- Extensive range of external/open architecture public and private investment options through Imprint

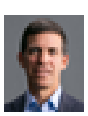
Ongoing Engagement: Dedicated transition-focused resources for portfolio companies (e.g., Value Accelerator), public company engagement on policy and disclosure, timetable of expectations for emissions disclosure and targets for relevant verticals, and portfolio companies GHG[1] measurement support program

One Goldman Sachs

Global Investment Research

GS SUSTAIN: Research and data tools to help clients explore how innovation, regulation, and implementation of sustainability topics will impact sustainable investing and broader capital flows

Carbonomics: Flagship series dedicated to examining the economics of decarbonization and sustainable growth, providing in-depth analysis of costs, incentives, and financing options for key technologies underpinning the paths to net zero carbon



"Our firm serves a wide range of clients, each with its own distinct set of preferences and objectives. Our *One Goldman Sachs* operating ethos helps us deliver the best of our firm's sustainable finance expertise, insights, and capabilities to our clients to help them advance their strategic priorities."

John Waldron | President and COO

1 Greenhouse gases (GHG) are defined as gases that trap heat in the atmosphere, and include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. Each gas, when combusted, has a different warming impact on the atmosphere, otherwise known as Global Warming Potential (GWP). In our metrics, we use CO_2 equivalents (CO_2e) to capture the contributions of all GHGs in our physical emissions intensities.

Working With Clients (continued)

Our primary businesses deliver our firm's sustainable finance strategy to clients. Below are sustainability-dedicated client-facing groups that are leading the delivery of our sustainable finance capabilities to clients from all sectors of the real economy across both public and private markets.

Global Banking & Markets

Our Global Banking & Markets franchise provides sustainability-related financing, advisory services, and risk management. Within GBM, there are several key groups that contribute to our sustainable finance initiatives.

The Sustainable Banking Group (SBG) specializes in delivering bespoke analytics, advice, commercialization, and capital solutions for clients focused on energy transition, on advancing their decarbonization goals and sustainability profiles, the circular economy, and on nature. These capabilities include traditional debt and equity finance, blended finance, structured finance, and M&A advisory. **The Commodities Sustainable Solutions** team helps drive our climate objectives across commodities markets by providing principal financing and trading solutions in areas such as clean power and carbon markets as they work with our clients to help them achieve their net zero climate transition objectives.

Asset & Wealth Management

Our Asset & Wealth Management business provides clients breadth via sustainability-related capabilities, across public and private markets, proprietary and third-party products, portfolio strategy and implementation, and depth, including specialist sustainability teams and strategies.

AM Sustainable Client Solutions is a dedicated sales and distribution team within AWM that mobilizes the full range of insights, advisory services, and investment solutions for our clients. **Public Markets Investing** has certain investment teams and capabilities as well as support roles that may focus on climate transition and inclusive growth, from research and data to investment teams and stewardship. Within Public Markets, the Sustainable Investing and Innovation Platform acts as a central resource for Sustainable Investing (SI) and provides enhanced SI-tooling, data, and research capabilities. **Goldman Sachs Alternatives**[1] also has teams specializing in sustainable investing. Sustainability integration is led by the Sustainability & Impact team, which specializes in operationalizing and scaling sustainability capabilities across the investing sleeves. The Sustainable Investing Group specializes in investing across the climate transition and inclusive growth thematics, partnering with clients through a series of Goldman Sachs Horizon strategies.

Enhancing Our Sustainability-Related Commercial Solutions for Clients

We continue to leverage complementary strengths of our existing investing teams to launch new sustainability-related strategies in line with many of our clients' preferences. For example, in March 2023, we launched a Global Impact Corporate Bond strategy and a USD Green Bond strategy managed by a dedicated Green, Social, and Impact bonds team that joined the firm through our acquisition of NN IP in 2022. Further expanding on our combined strengths, we recently launched a Global Green Bond strategy that leverages our acquired expertise in green bond investing within a passive investment approach.

1 Previously known as *Private Markets Investing* in prior reporting.

Working With Clients (continued)

Asset & Wealth Management (continued)

Our **External Investing Group** (XIG) is responsible for identifying, researching, and selecting leading third-party investment managers. Imprint is a dedicated team within XIG focused on thematic research, manager selection, and co-investments across sustainable growth themes. Within our **Private Wealth Management** (PWM) business, the Sustainable Solutions Group (SSG) advises clients on developing their sustainable investing strategy and works closely with firmwide resources to drive innovation and product offerings to help meet our clients' sustainable and impact investing goals.

Global Investment Research

Our Global Investment Research (GIR) team is instrumental in informing and educating our clients and investors about sustainability. Within GIR, two key research initiatives, GS SUSTAIN and *Carbonomics*, provide invaluable insights to inform sustainable investment decisions.

GS SUSTAIN, established in 2007, provides research and data tools to clients exploring how innovation, regulation, and implementation of sustainability topics will impact sustainable investing and broader capital flows. ***Carbonomics***, launched in 2019, is GIR's flagship series dedicated to examining the economics of decarbonization and sustainable growth, providing in-depth analysis of costs, incentives, and financing options for key technologies underpinning the paths to net zero carbon emissions.

Managing Our Firm and Addressing Market Gaps

In 2019, the Executive Office (EO) launched the Sustainable Finance Group (SFG) to formalize and drive the firm's sustainability strategy and related efforts across Goldman Sachs.

In partnership with other EO teams including Office of Government & Regulatory Affairs, Investor Relations, Corporate Communications, and others, SFG advances the firm's integrated commercial approach to sustainability through central coordination of our firm's regulatory preparedness, targets and commitments, reporting, strategic partnerships, environmental and social risk policies, and our cross-segment commercial delivery strategy.

Other internal functional groups supporting the firm's sustainability strategy include Controllers, Risk, Sustainable Operations and ESG Beacon, among others. Please see the ***Protecting the Value of Our Firm*** section for more information on these groups.

Our Sustainable Finance Framework and Sustainable Finance Commitment

In 2019, we launched our Sustainable Finance Framework and announced our firmwide 10-year, $750 billion sustainable finance commitment to support client demand for sustainable finance solutions across our financing, investing, and advisory work with clients.

Our Sustainable Finance Framework

Designed to support our sustainable finance strategy, our Sustainable Finance Framework is organized around two sustainability themes we expect to facilitate the greatest impact through our commercial work with clients and strategic partners — Climate Transition and Inclusive Growth. The five sub-themes within Climate Transition and four sub-themes within Inclusive Growth help us prioritize how we continue to develop and refine our sustainable finance capabilities to meet both current and future client demand.

Our Sustainable Finance Framework

Climate Transition

Clean Energy
Enable renewable energy generation, energy efficiency, and grid services.

Sustainable Transport
Shift modes of transit through electric vehicles, connected services, autonomous driving, and public transportation development.

Sustainable Food and Agriculture
Enable green agricultural production, storage, processing, and distribution to feed the world.

Waste and Materials
Promote sustainable production and consumption, along with responsible waste management.

Ecosystem Services
Contribute to the sustainable management of natural resources and monetize the value of forests, water, and biodiversity.

Inclusive Growth

Accessible and Innovative Healthcare
Enable the use of digital technology, advanced devices, and diagnostics for better outcomes.

Financial Inclusion
Advance financial inclusion for all, including underserved populations, by promoting access to capital, financial technology, and products that increase access, support financial health, and drive more equitable economic growth.

Accessible and Affordable Education
Enable greater access to education, improve learning outcomes, and help close opportunity gaps for learners of all ages.

Communities
Enable infrastructure development, affordable housing, and livelihood advancement.

Facilitating Our Clients' Priorities Through Our $750B Sustainable Finance Commitment

Since setting our 10-year goal, we've achieved approximately $555 billion in commercial activity, including $302 billion in Climate Transition, $74 billion in Inclusive Growth, and the remainder in multiple themes.[1] This progress demonstrates our ability to capture client demand by directing capital toward solutions that help our clients achieve their sustainability objectives. For more information on contribution by business segment and sub-theme, please see the ***Metrics and Targets*** section.

Progress Toward 2030 Target

Notable Transactions

Redwood Materials

Theme: Climate Transition
Business Segment: AWM

Goldman Sachs Alternatives co-led the $1 billion Series D funding round to support Redwood Materials, a leading lithium-ion battery materials manufacturer, in its effort to develop and localize the US' battery supply chain for electric vehicles and energy storage.

Amara NZero

Theme: Climate Transition
Business Segment: GBM

Goldman Sachs acted as Joint Global Coordinator and Joint Physical Bookrunner on Amara NZero's €270 million Green Senior Secured Notes. Amara is a global leading distributor of products and services used in the energy transition, directly contributing to worldwide decarbonization efforts. This was one of the first high-yield green bonds with proceeds used for acquisition financing, aligned with the ICMA Green Bond Principles. Amara published a Green Bond Framework with a Second Party Opinion.

Grow Therapy

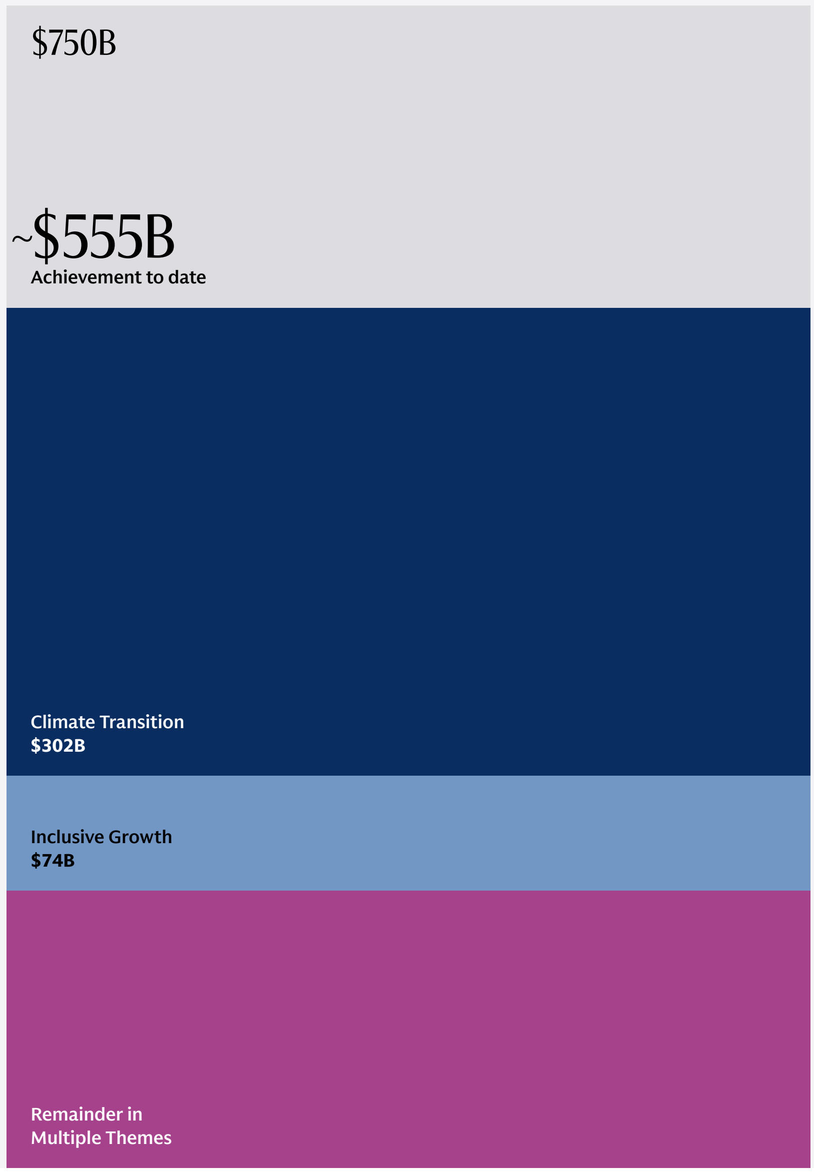
Theme: Inclusive Growth
Business Segment: AWM

Goldman Sachs Alternatives invested in Grow Therapy, a leading behavioral health provider enablement platform striving to create a more accessible healthcare industry by allowing mental health professionals to find patients, conduct virtual or in-person visits, and bill and collect payments.

The Ohio State University

Theme: Inclusive Growth
Business Segment: GBM

Goldman Sachs' Higher Education team served as lead Dealer Manager for The Ohio State University on an innovative liability management transaction targeting $600 million of outstanding debt. The transaction was part of a larger bond financing that raised $300 million of proceeds for a new in-patient hospital facility at The Ohio State University Wexner Medical Center.



→ In the next section of this report, we share how we are helping our clients capture opportunities and address market gaps to help them achieve their sustainability goals.[2]

1 Includes activity relating to both Climate Transition and Inclusive Growth.
2 Case study examples in the ***Thematic Opportunities With Our Clients and Partners*** section are for illustrative purposes only and in limited instances do not fall within scope of Goldman Sachs' $750 billion Sustainable Finance Commitment.

SECTION 03

Thematic Opportunities With Our Clients and Partners

Our clients continue to seek markets expertise, access to capital, and innovative sustainable finance solutions to support their decarbonization and sustainable growth strategies. Through our recent work with clients in all sectors of the real economy across public and private markets, we share six thematic opportunities in today's marketplace.

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24 Mobilizing Transition Finance Through Public-Private Partnerships

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40 Scaling Technology Solutions to Support the Energy Transition

46 Enabling the New Transportation Sector Value Chain

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Leveraging Data and Metrics for Better Decision-Making

In This Chapter

19 Our Centralized Sustainability Data Hub

20 Leveraging Data to Support a Range of Investors

23 Exploring GenAI to Support Our Clients and Our Reporting

At Goldman Sachs, data informs our decision-making, from how we manage our firm to how we help our clients deliver on their sustainability ambitions. As an investment bank, asset manager, corporate issuer, and risk manager, we seek to use measurement approaches and analytical tools to improve our identification and management of risks and opportunities. Not only is data a fundamental component of regulatory preparedness, it also enables our tracking and reporting on progress toward our existing targets and commitments and bringing differentiated insights to our clients.

Today's sustainability data landscape is complex and developing. Reliability of this data remains a key challenge for many companies and investors to execute their sustainability strategies. While the data landscape continues to evolve, significant challenges remain, particularly the availability, consistency, and comparability of decision-useful data.

The proliferation of fragmented sustainability disclosure requirements across jurisdictions creates further complexity as well as the potential for higher compliance costs, driven by new operational processes, reporting, and related controls associated with this data. As we continue our effort to comply with existing and forthcoming regional sustainability reporting requirements focused on financial materiality, e.g., United Kingdom Financial Conduct Authority's Taskforce on Climate-Related Financial Disclosures, we also are preparing for the European Union's Corporate Sustainability Reporting Directive (CSRD) that mandates the European Sustainability Reporting Standards (ESRS), which requires both financial and impact-related disclosures.

As we assess the data landscape in preparation for our mandatory firmwide sustainability reporting in 2025, we continue our work with today's data to develop both commercial and risk management tools and solutions to help our clients and firm improve decision-making capabilities.

Our Centralized Sustainability Data Hub

We strive to provide our clients and businesses with the most accurate and decision-useful data available, leveraging our in-house proprietary solutions and external resources. We provide our clients with tools to help them consistently and effectively evaluate their climate performance and progress, identify opportunities, and allocate capital to meet their objectives.

Overview of Our Sustainability Data Journey

Goldman Sachs has a long history of data engineering; for example, our Securities Database platform was launched in 1993 to blend quantitative finance, engineering, and technology. In 2013, Goldman Sachs started to make this available to institutional clients via Marquee, our digital platform for institutional and corporate clients. Our platforms continue to evolve with the development of open source, cloud native, and AI innovation, but our core tenants remain — collecting the highest-quality data and fostering the innovation of best metrics to help build trust.

Continuing our pursuit of innovative tools and solutions, we launched ESG Beacon in 2021, creating a centralized sustainability data hub. A partnership between SFG and our engineering teams, this data hub continues to develop solutions to improve decision-making, and manage risk and regulatory change, while delivering unique insights to our businesses and clients.[1]

ESG Beacon: Enabling Firmwide Data Integration and Connectivity

ESG Beacon builds on the firmwide data platform, known as Legend, ensuring integration and connectivity to other firmwide data. ESG Beacon provides a dedicated team to source, model, and deliver sustainability data, acting as a utility to businesses across the firm.

ESG Beacon's approach is to design and curate "*data models*" — clear names and definitions of the data elements and rules of how they link together across topics. Supporting strong data governance, it provides tools to help users translate between different models, track lineage back to authoritative sources, and compare multiple primary sources — ultimately forming a common data language to enable data integrity and connectivity to support our businesses and clients.

Since its launch, ESG Beacon has enabled more effective and efficient sharing and validation of underlying corporate emissions and investments data to evaluate climate-related risks and opportunities, monitor progress on public sustainability commitments, and prepare for the evolving sustainability reporting landscape.

1 Subject to firm policies, procedures, and controls.

Leveraging Data to Support a Range of Investors

We have clients across all sectors, including hard-to-abate sectors. As a result, measuring carbon emissions is an important tool for managing and monitoring climate risk. By establishing a baseline footprint, or estimate of the emissions associated with an entity's activities, investors and managers can make more informed decisions about their strategic plans and set realistic goals for reductions. Within our AWM business, we support private portfolio companies as they seek to measure and manage their carbon footprint.

CASE STUDY

Supporting Carbon Footprint Measurement for Goldman Sachs Alternatives Portfolio Companies

In 2023, we began emissions inventorying our Goldman Sachs Alternatives portfolio at scale, developing a program and tools to help portfolio companies begin calculating their carbon footprint, from measurement through the first steps of decarbonization. Through a negotiated agreement with a GHG Accounting service provider, Goldman Sachs Alternatives offers to work with participating portfolio companies to conduct activity-based emissions accounting across Scope 1 and 2 emissions as well as to estimate Scope 3 emissions. Our offering includes an inventory planning exercise co-developed by Goldman Sachs Alternatives that was completed in 2023, alongside recommendations on data improvements that can enhance the quality and usability of their GHG footprints. Based on footprint results, our provider also shares bespoke, high-level decarbonization recommendations with portfolio companies, allowing them to consider the best next steps to decarbonize their businesses. Companies can also choose to engage with the provider on net zero planning, upstream Scope 3 analysis, and decarbonization planning through enhanced SaaS offerings.

In 2023, 29 companies participated in this program, and our work allowed us to help accelerate pilots to bring activity-based emissions information from diligence into a detailed decarbonization analysis and planning exercise. Their data was also used in fund-level decarbonization opportunity assessment and planning exercises to enhance our efforts and impact. We continue to expand coverage across our portfolio and identify learnings from our work to date, including strategies to help improve portfolio company data quality, enhance data validation and controls, and provide more actionable information to companies and asset managers.

Leveraging Data to Support a Range of Investors (continued)

Our clients rely on a wide range of data to support their sustainable investing decisions, from asset allocation to investment selection and impact measurement. As sustainability investing matures and becomes more data-driven, there is rising focus to quantify impact — whether environmental or social.[1] Impact metrics such as avoided emissions can support sectors that play a critical role in emissions outside of traditional pure play green sectors.[2]

Marquee MarketView allows institutional clients to gain visual insights from the data tools provided by GS SUSTAIN.

To capture this client demand, PWM utilizes its bespoke ESG Portfolio Diagnostic tool, which provides metrics to improve transparency on environmental and social issues in public market portfolios for clients. In GBM, we have expanded our Marquee offering to include Marquee MarketView, an innovative visual analytics dashboarding solution designed to streamline our institutional clients' investment processes. Providing an ecosystem of visual insights developed by Goldman Sachs thought leaders, the tool helps answer important questions in global markets — all through a single, unified platform. GIR's GS SUSTAIN suite of sustainability metrics can be visualized in Marquee MarketView. In addition, Marquee's portfolio analytics help clients analyze their portfolios' climate performance using metrics from GS SUSTAIN's Climate Transition Tool.

CASE STUDY

Enhancing the GS SUSTAIN Climate Transition Tool

To meet our clients' needs to better understand transition risks and opportunities, GIR's GS SUSTAIN in 2022 developed the Climate Transition Tool, which combines existing climate-related disclosures with GS SUSTAIN proprietary Climate Transition metrics, where applicable, to quantify the transparency of a company's climate transition plan and its decarbonization performance. In Q4 2023, Marquee incorporated GS SUSTAIN's Climate Transition Tool metrics, allowing GBM clients to analyze their portfolios' climate performance. The Climate Transition Tool utilizes 20+ metrics and covers more than 7,000 public companies across 50+ sectors, including 3,200+ in the Americas, 2,600+ in APAC, and 1,200+ in EMEA. The Climate Transition Tool provides a view on companies' climate transition efforts through the lens of two distinct frameworks with associated scores:

The **Transition Plan Transparency** framework is an absolute assessment of companies' disclosures across metrics that demonstrate whether a company has a transition strategy in place (e.g., targets) and how integrated the strategy is with the broader business strategy (e.g., Task Force on Climate-Related Financial Disclosures support, assurance of disclosures).

The **Transition Performance** framework is a sector-relative assessment, factoring in changes in the carbon emissions profile of a company and green business mix exposures (e.g., green revenue and green CapEx), incorporating GIR research analysts' forward-looking estimates where applicable.

"Investors are looking to understand technologies and companies throughout the supply chain that are catalysts for returns-enhancing innovation and sustainable improvement, driving our research and analytics to be more forward-looking and focused on critical metrics underlying opportunity, risk, and performance."

Brian Singer | Global Head of GS SUSTAIN, Global Investment Research

1 GIR: ***GS SUSTAIN: Accelerating the Energy Transition: Metrics and Tools to measure progress***, November 2022.
2 GIR: ***GS SUSTAIN: Avoided Emissions: How quantifying Avoided Emissions can broaden the decarbonization investment universe***, July 2023.

Leveraging Data to Support a Range of Investors (continued)

To support our clients in managing risks and capturing opportunities for certain strategies, we have developed our own internal sustainability assessment methodology to quantify key sustainability metrics to enable comparability across public markets investments, as described below on the left. Separately, investors need high-quality, interoperable data to support their investment processes. As we expect data quality to improve over time, investors need to invest capital today. Open source data can help address this gap, and we share how we are supporting open source climate tools with the Linux Foundation below on the right.

CASE STUDY

Internally Developed Sustainability Measurement Toolkit for Our Public Markets Investing Teams

In April 2024, Asset Management Public Markets Investing rolled out an internal sustainability measurement toolkit for its teams that seek to integrate ESG factors or considerations in their investment process. The toolkit aims to enhance existing internally developed scorecards and tooling by incorporating data and promoting collaboration among our Public Markets Investing teams[1] on sustainability issues. The development process focused on identifying financially material ESG issues for public companies. Based on this principle, as well as on existing AWM frameworks and industry standards, Public Markets Investing built this toolkit predicated on 14 key issue areas rolling up to six themes and three sub-scores (E, S, and G). Recognizing that ESG considerations vary by industry, an internal proprietary materiality map was created to determine the relevant ESG issues for each industry based on input from the investment teams. The materiality map seeks to rank the importance of each issue. The issue assessments are designed to quantify each of the 14 ESG issues for each company in the universe. These quantitative results are then aggregated with the materiality map into one quantitative ESG measure. Finally, where applicable, public equity and credit analysts may use the toolkit to inform their overall view, including their ESG rating.

CASE STUDY

Supporting Open Source Climate Tools With the Linux Foundation

Goldman Sachs supports open source tools and analytics that our clients and others can use to advance solutions to data challenges through our participation in various industry groups. For example, Open Source Climate (OS-Climate) — an umbrella project of the Linux Foundation using open source best practices — was launched with the aim of building a non-profit, transparently governed public utility of climate-related data and analytics to rapidly scale investment in the climate transition. Since becoming OS-Climate's founding US bank member in 2021, we have supported the non-profit's work to develop an open source data platform and net zero alignment tools that can be used across industries. Through our membership in the Fintech Open Source Foundation (FINOS) — a fellow project of the Linux Foundation — Goldman Sachs has contributed to the open source design of sustainability reporting tools to help increase data transparency, accuracy, and efficiency, and support higher levels of audit assurance. In November 2023, Goldman Sachs hosted a daylong Hackathon, where more than 60 professionals from more than 15 firms, including non-profits, data-vendors, financial services, lineage-platforms, consultants, and auditors, participated. We joined in testing climate data's journey from collection to aggregation to digital reporting, and plan to continue contributing to open source solutions that help address some of today's common data challenges.

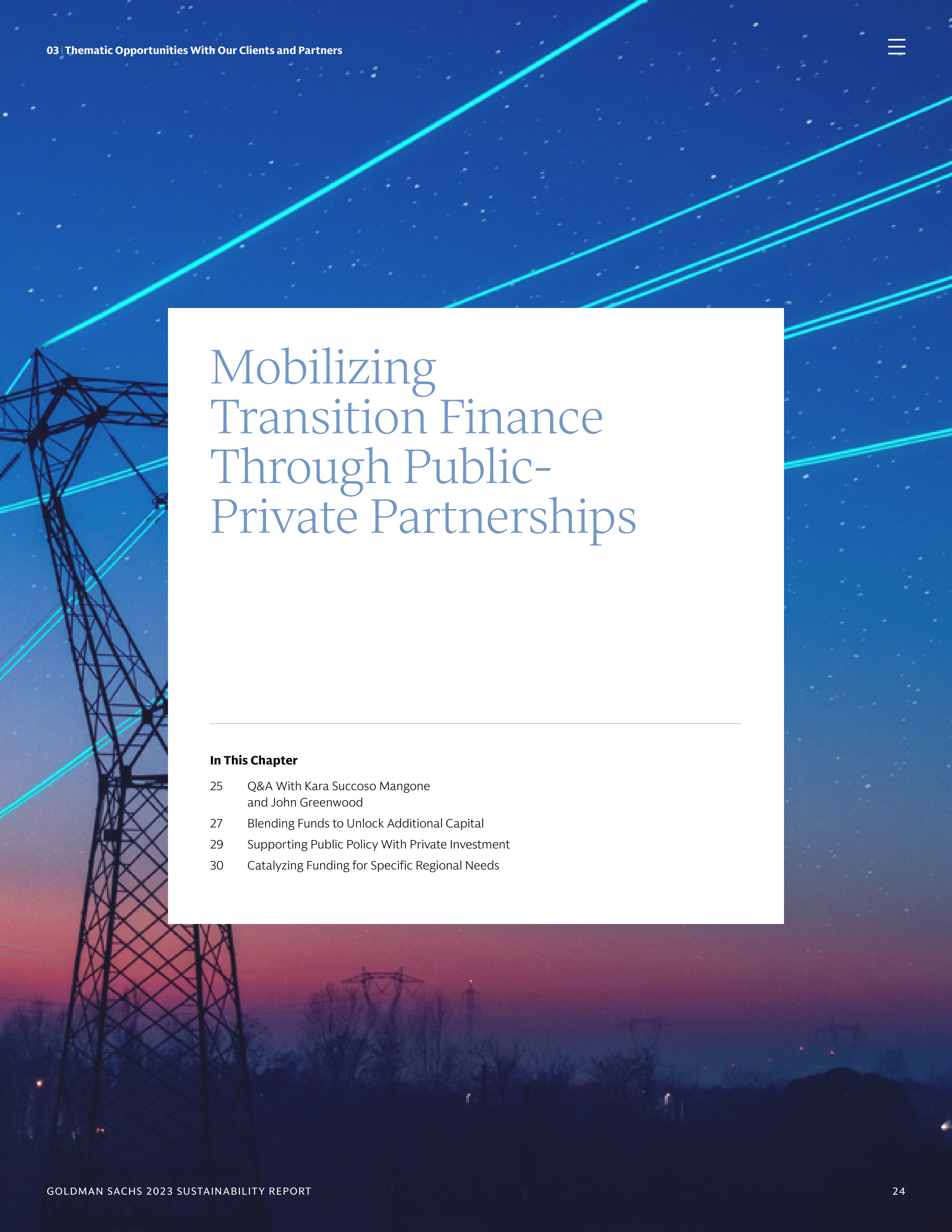
1 The sustainability measurement toolkit was developed for Goldman Sachs Asset Management public teams only and is subject to internal information barrier restrictions. The toolkit was designed to cover corporate public equities and fixed income securities, but is subject to data availability and subject to change at any time.

Exploring GenAI to Support Our Clients and Our Reporting

In 2023, our firm began exploring how Generative AI (GenAI) could help advance data sourcing, verification, and analytics by automatically structuring and summarizing large volumes of unstructured data to meet varied and emerging mandatory sustainability reporting requirements and help deliver on our clients' needs. Having high-quality and up-to-date data is crucial for providing high-quality solutions to our clients, stakeholders, and regulators. However, challenges persist in the sustainability-related data space due to limited company reporting, among other factors. Moreover, disclosures of companies in certain geographic regions, including Asia, are not published in English, increasing the complexity of the exercise. The current manual process is resource-intensive, limiting the depth of analysis and relying on readily available metrics rather than harder-to-identify, more comprehensive data. Going forward, GenAI could help to address some of these challenges by automating data discovery and analytics, offering a front-to-back framework that can be deployed across the entire organization, subject to implementation of appropriate controls, to ensure potential risks are suitably assessed and managed. In this context, GenAI could help to dynamically collect and structure unstructured data based on user-defined terms and be capable of processing data in any language. We look forward to continuing to identify ways to advance our GenAI efforts to enhance the value we bring to clients and support our own reporting.

"Our data engineers work every day to enable Goldman Sachs to be a data-driven organization. Sustainability data is notoriously noisy. As we explore emerging technologies like GenAI, our focus is on how to reduce noise by curating quality data that can help clients with their sustainability goals."

Neema Raphael | Chief Data Officer and Head of Data Engineering



Mobilizing Transition Finance Through Public-Private Partnerships

In This Chapter

25 Q&A With Kara Succoso Mangone and John Greenwood

27 Blending Funds to Unlock Additional Capital

29 Supporting Public Policy With Private Investment

30 Catalyzing Funding for Specific Regional Needs

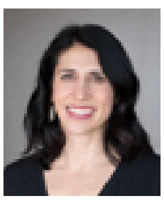
Combining private capital with public funds is critical to catalyzing investment in transition finance and meeting the investment requirements for mitigation and adaptation financing, estimated at $3–$6 trillion per year through 2050.[1] Since 2015, Goldman Sachs has been working with clients to help develop innovative blended finance structures to attract commercial capital toward projects that contribute to sustainable development. We continue to work with our clients to help increase financing for solutions through the development of innovative sustainable financing structures.

Below is an excerpt of a recent discussion on the role of public-private partnerships and related financing structures with Kara Succoso Mangone and John Greenwood.

~$3T–$6T

investment needed per annum for mitigation and adaptation financing through 2050[1]

Q&A With Kara Succoso Mangone and John Greenwood



(left) **Kara Succoso Mangone**, Head of Sustainable Finance Group

(right) **John Greenwood**, Co-Head of Americas Structured Finance and Head of Investment Banking for Latin America

Q: Why is blended finance a compelling tool for investing in emerging markets today, and what are some of the challenges in traditional finance that public-private partnerships can help overcome?

Kara: Private investors will often shy away from certain projects or markets because of specific risks that cannot be well managed, particularly in developing economies. There are several traditional finance-related challenges that public-private partnerships can help overcome. For example, by blending different sources of capital with discrete financial return objectives, this approach can crowd in additional pools of capital for development projects in emerging markets that might not have been available otherwise. In addition, blended finance transactions can serve as a demonstration of commercial viability and financial sustainability of projects, which can help scale up additional investments and a broader range of stakeholders to engage in future projects with similar risk profiles.

Q: What are some effective public-private financing structures you've seen in the marketplace? And, at what stage(s) of a project are they typically used?

John: We've seen public and philanthropic investors provide capital on below-market terms within the capital structure to lower the overall cost of capital or provide an additional layer of protection to private investors. Other times, development banks can help provide credit enhancements through guarantees or insurance. One of the compelling benefits of blended finance is that it can be used at different stages of a project, from providing a bridge for early-stage front-end engineering and design and permitting, to projects that have reached final investment decision that require catalytic capital to fill return profile gaps and crowd in additional funds. In addition, it can also be used by low-carbon companies in need of concessionary capital to help scale their technologies or solutions.

1 Prasad et al.: ***Mobilizing Private Climate Financing in Emerging Market and Developing Economies***, July 2022.

Q&A With Kara Succoso Mangone and John Greenwood (continued)

Q: In 2021, the firm launched the Climate Innovation and Development Fund, in partnership with Bloomberg Philanthropies and the Asian Development Bank. What was the objective of the fund, how was it structured, and are there any early results you can share?

Kara: The Asian Development Bank recently estimated ~$700B of investment per annum is required through 2050 to achieve the goals of the Paris Agreement.[1] Addressing market gaps like this with strategic partners is a core feature of our firm's sustainable finance strategy. Complementing our structuring and financing capabilities and expertise with the Asian Development Bank's on-the-ground experience and relationships in emerging Asian economies and Bloomberg Philanthropies' expertise in market data, we launched the Climate Innovation and Development Fund to help increase the pace, scale, and ambition of climate solutions that can contribute to the clean energy transition. Managed by the Asian Development Bank and seeded with grant capital from *Goldman Sachs Gives* and Bloomberg Philanthropies, the fund leveraged a unique blended finance facility structure featuring various finance mechanisms to mobilize capital through the targeted use of concessional financing, e.g., capital expenditure buy-down grants, performance or milestone-based grants, and liquidity reserves. These financing mechanisms were blended with ADB's own lending, investment, and financing mobilized from other investors.

With the closing of the fund's seventh and final investment, we're encouraged by the concessional capital that helped unlock ~$500 million in private sector and government investments across seven projects, each aimed at helping accelerate technologies and markets for a low-carbon future.

Q: Public-private partnership has been helpful to mobilize capital for climate transition technologies and solutions in emerging markets. Are there any other areas where you see this type of partnership playing a key role?

John: Protecting, preserving, and restoring nature and its ecosystems is inextricably connected with global efforts to mitigate the impacts, and adapt to the consequences of, a changing climate. We have already seen some examples of how public-private partnership can support natural ecosystems. In 2022, for example, we helped an island country in the Caribbean issue debt guaranteed by a development bank to enable the country to advance and protect its blue economy by strengthening its resilience through improved climate risk management in coastal and offshore areas, promoting better management of marine resources, and reducing marine pollution. We also see new, emerging opportunities to help sovereign clients with innovative financing structures. For example, debt-for-nature swaps are a new, innovative tool that incentivizes sovereigns, especially developing economies, to protect, preserve, or restore their natural ecosystems in exchange for reducing their debt burden. Debt-for-nature swaps can be used to support our sovereign clients in advancing their financial, natural capital, and climate-related goals.

1 *Asia in the Global Transition to Net Zero: Asian Development Outlook 2023 Thematic Report*, April 2023.

Blending Funds to Unlock Additional Capital

The public sector is increasingly seeking innovative financial structures and private sector resources to protect consumers from volatile energy prices and promote economic growth. Blending public and private funds can increase the pool of resources available for development projects and consumer aid.

In 2022, the Chilean government regulated energy price increases for residential households and small companies,[1] and created a new security, known as Client Transitory Protection Mechanism (MPC) backed by the Chilean sovereign. These MPC certificates are managed by the treasury to compensate power generation companies that receive below-market rates due to the law. Under this new structure, micro and small businesses are protected from large price increases, while power generation companies can continue to invest in infrastructure and provide reliable services to their customers.

CASE STUDY

Stabilizing Electricity Prices for Consumers With Chile Electricity MPC $1.1 Billion Senior Secured Financing

IDB Invest, the private sector financing arm of the Inter-American Development Bank, sought to raise money to purchase MPC certificates and compensate the power generation companies. As Sole Global Coordinator, Sole Placement Agent, and Joint Bookrunner, Goldman Sachs led a $1.1 billion senior secured financing to purchase MPC certificates levering the IDB's preferred creditor status. Moreover, the issuance and the broader program offered the participating power generation companies liquidity by allowing them to monetize their receivables and supported the government's goal of avoiding rises in electricity prices to the most vulnerable end consumers. This capital will help support the health of the Chilean electricity sector, which has seen solar production rise by more than 1,000% since 2015.[2]

1 IDB Invest: ***IDB Invest Supports Electricity Price Stability for Consumers and Small Businesses in Chile***, August 2023.
2 IEA: ***Chile — Countries & Regions***, as of March 2024.

Blending Funds to Unlock Additional Capital (continued)

Utilizing public and private funds to diversify energy sources through blended finance can improve the stability of energy prices, while helping to ensure reliability and emissions reductions. Russia's invasion of Ukraine had created significant volatility in European energy markets, resulting in diversification of energy providers. As part of this diversification, Czech hydropower operator ENERGO-PRO sought to expand operations and invest in new assets in Europe.

CASE STUDY

Diversifying Europe's Energy Mix With ENERGO-PRO

To facilitate this diversification, Goldman Sachs acted as Sole Global Coordinator and Bookrunner for ENERGO-PRO's issuance of €300 million Senior Unsecured Guaranteed Notes in July 2023. The issuance also benefited from a $545 million unconditional and irrevocable credit guarantee provided by the U.S. International Development Finance Corporation ("DFC" and the "DFC Guaranty"); this enabled the issuance to achieve a Moody's rating of Aa1 (significantly higher than their BBB- corporate rating), allowing ENERGO-PRO to secure long-term financing at significant interest rate savings during a period of prolonged volatility and regain access to international capital markets. ENERGO-PRO is a leading electricity distribution and renewable generation company in the Black Sea region with more than 2.5 million grid customers and 10.5 TWh of distributed electricity, and 34 operating hydropower plants with an installed capacity of 749 MW. This transaction allowed ENERGO-PRO to scale its production capabilities and will successfully enable the diversification of energy sources in Eastern Europe — helping to create less reliance on Russian exported oil and gas and was the DFC's first guarantee for a bond issuance in Europe and first guaranty under the European Energy Security and Diversification Act.

Supporting Public Policy With Private Investment

In 2015, Goldman Sachs Asset Management acquired the assets of Imprint Capital Advisors, one of the largest ESG and impact investors in the industry, and formed External Investing Group (XIG) Imprint. XIG Imprint is dedicated to sourcing, driving due diligence on, and investing in, impact managers across asset classes and impact themes. XIG Imprint's investment strategies leverage its rigorous manager selection, portfolio construction, risk management, and impact investing expertise.[1]

Core to this strategy is the identification of opportunities from policy support or incentives. In the European market, there are private investment funds dedicated to infrastructure assets, while the German government has introduced subsidy regimes that support renewables.[2] Following increased investor interest in climate transition investment opportunities, XIG Imprint invested in NeXtWind for a PWM client. NeXtWind is a German onshore wind repowering firm that is taking advantage of streamlined permitting and increasing subsidy levels from the German government.

CASE STUDY

NeXtWind

In August 2023, XIG Imprint provided a $15 million investment alongside Sandbrook Capital into NeXtWind. Founded in 2020, NeXtWind has acquired multiple operating onshore wind projects and bought an interest in a greenfield development. By capitalizing on new, efficient wind turbine technology, NeXtWind plans to double existing portfolio power generation. Additional value creation is expected through opportunistic greenfield acquisitions. Alongside the core German repowering strategy, NeXtWind also plans to expand into other adjacent strategies such as solar and battery co-location, leveraging management team and Sandbrook Capital experience.

1 Source: XIG Imprint, as of March 2024. The portfolio risk management process includes an effort to monitor and manage risk but does not imply low risk.
2 Appunn et al.: ***Germany's 2022 renewables and efficiency reforms***, December 2022.

Catalyzing Funding for Specific Regional Needs

Despite growth in recent years, global climate finance has not yet reached the scale necessary to meet the estimated transition requirements. In 2021–2022, average climate finance flows reached nearly $1.3 trillion — nearly double 2019–2020 levels, but well below the estimated need.[1] The gap is particularly acute in parts of Asia, where local economies remain heavily dependent on public sector financing — and where clean energy investment is still in its early stages.[2] In India alone, it is estimated that the power sector has a nearly $650 billion investment opportunity, which would support its 450 GW renewable energy target,[3] while Vietnam may need $8–$10 billion annually over the same period.[4]

To help drive more capital into the region to facilitate the energy transition, Goldman Sachs and Bloomberg Philanthropies partnered to seed and launch the Climate Innovation and Development Fund (CIDF) in 2021, in partnership with the Asian Development Bank.

CASE STUDY

Climate Innovation and Development Fund

In 2021, we announced the launch of the Climate Innovation and Development Fund, a blended finance facility designed to support sustainable low-carbon economic development with a focus on South and Southeast Asia to increase the pace, scale, and ambition of climate solutions and contribute to the clean energy transition. Managed by the Asian Development Bank and seeded with concessional capital from Goldman Sachs and Bloomberg Philanthropies, the CIDF invested across seven projects throughout 2022 and 2023. For more information on the CIDF and the approximately $500 million of blended private and public sector finance it helped catalyze for these projects, please see the CIDF report.[5]

Through the CIDF, we demonstrated that blended finance can serve as a mechanism to increase funding and be a powerful tool to help drive sustainable development. Combining different sources of capital enabled CIDF to mobilize significantly more funding for social and infrastructure projects. Based on this experience in developing and providing blended finance solutions, we identified six key learnings from CIDF:

1. Strategic Partnerships	Strategic partnerships bring added value via pooled experience and expertise.
2. Additional Capital	Blending funds unlocked significant additional capital — more than 20x the initial investment on average.
3. Proof-of-Concept	Blended finance aids in proving the concept for innovative technologies and commercial viability.
4. Project Selection and Visibility	Rigorous project selection helps address the challenges of prioritizing which opportunities to pursue.
5. Innovative Financing	Innovative finance mechanisms improve commercial viability.
6. Regional Focus	Tailoring funds to specific regions can maximize impact.

1 Climate Policy Initiative: ***Global Landscape of Climate Finance 2023***, November 2023.
2 GFMA et al.: ***Climate Finance Markets and the Real Economy***, December 2020.
3 Climate Finance Leadership Initiative: ***CFLI India***, as of April 2024.
4 USAID: ***Clean Energy***, September 2020.
5 Goldman Sachs et al.: ***Progress and Lessons from the Climate Innovation and Development Fund***, November 2023.

Unlocking Economic Opportunities

In This Chapter:

32 Investing Our Own Capital in Our Communities

37 Investing in Private Sector Solutions for Our Clients

In this chapter, we demonstrate how we leverage our firm's community development capital to support our communities across the areas of affordable housing, entrepreneurship, and business education. In addition, we share how we invest clients' assets in private markets for innovative education solutions and in public markets for sustainable development.

Investing Our Own Capital in Our Communities

Our investment strategy in communities is informed by research to identify areas of acute need and highest potential impact. In addition to research, listening and responding to community needs is core to our approach. Whether it is expanding *10,000 Small Businesses* into rural states, or launching *One Million Black Women: Black in Business* to serve solopreneurs, our goal is to direct our expertise and investments into high-impact opportunities. Partnerships are also essential to our strategy. Academic institutions, Community Development Financial Institutions (CDFIs), and other local partners play a critical role in the successful execution of our investments and programs, and we are invested in the capacity and resilience of these organizations.

The impact of our work is far-reaching:

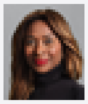
+$19B
of community loans and investment since 2001

+$3B
philanthropic giving worldwide

+250K
entrepreneurs served[1]

~194K
affordable units built or preserved

1 Entrepreneurs served across three Goldman Sachs initiatives: *10,000 Small Businesses*, *10,000 Women*, and *One Million Black Women*.



"Driving economic growth and opportunity in communities where we work and live continues to be our North Star. We approach our community investing with the same rigor and intensity as our broader client franchise, with a focus on helping deliver measurable impact in the near and long term."

Asahi Pompey | Global Head of Corporate Engagement and President of Goldman Sachs Foundation

Supporting Entrepreneurship in Our Communities

When surveying rural small businesses across the United States, only 7% believe they receive a fair amount of private sector resources.[1] Further, 68% of rural businesses report challenges in attracting workers to live in their communities, compared with 46% in non-rural communities.[2]

In recognition of these challenges faced by rural entrepreneurs, we announced *10,000 Small Businesses Investment in Rural Communities*, a $100 million commitment to provide business education and access to capital to 20 states in the next five years.

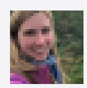
CASE STUDY

Catalyzing Entrepreneurship in Rural Communities With *10,000 Small Businesses*

To help support more businesses throughout the rural US, we launched a $100 million Investment in Rural Communities in September 2023 through our existing *10,000 Small Businesses* (10KSB) program. This investment will provide comprehensive support to rural and small business owners and includes $75 million in lending capital to CDFIs, $15 million to fund the *10,000 Small Businesses* education program at local community colleges, and $10 million in access to capital capacity-building grants. The initiative plans to reach over 800 rural small business owners across 20 states over the next five years, contributing to job creation and economic growth.

As part of the $75 million commitment to CDFIs, in October we announced the first lending commitment of $20 million to the CDFI Hope Enterprise Corporation based in Jackson, Mississippi, to help support a broader group of eight smaller CDFIs located throughout the South[3] providing small business loans and technical assistance in rural communities. Through this initiative, rural entrepreneurs will be integrated into a national network of small business owners, creating new channels of access for business leaders who would otherwise not have the opportunity to engage.

Both programs build on our 10KSB program that launched in 2009, which has helped entrepreneurs grow their businesses with results-oriented business training, access to capital, and personalized support services. In the US, more than 14,500 small business owners have graduated from the program, employing over 280,000 people and driving more than $25 billion in annual revenue.



Lee Porter
Owner of Ozark Green Roofs
Fayetteville, Arkansas

Lee Porter is the owner of Ozark Green Roofs in Fayetteville, Arkansas. Her admission to *10,000 Small Businesses* came at a pivotal time in her company's growth — having recently acquired two significant contracts to put green roofs on JB Hunt Transportation Headquarters and the Alice L. Walton School of Medicine. Lee is utilizing the 10KSB curriculum and network to pivot into a growth period, building off her five years of business success, with aspirations to be the defining resource for green roofs in the state of Arkansas.

1 Goldman Sachs: ***Goldman Sachs 10,000 Small Businesses Launches $100 Million Investment in Rural Communities Across America***, September 2023.
2 Goldman Sachs: ***Investing $100 million in the heart of rural communities***, as of March 2024.
3 Goldman Sachs: ***As Part of $100 Million Investment in Rural Communities, Goldman Sachs 10,000 Small Businesses Launches in Arkansas***, October 2023.

Supporting Entrepreneurship in Our Communities (continued)

Largely due to lower earnings and limited access to capital, Black Americans are much less likely to own high-return assets, including their own businesses.[1] Only 0.5% of single Black women own a business, a rate that is 24 times lower than for single white men.[2] Our *Black Womenomics* research shows that addressing the earnings gap for Black women could create up to 1.7 million US jobs and raise the level of annual US GDP by 1.4%–2.1% per year.[3]

Informed by these findings, Goldman Sachs launched *One Million Black Women: Black in Business*, an education program focused on Black women solopreneurs, providing them with tools and business education they need to grow their business, with the aim of bringing job and wealth creation to their communities.

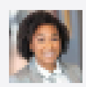
CASE STUDY

Helping Black Women Solopreneurs Grow Revenues and Create Jobs Through *One Million Black Women: Black in Business*

The *One Million Black Women*: *Black in Business* (BIB) initiative is a 10-week education program that covers topics core to business growth, including goal setting, business processes, understanding your customer, identifying opportunities for growth, business financials, and mastering the business pitch. This philanthropic program has now graduated more than 600 Black women solopreneurs from across 40 states, including Washington, D.C. Following their participation, BIB alumni are immediately demonstrating the impact of their involvement: 61% of program alumni reported increases in revenues just six months after completing the program, compared with 29% for all Black non-employer firms that increase revenues at the 12-month mark.[4]

In 2024, *Black in Business* aims to enroll another 450+ solopreneurs and partner with New York University Stern School of Business as the national academic partner to deliver the curriculum through its award-winning faculty. By expanding the national network of small business owners, BIB alumni will continue to grow their access to business knowledge and support.

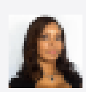
Recent alumni have been able to apply their learnings directly to their business and grow:



Subena Colligan
CEO of EHS Transformation Consultants
Cohort 4/Georgia

Subena is CEO and founder of EHS Transformation Consultants, an occupational health and safety consulting firm that specializes in transforming unsafe workplaces into industry benchmarks. An Air Force veteran, Subena took the leap into entrepreneurship in 2021 using her 401(k) to seed her business.

After graduating from the *One Million Black Women: Black in Business* program, Subena gained confidence, increased her revenue, and extended her client roster to include a Fortune 500–ranked company, major academic institution, and national baked goods producer.



Marsha Williams
Owner, R/E Brokerages of America
Cohort 2/Virginia

Marsha is owner of R/E Brokerages of America, which offers real estate, property management, commercial facility management, and relocation services. She founded the company in 2021, leveraging her 20+ years of real estate experience.

Upon entering the *One Million Black Women: Black in Business* program, Marsha set a goal to scale her business and hire her first employee. After completing the program, Marsha expanded her team and brought on new employees, attributing her business growth to the program's impact, contributing to greater job creation in Virginia.

1 Goldman Sachs: ***Black Womenomics: Investing in the Underinvested***, March 2021.
2 Ibid.
3 Ibid.
4 FED Small Business: ***2023 Report on Nonemployer Firms: Findings from the 2022 Small Business Credit Survey***, May 2023.

Improving Housing Affordability to Promote Stability and Opportunity

Housing affordability is a major obstacle to growth for advanced economies and is especially acute in the United States. Almost half of American households that rent are cost burdened, defined as spending more than 30% of their gross income on rent, while nearly a quarter of American homeowners are also classified as cost burdened.[1]

Housing affordability does not just impact the individual lives of those struggling to make ends meet — it also has a direct consequence on the broader economy. Without access to affordable housing, families have fewer opportunities to increase their earnings, creating an estimated $2 trillion annual drag on US GDP growth from lower wages and productivity.[2] Addressing the housing affordability gap, including the lack of financing for low-income housing, can enhance opportunities across our communities.

There is a demonstrated need for more housing stock to be developed, and yet Minority Business Enterprises (MBEs) face challenges securing financing for property development due to stringent net worth and liquidity requirements from traditional lenders. To connect MBEs to much-needed capital, we launched the Minority Business Enterprise Developers Guaranty Facility in New York City this past year.

Asahi Pompey, Global Head of Corporate Engagement, speaks at the launch event at City Hall in New York City to announce the $50 million guaranty facility.

CASE STUDY

Expanding Affordable Housing With the Minority Business Enterprise Developers Guaranty Facility

To help facilitate MBE developer financing, Goldman Sachs worked closely with the New York City Housing Development Corporation (HDC) and New York City Department of Housing Preservation and Development (HPD) to develop an innovative financing structure providing support for affordable housing projects sponsored by minority developers certified as MBEs. Goldman Sachs will offer up to $25 million from GSAM to establish a guaranty facility (“the Facility”), matched with $25 million from the city, to provide a supplemental backstop for construction projects and reduce the access-to-capital gap for qualified MBE developers, allowing them to obtain construction financing for which they might not otherwise qualify.

Leveraging HPD’s pipeline of development opportunities, the Facility will be utilized to support affordable housing projects in New York City, with commitments originated over a five-year investment period. At least 10 affordable housing projects sponsored by growing MBE developers are expected to benefit from the Facility, removing one of the major barriers to entry for these businesses and enabling MBE developers to succeed by scaling their operations and building a track record as affordable housing developers.

1 Joint Center for Housing Studies of Harvard University: ***The State of the Nation’s Housing 2023***, 2023.
2 National Low Income Housing Coalition: ***The Problem***, as of March 2024.

Improving Housing Affordability to Promote Stability and Opportunity (continued)

In addition to addressing financing gaps for new housing, Goldman Sachs is also helping support the preservation of existing affordable housing. The Low-Income Housing Tax Credit (LIHTC), created in 1986, provides tax credits to private developers who agree to keep rents at specified percentages of Area Median Income (AMI). From 1987 to 2009, approximately 2.2 million units were developed through LIHTC, representing nearly one-third of all new multifamily rental housing.[1] After 15–30 years, the affordability requirements expire, and rents typically revert to market rate. By providing competitive financing contingent on continued affordability, investors and financial intermediaries can help maintain housing affordability in existing LIHTC properties and prevent turnover and resulting instability in affordable housing driven by rent increases.

CASE STUDY

Preserving LIHTC Affordability in the Project Horizon Portfolio

In April 2023, Goldman Sachs financed the acquisition and preservation of the Project Horizon portfolio, consisting of 10,474 majority affordable housing units across 90 properties in Texas, Illinois, Indiana, Wisconsin, Florida, South Carolina, Kentucky, and New York. Primarily composed of former LIHTC units affordable to households earning up to 60% of AMI, the acquisition will help preserve affordability in the units, which risked being converted to market rate units upon the expiration of the original LIHTC restrictions. The average rent across the portfolio is below $1,000 per unit, and the portfolio houses more than 30,000 residents, including those in major cities such as Chicago, Dallas, Milwaukee, Tampa, and Indianapolis.

The acquisition will help preserve affordability across over 10,000 units of former LIHTC projects that could otherwise be at risk of being converted to market upon expiration of land-use restrictions put in place at the time of original LIHTC financial closings. By providing $454 million JV equity to the partnership, Goldman Sachs was able to help support the preservation of high-quality affordable housing options for local communities around the country.

1 HUD: ***What Happens to LIHTC Properties After Affordability Requirements Expire?***, as of March 2024.

Investing in Private Sector Solutions for Our Clients

With increasing interest and activity in sustainable and impact investing, our clients are seeking ways to enhance alignment of their investments with their respective sustainability or impact objectives. Through our open architecture platform, our AWM client franchise provides clients with a holistic suite of solutions across public and private markets, enabling us to invest our clients' assets to meet their discrete sustainable and impact investing objectives with the same rigor and risk-return standards of our traditional investment management capabilities.

Investing our clients' capital aligned with their thematic preferences

~$1.3B

Global Social Impact Public Equity Strategy AUS[1,2]

~$8.3B

Goldman Sachs Alternatives' contribution to the Inclusive Growth theme of our sustainable finance target

~$1.2B

capital committed by XIG Imprint on behalf of investors globally across +40 Inclusive Growth–themed strategies[2]

1 AUS: Assets Under Supervision.
2 As of 12/31/23.

"We are investing in segments of the economy, including the education sector, among others, that are undergoing significant disruption. Our investments are a great example of how private capital can help scale innovative business models to provide needed solutions in a creative way."

Greg Shell | Head of Inclusive Growth Strategy, Goldman Sachs Alternatives

Investing in Education to Enable Innovation and Growth

Low reading proficiency has historically been an important issue in K-12 education.[1] Funding gaps between affluent and underresourced students, estimated at nearly $2,700 per student in districts with more minority students,[2] persist in the American educational system, resulting in a compounding negative impact in our communities.

The COVID-19 pandemic has also resulted in unprecedented learning loss, with National Assessment of Education Progress scores pointing to a multi-decade low in reading proficiency levels across the board, while in 17 states students are more than a half of a school year delayed in learning, on average.[3] Recent findings reveal that 68% of US fourth-graders are not proficient in reading, up from 66% in 2019.[4] As a result, extensive funding at the state and federal level has been allocated to address both the achievement gaps and pandemic-driven learning loss.

High-dosage tutoring, defined as one-on-one or small-group tutoring at least three times per week,[5] is one of three solutions highlighted by the federal government to improve student achievement. In addition, a shift to evidence-based literacy practices known as the *Science of Reading* is underway nationally, with over 35 states passing relevant legislation since 2013.[6] Due to shortages across resourcing and staffing, schools are expected to continue leveraging the private sector to help implement these solutions. Through our Sustainable Investing Group's new Inclusive Growth Strategy, we are investing in solutions to help reduce this learning loss.

CASE STUDY

Closing Learning Gaps Through an Approach Grounded in the Science of Reading With Ignite Reading

Goldman Sachs recently led a Series B financing for Ignite Reading, a company providing one-to-one foundational reading skills tutoring based on the Science of Reading to students in K–12 schools and districts.

Founded in 2019, Ignite Reading has rapidly scaled while demonstrating strong efficacy to date. A study conducted by American Institutes for Research of kindergarten through third graders in six school districts in Massachusetts confirmed that after 14 weeks of tutoring with Ignite Reading, the number of students who scored at or above benchmark on the DIBELS assessment grew from 11% to 45%. These outcomes have proven consistent regardless of a student's gender, race, ethnicity, language, socioeconomic status, or special needs. During the 2022–2023 school year, 94% of students served by the company were Free or Reduced Lunch enrollees, 73% identified as from an underrepresented community, 27% identified as multilingual learners, and 17% received special education services.[7]

1 Hernandez et al.: Double Jeopardy: ***How Third-Grade Reading Skills and Poverty Influence High School Graduation***, April 2011.
2 Morgan: ***Equal Is Not Good Enough***, November 2022.
3 Bryant et al.: ***COVID-19 Learning Delay and Recovery: Where Do US States Stand?***, January 2023.
4 Annie E. Casey Foundation: ***Since Pandemic's Start, 42 States See Rise In Fourth-Graders Below Reading Proficiency***, November 2022.
5 Sawchuk: ***High-Dosage Tutoring Is Effective, But Expensive. Ideas for Making It Work***, August 2020.
6 Schwartz: ***Which States Have Passed 'Science of Reading' Laws? What's in Them?***, July 2022, updated January 2024.
7 Ignite Reading: ***Our Proven Program Gets Results***, as of March 2024.

Defining Social Impact Investing to Drive Sustainable Development

Investors are increasingly recognizing that promoting economic opportunities in all communities is a key to durable, long-term economic growth. With inflationary pressures and sluggish economic growth disproportionately affecting lower-income communities, investment in social solutions is on the rise.[1]

Building a more sustainable global economy is central to the United Nations' Sustainable Development Goals (SDGs). Many of the SDGs overlap across targets to expand access to essential goods and services. Companies in a variety of sectors are helping to make this happen, including enablers of digital connectivity for remote communities and reduced healthcare costs. Other promising companies are driving innovation in areas such as education and supplying more affordable homes.[2] Our Global Social Impact Equity strategy is designed to deliver on the sustainability preferences and goals of our clients who are seeking both financial returns and positive social outcomes.

CASE STUDY

Investing $1.3 Billion in Global Social Impact Public Equity Strategy[3]

To capitalize on this trend and drive sustainable outcomes, Goldman Sachs launched its first dedicated social impact public equity strategy in June 2023. With approximately $1.3 billion in AUS, the strategy seeks to create positive social impact by investing in companies considered to be sustainable investments. These companies aim to provide solutions that drive social sustainability by virtue of their alignment to key themes associated with solving social problems. Companies in the portfolio provide, invest, or create products, services, or technologies across a number of investment themes:

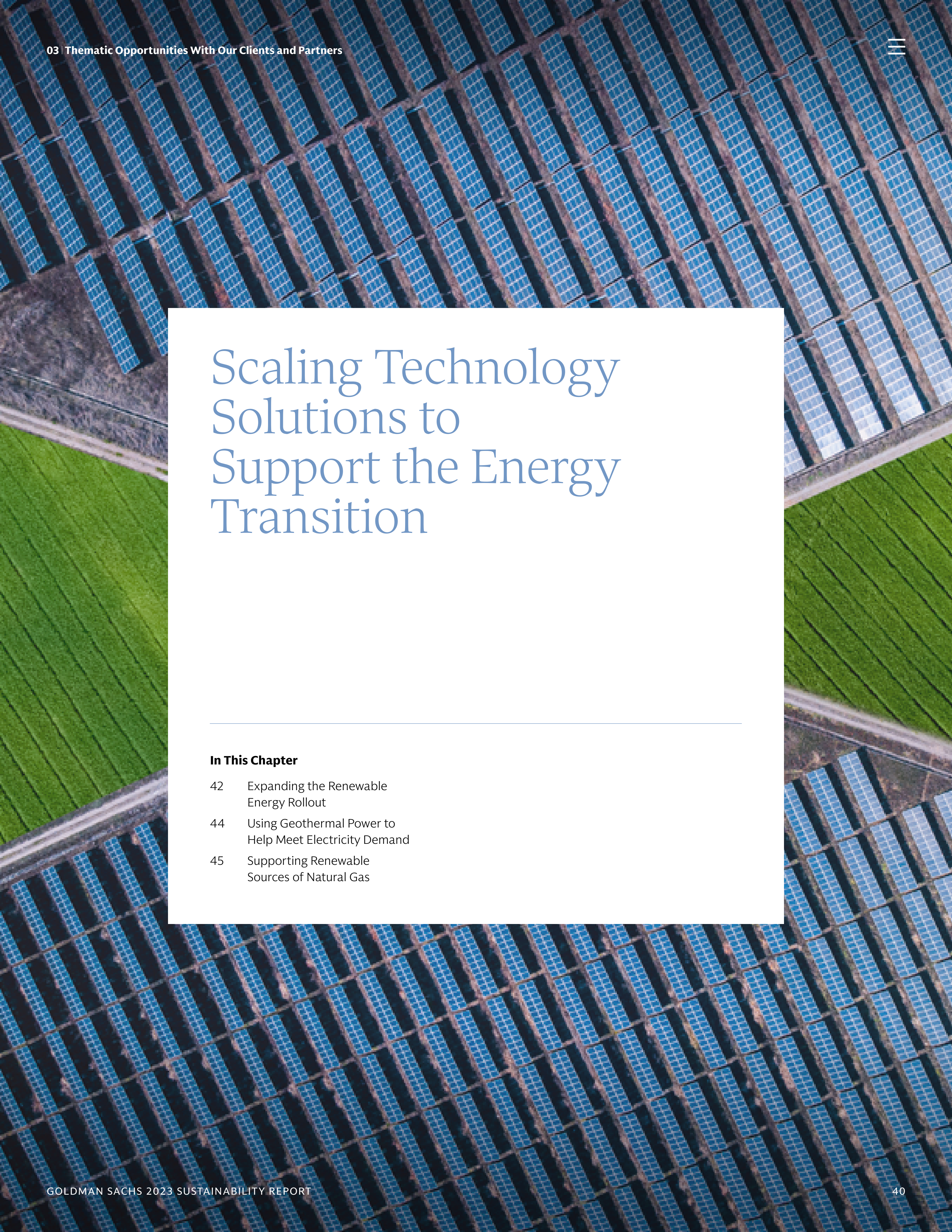
Thriving Communities: Investment in areas such as affordable housing, digital inclusion, access to clean water and sanitation, and access to clean energy. Within these areas, we invest in companies including information technology providers and developers of water-treatment and purification solutions.

Economic Empowerment: Enable people to participate in economic development by investing in education, equal job opportunities, and financial inclusion. Within this theme, we invest in companies including providers of online and hybrid education, human resource companies, and providers, of mobile phone–based financial services solutions.

Good Health and Well Being: Contribute to improving quality of life by focusing on areas such as nutritious food, active lifestyle, and accessible and innovative healthcare. Within these areas, the strategy invests in companies including medical technology developers, healthcare/insurance providers, and operators of fitness centers.

Safe Society: Help build a safe society and increase quality of life for individuals and communities. This theme covers areas such as data privacy and security, human safety, climate change resilience, and accountable institutions. We invest in companies including cloud security providers, safety equipment manufacturers, and environmental consulting firms.

1 GIR: ***10 Predictions for Sustainable Investing in 2023***, January 2023.
2 GIR: ***Social Capital: How Business Can Drive Impact Through Affordability***, September 2022.
3 Please note that for the purposes of the European Sustainable Finance Disclosure Regulation, the representative account of the strategy is an Article 9 product that has a sustainable investment objective. Please note that this material includes certain information on Goldman Sachs sustainability practices and track record, at an organizational and investment team level, which may not necessarily be reflected in the representative account. Please refer to the offering documents of any product(s) prior to investment, for details on how and the extent to which the product(s) takes ESG considerations into account on a binding or nonbinding basis.



Scaling Technology Solutions to Support the Energy Transition

In This Chapter

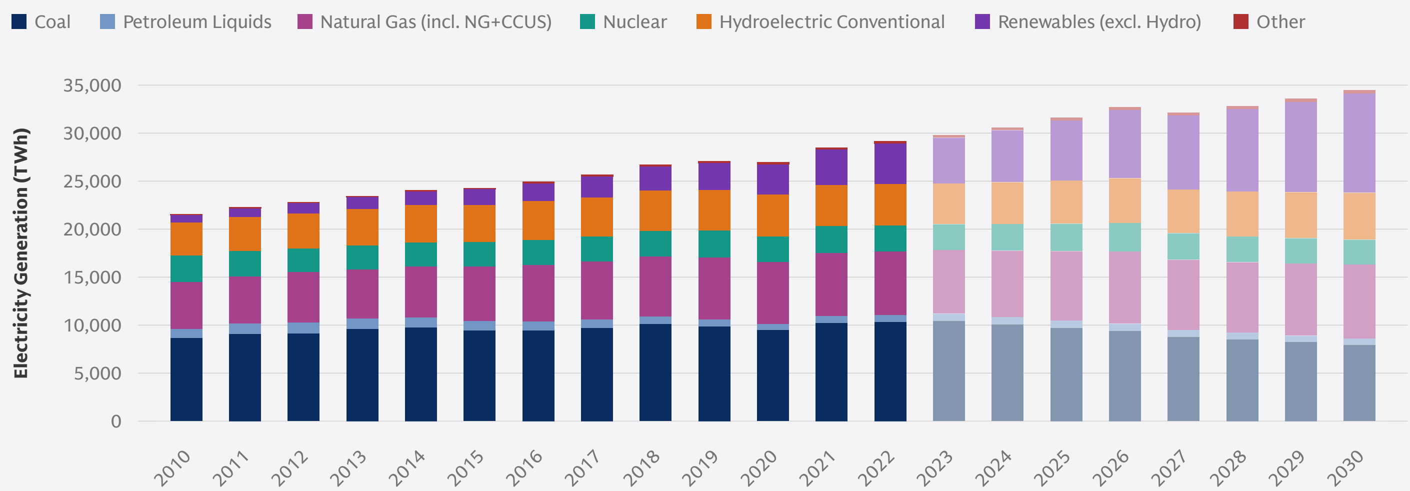
42 Expanding the Renewable Energy Rollout

44 Using Geothermal Power to Help Meet Electricity Demand

45 Supporting Renewable Sources of Natural Gas

The global economy has been powered by traditional energy sources since the Industrial Revolution and will continue to rely on traditional fuels throughout the energy transition to help ensure energy reliability and affordability as new technologies and energy sources scale to meet demand.[1] Transitioning to a low-carbon future will require a diverse set of energy sources, requiring an estimated $4.5 trillion per annum in clean energy investment to meet Paris Agreement climate goals.[2]

Global Power Generation by Year



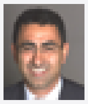
Source: Energy Institute, GIR *Carbonomics*

Global power generation nearly doubled in the past two decades, increasing by approximately 35% from 2010 to 2022.[3] During the same time, the share of fossil fuels (coal, petroleum, and natural gas) fell from 68% of total generation to 62%, while the share of renewables (excluding hydroelectricity) rose from 4% to 14%, representing more than a fourfold increase in total renewable generation.[4]

According to our *Carbonomics* research, we predict these two trends of declining but significant fossil fuel share and increasing renewable generation to continue through 2030 due to continued growth in electricity demand. By 2030, we predict that fossil fuel share will fall to 48% of total generation while renewable share (excluding hydro) will double to nearly 30%.[5]

To help address the scope and scale of the investment required, Goldman Sachs seeks to take a comprehensive approach to supporting these emerging and scaling technologies, including wind, solar, geothermal, and renewable natural gas, among others, which will play a critical role in enabling a secure, affordable energy future.

1 Energy Institute: ***2023 Statistical Review of World Energy***, June 2023.
2 IEA: ***Net Zero Roadmap 2023 Update***, October 2023.
3 Energy Institute: ***2023 Statistical Review of World Energy***, June 2023.
4 Ibid.
5 GIR *Carbonomics*.



"Our clients are in a dynamic stage evaluating a diverse future of energy, one of continued reliance on traditional energy sources while solutions are deployed to support broad-based electrification and address areas such as renewables intermittency and AI data centers' power demand. As a trusted advisor, we are focused on helping our clients support existing infrastructure and bring new, innovative technologies to market at scale that will help contribute to meeting increased global energy demand needs through our differentiated suite of financing, investing, and advisory capabilities."

Suhail Sikhtian | Global Head of Natural Resources Investing Banking

Expanding the Renewable Energy Rollout

A key focus of our clients is supporting incremental energy needs, driven in part by the prospect of data-center growth due to AI, and the rollout of renewable energy technology in developed markets, including the United States, which represented 13.5% of global emissions in 2021.[1] Given the size of US emissions, and likely demand increases from EV charging and data centers, it is critical to continue expanding the rollout of domestic renewable energy. New energy technologies also represent a significant investment opportunity, with policy incentives and related multiplier effects expected to drive trillions of dollars in investments across renewable technologies, according to Goldman Sachs *Carbonomics* research.[2]

In addition to renewable power generation capacity, substantial investment in transmission infrastructure, which connects generation facilities to end-use customers, is needed to enable low-cost wind and solar to connect to the grid. According to the US Department of Energy (DOE), the US will need to expand transmission systems by 60% by 2030[3] to meet growing energy demand. We are helping our clients drive international grid infrastructure investment, including advising Elia Group, a Belgian transmission and power generation company, on its investment in the US renewable energy market.

CASE STUDY

Investing in Renewable Infrastructure With Elia Group

Elia Group ("Elia"), one of the largest electric transmission system operators in Europe, acquired (through its WindGrid subsidiary) a 35.1% stake in energyRe Giga Projects ("energyRe Giga"), a subsidiary of energyRe LLC. The investment values energyRe Giga at $1.1 billion on a post-money basis. Elia's $400 million investment will be deployed over three years to fund energyRe Giga's pipeline of projects under development comprising transmission-led onshore wind and solar generation, transmission lines, and offshore wind generation assets. The investment allows Elia to enter the US market with a strong and well-established strategic partner. Elia and energyRe will be able to leverage their respective strengths by building upon complementary technical expertise and capabilities to support energy transition. Goldman Sachs acted as sole financial advisor to Elia on this transaction.

1 IEA: ***Greenhouse Gas Emissions from Energy Data Explorer***, as of March 2024.
2 GIR: ***Carbonomics: The third American energy revolution***, August 2023.
3 United States Department of Energy: ***Queued Up… But in Need of Transmission***, as of March 2024.

Expanding the Renewable Energy Rollout (continued)

Technological and financial innovations have brought renewable energy sources into the mainstream, resulting in more affordable energy, reduced carbon emissions, energy diversification, and job creation. Since 2008, the price of solar modules has dropped by 85%, according to Goldman Sachs research,[1] making solar competitive with other technologies. As solar production expands and becomes a larger part of the global energy mix, it is critical to continue investing in new technologies. We recently supported Nextracker on its separation from its parent company to enable greater flexibility for its future growth plans. The company is creating solutions that optimize solar energy production efficiency using software and tracking technology that monitors the movement of the sun.

CASE STUDY

Advising Nextracker's Spin-Off to Support Intelligent Solar Electricity Production

Goldman Sachs served as financial advisor on the spin-off of Nextracker, Inc., a leading provider of intelligent, integrated solar tracker and software solutions used for utility-scale and distributed-generation solar projects globally. Nextracker's products enable solar panels in large-scale power plants to follow the sun's movement and optimize solar performance. This allows more energy to be produced from a facility, accelerating the adoption of solar electricity production. Following a $638 million US IPO in February 2023, Nextracker successfully spun off from its parent company Flex Ltd. in January 2024. Supporting the spin-off and serving as financial advisor to a leading solar technology firm is an opportunity for us to enable solutions needed for clean energy production.

1 GIR, PV Insights, via ***GS Intelligence***.

Using Geothermal Power to Help Meet Electricity Demand

A key component of diversifying the global energy mix is finding a new source of low-carbon baseline generation to meet growing power demand. In the United States, the DOE expects electricity demand to accelerate over the next decade,[1] driven by new industrial facilities and data centers. While most of this new demand is expected to be met by wind and solar power generation, there is a need for new low-carbon sources of baseload generation, which can steadily produce electricity when intermittent energy sources such as wind and solar produce less power.

The DOE has identified geothermal energy as a low-carbon candidate to meet this need. Geothermal plants can produce electricity 24/7, emit no greenhouse gases, and have lifecycle emissions six to 20 times lower than natural gas.[2] While conventional geothermal generation requires existing geologic features to pump water underground, next-generation geothermal technologies can expand production to new areas, with the potential for 90 GW of installed capacity by 2050.[3] Goldman Sachs client Fervo Energy is at the forefront of next-generation geothermal power, and we helped support their efforts to expand geothermal production and advance geothermal technology.

CASE STUDY

Raising Capital to Accelerate Fervo Energy's Deployment of Next-Generation Geothermal

Goldman Sachs acted as exclusive placement agent for Fervo Energy's recent $244 million capital raise. This financing will unlock Fervo's next phase of growth, deploying proven technology adapted from the oil and gas industry at scale to deliver commercially viable 24/7 carbon-free energy. Since its last fundraise, Fervo has successfully brought its first commercial project online, establishing Fervo's system as the most productive enhanced geothermal system (EGS) in history. Fervo has also begun drilling at Cape Station, a 400 MW project in Beaver County, Utah. Early drilling results show reduced drilling times and lower costs that significantly exceed Department of Energy expectations for EGS. The fundraise will support Fervo's continued operations at Cape Station, which will begin delivering clean electricity to the grid in 2026.

1 United States Department of Energy: ***DOE Releases New Report Outlining Solutions to Meet Growing Electricity Demand***, April 2024.
2 United States Department of Energy: ***Geothermal Basics***, as of March 2024.
3 United States Department of Energy: ***LPO Tech Talk: Next-Generation Geothermal***, March 2024.

Supporting Renewable Sources of Natural Gas

In addition to supporting new renewable energy technology, Goldman Sachs is also supporting our clients' work in identifying more sustainable fuel sources for existing energy infrastructure. Renewable Natural Gas (RNG) is naturally occurring biogas that has been refined to use in lieu of traditional natural gas.[1] The biogas can be sourced from landfills, municipal water recovery facilities, organic waste management facilities, and livestock farms. Replacing conventional natural gas with RNG can reduce GHG emissions, improve air quality, provide fuel source diversification, and support a more circular economy.[2]

Sourcing high-quality inputs and reducing waste is crucial to realizing the benefits of RNG, and Goldman Sachs Alternatives has worked directly with Verdalia in Europe and Synthica in the US to advance sustainable RNG. Synthica produces RNG derived from processing pre-consumer organic waste, while Verdalia's feedstock will primarily be agricultural and livestock waste. Verdalia and Synthica are both working to design, build, own, and operate medium- to large-scale anaerobic RNG production facilities. Both portfolio companies are working to advance clean energy and circular economy solutions.

Historically, demand for RNG has been concentrated in the transport sector, as natural gas has increasingly been used as a transportation fuel for trucks and buses. Usage in the transportation sector has increased by 218% since 2018,[3] driven by low-carbon fuel standards. However, demand for RNG has increased in non-transportation use-cases for gas utilities, corporations, and other entities seeking to reduce the carbon intensity of their operations. Many companies in the industrial sector are seeking solutions to meet fast-approaching deadlines for GHG reductions, especially companies that use natural gas for high-heat and steam processes. RNG is a viable alternative, as it can be used as a direct replacement for natural gas.

A key driver in RNG demand is government renewable portfolio standards, which are becoming more stringent, and, in many cases, recognize RNG as an acceptable renewable resource. However, a key challenge to producing RNG is the availability of capital and high upfront costs compared with existing grid infrastructure.[4] Additionally, securing offtake agreements can add to the challenges of securing financing. By addressing these issues, financial firms can help their clients facilitate circular solutions by turning waste into new renewable energy sources. Working with our client Carolina Renewables, Goldman Sachs provided a financing for a facility producing RNG through anaerobic digestion by using existing waste products and selling the RNG under contracts underpinned by state and other incentives, thus facilitating the expansion of RNG production in the state.

CASE STUDY

Supporting Renewable Natural Gas Production With Carolina Renewables

Goldman Sachs provided a $70 million loan to support the ramp-up and operation of an RNG production facility in North Carolina for sponsor Carolina Renewables. The facility utilizes various agricultural, industrial, and commercial feedstocks such as swine waste, poultry waste, and other wastes to produce RNG and provide a sustainable energy source. This contributes to reducing greenhouse gas emissions while also promoting a circular economy by repurposing organic waste into energy. The RNG produced by the facility will be injected into existing pipelines for delivery to Duke Energy and British Petroleum. Currently, the feedstocks used in the facility are disposed in landfills, sprayed on open fields, or burned, releasing methane into the atmosphere. By using these waste products as a substitution for fossil fuel–based natural gas, Carolina Renewables is creating a more sustainable source of gas production and meeting local demand for alternatives to reduce their carbon footprint.

1 EPA: ***An Overview of Renewable Natural Gas from Biogas***, January 2024.
2 Ibid.
3 NGV America: ***Renewable Natural Gas Breaking Motor Fuel Usage Records***, April 2023.
4 EPA: ***An Overview of Renewable Natural Gas from Biogas***, January 2024.

Enabling the New Transportation Sector Value Chain

In This Chapter

48 Diversifying the Sourcing of Critical Minerals and Battery Component Production

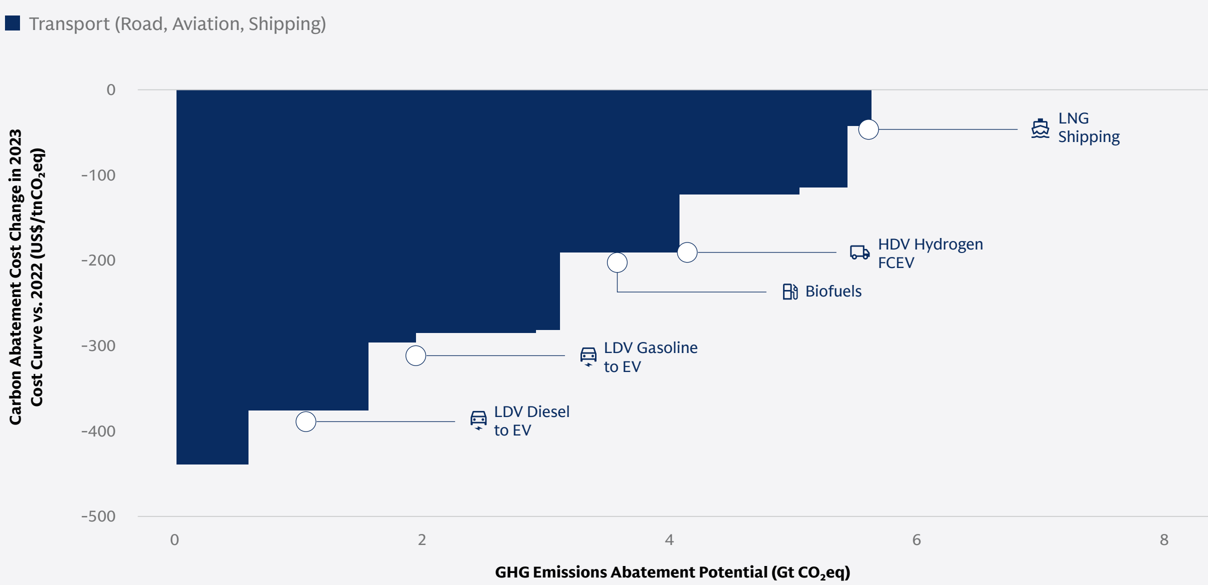
51 Facilitating Grid-Scale Battery Storage for Enhanced Energy Resiliency

Transportation, which accounts for more than a third of global CO_2 emissions,[1] is undergoing rapid change due to the global rollout of light-duty electric vehicles, while the electrification of other transportation sectors is becoming increasingly evident. At Goldman Sachs, we are supporting our clients to help create more sustainable value chains by diversifying the sourcing of critical minerals and enhancing battery recycling, while helping to ensure that electric grids and related infrastructure are equipped to handle increased demand and improve reliability and affordability. Taken together, our clients' priorities are helping to transform the transportation sector across the value chain.

While clean technologies dominated by renewable power remain at the lower end of the *Carbonomics* cost curve, they have become relatively more expensive year over year, driven by lower gas prices, higher interest rates, and cost inflation. At the same time, relatively more expensive technologies, such as electric vehicles and transportation, have become less expensive due to lower raw material costs and simpler battery integration.[2] The chart below shows the transportation sector technologies' carbon abatement cost reductions from 2022 to 2023.

In addition to these cost trends, we see increasing focus from corporates and consumers on solutions to improve consumption efficiency. This is driven in part by the need for energy and land use efficiency in service of meeting broader environmental and financial goals, the continued deployment of material-intensive, low-carbon technologies, and anticipated supply shortfalls of critical materials over the coming decade. Demand for critical minerals is expected to significantly increase over the next decades, which could strain supply chains and mining facilities. Circular economy solutions offer an array of benefits, including the extension of product lifespan and the reduction of waste materials. Across the transportation sector, we support our clients across various components of the value chain to help improve the reliability and affordability of electric and electrified solutions.

Transportation Sector Technologies' Carbon Abatement Cost Reductions From the 2022 to 2023 *Carbonomics* Cost Curves (US$/tn$CO_2$)



For illustrative purposes, this chart only includes the reductions in carbon abatement cost changes for transportation sector technologies. The technologies with increased abatement costs from 2022 to 2023 that are not shown include, but are not limited to, renewable power, renewable power with energy storage, SAF, and buildings efficiency (heat pumps), among others.

Source: GIR

1 IEA: ***Transport — Energy System***, as of February 2024.
2 For further detail on how different technologies have shifted the *Carbonomics* cost curve, please see the ***latest* Carbonomics *cost curve report***.

Diversifying the Sourcing of Critical Minerals and Battery Component Production

The adoption of electric vehicles (EVs) is rising, with EV car sales predicted to grow to 73 million units in 2040, up from around two million in 2020, according to Goldman Sachs research.[1] With the typical electric car requiring six times the raw material input of internal combustion vehicles,[2] the need for critical minerals is expected to increase dramatically.

Total demand for critical minerals over the next two decades is expected to rise by 90% for lithium, 60%–70% for nickel and cobalt, and 40% for copper and other rare earth elements under a below 2 degrees C scenario.[3] Ensuring these materials are sustainability sourced to minimize impact to natural ecosystems and communities is essential, as alternative manufacturing methods such as recycling and reuse are crucial to reducing raw material demand and diversifying the supply chain.

Graphite is another critical mineral in high demand from battery manufacturers, composing approximately 33% of lithium-ion battery cells by weight.[4] Graphite manufacturing is an energy-intensive process that is mainly conducted in emerging markets, where grid electricity is carbon intensive. By developing a fully integrated source of battery anode material (a key battery material), General Motors' investment in Nouveau Monde Graphite (NMG) is helping to create a more resilient North American supply chain for critical minerals.

CASE STUDY

Supporting General Motors' $150 Million Equity Investment for Sustainable Critical Minerals

Goldman Sachs acted as exclusive financial advisor to GM on its investment in NMG. The transaction is a milestone for the industry, with GM's investment demonstrating continued strong interest from original equipment manufacturers and battery cell manufacturers in securing local, sustainably sourced EV battery materials. In addition, it demonstrates Goldman Sachs' support of key investment projects transforming the transportation sector. GM committed an aggregate equity investment of $150 million in NMG. NMG aspires to become a strategic supplier to the world's leading battery and automobile manufacturers, providing high-performing and reliable advanced materials while promoting sustainability and supply chain traceability. GM's first tranche investment of $25 million will be used to support NMG's execution plan for its Phase-2 Matawinie Mine and Bécancour Battery Material Plant in Québec, Canada, while the second tranche investment of $125 million will support NMG developing the first fully integrated (from ore to active anode material) source of battery anode material in North America.[5] Under the terms of the agreement, NMG will provide GM with 18,000 tons per annum of active anode material. The agreement will support GM's EV production and add to its progress in developing a more sustainable and resilient North American–focused EV supply chain.

1 Goldman Sachs: ***Electric Vehicles are Forecast to Be Half of Global Car Sales by 2035***, February 2023.
2 IEA: ***The Role of Critical Minerals in Clean Energy Transitions***, March 2022.
3 Ibid.
4 Transport & Environment: ***From dirty oil to clean batteries***, March 2021.
5 NMG: ***NMG Announces Offtake Agreement with GM***, February 2024.

Diversifying the Sourcing of Critical Minerals and Battery Component Production (continued)

In addition to substantial raw material needs, EV battery manufacturing requires advanced engineered materials known more specifically as cathode active materials (CAM) and their precursors (pCAM).[1,2] These materials are the basis for EV batteries and are a key driver of the range, safety, durability, and carbon footprint. While most of the world's battery materials are made from mined metals, battery and automobile manufacturers are developing methods to incorporate recycled materials as part of their production process. This includes Ascend Elements, a US-based manufacturer of engineered materials.

CASE STUDY

Advancing North America's First Cathode Production Facility With Ascend Elements

Ascend Elements, a US-based manufacturer of sustainably engineered battery materials for electric vehicles, is commercializing an efficient circular method to make sustainable battery materials using recycled inputs. Ascend Elements' recycled battery materials help meet the growing demand for electric vehicle batteries while reducing supply chain carbon emissions.[3] Goldman Sachs acted as the sole private placement agent on Ascend Elements' recent $622 million Series D private placement round. The funding will advance construction of Ascend Elements' Apex 1 facility in Hopkinsville, Kentucky, which will be North America's first pCAM and CAM manufacturing facility.

1 National Academies Press: ***The Competitive Edge: Research Priorities for U.S. Manufacturing***, 1991.
2 Ascend Elements: ***Ascend Elements to Supply Sustainable Cathode Precursor (pCAM) Made from Recycled Battery Materials to Major U.S. Customer***, June 2023.
3 Ascend Elements: ***Ascend Elements Raises $542 Million to Accelerate Production of U.S.-engineered Lithium-Ion Battery Materials***, September 2023.

Diversifying the Sourcing of Critical Minerals and Battery Component Production (continued)

Batteries are the single most important component of an EV, representing 40% of total price,[1] and are a key determinant of the vehicle's range and performance. Battery manufacturing also represents a focal point of the entire EV supply chain, where critical minerals, engineered materials, and global supply chains converge. The manufacturing process itself requires large amounts of energy, estimated at around 50–65 kWh of electricity per kWh of battery capacity.[2] Currently, most lithium battery production is located in markets where more traditional sources of energy like coal are the primary energy source.[3] However, new battery manufacturers such as Northvolt are locating production facilities closer to their customers and using low-cost renewable energy for improved economics, reduced carbon footprint, and increased use of recycled materials to meet their sustainability ambition.

CASE STUDY

Northvolt's Financing Journey to Make a Greener Battery

Northvolt is a European supplier of sustainable, high-quality lithium-ion battery cells and systems. Manufacturing with clean energy, the company's mission is to deliver lithium-ion batteries with a 90% lower carbon footprint compared with those made using conventional methods, and establish capabilities to enable 50% of all of its raw material requirements to be sourced from recycled batteries by 2030. In 2019, Northvolt raised $1 billion from a consortium of investors co-led by funds managed by Goldman Sachs Asset Management and Volkswagen Group. Goldman Sachs Investment Banking acted as private placement agent in connection with two follow-on equity investment rounds in 2020 and 2021, as well as the convertible note capital raise in 2022 that was further increased in 2023. In each instance, funds managed by Goldman Sachs Asset Management participated in these financing activities. Northvolt's funding is supporting its expansion in Europe and North America and in executing on its mission to enable the energy transition through the development of a local, sustainable supply chain for lithium-ion batteries.

1 Carey & Lienert: ***Focus: The battery test race to work out what used EVs are really worth***, October 2023.
2 Kurland: ***Energy use for GWh-scale lithium-ion battery production***, December 2019.
3 MIT Climate Portal: ***How much CO_2 is emitted by manufacturing batteries?***, as of March 2024.

Facilitating Grid-Scale Battery Storage for Enhanced Energy Resiliency

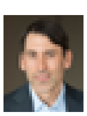
The rapid growth in EVs will also increase demand for consumers and businesses on electric grids, from both dedicated roadside EV chargers and home charging. Charging an EV battery can pull as much as 150 kilowatts from the grid — the equivalent of 1,500 100-watt lightbulbs — in less than an hour.[1] At the same time, solar and wind power are forming a larger portion of electric grids, but are intermittent, creating the need for flexible power capacity to smooth market imbalances and improve grid stability. Battery facilities that can store large amounts of renewable energy are critical to meeting this demand. These grid-scale facilities can charge up when the sun is flooding the system with power and discharge it when demand is high to improve affordability and resiliency for consumers.

Scaling up short-duration storage assets, such as large-scale lithium-ion batteries, is critical for electric grid operators to provide reliable, low-cost electricity while increasing the amount of renewable power generation on the grid. Furthermore, with increasing grid demand from EV charging needs, data centers, and other industrial demand, project developers and grid operators are investing in battery grid storage projects. Companies like GridStor are addressing these challenges and expanding the rollout of grid-scale battery storage.

CASE STUDY

Helping to Prepare the Grid for a Net Zero Future

To address these electricity needs in the marketplace and capitalize on the opportunity, the Sustainable Investing Group and infrastructure investing teams established GridStor as an operating company to acquire, develop, and operate stand-alone battery energy storage projects. Such energy storage systems expect to charge electricity during hours with relatively high renewable energy supply; the systems then discharge electricity during hours with low renewable energy supply, high demand, or when the grid needs instant response capacity for reliability. The battery storage assets are expected to play a critical role in providing grid reliability and help reduce price volatility. Since launching in April 2022, the GridStor team has grown to 36 employees, and had its first 60 MW come online in December 2023.



"Finding innovative, profitable solutions in private markets that address complex climate-related challenges and enable other companies, sectors, and value chains to become more sustainable themselves, presents a compelling investment opportunity for our Goldman Sachs Alternatives business to support the diverse set of our clients' investment preferences, by leveraging the distinctive breadth of our open architecture platform, which includes both Goldman Sachs solutions and those of other specialized external managers."

John Goldstein | Global Head of AM Sustainable Client Solutions

1 Goldman Sachs Asset Management: ***How Battery Storage May Ease the Shift to Renewables (gsam.com)***, April 2021.

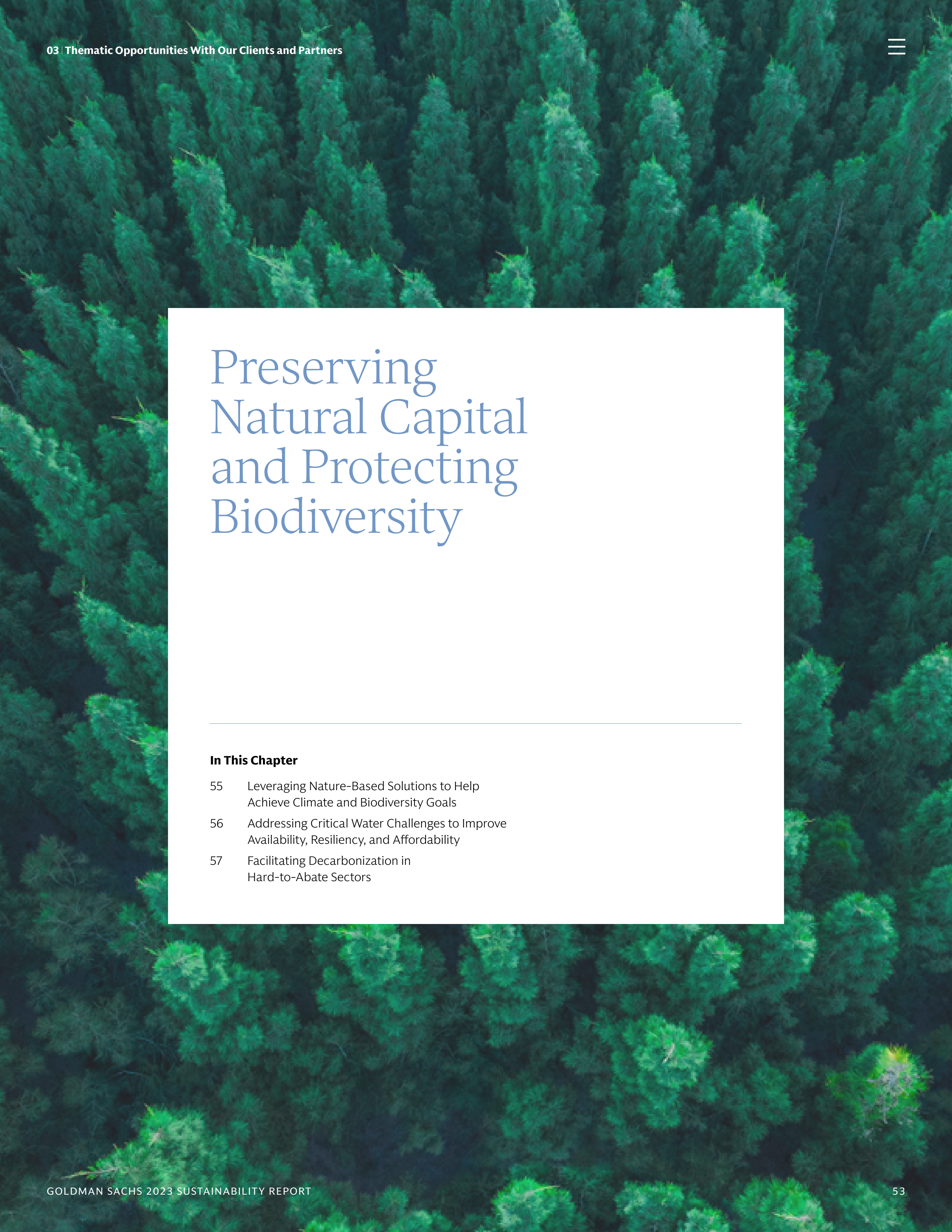
Facilitating Grid-Scale Battery Storage for Enhanced Energy Resiliency (continued)

The climate transition is driving a significant global build-out of intermittent renewable power generation, such as wind and solar. In turn, these accelerated shifts in the global energy mix are leading to market imbalances and the need for more flexible power capacity, as well as presenting challenges for system operators in maintaining grid stability. In recent years, this has intensified the demand for clean power technologies such as battery energy storage systems.

CASE STUDY

Pearl Street

To help meet these demands and challenges, the Commodities Sustainable Solutions team within the Commodities Group (part of GBM) is developing GS Pearl Street — a platform to provide trading, route-to-market, and principal financing solutions for clean power technologies. GS Pearl Street builds on our 20 years of experience in trading and financing in power markets, and will support owners of clean power assets and system operators as they manage the transition to renewable power generation. As part of this innovative platform, we are offering the owners of grid-scale energy storage systems a route-to-market solution combined with long-term project financing.



Preserving Natural Capital and Protecting Biodiversity

In This Chapter

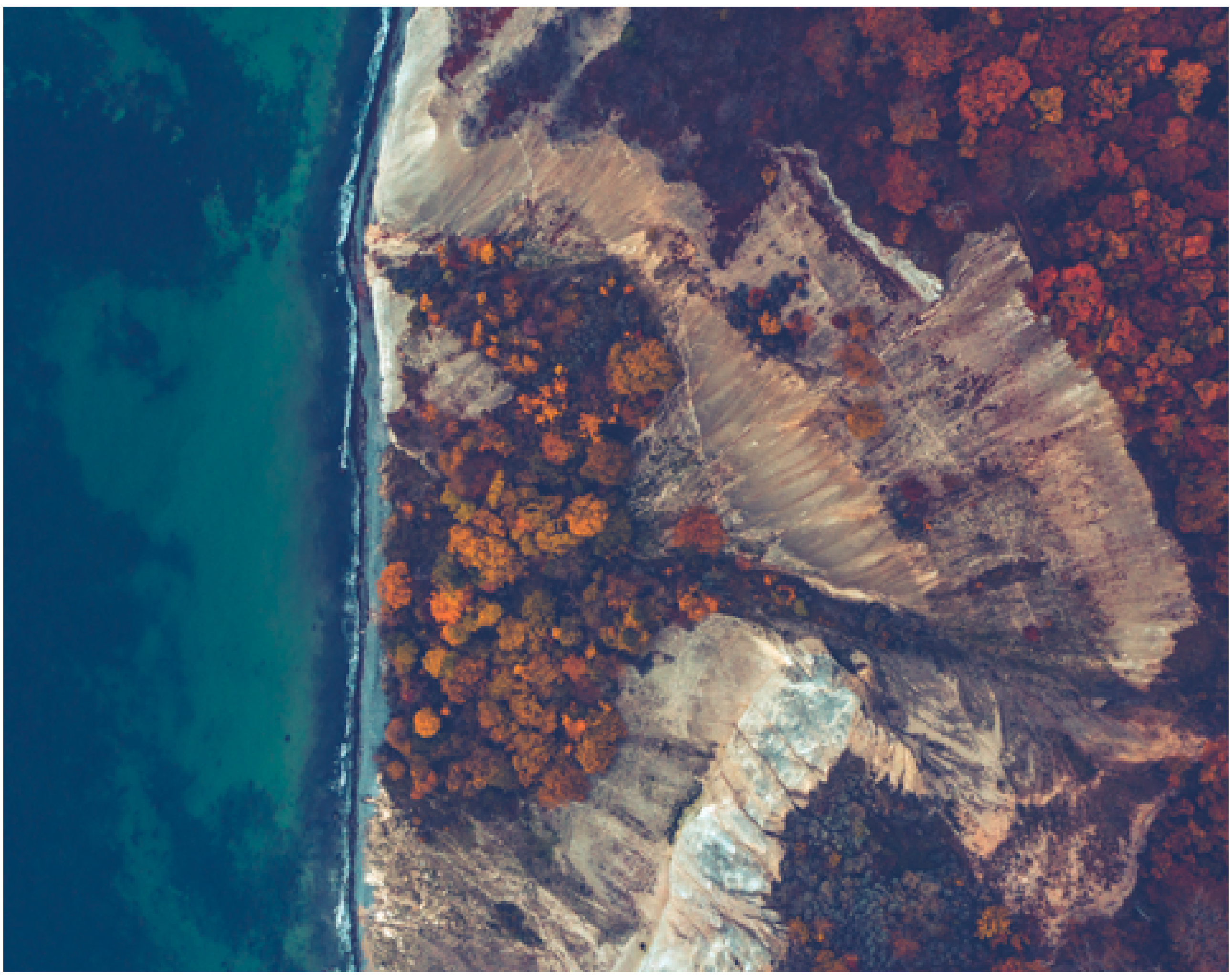
55 Leveraging Nature-Based Solutions to Help Achieve Climate and Biodiversity Goals

56 Addressing Critical Water Challenges to Improve Availability, Resiliency, and Affordability

57 Facilitating Decarbonization in Hard-to-Abate Sectors

The World Economic Forum estimates that $10.1 trillion in annual business value and 395 million jobs could be created by 2030 through the preservation of our ecosystems, biodiversity, and natural capital.[1] While preserving natural capital and protecting biodiversity is crucial to ensuring a sustainable economy, measuring its progress has its challenges. Unlike measuring climate change with one core metric, GHG emissions, there is no one metric to capture natural capital loss and degradation. With the final Taskforce on Nature-Related Financial Disclosures recommendations published in September 2023, we continue to assess our integration of these recommendations into our business decision-making and support for our clients as they seek to help preserve natural capital and protect biodiversity loss.

The world is dependent on nature and ecosystems for $44 trillion of economic output, or more than half of the world's GDP.[2] There is a growing recognition that biodiversity loss and insufficient related ecosystem services present systemic risk that could impact sustainability goals, economic growth, and stability. Managing the risks created by the decline of biodiversity and identifying the opportunities afforded by global conservation and remediation efforts requires an innovative and thoughtful approach.



1 WEF: ***New Nature Economy Report II***, 2020.
2 Ibid.

Leveraging Nature-Based Solutions to Help Achieve Climate and Biodiversity Goals

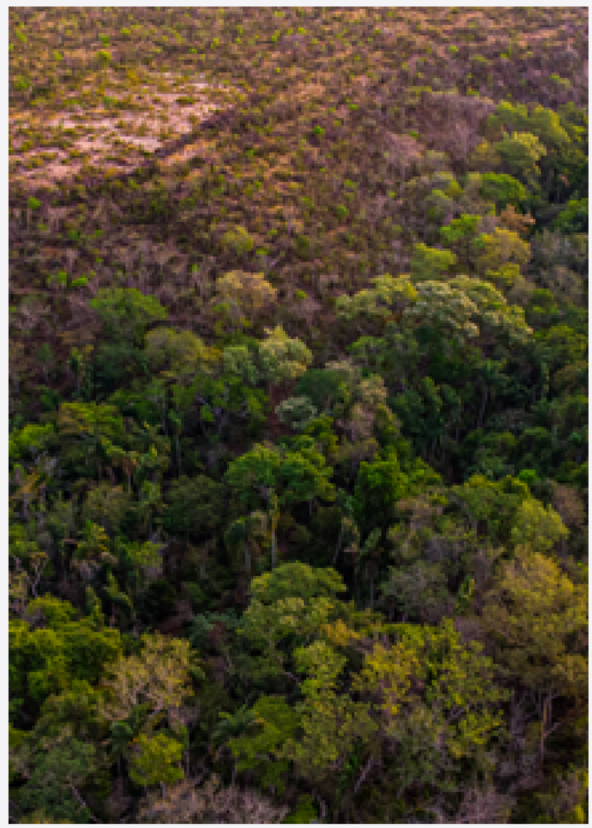
Despite significant efforts to decarbonize, additional mitigation tools are needed to complement the move toward lower carbon-sources of energy. One such opportunity is investing in nature-based solutions (NBS), which have the potential to deliver one-third of the climate mitigation necessary by 2030[1] while simultaneously providing human well being and biodiversity benefits.[2]

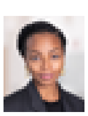
To help bridge this gap, Goldman Sachs offers clients seeking to support these goals an NBS investment strategy through XIG Imprint, our impact investing unit.

CASE STUDY

Restoring Forests With Apple and Conservation International

In 2021, Apple launched The Restore Fund with Imprint and Conservation International to invest in forestry projects that sequester carbon and demonstrate a viable financial model to scale forest restoration. With a focus on reforestation projects that support forest protection, biodiversity, and water quality, and provide jobs in local communities, the investments contribute to the broader climate transition. The Restore Fund invested alongside BTG Pactual Timberland Investment Group (TIG) in a reforestation strategy in the Cerrado region of Brazil, the biologically richest savanna in the world, which contains 11,000 plant species, half of which are endemic to the region. TIG's two-part strategy seeks to conserve and restore native ecosystems on half of their properties, and establish commercial tree farms that produce long-lived, renewable wood products, and sequester carbon on the other half. To date, Imprint has invested in a 35,000-hectare portfolio of properties with TIG and other investors. Biodiversity baseline assessments indicate that the portfolio supports over 297 species of animals and plants (including puma, ocelot, tapir, and orange-winged parrot). The portfolio currently supports 133 full-time-equivalent (FTE) jobs, an increase from nine FTE jobs prior to acquisition.





"Our clients are increasingly seeking portfolios that generate financial returns and also create positive impact. Nature-based solutions can be a great investment opportunity to help these clients achieve their investment objectives."

Lisa Williams | Head, Nature-Based Solutions, XIG Imprint

1 Griscom et al., 2017: ***Natural Climate Solutions. Proceedings of the National Academy of Sciences***, 2017.
2 World Bank: ***Climate Explainer: Nature-Based Solutions***, May 2022.

Addressing Critical Water Challenges to Improve Availability, Resiliency, and Affordability

Rising costs and inefficient practices are creating water affordability issues for communities worldwide, with an estimated four billion people experiencing severe water scarcity for at least one month per year.[1] Addressing these basic needs will require increased financing to clean water. Goldman Sachs Research estimates that an additional $200 billion per year is needed through 2030 to support clean water pathways.[2]

Our work with clients in the water sector demonstrates how targeted capital can help address our nature and social challenges together.

CASE STUDY

Advising Evoqua's Acquisition by Xylem to Create One of the World's Largest Pure-Play Water Technology Companies

Evoqua Water Technologies Corp. was a leading provider of mission-critical water and wastewater treatment solutions, offering a broad portfolio of products, services, and expertise to support industrial, municipal, and recreational customers. The company was acquired by Xylem Inc in May 2023 in an all-stock transaction reflecting a value of approximately $7.5 billion and creating one of the largest pure-play water technology companies in the world. Xylem is a leading water Equipment, Technology and Service company whose customers include utilities and engineering, procurement, and construction firms. Its key products include water infrastructure and measurement and control solutions. We acted as the lead financial advisor to Evoqua in its sale to Xylem, supporting the creation of a transformative platform addressing global water challenges and uniting cultures with sustainability at their core.

1 UNICEF: ***Water scarcity | UNICEF***, as of February 2023.
2 GIR: ***Green Capex: Making infrastructure happen***, October 2021.
3 Xylem: ***Xylem Completes Acquisition of Evoqua***, May 2023.

Facilitating Decarbonization in Hard-to-Abate Sectors

Carbon emissions are concentrated in a handful of sectors. The Energy, Materials, Autos, Capital Goods and Utilities sectors represent only 22% of the market, but contribute approximately 82% of total global emissions, 94% of total water consumption and 93% of total waste,[1] highlighting the need for sound transition plans that safeguard the environment.

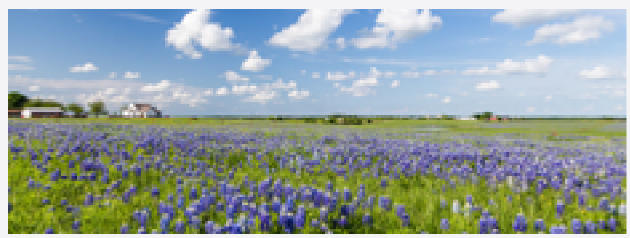
We are working with our clients to help them deliver on their transition strategies while considering energy security and affordability.

Circular solutions, such as capture and sequestration technology, can reduce the negative impacts of energy exploration during the transition to a low carbon economy. In working with Milestone Environmental Services we are supporting operators to help achieve their waste and emissions reduction ambitions.

CASE STUDY

Global Environmental Transition Equity Strategy

Goldman Sachs Asset Management Global Environmental Transition Equity Strategy was launched in November 2023 and is our first strategy dedicated to the transition from a carbon emissions–intensive economy to one that is increasingly renewable energy–based, low-carbon, and environmentally friendly. Investing across the range of high-emitting sectors with the biggest impact not only on carbon emissions but also on water consumption and waste generation, the portfolio consists of predominantly high-quality, mature, value-oriented companies that exhibit strong free-cash-flow yields and potentially attractive valuations. The five key themes the strategy focuses on are extraction, power generation, manufacturing, transportation, and consumption. Crucial to the successful implementation of the strategy is for us to partner with the portfolio companies, identify synergies, advance sustainability practices, and focus on shareholder value creation. Our Investment Stewardship team is critical to our process in our role as an active asset manager. This strategy leverages Goldman Sachs Asset Management's proprietary internal tools and systems to both qualitatively and quantitatively assess the environmental impact and transition plans of the companies in which they invest for clients.



CASE STUDY

Milestone Environmental Services

Milestone Environmental Services, headquartered in Houston, Texas, is a leading environmental services and carbon management company and one of the largest independent energy waste sequestration companies in the United States. Milestone operates a leading integrated network of waste management infrastructure that reduces the carbon impact of its customers by permanently sequestering hydrocarbon waste over a mile below the surface, preventing greenhouse gas emissions and water and ground contamination. Milestone was acquired by SK Capital Partners from Amberjack Capital Partners in October 2023. The acquisition will drive forward the continued growth of Milestone's business, services and client base. Goldman Sachs served as the exclusive financial advisor to Milestone on the sale to SK Capital Partners, supporting the company on its mission to offer alternative, environmentally responsible solutions to clients in the oil and gas sector aiming to meet their carbon reduction goals and advance their sustainability objectives.

1 MSCI, Goldman Sachs Asset Management. Market as denoted by MSCI ACWI, as of September 2023.

SECTION 04

Protecting the Value of Our Firm

We employ a comprehensive approach to safeguarding the value of our firm, integrating governance, risk management, and regulatory preparedness. We continually evaluate and enhance our governance structures, policies, and practices, while fostering a culture where risk management is ingrained in our decision-making process. Our risk frameworks cover a range of climate, environmental and other social-related risks, while our risk appetite adapts to changing market conditions. Both governance and risk management are key to regulatory preparedness, allowing Goldman Sachs to stay positioned for growth while meeting regulatory requirements.

In This Section

59 Governance

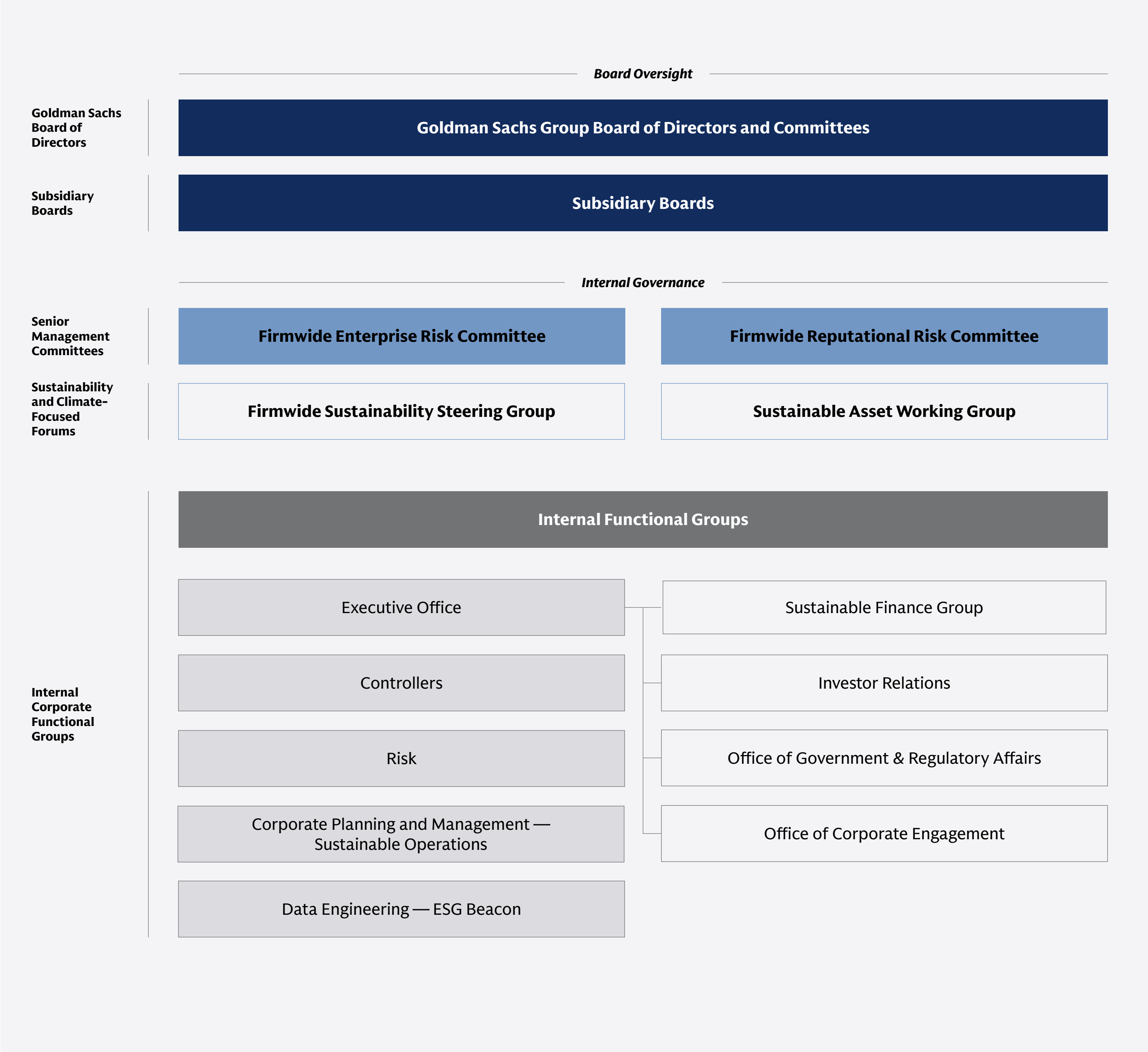
62 Risk Management

64 Regulatory Preparedness

Governance

Responsibly managing our business is paramount. From the oversight of our Board of Directors to internal governance structures, we manage a broad spectrum of financial and nonfinancial risks across our businesses. This includes the evaluation of sustainability-related opportunities, management of climate and other sustainability-related risks, and preparation of our voluntary and regulatory-required sustainability disclosures.

Goldman Sachs Sustainability-Related Organizational Structure



Board Oversight

Board of Directors

The Goldman Sachs Group, Inc. Board of Directors and its committees are responsible for overseeing the business and affairs of our firm, including oversight of the management of the firm's most significant risks.

Given the interdisciplinary nature of the oversight of sustainability, including priorities of climate transition and inclusive growth, and the financial and nonfinancial risks related to these activities, the Board carries out its oversight of these matters directly, at the full Board level, as well as through its committees, including its Risk and Public Responsibilities Committees.

This may include periodic updates on the firm's sustainability strategy and initiatives, as well as targets, progress and incentives related thereto, discussions regarding the climate models the firm utilizes to assess physical and transition risks, and reviews of our sustainability- and climate-related reporting.

Risk Committee

The Risk Committee of the Board plays a central role in our Board's oversight of firmwide financial and nonfinancial risks. This includes the firm's overall risk-taking tolerance and risk governance, including with respect to climate risk. As part of its oversight, the Risk Committee receives periodic updates on our climate risk management approach, including scenario analysis capabilities and integration into existing risk management processes.

Public Responsibilities Committee

The Public Responsibilities Committee of the Board assists the Board in its oversight of our firmwide sustainability strategy and sustainability issues affecting the firm. As part of its oversight, the Public Responsibilities Committee receives periodic updates on our sustainability strategy and reporting as well as updates on initiatives such as *One Million Black Women* and *10,000 Small Businesses*. The Public Responsibilities Committee also periodically reviews our governance and related policies and processes for sustainability and climate-related matters.

Subsidiary Boards

As applicable, boards of our subsidiary entities around the globe may provide additional oversight of sustainability matters as may be required from time to time.

Internal Governance

Senior Management Committees

Various senior management committees and groups oversee our transaction selection decisions and risk management processes. The **Firmwide Enterprise Risk Committee** (ERC) is responsible for overseeing all of our financial and nonfinancial risks, including climate-related risk. The ERC, through its oversight of the Enterprise Risk Management Framework, monitors the firm's risk profile on both an aggregate and segment level, inclusive of key trends, top and emerging risks, and significant events that potentially affect the firm's risk profile. The ERC is co-chaired by the chief risk officer (CRO) and chief operating officer. The chief financial officer is vice-chair, and the Committee also includes senior firm leaders, many of whom are also members of other firmwide risk committees.

Our **Firmwide Reputational Risk Committee** is responsible for assessing reputational risks through thematic discussions and by reviewing transactions identified as having potential heightened reputational risk, including those driven by sustainability-related issues, pursuant to the criteria established by the Firmwide Reputational Risk Committee and as determined by committee leadership.

Sustainability and Climate-Focused Forums

In addition to senior management committees, several firmwide forums are focused on convening key senior stakeholders from across our businesses and corporate functional groups to oversee climate and other sustainability-related issues.

The **Sustainability Steering Group** convenes key senior stakeholders, including those from the Sustainable Finance Group (SFG), Risk, Controllers, Global Banking & Markets (GBM) and Asset & Wealth Management (AWM). This group provides guidance on key climate risk and opportunity decisions, including interim goal setting to achieve our long-term net zero by 2050 pathway commitment. Chaired by the firm's CRO and head of SFG, the group reviews progress and provides feedback on climate strategy, risk management, integration and climate-related capabilities more broadly. This includes oversight of our 2030 sectoral targets in Energy, Power and Auto Manufacturing, and associated voluntary reporting. Further, the group oversees firmwide regulatory sustainability implementation, including oversight of sustainability reporting requirements.

The **Sustainable Asset Working Group** (SAWG) discusses, guides, and validates sustainable client offerings and attributions at the transaction and product level, as well as applying our allocation methodology for transactions that contribute toward our firmwide $750 billion sustainable finance commitment. This commitment is built on commercial activity that is aligned with our firm's Sustainable Finance Framework. SAWG also governs the firm's Sustainability Issuance Framework and sustainability issuances. Finally, SAWG serves as an internal control group to help ensure accuracy and accountability for our firmwide $750 billion sustainable finance commitment and consists of members from our businesses, SFG and control-side personnel.

Internal Functional Groups

We embed sustainability responsibilities within various firmwide functional teams that support our businesses and clients. In addition, a group of senior leaders from across the firm reviews and provides feedback prior to sustainability report disclosures.

Our **Executive Office** (EO) plays an integral role in setting and advancing Goldman Sachs' corporate strategy and in preserving the firm's distinctive culture. The EO is responsible for safeguarding the firm's relationship with alumni, clients, shareholders, policymakers and the broader public, while ensuring our own people remain informed about the firm's priorities, including sustainability-related priorities. The EO also partners with the businesses to source high-impact opportunities in line with the firm's sustainability-related objectives.

In addition to SFG, which leads the advancement of firmwide sustainability strategy, other EO teams supporting the firm's sustainability strategy include the **Office of Government & Regulatory Affairs** (OGRA), **Investor Relations** (IR), and the **Office of Corporate Engagement** (OCE). OGRA manages relationships with regulatory and legislative bodies around the world, while also advancing a public policy agenda in support of the firm and our clients, and partners with SFG on discussions on sustainability-related policy topics, where applicable. IR works closely with senior management to shape the firm's external engagement with equity and debt investors, research analysts, rating agencies, credit counterparties and sustainability-focused stakeholders. The team also collaborates with key internal constituents on competitive positioning, firmwide strategic initiatives, and capital and resource management. OCE leverages our capital, people, and innovations to help address economic and societal challenges, catalyze markets, and transform communities.

Other Internal Functional Groups outside the EO include **Controllers**, responsible for the tracking and review of progress toward select firmwide sustainability-related targets, including the 2030 sectoral targets. This team also coordinates with SFG and various functional teams to ensure the consistency, accuracy and completeness of reporting toward these targets and other climate-related disclosures.

Risk is an independent risk oversight and control function of the firm and is responsible for the effective identification, monitoring, evaluation, and management of the firm's financial and nonfinancial risks. At an operational level, Risk specialist teams are responsible for the development of the firm's climate, environmental and social-related risks programs, including setting and evaluating risk appetite, quantifying climate-related risk and integrating that risk into business and risk management practices. Select teams within Risk also guide environmental, health and safety standards for our investing activities and perform due diligence on proposed investment transactions to help business teams identify and mitigate potential sustainability risks.

Corporate Planning & Management (CPM) unifies Finance & Planning, Spend Management, Operational Risk and Resilience, and CPM Engineering teams to deliver business planning and analytics, expense management, third-party risk management, sustainability initiatives for our operations and supply chain, and governance strategies across the firm. As part of CPM, the **Sustainable Operations** team manages the firm's operational and supply chain sustainability-related goals, including our commitment to achieve net zero by 2030, and partners with **Corporate & Workplace Solutions** to deliver environmentally responsible workplace solutions.

Data Engineering is the group that seeks to deliver fast, easy and secure access to high-quality data for running businesses effectively at scale. Their work spans a combination of curating core datasets for the firm, hosting a consolidated enterprise data platform that enables building, publishing, and consuming high-quality data services, collaboration with divisions in machine learning, data design, and data licensing, and enforcing strong data governance throughout the firm. Within Data Engineering is **ESG Beacon**, a team focused on sustainability data and shared tooling to streamline use and ensure strong governance. The team sources, ingests, models, and delivers shared sustainability data to businesses across the firm.

Risk Management

As a global financial institution, Goldman Sachs is exposed to climate and other environmental and social-related risks that manifest in different ways across our businesses.

We manage these risks through our three lines of defense to ensure robust oversight and monitoring across the organization. As highlighted earlier in this report, we see climate and other environmental and social-related opportunities across our financing, investing and advisory activities. From a risk perspective, extreme weather events and chronic changes in temperatures resulting from climate change may disrupt operations or affect the value of our clients' and the firm's portfolios; further, there are other environmental risks such as biodiversity and social risks impacting human capital. To identify, mitigate and adapt to these climate and other environmental and social-related risks, we are focused on advancing our risk management capabilities, building on our risk management culture.

Our Three Lines of Defense

Goldman Sachs Enterprise Risk Management Framework consists of several key processes, including risk identification and assessment, risk appetite, limits and threshold setting, risk reporting and monitoring, and risk decision-making. Our risk management framework is based on a "three lines of defense" structure, which covers financial and nonfinancial risks, including climate and other environmental and social-related risks.

First Line: Our Businesses

Our businesses are considered the first line of defense and are accountable for outcomes of risk-generating activities, as well as for assessing and managing those risks, including climate and other environmental and social-related risks, within clients' risk appetite and the firm's risk appetite.

Second Line: Independent Oversight and Control Functions

Independent risk oversight and control functions are considered the second line of defense. There are both business segment–specific and firmwide risk and control functions that perform second-line risk management activities, including independent assessment, oversight, and challenge of the risks taken by the first line of defense.

Third Line: Audit

Internal Audit is the third line of defense and provides independent assessments and opinions of the firm's overall control environment, risk management controls, and governance processes. Internal Audit reports to the Board Audit Committee.

Climate Risk Management

Risk identification serves as the foundation for our firm's risk processes, informing risk strategy, mitigants and controls. Our bank's risk identification process is supported by quantification methods, data infrastructure and analytics, culminating in our comprehensive Risk Factor Inventory encompassing financial and nonfinancial risks, including climate-related risks.

This identification of climate-related risks precedes a materiality assessment of risk factors that may manifest across the firm's businesses. The risk taxonomy is the classification structure by which the firm organizes potential risks and risk events, providing common terms for risk identification, assessment, monitoring and reporting processes. Within this taxonomy, climate-related risks are categorized within the broader Strategic and Business Environment Risk category as distinct, stand-alone risks. Additionally, we consider climate-related risks to be potential drivers across all risk categories. In describing physical and transition risks as risk drivers, we emphasize how they may impact other risk categories (Credit and Market Risk, Liquidity and Funding Risk, and Operational Risk) over a range of time horizons.

Other Environmental and Social Risk Management

As our risk management modeling evolves, we are increasingly considering climate-related risks alongside other environmental and biodiversity risks such as seismic and water stress risk. We also integrate and manage environmental and social risks through risk assessment and reporting. These environmental risks may not be exclusively linked to long-term changes in the climate; nonetheless, we find they are best assessed together with climate-related risks. Given the significance of these environmental risks, in-house specialist teams consider climate-related and environmental (C&E) risk in an integrated manner.

We proactively manage and publicly report the material impacts of sustainability-related risks to our firm, including C&E and social risks across our first- and second-line teams. Dedicated teams within Legal and Compliance examine and advise the firm on legal, regulatory and reputational environmental, social and governance risks. Select teams within the Risk division also guide environmental, health and safety standards for our investing activities and perform Environmental, Health and Safety (EHS) due diligence on proposed investment transactions to help business teams identify and mitigate potential risk.

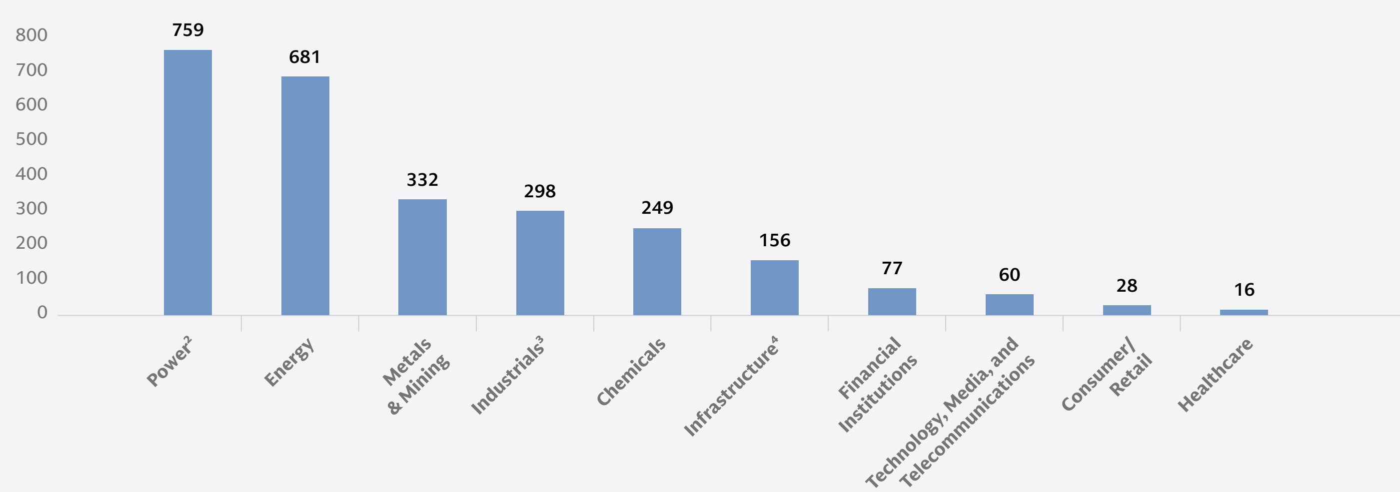
Guidelines and Policies

Our perspectives on sustainability are informed by our stakeholders, including investors, nongovernmental organizations and regulators — and they help us to better advise our clients in terms of how to improve environmental and social practices. Examples of our firm's related guidelines include our ***EPF***, ***Code of Business Conduct and Ethics***, the ***Statement on Human Rights***, ***Statement on Modern Slavery and Human Trafficking***, and the ***Vendor Code of Conduct***. Notably, our EPF guides our overall approach to sustainability issues — including management of environmental and social risk across a broad scope of sectors and products.

Our advisory, financing and direct investing teams include environmental and social due diligence as part of the review process. Transactions that may have significant environmental or social risks, including reputational risks, are escalated for enhanced review and business selection discussion. Several teams are involved in helping businesses identify and mitigate potential environmental and social risks, including our Business Intelligence Group, SFG, and Operational Risk. For several sectors with particular environmental sensitivity (e.g., Oil & Gas, Chemicals, Metals & Mining, Forestry, Water), business teams are equipped with enhanced due diligence guidelines and training to evaluate and engage with new and existing business opportunities more effectively.[1]

2023 Transaction Highlights

In 2023, SFG reviewed more than 2,600 transactions for environmental and social reputational risks.



1 We focus primarily on climate-specific risks in this disclosure; however, many of the program enhancements described apply to both climate risk and environmental and social risk.
2 Power includes Biofuels.
3 Industrials includes Forestry.
4 Infrastructure includes Transportation.

Regulatory Preparedness

Goldman Sachs has been providing voluntary sustainability disclosures for the better part of two decades, beginning with our first Environmental Report in 2006. We have since evolved our voluntary sustainability disclosures to increase transparency, including with our first SASB disclosure in 2019.

Since then, the sustainability reporting landscape has continued to evolve, with a shift from voluntary to mandatory reporting. In June 2023, global sustainability standard setter International Sustainability Standards Board (ISSB) published its inaugural IFRS S1 (General Requirements for Disclosure of Sustainability-Related Financial Information) and IFRS S2 (Climate-Related Disclosures) standards. With its goal to create a global baseline of consistent, comparable, and decision-useful sustainability information for investors that could be used alongside financial statements, the ISSB sought to facilitate interoperability across jurisdictions to reduce the operational burden and complexity of new regulatory reporting for corporates, including Goldman Sachs and our clients.

Some jurisdictions, however, have already passed laws that mandate disclosures that go well beyond the ISSB's definition of materiality and global baseline of disclosures. For example, Goldman Sachs Group at the consolidated level will be subject to new, extraterritorial sustainability-related laws that have been implemented by EU policymakers and member states. In particular, Goldman Sachs will be subject to new, extensive disclosure requirements that exceed the ISSB's global baseline as required under the EU CSRD.

While Goldman Sachs published a regulatory disclosure under the CSRD's predecessor, the Non-financial Reporting Directive, in 2023 for one of our European entities, the CSRD will significantly expand both the scope and breadth of both qualitative and quantitative financial and impact-related disclosures associated with the 12 ESRS.

We are investing to be able to produce the required sustainability data and associated reporting capabilities. We are also reviewing our existing governance and oversight structures and developing and implementing our longer-term operating model. We are designing a flexible operating model to meet our voluntary reporting objectives as well as to comply with existing and additional forthcoming mandatory reporting requirements across other jurisdictions.

Continuing to prepare for this shift in sustainability reporting will guide our approach to broader sustainability measurement, reporting and commitments as well as our ongoing assessment of voluntary and regulatory frameworks, which may influence our continued participation in voluntary sustainability-related industry organizations. As this shift unfolds, our client-centric sustainability strategy will persist as we continue to develop and deploy innovative products and solutions for our clients, work with regulators and strategic partners to address gaps in the marketplace, and protect and preserve the long-term value of our firm.

→ For information on our existing statements, policies, and reports on sustainability, please visit the ***Corporate Governance*** section of our website. For more information about our financial and nonfinancial regulatory disclosures, please visit the ***Regulatory Disclosures*** section of our website.

SECTION 05

Metrics and Targets

Our overall sustainability strategy is supported by specific metrics and targets that help us track progress, report to our stakeholders, and drive our business decision-making.

These metrics and targets support our strategic objective of working with our clients to help them achieve their sustainability goals, while managing our firm's sustainability-related risks and opportunities.

In This Section

66 Progress Toward Our Firmwide $750 Billion Sustainable Finance Commitment

68 Progress Toward Our 2030 Sectoral Targets

69 Progress Toward Our Operational and Supply Chain Commitments

74 SASB Index

79 Thematic Index for Our Existing Sustainability Disclosures

Progress Toward Our Firmwide $750 Billion Sustainable Finance Commitment

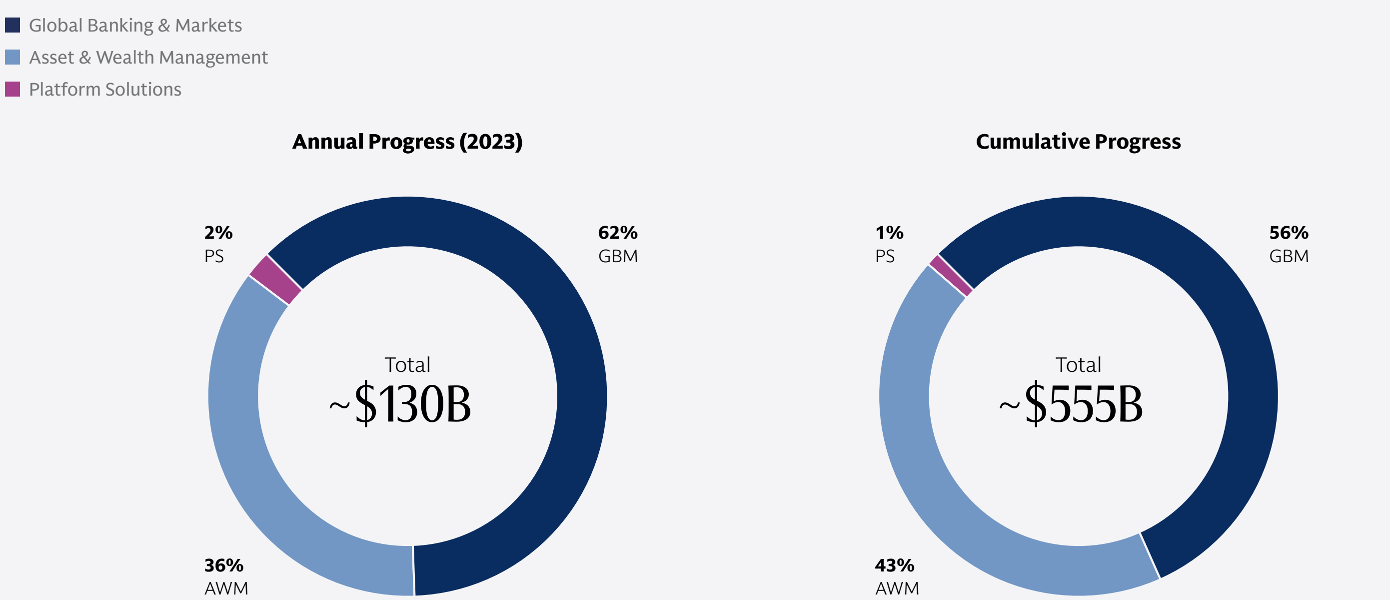
In 2019, we developed our Sustainable Finance Framework and announced our firmwide 10-year, $750 billion sustainable finance commitment to support the increasing demand for sustainable finance solutions across our financing, investing, and advisory work with clients.

We have made significant progress over the first four years. Since setting this 10-year commitment, we have achieved approximately $555 billion[1] in commercial activity, including $302 billion in Climate Transition, $74 billion in Inclusive Growth, and the remainder in multiple themes.[2] Of the $302 billion in Climate Transition, the most significant sub-theme contributor is from Clean Energy followed by Sustainable Transport and Ecosystem Services, which together drive the majority of the contribution.

This progress reflects our integrated sustainable finance strategy and our ability to direct capital toward solutions necessary to help our clients achieve their sustainability ambition.

Progress Toward 2030 Target

Progress by Business Segment



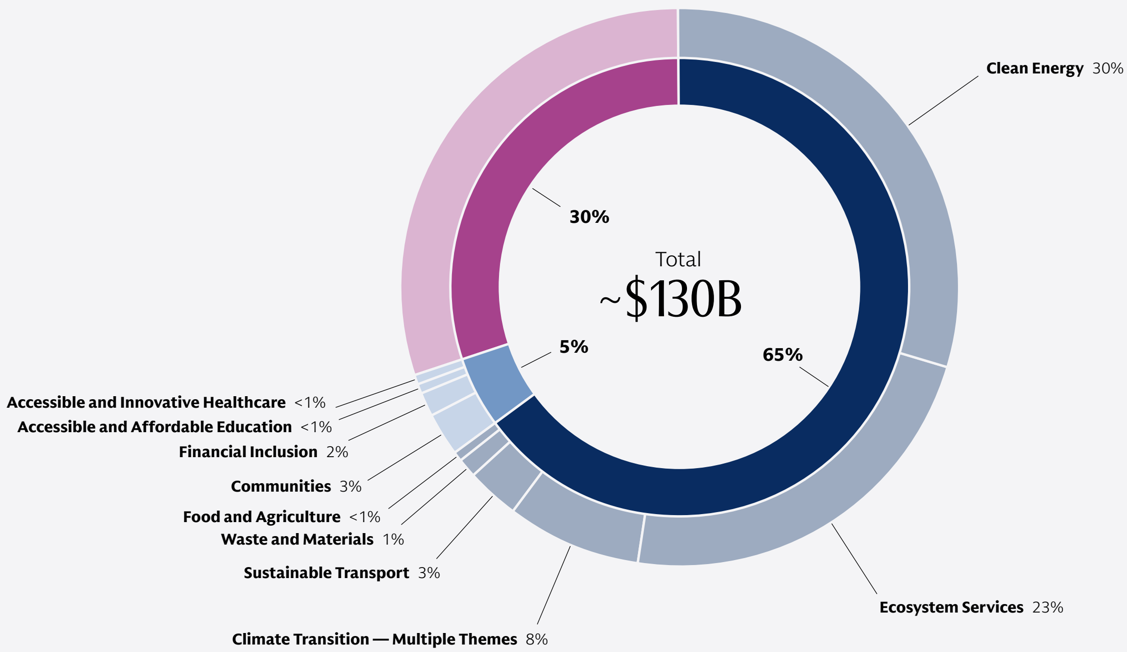
1 As of 12/31/23.
2 Includes activity relating to both Climate Transition and Inclusive Growth.

Progress Toward Our Firmwide $750 Billion Sustainable Finance Commitment (continued)

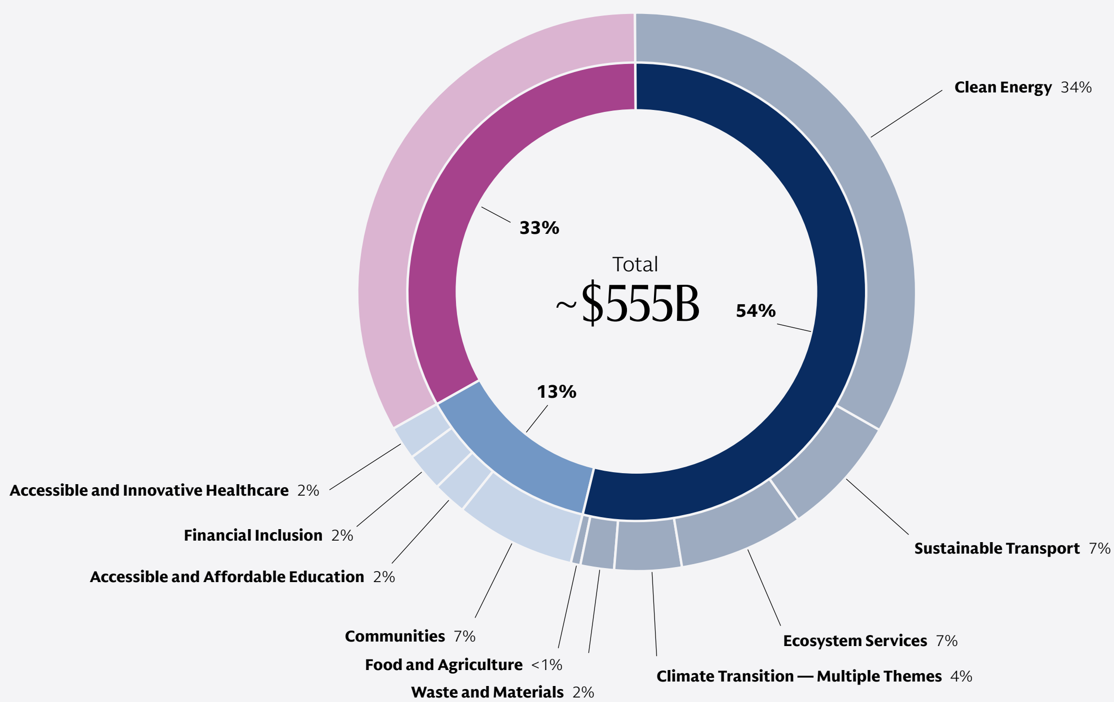
Progress by Theme

Climate Transition
Inclusive Growth
Multiple Themes

Annual Progress (2023)



Cumulative Progress



Progress Toward Our 2030 Sectoral Targets

We are committed to working with our clients, investors and the public sector to support the goals of the Paris Agreement. At the same time, we recognize that there are substantial gaps between the Paris-aligned scenarios and the current state of policies, commitments, and technologies. In our ongoing pursuit of these targets, we continue to evaluate data quality, and, if necessary, adjust our reporting and methodology to ensure the accuracy and relevance of our metrics.

In December 2021, we published physical emissions intensity-based targets[1] related to our financing activities in Energy,[2,3] Power, and Auto Manufacturing[4] using 2019 data. These sectors reflect where we saw the greatest opportunity to proactively engage clients, to deploy capital required for the transition, and to invest in new commercial solutions to support the transition to a low-carbon economy.

In December 2023, we provided our first update on progress toward these 2030 sectoral targets,[5] taking into account the most recent data available for our physical emissions intensity calculation.[6] In our 2021 portfolios, we have begun to see progress toward these portfolio targets, but reiterate that year-to-year progress may not always be linear. Below is a summary of our December 2023 update. For more detailed information on this progress, please see the ***Goldman Sachs 2023 TCFD Report***.

2030 Sectoral Targets and Intensities of Our 2021 Financing Portfolios

Sector	Metric	2019 Baseline	2021 Intensity[a]	2021 vs. 2019	2030 Sectoral Targets
Energy	gCO_2e / MJ	72	72	0%	56–60 (17–22%)[b]
Power	$kgCO_2e$ / MWh	417	296	-29%	147–219 (48–65%)[b]
Auto Manufacturing	gCO_2e / km	152	119	-22%	70–77 (49–54%)[b]

a Majority of vendor data was pulled during July 2023.
b Reduction percentage from 2019 baseline to 2030 sectoral target.

Later this year, we plan to provide another update on our sectoral targets. We will continue to support our clients in critical sectors as they deliver on their climate transition strategies, including by providing financing and investing in climate transition–enabling technology and infrastructure. As relevant regulations are finalized, we anticipate providing additional disclosures in 2025 to comply with climate- and other sustainability-related reporting requirements, including those of the EU CSRD.

1 The upper bound of each target does not exceed the expectations set by the below 2 degrees C scenario, whereas the lower limit aligns with the 1.5 degrees C pathways. The referenced 2- and 1.5-degrees C pathways are based on Goldman Sachs' *Carbonomics* research, which starts with the same science-based carbon budgets from IPCC as other research scenarios and builds out pathways based on the costs of different technologies and approaches to decarbonization. For additional details on the Goldman Sachs *Carbonomics* research, please refer to the ***Goldman Sachs TCFD Report 2021***.
2 Includes all liquid and gaseous fuels, such as oil, natural gas, hydrogen, biofuels, and sustainable aviation fuel.
3 Energy has been renamed from Oil & Gas in the Goldman Sachs TCFD Report 2021.
4 Our target is specifically focused on light-duty-vehicle auto manufacturing, including both cars and light trucks for passenger and commercial uses.
5 Emission scopes vary across sectors: Energy and Auto Manufacturing encompass Scopes 1, 2, and 3, while Power focuses solely on Scope 1 emissions. For detailed methodology and rationale on scope inclusion/exclusion in each sector, please refer to pages 44–46 of the ***Goldman Sachs TCFD Report 2021***.
6 Due to the time lag that exists for company-reported intensities and vendor ingestion of company emissions and production data, 2021 is the most current year where data exists across all three of these inputs for our physical emissions intensity calculation.

Progress Toward Our Operational and Supply Chain Commitments

We are committed to increasing the sustainability of Goldman Sachs' operations, business travel, and supply chain globally. This is why we set 2025 sustainability goals, that aim to further improve our performance across a range of areas including water, waste and energy consumption, renewable energy procurement, and sustainable supply chain practices. In the past year, we have advanced progress toward our commitments that target net zero by 2030 in our operations and supply chain.

Following this 2030 net zero commitment, we conducted a detailed assessment across our footprint to better understand key emissions sources. In 2023, we revised our carbon accounting methodology, which included leveraging a third-party technology solution. Our new measurement approach incorporates the latest climate science, helps increase the accuracy of our reported emissions, and enables the integration of more advanced carbon calculations.[1] We expect this new measurement approach to enable us to identify more impactful opportunities for emissions reduction across all scopes, including our Scope 3 emissions, which we seek to reduce in partnership with our vendors.

The following section presents our current operational and supply chain sustainability metrics, along with key progress updates.

2023 Metrics and Key Indicators

	2022–2023 Trend	2023	2022	2021	2017 Base Year
Organization					
Global facilities reported[2]	↑	**308**	**292**	**286**	**286**
Revenues ($M)	↓	**$46,254**	**$47,365**	**$59,339**	**$32,730**
Operational rentable square feet (million sq. ft.)[2]	↓	**10.6**	**10.7**	**10.6**	**10.0**
Employees	↓	**45,300**	**48,500**	**43,900**	**33,600**
Occupied seats[2,3]	↑	**53,000**	**52,800**	**51,000**	**40,600**
Certification					
◊ LEED-certified buildings (% of sq. ft.)[4]	↓	**70%**	**71%**	**74%**	**–**
◊ ISO 14001–Certified Operations (% of sq. ft.)[4]		**100%**	**100%**	**100%**	**–**
◊ ISO 20121–Certified Events (% onsite events)[4]		**100%**	**100%**	**100%**	**–**
Energy					
Global direct energy consumption (MWh)[5]	↑	**41,701**	**39,819**	**42,830**	**42,103**
Natural gas[6]		42%	62%	69%	88%
Other fuels[7]		58%	38%	31%	12%

1 As a result of this update, we have re-baselined our Scope 1, 2, and 3 (excluding Category 15) emissions back to our 2017 base year. The updates to our Scope 1, Scope 2, and Scope 3 Business Travel are reflected in the operational metrics table.
2 This metric includes data that was normalized for sites that closed during the reporting year by multiplying the site value by the percentage of time Goldman Sachs operated the facility.
3 Occupied seats represent the number of people expected in the office, including both contingent workers and employees.
4 This symbol ◊ before an indicator denotes a commitment through Goldman Sachs' 2025 ESG and Net Zero Commitments and ongoing 2020 Operational Commitments. Further information on these commitments may be found on our Operational Impact pages ***here***. Net Emissions represent achievement of ongoing Carbon Neutral commitment. Reductions are from a 2017 baseline, except plastics, which are from a 2021 baseline or where otherwise noted.
5 Historical energy, water and greenhouse gas metrics were updated to reflect a new methodology in 2023. For originally reported values, please refer to our ***2022*** and ***2021*** Sustainability Reports. Global renewable energy consumption and verified carbon credits reflect the totals at the time of original reporting (excluding the methodology impact).
6 Historical data points may be adjusted to reflect new information and/or changes to accounting methodologies.
7 Other fuels include fuel oil, LPG, vehicle fuel and jet fuel.

2023 Metrics and Key Indicators (continued)

	2022–2023 Trend	2023	2022	2021	2017 Base Year
Energy (continued)					
Global intermediate energy consumption (MWh)[5]	↓	**451,817**	**466,608**	**441,102**	**504,826**
Purchased electricity		97%	96%	96%	97%
Purchased steam & chilled water		3%	4%	4%	3%
Global direct and intermediate energy consumption (MWh)[5]	↓	**493,518**	**506,427**	**483,932**	**546,929**
Reduction in global energy consumption from baseline (%)		-10%	-7%	-12%	n/a
Energy use intensity for offices (kWh/sq. ft.)	↓	**18.9**	**21.5**	**21.4**	**32.7**
◊ Reduction in energy use intensity for offices from baseline (%)[4]		-42%	-34%	-35%	n/a
Global renewable energy consumption (MWh)	↓	**436,210**	**448,939**	**416,660**	**453,518**
◊ Percent renewable energy[4,8]		100%	100%	100%	94%
Greenhouse Gas (GHG) Emissions					
Scope 1 — Direct (metric tons CO_2-equivalent [tCO_2e])[5]	↑	**13,842**	**12,595**	**12,648**	**11,102**
Natural gas[6]		23%	35%	42%	61%
Other fuels[7]		43%	30%	26%	11%
HFC refrigerants		34%	35%	32%	28%
Scope 2 (location) — Indirect (tCO_2e)[5]	↓	**155,105**	**156,468**	**145,013**	**190,782**
Purchased electricity		98%	98%	98%	99%
Purchased steam & chilled water		2%	2%	2%	1%
Scope 2 (market) — Indirect (tCO_2e)[5]	↓	**9,252**	**9,821**	**11,121**	**18,192**
Purchased electricity		68%	67%	70%	85%
Purchased steam & chilled water		32%	33%	30%	15%
Scope 3: Category 6 — Business travel (tCO_2e)[5]	↑	**79,915**	**61,517**	**21,496**	**120,335**
Commercial air[9]		90%	84%	67%	81%
Other travel[10]		10%	16%	33%	19%
Total Emissions: Scope 1 & 2 (location) (tCO_2e)[5]	↓	**168,947**	**169,063**	**157,661**	**201,884**
Total Emissions: Scope 1 & 2 (market) (tCO_2e)[5]	↑	**23,094**	**22,416**	**23,769**	**29,294**
Total Emissions: Scope 1, 2 (market), and 3 Category 6 (tCO_2e)[5]	↑	**103,009**	**83,933**	**45,265**	**149,629**
◊ Net Emissions: Scope 1, 2 (market), and 3 Category 6 (tCO_2e)[4,5]		**0**	**0**	**0**	**0**
Verified carbon avoidance credits (tCO_2e)[11]		79,915	57,233	26,116	146,950
Verified carbon removals (tCO_2e)[11]		23,094	21,820	20,000	0

4 This symbol ◊ before an indicator denotes a commitment through Goldman Sachs' 2025 ESG and Net Zero Commitments and ongoing 2020 Operational Commitments. Further information on these commitments may be found on our Operational Impact pages ***here***. Net Emissions represent achievement of ongoing Carbon Neutral commitment. Reductions are from a 2017 baseline, except plastics, which are from a 2021 baseline or where otherwise noted.
5 Historical energy, water and greenhouse gas metrics were updated to reflect a new methodology in 2023. For originally reported values, please refer to our ***2022*** and ***2021*** Sustainability Reports. Global renewable energy consumption and verified carbon credits reflect the totals at the time of original reporting (excluding the methodology impact).
6 Historical data points may be adjusted to reflect new information and/or changes to accounting methodologies.
7 Other fuels include fuel oil, LPG, vehicle fuel, and jet fuel.
8 The firm sourced renewable electricity equivalent to 100% of global electricity consumption. 96% is in line with RE100 market boundary criteria and requirements for firms joining prior to 2021.
9 This includes impact of incremental changes in air travel emission factors in 2023.
10 This includes charter air, rail/bus, ferry, car, and hotels.
11 The firm purchases third-party-verified carbon offsets (avoidance and/or removal credits) with emission claims that are tracked on the registries of Verra, Green-e, Gold Standard, or other similar platforms. For YE 2023, credits are sourced from a variety of projects: ***Madre de Dios REDD projects***, ***Hechu Afforestation Project in Anhui Province***, ***India's Breathing Space Improved Cooking Stoves Programme***, ***Guizhou Province Qianxinan Afforestation Project***, and ***Ascend N2O Abatement project in US***. Credits are applied to net emissions: Scope 1, 2 (market) and Scope 3 Category 6.

2023 Metrics and Key Indicators (continued)

	2022–2023 Trend	2023	2022	2021	2017 Base Year
Water					
Global water withdrawal (m^3)	↓	**918,515**	**930,682**	**826,151**	**1,026,286**
Reduction in global water withdrawal from baseline (%)		-11%	-9%	-20%	n/a
Water use intensity for offices (m^3/occupied seat)	↑	**13.0**	**12.7**	**11.2**	**19.0**
◊ Reduction in water-use intensity for offices from baseline (%)[4]		-32%	-33%	-41%	n/a
Waste					
Global business waste (metric tons)[12]	↓	**2,744**	**3,676**	**2,820**	**5,979**
Recycled/Composted material		68%	55%	58%	57%
◊ Landfilled material[4,12]		4%	3%	3%	7%
Waste to energy		28%	42%	39%	36%
Global e-waste (metric tons)	↑	**380**	**193**	**321**	**265**
Recycled material		100%	100%	100%	100%
Global construction waste (metric tons)	↑	**723**	**676**	**158**	**4,171**
Recycled/Composted material		90%	61%	84%	99%
Landfilled material		10%	25%	16%	1%
Waste to energy		0%	14%	0%	0%
Responsible Sourcing					
Paper consumption (million sheets)	↑	**57**	**51**	**42**	**168**
Certified new fibers (FSC/SFI)		95%	94%	96%	69%
Post-consumer recycled		3%	3%	3%	22%
New fibers		2%	3%	1%	9%
Paper consumption/employee (sheets)	↑	**1,253**	**1,051**	**965**	**4,583**
◊ Reduction in paper consumption/employee from baseline (%)[4]		-73%	-77%	-79%	n/a
◊ **Green cleaning products (%)[4,6]**	↑	**67%**	**58%**	**48%**	**–**
◊ **Sustainably sourced food (%)[4,6]**	↑	**21%**	**11%**	**12%**	**–**
Single-use plastics (metric tons)[6,13]	↓	**22**	**29**	**27**	**–**
◊ Plastic beverage bottles and disposable plastics (%)[4,6]		75%	84%	91%	–
Office supplies (%)[6]		25%	16%	9%	–
Supply Chain					
◊ **Vendors with inherently higher ESG risk who have been assessed (%)[4,14]**		**98%**	**97%**	**60%**	**–**
◊ **Spend $1.5B with small and diverse vendors (%)[4,15]**		**32%**	**–**	**–**	**–**

4 This symbol ◊ before an indicator denotes a commitment through Goldman Sachs' 2025 ESG and Net Zero Commitments and ongoing 2020 Operational Commitments. Further information on these commitments may be found on our Operational Impact pages ***here***. Net Emissions represent achievement of ongoing Carbon Neutral commitment. Reductions are from a 2017 baseline, except plastics, which are from a 2021 baseline or where otherwise noted.
6 Historical data points may be adjusted to reflect new information and/or changes to accounting methodologies.
12 The firm has diverted 100% business waste from landfill where alternative disposal methods exist. Currently, no alternatives exist in Hong Kong, Australia, and New Zealand.
13 2021 is the new baseline year for single-use plastics because data boundary has increased and data collection has improved.
14 All vendors whom we deem to have an inherently higher ESG risk — which includes higher risk of modern slavery and human trafficking — and are over our material spend threshold, are required to complete an ESG questionnaire.
15 In 2022, we achieved our 2025 goal early and set a new goal to spend cumulative $1.5 billion with small and diverse vendors globally between 2023 and 2025.

Progress Toward 2030 Net Zero Commitments

In 2023, we continued to engage our vendors to understand their climate goals.

2023 Supply Chain Net Zero Initiatives

Emissions Footprint and Climate Goals Disclosure

Vendors representing over 70% of our supply chain emissions disclosed their emissions and climate goals, helping us to understand our footprint and prepare for reporting on our supply chain.

Net Zero Carbon Goals

Nearly 40% of the vendors we engaged in 2023 have a net zero carbon commitment.

Educational Sessions

Hosted a series of educational sessions with key vendors to communicate our goals and the value of GHG measurement.

Free Vendor Resources

Offered free resources to help vendors complete a GHG footprint for the first time.

Driving Sustainability in Our Workplaces

Since 2005, the firm has had a global focus on designing, building, and operating sustainable workplaces.

As of 2023, 70% of our global workplace square footage is LEED (or equivalent)-certified, demonstrating a consistent framework for healthy and efficient green buildings.[1] Building on global efforts, our new LEED Platinum office in Hyderabad, India, which opened in October 2023, showcases key sustainability initiatives, including maximizing exposure to natural light, utilizing a sensor-driven lighting system, increasing energy efficiency levels to 11% higher than benchmark building standards, and using high-efficiency filters to promote healthy indoor air quality. Hyderabad Opel has been awarded WELL Platinum certification for New & Existing Interiors, marking a significant milestone as the firm's first Platinum certified property in our portfolio. WELL provides evidence-based strategies across a number of areas to offer a holistic pathway to enhancing the health and well being of our people, including air and water quality, healthy foods, lighting and acoustics, thermal comfort, restriction and management of polluting compounds and volatile organic chemicals (VOCs) and ergonomics and movement. Sample highlights from Opel contributing to the certification include indoor connectivity through the vertical grand staircase, biophilia, collaboration areas that boost flexibility to help lower stress, 100% height-adjustable desks with ergonomic chairs and an overall approach to sustainable design. Sourcing of office furniture for Hyderabad was also designed to reduce waste and support our inclusive growth strategies. 100% of furniture in our collaboration spaces was reused from previous offices, and all furniture in our cafeteria and offices was sourced from Howe Work Spaces, a micro and woman-owned business, that is also a Goldman Sachs *10,000 Women* graduate.

1 U.S. Green Building Council: ***LEED rating system*** and International WELL Building Council: ***WELL rating system***, as of March 2024.

Driving Sustainability in Our Workplaces (continued)

Since 2020, we have sourced electricity equivalent to 100% of our global consumption from renewable sources and continue our focus on adding clean power to the grid by executing long-term power purchase agreements. We continue to identify opportunities to more efficiently operate existing workplaces and reduce energy consumption. In 2023, we fully transitioned the Plumtree Court office in London to a demand-based heating operation that aligns with building occupancy. This approach led to an approximately 45% reduction in natural gas usage compared with 2022. Across three key locations, we have leveraged our Intelligent Building Platform (IBP) to reduce overall energy consumption. In 2023 alone, this identification process pinpointed thousands of instances where equipment in these buildings was operating below its maximum achievable efficiency, enabling us to reduce their overall energy consumption by approximately 12 gigawatt hours as compared with 2022. The IBP employs technology to constantly monitor our sites and identify deviations from optimal performance in building equipment and systems.

Across our global hospitality operations, which include on-site cafeterias and micro-markets, we continue to increase our purchasing of sustainably sourced food and reduce our global plastic consumption.

Supply Chain Sustainability Progress

After exceeding our 2025 small and diverse vendor spend goal three years early in 2022, we set a new goal to spend $1.5 billion between 2023–2025. We continued to grow our spend with small and diverse vendors in 2023, increasing our spend to $485 million globally, which brings us nearly a third of the way to our 2025 goal. The percentage of our addressable spend with small and diverse vendors remained constant at 7%.

In 2023, we were recognized by WEConnect International with a Gold award in their 2023 Top Global Champions for Supplier Diversity and Inclusion, demonstrating a high level of commitment to global supplier diversity efforts.[1] We continued to advance our efforts in the UK, becoming founding members of Veteran Owned UK and sponsoring the MSDUK and WEConnect International regional conferences. Globally, we delivered training to over 150 small and diverse businesses from our *One Million Black Women* and *10,000 Small Businesses* programs and partnered with Disability:IN and OutBritain to prepare their members on how to do business with large corporations.

We continue to refine our approach to managing ESG-related risks in our supply chain. In 2023, we automated the categorization of a vendor's ESG risk profile within the vendor management system, with ESG risk contributing to the overall risk profiles of our vendors. We also issued an updated Vendor Code of Conduct to all our vendors, encouraging them to commit to legal, ethical, safe, fair and environmentally responsible business practices. In 2023, we partnered with STOP THE TRAFFIK, a non-profit working to prevent modern slavery and human trafficking, to host a session for our vendor management and sourcing teams on modern slavery and human trafficking and its intersection with climate change.

$485M
global spend with small and diverse businesses in 2023

~$35M
increase in small and diverse spend compared with 2022

63%
of small and diverse spend with minority- and women-owned businesses

38%
of small and diverse spend with Tier 2 vendors[2]

Reducing Barriers to Entry

We listened to *10,000 Small Businesses* alumni in our supply chain to better understand their experiences working with large corporations and the barriers that may exist for small businesses. Participants highlighted cash flow constraints and the complexities of corporate procurement processes as key challenges. In response, we introduced more favorable payment terms globally for our small business population and developed training for our global Strategic Sourcing teams on best practices when buying from small businesses.

1 ***WEConnect International: 2023 Top Global Champions for SD&I***.
2 Tier 2 vendor spend is direct and indirect subcontracted spend with a small and/or diverse vendor through a large non-diverse vendor.

SASB Index

We leverage the Sustainability Accounting Standards Board (SASB) standards to provide disclosure for metrics related to the three sectors that most closely align to our mix of businesses: Asset Management & Custody Activities, Investment Banking & Brokerage and Commercial Banks. Disclosures that appear in more than one of these sector standards are included in a separate section at the top of our SASB Index below.

Unless otherwise noted, all data and descriptions apply to our entire firm, not just the businesses relevant to that sector. We do not currently disclose all metrics included in the standards for these three sectors, but we will continue to evaluate them in the future. All data is as of or for the year ended December 31, 2023, unless otherwise noted.

Topic	Accounting Metric	Code	Response
Disclosures Included in Multiple Sectors' Standards			
Diversity & Inclusion	Percentage of gender and racial/ ethnic group representation for (1) executive management, (2) non-executive management, (3) professionals, and (4) all other employees	FN-IB-330a.1. FN-AC-330a.1	US Workforce Demographics Updated data will be included in our forthcoming 2023 People Strategy Report. As part of our commitment to improving diversity at the firm, we have also published our progress toward our aspirational goals; please see pages 5–6 of our ***2023 Form 10-K***.
Business Ethics	Description of whistleblower policies and procedures	FN-IB-510a.2 FN-AC-510a.2 FN-CB-510a.2	***Raising Integrity Concerns*** ***Code of Business Conduct and Ethics***
	Total amount of monetary losses as a result of legal proceedings associated with: • Marketing and communication of financial product-related information to new and returning customers; • Fraud, insider trading, anti-trust, anti-competitive behavior, market manipulation, malpractice, or other related financial industry laws or regulations; and • Professional integrity, including duty of care	FN-AC-270a.2 FN-AC-510a.1 FN-IB-510a.1 FN-IB-510b.3 FN-CB-510a.1	Net provisions for litigation and regulatory proceedings were $115 million for 2023.

Topic	Accounting Metric	Code	Response
Disclosures Included in Multiple Sectors' Standards (continued)			
Systemic Risk Management	Global Systemically Important Bank (G-SIB) score, by category	FN-IB-550a.1 FN-CB-550a.1	The G-SIB surcharge is updated annually based on financial data from the prior year and is generally applicable for the following year. The G-SIB surcharge is calculated using two methodologies, the higher of which is reflected in the firm's risk-based capital requirements. The first calculation (Method 1) is based on the Basel Committee's methodology which, among other factors, relies upon measures of the size, activity and complexity of each G-SIB. The second calculation (Method 2) uses similar inputs but includes a measure of on short-term wholesale funding. Further information about Method 1 can be found on the Bank for International Settlement's website and further information about Method 2 can be found on the Federal Reserve Board's website. We are bound by Method 2 and our applicable G-SIB buffer is 3%. Please see pages 12, 88–89 and 203–204 of our ***2023 Form 10-K*** for further information. Further information about the indicators which factor into the calculation can be found in our FR Y-15 filing, which can be accessed here: (***https://www.bis.org/bcbs/gsib/***) (***https://www.govinfo.gov/content/pkg/FR-2015-08-14/pdf/2015-18702.pdf***) (***https://www.ffiec.gov/NPW***)
	Description of approach to incorporation of results of mandatory and voluntary stress tests into capital adequacy planning, long-term corporate strategy, and other business activities	FN-IB-550a.2 FN-CB-550a.2	We conduct various scenario analyses, including as part of the Comprehensive Capital Analysis and Review and Dodd-Frank Act Stress Tests, as well as our resolution and recovery planning. Please see pages 14–18, 84, and 86–88 of our ***2023 Form 10-K***.
Asset Management & Custody Activities			
Transparent Information & Fair Advice for Customers	Description of approach to informing customers about products and services	FN-AC-270a.3	We believe our clients are best served by having a clear understanding of how we work together, the capacities in which we act and the fees we charge. In addition to contracts for products and services, as well as regulatory disclosures, we provide Wealth Management clients a comprehensive brochure outlining the services we provide and the related fee structures, including how their advisor is compensated for each type of service and fee. Please also refer to the ***Business Standards Committee Impact Report***, ***Code of Business Conduct and Ethics*** and Risk Factors detailed on pages 31–59 of our ***2023 Form 10-K*** for additional firmwide information.
Incorporation of ESG Factors in Investment Management and Advisory	Amount of assets under management, by asset class, that employ (1) integration of environmental, social, and governance (ESG) issues, (2) sustainability themed investing, and (3) screening	FN-AC-410a.1	As of December 2023, Goldman Sachs Asset Management manages $327.6 billion in sustainability-related assets under supervision.
	Description of approach to incorporation of environmental, social and governance (ESG) factors in investment and/or wealth management processes and strategies	FN-AC-410a.2	At Goldman Sachs Asset Management, we believe ESG factors can be important tools for identifying investment risk and capturing opportunities on behalf of our clients. Our approaches to ESG integration will vary by investment team and asset class and ***Goldman Sachs Asset Management's Statement on Sustainable Investing — Public Investing*** sets out a summary of some of the elements of our approach to Sustainable Investing in our public markets investment businesses.

Topic	Accounting Metric	Code	Response
Asset Management & Custody Activities (continued)			
Incorporation of ESG Factors in Investment Management and Advisory (continued)	Description of proxy voting and investee engagement policies and procedures	FN-AC-410a.3	Please see our Approach to Stewardship, which sets out a summary of some of the elements of our approach to stewardship in the Goldman Sachs Asset Management public markets investing business, including our approach to engagement, proxy voting and industry leadership. Please also see our most recent Stewardship Report, our UK Stewardship Code Statement, and our Global Proxy Voting Policy. ***Stewardship (gsam.com)***
Systemic Risk Management	Description of approach to incorporation of liquidity risk management programs into portfolio strategy and redemption risk management	FN-AC-550a.2	Goldman Sachs Asset Management (GSAM) oversees liquidity risk management for the funds and client portfolios for which it serves as fund manager/investment advisor. GSAM monitors liquidity risk associated with a portfolio's ability to meet potential cash outflows related to investor redemptions/withdrawals or potential liabilities related to derivative positions and secured funding trades, as well as changes in the liquidity of positions within the portfolio. GSAM manages the liquidity of its portfolios in line with the investment strategy of each portfolio, applicable regulatory requirements, potential investor redemption requests and broader macro market conditions, at all times in the context of GSAM's obligations and its role as a fiduciary, where applicable.
	Total exposure to securities financing transactions	FN-AC-550a.3	As of December 2023, we had $40.2 billion of credit exposure from securities financing transactions. Please see page 117 of our ***2023 Form 10-K*** for further information.
	Net exposure to written credit derivatives	FN-AC-550a.4	As of December 2023, written credit derivatives had a total gross notional amount of $523.77 billion and purchased credit derivatives had a total gross notional amount of $595.23 billion. Please see page 162 of our ***2023 Form 10-K*** for further information.
n/a	(1) Total registered and (2) total unregistered assets under management (AUM)	FN-AC-000.A	Registered AUS: $663 billion Unregistered AUS: $2,149 billion
n/a	Total assets under custody and supervision	FN-AC-000.B	$2.8 trillion Assets Under Supervision. Please see page 78 of our ***2023 Form 10-K*** for further information.
Investment Banking & Brokerage			
Incorporation of ESG Factors in Investment Banking & Brokerage Activities	Description of approach to incorporation of environmental, social, and governance (ESG) factors in investment banking and brokerage activities	FN-IB-410a.3	***Environmental Policy Framework*** Please see page 45 of our ***2023 TCFD Report***, which highlights targets for sectors that are material to our financing portfolio. These sectors reflect where we see the greatest opportunity to proactively engage with our clients, deploy capital required for the transition, and invest in new commercial solutions to support transition to the low-carbon economy.
Professional Integrity	Description of approach to ensuring professional integrity, including duty of care	FN-IB-510b.4	The firm maintains a ***Code of Business Conduct and Ethics*** and requires employees to annually certify they have reviewed and will comply with the code. See the ***Business Standards Committee Impact Report*** and our ***Business Principles*** for further information.

<table>
<tr><th>Topic</th><th>Accounting Metric</th><th>Code</th><th>Response</th></tr>
<tr><td colspan="4">Investment Banking & Brokerage (continued)</td></tr>
<tr><td rowspan="3">Employee Incentives and Risk Taking</td><td>Percentage of total remuneration that is variable for Material Risk Takers (MRTs)</td><td>FN-IB-550b.1</td><td>MRT is a regulatory term applied in the UK and Germany, but not a concept we apply to our global workforce. Within our UK entity workforce only, ~40% of total remuneration awarded to MRTs for 2022 performance was variable. Within our German entity workforce only, ~29% of total remuneration awarded to MRTs for 2022 performance was variable.
Note that we apply a pay-for-performance philosophy across our organization. Please see our Compensation Principles for further information.</td></tr>
<tr><td>Percentage of variable remuneration of Material Risk Takers (MRTs) to which malus or clawback provisions were applied</td><td>FN-IB-550b.2</td><td>All equity-based awards granted to employees are subject to robust forfeiture and clawback provisions. Please see page 52 of our 2023 Proxy Statement.</td></tr>
<tr><td>Discussion of policies around supervision, control, and validation of traders' pricing of Level 3 assets and liabilities</td><td>FN-IB-550b.3</td><td>Please see pages 64–65 of our 2023 Form 10-K.</td></tr>
<tr><td>n/a</td><td>(1) Number and (2) value of (a) underwriting, (b) advisory, and (c) securitization transactions</td><td>FN-IB-000.A</td><td>Per Dealogic, our transaction volumes for 2023 were<table><tr><td>Announced mergers and acquisitions</td><td>$923B</td></tr><tr><td>Completed mergers and acquisitions</td><td>$1,008B</td></tr><tr><td>Equity and equity-related offerings</td><td>$43B</td></tr><tr><td>Debt offerings</td><td>$209B</td></tr></table>Please see page 74 of our 2023 Form 10-K for further information.</td></tr>
<tr><td>n/a</td><td>(1) Number and (2) value of proprietary investments and loans by sector</td><td>FN-IB-000.B</td><td>The table below presents the concentration of our $35.9 billion of firmwide gross corporate loans by industry:<table><tr><td>Consumer & Retail</td><td>11%</td></tr><tr><td>Diversified Industrials</td><td>17%</td></tr><tr><td>Financial Institutions</td><td>8%</td></tr><tr><td>Funds</td><td>4%</td></tr><tr><td>Healthcare</td><td>9%</td></tr><tr><td>Natural Resources & Utilities</td><td>8%</td></tr><tr><td>Real Estate</td><td>13%</td></tr><tr><td>Technology, Media & Telecom.</td><td>25%</td></tr><tr><td>Other (incl. Special Purpose Vehicles)</td><td>5%</td></tr></table>The table below presents the asset class breakdown of our $13.7 billion of equity securities at fair value (reported within our Asset & Wealth Management and Global Banking & Markets segments):<table><tr><td>Corporate</td><td>73%</td></tr><tr><td>Real Estate</td><td>27%</td></tr></table>For further information about investments, please see pages 113 and 165, respectively, of our 2023 Form 10-K.</td></tr>
</table>

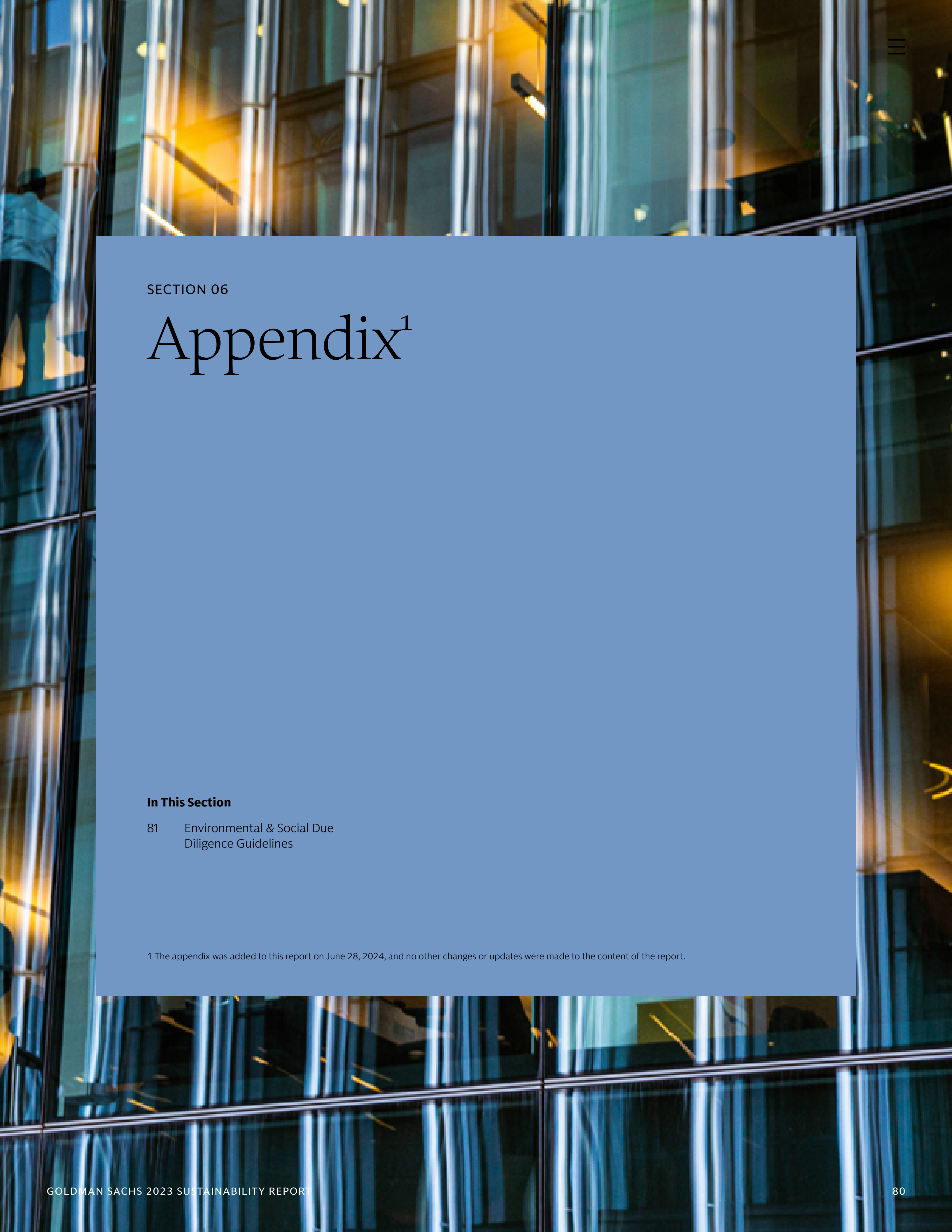
Topic	Accounting Metric	Code	Response
Commercial Banks			
Data Security	Description of approach to identifying and addressing data security risks	FN-CB-230a.2	Please refer to our Client Security Statement, which provides an overview of the firm's approach to information security and its practices to secure data, systems and services, similarly aligned around the five functions of the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF).
Financial Inclusion & Capacity Building	(1) Number and (2) amount of loans outstanding qualified to programs designed to promote small business and community development	FN-CB-240a.1	As of December 2023, our Urban Investment Group had $0.93 billion of debt assets outstanding from 102 transactions and $4.1 billion of equity assets outstanding from 244 transactions. See our Urban Investment Group's website for further information. Please also refer to our programs *10,000 Small Businesses*, which provides entrepreneurs in the US and UK access to education, capital and business support services, and *10,000 Women*, a global initiative providing women entrepreneurs with a business and management education, mentoring and networking, and access to capital.
	Number of participants in financial literacy initiatives for unbanked, underbanked or underserved customers	FN-CB-240a.4	Please refer to our *One Million Black Women*: *Black in Business* program, which is dedicated to equipping sole proprietors with the tools necessary to turn their business potential into business growth.
Incorporation of ESG Factors in Credit Analysis	Commercial and industrial credit exposure, by industry	FN-CB-410a.1	Credit Exposure from firmwide Corporate Loans and Lending Commitments by Industry: Consumer & Retail: 12% Diversified Industrials: 20% Financial Institutions: 9% Funds: 3% Healthcare: 10% Natural Resources & Utilities: 16% Real Estate: 7% Technology, Media & Telecom.: 21% Other (incl. Special Purpose Vehicles): 2% Please see page 113 of our ***2023 Form 10-K*** for further information.
	Description of approach to incorporation of environmental, social, and governance (ESG) factors in credit analysis	FN-CB-410a.2	Environmental Policy Framework Please see page 7 of our ***2023 TCFD Report***, which outlines the integration of climate risk into our risk program.
	(1) Number and (2) value of loans by segment: (a) personal, (b) small business and (c) corporate	FN-CB-410a.2	The table below presents firmwide information by loan type: Corporate: $35.9B Commercial Real Estate: $26.0B Residential Real Estate: $25.4B Securities-Based: $14.6B Other Collateralized: $62.2B Installment: $3.3B Credit Cards: $19.4B Other: $1.6B Please see page 168 of our ***2023 Form 10-K*** for further information.

Thematic Index for Our Existing Sustainability Disclosures

Goldman Sachs has been providing voluntary sustainability-related disclosures for the better part of two decades, beginning with our first Environmental Report in 2006. We have since advanced our voluntary disclosures to meet the growing set of investor expectations, beginning with our first SASB disclosure in 2019, and our inaugural Task Force on Climate-Related Financial Disclosures in 2020. As investor expectations for voluntary sustainability disclosures continue to evolve, this year we provide a thematic index below that maps disclosures from this report as well as other existing disclosures to the four core content areas of interest to investors, including Governance, Strategy, Risk Management, and Metrics and Targets.

As the sustainability reporting landscape continues to change, we plan to continue providing transparency and comparability of decision-useful sustainability-related information to our investors.

Core Content Areas for Investors	2023 Sustainability Report Content Areas	Other Existing Disclosures
Governance	• Governance (pages 59–61)	• ***Public Responsibilities Committee*** • ***Risk Committee*** • ***Proxy Statement for 2024 Annual Meeting of Shareholders*** (pages 8–30) • ***Goldman Sachs 2023 TCFD Report*** (pages 9–12)
Strategy	• Our Sustainable Finance Strategy (pages 9–13) • Our Sustainable Finance Framework (page 14) • Thematic Opportunities With Clients and Partners (pages 16–57)	• ***Form 10-K*** (pages 7–8) • ***Proxy Statement for 2024 Annual Meeting of Shareholders*** (pages 32–34)
Risk Management	• Risk Management (pages 62–63)	• ***Goldman Sachs 2023 TCFD Report*** (pages 35–42)
Metrics and Targets	• Progress Toward Our Firmwide $750 Billion Sustainable Finance Commitment (pages 15, 66–67) • Progress Toward Our 2030 Sectoral Targets (page 68) • Progress Toward Our Operational and Supply Chain Commitments (pages 69–73) • SASB Metrics (page 74–78)	• ***Goldman Sachs 2023 TCFD Report*** (pages 43–51)



SECTION 06

Appendix[1]

In This Section

81 Environmental & Social Due Diligence Guidelines

1 The appendix was added to this report on June 28, 2024, and no other changes or updates were made to the content of the report.

Environmental & Social Due Diligence Guidelines

The firm's position on environmental and social risk due diligence was previously captured within a section of a broader environmental policy framework document that also included historical sustainability initiatives across our operations, business activities, research, and governance. Going forward the relevant risk-based due diligence guidelines will be regularly reviewed and incorporated into our core sustainability reporting.

Goldman Sachs undertakes a robust review process to assess environmental and social considerations, as well as related risks including credit, operational, regulatory, or reputational risks, in our transaction due diligence processes. The firm equips business teams with environmental and social due diligence guidelines for key sectors, as well as guidelines for certain cross-sector issues. Advisory, financing, and direct investing teams seek to integrate environmental and social due diligence as part of their normal course, risk-based due diligence requirement, where relevant.

While there are some activities Goldman Sachs generally will forgo due to the risks they present, the firm makes decisions, including for any such activities, on a case-by-case basis considering, among other things, all applicable laws as well as credit, operational, regulatory, and reputational risks. The following is a non-exhaustive list of such activities that the firm will generally forgo.

- Financing of any potential transactions where there is credible evidence of child labor, forced labor or human trafficking.
- Financing of any projects or initiation of loans where the specified use of proceeds would significantly convert or degrade a critical natural habitat.
- Financing of extractive projects, commercial logging or other environmentally sensitive projects in prescribed UNESCO World Heritage sites.
- Financing of projects that contravene any relevant international environmental agreement which has been enacted into the law of, or otherwise has the force of law in, the country in which the project is located.
- Financing of companies or projects that collude with, or are engaged in, illegal logging or utilize illegal or uncontrolled fire for forestry (including logging and primary processing of forest products) or palm oil transactions.
- Financing that directly[1] supports the development of new coal fired power generation unless it has carbon capture and storage or equivalent carbon emissions reduction technology ("CCS").
- Financing that directly supports new thermal coal mine development or any mountaintop removal mining.
- Financing that directly supports new upstream Arctic oil exploration or development.

1 "Directly" is defined as project specific financings or general corporate financings where there is dedicated capital expenditure that is specified in the use of proceeds for the activity.

Additional Sector Guidelines

In addition, we apply enhanced due diligence to transactions in the following sectors.

Chemicals

As part of our enhanced due diligence for transactions where the use of proceeds is related to new production, transport or storage of chemicals, we will conduct a review of the type of chemical and potential risks and the company's environmental, health and safety track record. In addition to standard due diligence items, we will examine whether the company's production process requires the use, handling, transport, storage or disposal of hazardous chemical materials. We will also consider the company's policies and procedures in place to prevent exposure to hazardous chemicals in addition to emergency preparedness and response plans in the event of significant fire, explosion or spills. We will review the company's impact on resources, including energy and water. In addition, we will consider whether the company's production process generates significant air emissions (e.g., sulfur dioxide, nitrogen oxide, PM10, volatile organic compounds, etc.) or emissions with significant cumulative impacts on local air quality.

Infrastructure & Transportation

As part of our enhanced due diligence for financing transactions relating to transportation and infrastructure projects, including the development and expansion of roads and railways, ports, harbors and airports, we consider the environmental and social impacts.

For transactions where potentially significant effects on local communities are identified, we will examine our clients' engagement process. In cases where there is large-scale resettlement, we will closely evaluate the stakeholder engagement process and, if appropriate, work with the client to improve aspects such as compensation measures and/or community engagement.

Water

As part of our enhanced due diligence for new water and wastewater infrastructure projects, we expect companies to have conducted a comprehensive environmental and social impact assessment, addressed potential multi-national concerns and conflicts on a regional or international level and have a commitment to mitigate significant impacts to those who may be adversely affected. We will also consider companies' plans to mitigate ecological and social impacts if water and wastewater treatment projects potentially impact fisheries, water flow and quality due to issues such as improper sewage discharge or reduced access to water resulting from diverted uses.

Additionally, for transactions where potentially significant effects on local communities are identified, we will examine our clients' stakeholder engagement process. In cases where there is large-scale resettlement, we will closely evaluate the stakeholder engagement process and, if appropriate, work with the client to improve aspects such as compensation measures and/or community engagement.

Forestry

As part of our enhanced due diligence for transactions related to forestry, we examine whether clients that process, purchase, or trade wood products from particularly high risk countries have systems in place to assess whether the wood they process, purchase or trade comes from legal sources. This includes understanding clients' supply chain monitoring systems and chain of custody certification.

We require clients to obtain or be working towards Forest Stewardship Council or a comparable certification when we finance forestry projects that impact high conservation value forests to promote the preservation of crucial forest ecosystems. For operations that are not already certified, we will introduce our clients to, or suggest to them, experts who can help establish a rigorous, time-bound, step-wise commitment to achieve certification within three years.

Palm Oil

As part of our enhanced due diligence for transactions related to palm oil, we require clients' compliance with all legal requirements, including in the case of Indonesia, the Indonesian Sustainable Palm Oil (ISPO) system.

We also require clients to obtain Roundtable on Sustainable Palm Oil (RSPO), or a comparable, certification. For operations that are not already certified, we will introduce our clients to, or suggest to them, experts who can help establish a rigorous, time-bound, step-wise commitment to achieve certification within three years.

Furthermore, we require clients to have a commitment to no net deforestation, no peatland development and no human rights violations. Where this is not in place, we will introduce our clients to, or suggest to them, experts who can help establish such a commitment. Clients should have a plan in place to demonstrate compliance with this commitment.

Biofuels

As part of our enhanced due diligence for financing transactions related to biofuels, considerations include but are not limited to: type of feedstock; forest and natural habitat conversion and impacts to High Conservation Value Forests; illegal logging; illegal and uncontrolled fire; impacts to communities and indigenous peoples; unacceptable labor practices that disregard international regulations; and lifecycle greenhouse gas emissions of a biofuels project.

Mining, Coal & MTR

As part of our enhanced due diligence for financing transactions that directly pertain to the development of new mine resources, we will review the company's compliance with all local laws and permitting, environmental and social impact assessment and management plan, use of freshwater resources and community impacts. Where appropriate, we will encourage our clients to follow best practice guidelines, such as the principles developed by the International Council on Mining and Metals (ICMM).

For transactions involving coal mining globally, we apply enhanced due diligence, including consideration of the following factors: companies' environmental, health and safety (EHS) track records; siting and ecological impacts; regulatory compliance and ability to meet international best practices where local regulation is lagging; litigation, violations, and citations; remediation methods; impact on water quality; and local community and human rights issues.

For financings involving any companies that derive a significant portion of their revenue from thermal coal mining production, we will engage with them to understand their strategy to diversify away from thermal coal mining and reduce overall carbon emissions from their operations and products. Companies' diversification strategy and carbon emissions reduction initiatives will be a key consideration in our evaluation of future financings with the goal of helping their transition strategy. We will phase out our financing of thermal coal mining companies that do not have a diversification strategy within a reasonable timeframe.

Conventional Oil & Gas

As part of our enhanced due diligence for financings that can facilitate the development of new conventional oil & gas reserves or related infrastructure, considerations include but are not limited to: pollution (potential for releases of petroleum, wastewater or hazardous substances); risks related to deep water drilling operations; EHS track record and experience of the operator; governance (including the ways in which beneficiary governments utilize oil revenues); ecological and social impacts; potential impacts on indigenous peoples; and companies' strategies and commitments to reducing overall greenhouse gas (GHG) emissions.

Unconventional Oil & Gas

As part of our enhanced due diligence for financings that can facilitate the development of new unconventional oil & gas and hydraulic fracturing, considerations include but are not limited to: companies' care taken on location and site selection; well construction method, including integrity of casing and cementing; management of ongoing operations, including well flow and pressure monitoring; integrated water management, including groundwater testing, water withdrawal, wastewater management; fracking fluid usage and disclosure; air emissions management, including fugitive methane emissions and use of flaring and venting; engagement with and mitigation of impacts on the local community; and companies' strategies and commitments to reducing overall GHG emissions.

Oil Sands

As part of our enhanced due diligence for transactions relating to oil sands, considerations include but are not limited to: energy use and greenhouse gas emissions; environmental impacts related to integrated water and waste management; forest and biodiversity preservation; potential local community impacts, including in Canada those relating to Canada's First Nations people; and companies' strategies and commitments to reducing overall GHG emissions.

Arctic Oil

As part of our enhanced due diligence for transactions relating to Arctic oil, considerations include but are not limited to: energy use and GHG emissions; environmental impacts; emergency management plans; forest and biodiversity preservation; endangered species protection and management plans; potential local community impacts, including those relating to Indigenous Peoples and subsistence resources; and companies' strategies and commitments to reducing overall GHG emissions.

Coal Fired Power Generation

As part of our enhanced due diligence for financings involving power sector companies that derive a significant portion of their generation from coal, we will engage with the companies to understand their strategy to diversify away from coal and reduce overall carbon emissions, with the goal of supporting their low carbon transition.

Gas Fired Power Generation

As part of our enhanced due diligence for financing opportunities for new natural gas-fired power generation, considerations include but are not limited to: possible community health, safety and environmental considerations that could result from combustion, ecological and social sensitivities pertaining to development; community impacts and siting; and water used for cooling and discharge associated with natural gas boilers and combined cycle systems.

Hydroelectric Power

As part of our enhanced due diligence for financings that pertain to new large-scale hydropower, we will review the project's environmental and social impact assessment to understand whether the new development occurs in a responsible and sustainable manner. If appropriate, we will also refer our clients to best practice guidelines such as the International Hydropower Association (IHA)'s Sustainability Assessment Protocol. For certain transactions where there could be material effects on local communities, we expect our clients to demonstrate an appropriate stakeholder engagement process. In cases where there is large-scale resettlement, we will closely evaluate the stakeholder engagement process and, if appropriate, work with the company to improve aspects such as compensation measures and/or community engagement.

Nuclear

As part of our enhanced due diligence for financings relating to new nuclear power, considerations include but are not limited to: EHS track record and governance; procedures around safe waste management practices; the secure transport, storage and handling of nuclear material; the host country's legal, regulatory and safety framework; risks around terrorism and proliferation of nuclear weapons; proximity to seismic zones; fuel supply and water usage; and any possible community impacts and opposition.

Cross-Sector Guidelines

Human Rights and Indigenous Peoples

We recognize that environmental and social issues are often linked. We have a responsibility to help protect, preserve and promote human rights around the world. Our ***Business Principles*** and our ***Code of Business Conduct and Ethics*** also play an important role in determining our responsibilities as corporate citizens, and help to inform our business selection process and guide our business decisions and judgments. See the ***Goldman Sachs Statement on Human Rights*** and the latest ***Goldman Sachs Statement on Modern Slavery and Human Trafficking***.

As part of our enhanced due diligence for transactions where the use of proceeds may have the potential to directly impact indigenous peoples, we expect our clients to demonstrate alignment with the objectives and requirements of IFC Performance Standard 7 on Indigenous Peoples, including free, prior and informed consent. We also expect our clients to demonstrate an appropriate stakeholder engagement process for certain transactions where potentially significant effects on local communities are identified. In cases where there is large-scale resettlement, we will closely evaluate the stakeholder engagement process and, if appropriate, work with the company to improve aspects such as compensation measures and/or community engagement. Considerations include but are not limited to: companies' human rights and indigenous peoples policies; avoidance of relocation or impacts on traditional lands, food security, water and other essential resources, and/or sites with significant cultural or spiritual importance (in cases where avoidance is not feasible, mutually agreed remediation actions and compensation); stakeholder engagement processes and management plans (e.g., stakeholder mapping, consultation with sufficient time for decision making, communication in a culturally appropriate manner, adequate representation of vulnerable groups within impacted communities); and operational grievance and monitoring mechanisms.

The Environmental & Social Due Diligence Guidelines reflect Goldman Sachs' independent approach to certain transactions that have been identified as high risk, presenting significant environmental and social concerns, as well as risks including credit, operational, regulatory, and/or reputational risk, as of June 28, 2024. This document provides general information regarding a number of policies, procedures, and positions and is subject to change without notice. The firm does not undertake to update any such information.

Goldman Sachs

Sustainability Issuance Report 2023

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SECTION 01

Introduction

Over the past two decades, sustainable finance has become increasingly important to our firm's business strategy of creating long-term value for our clients, our firm and our shareholders. As part of this strategy, we announced our firmwide 10-year, $750 billion sustainable finance commitment in 2019 to support client demand for sustainable finance solutions across our financing, investing and advisory work with clients.

We've continued to advance our commitment to enhance and expand sustainable finance expertise across our business segments, and launched our inaugural Sustainability Bond and Goldman Sachs Sustainability Issuance Framework in 2021. This year, we are providing an update on our comprehensive 2023 sustainability issuances.

Our strategy is organized around two sustainability themes — Climate Transition and Inclusive Growth. Through these two key themes and nine underlying sub-themes, we expect to facilitate the greatest impact through our commercial work with clients and strategic partners. Our Sustainability Bonds and Goldman Sachs Sustainability Issuance Framework are aligned with these same themes. The framework expands upon our firmwide commercial model of facilitating capital movement and supporting innovation that encourages progress on climate transition and inclusive growth, and it builds upon years of experience designing and helping clients issue Green, Social, and Sustainability financial products.

As an advisor, financier, and investor, we leverage the full range of our expertise and services as we look to help our clients develop innovative sustainability solutions. From supporting sustainable infrastructure projects to investing in companies helping to power critical innovation in clean energy and in underserved communities, we continue to remain focused on our ability to help deploy capital. With a keen eye toward achieving a more sustainable future, we seek to help create a thriving future for our clients, our firm and our communities.

Overview of Sub-Themes

Climate Transition

Clean Energy
Enable renewable energy generation, energy efficiency, and grid services.

Sustainable Transport
Shift modes of transit through electric vehicles, connected services, autonomous driving, and public transportation development.

Sustainable Food and Agriculture
Enable green agricultural production, storage, processing, and distribution to feed the world.

Waste and Materials
Promote sustainable production and consumption, along with responsible waste management.

Ecosystem Services
Contribute to the sustainable management of natural resources and monetize the value of forests, water, and biodiversity.

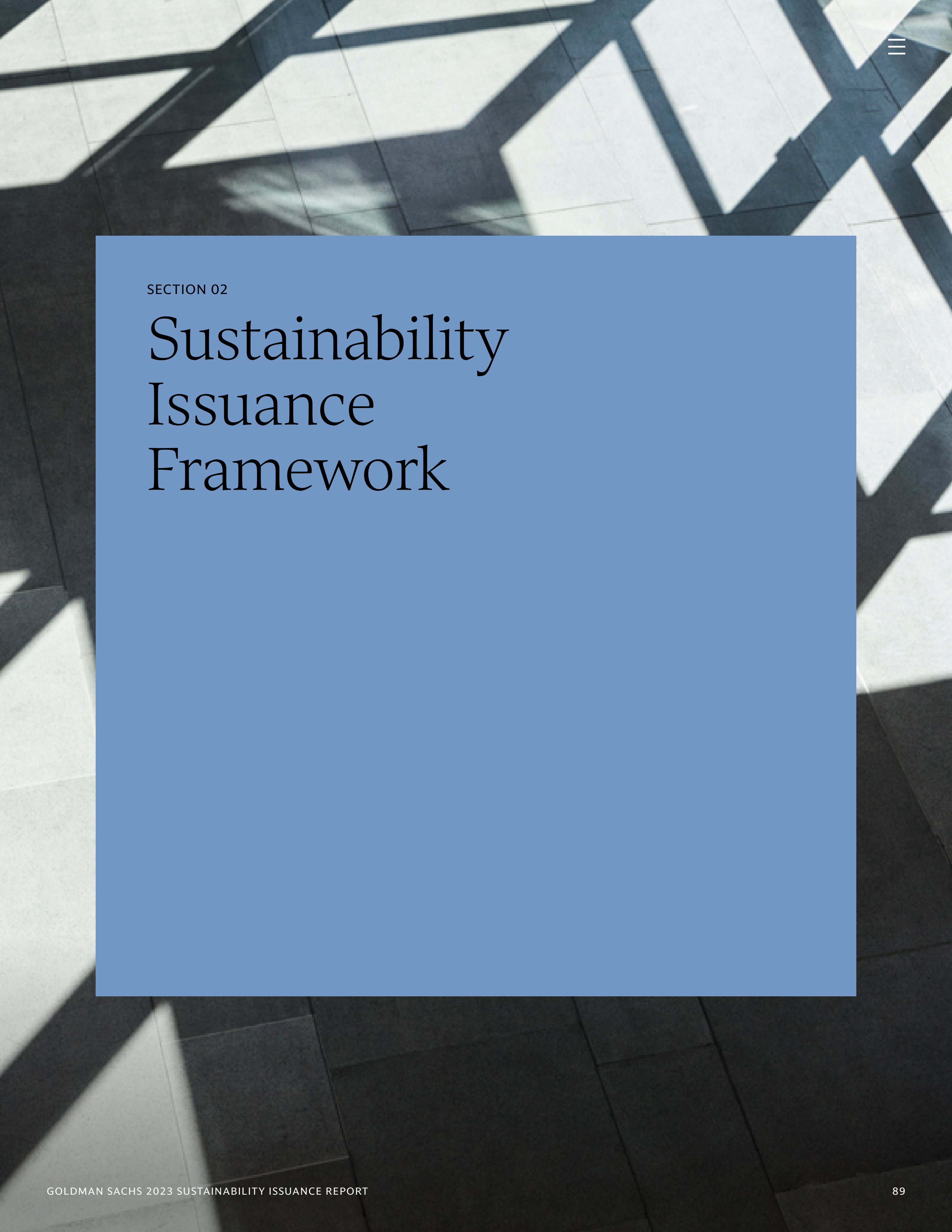
Inclusive Growth

Accessible and Innovative Healthcare
Enable the use of digital technology, advanced devices, and diagnostics for better outcomes.

Financial Inclusion
Advance financial inclusion for all, including underserved populations, by promoting access to capital, financial technology, and products that increase access, support financial health, and drive more equitable economic growth.

Accessible and Affordable Education
Enable greater access to education, improve learning outcomes, and help close opportunity gaps for learners of all ages.

Communities
Enable infrastructure development, affordable housing, and livelihood advancement.



SECTION 02

Sustainability Issuance Framework

Governance

As a baseline, all projects and assets under consideration for financing must meet the standards set by our environmental and social risk management procedures, including the ***Goldman Sachs Environmental Policy Framework***, which provides guidance on financing in certain environmentally and socially sensitive sectors. The firm's risk management covers broader risk factors such as potential legal and regulatory risks.

The Sustainable Asset Working Group consists of senior cross-divisional stakeholders from the Sustainable Finance Group, Investor Relations, Corporate Treasury, Legal, Controllers, Compliance, and relevant business teams. This group reviews and confirms eligible projects and assets for funding with proceeds from Green, Social or Sustainability issuances. It also serves as an internal control group to help ensure accuracy and accountability for our firmwide $750 billion sustainable finance commitment.

Proceeds from our Green, Social, or Sustainability issuances are used to finance new projects or assets that meet the criteria of the respective type of issuance, and we aim to allocate all proceeds within two years following the issuance. Additionally, loans and investments made up to one year prior to the issuance that qualify under the relevant criteria are also eligible for refinancing with its proceeds.

For further information on eligibility and exclusion criteria for our Green, Social, and Sustainability issuances, please refer to our ***Goldman Sachs Sustainability Issuance Framework***.

Reporting

For our sustainability-related commitments, we are committed to measuring and providing transparency on our progress. Annual updates on the allocation of the proceeds under the Goldman Sachs Sustainability Issuance Framework will include details on the expected and realized qualitative — and, where possible — quantitative environmental and social impacts. Reports will continue to be published on our website annually until the proceeds of all outstanding sustainable instruments are fully allocated to eligible assets.

External Assurance

Goldman Sachs engaged an independent accountant to provide external assurance on the total net proceeds of $537,181,760, the total gross issuance amount of $543,286,810, and the total allocated funds of $578,259,084. The Report of Independent Accountants is included herein.

The total allocated funds of approximately $578 million exceed both the gross issuance size of approximately $543 million and the gross issuance size net of underwriting fees of approximately $537 million to ensure issuance proceeds are fully allocated.

By the Numbers

Progress Related to 2023 Issuances

2023 Allocation of Funds by Region

Geography	Amount ($M)
Americas	$563
EMEA[1]	$15
Total[2]	**$578**

2023 Allocation of Funds by Impact Theme

Impact Theme	Amount ($M)
Communities	$563
Clean Energy	$5
Sustainable Transport	$10
Total	**$578**

KPI Reporting[3]

8

sustainability issuances

~$543M

of sustainability issuances[4]

Clean Energy

~1M MWh

of annual targeted renewable fuel capacity in development[5]

Communities

~10,700

affordable housing units built or rehabilitated[6,7]

Communities

~$200M

of small/midsized businesses loan funding[8]

1 EMEA represents Europe, Middle East and Africa.
2 The total allocated funds of approximately $578 million exceed both the gross issuance size of approximately $543 million and the gross issuance size net of underwriting fees of approximately $537 million to ensure issuance proceeds are fully allocated.
3 Key performance indicators (KPIs), as provided directly by the relevant companies, represent aggregate metrics across the newly allocated investments and loans where data was available and singular metrics where aggregation was not possible or practicable. KPIs are provided where possible based on information access depending on deal structure as well as confidentiality considerations.
4 Represents gross issuance size. Issuance size net of underwriting fees results in net proceeds of approximately $537 million.
5 Represents a projection for the expected amount of energy to be produced (MWh). "MWh" represents megawatt-hours.
6 Affordable housing is defined in this context as housing that is affordable to tenants earning up to 80% of the area median income.
7 Represents the number of affordable housing units that Goldman Sachs provided financing for the construction and/or rehabilitation of and may still be under development.
8 Small/midsized businesses are defined as businesses having approximately between five and 25 employees.

For additional details on eligibility criteria associated with relevant green and social project categories, please refer to our ***Sustainability Issuance Framework***.

The distribution of impact themes, regional footprint, and supporting KPIs are dependent on investment activity in the given year(s) from which on-balance-sheet investments are selected for allocation toward the issuance. Therefore, these attributes may change meaningfully from year to year.

SECTION 03

Sustainability Issuances

Sustainability Issuances[1,2]

Throughout 2023, Goldman Sachs issued the equivalent of approximately $543 million of sustainability issuances, with proceeds fully allocated to new investments and loans.

Eligible categories are based on our nine key impact themes that are the foundation to our overarching 10-year, $750 billion sustainable finance commitment.

Total Breakdown

Over the course of 2023, and as of December 31, 2023, Goldman Sachs has issued the equivalent of $543,286,810 in sustainability issuances ($537,181,760 net of underwriting fees).

Funding Allocation

Issuance Date	Currency	Issuance Size	Issuance Size USD Equivalence[3]	Maturity Date	ISIN
Jan 6, 2023	EUR	150,000,000	$159,000,000	Jun 10, 2033	FR001400DM05
Mar 14, 2023	EUR	1,483,000	$1,586,810	Apr 21, 2031	XS2423171904
May 5, 2023	EUR	220,000,000	$242,000,000	Aug 10, 2028	FR001400G529
May 26, 2023	EUR	50,000,000	$53,500,000	Oct 6, 2033	FR1459AB0027
Jul 27, 2023	EUR	30,000,000	$33,000,000	Nov 7, 2033	FR1459AB0084
Aug 22, 2023	MXN	200,000,000	$12,000,000	Aug 13, 2030	XS2671188840
Oct 9, 2023	EUR	30,000,000	$31,500,000	Dec 28, 2033	FR1459AB1439
Nov 8, 2023	EUR	10,000,000	$10,700,000	Oct 16, 2026	XS2692315133
Total Gross Issuance			**$543,286,810**		
Total of Net Proceeds			**$537,181,760**		

1 All $ figures on the remaining pages of this section are in millions unless otherwise noted.
2 To ensure issuance proceeds are fully allocated, the total amount of investments and loans allocated funding exceeds the total amount raised through each issuance. $543,286,810 represents gross issuance size. Gross issuance size net of underwriting fees is $537,181,760; however, proceeds have been allocated by the firm to investments and loans based on gross issuance size.
3 USD equivalent amount uses spot foreign exchange rate on issuance date.

First Sustainability Issuance

On January 6, 2023, Goldman Sachs issued €150 million ($159 million) 10NC4 autocallable notes.
Funding has been allocated to $164.6 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$164.6		$164.6
Total	**$164.6**		**$164.6**

Second Sustainability Issuance

On March 14, 2023, Goldman Sachs issued €1.5 million ($1.6 million) 8yr1m capped participation certificates.
Funding has been allocated to $8.7 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$8.7		$8.7
Total	**$8.7**		**$8.7**

Third Sustainability Issuance

On May 5, 2023, Goldman Sachs issued €220 million ($242 million) 5yr phoenix coupon notes.
Funding has been allocated to $242.3 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$227.3		$227.3
Sustainable Transport Related to: • Manufacturer of electric vehicle technology		$10.1	$10.1
Clean Energy Related to: • Biomethane plants in Europe		$4.9	$4.9
Total	**$227.3**	**$15.0**	**$242.3**

1 “Affordable housing” is defined in this context as housing that is affordable to tenants earning up to 80% of the area median income.

Fourth Sustainability Issuance

On May 26, 2023, Goldman Sachs issued €50 million ($53.5 million) 10NC1yr autocallable notes.
Funding has been allocated to $69.2 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$69.2		$69.2
Total	**$69.2**		**$69.2**

Fifth Sustainability Issuance

On July 27, 2023, Goldman Sachs issued €30 million ($33 million) 10NC2yr autocallable notes.
Funding has been allocated to $33.2 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$33.2		$33.2
Total	**$33.2**		**$33.2**

Sixth Sustainability Issuance

On August 22, 2023, Goldman Sachs issued Mex$200 million ($12 million) 7yr fixed rate notes.
Funding has been allocated to $17.3 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$17.3		$17.3
Total	**$17.3**		**$17.3**

1 "Affordable housing" is defined in this context as housing that is affordable to tenants earning up to 80% of the area median income.

Seventh Sustainability Issuance

On October 9, 2023, Goldman Sachs issued €30 million ($31.5 million) 10.25NC1yr memory phoenix autocallable notes. Funding has been allocated to $31.8 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1] • Small/midsized businesses loan funding[2]	$31.8		$31.8
Total	**$31.8**		**$31.8**

Eighth Sustainability Issuance

On November 8, 2023, Goldman Sachs issued €10 million ($10.7 million) 3yr forward bond to maturity note. Funding has been allocated to $11.2 million of eligible investments and loans.

Impact Theme	Americas	EMEA	Total
Communities Related to: • Affordable, multifamily residential, and mixed-use developments[1]	$11.2		$11.2
Total	**$11.2**		**$11.2**

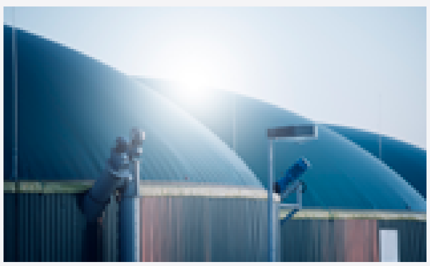
1 “Affordable housing” is defined in this context as housing that is affordable to tenants earning up to 80% of the area median income.
2 “Small/midsized businesses” are defined as businesses having approximately between five and 25 employees.

SECTION 04

Featured Investments

Climate Transition

At Goldman Sachs, we are committed to aligning our business with a net zero by 2050 pathway, and we seek to drive decarbonization in the real economy in partnership with our clients and companies that we invest in. Preventing negative impacts of climate change will require capital, innovation, and coordination across both the public and private sector as businesses across regions and sectors seek to implement low-carbon solutions — and communities everywhere adapt to an increasingly warming world.



CASE STUDY

Verdalia Bioenergy

Expanding European Biomethane Capacity

Goldman Sachs invested in Verdalia Bioenergy, which was established in 2023, as a new business focused on developing, acquiring, building, and operating biomethane plants across Europe with the aim of deploying at least €1 billion by the end of 2026. The company has a portfolio of development-stage biomethane projects in Spain with a total capacity of ~1 TWh/year (equivalent to ~3.4 million MMBtu),[1] with a strong pipeline of incremental opportunities. In addition, Verdalia has also expanded into Italy as a second country.

As part of the ongoing transformation of the global energy supply, alternative fuels such as biomethane — a negative or low-carbon natural gas produced through the anaerobic digestion of organic waste — can serve an important role. Biomethane is particularly relevant for Europe's decarbonization and energy security plans, given it provides the benefits of fossil fuel natural gas with lower-lifecycle carbon emissions, while being produced domestically and leveraging the large gas infrastructure already in place. The environmental benefits of biomethane are also amplified, as it prevents methane emissions that could otherwise be released into the atmosphere from the decomposition of organic waste.

CASE STUDY

Rimac Group

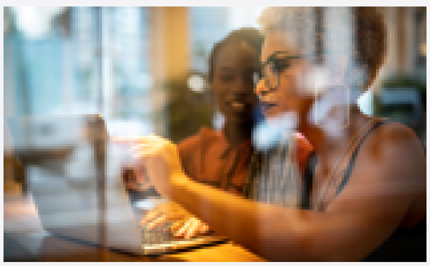
Building Efficient Batteries for Performance EVs

The Rimac Group manages the European Rimac companies that provide premium and luxury technology solutions in the mobility and energy sector. The Rimac Group owns 100% of Rimac Technology, which is a majority shareholder of the hypercar manufacturer Bugatti Rimac, and is invested in P3 Mobility. Rimac Technology is focused on the development and manufacturing of high-performance mobility battery systems, eAxles, and electrical control units that push boundaries in efficiency and performance for EVs, as well as battery energy storage systems. In cooperation with premium original equipment manufacturers, such as BMW, Rimac Technology is embarking on the next stage of development by delivering larger volumes of advanced battery systems. Our investment in Rimac Group centers on the secular tailwinds related to the mega-trend of EV adoption in Europe, coupled with a sizable, higher-margin market in the supply of critical components to premium and high-performance passenger vehicles.

1 "TWh" represents terawatt-hours and "Btu" represents British thermal units.

Inclusive Growth

We recognize that growth must be inclusive to be sustainable. As with the complexity of a transition to a low-carbon economy, the inclusive growth challenge is far from simple and cannot be solved by a single financial institution. Our approach combines over two decades of experience investing in underserved communities, on-the-ground knowledge from connecting with and listening to diverse communities, and partnerships to help drive solutions that can improve affordability, access and quality of life.



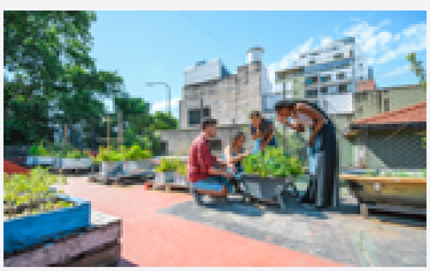
CASE STUDY

NOWAccount®

Helping Small Businesses Manage Short-Term Liquidity

Goldman Sachs provided, as part of our *One Million Black Women*[1] initiative, a $200 million loan facility to Now, an innovative payment solutions business that helps small B2B companies get paid immediately via their NowAccount®, so they can increase cash flow while eliminating the risk of late payments and nonpayment of invoices. Through this investment, Now aims to accelerate invoice payments to help small and often underresourced businesses such as Black women–owned businesses optimize their short-term liquidity needs so they can grow sustainably.

Now has formed strategic partnerships with organizations — including Initiative for a Competitive Inner City, Georgia Minority Supplier Development Council, Black Directory and Culture Genesis, among others — to increase its reach among Black women entrepreneurs.



CASE STUDY

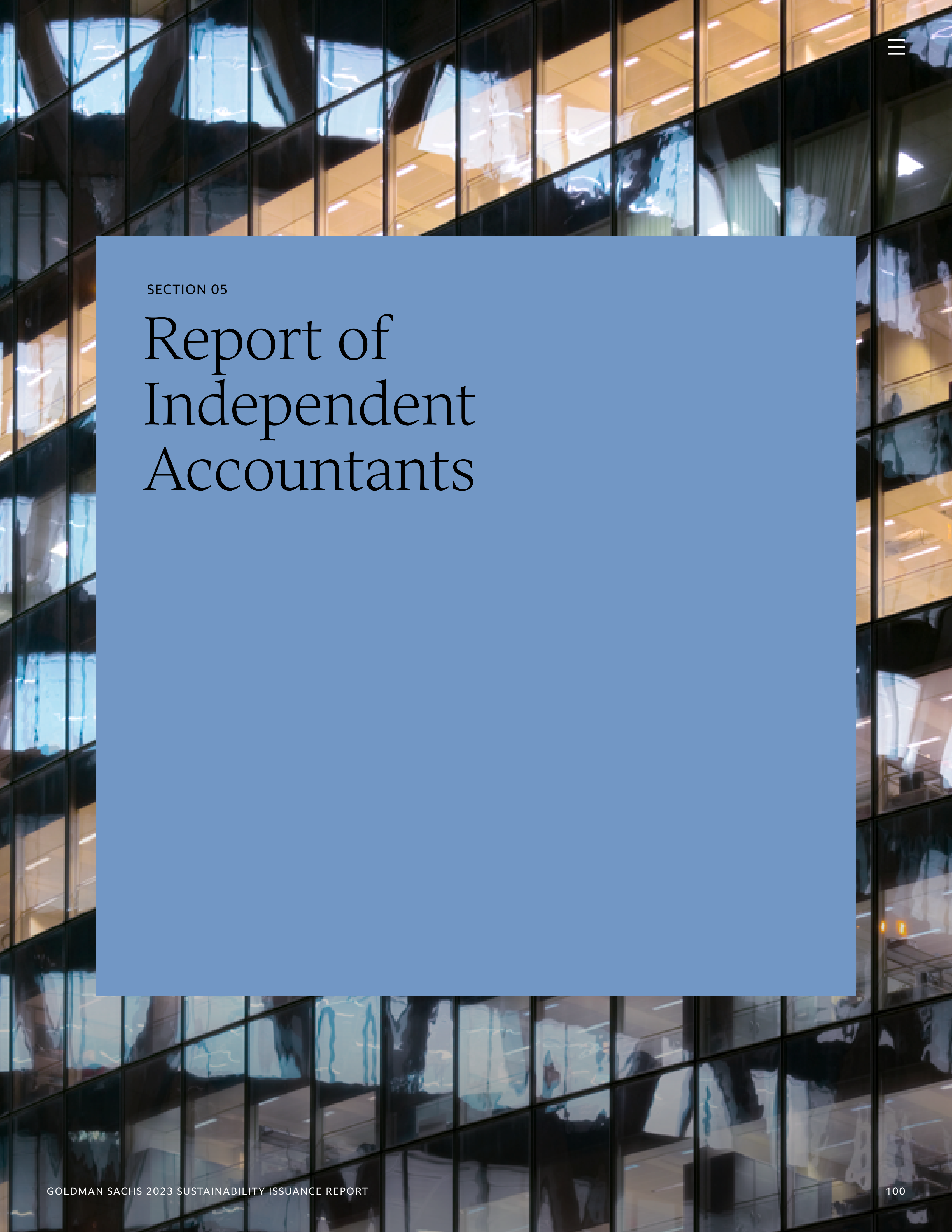
Clarkson Estates

Meeting Community Needs in Brooklyn, New York

In December 2023, CAMBA Housing Ventures, a New York City–based affordable and supportive housing developer, broke ground on a 328-unit affordable housing development in Prospect Lefferts Gardens in Brooklyn. The development includes 29,000 square feet of community facility space to host programming focused on economic development, including workforce training and childcare. The project was made possible by financing from Goldman Sachs, ***CAMBA***, ***CREA***, the ***Federal Home Loan Bank of New York***, the ***New York State Division of Homes and Community Renewal***, and the ***New York State Office of Temporary and Disability Assistance***.

In early 2023, Goldman Sachs committed $219.5 million as part of our *One Million Black Women* initiative to finance the project, which will set aside half of its units to house formerly homeless populations. The project is also part of New York State's Vital Brooklyn Initiative, a statewide program that aims to provide a holistic approach to community development for underserved communities in central Brooklyn.

1 Goldman Sachs *One Million Black Women* is a $10 billion investment strategy designed to help narrow opportunity gaps facing Black women across education, healthcare, housing and more.



SECTION 05

Report of Independent Accountants

Report of Independent Accountants

To the Management of The Goldman Sachs Group, Inc.

We have examined the management assertion of The Goldman Sachs Group, Inc. that the total net proceeds of $537,181,760, from the total gross issuance of $543,286,810, consisting of the net proceeds from:

(i) the January 2023 EUR 150.0 million ($159.0 million) autocallable notes due 2033;
(ii) the March 2023 EUR 1.5 million ($1.6 million) capped participation certificates due 2031;
(iii) the May 2023 EUR 220.0 million ($242.0 million) phoenix coupon notes due 2028;
(iv) the May 2023 EUR 50.0 million ($53.5 million) autocallable notes due 2033;
(v) the July 2023 EUR 30.0 million ($33.0 million) autocallable notes due 2033;
(vi) the August 2023 MXN 200.0 million ($12.0 million) fixed rate notes due 2030;
(vii) the October 2023 EUR 30.0 million ($31.5 million) memory phoenix autocallable notes due 2033; and
(viii) the November 2023 EUR 10.0 million ($10.7 million) forward bond to maturity note due 2026,

were used to finance or refinance, in whole or in part, investments made and loans entered into in relation to eligible green and social projects to which there were total allocated funds of $578,259,084 during the period from within one year prior to each issuance through December 31, 2023, based on the assessment criteria described in the Section of this *Sustainability Issuance Report 2023* entitled *Sustainability Issuances*. The Goldman Sachs Group, Inc.'s management is responsible for its assertion. Our responsibility is to express an opinion on management's assertion based on our examination.

Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants (AICPA). Those standards require that we plan and perform the examination to obtain reasonable assurance about whether management's assertion is fairly stated, in all material respects. An examination involves performing procedures to obtain evidence about management's assertion. The nature, timing, and extent of the procedures selected depend on our judgment, including an assessment of the risks of material misstatement of management's assertion, whether due to fraud or error. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

We are required to be independent and to meet our other ethical responsibilities in accordance with relevant ethical requirements related to the engagement.

Only the total net proceeds of $537,181,760, total gross issuance of $543,286,810, total allocated funds of $578,259,084 and the related criteria described in the Section of this *Sustainability Issuance Report 2023* entitled *Sustainability Issuances* is part of the management assertion of The Goldman Sachs Group, Inc. and our examination engagement. The other information in the *Sustainability Issuance Report 2023* and *Goldman Sachs 2023 Sustainability Report* has not been subjected to the procedures applied in our examination engagement, and accordingly, we make no comment as to its completeness and accuracy and do not express an opinion or provide any assurance on such information.

In our opinion, management's assertion is fairly stated, in all material respects.

PricewaterhouseCoopers LLP

New York, New York
April 26, 2024

PricewaterhouseCoopers LLP, 300 Madison Ave, New York, NY
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