Data & Insights to accelerate impact finance and de-risk investments in cities
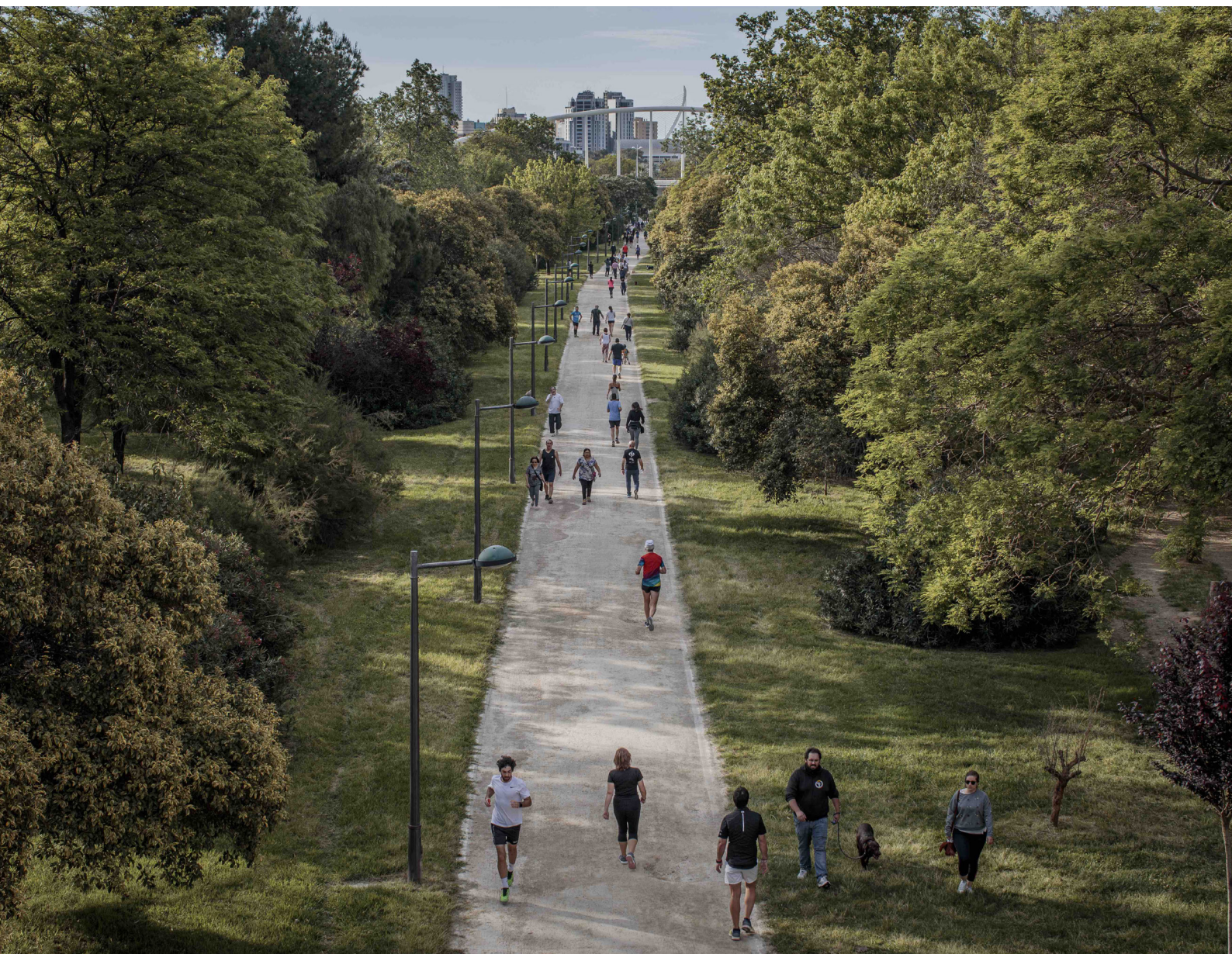
Urban Transitions Mission & Google join forces

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01.

The urban climate finance challenge

More than half of the world's population now lives in cities and towns. By 2050, it is projected that 68% of the global population will reside in urban areas. Cities are at the forefront of climate action, and are pivotal to delivering effective responses to climate change and to ensuring a more sustainable future. Through ambitious action they can help set the course for reducing up to 90% Greenhouse Gas (GHG) emissions by 2050 with technically feasible, widely available measures (Cities Climate Finance Leadership Alliance, CCFLA). However, this goal is under threat as cities report they are not able to access the financing required to secure bold climate transitions. There is a substantial mismatch between climate transitions needs and available resources: a total of USD 384 billion is estimated to be needed annually to support cities in their efforts, but experts have only been able to track about USD 75 billion of actual investments (CCFLA). Insufficient project structuring, lack of accessible climate modeling and high-perceived risks are at the root of this financing gap. Key data analytics, together with robust scenario analysis, can help city practitioners develop financing and de-risking investment strategies to ensure sustainability impact.

Sustainability data and insights can drive and significantly boost local investments. Impact investment, in particular, uses Environmental, Social and Governance metrics (ESG) to trace and enable measurable results in local economies (e.g., by improving green jobs, circularity metrics and healthier environments), helping achieve local climate targets by optimizing risk, return and impact to benefit people and the planet.

UTM – Brokering solutions to bridge the urban finance gap
The Urban Transitions Mission (UTM) works to empower cities to adopt innovative solutions for net-zero transitions at each stage of a city's climate action journey. Launched at COP26, UTM aims to increase the capacity for net-zero, resilient urban transitions. 98 ambitious cities have already joined the UTM city cohort. Through its finance & funding helpdesk, the mission has collected more than 230 investable projects at different stages and is actively supporting 18 of them. These projects offer a snapshot of the global bottom-up demand for urban climate finance. Key findings are:

- Over USD 2.3 billion in total investment needed already estimated for UTM cities

- Over 60% of projects are at scoping, pre-feasibility or feasibility stage, of which about 50% require full funding by an external actor (either public or private)

- Transport, waste and water management, and energy are among the key sectors where UTM cities are seeking finance

Cities worldwide are working to de-risk investments and nurture impact.
To achieve the target, most cities work on:

- A climate strategy, climate investment plan and a multilevel enabling framework - key to ensuring the buy-in of the private sector.

- A solid and climate-aligned use of municipal resources - this will back net-zero commitments and decrease the perceived risk for impact investors in the city.

- A funnel of concrete, data-backed investable project ideas with impact - curbing GHG emissions and fostering the transition to a greener economy.

Google's Environmental Insights Explorer (EIE) provides cities with insights to better understand their emissions, identify areas for improvement, evaluate the impact of climate policies, and develop targeted climate action plans. By using EIE, cities can take a more data-driven approach as they develop their investment plans to address climate change and create a more sustainable future for their residents. The data is available to over 40,000 cities worldwide.

"Google EIE has been a significant asset to our work so far. Particularly in Puerto Montt, it provides a range of transportation information available from 2018 to 2023, which allows us to improve our performance both to make our mobility corridor project more accessible to neighboring municipalities and easier to assess for its contribution to climate action."

Daniel Reyes
Chief Urban Planning Advisor
Puerto Montt Municipality, Chile

02.

Why work together

The Urban Transitions Mission (UTM) is collaborating with Google to support cities within UTM's cohort to access and utilize climate data through the Environmental Insights Explorer.

Accessing and collecting the right data is key to securing sound financial planning at city level, as well as advancing on project financing. Geospatial, high quality data, energy consumption metrics and hyperlocal air quality information are some of the key insights that cities often need - and lack - when designing climate interventions.

Google Environmental Insights Explorer (EIE) is a free platform powered by Google proprietary data that provides cities and regions with valuable environmental data and insights including transportation and building emissions, solar rooftop potential as well as tree canopy mapping. This tool leverages Google's extensive data sources and advanced modeling capabilities to help communities measure emissions, analyze trends, and identify opportunities for climate action.

Following a collaborative guide dedicated to supporting cities in the development of sustainable mobility strategies and policy making published in 2023, this new publication explores how to use EIE's insights to accelerate climate action and investments in urban climate and infrastructure projects. This guide explains how to get started with EIE and its available tools, to support cities in de-risking investment for urban transitions, based on the lessons learned from UTM cities, including Puerto Montt, Cascais and Miami-Dade County.

To help bridge the gaps within cities' climate action journeys, Google EIE can provide:

- Ready-to-use data to feed into GHG inventories.

- Key city-wide and neighborhood level estimates of potential intervention for transportation, energy efficiency and Renewable Energy Sources (RES).

- Tools for scenario analysis in transport, rooftop solar potential, buildings and tree canopy cover.

Before starting, please consider the following:

- Google EIE can provide estimates for both city-wide data and neighborhood level data. This data is not meant to replace real time data coming from other sources, but rather complement and validate them.

- Granularity might limit dat availability for small-scale projects.

- Key tools available in Google EIE can help with Task Force on Climate-related Financial Disclosures (TCFD) assessments, providing a key enabling framework for impact investing.

Calculation methodology: GHG emission sectors, EIE technology and modeling

EIE uses unique Google data sources and modeling capabilities to produce estimates of activity, emissions, and reduction opportunities. The insights are a modeled estimate based on actual measurements of activity and infrastructure. This is the same underlying information that is made available in Google Maps. Advanced machine learning techniques are being used to understand how people are moving around the world, and then apply scaling, efficiency, and emissions factors. In generating these estimates, EIE has worked with experts to make methodology choices, while acknowledging that cities may make different methodology choices that generate different results.

For more information on the methodology used in EIE please visit: https://insights.sustainability.google/methodology

Are you interested in specific data for your city?

Visit the Environmental Insights Explorer site https://insights.sustainability.google/, select your language and sign up. Let your UTM contact know that you have requested access – UTM will help you explore features and interpret available insights for your city as you are planning for further investments.

03.

How Google EIE can inform your climate finance strategy

Cities require substantial resources for their net-zero transition. Whether these come from municipal budgets, fiscal transfers across levels of governments or private-public partnership, being able to develop a solid funnel of investment-ready projects, based on evidence and backed by adequate monitoring, reporting and verification (MRV) mechanisms is key to securing interest from investors and accessing the right resources.

Before diving into the features of EIE to self-assess the state of play and priorities for your city, you can reflect on the following points:

- What is the current situation of your city in terms of systems and processes available to manage data and information?
- Does your city have the necessary staff and skills to manage data and information applicable to improving climate plans and strategy?
- What municipal department, team, or individuals will lead this work? Is there a link between the sustainability and financial department?
- What are the specific barriers or problems that your city aims to overcome?
- Do you already have an investment plan connected with your climate action plan?
- Do you have a pipeline of medium to large scale infrastructure projects that will drive your city towards net zero? Are you planning to develop one?

City practitioners and financial officers can explore Google EIE data to track and extrapolate key geographical-based information that can help plan and accelerate implementation of climate actions, and inform local investment strategies for key infrastructures.

Among others, cities can:

- Model interventions that increase the Land Value Capture (LVC) of selected city areas (Lincoln Institute), by exploring and applying insights on rooftop solar potential and tree canopy cover.

- Leverage transportation insights to forecast the effects and impacts of planned or new infrastructure projects in terms of both CO2 reduction and $ gains.

- Estimate the economic benefit of the roll-out of 100% renewable energy projects and regional energy efficiency targets, by leveraging available neighborhood level data for buildings and solar potential, and therefore informing strategic investment - both public and private - in the city territory.

- Use EIE's scenario analysis tools for transportation and tree canopy cover to help assess and model both transitional and physical risks in the field of mitigation and adaptation.

"In Cascais, climate action is a driving force for new jobs, innovation and an economic revamp which is modernizing cities, while significantly increasing well-being for all.

Our collaboration with UTM and the usage of the EIE tool have accelerated our carbon disclosure assessment while, simultaneously, adding transparency with Google's easy to consult and intuitive platform for environmental data."

João Dinis
Director
Cascais Ambiente, Portugal

04.

Disclosing key information to de-risk investments

To effectively connect capital planning and budgeting decisions with climate action, cities need reliable and consistent information. Originally developed for use by the private sector, TCFD reporting is required by banks and financial actors to scan climate-related risks and opportunities and assess their linkage to strategy, risk management and governance inside an organization. Increasingly compiled by cities to help inform both short-term budgeting and long-term financial planning, solid TCFD reports help attract financial resources for the transition, when needed, and are valuable tools for city finance officers to better grasp the state of a city's climate finance.

Google's Environmental Insights Explorer can:

Speed up assessment and inform your climate strategy:

By running simulations for transport and rooftop solar potential, you can more easily spot climate-related opportunities across the city and at district level. Those can in turn kick-start action to identify corrective infrastructure measures. Additionally, tree canopy cover static data can be a valuable source to identify areas of the city where Nature-based Solutions (NbSs) will help resilience and increase land value. Collecting all that information from scratch would require significant time and resources from the city administration; employing Google EIE for a first analysis could save time and increase efficiency.

Provide key insights and metrics to identify and manage risks:

Identifying the right metrics that can inform city-wide climate transitions is often a tricky exercise - not all data might be available at the same time, with the same level of quality, on a yearly basis. The insights offered by Google EIE help cities complement and validate data available, without having to rely solely on downscaled national data. These insights offer a picture of current and projected physical risks that may influence investment decision-making, according to TCFD's recommendations. The insights help cities to visualize progress in achieving local climate targets, both holistically and in selected areas of intervention, offering evidence for project-specific investment in the city.

Help develop and inform your GHG inventory:
GHG reduction potential is a key metric for public investment as well as for impact investors. It is therefore essential for a city to be able to calculate, track and forecast potential emissions reductions from planned actions. Cities often struggle with the development and update of their inventories, with limited financial and human resources available, particularly in smaller municipalities. Google EIE offers insights on how to effectively categorize emissions in transport and building efficiency, facilitating a quick and straightforward overview of existing trends over recent years, and offering an evidence basis for investments in specific projects and future local climate actions.

Support prioritization of measures and identification of investment opportunities for your city's transition:
Thanks to the cross-sectoral snapshot offered by Google EIE's insights, city staff have an expanded understanding of the projected impact of existing and new city-wide action. Through the modeling features offered, financial officers can be supported in quantifying potential return on investment for selected interventions, prioritizing those that can provide a positive one - both financial, environmental and societal. We will see in section 5 how this can be better achieved.

"In Miami-Dade County, we are using EIE as one of our main data sources to quantify regional transportation emissions and for the development of strategies to minimize these. Understanding the economic value of natural infrastructure as carbon sinks is essential to us; air quality data would strengthen our case for advancing policies that prioritize the protection of natural spaces and the expansion of urban green areas. All of this can be made clear via climate disclosure."

Jason Grant, Ph.D
Senior Energy Resilience Program Manager
Miami-Dade County Office of Resilience

05.

Strengthening projects through scenario analysis

Evidence-based assessments and scenario analysis are key tools for informed decision-making and project development. Robust modeling has become a cornerstone of financial planning, with funds, investors and financial institutions increasingly requiring modeling as a basis to justify investments, prioritize interventions and ensure impact - in financial terms, for GHG reduction and towards a transitional economy. Scenario analyses linked to specific project interventions are particularly useful to determine risks and allocate investments.

Thanks to Google EIE insights cities can inform their planned infrastructure and related investment across sectors. For example:

Modeling the impacts - financial and environmental - of mobility infrastructures:

Transportation insights provide breakdowns of mobility flows for the city territory and selected areas by transport mode. By using the tools directly available on the EIE website https://insights. sustainability.google/, you can interact with the insights provided, changing, for example, modal split, traffic flows and geographical areas, to better suit the parameters of your planned and future interventions. Do you want to build e.g., a bicycle and pedestrian bridge in one of your neighborhoods? The insights available will help you with modeling the impact of the foreseen infrastructure in terms of GHG emission reductions and traffic flows and help you determine the feasibility of the intervention.

Identifying areas for RES project development and investment:

Using rooftop solar potential insights can open a window of opportunity to inform a city's trajectory and plan for a longer-term 100% RES vision. By employing the data in local energy one-stop-shops, or in conjunction with energy community organizations, rooftop solar potential insights can help modeling the foreseen energy output impact of photovoltaic panels over different buildings, and inform policies and measures to support and engage vulnerable communities in local energy transitions. While not decisive, such analysis can help public and private investors in locating the investment to maximize the solar potential - and thus, the return on investment.

Adding new evidence for informed policy-making and investment across sectors:

By combining and cross-referencing insights provided by Google EIE with other locally available data, cities can derive or refine useful information, such as the potential costs of the action, scale of revenue streams and the potential for job creation. These measurements are key metrics for investors looking to maximize environmental and social impact. The combination of the available insights with additional data points can also inform integrated, cross-sectoral urban planning. For example, by bringing together data on transport flows, buildings, tree canopy cover and air quality, and cross-referencing with relevant demographic information, cities can inform the development of policies and strategies to tackle the effect of extreme heat on both people and infrastructures.

06.

Using Google EIE towards impact finance

A growing number of cities worldwide are committing to net-zero targets. To reach this goal, cities will need to find pathways to reduce and address indirect emissions across their value chain (including Scope 2, and increasingly Scope 3). The investment needed to reach this goal cannot be achieved by employing only municipal resources or public funding: reaching net zero requires a whole city approach, with both private sector and local stakeholders actively engaged in a shared pathway. Impact finance has a key role to play in making these transitions happen, with local governments acting as enablers of successful sustainable investment.

Impact investors are often private, medium-small size investors who seek to achieve social or environmental goals, in addition to generating profit from their investment. These investors go beyond market-related ESG metrics, looking into the additionality (would the investment take place without my intervention?) and measurability (what and how much will the investment bring to society?) of the projects they are investing into.

Cities can benefit from the insights offered by EIE in their quest to attract impact investors by: identifying data to quantify and qualify potential for projects curbing emissions in high impact sectors, modeling how these projects fit into more complex long-term strategies by the city, making the case for different profiles of impact for investors to intervene.

The insights provided also offer access to sectoral data from which cities can derive impact metrics, such as GHG reduction, extrapolate information and data points concerning improved "livability" and social equity in the use of space via access to services (e.g. via tree canopy, transport data, improved air quality), provide reference data to calculate potential creation of green jobs, of key relevance for impact investors.

Impact and green investing is increasingly present in the agendas of small and large financial institutions alike. Private investors and foundations have led the way in exploring new pathways for responsible investments, multilateral development banks (MDBs) are following suit, discussing reforms in their project screening criteria, leading to significant changes in the future of climate and sustainability investments - e.g., the European Investment Bank, the larger global multilateral lender, prioritize climate action as number one priority. Google EIE can help city officials in informing banks, private sector and other stakeholders in sharing consolidated, at-a-glance sustainability insights related to specific investment ideas and projects in the four insights areas covered by the tool.

07.

Recap & how to get started

Data and insights can help local governments in driving forward implementation of climate action by facilitating access to funding. Data helps cities to inform the disclosure of physical and transitional risks to financing institutions, optimizing transparency and helping prioritize sound projects. Scenario-analysis increasingly sets the tone for decision making in sound budgeting and capital investment in cities. Evidence-based, integrated climate action and investment planning is becoming a prerequisite to unlock finance for urban transitions.

Access to data, the ability to manage it and use it for relevant forecasting is a key instrument to leverage impact finance, attract and engage interested investors.

Whilst municipalities are still faced with a large financing gap to ensure successful climate transitions to net-zero, resilient and inclusive futures, data, digital solutions and AI technologies can help cities in advancing in their climate action journey, make sound and informed investment decisions that will have not only a financial but also a societal and environmental return on investment.

"Our climate action plan impacts the safety and well-being of our citizens by addressing climate change consequences. It aims to improve air quality, reduce illnesses associated with extreme heat, prepare for sea-level rise and flooding, improve water quality, minimize inequalities, and improve overall quality of life. Our Mayor has emphasized the importance of resilience across all departments, establishing a new Chief of Resilience position, comprehensive data from EIE support grant funding and private financial sourcing by identifying data gaps that would attract private investors."

Jason Grant, Ph.D
Senior Energy Resilience Program Manager
Miami-Dade County Office of Resilience

07.

Recap & how to get started

As you explore how your city can leverage the insights offered by Google EIE to continue to inform your transitions financial planning and the outreach to partners and investors, **consider the following questions to kickstart your journey:**

1. Is your climate strategy mainstreamed in your city budget and city-wide financial planning? Do you have a dedicated investment plan?

2. Have you performed a financial pre-feasibility assessment of the actions in your plan? What kind of data would you need to support one?

3. Do you have an overview of what metrics and targets you will need to calculate investment risk for sustainability action (both climate and transitional risks)?

4. What are the main challenges and gaps you have identified in the data currently available to your city? What are your goals using the data and features of the tool?

5. Have you considered using Google EIE rooftop solar and tree canopy cover data to help enhance LVC in your city? Did you use Google EIE Transportation data to plan sustainable mobility infrastructure and assess their impact?

6. Are you including climate-related financial disclosure in your yearly financial reports? Have you considered using sustainability insights to inform your disclosure cycle?

7. What departments, teams or experts do you need to work with to identify relevant insights able to inform your city's integrated climate action and investment planning?What capacity and resources can you dedicate?

About Urban Transition Mission

The Urban Transition Mission (UTM) mobilizes decision makers across all levels of government to prioritize climate neutral and net-zero pathways enabled by clean energy and systemic innovation across all sectors and in urban governance. By accelerating capacity-building and closing the gap between research, development and deployment, the Mission will empower cities to adopt innovative solutions and help reach tipping points in the cost and scale of those solutions for urban transitions.

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About Google's Environmental Insights Explorer

Google's Environmental Insights Explorer (EIE) is a free platform for cities and local governments to understand their main sources of greenhouse gasses (GHGs), and to identify areas of opportunity for emissions reduction and climate adaptation projects. EIE information is delivered through ready-made insights and inbuilt scenario planning functionality, and has been designed to support cities across their climate action journeys: from measuring and planning, to developing climate action plans, and enacting policies, and tracking impact over time.

Check your city here : https://goo.gle/utm