
Policy Brief 35

Green Govtech Ibero-America: A Policy Brief on Enabling Regional Green GovTech development and usage

Govtech

Policy Brief by StateUp and CAF.

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2022 Corporación Andina de Fomento.

The ideas contained in this study are of exclusive responsibility of the authors and do not compromise CAF's official position.

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Glossary

Artificial intelligence (AI): The application of machines—especially computer programs—to perform tasks that typically require human intelligence.

Big data analytics: The use of advanced analytic techniques against very large, diverse data sets that include structured, semi-structured and unstructured data, from different sources, and in different sizes.

Gamification: Applying elements of game playing (e.g., point scoring, competition with others, rules of play) to other areas of activity, typically as a technique to encourage engagement with a product or service.

Govtech: Engaging digital and emerging technologies, particularly developed by startups, to improve how government functions and public sector organisations deliver services.

Greentech: Technology developed to mitigate or reverse the negative effects of human activity on the environment.

Internet of Things (IoT): Network of smart devices that can continuously sense or interact with their environment. These devices are able to communicate and respond to information that they gather, enabling the system to facilitate activities, streamline processes, and inform decision-making.

Remote sensing: The process of detecting and monitoring from a distance the physical characteristics of an area by measuring its reflected and emitted radiation (typically from satellite, aircraft, or ships).

Renewable power generation: The generation of power from energy sources we cannot run out of, either because the sources are not depleted when used (e.g. wind and solar) or can be replenished (e.g. biomass).

Unicorn: A startup valued at more than \$1 billion.

Executive Summary

Green Govtech refers to the collaboration between the public sector and data-driven startups using digital and emerging technologies to deliver green, climate change and environment related public policies.

For governments to be a source of wide-scale regeneration that benefits people and planet for the long-term, it is not enough alone for them to focus on greening the economy. They must also attend to greening their own operations - with the opportunity to shift at least \$10.25 trillion annually (World Bank Group, 2018; WEF and UNEP, 2021) towards green spending through public procurement alone.

Technology has a particular value to play in enabling this transition. Green Govtech in Latin America is still in its early stages, but

there is a need and opportunity for rapid expansion. To grow the sector at pace, policy-makers should focus on three key areas: ecosystem development, funding development, and cross-regional government learning and experience sharing. CAF, as a leading regional ecosystem hub for GovTech and promoter of a green transition, is singularly well placed to help drive change. This policy brief maps the current regional context, the technology developments already underway and that are needed, the funding mechanisms required, and recommendations for next steps. It is designed to pave the way for further ideas and initiatives, rather than as an in-depth analysis of the region.

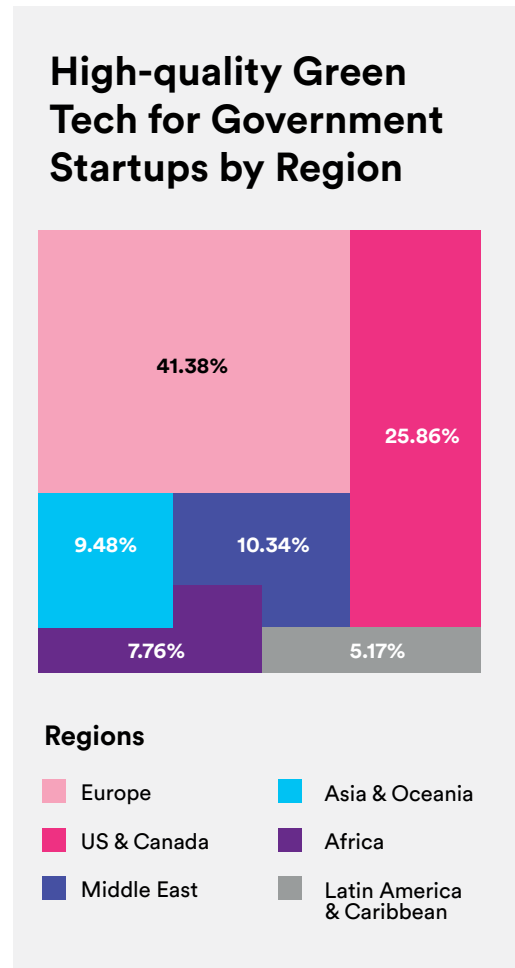
1. Introduction

The effects of climate change are already significant in Latin America and the Caribbean (LAC). They include an average annual loss of 1.7% of GDP, with 48% of capital cities in LAC at extreme risk of facing adverse effects of climate change. For governments to be a source of wide-scale climate action that benefits people and planet in the long-term, it is not enough alone for them to focus on greening the economy. They must also attend to greening their own operations - with the opportunity to shift at least \$10.25 trillion annually (World Bank Group, 2018; WEF and UNEP, 2021) towards green spending through public procurement alone.

In Latin America and the Caribbean (LAC), public procurement contributes at least 14.53% of GDP.³ This presents an opportunity to further catalyze entrepreneurs, inventors, and investors to help develop the innovations and technologies needed for both climate mitigation and adaptation while creating healthier local places, planetary wellbeing, and wealth too. As a leading supporter of GovTech regional development, CAF is uniquely placed to support this development.

To date, while the tech sector across Latin America is thriving, high-quality green technologies—technologies whose use is intended to create resilience towards, mitigate, or reverse the effects of human activity on the environment—have not been the primary focus in the region (see fig. 1).⁴

Fig. 1 High-quality Green Tech Startups for Government by Region



1 <https://reliefweb.int/sites/reliefweb.int/files/resources/A%20green%20and%20resilient%20recovery%20for%20Latin%20America.pdf>

2 Global Status Report 2020

3 <https://www.piiie.com/blogs/realtime-economic-issues-watch/how-large-public-procurement-developing-countries>

4 Per data from StateUp, Nebula public-purpose technology intelligence platform (2022) and CAF GovTech Observatory.

However, there is much need and much potential. For example:

- In terms of **biodiversity**, Latin America and the Caribbean are home to the largest number of megadiverse countries in the world (Brasil, Colombia, Ecuador, Mexico, Perú, and Venezuela), containing approximately 68%⁵ of the world's biodiversity, which needs studying and protecting.⁶ These ecosystems create **livelihoods** for local people, and have far-reaching environmental impacts beyond the region alone: the Amazon rainforest, for example, is a huge carbon sink that helps to regulate global temperatures. Furthermore, fragmentation between ecosystems is the largest cause of biodiversity loss globally and the Amazon is no exception. This will require large investments in digital infrastructure to monitor and have data-driven decision-making tools.
- In terms of **vulnerabilities**, Latin America has also been particularly vulnerable to natural disasters caused or exacerbated by the climate crisis: between 2000 and 2019 more than 152 million Latin Americans were affected by climate-related disasters, including 12 flooding events with an eventual bill of at least \$1 billion each in damages⁷.

Governments in the region have a role to play in encouraging innovation that helps to protect the natural environment, enabling generations to come to benefit from it. Public procurement from innovative green technology startups (see p. 10) is one vehicle available to them to promote a green transition within their own organisations and operations, while benefiting from the positive externality of supporting local innovation and economic prosperity.

Other mechanisms, such as R&D grants, may also be valuable to explore.⁸

There is also an opportunity for significant private investment into greentech for government. For Latin American startups, 2021 was remarkable in relation to funding. **Per Crunchbase**, “Venture and technology growth investors poured an estimated \$19.5 billion into the region [...] more than triple prior-year levels, which were themselves record-setting.” As greater understanding develops of the critical place of green technology in creating societal and economic resilience, investors in the region are likely to view the space more favourably. Nonetheless, there is still a need for more private sector investment with favourable conditions for start-up to adequately and sustainably ride this investment wave. This will enable them to address profound, long-term needs like decarbonization and greening public sector organisations and operations. According to CAF, *“in 2019, green financing in Latin America reached almost 8 billion dollars, but the gap of finance needed for adaptation to climate change was 110 billion”*

The region can also benefit from technology innovations created elsewhere. In areas such as shared environmental resource management, circular economy, clean energy, and green public procurement, there has been remarkable progress in terms of technology and product development in recent years. Many of these developments are produced by startups, which seek internationalisation. In providing the enabling environment for them to flourish, through policy, regulation, and market opportunities, countries in Latin America can reap the benefits of these technology advancements and become case studies in good practice.

⁵ IPBES-IPCC CO-SPONSORED WORKSHOP BIODIVERSITY AND CLIMATE CHANGE

⁶ <https://www.cepal.org/es/temas/biodiversidad/fortalezas-desafios-regionales>

⁷ <https://blogs.worldbank.org/transport/how-better-transport-will-help-latin-america-get-ahead-climate-crisis>

⁸ Financing Innovation: Evidence from R&D Grants

2. Technology Innovation

2.1. Key needs and case studies of addressing them

Here, we note six key areas of technology development that are critical to enabling a green transition. From the Amazon to the bio-diverse flora and fauna of central and south America, the LAC region has particular responsibility for many of the world's most treasured environmental resources. Latin America has also been particularly vulnerable to natural disasters caused or exacerbated by the climate crisis, and there is growing consensus on the need to achieve net decarbonisation of the regional economy **by 2050**, making these

focuses especially important to policy makers at the national and regional levels. Fig. 2 notes the kinds of technologies being developed to meet each focus area. Together, these provide clear vehicles for delivering the Sustainable Development Goals, in particular:

- 6 (clean water and sanitation)
- 7 (affordable and clean energy)
- 11 (Sustainable Cities and Communities)
- 13 (Climate Action)
- 14 (aquatic life) and;
- 15 (terrestrial life) among others.

Fig. 2 Green Govtech: Key needs and opportunities

Decarbonising Infrastructure and the Built Environment

- Managing the built environment as a system of systems, including land-use change monitoring and modelling using GIS.
- Digitising the planning and execution of construction projects through workflow automation.
- Monitoring and managing energy consumption.

Examples include: Recircular (Spain), Leakmited

Environmental Management and Restoration

- Reforestation.
- Water management.
- Promoting biodiversity.

- Air quality monitoring and management.
Examples include: Rentadrone (Chile), qAIRa (Perú)

Clean energy Solutions and support

- Solar power generation and storage.
- Developing smart batteries.
- Surveying and inspecting energy generation sites.

Examples include: Sunai (Chile), Percepto (Israel)

Community Engagement

- Enabling citizen-state collaboration.
- Collecting public sentiment across media.
Examples include: Citibeats (Spain), Munidigital (Argentina), Irys (US/Mexico)

<p>Green Public Procurement</p> <ul style="list-style-type: none"> • Green Finance. • Digital platforms for identify green suppliers. • Project management monitoring and evaluating. • Upskilling procurement officers. <p><i>Examples include: Kodiak Rating (Sweden), Circular (UK)</i></p>	<p>Environmental Intelligence & Data-driven Decision-making</p> <ul style="list-style-type: none"> • Climate change Adaptation and mitigation. • Optimising the distribution of energy. • Quantify climate risk to physical assets. <p><i>Examples include: Green Urban Data (Spain), Farad.ai (UK).</i></p>
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Fig. 3 provides brief cases of these technologies in action. Strengthening key capacities, like green public procurement, and better using environmental data will also have a broader positive impact on decarbonising the wider economy, through enabling sustainable productive value chains.

Fig. 3 Case studies

<p>Decarbonising Infrastructure and the Built Environment: waste reduction</p>	<p><i>Recircular</i> (Spain) provides an online platform that allows clients to buy and sell waste material, working towards a circular economy. It helps to price the material, connects clients with potential customers, and produces impact reports on their use of the materials.</p> <p>Where it has been used or piloted: waste from coffee production is a major source of water pollution and methane emissions. Recircular has put coffee producers in contact with companies that can turn waste materials from coffee into pigment, biogas and even construction materials.</p>
<p>Environmental Management and Restoration: air quality management</p>	<p><i>qAIRa</i> (Peru) develops drones that carry air quality sensors and measurement modules, to support air quality monitoring programs.</p> <p>Where it has been used or piloted: qAIRa has created air pollution maps of the city of Lima for use by its municipal government.</p>
<p>Clean Energy Solutions and Support: efficient renewable energy</p>	<p><i>Sunai</i> (Chile) runs NEURAL, a platform that uses AI to monitor functions and maximise efficiency in photovoltaic plants. It also uses drone technology to survey solar power plants for faults.</p> <p>Where it has been used or piloted: NEURAL has been applied to more than 200MW of solar production in 6 countries.</p>
<p>Community Engagement: citizen-state collaboration</p>	<p><i>Munidigital</i> (Argentina) uses Software Geotagging, GPS and Robotic process automation to help public servants manage their cities and communicate with citizens.</p> <p>Where it has been used or piloted: Munidigital has reportedly worked with more than 1,000 municipal governments in South America and Europe, reporting big increases in citizen satisfaction and savings in city budgets.</p>
<p>Green Public Procurement: supply chain traceability</p>	<p><i>Circular</i> (UK) uses blockchain and AI to cut the cost of traceability and due diligence in raw materials supply chains. Responsible sourcing.</p> <p>Where it has been used or piloted: Circular recently announced that it would collaborate on the creation of the first ever transparent manganese supply chain.</p>
<p>Environmental Intelligence and Data-driven Decision-making: monitoring public goods</p>	<p><i>Green Urban Data</i> (Spain) has developed software that helps local municipalities prioritise and make decisions that fight climate change. Products map pollution levels, track temperatures, and plan eco-friendly routes through cities.</p> <p>Where it has been used or piloted: during the pandemic, when it was harder for human workers to monitor environmental public goods, Green Urban Data used satellite imagery to monitor fires, water supplies and beaches.</p>

Source: own elaboration

2.2. Green Govtech production in LAC

Green Govtech is still nascent in Latin America. However, there are several stand-out ex-

amples of both startups with a green government focus (see Table 1.), and of green technology uptake by public sector organisations and partners. Table 1. details examples of green Govtech being developed in the region.

Table 1. What green Govtech innovations are Latin America and Iberoamerica producing? Examples

STARTUP NAME	COUNTRY	DESCRIPTION	FOCUS AREA
Aquosmic	Mexico	Uses AI and quantum computing to classify and quantify the thermodynamic properties of materials captured by satellite imaging. Helps identify water health problems.	Environmental Management and Restoration; Environmental Intelligence
Citibeats	Spain	Collects public sentiment across social media and local news channels. Proprietary AI algorithm analyses them and creates visualisations.	Community Engagement
Fractal Engenharia	Brazil	Develops tools for water resource management. Flagship product (SIG ² A) is a smart water management system that analyses data collected from satellites and meteorological stations for water planning. Also has a tool for managing dams.	Environmental Management and Restoration; Environmental Intelligence
Green Urban Data	Spain	Software that helps local municipalities prioritise and make decisions that fight climate change. The product maps pollution levels, tracks temperatures, and plans eco-friendly routes through cities.	Environmental Intelligence
Hop Ubiquitous (HOPU)	Spain	Helps cities mitigate climate change. Offers air quality monitoring products, including a dashboard to track and visualise air quality over time.	Environmental Intelligence
MuniDigital	Argentina	Software that helps public servants manage their cities and interact with citizens.	Community engagement; Environmental Intelligence
Muvo	Colombia	Hardware and software to improve urban mobility, with a focus on Latin America / Colombia. Products include an app, bicycle, and eScooter – available for one-off rentals or subscriptions.	Mobility Urban and Local Tech
qAIRa	Peru	Develops drones that carry air quality sensors and measurement modules, to support air quality monitoring programs.	Environmental Intelligence
ReciclAPP	Chile	App that promotes recycling by helping users understand what can be recycled and when/where/how to schedule pickups.	Environmental Intelligence
Rentadrone	Chile	Using drone-powered thermal aerial imagery, detects, classifies, and organises errors and damaged modules in solar power panels, and automatically detects diseases on crops.	Environmental Management and Restoration; Environmental Intelligence
Sistema.bio	Mexico	Develops and sells products to convert organic waste into clean energy for smallholder farmers. Trains local partner organisations, who then bring Sistema.bio's products to their communities.	Environmental Management and Restoration; Clean energy solutions and support
Unblur	Spain	Platform for first responders that helps commanders make data-driven decisions during an incident. Also includes AI-powered tools for post-incident analysis.	Climate adaptation; Urban and Local Tech; Human security
Vikua	Venezuela	Develops digital tools to turn cities in the developing world into "smart" cities. Includes a platform for upskilling public servants and for managing public services.	Urban and Local Tech

STARTUP NAME	COUNTRY	DESCRIPTION	FOCUS AREA
Worldsensing	Spain	IoT company specialising in sensing solutions for “smart” cities and industries such as mining, rail, construction, and critical infrastructure. Flagship product monitors critical infrastructure.	Environmental Intelligence

Source: own elaboration

It is notable that in Latin America, a majority of companies focused on green Govtech are developing “environmental intelligence and data-driven decision-making” tools (see Table 1.). These tools are crucial for understanding the world around us and capturing the data to enable policy leaders to make good decisions.

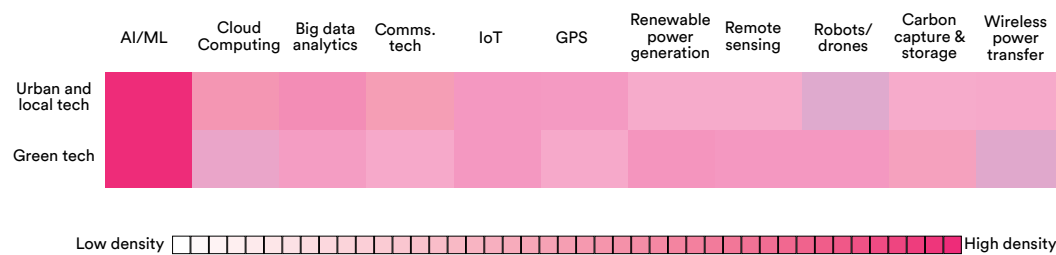
However, over the next decade, there will be a huge need for technologies that not only monitor the environment but directly benefit it. There is an urgent need for more technologies that will actually decarbonize the planet, and the active government support to enable this.

In this respect, policymakers in Latin America may do well to understand the key technologies currently being developed for decar-

bonisation in other global regions. According to data from the Nebula public-purpose tech intelligence platform, the top 5 technologies being developed as core to green tech products and services are:

1. AI/Machine learning
2. Renewable power generation
3. IoT
4. Remote sensing
5. Big data analytics
6. Real-time information

Fig. 4. Global distribution of technology use in urban and local tech & green tech.



Source: StateUp 21: Data-driven insights into global public-purpose tech

Policy makers and advisors, as well as investors, who are focused on the development of specific technologies through industrial strategies and other policy mechanisms may use

this information to prioritise a focus on key technologies with the capacity for green applications.

Green Govtech in LAC: “Company in Action” Case Studies

MuniDigital

Argentina, founded in 2018

- MuniDigital, a city management platform with a strong citizen engagement component, has launched a campaign to take a census of 100 million trees. So far, 10 million trees have been registered.
- Citizens download MuniDigital’s PAN-DO app and take pictures of trees. MuniDigital uses these images to determine information including the tree’s species, its location, and its age.
- Tree censuses are helpful in ensuring that trees reach maturity, which is the stage when they capture the most carbon. Data from the app enables public officials to better understand their forest inventory and plan any intervention strategies as needed (e.g., reforestation campaigns, follow-up care).

Fractal Engenharia

Brazil, founded in 2010

- Fractal Engenharia’s Critical Hydrological Events Forecasting System predicts water levels and flow in real time. It collects data from sources such as weather radars and rain records to mitigate the risks stemming from climate variability.
- Before Brazil’s Civil Defence began to use Fractal Engenharia’s system, they would track and analyse data manually in Excel. This approach only worked for forecasts within the next few hours. Flooding forecasts play a crucial role in their work because this data helps determine whether or not to open dams.
- Fractal Engenharia’s system has streamlined the process of opening and closing spillways. The ability to predict when a flood will occur has saved lives and physical assets, enabling people and equipment to move prior to inclement weather.

2.3. Funding

Total funding for the highest quality GovTech startups in LAC and Spain is currently at least USD 279 million dollars, according to data from the Nebula public-purpose technology platform. Data from the CAF GovTech Observatory supports this estimation. Of this, approximately, 13% has gone to green Govtech in recent years. As green Govtech grows in the region, accurately tracking funding will provide a critical benchmark for startups and funders alike. It will also be critical to helping both public and private investors navigate

how to plug the estimated 110 billion USD funding gap needed for adaptation to climate change”⁹.

According to a **2022 BCG report**, annual global green technology investment doubled between 2016 and 2021. Simply extrapolating this trend, we would expect total funding for the highest quality green govtech startups in the region to exceed \$500 million by 2027. This is a conservative estimate, as the forecasted growth rate in VC investment for the LAC tech startups is much higher (the **IADB expects** annual VC investment for the Tecnolatinas eco-

⁹ Building a Greener Latin America

system to grow more than six-fold over the next decade, from \$4.6 billion in 2019 to over \$30 billion by 2030). Investment into gov tech has also been accelerating: using Crunchbase data, **Government Technology estimates** that 2/3 of the global VC investment into govtech startups over the period of 2003 - 2019 has happened over the last 5 years.

Notable recent funding rounds

- In February 2021, Mexican clean energy financing platform Wirewatt raised a \$4 million private equity round from green infrastructure-focused MGM Innova Group.
- In May 2021, Chilean startup Algramo, an environmentally-conscious cleaning products producer, raised an \$8.5 million Series A led by Dalus Capital.
- In June 2021, Brazilian solar investment platform Solfácil raised a \$30 million Series B led by QED Investors.
- In July 2021, as part of their €2 million fundraiser, Spanish startup Citibeats received an investment from CAF. This will support the startup's efforts to expand their data intelligence platform, helping to understand climate change and social issues through advanced sentiment analysis.

3. Policy Themes

How can policy be used as a lever to support the key opportunities for green Govtech development and uptake described in Part 2? Here, we outline a variety of policy approaches being piloted internationally. Because policy surrounding greentech is young in every region, long-run evidence of success is limited. But keeping track of these policy developments and drawing on the available evidence

base produced by academic research will help policy makers in the region to formulate policy and mechanisms to create the necessary enabling environments for green Govtech.

3.1 Managing and restoring the LAC region's shared environmental public goods

Conserving environmental resources like water, air, the atmosphere, soil, and biodiversity is fundamental not just to decarbonisation, but to enabling people and nature to thrive together for generations. These public goods are vital both for tackling the climate emergency and for promoting the flourishing of human beings and their communities. Ensuring that water supplies and the air are clean, and protecting green spaces, is intimately linked with human health and happiness, as well as with reducing greenhouse gas emissions and the human impact on the environment at large.¹⁰ The LAC region at large is rich in raw materials, making its economies unusually dependent on extractive activities, which creates an extra difficulty when it comes to preserving environmental public goods.

Search data presents exciting opportunities to better connect public servants and local decision makers with innovative solutions to help address urgent place-based needs regarding environmental public goods. Search data can reveal what problems the populations in different local places are facing in real time, offering opportunities for interventions when and where it matters. Google Trends can also be used to identify regions that consistently perform searches around specific public problems. Utilising search data to understand public problems has clear advantages for government and policy-makers. Innovators, too, can harness the power of search data to better target technological solutions to pressing problems. Investors interested in supporting

¹⁰ <https://www.eea.europa.eu/signals/signals-2018-content-list/articles/clean-water-is-life-health>; <https://iopscience.iop.org/article/10.1088/1748-9326/10/11/114002>

technologies to address particular public problems can also use search data to identify and assess different markets.

For example, Fig. 5 shows global searches for river flooding and air quality, which are revealed to have an outsized number of searches in Latin American countries when compared to all other countries globally.

Based on the above, the impacts green Govtech could have, are:

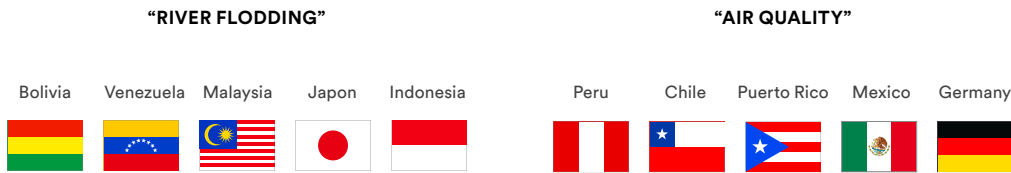
- **More cost-effectively managing water and air quality.** For example, using dro-

nes, Auckland Council in New Zealand has saved an estimated 30 percent in water quality management costs.

- **Preserving a key carbon sink**, which absorbs more carbon from the atmosphere than it releases. Conservation zones sequester 500 million tonnes of carbon annually. Sustaining protected area coverage can stop this rate from falling below 300 million tonnes annually by 2100. Many carbon capture and storage startups are emerging to facilitate this effort, including **Carbfix** (Iceland), Carbon Craft Design (India), CarbonCure (Canada), and Holy Grail (US).

Fig. 5. Search data: A window into public problems

THE 5 COUNTRIES WHERE EACH TOPIC WAS MOST POPULAR IN GOOGLE SEARCH DURING 2021



Source: [StateUp 21](#): Data-driven insights into global public-purpose tech

3.2 Greening public procurement – 14.53% of GDP in LAC – both as an end in itself and to encourage wider greening of the economy

Public procurement offers a powerful route to improved environmental stewardship—but greening public procurement is still an evolving practice¹¹. Countries including Canada, with its Greening Government Strategy, and Singapore, are leading the way.¹² Alongside regulatory change and upskilling, the uptake of digital technologies, including those de-

veloped by startups, can facilitate the development of Green Public Procurement (GPP). Startups like Kodiak Rating (Sweden) and Circular (UK) have created technologies specifically to green the procurement and supply chain process.

GPP not only contributes to decarbonizing government organisations and operations, but can also create incentives and new markets for sustainable products and processes developed by startups, boosting demand for green technologies in a wide range of sectors, from transport to construction. In Sweden, re-

¹¹ Green Procurement refers to the procurement of products and services that cause minimal adverse environmental impacts

¹² [Tanya Filer, How governments can turn procurement into a climate innovation tool.](#)

gional public transport authorities have used environmental criteria in public procurement for some time. In 2014, around 58% of vehicle kilometres in public bus transport in Sweden were driven with non-fossil fuels, compared to only 8% in 2007, providing evidence of the market creation opportunities that green public procurement offers.¹³

As a growing number of governments take green procurement seriously, lesson-sharing is critical given the newness of the task at hand.

The impact it could have:

- Green public procurement (GPP) can reduce public sector emissions; forecasts for

China indicate cumulative GHG emissions reductions of up to 232 millions of tonnes of CO₂ by 2030.

- In 2020 Brazil spent 35.5 billion BRL (\$6.95 billion) on public procurement, giving it considerable power to reduce GHG emissions with a more sustainable procurement policy.¹⁴
- GPP can also encourage green innovation in the private sector: in the US, research demonstrates that a 1 percent increase in GPP is correlated with a 0.046 percent increase in the number of new green patents.

“Green Public Procurement is a cross-cutting policy instrument that can transform and stimulate cleaner industrial production, cleaner services and create incentives and new markets for sustainable products and processes. While scarce, the available evidence demonstrates that Governments through instruments like public procurement could incentivise demand for green products in a wide range of sectors, e.g. transport, construction, and potentially others, while decarbonising at the same time their own operations (Aldenius and Khan, 2017; Tarantini et al. 2011; Ghisetti, 2017; European Commission, 2012).”¹⁵

Dr. Cristina Peñasco

University Lecturer in Public Policy, University of Cambridge

Source: States Regenerate (2021)

3.3 Greening infrastructure and the built environment, with public investment comprising 44% of regional infrastructure investment in LAC

To decarbonise the economy and make biodiversity friendly environment, we must re-

imagine these assets as a complex “system of systems”, and draw on advances in complexity management and the technology innovations around it to manage our built world as such. Digital twin technology¹⁶, such as that in development by startups BeamUP (Israel), Imerso (Norway), and PassiveLogic (US), is critical to this effort. By creating a virtual replica of infrastructure projects, these startups can

¹³ Malin Aldenius and Jamil Khan, *Strategic use of green public procurement in the bus sector: Challenges and opportunities*

¹⁴ <https://www.oecd.org/competition/fighting-bid-rigging-in-brazil-a-review-of-federal-public-procurement.htm>

¹⁵ *States Regenerate*

¹⁶ A digital twin is a virtual representation of real-world entities and processes, synchronized at a specified frequency and fidelity.

help public sector organisations identify any issues before breaking ground – saving resources and reducing their carbon footprint.

There are also interventions that governments can make into specific infrastructure systems, including decarbonising building materials, construction and, introducing the idea of biodiversity positive infrastructures. For example, **EConcrete**, a startup, has developed a bio-enhancing concrete technology that provides ecological advantages and superior structural performance for any marine infrastructure project. These developments will be critical for the future of Latin American maritime activity and port sector.¹⁷ We must also recognise the value of nature-based infrastructure, which could play a key role in climate mitigation, adaptation and biodiversity restoration, this may include restoring mangroves and seagrass in coastal areas, for example.

Much innovation which could enable decarbonisation of infrastructure and government operations entails improving visibility or coordinating use of data, for example about energy use, emissions, efficiency, costs, or other key metrics. For example, Green Urban Data (Spain), creates products to map pollution levels, track temperatures, and plan eco-friendly routes through cities, while Farad.AI (UK) uses data and AI to predict the regional peak load of the electricity grid.

Equally, much innovation which can aid in decarbonising key operations or infrastructure would benefit from the use of real data in the innovation process. As a result, making data available in a thoughtful, useable way, can help innovators develop new technologies and bring them to market.

The impact it could have:

The impact it could have:

- Reducing carbon emissions from public buildings by up to 15%¹⁸
- Reducing waste and increasing the resilience of vital infrastructure
- Forming a considerable carbon sink of up to half a trillion new trees could remove two-thirds of all anthropogenic CO₂ emissions¹⁹
- Restoring ecosystems, building a network of biodiversity positive infrastructures.

- Estimates for the value of open government data as a percentage of GDP have ranged from 0.08% to 7.19%. A recent OECD report cites a range of 1% to 2.5% of GDP. From this, the European Union identifies geospatial, earth observation and environmental data as among the most valuable.²⁰
- In the LAC region, transport emissions are unusually high: they account for 35% of emissions related to fuel combustion, against a global average of 22%.²¹ So, greening public transport in Latin America could have a huge impact on its GHG emissions.
- This could help the LAC region and its countries to work towards green data taxonomies accepted by the global community.

3.4 Bolstering the use of data and innovation in addressing regional environmental needs

¹⁷ Latin America needs USD 55 billion by 2040 to boost maritime and port industry

¹⁸ Digital Buildings (research based on UK data)

¹⁹ Protected areas' role in climate-change mitigation

²⁰ The Value of Data Summary Report 2020, Bennett Institute for Public Policy, University of Cambridge

²¹ <https://blogs.worldbank.org/transport/how-better-transport-will-help-latin-america-get-ahead-climate-crisis>

3.5 Creating the leadership and accountability mechanisms to enable a green transition in government and the wider economy

The decarbonisation of the public sector requires real, long-run leadership. The appointment of a Chief Decarbonisation Commissioner, with teeth and an infrastructure around the role, is critical to ensuring responsible decarbonisation, and the responsible engagement of digital and emerging technologies to help with this mission. While startups are not the only vehicle to green innovation, because of the pace and creativity with which startups can work, a key part of this role should be developing a prospering Green-Govtech startup sector, and prioritising the development of robust connectivity with them, understanding and delivering on needs and opportunities for collaboration.

The impact it could have:

- A dedicated government body for promoting and monitoring decarbonisation can reduce emissions by 32% in 10 years, according to data from Canada.²²
- Precedent from France suggests that high-quality citizen engagement could generate hundreds of new ideas for government decarbonisation.²³

4. Recommendations and conclusions

Green Govtech in Latin America is still in its early stages, but there is a need and opportunity for rapid expansion. To grow the sector

further, policymakers should focus on three key areas: ecosystem development, funding development, and cross-regional government learning and experience sharing.

4.1 Development of the govtech and greentech ecosystems

LAC is a unique region: with a shared language and similar cultures, there is unrivalled potential for cross-national collaboration. Yet at present each of the region's 33 countries has its own entry requirements and business laws that present a barrier for greentech companies looking to scale beyond domestic markets and to recruit talent across borders. Within LAC states there are other factors that make it difficult to launch startups: across much of Latin America, there is no culture of job hopping, and leaving an important corporate role to build a company is often considered reckless.²⁴ Governments at the national and local levels in the LAC region could further stimulate the Greentech sector by removing these roadblocks and making better use of existing institutions, like universities, to cultivate innovation ecosystems.

LAC governments could:

- Establish public-private governance mechanisms to further develop the green Govtech ecosystem through continuous dialogue and collaboration.
- Lower barriers to cross-regional recruitment, perhaps using the planned African Union passport as a model.
- Reduce the risks involved in launching or joining a startup, e.g. by making it easier to dissolve a company (in Brazil, for example, this currently takes 2 years on average).

²² <https://www.canada.ca/en/treasury-board-secretariat/services/innovation/greening-government/strategy.html>

²³ States Regenerate: Key Ideas (2021)

²⁴ Latin America Startup Ecosystem Not for the Faint of Heart

- **Lower the barriers for starting green Govtech startups**, for example through tax incentives for founders working in green related public problems.
- Integrate **universities into GreenTech innovation ecosystems**, perhaps using as a model the Social Innovation Exchange, which has run Latin American Social Innovation Studios in 8 universities across 4 Ibero-American countries, promoting methods and tools in social innovation.²⁵
- **Offer regional and municipal governments support and funding in their search for green Govtech partners.**
- **Encourage regional and municipal governments to exchange information on successful Green GovTech collaboration.** Promote similar partnerships in other cities.

4.2 Engage Govtech as a mechanism to support delivery and impact

Green Govtech is a thriving field with the capacity to deliver in a wide range of government priority areas. Greentech companies can help to deliver policies ranging from Smart Cities (e.g. Worldsensing, Vikua), to zero-carbon transport options (Kappo, Muvo), to pollution management (HOPU, Aquosmic). The challenge is to make best possible use of these technologies by linking companies with government bodies of all levels. Green GovTech has been especially effective at the municipal level, but central government also has a role to play in facilitating its policy impacts.

LAC governments could:

- **Develop comprehensive govtech policies to promote better coordination** within institutions in the public sector, and between the public sector and startups to increase their participation in the delivery of green related public policies.
- **Implement specific procurement provisions to support the participation of greentech startups.** One possible approach

4.3 Funding green Govtech

Startup funding is enjoying an organic boom in Latin America, allowing the region to produce a record number of “unicorns”, valued at more than \$1 billion. Funding is up across the board. But governments can still take steps to guide it. The funding boom has been concentrated in a relatively small number of companies and shows a bias towards late-stage funding; while there has also been a hike in early- and seed-stage funding, these have not risen as fast. Nonetheless, they have been enjoying increasing success in attracting more international venture capitalists. Governments need to entrench this trend and encourage investors to take a greater interest in younger startups, to ensure that this boom translates into sustained growth.²⁷

LAC governments could:

- **Develop public and hybrid govtech investment funds with specific verticals aimed at the greentech sector.**
- **Focus on attracting high-quality investment with tax incentives, publicity campaigns, and**

²⁵ <https://socialinnovationexchange.org/our-work/programmes/knowledge-learning/challenging-universities-rethink-their-purpose/latin-america>

²⁶ <https://news.crunchbase.com/news/latin-america-venture-growth-startups-2021-monthly-recap/>

²⁷ <https://news.crunchbase.com/news/latin-america-venture-growth-startups-2021-monthly-recap/>

funding for Investment Promotion Agencies to incentivise international VCs.²⁸

- **Make it easier to take firms public by investing in initiatives** like Chile's public accelerator, Start-Up Chile, which has facilitated 42 such transitions in the last eight years. Also provide support for acquisitions and other means of scaling the business.
- **Partner with international financial institutions** to secure funding to implement Govtech policies, and for the creation and support of public, private and hybrid greentech investment funds. For instance, the government of Córdoba, Argentina worked with CAF to develop their local Govtech investment fund, which has now received funding from other development banks and investors.²⁹

4.4 Cross-regional government learning and experience sharing

While Latin American countries are linguistically and culturally unified, their political cultures show considerable divergence. This can be a barrier to cross-regional learning and collaboration between governments. Governments in the LAC region should recognise that they could benefit from increased cooperation and information sharing across ecosystems and understand the value of cooperation to cultivate this ecosystem. They should also prioritise data management: much innovation

which could enable decarbonisation of infrastructure and government operations will be possible only through improving visibility or coordination of data, for example about energy use, emissions, efficiency, costs, or other key metrics.

LAC governments could:

- **Promote national, regional and global conferences** and events for civil servants and startups, to facilitate sharing of policy knowledge and practical experience.³⁰
- **Organise joint public challenge programmes to solve concrete climate and environment related public problems in the region.** For instance, as part of COP26, eight governments, the United Nations, and other partners launched the Global Scale Up Programme to support startups approaching problems such as resilience, food waste, and decarbonisation of transport.³¹
- **Promote expert research into the effectiveness of their policies on GreenTech**, which will benefit surrounding countries while also helping to deepen ties with universities and make both central and local government more transparent, encouraging further innovation and investment.
- **Develop strategies for effectively sharing their own data**, and encouraging companies to share their data, without compromising economic incentives.

²⁸ <https://blogs.lse.ac.uk/businessreview/2019/02/22/governments-strive-to-attract-investment-but-so-far-theres-no-evidence-of-what-works/>

²⁹ <https://cordoba.gov.ar/la-municipalidad-creo-un-fondo-para-emprendimientos-innovadores/>

³⁰ <https://www.istr.org/page/LAC>

³¹ <https://cop26.civtechalliance.org>





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