

Impact Study

Ireland Data Center

2024



Google's Data Center Impact in Ireland

Google's data center in Ireland is helping to rapidly grow the 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 Ireland drive local economic development through job creation, promote environmental stewardship through carbon-free energy production, and foster thriving communities.

Google has invested in Ireland's digital infrastructure since 2011. This Impact Study provides a summary of key economic, environmental, and social metrics that Google's digital infrastructure investments have had on Ireland in recent years.

Economic

Google's investments in digital infrastructure in Ireland support jobs in construction, engineering, and the service industry.

Google's data center contribution to labor income in Ireland is equal to supporting **~3,920 households in the country each year.**

EUR ~1,007M¹

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

~3,050

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 an agreement with Power Capital Renewable Energy for **58 MW of solar capacity which will help Ireland's data center achieve a 60% CFE by 2025.**

43% (2023) | 39% (2022)

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

Social

Google's community investments include support to Citywise Education's STEAM⁵ program which helped empower 500+ students, **generating an EUR ~2.70⁶ social benefit for every Google-invested dollar** and fostering a more digitally skilled future workforce in Ireland.

EUR ~490K⁷

Invested in Ireland 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 ~1,110 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. STEAM stands for science, technology, engineering, art, and math. 6. Equivalent to USD ~2.90. 7. Equivalent to USD ~519K.

Impact Study: Ireland Data Center

Economic Impact: 2021-2023^{1,2}EUR ~1,007M³Annual Contribution
to Local GDP*Includes⁴ EUR ~685M direct, EUR ~221M indirect, and EUR ~102M induced*

~3,050

Annual
Jobs Supported⁵*Includes ~790 direct jobs, ~1,735 indirect, and ~520 induced*EUR ~261M⁶Annual
Labor Income*Includes⁷ EUR ~148M direct, EUR ~89M indirect, and EUR ~23M induced*

Google aspires to increase its contribution to Ireland's GDP by supporting the growth of the country's digital economy and digital infrastructure goals.

Google's data center contribution to direct, indirect, and induced labor income in Ireland is equal to supporting ~3,920 households in the country each year.

Top GDP Contributions

Professional, scientific, and technical services⁸**(61% of Total GDP Contribution from Google's investments in Ireland)**Other (various sectors such as management and telecommunications)
(39%)

Spotlight: Business Environment

"Google is one of Ireland's biggest employers and it has helped make Ireland the tech capital of Europe."

-Tánaiste (Leo Varadkar), in response to Google's recipient of IDA Ireland's Special Recognition Award in 2021

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 (IRS). 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 ~1,110 Million. 4. Equivalent to USD ~755 Million direct, USD ~244 Million indirect, and USD ~112 Million induced. 5. Google's support to jobs includes construction, engineering, networking, renewable energy jobs, security, and services, among others. 6. Equivalent to USD ~288 Million. 7. Equivalent to USD ~163 Million direct, USD ~98 Million indirect, and USD ~26 Million induced. 8. Includes computer systems, data processing, software services, and other computer-related facility management support, etc.

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

43% (2023) vs. 43% (2023 Regional Grid)

39% (2022) vs. 39% (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.

1.08 (2023)

1.09 (2022) vs. 1.58 (industry average)

Avg. Power Usage Effectiveness

Compared to the industry average, Google's Ireland data center is achieving an 86% reduction in overhead power usage. For every watt of power used to run servers and network equipment, only 0.08 watts are used to run supporting infrastructure like cooling and lighting.

Spotlight: Carbon-Free Energy

To advance Google's 24/7 CFE commitment, in 2023, Google signed an agreement with Power Capital Renewable Energy for 58 MW of capacity through the creation of a new solar farm, the Tullabeg Solar Farm.

By 2025, the energy from this project is forecasted to help Ireland's data center reach 60% CFE.

This project will also support the Irish Government's Climate Action Plan's goal that corporate power purchase agreements supply 15% of the country's electricity demand by 2035.

"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

0.4M Liters (2023)

0.4M Liters (2022)

Seawater Usage

Google strives to protect water quality and ecosystem health in the communities where it operates, including Ireland.³

Sustainability Spotlight

Rather than use mechanical cooling, Google's Dublin data center (which was converted from a warehouse on an industrial site) uses an advanced air-cooling system that takes advantage of Ireland's cool, fresh air to reduce energy demand. Local artist Fuchsia MacAree captures the data center's connection to Ireland's weather in a playful mural with vibrant runaway balloons and swaying trees painted across the data center's exterior.

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



EUR ~490K²

Given to communities in 2022 and 2023

Surrounding Google's data center in Ireland 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



EUR ~2.70⁴

Social benefit per Google-invested dollar⁵

Based on STEM educational program⁶

Google invested EUR ~490K² in Ireland communities, including:

Learning and Exploration

Google has provided support to help students better engage with school curriculum.

- Since 2019, Google has provided EUR ~140K⁷ to support Citywise Education's STEAM programs across 15 local schools. This included helping Citywise integrate virtual reality into their programs, reaching 500 students and generating the social benefit referenced above.
- Google gave EUR ~20K⁸ to Scoil Maelruain Junior National School to install a sensory room and interactive furniture (such as a climbing wall) that allows children to better engage with the school curriculum, particularly those with additional needs.

Enhancing Childhood Development

From 2021-2023, Google gave EUR ~110K⁹ in partnership with the Childhood Development Initiative to help deliver two of its "most innovative programs", including:

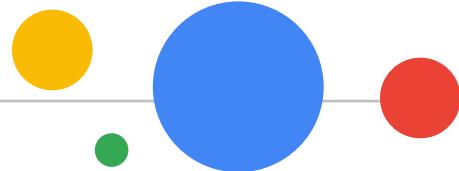
- Supporting young students at 9 schools across Tallaght with programming that helps them overcome anxiety associated with attending school.
- Providing students' parents exposure to STEAM education. At the end of the program, 94% of parents felt confident in engaging their children with STEAM.



"By providing this funding to our school, [Google] has allowed our organization to function in a much more inclusive way. When children's regulation needs are met, their wellbeing increases and their capacity to learn increases."

- Claire Durr, Principal at Scoil Maelruain

Notes: 1. Numbers were converted into local currency using the average 2022-2023 exchange rate and rounded to the nearest ten thousand. 2. Equivalent to USD ~519K. 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 2.90. 5. This calculation is directional and represents Google's step toward understanding social value associated with its community investments. 6. Calculation based on Citywise Education's STEAM program. 7. Equivalent to USD ~146K. 8. Equivalent to USD ~25K. 9. Equivalent to USD ~114K.



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 Ireland.

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 Ireland articulates Google's impact across these three domains. As Google considers its future strategy in Ireland, 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 Ireland. 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 Ireland 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.