

Impact Study

Chile Data Center

2024



Google's Data Center Impact in Chile

Google's data center in Chile is helping support the growing digital economy. It is what you rely on to pull up a map to a new restaurant, attend online classes, or access your healthcare records.

Google's digital infrastructure investments in Chile drive local economic development through job creation, promote environmental stewardship through carbon-free energy production, and foster thriving communities.

Google has been part of Chile's digital infrastructure since 2015. This Impact Study provides a summary of key economic, environmental, and social metrics that Google's digital infrastructure investments have had on Chile in recent years.

Economic

Google's investments in digital infrastructure in Chile support jobs in construction, engineering, and the service industry. Google's data center contribution to labor income in Chile is equal to supporting **~4,790 households in the country each year**.

CLP ~191,554M¹

Annual contribution to Chile's GDP² (2021-2023)

~5,520

Annual jobs supported (2021-2023)

Environmental

As part of Google's commitment to operate all of its data centers using carbon-free energy by 2030, Google signed a contract in 2019 with AES Chile to **bring 125 MW of wind and solar energy to its data center**.

91% (2023) | 90% (2022)

Percentage of electricity matched with carbon-free energy^{3,4} supply at every hour of every day at Google's data center in Chile

Social

Google's community investments include support to the Young Science Foundation's Science Bus which helped empower 2,000 students, **generating a CLP ~3,530⁵ social benefit for every Google-invested dollar** and fostering a more digitally skilled future workforce in Chile.

CLP ~636M⁶

Invested in Chile communities surrounding Google's data center in 2022 and 2023

This report provides a summary of Google's data center impact. The overall impact of all Google operations is significantly larger, encompassing contributions beyond data centers, including economic benefits from its platforms, products, and services used across various sectors.

Notes: 1. Equivalent to USD ~233 Million. 2. GDP stands for gross domestic product. 3. Google defines carbon-free energy (CFE) as any type of electricity generation that doesn't directly emit carbon dioxide, including (but not limited to) solar, wind, geothermal, hydropower, and nuclear. Sustainable biomass and carbon capture and storage (CCS) are special cases considered on a case-by-case basis, but are often also considered carbon free energy sources. 4. Google's CFE is influenced by various factors, such as overall electricity usage, purchases of carbon-free energy, technological advancements, and changes in the broader energy landscape. 5. Equivalent to USD ~4. 6. Equivalent to USD ~744K.

Economic Impact: 2021-2023^{1,2}



CLP ~191,554M³

Annual Contribution
to Local GDP

*Includes⁴ CLP ~77,811M direct,
CLP ~60,021M indirect, and CLP
~53,721M induced*



~5,520

Annual
Jobs Supported⁵

*Includes ~360 direct jobs, ~3,375
indirect, and ~1,785 induced*



CLP ~75,103M⁶

Annual
Labor Income

*Includes⁷ CLP ~16,734M direct,
CLP ~39,141M indirect, and CLP
~19,228M induced*

Google's contribution to Chile's GDP increased by ~13% between 2021 and 2023, compared to the country's overall GDP growth of ~3% during the same period.

Google's data center contribution to direct, indirect, and induced labor income in Chile is equal to supporting ~4,790 households in the country each year.

Top GDP Contributions⁸



Professional, scientific, and technical services⁹

(22% of Total GDP Contribution from Google's investments in Chile)



Construction
(12%)



Utilities
(10%)

Spotlight: Entrepreneurship

As part of Google's Data Center Community Impact Program, Google funded Kodea Foundation's Emprendedoras Conectadas, an initiative that has provided free digital skills and AI training to 878 women entrepreneurs, equipping them with critical tools to grow their businesses. The program also seeks to create a community to help expand their networks and share information.

Direct: includes Google employees and contractors (incl. their payroll and benefits) and annual spend on Google's suppliers

Indirect: includes Google's suppliers' employees and contractors, the suppliers' payroll and benefits due to Google orders, and suppliers spend

Induced: includes impact generated by the household spending of Google's employees and their suppliers in their local economies

Notes: 1. Numbers were converted into local currency using the average 2021-2023 exchange rate (IMF). 2. GDP and labor income rounded to the nearest one-million; Jobs and household numbers rounded to the nearest multiple of five. 3. Equivalent to USD ~233 Million. 4. Equivalent to USD ~95 Million direct, USD ~73 Million indirect, and USD ~65 Million induced. 5. Google's support to jobs includes construction, engineering, networking, renewable energy jobs, security, and services, among others. 6. Equivalent to USD ~91 Million. 7. Equivalent to USD ~20 Million direct, USD ~48 Million indirect, and USD ~23 Million induced. 8. Top GDP contributions detail the three largest contribution areas and are not meant to total to 100%. 9. Includes computer systems, data processing, software services, and other computer-related facility management support, etc.

Environmental Impact: 2022 & 2023^{1,2}

91% (2023) vs. 61% (2023 Regional Grid)

90% (2022) vs. 53% (2022 Regional Grid)

24/7 Carbon-Free Energy (CFE)

Google has matched 100% of its global annual electricity consumption with renewable energy purchases, and has further committed to operating at 24/7 CFE by 2030. This means matching electricity demand with CFE supply every hour of every day.

1.09 (2023)

1.09 (2022) vs. 1.58 (industry average)

Avg. Power Usage Effectiveness

Compared to the industry average, Google's Chile data center is achieving an 84% reduction in overhead power usage. For every watt of power used to run servers and network equipment, only 0.09 watts are used to run supporting infrastructure like cooling and lighting.

Spotlight: Carbon-Free Energy

To advance Google's 24/7 CFE commitment, Google signed a contract in 2019 with AES Chile to bring 125 MW of clean energy to its data center, as part of a hybrid wind and solar portfolio.

The project, which added 23 new wind turbines, was expected to enable the data center in Chile to operate at above 80% carbon-free energy.

"Our long-standing data center efficiency efforts are important because our data centers represent the vast majority of our direct electricity use. Google's [global] data center consumption was more than 24 TWh in 2023 which translates to approximately 7-10% of global data center electricity consumption."

- 2023 & 2024 Google Environmental Reports

398.2M Liters (2023)

392.2M Liters (2022)

Water Consumption

The amount of water used is equivalent to irrigating less than one golf course annually in both 2023 and 2022. Google strives to protect water quality and ecosystem health in the communities where it operates, including Chile.³

Sustainability Spotlight

In Chile, Google is partnering with the Bonneville Environmental Foundation and Kilimo to address freshwater supply strain from the Maipo River, which provides water for drinking and agriculture for 40% of Chile's population. Kilimo's solution uses satellite data, soil moisture readings, and weather information to provide farmers with real-time irrigation recommendations on an app.

Notes: 1. For more information on the environmental statistics, refer to the 2023 & 2024 Google Environmental Reports. 2. As applicable, the water consumption represents total water consumption across all data centers in the country; CFE and PUE are averages across data centers. 3. Google seeks to replenish 120% of the freshwater volume it consumes, on average, across its offices and data centers by 2030.

Social Impact: 2022 & 2023¹

CLP ~636M²

Given to communities
in 2022 and 2023

*Surrounding Google's data center
in Chile in addition to other
Google.Org programs³*



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Organizations supported
in 2022 and 2023

*Focused on education, workforce,
and community development,
among other areas*

CLP ~3,530⁴

Social benefit per
Google-invested dollar⁵

*Based on STEM educational
program⁶*

Google invested CLP ~636M² in Chile communities, including:

Environmental Stewardship

Since 2020, Google has given CLP ~334M⁷ to help clean and transform waste dumps into public spaces in Quilicura. This included:

- Partnering with Cultiva and working alongside 100 neighbors, students, municipal officials, and the indigenous Mapuche community to create an "urban forest" in Quilicura, complete with trails and educational signage.
- Partnering with the Municipality of Quilicura to support Ciudad Emergente's Clean and Safe Quilicura initiative which works to transform micro-dumps and informal solid waste dumps into public spaces. After a site is selected, participants from schools, communities, and companies come to clean the location. Shortly thereafter, the design is identified and validated with community members and others, before construction.

STEAM⁸ Programming

In 2022, Google gave CLP ~43M⁹ to support the Young Science Foundation's Science Bus, STEAM on Wheels program. This program empowers students who would otherwise not have access to STEAM programming:

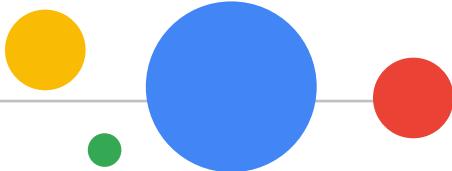
- Google's support to the mobile classroom helped bring STEAM curriculum to over 2,000 3rd and 4th grade Quilicura students, generating the social benefit referenced above.



"Science is important for learning and it helps us to cope with the difficulties of life. Thank you for considering us in this experience of working with the Science Bus, it gives us new knowledge."

-Gisell Aguilera, 4th grade student

Notes: 1. Numbers were converted into local currency using the average 2022-2023 exchange rate and rounded to the nearest one-million. 2. Equivalent to USD ~744K. 3. The amounts listed are in addition to other Google programs, like Grow with Google, Google.Org's Impact Challenge, and other initiatives. 4. Equivalent to USD ~4. 5. This calculation is directional and represents Google's step toward understanding social value associated with its community investments. 6. Calculation based on the Young Science Foundation's Science Bus STEAM on Wheels program. 7. Equivalent to USD ~390K. 8. STEAM stands for science, technology, engineering, art, and mathematics. 9. Equivalent to USD ~50K.



The Google Differentiator

Google recognizes that its data center operations and value chain can be engines of economic, environmental, and social progress. Google aims for its investments to catalyze positive spillover effects within Chile.

Google thinks about its investments holistically.

Google recognizes that it can catalyze greater impact when it looks at its economic, environmental, and social efforts collectively, which is why Google's 2024 Impact Study in Chile articulates Google's impact across these three domains. As Google considers its future strategy in Chile, it will continue to look for opportunities to keep digital infrastructure secure and sustainable while driving local economic development, fostering thriving communities, and spurring environmental stewardship.

Google seeks to harness AI to drive innovation and accelerate climate action.

Google continues to invest in state-of-the-art infrastructure to support its artificial intelligence (AI) efforts and rapidly grow the digital economy in Chile. However, Google recognizes that these benefits also come with increased energy usage and emissions and might have unintended consequences if not properly managed. As part of its AI for Sustainability strategy, Google is taking steps to use AI to accelerate climate progress and through its AI Opportunity Agenda, Google is providing recommendations for governments to amplify the positive impacts of AI for the broadest possible range of people.

Google seeks to engage directly with community members to advance and measure impact.

Google continues to work closely with community members in Chile to understand its impact and refine its strategy. This report represents a step toward measuring impact as Google moves from measuring inputs to measuring impact and value. This includes Google's approximation of a "social return on investment", intended to estimate the social value created per Google-invested dollar based on educational empowerment and future job opportunities. Google will continue to find ways to be more transparent and articulate its impact to local communities across all dimensions.

Thank you!

To the many community members and Googlers who strive to make Google's ambitious economic, environmental, and social goals a reality.

For additional information or any questions please reach out to:

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DISCLAIMER: This Impact Study was prepared by Deloitte Consulting LLP ("Deloitte") for Google LLC ("Google") during Fall 2024. The purpose of the study is to assess the economic, environmental, and social impacts of Google's data centers modeled from the years of 2021-2023. The modeling, analysis, and results shown as part of the impact are based on information provided directly by Google LLC, publicly available information, and third-party information. Any revisions to those data will affect the assessments shown as part of the study. To calculate economic impacts, this study used an input-output model developed by IMPLAN. In preparing this study, Deloitte has, without independent verification, relied on the accuracy of information made available by Google.