
STATEUP 21

DATA-DRIVEN
INSIGHTS INTO
GLOBAL PUBLIC-
PURPOSE TECH



NEBULA COMMUNITY MEMBERSHIP

JOIN THE INTERNATIONAL PUBLIC-PURPOSE
TECHNOLOGY COMMUNITY ADDRESSING BIG
PUBLIC NEEDS! NEBULA COMMUNITY MEMBERS:

Gain access to high-quality, expert curated PPT technology data

that cuts through noise to show real innovations addressing big public needs

Have a simple way to **stay up to date on everything PPT**

Engage in connections and conversations with top PPT experts

(technologists, researchers, investors, and more) all committed to addressing big public needs through responsible and innovative technology usage

Have a say in the resources you most need

to work towards your mission, and in the topics and types of PPT knowledge spaces you would like to see developed going forward

JOIN NEBULA, THE FASTEST GROWING PUBLIC-PURPOSE TECH COMMUNITY, WITH YOUR FREE COMMUNITY MEMBERSHIP AVAILABLE [HERE](#).



NEBULA
by StateUp

ABOUT STATEUP

STATEUP IS A LEADING INTERNATIONAL PROVIDER OF OF PUBLIC-PURPOSE TECHNOLOGY INTELLIGENCE AND POLICY GUIDANCE. OUR MULTIDISCIPLINARY EXPERTISE HELPS TO BRIDGE THE GAP BETWEEN THE WORLDS OF GOVERNANCE AND TECHNOLOGY INNOVATION. WE OFFER RESEARCH AND ADVISORY, UPSKILLING, AND DATA AND INTELLIGENCE PRODUCTS AND SERVICES. WE WORK WITH GOVERNMENTS, INTERNATIONAL ORGANISATIONS, TECHNOLOGY COMPANIES, AND RESEARCH BODIES FOR THE WELLBEING OF PEOPLE AND PLANET.

STATEUP 21 CREATED BY: TANYA FILER, RILEY KAMINER, BLUEBELL DRUMMOND, RACHEL OSNOS, AND HARVEY LOGAN

FOR PRESS AND MEDIA INQUIRIES, PLEASE CONTACT RACHEL OSNOS, COMMUNICATIONS AND MARKETING LEAD: ROSNOS@STATEUP.CO

Rigorous, impartial, independent analysis is central to StateUp 21. All Members of StateUp 21 were selected on their own merits. No Member has paid a fee or offered any other financial incentive, directly or indirectly, to be included. The criteria and methodology that we used to choose Members is described later in the report.



StateUp 21 is the first of its kind - a must-have resource for anyone interested in technology that addresses big public needs. Whether you're a public servant seeking better understanding and procurement of technologies to address critical issues, an investor seeking to understand long-termist opportunities, or an innovator learning from leading startups' in-depth profiles, StateUp 21 provides an expert-curated, data-driven springboard. StateUp's voice and research are uniquely positioned to open the discussion, and create a better path forward, for these stakeholders to collaborate."



JAIDEEP PRABHU

Professor of Marketing and Jawaharlal Nehru Professor of Indian Business & Enterprise at the Judge Business School, University of Cambridge

EXECUTIVE SUMMARY AND KEY FINDINGS

STATEUP 21 PROVIDES RIGOROUS, INDEPENDENT, EXPERT ANALYSIS OF PUBLIC-PURPOSE TECHNOLOGY MEGATRENDS AND SOME OF THE MOST EXCITING AND UP-AND-COMING STARTUPS DEVELOPING PUBLIC-PURPOSE TECHNOLOGY—TECHNOLOGY THAT HELPS TO ADDRESS BIG PUBLIC NEEDS AT SCALE—IN 2022. COMPILED BY STATEUP'S LEADING EXPERTS IN PUBLIC-PURPOSE TECHNOLOGY, IT IS THE FIRST ANNUAL PUBLICATION TO OFFER BOTH DATA-DRIVEN INSIGHTS INTO THE INTERNATIONAL PUBLIC-PURPOSE TECHNOLOGY LANDSCAPE, BASED ON TENS OF THOUSANDS OF DATA POINTS, AND DEEPLY RESEARCHED PROFILES OF SOME OF THE MOST PROMISING PUBLIC-PURPOSE TECHNOLOGY STARTUPS—OUR SECOND COHORT OF STATEUP 21 MEMBERS.

TOP COUNTRIES FOR PPT PRODUCTION:

USA, UK, Israel, Germany, Spain

TOP 5 TECHNOLOGIES USED ACROSS ALL PUBLIC PROBLEM AREAS:

AI / Machine Learning, Cloud Computing, Big Data Analytics, Communications Tech, IoT

TOP 3 TECHNOLOGIES USED TO ADDRESS URBAN AND LOCAL PROBLEMS:

AI / Machine Learning, Big Data Analytics, Cloud Computing

BIGGEST PPT SERIES B:

Commonwealth Fusion Systems, \$1.8 billion

5 Features of Public-Purpose Tech Startups:

1. They are tackling long-term problems
2. They have a mature and active relationship to government and policy
3. They thrive through close links to university ecosystems
4. They are benefitting from investments, IPOs, and acquisitions
5. They are at the centre of an emergent debate about investment and ownership models

CONTENTS

TECHNOLOGY GLOSSARY	6
WELCOME TO STATEUP 21	9
OUR EXPERTS AND CONTRIBUTORS	10
WHERE ARE THEY NOW? CATCHING UP WITH THE INAUGURAL STATEUP 21 COHORT (2021)	11
WHAT IS PUBLIC-PURPOSE TECHNOLOGY	12
PART 1: DATA AND ANALYTICS	14
INTRODUCTION	15
BUILDING THE PUBLIC-PURPOSE TECHNOLOGY COMMUNITY	17
WHY IS PUBLIC-PURPOSE TECH RISING TO PROMINENCE NOW?	20
WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP?	23
THE GEOGRAPHY OF PPT	32
PUBLIC PROBLEM AREAS	35
FOCUS ON: TECH FOR LOCAL PLACES	37
TECHNOLOGY TRENDS	41
MAKING THE SELECTION	44
PART 2: 2022 MEMBER PROFILES	45
STATEUP 21 MEMBERS	46
ONES TO WATCH	46
STATEUP 21 MEMBER PROFILES	47

TECHNOLOGY GLOSSARY

ARTIFICIAL INTELLIGENCE (UMBRELLA TERM)

The application of machines—especially computer programs—to perform tasks that typically require human intelligence.

MACHINE LEARNING

A field of study concerning how to automatically extract meaningful information from data with statistical algorithms. ML's driving principle is that an algorithm can use statistical patterns within data to make accurate predictions about new data that it hasn't seen before.

COMMUNICATIONS TECHNOLOGIES

Software and hardware used to process and communicate information.

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.

GPS

Satellite navigation system used to determine the ground position of an object.

ROBOT

A machine controlled by a computer that is used to perform jobs automatically.

DRONE

An unmanned aerial vehicle (UAV); an aircraft that carries no human pilot or passengers.

ENCRYPTION

The process of converting data to an unrecognisable or "encrypted" form, protecting sensitive information so that only authorized parties can view it.

DEEP LEARNING

Subset of ML that utilizes a hierarchical level of artificial neural networks to carry out the process of machine learning.

ROBOTIC PROCESS AUTOMATION

Term used for software tools that partially or fully automate human activities that are manual, rule-based, and repetitive.

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.

CLOUD COMPUTING

A model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

OPEN-SOURCE SOFTWARE

Software that is distributed with its source code, making it available for use, modification, and distribution with its original rights.

BLOCKCHAIN

An open, distributed ledger that stores data in an immutable, decentralized manner via encryption and consensus algorithms, providing a mechanism for permanently recording and verifying transactions and contracts.

QUANTUM COMPUTING

The application of atomic scale phenomena, described by quantum mechanics, to build computer processors and execute computations that are capable of solving problems too complex for classical computers.

TECHNOLOGY GLOSSARY CONTINUED

EDGE COMPUTING

The use of computing resources (including data storage and processing) in close proximity to the devices that generate the data, thereby reducing network latency and bandwidth usage generally associated with cloud computing.

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).

CARBON CAPTURE, USAGE, AND STORAGE

A collection of technologies that capture carbon dioxide emissions (either at emission sources or from regions dense with emissions) then condense the gas and transport it to be stored (typically underground) or used in industrial processes or manufacturing.

WIRELESS POWER TRANSFER

The transmission of electrical energy without physical connectors such as wires.

DIGITAL TWIN

A virtual model that represents a physical asset, system or process. Designed to detect, prevent, predict, and optimise through real time data analytics and simulations.

VIRTUAL REALITY

Computer technology that is interfaced with a user's vision (typically through a headset) to immerse them in an interactive virtual environment, in which objects have a sense of spatial presence.

AUGMENTED REALITY

Computer technology that is interfaced with a user's vision (typically through glasses or a smartphone) to layer digital content on the user's view of their surroundings.

BIOMETRICS

The measurement and statistical analysis of physical and behaviour characteristics by automated technologies for authenticating and verifying identity.

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).

GEOTAGGING

The addition of geographical identification metadata to a digital object.

BLUETOOTH

A wireless protocol that facilitates communication between enabled devices over a short distance (e.g. 30 ft.).

NANOTECHNOLOGY

Technology that employs functions or features arising from the shape or size of structures, devices, and systems at the nanometre scale (for context: a human hair is 100,000 nanometres wide).



JOIN THE CONVERSATION LIVE

THURSDAY, 17TH FEBRUARY,
2022 REGISTER [HERE](#)

SESSION 1: ASK-ME-ANYTHING WITH STATEUP 21 STARTUP FOUNDERS 5:00 PM GMT

How do you build a startup that addresses big public needs? StateUp will host an informal forum for aspiring entrepreneurs and young professionals aiming to work in public-purpose technology to learn from StateUp 21 startup founders. Bring all your burning questions!

Building a career in public-purpose technology? We have something just for you! For the most exciting career opportunities in public-purpose technology, check out our brand new [Nebula Hire jobs board](#).

SESSION 2: KEY IDEAS FROM STATEUP 21 AND THE STATE OF GLOBAL PUBLIC- PURPOSE TECH 6:00 PM GMT

Who are today's startups forging the brightest future, and how are they innovating? Join a leading panel of founders, investors, and policy experts to discuss the opportunities and challenges that startups addressing big public needs face in 2022, and hear key insights from StateUp 21.

LAUNCH
EVENT

WELCOME TO STATEUP 21

WELCOME TO THE 2022 EDITION OF STATEUP 21. WHEN WE FIRST LAUNCHED THIS FLAGSHIP PUBLICATION A YEAR AGO, WE WERE TESTING THE BELIEF THAT THERE WAS A NEED FOR A MORE RIGOROUS LEVEL OF ANALYSIS OF THE GLOBAL GOVTECH SECTOR THAN HAD PREVIOUSLY BEEN AVAILABLE. IN THE PAST YEAR, THE FIRST EDITION OF STATEUP 21 HAS BEEN DOWNLOADED ALMOST EVERY WEEK, READ THOUSANDS OF TIMES, AND CITED IN MEDIA, TECHNOLOGY, INVESTMENT, AND ACADEMIC SOURCES. WE ARE PROUD OF ITS CONTRIBUTION TO DEVELOPING KNOWLEDGE AND UNDERSTANDING AT THE INTERSECTION OF TECHNOLOGY AND GOVERNANCE THROUGH BOTH DATA-DRIVEN ANALYSIS OF MACRO-LEVEL TRENDS AND CAREFULLY RESEARCHED QUALITATIVE PROFILES OF HIGH-QUALITY TECHNOLOGY INNOVATIONS.

This year, we have broadened our focus to public-purpose technology, defined by the outcome of addressing major public needs, rather than by a specific buyer. This reflects a reality in which both governments and other organisations are procuring vital technology to help to address big public needs, from environmental resource management to community financing products.

The pandemic has equipped us with a growing understanding that we need to look beyond the immediate present. Future generations will experience extreme risks including climate change, biosecurity, and the development of rapidly emerging technologies that have few societal safeguards around them. We have a great need to show responsibility to future generations, regenerating local places both now *and* for the future to ensure their wellbeing and prosperity.

In our work with central and local government teams, MPs, and technology companies over the past year, we have begun to observe a growing understanding of the role of technology in addressing long-term issues, including connected communities, climate adaptation, and complex systems management. But it is by no means the norm. Long-termism is typically absent from broader conversations on the role of technology innovation in society and the economy. And founders, often under pressure for quick returns on investment or to ward off competition, often feel disincentivised to take a longer term view.

With this in mind, we are pleased to have selected for inclusion 21 startups who aim to address long-term needs, from climate adaptation for local communities to eradicating diseases. In some cases, these companies are exploring alternative financing mechanisms or have secured "patient" capital in order to have the necessary timescales for R&D to explore tough markets. In every case, they have a mature appreciation of the role of public policy, either working directly with public sector organisations or understanding the value of public policy levers to enable regeneration. Long-termism also means understanding which technologies will be most useful not only today, but years from now. Our analysis of the technologies that are driving public-purpose tech contributes to this picture.

The StateUp team has spent the past year listening to and closely observing the needs of different stakeholders within the public-purpose technology ecosystem. We have heard time and again about a need for critical knowledge and ideas infrastructure, to bust silos and create the data, knowledge, and relationships needed for technology innovation to be part of the answer to pressing public needs. With this in mind, today we are delighted to launch:

- **The Nebula Community:** the global community for experts and enthusiasts in technology that address big public needs and the public policy, organisations, business models, and investments around them.
- **Nebula Hire:** the jobs' board matching top talent with high-quality roles in public-purpose tech.

Together with the rich data and analytics found in StateUp 21, we hope that the Nebula Community and Nebula Hire will provide ample opportunity for learning, meeting, and the development of meaningful professional lives, providing a holistic set of resources for the public-purpose technology community now and for the long-run.

We welcome your feedback, and hope that you enjoy this latest edition of StateUp 21.

Warmest regards,



OUR EXPERTS AND CONTRIBUTORS



TANYA FILER, PhD
 Founder and CEO,
 StateUp
 @TanyaFiler



BLUEBELL DRUMMOND
 Researcher,
 StateUp
 @blueb311



RILEY KAMINER
 Principal (Ecosystem),
 StateUp
 @rileywk



JOHANNES LENHARD, PhD
 Expert in Venture Capital,
 Ethics, and ESG,
 StateUp
 @JFLenhard



SAM GILBERT
 Advisor, StateUp
 @samgilb



PAOLO TURRINI, PhD
 Expert in AI for Public Good,
 StateUp



REHEMA MSULWA, PhD
 Expert in Infrastructure,
 StateUp



STEPHANIE DIEPEVEEN, PhD
 Expert in Digital Technologies and
 Governance,
 StateUp
 @sdiep



RACHEL OSNOS
 Marketing Lead,
 StateUp
 @rachel_osnos



HARVEY LOGAN
 Analyst,
 StateUp
 @harv_logan

WE WOULD LIKE TO THANK THE FOLLOWING CONTRIBUTORS:

YAU BEN-OR

LEO RINGER

PIA MANCINI

RACHEL TOBIN

DR. CRISTINA PEÑASCO

TOLUWANIMI SEGUN

PROF. JAIDEEP PRABHU

WHERE ARE THEY NOW?

CATCHING UP WITH THE INAUGURAL STATEUP 21 COHORT (2021)

IN 2021, STATEUP 21 COMPANIES DEVELOPED PUBLIC-PURPOSE TECH PRODUCTS TO ENGAGE CITIZENS, IMPROVE MOBILITY, BUILD RESILIENT COMMUNITIES, AND MORE.

AMP Robotics raised a \$55 million Series B round of fundraising led by XN. In 2022, AMP Robotics plans to continue expanding throughout the US and Europe, while further developing its AI-powered recycling tools.

In March 2021, **Logically** launched a threat intelligence platform to help public sector organisations to analyse and mitigate harmful misinformation and problematic content. Logically's team doubled in size in 2021. The UK and India-based startup also opened a US office.

Lithuanian mobility-as-a-service platform **Trafi** launched in Bogotá, Munich, and the Solent region (UK) last year. Trafi also won a tender to continue scaling Jelbi, their MaaS app for Berlin.

Cyan Forensics raised a Series A round of £5 million in March 2021. The Scottish startup plans to use these funds to grow its 25-person team and open a US office in early 2022. Last year, Cyan Forensics acquired its first dozen American customers and collaborated with the US National Center for Missing and Exploited Children, and a Cyan Forensics-led consortium won the UK government's Safety Tech Challenge Fund.

Last year, Brazilian startup **Colab** made more tools available to help citizens better connect with municipalities. In 2022, Colab plans to expand to new municipalities and further develop its app to include more tools related to healthcare, education, social assistance, mobility, and taxes.

Privitar launched a series of new products and features for its customers, including HIPAA compliance and a way to protect sensitive data for use on Amazon Web Services. In 2022, Privitar will launch its self-service Data Provisioning Platform, to make data available safely and at scale.

In 2021, **Spacept** reports that it gained significant traction in Europe and began to plan expansion into the US. This year, the Swedish AI startup expects to continue growing its portfolio of products and expand across Europe, the US, and Asia.

Irys was very active in 2021. The US and Mexico-based startup launched its platform early in the year, with an initial focus on the North American and UK markets. Irys won two SBIR contracts through the US Air Force's AFWERX innovation program. Irys' founders presented at COP26's Tech For Our Planet showcase. In 2022, Irys has its sights set on a fundraising to scale its business operations.

Last year, **Commonplace** was chosen by Innovate UK and the Ministry of Housing, Communities and Local Government to help reimagine planning notices for the 21st century. They presented at Tech for Our Planet at COP26 and launched projects in collaboration with UN Women the University of Westminster. This year, Commonplace plans to expand its customer base to include housing associations, developers, and government both in the UK and internationally.

In 2021, **CitizenLab** went open-source and launched a workshops module for online participatory meetings. They are now working with over 300 governments worldwide. In 2022, CitizenLab plans to grow its team and develop new tools for equitable and inclusive participation, including a community insights module.

Chainalysis raised \$200M in 2021, divided evenly between a Series D round led by Paradigm and a Series E round led by Coatue.

Zencity made two acquisitions in 2021. In March, it acquired Elucid, which uses social media advertising to poll citizens on specific issues. In December, Zencity acquired mobile-first citizen engagement platform Civil Space.

In September 2021, **Recycleye** raised a £3.5 million seed round led by Promus Ventures. Recycleye plans to use these funds to further develop their machine learning-powered waste sorting systems and expand into new European markets.

Aleph Alpha raised a €27 million Series A in July 2021. This funding round, which was co-led by Earlybird VC, Lakestar, and UVC Partners, will enable Aleph Alpha to further develop their artificial intelligence tools for use in security-critical environments.

WHAT IS PUBLIC-PURPOSE TECHNOLOGY?

PUBLIC-PURPOSE TECH (PPT) MAY BE BEST DEFINED BY ITS INTENTION AND OUTCOMES - SERVING A BIG PUBLIC NEED - RATHER THAN A SPECIFIC PRODUCT OR CUSTOMER. PPT HELPS TO ADDRESS BIG, PUBLIC PROBLEMS, WHERE TECHNOLOGY IS A KEY PART OF THE WAY FORWARD, ALONGSIDE POWERFUL POLICY, CULTURAL, AND LOCATION-BASED LEVERS.

While the terminology of public-purpose tech is still evolving, there is a core need to take public problems as the starting point from which to work towards the necessary solutions. As well, we need to interrogate which "public" we mean. Two possibilities are "public" as citizens and others impacted by government vs. "public" as government actors. However, the meaning of a public (eg. who is "vulnerable") may be context-specific.

At StateUp, we have taken 22 core public problem areas as the starting point for our data and analysis. While there are many more, these areas have an outsized impact on local and planetary wellbeing. As discussed on p.9, while each of these problems requires targeted solutions, they cannot be treated in silos. Transport infrastructure needs to be closely coordinated with the power grid, for example, to manage the growing popularity of electric cars and the integration of digital technologies into roads and rail.

PPT is marked by a particularly dynamic relationship with government and policy. Governments may or may not be direct procurers of PPT, but certainly must have sufficient awareness to design nurturing innovation policy and responsible regulatory environments.

Above all, PPT is not about technology alone. It is a holistic approach centred upon technology that meets a big public need, and the infrastructure—people, public policies, organisations, cultures, investments, and business models—around it. As public-purpose technology evolves, you can keep track of the latest ideas on it in [The New PPT](#), the ideas forum for public-purpose technology.

22 CORE PUBLIC PROBLEM AREAS

ADMINISTRATIVE TECH

AGRITECH

AI / MACHINE LEARNING

BLUETECH

DIGITAL ID / ACCREDITATION

DIGITAL ENGAGEMENT / PARTICIPATION

EDUCATION

FINTECH FOR PUBLIC NEEDS

DECARBONISATION AND GREENING PUBLIC SERVICES

HEALTHCARE

HUMAN SECURITY

INFRASTRUCTURE AND BUILT ENVIRONMENT

INTELLIGENT POLICYMAKING

LEGAL, COMPLIANCE AND REGULATORY ISSUES

MOBILITY

ONLINE SAFETY

PUBLIC SAFETY

PUBLIC PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

PUBLIC SECTOR DATA STRATEGIES

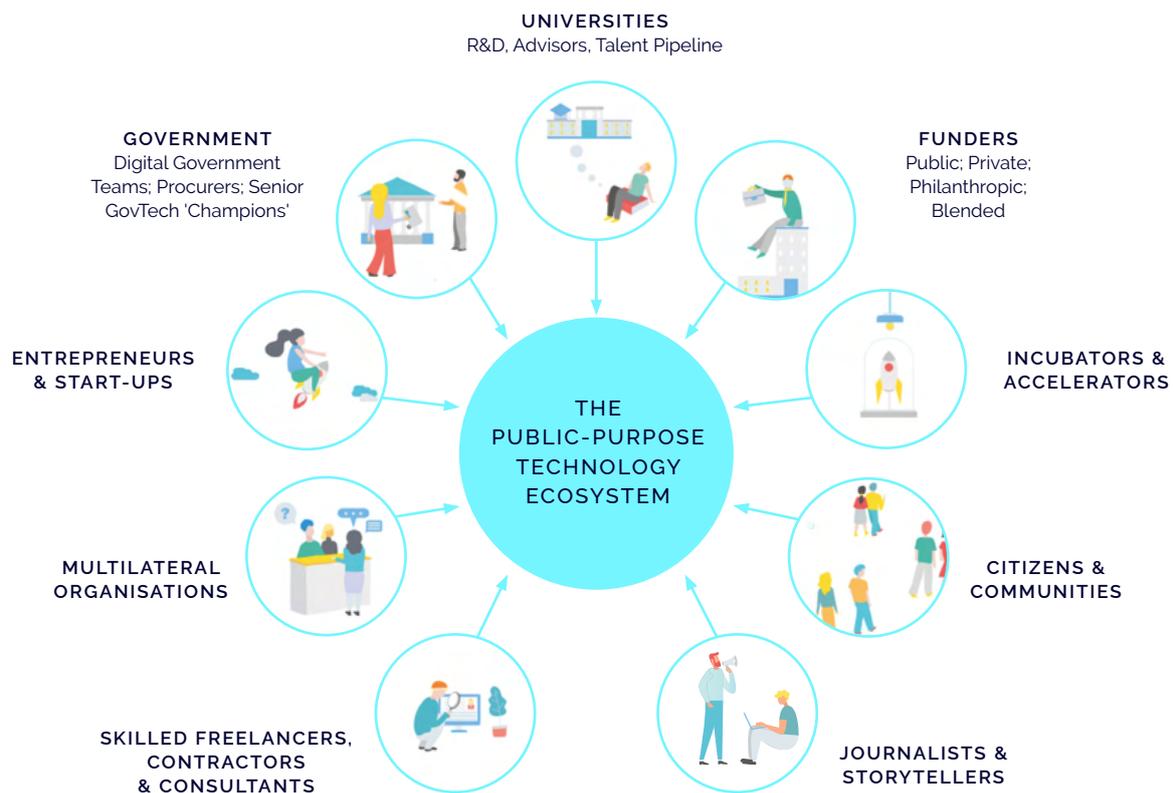
SOCIAL INTRANET

SOCIAL CARE

URBAN AND LOCAL NEEDS

WHAT IS PUBLIC-PURPOSE TECHNOLOGY? CONTINUED

FIGURE 1
THE PUBLIC-PURPOSE TECHNOLOGY ECOSYSTEM



STATEUP 21 DATA AND ANALYTICS



STATEUP 21

STATEUP 21 PROVIDES RIGOROUS, INDEPENDENT, EXPERT ANALYSIS OF SOME OF THE MOST EXCITING PUBLIC-PURPOSE TECHNOLOGY STARTUPS IN 2022. COMPILED BY MULTIDISCIPLINARY SPECIALISTS AT STATEUP, IT IS THE FIRST ANNUAL PUBLICATION TO OFFER BOTH DATA-DRIVEN INSIGHTS INTO THE INTERNATIONAL PUBLIC-PURPOSE TECHNOLOGY LANDSCAPE AND DEEPLY RESEARCHED PROFILES OF SOME OF THE MOST PROMISING PPT STARTUPS. STAGE-, REGION-, AND TECHNOLOGY-AGNOSTIC, WE OFFER A TRULY GLOBAL PERSPECTIVE AND OBSERVE BOTH THE TECHNOLOGIES ADDRESSING BIG PUBLIC NEEDS TODAY, AND WHERE INNOVATION WILL HELP TO ADDRESS SOCIETAL NEEDS IN COMING YEARS.

INTRODUCTION

Over the last 12 months, public-purpose technology (PPT) has begun to reach a level of social uptake and **recognition** that we have not witnessed before. From digital identity to telemedicine, people around the world are increasingly reliant on new technology applications to improve collective life and wellbeing. For many of us, PPT is increasingly shaping our experiences of cities, green spaces, institutions, and citizenry. When it is done well, it is **making them better**.

There is good reason to believe that the trend towards greater investment in, and public recognition of, PPT will only accelerate in the coming year. In some regions, venture capital and public funding, such as the £8 billion Levelling Up budget (UK) and \$973B Infrastructure fund (US), began to be deployed in 2021 to address big public needs. These public budgets, both focused to a great extent on mobility, digital connectivity, and addressing urban-rural divides, will begin to be deployed in earnest in 2022. As the world continues to emerge from Covid-19 this year, the capacity for governments and the entrepreneurial sector to cooperate in addressing major public needs will become more critical than ever.

Yet there remains a huge gulf in knowledge and understanding between key contributors to PPT ecosystems. Take governments. Many do not have the internal capacity to digitalise every system and service alone—nor would this be desirable: it would limit who gets to have creative input into technologies whose outcomes will impact diverse lives. Much digital innovation that public sector organisations need already exists. The applications are novel, not the technology development itself. Procurement or constituent communications platforms, for example, operationalise existing communications technologies and data analytics for public sector needs.¹

So, the finding in a **recent survey** that half of 167 cities globally described identifying innovative suppliers as one of their toughest obstacles to achieving the United Nations' Sustainable Development Goals—the second hardest barrier after regulatory complexity—is horrifying. Globally, thousands of startups—just one type of government technology supplier—are developing high-quality, contextually sensitive products and services to help to address the big public needs that cities face, from sustainable micro-mobility to **overcoming property tax evasion**.² With exceptions such as emerging technologies to tackle decarbonisation, the problem is often not supply, but knowledge sharing and relationships.³

This is why in 2021 we launched StateUp 21, the first annual publication to provide both data-driven insights into the international public-purpose technology landscape and deeply researched profiles of 21 emerging and sector-leading startups. Last year, we focused specifically on “GovTech”, or technology for government markets. This year our focus expands to range across PPT. Governments necessarily have an active, multifaceted role to play in developing PPT ecosystems, but that role extends beyond (and may not always include) being a direct procurer, depending on the technology and on local contextual factors. While “GovTech” is often used to describe these technologies, there is a risk of conceptual stretching in this usage, for which “public-purpose technology” corrects.

StateUp 21 aims to help public servants to understand what technologies are available to help address pressing local and global public needs, and to help entrepreneurs, investors, and researchers better understand and contribute to the public-purpose technology landscape. In this way, it forms part of our **broader mission** at StateUp to build the knowledge, ideas, and relationships infrastructure for public-purpose technology.

This year's edition of StateUp 21 places special emphasis on regeneration and long-termism. They require a level of ambition far beyond quick fixes, and a careful combination of speed of work and, often, patient investment. The idea of regeneration is less focused on minimising the negative impacts of humans on the environment but rather on allowing for the mutual flourishing of human societies and the natural environment, in thoughtfully developed, well connected, local places, for generations to come. Albeit unevenly distributed, we are witnessing the emergence of a new sense of pride in local place and sensitivity to local needs; entrepreneurs focused on regeneration rather than just sustainability; and both startups and institutions, from the **international** to towns and cities level, increasingly focused on long-term change, rather than short-term, “quick wins” alone. The kind of durable material that StateUp 21 member EConcrete (US) is developing for coastal areas is one example. It symbiotically encourages marine life and benefits from marine species, ensuring the long-term survival of both nature and physical infrastructure in areas susceptible to climate impact. This is productive long-termism, enabled by startup innovation and public procurement, in action. The current edition of StateUp 21 reflects this much-needed direction of travel.

¹ <https://www.bennettinstitute.cam.ac.uk/blog/govtech-investment-patience-virtue/>

² <https://stateup.co/nebula/>

³ On government as “first procurer” of emerging green technology see <https://www.project-syndicate.org/commentary/greentech-boom-needs-state-follow-through-by-william-janeway-2021-03>

STATEUP 21 CONTINUED

WHAT IS STATEUP 21?

StateUp 21 is the key international resource today on public-purpose technology. It combines macroanalysis based on tens of thousands of data points on PPT innovation with its centrepiece—detailed case studies of 21 emerging and leading startups addressing big public needs. This is the product of a stringent selection process, guided by detailed data analysis and recommendations from key industry players. StateUp 21 isn't advertorial; it's rigorous, independent, expert insight. We focus exclusively on startups, not other company types, even as we acknowledge the developments taking place in other organisations including established technology companies, public sector organisations, and universities. While startups are not the only vehicle of PPT, we place particular focus on them here because of the speed with which they are working and the sheer range of tools that they are developing, and the proven ability of entrepreneurs to bring transformative and beneficial technologies and approaches to help address big public needs.

StateUp 21 provides much-needed systematic data and analysis on the state of public-purpose technology around the world. Using Nebula, we have been able to conduct detailed analysis of the products and services that PPT companies offer, and the technologies that they use. This analysis illustrates the immense potential of the technology innovations being developed today: for example, 19% of PPT startups are addressing urban and local technology needs, many of them supporting green agendas.

Companies profiled are chosen on a geography-, technology- and stage-agnostic basis (for methodology, see p.44). Each profile provides a detailed evaluation explaining what the company does—be it developing new materials for physical infrastructure in coastal areas or rethinking community financing—how they have got here, and what they plan to do next. The "StateUp View" offers added detail on what we consider to be their USPs, drawing on evaluations from our [Experts](#) in AI, infrastructure, digital governance, investment, FinTech, data strategies, and more. StateUp 21 also highlights several "Ones to watch", young companies with extraordinary potential for the future.

StateUp 21 is not "solutionist"—we do not suggest that technology alone can "solve" big global needs nor advocate for technology interventions where none are needed. But we do believe that technology that is thoughtfully developed and deployed with appreciation of local context is absolutely essential to addressing tough global challenges, from climate change to human security, and will become even more critical in coming decades. It is the stories of these innovations and the entrepreneurs behind them that we tell here.

TechCrunch's Mike Butcher [recently wrote](#) that "there is already momentum toward a more unliveable, hotter, and more chaotic world, and right now we need many, many more efforts to stop these trends." By bringing together information—both data-driven analysis of PPT and detailed profiles on some of the highest quality startups in this field—StateUp 21 offers an unprecedented insight into the dynamic and increasingly important part of the technology economy that is laser focused on addressing profound public needs. This combination of macro-level analysis and detailed case studies represents the most comprehensive resource today to present a global view on the public-purpose technology landscape.

BUILDING THE PUBLIC-PURPOSE TECHNOLOGY COMMUNITY

WHY WE ARE BUILDING THE COMMUNITY AND RELEASING THE HIGHEST QUALITY DATASET ON PUBLIC-PURPOSE TECHNOLOGY

Over the past year we have observed the criticality of bridging the gap between the worlds of policy and technology to help to address big public needs. Gordon Brown recently observed that "We used to say the past was a foreign country. For policymakers and leaders today, the present is a foreign country." Nowhere can this more acutely be felt than when it comes to technology, and nowhere is it more urgent to address. In most countries, understanding of public-purpose technology remains scant in wider government, public discourse, and investor circles. Take a recent survey, in which half of 167 cities globally described identifying innovative suppliers as one of the greatest obstacles to achieving the Sustainable Development Goals. But it is not just those in government and policy that feel starved of high signal, high trust information. Startups, investors, and researchers too often feel at a loss when it comes to connecting with others in the ecosystem, due to siloed relationships, data, and knowledge spaces.

To contribute to addressing this problem, the launch of StateUp 21 also marks the launch of the **Nebula Public-Purpose Tech Community**. This community is for silo-busters.

NEBULA COMMUNITY MEMBERS

- Gain access to high-quality, expert curated PPT technology data that cuts through noise to show real innovations addressing big public needs
- Have a simple way to stay up to date on everything PPT
- Engage in connections and conversations with top PPT experts (technologists, researchers, investors, and more) all committed to addressing big public needs through responsible and innovative technology usage
- Have a say in the resources they most need to work towards their mission, and in the topics and types of PPT knowledge spaces they would like to see developed going forward.

Community membership includes access to tens of thousands of data points on public-purpose technology, freely available to everyone. Our first-of-its-kind global, curated public-purpose technology dataset focuses on high-quality technology innovations to address big public needs, from technology for local places to environmental resource management, in every global region.

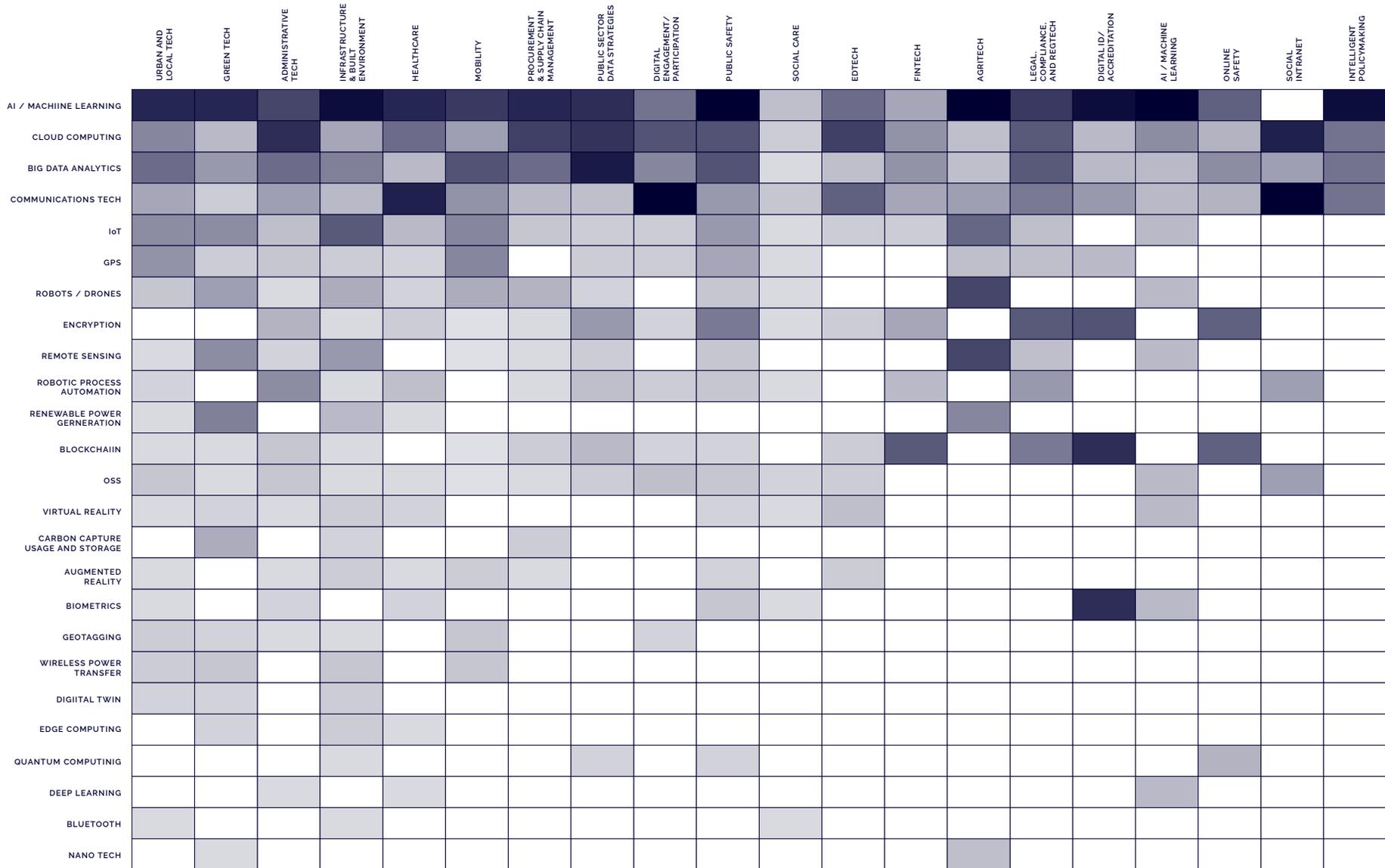
Our **Community membership** forms part of our mission to build the critical knowledge and relationships infrastructure for public-purpose technology. In joining this community, you will become a silo-buster, joining startups, investors, public servants and researchers committed to the joint effort of including technology in holistic approaches to addressing big public needs.

ABOUT THE DATA

When we launched StateUp 21 last year, we described how the data on GovTech—technology for government markets—was patchy, often lost in the more general category of technology companies. The general aggregators of data did not have reliable ways of accounting for this category of startup. We described how StateUp had responded to this challenge by creating a unique, carefully curated and quality controlled proprietary database of GovTech companies, enabling analysis of macro trends.

This year, we have broadened our focus to public-purpose technology. While retaining our insistence on selectivity, curation, and quality-control, the dataset, which forms one part of the wider **Nebula ecosystem** of research, analysis, and community-building, has more than doubled in size this year. It now covers 22 public problem areas, from identification to environmental resource management, and tens of thousands of data points on almost 1000 public-purpose technology startups around the world, their client and partner organisations, innovative tech IP, and investors. Key aspects of these data are now available to our community for free.

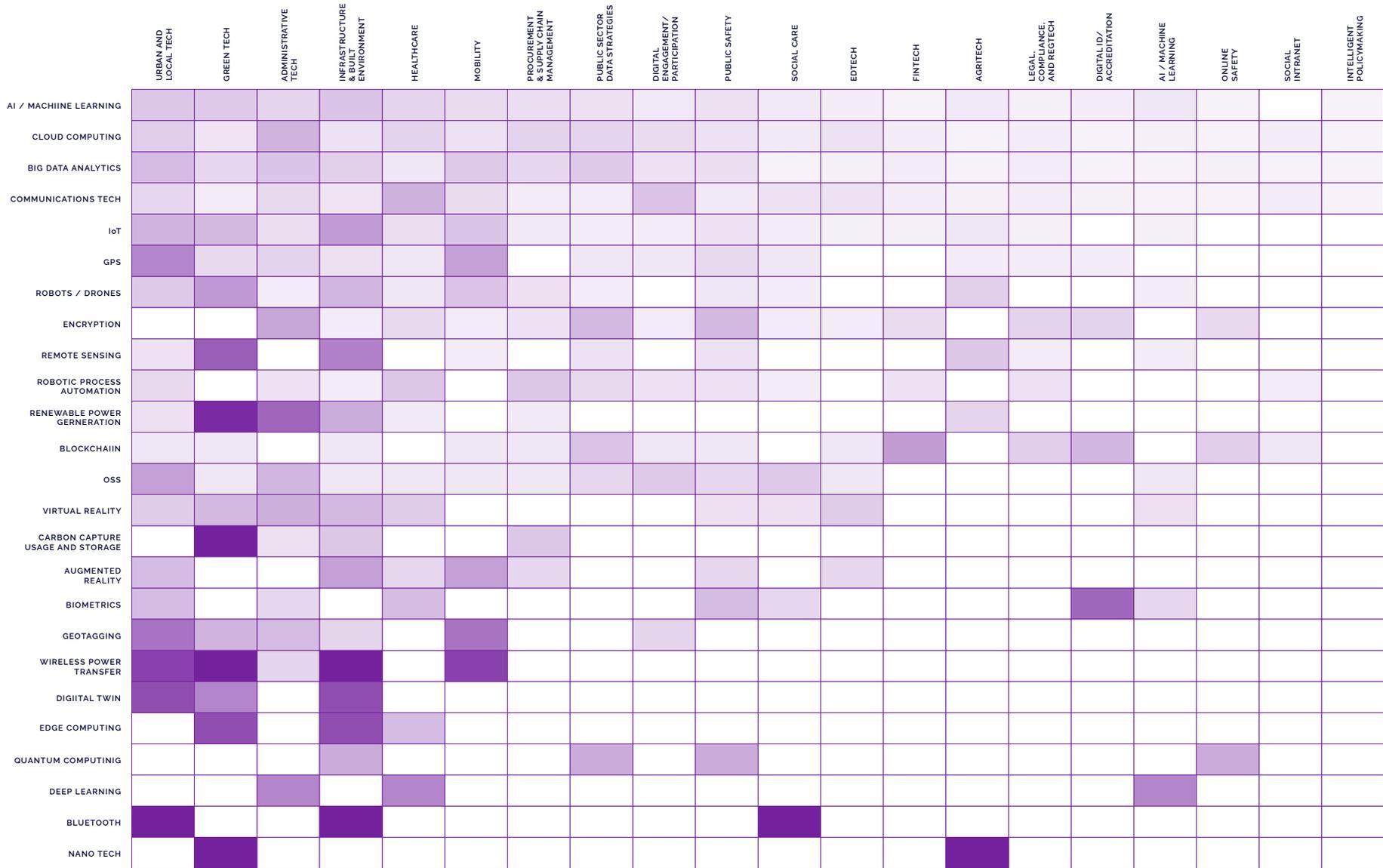
FIGURE 2 | PUBLIC PROBLEM VERSUS TECHNOLOGY | 1. DISTRIBUTION OF TECHNOLOGY USE IN EACH PUBLIC PROBLEM AREA



LOW DENSITY HIGH DENSITY

Data source: Nebula intelligence platform

FIGURE 3 | PUBLIC PROBLEM VERSUS TECHNOLOGY | 2. DISTRIBUTION OF PUBLIC PROBLEM AREAS EACH TECHNOLOGY INNOVATION IS APPLIED TO



LOW DENSITY HIGH DENSITY

Data source: Nebula intelligence platform

WHY IS PUBLIC-PURPOSE TECH RISING TO PROMINENCE NOW?

DRIVERS & ENABLERS

PUBLIC-PURPOSE TECHNOLOGY IS EXPECTED TO PLAY AN INCREASINGLY SIGNIFICANT ROLE IN THE TRANSFORMATION REQUIRED TO MEET KEY SOCIETAL AND PLANETARY OBJECTIVES INCLUDING: CONNECTIVITY AND INCLUSION; REACHING NET ZERO; ENSURING HUMAN SECURITY. BUT IF PPT IS TO HAVE A MORE CENTRAL ROLE IN THE PROGRESS THAT IS NEEDED, WE MUST UNDERSTAND THE DRIVERS THAT ARE BEGINNING TO PUSH ATTENTION ONTO TECHNOLOGY AS A CONTRIBUTOR TO CHANGE, AND THE ENABLERS THAT ARE FACILITATING NEW STARTUPS AND THE SCALING UP OF BOTH COMPANIES AND TECHNOLOGIES FOCUSED ON ADDRESSING PUBLIC PROBLEMS.

Through our research and analysis we have identified six key drivers that are currently contributing to the development of PPT ecosystems:

In some countries, these drivers have met an increasingly enabling environment for PPT development and uptake, which includes some of the following factors:

DRIVERS

- **Global megatrends** incl. geopolitical shifts, climate risk, population growth, pandemic and infodemia, technological breakthroughs
Further reading: Azeem Azhar, [The Exponential Age](#)
- **Failures of global coordination** to address the needs that these megatrends create or anticipate
Further reading: Tom Fletcher, [How to Save Multilateralism](#); Tanya Filer and Antonio Weiss, [Digital Minilateralism are the Future of International Cooperation](#)
- **Some increasing political recognition** of the role of innovation in addressing local and global needs, including, in some places, to rethink how decisions are made and resources are allocated to enable more equitable outcomes
Further reading: Pete Buttigieg, [Steering Innovation Toward the Public Good](#)
- **Technology founders' ambition** to address genuinely big public problems
Further reading: [StateUp 21 startup profiles](#)
- **Expectations of digital-first approaches** by younger generations
- **Cultural signals and public pressure** incl. from "Gen Z" to address big public needs
Further reading: [Pew Research on Gen Z attitudes in the US](#)

ENABLERS

- **Uptick in innovation budgets and policy** incl. Infrastructure Bill (US, 2021) and Levelling Up (UK, 2021), both of which emphasise place
- **Growth of, and growing appreciation of, university spin-offs and other R&D linkages between startups and universities**
Further reading: [Public-purpose technology Spin-offs](#)
- **Use of network effects and the data produced through them** (see Box 1.)
Further reading: [Should Governments Be Data-Optimists?](#)
- **Advances in complex systems management** enabling a more holistic approach to addressing public needs
- **Example: The High-Performance Computing Center Stuttgart** has produced a digital twin of the entire town of Herrenberg in western Germany, in collaboration with the town authorities.

Further Reading: [States Regenerate: Opportunity 4, decarbonising infrastructure and the built environment](#)
- **Capital deployed to PPT with greater urgency than previously, and richer conversation about investment models** (though we do not yet see evidence of widespread uptake of new models)
Further reading: [Europe is dreaming of unicorns and neglecting the rest](#)
- **Diverse and motivated talent interested in addressing big public needs** meeting opportunities

WHY IS PUBLIC-PURPOSE TECH RISING TO PROMINENCE NOW? CONTINUED

BARRIERS

NONETHELESS, PPT STARTUP FOUNDERS CONTINUE TO PERCEIVE THE FOLLOWING BARRIERS IN FOUNDING AND SCALING UP COMPANIES. WHILE BARRIERS DIFFER ACROSS COUNTRIES, THERE ARE ALSO SOME BROAD, CONSISTENT, CROSS-REGIONAL PATTERNS, INCLUDING:

BARRIERS

PUBLIC-SECTOR PROCUREMENT:

- **Low appetite** for taking risk on innovative companies.
- **Slow pace** at which public sector organisations float RFPs and make decisions.
- **Limited mechanisms** for including best available technologies or sole provider of unique technologies in public bidding processes.
- A need to make calls for proposals **easier** to find and requiring **less effort/time for reporting**.
- A need for better **time management**, faster to prepare documents, longer to engage with the market and work on delivery.

BROADER ENABLING POLICY ENVIRONMENT:

- **Lack of government support** in setting the conditions for de-risking the uptake of digital innovation in conservative sectors like infrastructure and the built environment.
- **Lack of data standards and innovation-friendly regulation** to set the stage for the responsible experimentation.

INVESTORS' PERSPECTIVES:

- Investors' measurement and anticipated timeframes for ROI.
- Need for more investment in **skills and R&D** in local economies.

[JOIN OUR ROUNDTABLE ON MEASURING ROI](#)



As early stage investors, we're pleased to see more startups tackling big public needs, whether that be climate change, healthcare, mobility and more. Common to all of these is the fact that public policy, and those that create it, really matter. Whether a startup is selling to government, operating in a regulated market, or innovating in ways that will pose new questions of policymakers, tackling big public needs means big public interest. This doesn't mean these companies will face constraints or grow more slowly, far from it. Startups that think carefully about policy can turn it into an asset, for example as a way to scale quicker, or to build defensibility around their business model. Smart founders with this maturity of thinking really stand out, and that's something we at Form Ventures help them with."



LEO RINGER

Founding Partner,
Form Ventures

NEBULA ROUNDTABLES

WHETHER YOU'RE A PUBLIC
SERVANT, STUDENT, INVESTOR,
OR ENTREPRENEUR, WE HAVE A
CONVERSATION FOR YOU TO JOIN.

We're hosting the most useful, innovative,
and thought-provoking conversations on
technology that serves a big public need,
and the public policies, organisations,
cultures, investments, and business
models around it.

[EXPLORE OUR ROUNDTABLES](#)



NEBULA
by StateUp

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP?

WHEN EXAMINING THE ALMOST 1000 COMPANIES SELECTED FOR INCLUSION IN OUR CURATED PPT DATASET, AND ASSESSING DOZENS OF HIGH-QUALITY COMPANIES TO INCLUDE IN THIS YEAR'S EDITION OF STATEUP 21, WE IDENTIFIED SEVERAL PATTERNS. NO MATTER WHAT PROBLEM AREA, LEVEL OF GOVERNMENT, POLICY DOMAIN, OR LOCAL CONTEXT THAT THEY FOCUS ON, EVERY COMPANY WE SELECTED (AS WELL AS MANY OTHERS) SHOW EVIDENCE OF AT LEAST SOME OF THESE FIVE QUALITIES:

1. THEY ARE TACKLING LONG-TERM PROBLEMS

To survive, startups often need to address problems for which there are customers today, and they may be subject to investor pressure to meet a return on investment within a short timeframe. But big public needs, from social care to mobility systems, cannot be solved overnight with a quick technological fix. The companies that we have selected recognise this characteristic, and are led by founders with a capacity for long-term thinking and an appetite to act for the long-term. In different ways, they each think about, and often act at the level of what the technology writer Kevin Kelly [describes](#) as "civilizational scale, infrastructural necessities, and feeding the network" required to address these greater needs. Take StateUp 21 member UrbanFootprint (US). Recognising cities as increasingly complex systems that must be developed and managed as such, their platform combines climate, mobility, and community vulnerability data to enable long-term urban planning. These companies were founded to address meaningful problems, sometimes over long time cycles and with long R&D cycles or [demand side procurement timelines](#). In this way, they defy the "now"-centricity of other startups.

This capacity for long-termism is evident in the age profile of our cohort of StateUp 21 members (see Fig. 4). While some of them were founded just two or three years ago and are already showing impact, several, like Carbfix (Iceland) or Calwave (US), have undertaken years of R&D, sometimes supported by more patient forms of capital than conventional VC cycles typically enable. It takes a particular quality of founding team to take on this commitment, and to seek out sufficiently patient capital to facilitate longer development cycles. But the quality and range of startups committed to addressing problems where there are no "quick fixes" is promising.

Further reading: [VCs are gatekeepers to capital. But can they act for the long term?](#)

FIGURE 4
NUMBER OF STATEUP 21 MEMBERS
AND ONES TO WATCH BY FOUNDING
YEAR

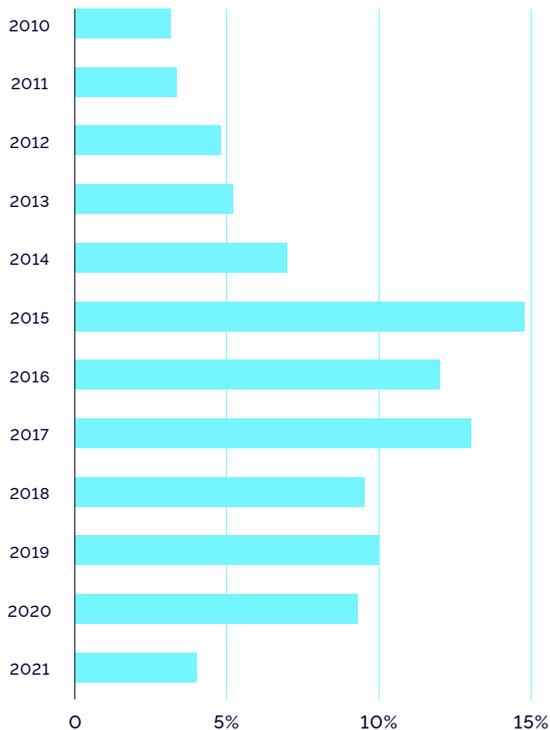


Data source: Nebula intelligence platform

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

FIGURE 5
FOUNDING YEAR OF PPT STARTUPS
BY % OF WHOLE DATASET

THE TOTAL IS LESS THAN 100% DUE TO COMPANIES FOUNDED BEFORE 2010



Data source: Nebula intelligence platform

2. THEY HAVE A MATURE AND ACTIVE RELATIONSHIP TO GOVERNMENT AND POLICY

85% of this year's StateUp 21 cohort sell directly to public sector organisations, including transit authorities; even as many of them also have B2B, B2C, or B2B2G business models. Public procurement is critical to bringing more and better digital innovation into public sectors globally. At its best, knowledgeable technology procurement strengthens vendor offerings and enables them to contribute to local economies, ultimately benefiting citizens. Public procurement can also be a powerful vehicle for supporting a host of policy objectives including decarbonisation, improving countries' productivity, and fostering innovation.⁴

Startup innovations are also important for enabling public procurement to serve as a vehicle for change. Procurement innovations like the digital platform developed by Portal de Compras Públicas (Brazil), to which 2,200 Brazilian municipalities are reportedly signed up, can help governments to realise the full possibilities of engaging their own procurement to realise policy objectives, encourage local economies, and stimulate local innovation and SME growth.

Even those PPT startups who do not sell directly to the public sector must understand and navigate their public policy exposure. The highest quality PPT companies actively seek out opportunities for engagement with public servants, and understand that technology can be at its most powerful when working in tandem with policy levers (where they exist) to address big societal and infrastructural needs.

Some PPT companies, like StateUp 21 member Ivix (Israel), focused on combating tax evasion, are building tools that directly facilitate policy or regulatory implementation—and their products and services are strengthened by substantive inhouse policy expertise. And as some governments move towards developing open regulation platforms, new opportunities will develop for varied intermediary providers to supply regulatory compliance innovations to both end-user businesses and government organisations.

Further reading: [Systematic review of the outcomes and trade-offs of ten types of decarbonization policy instruments](#)

[CLICK HERE TO SEE A CURATED SET OF PUBLIC PROCUREMENT INNOVATIONS](#)



Public spending components of stimulus packages, in the form of R&D investments and green public procurement, are among the instruments with the greatest potential, albeit largely unexplored in the case of the latter, to contribute to a green economic recovery.

Public procurement accounted for about 15% of OECD GDP in 2017. This represents 30.45% of the total public expenditure in the OECD on average (OECD Database, 2019). Because procurement is used at local and regional levels too, if it is well designed, it can foster local economies and create market opportunities. 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."



DR. CRISTINA PEÑASCO

University Lecturer in Public Policy and Centre Fellow at Centre for the Environment, Energy and Natural Resource Governance (C-EENRG), University of Cambridge

⁴ Impact of public procurement for innovation on firm productivity

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

3. THEY THRIVE THROUGH CLOSE LINKS TO UNIVERSITY ECOSYSTEMS

Big public needs require multidisciplinary, pairing technical skills with deep appreciation of societal needs and cultural contexts. Universities are natural launchpads for these kinds of startups, providing access to specialist and emergent talent from across different fields. Although departmental silos exist, the opportunities to interact across disciplines, either through formal or informal mechanisms, is clearly giving root to a set of very high quality startups driven by a mission to address key public challenges, from recycling to local mobility options.

As we noted last year, startups connected to university ecosystems may also be particularly well placed to prioritise and build for trustworthiness, which is requisite for technology with which citizens are expected to interact. Their proximity to the latest research and debate on responsible technology and technology policy can provide this additional value. But to encourage further university-born PPT innovation, particularly in the UK and Europe, there are structural and bureaucratic barriers to overcome, including questions over intellectual property rights and [equity sharing arrangements](#).

LEARN ABOUT OTHER UNIVERSITY SPINOUTS ADDRESSING BIG PUBLIC NEEDS HERE



We often hear people say: "what you do is crazy but since you work with Oxford and Cambridge we know we can trust you". Organisations that serve big public needs tend to be conservative and less open to disruptive innovation. Our joint work with high tier universities helps us prove that our innovation is robust and trustworthy."



YAU BEN-OR
CEO,
Rural Senses

Further reading: [Put universities at the heart of an innovation-led recovery](#)

FIGURE 6

10 PUBLIC-PURPOSE TECHNOLOGY STARTUPS SPUN OUT FROM UNIVERSITY RESEARCH OR CLOSELY LINKED TO UNIVERSITY ECOSYSTEMS

CARBFIX (ICELAND) University of Iceland, CNRS Toulouse, and the Earth Institute, Columbia University	RURAL SENSES (UK) University of Cambridge
SUPERPEDESTRIAN (US) MIT	COMMONWEALTH FUSION SYSTEMS (US) MIT
RECYCLEYE (UK) Imperial College, London	ADDIONICS (ISRAEL) Imperial College, London
ECODRONE (ITALY) University of Florence	MONOLETS (US) University of California, Berkeley
ANIMAL DYNAMICS (UK) University of Oxford	CARBONBUILT (US) University of California, Los Angeles

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

4. THEY ARE BENEFITTING FROM INVESTMENT, IPOS, AND ACQUISITION

As the Knight Foundation describes, venture capitalists (VCs) have historically held "a long-standing aversion toward companies with government sales models." VCs have often perceived risk, slowness, and uncertain growth trajectories in startups targeting the government market.⁵ They have also often been unwilling or unable to provide the kind of 'patient capital'—investment accepting of long and inexact timeframes—that some PPT ventures may require. This quality of capital may be needed for several reasons including long R&D cycles (for example, for decarbonisation technologies) or, where government is the primary client, long demand-side timelines to secure contracts.

Despite these challenges, PPT benefitted from the broader rise in VC investment in 2021 (see Table 1). This is particularly true in areas now broadly considered to be mission-critical to government, the economy, and society, like green technology. A number of companies have also joined the IPO rush, including one, Windward (Israel), selected for StateUp 21 prior to announcing its IPO.

A number of high-profile PPT acquisitions in the past two years is likely to continue to move the needle in terms of venture capital investment (see Table 2). These acquisitions signal the beginning of consolidation in some highly fragmented spaces like digital engagement and data-driven decision making. Last year, we observed that digital engagement was overcrowded, with similar offerings, little differentiated from each other in terms of technology, competing for customers. Although we expect small, local offerings to continue to develop, the acquisition of Bang The Table (2021) and OpenCities (2021) by Granicus (US), and Israeli Zencity's acquisition of Elucd (2021) and Civil Space (2021) hints that products within these spaces are beginning to be consolidated, with established companies and scaleups now moving both to internationalise and to offer an ecosystem of engagement products and services through acquisition.

⁵ <https://knightfoundation.org/features/civictechbiz/>

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

TABLE 1
RAISING CAPITAL FOR PUBLIC-PURPOSE TECHNOLOGY IN 2021

COMPANY (COUNTRY)	FOCUS	ROUND	AMOUNT RAISED (GBP)	INVESTORS IN THIS ROUND INCLUDE	QUARTER (2021)
Commonwealth Fusion Systems (USA)	Green Energy	Series B	£1.8 billion	Tiger Global Management, Coatue, Emerson Collective, Google, Bill Gates, Marc Benioff's TIME Ventures, Khosla Ventures, Soros Fund Management LLC	4
Dataminr (USA)	Public Safety	Series F	£348 million	Eldridge, Valor Equity Partners, MSD Capital, Reinvent Capital, ArrowMark Partners, IVP, Eden Global, Morgan Stanley	1
Kry (Sweden)	Healthtech	Series D	£219 million	CPP Investments, Fidelity, The Ontario Teachers' Pension Plan, Index Ventures, Accel, Creandum and Project A.	2
Huma (UK)	Healthtech	Series C	£95 million	Bayer, Hitachi Ventures, Samsung Next, Sony Innovation Fund, Unilever Ventures, and HAT Technology & Innovation Fund	2
Mark43 (USA)	Public safety	Series E	£74 million	The Spruce House Partnership, Tiger Global Management, The Radcliff Companies, former Australian Prime Minister Malcolm Turnbull and former Lord Mayor of Sydney Lucy Turnbull	3
Chainalysis (USA)	Blockchain data analysis	Series D	£73 million	Paradigm, TIME Ventures (Marc Benioff), Addition, and Ribbit.	1
Chainalysis (USA)	Blockchain data analysis	Series E	£73 million	Coatue, Benchmark, Accel, Addition, Dragoner, Durable Capital Partners, gYards Capital, Altimeter, Blackstone, GIC, Pictet, Sequoia Heritage, and SVB Capital.	2
Climavision (USA)	Green tech	Series A	£73 million	The Rise Fund	2
Ada Health (Germany)	Healthtech	Series B	£66 million	Bayer, Samsung Catalyst Fund, Vitruvian Partners, Inteligo Bank, F4 and Mutschler Ventures	2
RapidSOS (USA)	Public safety	Series C	£62 million	Insight	1
Heliogen (USA)	Green energy	Early stage venture	£61 million	ArcelorMittal, Edison International, Prime Movers Lab, Ocgrow Ventures, A.T. Gekko	2
AMP Robotics (USA)	Recycling	Series B	£40 million	XN, Valor Equity Partners, GV, Sequoia Capital, Sidewalk Infrastructure Partners, Congruent Ventures, and Closed Loop Partners	1

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

TABLE 1 CONTINUED

RAISING CAPITAL FOR PUBLIC-PURPOSE TECHNOLOGY IN 2021

COMPANY (COUNTRY)	FOCUS	ROUND	AMOUNT RAISED (GBP)	INVESTORS IN THIS ROUND INCLUDE	QUARTER (2021)
Placer.ai (USA)	Local tech	Series B	£37 million	Josh Buckley, Todd Goldberg and Rahul Vohra, Fifth Wall, JBV Capital, and Aleph VC	2
accuRx (UK)	Healthtech	Series B	£28 million	Lakestar, British Patient Capital, Latitude VS, Atomico, Trusted Insight and Encore Capital	3
Zencity (Israel)	Citizen engagement	Venture funding	£22 million	TLV Partners, Vertex Ventures Israel, Salesforce Ventures, M12 – Microsoft's venture fund, and Canaan Partners Israel	2
Interactio (Lithuania)	Language interpretation	Series A	£22 million	Eight Roads Ventures, Storm Ventures, Practica Capital, Notion Capital	2
Aleph Alpha (Germany)	Artificial General Intelligence	Series A	£19 million	Earlybird VC, Lakestar and UVC Partners	3
Carbyne (USA/Israel)	Public safety	Series B	£15 million	Global Medical Response, Hanaco VC, Intercap VC, Elsted Capital	2
Edgybees (Israel)	Public safety	Series A	£8 million	OurCrowd, Seraphim Capital, 8VC, NFX, Verizon Ventures, Motorola Solutions Venture Capital, Seraphim Capital, LG Technology Ventures	1
Esper (USA)	Intelligent policymaking	Series A	£6 million	Cota Capital, 8VC, Gaingels, and Stand Together Ventures Lab	3
Cyan Forensics (UK)	Online safety	Series A	£5 million	Par equity, Mercia, Triple Point, SIS Ventures, Scottish Enterprise and the MacLeod Family Trust	1
Aleph Alpha (Germany)	Artificial General Intelligence	Seed	£4 million	LEA Partners, 468 Capital and Cavalry Ventures	1
Recycleye (UK)	Recycling	Seed	£4 million	Promus Ventures, Playfair Capital, MMC Ventures, Atypical Ventures, and Creator Fund	3
Camino (USA)	Permitting and licensing	Seed extension	£2 million	Storm Ventures, Govtech Fund, Builders VC, Hanover Ventures, and Lincoln Property Company	1
Aprova Digital (Brazil)	Digital transformation	Seed	£590,000	Astella Investimentos	1
Facilit Tecnologia (Brazil)	Administrative Tech	Early stage venture	£400,000	KPTL	1

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

TABLE 2
EXAMPLE PPT ACQUISITIONS IN 2020-21

COMPANY	ACQUIRED BY	DATE
Neighborland	Nextdoor	Apr 2020
Kofile	Audax Group	Feb2020
PrimeGov	Rock Solid Technology	Mar 2021
Callyo	Motorola	Aug 2020
Bang the Table	Granicus	Jun 2021
OpenCities	Granicus	Jun 2021
doDoc	Envision Pharma Group	Mar 2021
Scytll (inc. Civiciti)	Service Point Solutions	Oct 2020
ProcureNow	OpenGov	Jun 2021
The Atlas	Government Executive Media Group	Dec 2020
SmartProcure	Thompson Street Capital Partners	Jan 2021
Seamless docs	Kofile	Oct 2020
GovSpend	Thompson Street Capital Partners	Jan 2021
Moovit	Intel	May 2020
Buyerquest	The ODP Corporation	Feb 2021
EYN	Onfido	Oct 2021
Electronic IDentification (eID)	Signicat	Jul 2021
ID R&D	Mitek	Jun 2021
Elucd	Zencity	Mar 2021
Civil Space	Zencity	Dec 2021



Excerpt from Sam Gilbert, "*Is Public-Purpose Technology the New FinTech?*", The New PPT

Public-Purpose Tech (PPT) is at a similar stage of evolution now as fintech was in 2012. Currently, PPT is dominated by "GovTech" — software solutions designed to enable local and national governments to operate more efficiently [...] But just like investors came to see that there was much more to fintech than mobile payments, GovTech is only the tip of the iceberg when it comes to PPT. And below the metaphorical water-line, entrepreneurs are hard at work. In the coming years, we will see different kinds of PPT startups with different business models gain traction as they progress from MVP to product-market fit to scale — ranging from AI companies applying machine-learning to the built environment, to infrastructure providers enabling GDPR-compliant analysis of medical records, to analytics firms using sewage data to create epidemiological insights.

Meanwhile, impact startups whose core purpose is to improve citizens' lives will come to be identified with PPT. These might include apps enabling people to provide remote care to relatives with dementia, next-generation credit unions, or SaaS companies helping businesses to reduce their carbon footprint.

As entrepreneurs tackle a wider range of public challenges, and venture capital investors' understanding of PPT becomes more expansive, orders-of-magnitude more investment will follow. Today, as Nebula reveals, the bulk of investments in PPT are at seed-stage. As these startups mature, the historical trajectory of fintech suggests we could see mega C- and D-rounds at unicorn valuations for PPT companies within 5 years, and major trade exits and IPOs within 10.

Fintech investments are now around 30 times their 2012 levels. The scale of opportunity in addressing public challenges in areas like the green transition, open data, and social care means PPT has every chance of following in fintech's footsteps.



SAM GILBERT

Advisor, StateUp and Co-founder, Bought by Many

WHAT DIFFERENTIATES A PUBLIC-PURPOSE TECHNOLOGY STARTUP? CONTINUED

5. THEY ARE AT THE CENTRE OF AN EMERGENT DEBATE ABOUT PPT INVESTMENT AND OWNERSHIP MODELS

The uptick in investment is welcomed by entrepreneurs focused on public-purpose technologies. But there is also an **emergent discussion** about whether the conventional VC model provides the most appropriate kind of financing for companies seeking to effectuate big public change. We have already seen PPT startups pivot away from addressing public needs towards more conventional B2B plays (for example, pivoting from tackling misinformation to focus on advertising and brand reputation) in an effort to win VC investment. And there is an awareness that if pushed towards quick acquisition, PPT startups could end up in environments less supportive of their mission. As Pia Mancini, co-founder of StateUp 21 member Open Collective **describes**, "In the case of an acquisition or merger with another company, we could not ensure that our values would be maintained."

Here, there may be a more **proactive role** for states to play in their capacities both as LPs and procurers to encourage a shift towards business with a public purpose. New models of "exiting" a startup are also being designed. The Exit as a Community movement encourages a transition from investor ownership to community ownership, for example.



Why are states not much more explicitly supporting this shift towards business with a public purpose, possibly even building it into funding agreements? The overall goal of the EU's Green Deal, for instance, couldn't be more aligned with a buzzing PPT sector.

The role VCs have in shaping the economy of tomorrow is crucial; the companies they finance now will be the big tech companies in ten years. Laying the groundwork for a more sustainable economy starts now, specifically through the hands of VCs funding startups — and the influence that states funding VCs can and should have.



DR. JOHANNES LENHARD

Expert in Venture Capital,
Ethics, and ESG,
StateUp

Further reading: [Exit to Community: A community primer](#)



Rather than exiting to an acquisition or IPO, we want to transfer ownership to our community. We will be working to make that a reality. Our investors are just the first chapter of this story; we then need to design an agreement in collaboration with our community of Collective Admins and Fiscal Hosts. How can we bring them in to become the steward-owners of this infrastructure for the commons? What roles can we imagine, what power distributions?"



PIA MANCINI

Co-founder,
Open Collective

NEBULA HIRE

WELCOME TO NEBULA HIRE: STATEUP'S LOW-COST, HIGH-QUALITY JOBS BOARD FOR THE HIGHEST QUALITY PUBLIC-PURPOSE TECH ROLES.

HIRING GREAT
TALENT?
FIND THE
MOTIVATED,
HIGH-QUALITY
TALENT YOUR
ORGANISATION
NEEDS

SEEKING
A CAREER
WITH PUBLIC
PURPOSE?
FIND YOUR
NEXT EXCITING
OPPORTUNITY
IN PUBLIC-
PURPOSE TECH

With 1000s of views from professionals and new entrants each month, we've heard from motivated graduates and industry "insiders" how they've been using StateUp resources to find their next role using technology to address big public needs. We're thrilled to launch Nebula Hire—connecting motivated graduates and industry insiders with top public-purpose tech roles.

Get started today:

[EXPLORE ROLES](#)

[HIRE TALENT](#)



NEBULA
by StateUp

THE GEOGRAPHY OF PUBLIC-PURPOSE TECHNOLOGY

WHICH COUNTRIES PRODUCE THE HIGHEST PERCENTAGE OF HIGH-QUALITY PPT STARTUPS, AND WHERE IS PPT BEING USED? AS FIG. 7, OUR GLOBAL HEATMAP OF PPT PRODUCTION, DEMONSTRATES, THE TOP 10 COUNTRIES BY NUMBER OF QUALITY CONTROLLED PPT STARTUPS ARE IN EUROPE, ASIA, AFRICA, THE MIDDLE EAST, NORTH AND SOUTH AMERICA. INNOVATORS ACROSS THE GLOBE ARE DEVELOPING AND APPLYING INNOVATIVE TECHNOLOGICAL SOLUTIONS TO ADDRESS BIG PUBLIC PROBLEMS BOTH LOCALLY AND WITH AN INTERNATIONAL FOOTPRINT.

The top 5 producers according to our data are the US, UK, Israel, Germany, and Spain respectively. These countries, all advanced economies, have robust wider technology ecosystems in place with policy support for innovation. They also all rank relatively well for government digitalisation efforts (source: World Bank GovTech Index, a government digitalisation index), which suggests a dynamic relationship between state digitalisation capacity and the broader development of technologies that address public needs. These more digitalised public sectors may also be better placed to procure PPT through the use of online marketplaces. While no one policy context will necessarily produce more or higher quality

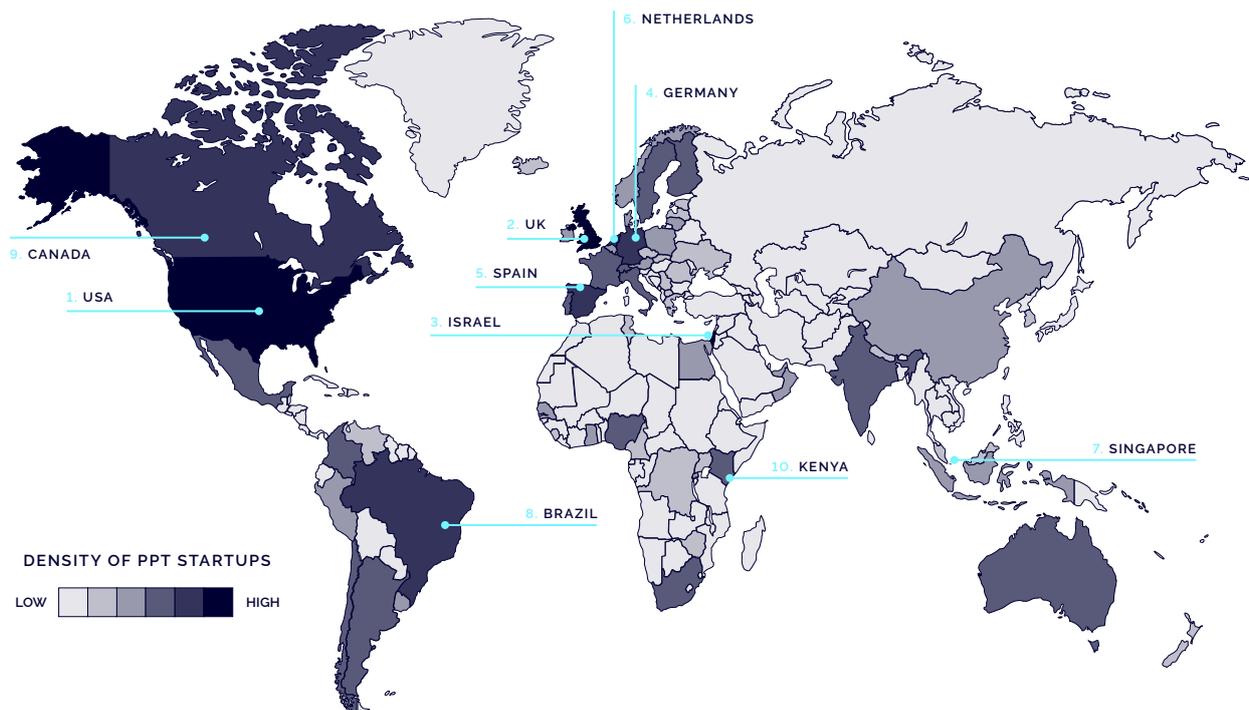
PPT, our data indicate an active relationship between states deliberately engaged in their own digitalisation and in shaping a robust digital economy and the development of broader PPT ecosystems (see Fig. 8).

Ranking sixth to tenth is a set of countries that have each, in different ways, set assertive innovation or "startup" policy in recent years designed to stimulate local technology ecosystems: Singapore, The Netherlands, Canada, Brazil, and Kenya. Singapore, The Netherlands, Canada, and Brazil also have robust digital government practices in place, ranking among the most advanced in the World Bank GovTech Index.

Other strong performers are Nigeria, France, Switzerland, Australia, India, and Chile. Nigeria and Kenya both rank lower for government digitalisation than other countries that top the ranking for high-quality PPT production. In these countries, entrepreneurs have sometimes described the development of purpose-driven technology innovation as plugging a gap in state capacity, rather than a natural complement to it.

In terms of uptake, PPT startups work in a wide variety of countries, and often rapidly internationalise. For example, 43% of StateUp 21 members currently work in two or more countries.

FIGURE 7
TOP PUBLIC-PURPOSE TECH PRODUCING COUNTRIES (BASED ON ALMOST 1000 HIGH-QUALITY PPT STARTUPS GLOBALLY)



Data source: Nebula intelligence platform

FIGURE 8
TOP PPT PRODUCING-NATIONS AND THEIR ENABLING ENVIRONMENTS



Data source: Nebula intelligence platform

THE GEOGRAPHY OF PUBLIC-PURPOSE TECHNOLOGY CONTINUED

While PPT is being produced in diverse global regions, it is not always directed towards the places that need them the most. Search data presents exciting opportunities to better connect public servants and local decision makers with innovative solutions to help address urgent place-based needs. 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. For example, scientists **have shown** that Google search queries related to COVID-19 symptoms can track the spread of COVID-19 earlier than reported case numbers. Zooming out, 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 benefits** for government and policy-makers. But innovators should also harness the power of search data to better target technological solutions to pressing problems. Investors interested in supporting technologies to address particular public problems can also use search data to identify and assess different markets. Shown in Fig. 9 are just four of the public problem areas that members of the 2022 StateUp21 cohort are addressing: river flooding, malaria, air quality, and green energy. For each area we have highlighted the top 5 countries where the Google search topic was most popular in 2021, which suggests possible opportunities to provide assistance, if the enabling conditions are in place, for innovators working on these problems.

FIGURE 9
SEARCH DATA: A WINDOW INTO THE PUBLIC'S PROBLEMS

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



Data source: Google Trends

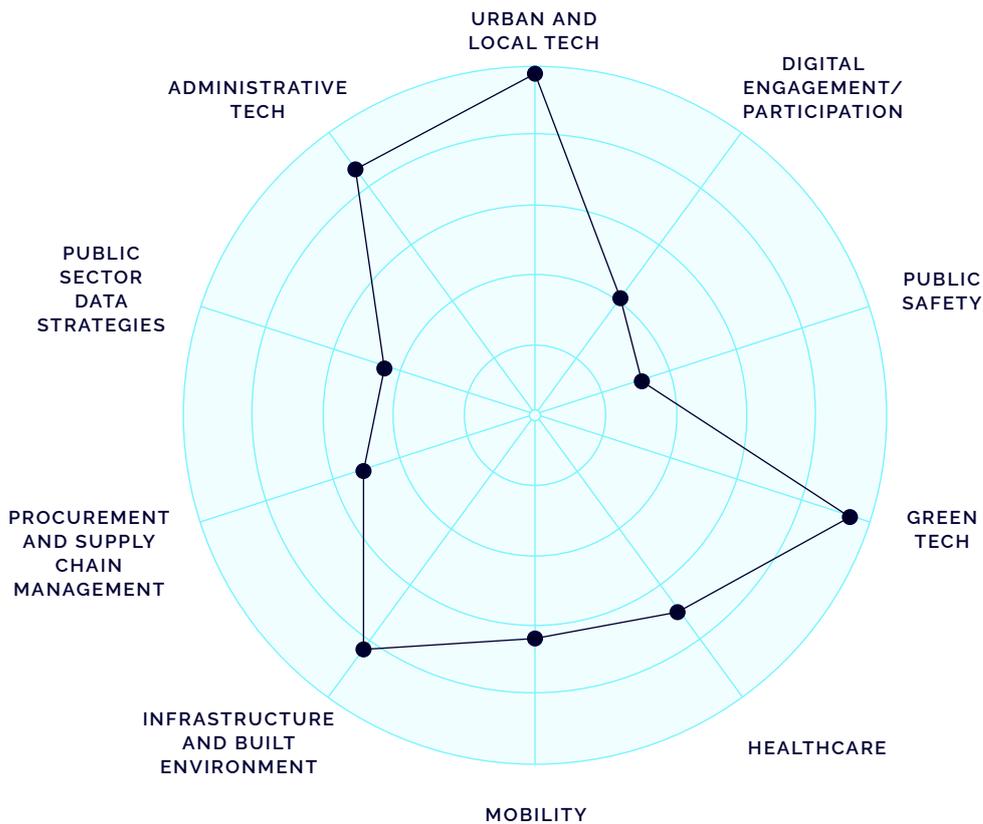
PUBLIC PROBLEM AREAS

WHICH PUBLIC NEEDS ARE PPT STARTUPS ADDRESSING?

TOP 10 BY % OF TOTAL

Urban and local needs (19.8%), decarbonising the public sector and public goods (19.1%), administrative unbundling (17.6%), and infrastructure and the built environment (16.8%) are the best represented public problem areas within the data. But public problems rarely arrive neatly packaged in silos. Some startups work at the intersection of addressing more than one public need, so are counted more than once. Sustainable mobility systems for cities is one example at the juncture of multiple public needs, directly addressing questions of inclusion, decarbonisation, city planning, and more. Companies like StateUp 21 member Fairtiq (Switzerland), for example, deliver benefits directly at this juncture.

FIGURE 10
WHICH PUBLIC NEEDS ARE PUBLIC-PURPOSE TECH STARTUPS ADDRESSING? TOP 10 BY % OF TOTAL



Data source: Nebula intelligence platform

PUBLIC PROBLEM AREAS CONTINUED

1. ADDRESSING URBAN AND LOCAL NEEDS

See Focus on Tech for Local Places

2. DECARBONISATION AND GREENING GOVERNMENT

Earlier this year, [we described](#) how governments around the world could collectively shift at least £7.8 trillion annually towards green purchasing, and have a unique capacity to drive decarbonisation because of their purchasing power and dominant role in financing and managing polluting assets like infrastructure.⁷ Many companies are focusing on environmental monitoring and measurement, and this attention is welcome. But there is an urgent need for more technologies that will actually decarbonise the planet, and the active government support to enable this. For example, Commonwealth Fusion Systems (US), founded in 2017, challenges the meaning of “startup” or “scaleup” following its \$1,800,000,000 Series B (it was selected for inclusion prior to the raise). Commonwealth Fusion Systems is developing the world’s first net energy-producing fusion machine, called SPARC, to ultimately produce the first commercially viable fusion power plant, and is a clear example of the deployment of patient capital—an investment with long and uncertain timelines—but with potentially outsized benefits to people and planet if it can move beyond research to real-world benefits. StateUp 21 member Calwave (US) is another example of a company bringing genuine innovation to energy supply. Despite recent estimates that wave power could provide up to **30% of the US energy demand**, the expansive power of ocean waves still remains largely untapped.

3. REDUCING BUREAUCRATIC BURDEN FOR PUBLICS AND PUBLIC SERVANTS

Administrative tech forms the third largest public problem area, comprising 23% of PPT startups, according to our data. This wide-ranging category includes firms that help manage human capital and track or create budgets more efficiently. It is a big, if unsexy and little discussed, category. But it is well represented with good reason. This area often addresses the “boring”, endemic problems that majorly impact the lives of citizens and public servants. In Canada, problems with the £500 million Phoenix payroll system, for example, left some government staffers unpaid for months, while others were overpaid. Ottawa reportedly paid \$560 million Canadian dollars to fix the problem.⁸ The availability of high quality and reliable administrative tech fundamentally impacts the capacity of the state to carry out its core functions. For example, StateUp 21 member IVIX (Israel) is developing AI to help governments identify and collect \$6 billion in lost tax revenue each year.⁹

4. IMPROVING INFRASTRUCTURE AND THE BUILT ENVIRONMENT FOR PEOPLE AND PLANET

Last year, we selected infrastructure and the built environment as our “Subsector to watch”. A slew of policymaking over the past 12 months looks set to encourage further growth over the next year. Passed in November, the US Infrastructure Investment and Jobs Act has allocated USD \$973 billion over five years to addressing national infrastructure needs, from roads and bridges to electric grid updates. The bulk of funding, \$283.8 billion of it, will go towards transportation. In the UK, the Levelling Up Fund, passed in June, has assigned £4.8 billion to invest “in infrastructure that improves everyday life across the UK.”¹⁰

Infrastructure innovation is critical to our social capital and to the environmental agenda, and there is increasing acknowledgment that change is needed from industry insiders within a highly conservative industry. The first-of-its-kind [Vision for the Built Environment](#), launched in 2021 by the Construction Innovation Hub and industry partners in the UK, is evidence of this new commitment to engage technology as an enabler of a healthier built environment. Startups like StateUp 21 member eConcrete (Israel), creating climate-smart marine infrastructure, are more crucial than ever, and may find an increasingly receptive market for their products.

⁷ <https://www.brookings.edu/techstream/how-governments-can-turn-procurement-into-a-climate-innovation-tool/>

⁸ <https://www.theglobeandmail.com/politics/article-ottawa-paid-out-400-million-in-phoenix-pay-compensation-to-federal/>

⁹ <https://israeldefense.co.il/en/node/50973>

¹⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966138/Levelling_Up_prospectus.pdf

FOCUS ON: TECH FOR LOCAL PLACES

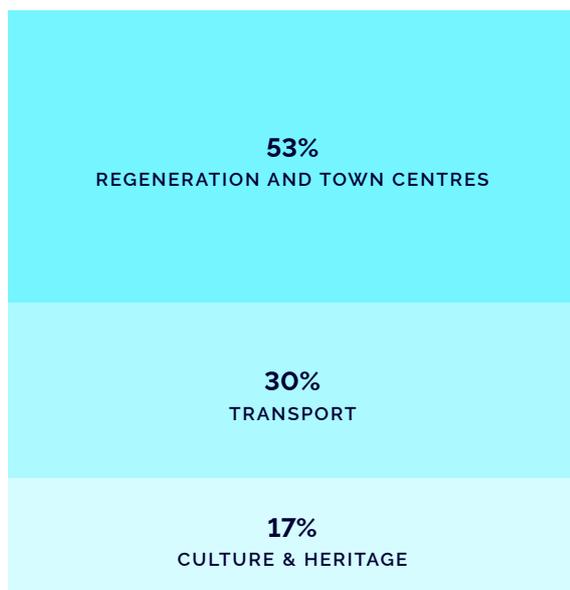
This year, we are particularly excited by developments aimed at addressing urban and local needs. There has been much discussion and anxiety about the future of cities over the past two years, with prospects of decentralised workforces driving claims that cities have had their day. There is now some consensus that this is unlikely, but the discussion that it is provoking could paint the path towards cities that work better for their habitants and people who spend time in them for work, leisure, or tourism. Moreover, it has also drawn attention to the need for a greater level of resourcing in other places, including towns in urgent need of regeneration. It is evident that technology, from mobility to digital connectivity, has a powerful role to play in better connecting towns to their wider regions and nations, and to nearby cities.

Last year, we predicted that 2021 would be an important year for developments in Infrastructure and the Built Environment. This has been the case, particularly at the level of policy. We expect there to be multiple implications for technology procurement and uptake at the local level as a result of these policy developments, particularly for technology focused on resilience building, such as climate, cyber, mobility, and connectivity. In the UK and US, the size of procurement deals done by some local governments may rise as a result, as more capital becomes available.

There are 5 macrorends that we expect to gather pace in 2022, and which could benefit local efforts at regeneration:

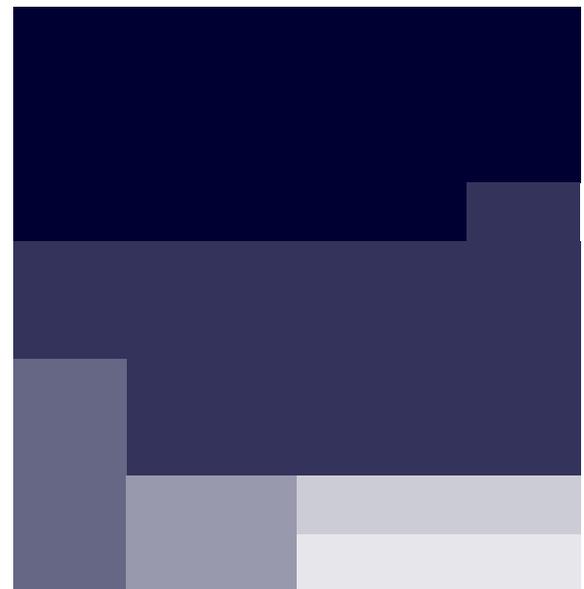
- System-of-systems thinking and planning
- Better use of data to drive decision making
- More and higher quality engagement with local people
- Digital and physical inclusivity
- Rural-urban connectivity

FIGURE 11
ROUND 1 FUNDING ALLOCATION,
UK LEVELLING UP BUDGET



Data source: Lichfields

FIGURE 12
LEADING TECH FOR LOCAL PLACES BY REGION



EUROPE	37.9%
US & CANADA	35.2%
LATIN AMERICA & THE CARIBBEAN	8.0%
ASIA & OCEANIA	7.3%
MIDDLE EAST	5.7%
AFRICA	5.7%

Data source: Nebula intelligence platform

FOCUS ON: TECH FOR LOCAL PLACES CONTINUED

1. SYSTEM-OF-SYSTEMS THINKING AND PLANNING

Perhaps the greatest challenge and opportunity for local places is to move from fragmented processes to understanding, analysis, and management at the whole-of-place level. We are seeing a greater level of interconnection than ever before both within and between places as digitalisation processes link together the physical and digital worlds: doctors' surgeries and virtual appointments; sensors to test air quality; app-based micromobility options. Add to this the many interfaces with the natural environment and we can see that every local place is a deeply interconnected system of systems, which must be managed as such. The uptick in usage of digital twins at the town or city level, and to manage critical infrastructure, speaks to a growing appreciation of the need for complex systems management in local places. Cities like **Boston** are pioneering this approach, while companies like CityZenith (US) and Akselos (Switzerland) are developing the technical capacity to engage digital twins, not in itself a new technology, beyond the individual building level.

Complex systems thinking also requires understanding the relationship of our built environment to climate, and the natural capital and ecosystem services around it. Regeneration for towns and cities necessarily involves cutting carbon emissions. But they must also prepare to ride out the shocks of climate change. That is why innovations such as the new material that StateUp 21 member EONcrete is developing is important: it is reportedly 10% stronger than traditional concrete, protecting from extreme weather conditions, while also having a 70% lower carbon footprint. Additionally, EONcrete's proprietary admixture is designed to attract an external layer of oysters, corals, and tubeworms—living creatures that protect the concrete from weathering and buffer the hydrodynamic force from strong waves and currents. As such, it spearheads an approach that enables humans, in turn, to benefit from ecosystem services.

2. BETTER USE OF DATA TO DRIVE DECISION MAKING

Systems-level management allows the collection of data that were previously unavailable. From mapping microbiomes within urban transit systems to sampling sewage to detect COVID-19 outbreaks, these types of project are **already underway**.

But while collecting and triangulating varied place-specific data matters, it is their analysis that can inform systems-based policies and strategies that enable us to understand and coordinate local places as a system of systems. That is why companies such as StateUp 21 member UrbanFootprint bring value. UrbanFootprint's **Analyst** platform contains

hundreds of datasets (e.g., transit lines, flood and fire risk, poverty indexes) that can be overlaid on top of a map. Users test different scenarios to better understand the impacts of policy decisions like land use changes and mobility investments, enabling a holistic approach. StateUp 21 One to Watch, ruralsenses, with its focus on training and engaging local talent as data collectors, is similarly promising. Providing the structure and culture of local government is such that the joined-up decision making that these approaches enable can be made, these kinds of technologies could be a boon for local places.

Important data to inform decision making will also derive directly from infrastructure and buildings. As HKS Prof of Urban Policy Stephen Goldsmith **describes** in the US context, "State and local leaders shouldn't wait for the federal government to act on investing in intelligent infrastructure." Aging water infrastructure reportedly results in "nearly one-sixth of the US's treated drinking water lost through leaks—enough to compensate for many of the country's parched rivers and reservoirs." This makes the kind of technology developed by StateUp 21 One to Watch Leakmited, an AI-Assistant to pre-locate leaks investigation areas, critical.

3. MORE AND HIGHER QUALITY ENGAGEMENT WITH LOCAL PEOPLE

There is evidence to suggest that when people feel happier with their urban neighbourhoods, they are more likely to engage in community activities, contributing to cohesion.¹¹ However, this sense of happiness is subjective: there is no one model that will make every community happy. To create local places that encourage flourishing, it is necessary to consult local people about the kind of built and social environment that they want.

It is promising, then, to see a renewed emphasis on engaging local people. Recent conflicts between local people and planners illustrate the advantages of early, thorough dialogue with local communities. For example, the recent protests in Islington, London, over the felling of 7 trees in order to make room for 25 social housing units, in a complex that is slated to include 63 new trees, could perhaps have been avoided had there been a stronger effort to inform local people of the details of the plans.¹² Plans to construct new high-rise residential blocks next to Clapham Junction have been delayed for some years by opposition from groups of residents who feel that their views have been ignored by the planners.¹³ Local opposition will always slow projects and prevent them from serving their full purpose.

¹¹ Bottini, Luca. 'The effects of built environment on community participation in urban neighbourhoods: an empirical exploration.' *Cities*, 81. 2018. 108-114. <https://doi.org/10.1016/j.cities.2018.03.020>.

¹² 'Islington council homes: Tree felling campaigners dig protest 'tunnel''. BBC News. <https://www.bbc.co.uk/news/uk-england-london-55997110>

¹³ Richert, Cyril. 'The full case against Winstanley & York Rd scheme: social cleansing and contempt for local residents.' CJAG. 19 January 2021. <https://cjag.org/2021/01/19/the-full-case-against-winstanley-york-rd-scheme-social-cleansing-and-contempt-for-local-residents/>

FOCUS ON: TECH FOR LOCAL PLACES CONTINUED

Some governments, especially at the municipal level, have seized this opportunity. In 2019, the city of Lisbon introduced a "green participatory budget" that allowed residents of the city to decide on their own greenhouse gas reduction schemes like cycling lanes and tree-planting, which the government then procured. Startups like StateUp 21 member The Future Fox (UK) have built platforms to enable inclusive decision making processes with the aim of better outcomes. While participatory approaches will not produce successful outcomes by default, carefully designed, they should be an integral part of any local decision-making process.¹⁴

4. DIGITAL AND PHYSICAL INCLUSIVITY

Inclusion is not just about the policies and strategies that get set in local places. It is also about who gets to enjoy and benefit from physical places, and how. Urban accessibility is a key theme within broader urban renewal agendas. StateUp 21 member WeWalk (UK and Turkey), focused on urban accessibility for visually impaired people, and One to Watch DotLumen, which aims to replicate the main features of a guide dog (there are only around 20,000 guide dogs for 40 million blind people), are well placed to enable inclusion in urban environments.

5. RURAL-URBAN CONNECTIVITY

Inclusivity is not just about what happens within urban boundaries. Rethinking urban environments must also consider the broader local and regional environment, to reduce inequalities. We already know that positive agglomeration effects can emerge for towns that are well connected to local cities, including through mobility systems and improved access to education and healthcare. Here, too, it is important to think on the systems' level and to identify technology needs holistically. Mobility startups serving rural populations with on-demand services often rely on an ecosystem of enabling technology, for example geolocation technologies.

Urban and local tech startups are most likely to say that they are using AI / ML as a key technology compared to startups focused on any other area. While there are many beneficial uses of these technologies for urban inhabitants (as documented in several StateUp 21 profiles) taking an exclusively algorithmic view of urban life will lead to cities that, as Ben Green describes, "appear smart but under the surface are rife with injustice and inequality," with backlashes likely to follow.¹⁶ We support the idea of a "smart enough" city: able to embrace technology as a powerful tool when used in conjunction with other forms of policy development and social change.

Responsible technology uptake at the local level will require lesson and experience sharing, and the infrastructure to enable these processes. Cities have already proven adept at learning from each other. As Azeem Azhar notes, the C40 initiative has allowed mayors across the world to collaborate in tackling climate change, and *Mayors for a Guaranteed Income* has joined together more than fifty U.S. cities in pursuit of a universal basic income.¹⁷ These have delivered results. The former helped secure **£27.5m funding from the UK government** to launch a new Urban Climate Action Program "to accelerate the implementation of climate action plans" in 15 C40 cities across Africa, Southeast Asia and Latin America. In the digital field, **UN-HABITAT Digital City Toolkit**, and the **EU's Eurocities** programs are seeking to address city-level digitisation efforts. As cities, towns, and other local places continue to adopt digital and emerging technologies to address big public needs, this cross-pollination will grow more important, enabling knowledge aggregation and the development of collective memory on what works or does not. This strong record of cooperation to date sets the ground for local places to continue to learn from each other and de-risk uptake of technology needed to enable local regeneration.

¹⁴ <https://www.brookings.edu/techstream/how-governments-can-turn-procurement-into-a-climate-innovation-tool/>

¹⁶ *The Smart Enough City: Putting Technology in its Place to Reclaim Our Urban Future*

¹⁷ *Exponential: How to Bridge the Gap Between Technology and Society*

NEBULA PRO MEMBERSHIP

ACCESS THE DATA, RESEARCH, AND
RELATIONSHIP-BUILDING THAT YOU
NEED TO EXCEL IN PUBLIC-PURPOSE TECH.

Nebula Pro Members have next-level platform access:

- **Full data access**, including:
 - Access to the full curated technology dataset featuring tens of thousands data points
 - Data on clients and partners of public-purpose tech startups
 - Data on leading investors into public-purpose tech
 - Macro-level analytics
- **Deep policy research drawing on experts at leading universities**
- **Opportunities to commission tailored work for your organisation**
- **Priority access** to intimate, expert-led roundtables on core public-purpose tech themes
- **Dedicated client service** support

CONTACT US TO LEARN MORE ABOUT NEBULA PRO
MEMBERSHIP FOR YOUR ORGANISATION'S NEEDS.



RESEARCH AND TRAINING

OUR EXPERTS WORK AT THE CUTTING-EDGE OF PUBLIC-PURPOSE TECHNOLOGY, DIGITAL GOVERNANCE, AND INNOVATION POLICY. WE ARE A TRUSTED SOURCE OF RESEARCH AND TRAINING, CUTTING THROUGH THE HYPE THAT CAN SURROUND "INNOVATION" TO DELIVER DEEPLY RESEARCHED, DATA-DRIVEN ANALYSIS AND INSIGHTS. OUR CAREFULLY CURATED DATASETS COMBINED WITH RESEARCH LEADERSHIP ARE KEY TO OUR APPROACH.

StateUp works with governments, international organisations, technology companies, investors, and research institutions. We work internationally, with an ear to the ground on the latest policy and technology developments across countries and regions. We believe context is key.

Examples of our research and training:

- **Training MPs** in the foundations of digital governance and the digital economy
- Producing **a guide for policymakers** to enable innovation in the built environment and infrastructure sectors and co-developing **a Vision** for the sector with stakeholders from across the sector
- Developing the **evidence base** and advising on mechanisms for **bilateral cooperation** between two countries on scientific research and innovation

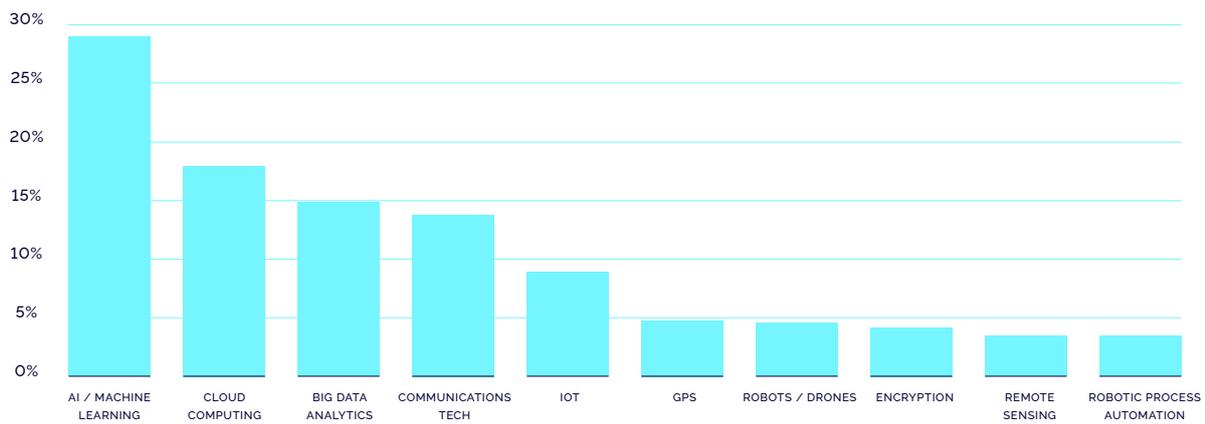
CONTACT US TO CO-DESIGN A PROGRAMME
THAT FITS YOUR NEEDS ON HELLO@STATEUP.CO

TECHNOLOGY TRENDS

ARE WE USING THE FULL TECHNOLOGY TOOLKIT TO ADDRESS BIG PUBLIC NEEDS?

FIGURE 13
WHICH TECHNOLOGIES ARE POWERING PUBLIC-PURPOSE TECH?

TOP 10 TECHNOLOGIES BY % OF STARTUPS THAT SELF-REPORT USING THEM AS CORE TO THEIR PRODUCTS AND SERVICES



Data source: Nebula intelligence platform

Our dataset tracks 25 technologies that startups describe as "core" to their products and services. The top 4 technologies reportedly used by PPT startups are: AI/Machine Learning, Big Data Analytics, Cloud Computing, and Communications Tech. Our analysis revealed that another prominent grouping of technologies is those directly related to digitally establishing networks and location, such as through IoT and GPS (for definitions, see Technology Glossary, p. 6). Each of these technology categories has established uses across a wide range of public problem areas (see Fig. 2 and 3).

TABLE 3
TOP 4 INNOVATIVE TECH/IP - PUBLIC PROBLEM AREA WHERE >25% COMPANIES REPORT USING

TECH	PUBLIC PROBLEM AREA
AI / MACHINE LEARNING	Urban and Local Needs / Decarbonisation and Greening Public Services / Infrastructure and Built Environment / Healthcare / Mobility / Public Procurement and Supply Chain Management / Public Sector Data Strategies / Public Safety
CLOUD COMPUTING	Administrative Tech / Public Sector Data Strategies / Digital Engagement & Participation
BIG DATA ANALYTICS	Public Sector Data Strategies / Public Safety
COMMS TECH	Healthcare / Digital Engagement & Participation

TECHNOLOGY TRENDS CONTINUED

IT IS ALSO NOTABLE THAT:

The top 3 technology categories are software based, and encompass a wide range of different techniques, whereas the lower reported technology categories (albeit still significant when grouped by type) are more hardware based, which often brings additional upfront costs. Despite the potential of IoT, for example to address local mobility needs or measure air quality, privacy and regulatory issues may also hinder broad uptake, particularly at the local government level, at which these problems are often tackled.

Across 7 key public problem areas, from urban and local needs to public sector data strategies, more than 25% of startups describe AI / ML as core to their product development. The pace that AI is being developed for public sector organisations across all policy domains indicates a need to upskill public servants so that they can better understand the technology. This is particularly true in urban and local settings, and for public servants focused on the climate agenda, where there is a particularly strong dominance of AI development in technology products. Despite this need, many government organisations, particularly at the local level, disclaim any ability to understand how AI systems that they have procured from third parties work.

It is, nonetheless, reasonable to take some claims of AI use or development with a pinch of salt. Many startups aspire to use AI but may not have yet integrated it into product offerings. We are also aware of several cases where PPT startups have halted development of AI systems.

There is a high level of concentration around these top 5 technology categories, after which there is a significant drop in reported usage, with other digital and emerging technologies—including blockchain, virtual reality, and biometrics—being used much less widely as core to PPT products and services. For policymakers and public servants looking to gain foundational understanding of technology solutions, this finding could guide and narrow their focus in what can otherwise often seem an overwhelming technology landscape. However, there is a balance to be struck. They should not be constrained by what is already being applied when seeking to understand what could bring about long-term benefit.

BETTER CONNECTING TECHNOLOGY INNOVATIONS TO PUBLIC PROBLEMS

Our analysis reveals the connections between the top technological innovations and the key public problem areas they are being used to address. Reviewing this network of connections, as visualised in Fig. 2 and 3, has a range of implications. For example, countries that have cultivated an environment for certain types of technologies to thrive can now identify the different public problem areas that these technologies can be harnessed to address, based on current evidence of use cases and applications.

On the flip side, countries can identify which technologies they should be cultivating to address their most pressing problems. Startups that have developed strong IP in one technology area can assess the network (Fig. 14) to identify other public problems areas in which their IP can be applied. Investors focused on particular emerging technologies can gain insight into which sectors and problem areas they might expect to find growth in.

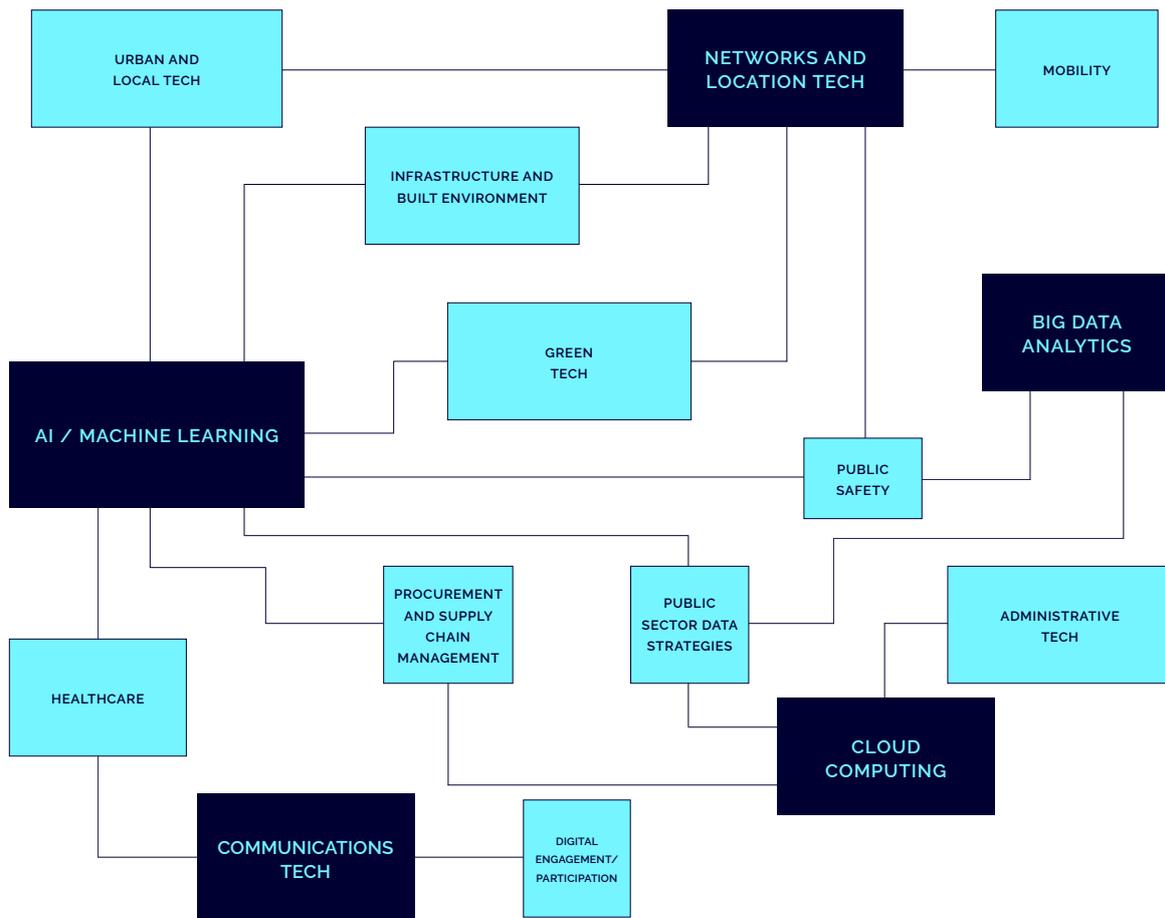
However, we should be cautious about using current data on technology applications as a direct proxy for future possibilities. At the moment, there is a clear dividing line between the widely applied technologies traced in Fig. 14 vs. technology that is more "problem-specific" in terms of current application. Fig. 2 (Tech Sector Heatmap 1) puts this in stark relief. Looking at the distribution of technology use in each individual public problem area, we can identify which technologies are being used to solve specific problems versus those being broadly applied to address a broad range of needs. For example, biometric technologies are engaged relatively widely by digital identity startups, but are little used across almost any other public problem area.

Of course, some technologies, like biometrics, are necessarily application-specific, at least in the first instance. But this finding indicates that we may not be using the full technology toolkit currently available across a sufficiently broad range of public needs. There is more work to do in identifying unexplored public good use cases for specific digital and emerging technologies to ensure that we are using the full toolkit at our disposal. Policymakers around the world, assisted by organisations focused on responsible technology usage, are setting AI-specific stimulus packages, innovation policies, standards, and regulations. But it may serve to cast the net wider if we are to reap the benefits of a broader range of currently available and emerging technologies.

TECHNOLOGY TRENDS CONTINUED

FIGURE 14
CONNECTING PUBLIC PROBLEM AREAS WITH TECHNOLOGICAL SOLUTIONS

IN THIS NETWORK DIAGRAM THE TOP INNOVATIVE TECHNOLOGIES ARE CONNECTED TO THE MAIN PUBLIC PROBLEM AREAS WHERE THEY ARE CURRENTLY BEING APPLIED (>25% OF COMPANIES REPORT USE). THE SIZE OF EACH RECTANGLE REPRESENTS ITS PROMINENCE IN THE NEBULA DATABASE.



Data source: Nebula intelligence platform.

This may be the case in relation to Web3 technologies and approaches, which have become simultaneously venerated and dismissed as hype over the past year. Currently, Web3 technologies, based on blockchains, are little used to address public needs overall, and are used in relatively few public problem areas (see Fig. 2). Like emergent technology categories before it, Web3 is mired by an inconsistent and hazy use of terminology. In this instance, that haziness is paired with technical complexity and a history of high-profile criminal activity in some areas, which may impede serious thinking about possible beneficial uses. At the same time, beyond **some blockchain applications**, actually existing public use cases are currently few and far between, and

not well identified. While policymakers should not get lost in the hype, an understanding of potentially useful applications would be valuable in shaping future industrial and innovation policy. For example, as author and entrepreneur Sam Gilbert **writes**, with homeschooling likely to continue in some form over coming years, VR teaching environments could help to improve on current experiences. In the US context, the **argument** that tools like stablecoins and digital identity can "enable more efficient distribution of aid to working families and protect our systems from exploitation by foreign criminals" could compel, providing the necessary policy and regulatory infrastructure for responsible uptake is in place.

MAKING THE SELECTION

SELECTION FOR STATEUP 21 WAS GUIDED BY RECOMMENDATIONS FROM KEY INDUSTRY PLAYERS, AS WELL AS DETAILED ANALYSIS OF COMPANIES FROM OUR QUALITY CONTROLLED PROPRIETARY DATABASE OF ALMOST 1000 STARTUPS ADDRESSING BIG PUBLIC NEEDS INTERNATIONALLY. STARTUPS COULD ALSO SELF-NOMINATE THEMSELVES FOR CONSIDERATION, AND WE RECEIVED DOZENS OF HIGH-QUALITY SELF-NOMINATIONS. ONCE THE LONGLIST WAS SET, WE REQUESTED FURTHER INFORMATION FROM THE STARTUPS THEMSELVES. COMPANIES WERE GIVEN THE OPPORTUNITY TO EXPLAIN THE BIG PROBLEMS THEY ARE TACKLING AND WHY THEY ARE BEST POSITIONED TO MAKE A POSITIVE IMPACT. THEY WERE ALSO ENCOURAGED TO HIGHLIGHT THEIR INNOVATIVE APPROACHES AND ANY ADVANCED TECHNOLOGY THEY USE.

We then determined a shortlist based on this information. We aimed to include startups operating across a representative sample of public problem areas, working with a diverse range of clients, and at various stages of growth. We also considered the quality of founding teams, government contracts, and investors—albeit recognising that younger companies could only imperfectly be evaluated against these criteria. Public sector contracts were not a necessary condition for inclusion, but 85 % of members are actively working with or pursuing public sector contracts.

STARTUPS WERE SELECTED FOR:

- A focus on ambitious, long-term public needs
- Local and global impact
- Quality of founding team
- Innovative tech IP or innovative applications of existing technologies to now address big public needs
- Sensitivity to local contexts

Startups were able to fact check their profiles ahead of publication, but they were not permitted to make substantive changes to the content. It was challenging to decide which firms to include in our final list. But the difficulty of this task shows that the PPT is vibrant and rapidly developing, promising rich pickings for future editions of StateUp 21.

Featuring in StateUp 21 does not involve any sort of payment. The aim of this resource is to provide independent research insights. We believe this is much needed for the government market, the entrepreneurial sector looking to interact with and sell into it, and investors seeking out impactful companies. StateUp 21 is not a conventional 'list'—we aim to bring granular understanding of the latest genuinely innovative and useful technologies addressing critical public needs, moving beyond hype narratives.

STATEUP 21 2022 MEMBER PROFILES



STATEUP 21 MEMBERS

AIRSEED [Australia]

Agritech / AI & Machine Learning / Decarbonisation

AVELA [US]

Education / Administrative Tech / AI / Machine Learning

BITT [Barbados]

FinTech for public needs

BUILDERS PATCH [US]

Infrastructure and Built Environment

CALWAVE [US]

BlueTech / Decarbonisation and greening public services / Urban and Local Needs

CARBFIX [Iceland]

Decarbonisation

ECONCRETE [Israel]

BlueTech / Decarbonisation / Infrastructure and Built Environment

ELECTREON [Israel]

Mobility / Urban and Local Needs

FAIRTIQ [Switzerland]

Mobility

IGNITE POWER [Rwanda]

Decarbonisation and greening public services / Urban and Local Needs

IVIX [Israel, US]

FinTech for public needs

OLIO [UK]

Urban and Local Needs / Social Care

OPEN COLLECTIVE [US]

Digital Engagement & Participation / FinTech for public needs

PORTAL DE COMPRAS PÚBLICAS [Brazil]

Public Procurement

RENSOURCE [Nigeria]

Decarbonisation and greening public services / Infrastructure and Built Environment

THE FUTURE FOX [UK]

Digital Engagement & Participation / Data-driven decision making

TOKA [Israel, US]

Cybersecurity / Public Safety

URBANFOOTPRINT [US]

Infrastructure and Built Environment / Urban and Local Needs

WEWALK [US, Turkey]

Social Care / Urban and Local Needs

WINDWARD [Israel, UK, US]

Data-driven decisionmaking / Public Safety / Supply Chain Management

ZZAPP MALARIA [Israel]

Healthcare / Human Security / Urban and Local Needs

ONES TO WATCH

ADDIONICS

Develops 3D electrode technology that enhances the capacity, power, safety, charging time, lifespan, and cost of batteries of any chemistry (including Lithium-ion).

AQUOSMIC

Uses AI and quantum computing to classify and quantify the thermodynamic properties of materials captured by satellite imaging.

B2GOV

Helps businesses sell to government. Online portal displays public procurement opportunities alongside data around past prices and major competitors.

CITYMAAS

Creates digital tools to help disabled people more easily navigate the physical and online world.

DIPTERA.AI

Invented a product that makes it cheaper and easier for local municipalities to control the mosquito population.

GOVLIA

A B2G marketplace that enables governments to implement and manage local preference or supplier diversity programs; saving time, money and resources.

LEAKMITED

Locates water leaking pipes using AI and Satellite Images.

MONOLETS

Enables products to be tracked in challenging conditions (e.g., where items are densely packed, or separated by liquids/metals that deter most radio signals).

RURAL SENSES

Social enterprise that helps project developers to understand rural community needs and evaluate project impact efficiently and accurately using AI-enhanced data analysis and user-centric data collection.

.LUMEN

Research startup that is developing a headset to help blind people better navigate their environment.

STATEUP 21 LAUNCH EVENT

JOIN THE CONVERSATION LIVE

THURSDAY, 17TH FEBRUARY, 2022

REGISTER HERE

**SESSION 1: ASK-ME-ANYTHING WITH STATEUP 21
STARTUP FOUNDERS**
5:00 PM GMT

How do you build a startup that addresses big public needs? StateUp will host an informal forum for aspiring entrepreneurs and young professionals aiming to work in public-purpose technology to learn from StateUp 21 startup founders. Bring all your burning questions!

Building a career in public-purpose technology? We have something just for you! For the most exciting career opportunities in public-purpose technology, check out our brand new [Nebula Hire jobs board](#).

**SESSION 2: KEY IDEAS FROM STATEUP 21 AND
THE STATE OF GLOBAL PUBLIC-PURPOSE TECH**
6:00 PM GMT

Who are today's startups forging the brightest future, and how are they innovating? Join a leading panel of founders, investors, and policy experts to discuss the opportunities and challenges that startups addressing big public needs face in 2022, and hear key insights from StateUp 21.



AIRSEED

AIRSEED HAVE DEVELOPED THE SPECIALISM AND TECHNOLOGY TO SCALE ENVIRONMENTAL RESTORATION USING SEED-PLANTING DRONES

COMPANY SUMMARY

- Year Founded: 2018
- Funding: Series A forthcoming
- Revenue growth from 2020 to 2021: N/A
- Lead investors: [TWIYO](#)
- HQ: Sydney, Australia; Satellite office in Cape Town, South Africa
- FTEs: 10
- Key clients/partners: N/A
- Key executives: Andrew Walker, Director, CEO and co-founder, previously mechanical engineer at BMW and Airbus; Andries Louw, Director, Chief Pilot, Co-founder, previously researcher in use of geospatial data for precision agriculture and land surveying.

PROFILE

The environmental and human [risks](#) incurred through deforestation and biodiversity loss cannot be overstated. The continual destruction of natural ecosystems is accelerating climate change, decreasing food and water security, and endangering human health and natural assets. Deforestation or conversion of land for agriculture use is a [key direct human](#) driver of biodiversity loss. Indirect human impact is felt through the effects of climate change, for example, increased frequency of forest fires.

[AirSeed](#) has developed specialised planting drones that use patented Seed Pods to restore diverse natural ecosystems, ranging from arid zones to rainforests. AirSeed projects begin with an ecological survey to develop a planting plan that incorporates native species. Next, Seed Pods are prepared for planting; AirSeed's proprietary biotechnology ensures each Seed Pod is soil and species specific, incorporating the right mix of nutrients and minerals to aid seedling growth. AirSeed's drones then autonomously fly routes determined using machine learning and to precision plant Seed Pods in locations recorded using GPS. The use of these specialised drones facilitates access to large areas of land, which may be remote or hazardous, and the GPS logging allows AirSeed to monitor the restoration progress.

AirSeed reports that, in a single day, two people can plant 40,000 seeds, making their process 25 times faster and 80% more cost effective than manual planting methods. Their goal is to be planting 100 million seeds a year by 2024. This scale up will require strong state support. Australia, where AirSeed is based, suffers increasingly frequent intense climate events, such as [fires](#) and [floods](#), that destroy vast areas of vegetation home to unique and near-extinction species. Australia is therefore the ideal location to test and scale AirSeed's technology, but deforestation and biodiversity loss are global issues. Following commitments at the 26th UN Climate Change Conference to conserve forests and restore biodiversity, governments will need to increase adoption of nature based climate mitigation solutions. NGOs and corporate entities are also expected to invest in this endeavour.

PLANS FOR 2022

This year will see AirSeed Technologies move from test phase to large scale deployment through a number of new planting projects commencing with commercial and government partners.

WHO SHOULD CONNECT WITH THIS COMPANY?

Governments, NGOs, and corporations responsible for or interested in sustainable biodiversity restoration to combat climate change.

COMPANY IN ACTION

AirSeed's newly developed Seed Pod planting drone, Artemis, underwent the final stages of testing in late 2021. This [video](#) shows the Seed Pod planting drone technology being put to the test in Australia.

STATEUP VIEW

Mass tree-planting projects that claim to offset carbon emissions have received [criticism](#) in recent years, with experts highlighting the potential environmental and societal damage caused by poor planning, often due to the use of alien seeds or selection of unsuitable locations. AirSeed stands apart from such projects by applying their specialised ecological knowledge and land surveying capabilities.

In the wake of the pandemic, citizens and states have heightened awareness that biodiversity loss can increase the [spread](#) of zoonotic diseases, such as COVID-19. This link adds to the multitude of factors that should motivate public and private landowners to act fast in restoring natural ecosystems. StateUp expects that this crucial aspect of fighting climate change will receive increasing attention from policymakers and investors serious about reaching net zero.

New technologies will be vital in achieving the levels of environmental restoration desperately needed; '[eco disruptors](#)' with exceptionally strong technical teams, such as AirSeed, will be at the forefront of innovating restoration solutions. AirSeed stands apart from [other drone-based seed-planting startups](#) due to the strength of their technical team and because of their focus on environmental restoration specifically to combat biodiversity loss and climate change – other startups typically focus on providing a reforestation service to timber producers. Currently, the financial incentives are greater for timber reforestation than for environmental restoration. However, with increasing commitments from governments to tackle biodiversity loss, new opportunities for growth are certainly on the horizon for environmental restoration startups such as AirSeed.

AVELA

AVELA ENVISIONS A WORLD WHERE OPPORTUNITIES ARE MORE EQUITABLY AND EFFICIENTLY ALLOCATED, STARTING WITH EDUCATION

COMPANY SUMMARY

- Year Founded: 2019
- HQ: San Francisco
- FTEs: 11-50
- Key clients/partners: Teach for America (TFA), the Inter-American Development Bank (IDB), Tulsa Public Schools (TPS), Oakland Enrolls, My Schools Newark, New Orleans Public Schools (NOLA-PS), Jersey City Board of Education (JCBOE)
- Key executives: Greg Bybee, co-founder and CEO, social entrepreneur and co-founder of a communications platform for policymakers; Joshua A. Angrist, co-founder and board member, MIT economics professor, 2021 Nobel Laureate; Parag Pathak, co-founder and board member, MIT economics professor and Clark Medalist

PROFILE

Avela is using technology to reduce bias, inequality, and inefficiencies in assessment processes. Their team, including a Nobel Laureate in economics and a Clark Medalist, have developed a set of matchmaking algorithms. Based on a given set of inputs, these algorithms determine the fairest distribution of outcomes. Avela's platforms have already had real-world impact, including determining the most efficient allocation of ventilators during the pandemic and matching kidney donors to patients in most urgent need.

Allocating students to schools is notoriously biased by factors such as a student's socioeconomic status or the training resources available to them. Avela's Explore platform works to combat this bias by enabling parents to compare schools and express their preferences. Research suggests that students who attend a school of their choice have better nonacademic outcomes (e.g., fewer disciplinary actions) and in some cases better academic outcomes as well.

Research conducted by the MIT economists found that school districts saw a 90% reduction in the number of dissatisfied families when using Avela's platform, with 50% more students placed in their preferred school. Avela underscores the tangible effects this has on learning outcomes: MIT research suggests that students who enrolled in their first choice school improved maths achievement by 0.4 standard deviations.

Avela's Match platform is also being used by the US Army to match soldiers to the brigades where their skills are most needed.

PLANS FOR 2022

Launch Avela Enroll, a platform for school enrollment.

WHO SHOULD CONNECT WITH THIS COMPANY?

Organisations such as school districts and public sector authorities that need to manage a large number of employees, participants, or other stakeholders.

CASE STUDY

Teach for America, a nonprofit, recruits recent college graduates to teach in low-income schools for at least two years. The organisation used Avela Match to assign teachers to partner schools.

Dr. Jonathan Davis, an economist at the University of Oregon, studied the programme and found that by improving the teacher match, teacher satisfaction increased 33% while teacher retention increased 16%. Davis calculates that this impact is "comparable in magnitude to the change from raising new teachers' salaries by \$8,000 per year." These positive effects, Davis argues, come from the increased influence teachers get over their assigned match by using Avela's platform.

Listen to co-founder and MIT economist Parag Pathak explain his work on ventilator allocation during the Covid-19 pandemic on the Freakonomics podcast.

STATEUP VIEW

Insights from Dr. Paolo Turrini, StateUp Expert and Associate Professor in Computer Science at the University of Warwick

The use of algorithms for conflict resolution is well established, and there are many success stories. These procedures can construct allocations to optimise pre-defined notions of fairness and are backed by Nobel prize winning research, such as the famous Gale-Shapley 'stable marriage' algorithm.

Avela shows great promise. Its platform is currently applied to small-scale contexts, and scaling up to more complex scenarios involving uncertainty and incomplete knowledge will be the next hurdle.

It can also be challenging to adapt the definitions of optimality and fairness to the context studied—determining what people really want or need is not always easy. AI researchers studying reinforcement learning could help to make Avela's algorithms effective in uncertain conditions, further differentiating Avela's work from other matching algorithms in the market.

BITT

BITT'S DIGITAL CURRENCY MANAGEMENT SERVICES ARE HELPING GOVERNMENTS TRANSITION TO MORE EFFICIENT AND INCLUSIVE FINANCIAL SYSTEMS

COMPANY SUMMARY

- **Year Founded:** 2013
- **HQ:** Bridgetown, Barbados
- **FTEs:** 51-100
- **Key clients/partners:** The Central Bank of Nigeria, The Eastern Caribbean Central Bank, The National Bank of Belize, TASCOMBANK
- **Key executives:** Brian Popelka, CEO: 14 years of experience in E-commerce at Overstock; Jim Martin, CTO: 25+ years experience in software development, architecture and management; Simon Chantry, CIO and co-founder: background in nuclear engineering, member of OECD Blockchain Advisory Board and WEF Digital Currency Governance Consortium. Patrick Hidalgo, CFO: 15+ years of experience in financial markets.

PROFILE

Central Bank Digital Currencies (CBDCs) refer to digital money which is the direct liability of a given central bank. For citizens, owning CBDC units will feel like having a checking account with the central bank (as opposed to a commercial bank). For central banks, CBDCs hold promise for broadening control over financial systems, increasing macro stability and efficiency, and promoting financial inclusion.

CBDCs are open to several design questions: for example, should they leverage conventional payments infrastructure or distributed ledger technologies? Bitt, a financial technology startup, offers expertise and technology so that central bankers can answer such questions through experimentation and experiential learning. At the core is its Digital Currency Management System (DCMS) that enables central banks, financial institutions, and governments to deploy CBDC and stablecoin infrastructure. Bitt also facilitates at different points of CBDC deployment. For example, to specify CBDC technical requirements, central banks can trial DCMS features using Bitt's "CBDC Sandbox" or "CBDC Pilot" services.

Bitt's offering is timely. A 2021 Bank of International Settlements survey found that 86 percent of central banks are actively researching CBDCs, 60 percent are experimenting and 14 percent are piloting. The pandemic sharpened both a shift away from physical notes and the urgency of quickly responding to financial instability, boosting CBDC consideration. Even before COVID-19, governments reasoned that CBDCs could buoy monetary sovereignty against foreign currencies and cryptocurrencies.

PLANS FOR 2022

Expanding into new markets; Growing the team

WHO SHOULD CONNECT WITH THIS COMPANY?

Central Banks, Financial Institutions, Public Tax Authorities, Digital Government Agencies and Departments

CASE STUDY¹

The Caribbean faces twin problems of costly and slow cross-border transactions and a large unbanked population. To address this situation, in 2019 the Eastern Caribbean Central Bank (ECCB) partnered with Bitt to develop and deploy the digital version of the Eastern Caribbean dollar, DCash. The aim was for DCash to underpin the region's retail payment system, especially for unbanked

residents, merchants requiring low cost payments infrastructure, and diasporans seeking cheaper remittance channels.

IMAGE FROM LEDGER INSIGHTS

Bitt built DCash on Hyperledger Fabric, an open source, permissioned blockchain hosted by The Linux Foundation. Bitt faced some deployment challenges, from relatively low internet penetration to Eastern Caribbean residents being wary of using a "cryptocurrency". The pandemic also caused Bitt to deploy technology remotely. However, Bitt and the ECCB surmounted these challenges, for example through an extensive educational campaign to allay residents' concerns.

DCash was launched as an invitational pilot in March 2021. A bank account is not necessary to obtain a DCash Wallet. There are no minimum balances or payments amounts and no payment fees, including for remittances. Transactions are stored on Hyperledger Fabric, but financial institutions are responsible for personally identifiable information. DCash facilitates instant payments across participating countries in the Eastern Caribbean Currency Union (ECCU, participating countries are Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Vincent and the Grenadines and St. Lucia). The next step is expanding to Anguilla, the last remaining ECCU member country, and enhancing application features.

STATEUP VIEW

Bitt's story is still developing, but it looks to us like one of accumulated advantage (see the Matthew Effect). According to the Atlantic Council's CBDC project tracker, Bitt is responsible for six of the seven "launched" CBDC projects globally. It got its start independently launching a blockchain-based Barbadian dollar, mMoney, in 2016. Barbados was about 80 percent cash reliant at the time; adoption grew and regulatory approval came when the benefits of digitizing transactions became apparent.

This was the springboard for conversations with the ECCB, giving it multiple country deployments in one go. In fact, the ECCB initially said it would not outsource its CBDC development. It relented because its CBDC shares with Bitt's work in Barbados a focus on digital financial inclusion in emerging economies.

The Central Bank of Nigeria cited Bitt's experience with the ECCB as a key reason it won the contract to develop Nigeria's CBDC, the e-Naira. If Bitt can manage it – early evidence suggests some difficulty with adoption – successful deployment in Africa's largest economy and population will only help its reputation amongst countries with significant unbanked populations; as a Bitt VP notes, these countries have the highest appetite for CBDCs.

Another hurdle is that CBDCs are suspected to be government surveillance tools. This is less of a concern with token-based CBDCs like DCash, which allow for anonymous transactions. There will likely be more resistance with identification-based systems like the e-Naira.

READ MORE

- [Bitt's Deal with the National Bank of Belize](#)
- [Bitt is a finalist in the Global CBDC Challenge](#)
- [Details of Bitt's deal with the Central Bank of Nigeria](#)
- [Overstock obtains controlling interest in Bitt](#)

¹ [DCash: motivations, challenges, and lessons from the first monetary union CBDC pilot; Central Bank Digital Currency Partner: Bitt; DXCD, The Eastern Caribbean Central Bank, Digital Money Is Being Readied For Production](#)

BUILDERS PATCH

A DATA-DRIVEN PLATFORM THAT MODERNISES HOUSING FINANCE TO HELP GOVERNMENTS TACKLE THE AFFORDABLE HOUSING CRISIS

COMPANY SUMMARY

- Year Founded: 2017
- Funding: Seed, \$2.3million (August 2021)
- Revenue growth from 2020 to 2021: x10
- Lead investor: Urban Innovation Fund
- HQ: New York, USA
- FTEs: 3
- Key clients/partners: NYC HDC, Hacienda CDC, Xenolith Partners LLC.
- Key executives: Kanan Ajmera, CEO and founder; Uma Pandit, Head of Product Experience and co-founder

PROFILE

Many developed nations are facing affordable housing crises in their cities. Decades of housing construction that lagged behind population growth, followed by reductions in housing stock since 2016, placed the US in a particularly bad position pre-pandemic. Since 2020, changes in housing preferences and disruptions to supply chains have further reduced stock and driven up prices. Policy experts agree that simply building more housing will not solve the crisis – amongst other changes, the cost of construction must come down. Government agencies must work with developers and suppliers to reduce housing development-related costs.

Builders Patch increases efficiencies in housing development by modernising the financing process for community developers and government authorities, ultimately bringing down the time and costs involved. Builders Patch is a secure, cloud-based platform that facilitates management of multi-family housing deals from acquisition to asset management using automated processes. Currently, the platform is primed for automating due diligence collection, underwriting, and loan approval for lenders and multifamily developers. In 2021, Builders Patch partnered with the New York City Housing Development Corporation, the largest municipal Housing Finance Agency in the USA, to manage loan proposals for the City's affordable housing projects and to collect the associated due diligence.

While affordable housing didn't make the final version of the bipartisan US Infrastructure Investment and Jobs Act, it remains a key component of the Biden administration's plan to 'Build Back Better'. Innovative platforms, such as Builders Patch, that automate housing finance processes can lead to higher returns on government investment, aiding the necessary development of millions more affordable homes.

CASE STUDY

In 2020, the Builders Patch team worked with Hacienda CDC to onboard their projects to the Builders Patch platform. Hacienda is a non-profit community developer based in Portland, Oregon that aims to design and build housing with public purpose and well-being in mind, particularly for the Latino community. Builders Patch transformed Hacienda's company practices and workflows by automating key processes. Hacienda highlighted that the automated platform not only made the organisation far more time efficient, it also facilitated recruitment of young new employees able to onboard quickly. More broadly, Hacienda said that Builders Patch has afforded their teams the freedom to focus on the entrepreneurial and creative side of development. Hacienda also reported that using the Builders Patch platform has allowed them to keep pace with competitors in a fast-growing sector.

PLANS FOR 2022

Expanding the Builders Patch team and the platform to serve more users.

WHO SHOULD CONNECT WITH THIS COMPANY?

Private organisations and public institutions responsible for or involved in housing finance.

STATEUP VIEW

Insights from Dr. Rehema Msulwa, StateUp Expert in Infrastructure
The issues of access to land and construction costs have been unabating drivers of housing unaffordability that can be partly attributed to the institutional design of planning systems. Some elements of these cost and accessibility issues are therefore beyond the scope of private sector innovation. However, as Builders Patch demonstrates, there is scope to streamline processes at the organisational level through digital transformation.

Affordable housing development has seen little radical digital innovation in the last half-century, unlike other infrastructure subsectors. Likewise, non-profit organisations and local governments are benefitting relatively less from innovation and technology adoption than the private sector. Using technology to innovate key financing processes is certainly a step in the right direction toward increasing affordable housing development.

The rising digital interconnectedness of infrastructure, in addition to net zero targets, will necessitate closer collaboration between the public and private sectors and increase complexity of housing finance. Digital platforms, big data analytics, and machine learning tools will undoubtedly be at the core of overcoming these complexities. Builders Patch are expanding the data capacity in their team and StateUp expects the startup's continuing growth will be accompanied and accelerated by further advances in its data-driven offerings. As governments and developers seek digital solutions to lower housing development costs, StateUp predicts that startups such as Builders Patch will continue to seize opportunities for innovation.

CALWAVE POWER TECHNOLOGIES

UC BERKELEY SPIN-OUT CALWAVE'S TECHNOLOGY CAPTURES THE VAST AND STEADY POWER OF THE OCEAN AT SCALE

COMPANY SUMMARY

- **Year Founded:** 2014
- **Funding:** \$19M in USA Department of Energy awards
- **Revenue growth from 2020 to 2021:** 0%; pre-revenue.
- **Lead investors:** Sustainable Ocean Alliance, Breakout Labs, CITRIS Foundry
- **HQ:** Berkeley, California, USA
- **FTEs:** 1-10
- **Key clients/partners:** US Department of Energy, UC Berkeley, Scripps Oceanography, Michelin
- **Key executives:** Dr. Marcus Lehmann, CEO and co-founder, Mechanical Engineering PhD from Hamburg University of Technology; Dr. Thomas Boerner, CTO and co-founder, Mechanical Engineering PhD from University of California, Berkeley; Daniel Petcovic, COO, 7 years as an engineer at Lockheed Martin.

PROFILE

For a successful transition to net zero, all sources of renewable energy must be harnessed. Despite recent estimates that wave power could provide up to 30% of the US energy demand, the expansive power of ocean waves remains largely untapped. Wave energy converters (WECs) capture the steady power of waves to produce clean electricity. However, the vast power of the ocean comes with a downside: frequent, extreme weather conditions and storms create waves with enormous impact on any structure they encounter. To survive these aggressive conditions at sea, WECs are typically composed of heavy and expensive steel, making them challenging to operate and maintain, and ultimately limiting the capacity of WECs to significantly contribute to global energy supply.

CalWave, a spin-out from UC Berkeley, has overcome this fundamental structural challenge by designing WECs that function submerged several metres beneath the ocean surface. Submersion avoids the harshest conditions at the surface while still capturing the power of the waves via pressure exerted on the devices during wave motion. Sheltered from the worst impact, CalWave's proprietary WEC technology (called xWave™) is composed of lightweight and durable materials, and can autonomously reposition its mechanical components relative to wave size or temporarily shut down during the strongest surges. This combination of features makes xWave™ devices an efficient, cost-effective, and scalable way to capture ocean wave power.

The Biden administration's Infrastructure Investment and Jobs Act included commitments to invest in "water power projects" and a growing number of coastal states, such as California, have committed to transitioning to 100% clean energy. Having already secured \$11 million in development contracts with the US Department for Energy, the outlook is positive for CalWave's aims to deploy its xWave™ technology at utility scale.

PLANS FOR 2022

First long-duration, at-sea technology demo is expected to complete in February; Prepare to install the first commercial-scale, utility grid-connected wave energy test site rated for 20 MW in the USA.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public or investor-owned electricity providers looking to add predictable and consistent renewable energy capacity to their supply portfolio, particularly in municipalities with unsheltered coastline (such as in the Americas, Australia, Portugal, parts of Scandinavia, South Africa, and the United Kingdom and Ireland) or small island nations (such as those in the Pacific or Indian Ocean, or Caribbean Sea).

COMPANY IN ACTION

In September 2021, CalWave deployed its xWave™ pilot unit, x1™, in San Diego, California.[\[ref\]](#) The x1™ device was installed 300m from the Scripps Institution of Oceanography's research pier and 26m below the ocean surface.[\[ref\]](#) Power produced was supplied to the coast via a temporary cable (which conveniently comprises the same power export infrastructure that is used for wind farms). The six month pilot was designed to test the performance and reliability of the x1™ system in the open ocean. Through additional collaborations, CalWave integrated monitoring tools that supplied scientists with data about how the machines impacted the marine ecosystem through noise, collisions, or ecosystem changes. The pilot was funded by the US Department for Energy and was California's first long-duration demonstration of a submerged WEC at sea. Results of the pilot are expected March 2022.

Multimedia: <https://redshift.autodesk.com/calwave/>

STATEUP VIEW

Taking a global view, StateUp envisages a growing, global market for utility-scale submerged WECs, such as xWave™. 10% of the world's population live on an island. Many small island communities find clear, flat land scarce (unsuitable for solar farms) or have a tourism-based economy (unsuitable for wind farms, considered visual pollution by some). Zooming out further, 40% of the world's population live within 100km of the coast. The infrastructure for delivering renewable electricity at greater distances from its source is becoming more efficient as States around the world are prioritising upgrading electricity grids.

Wave power technologies have long lagged behind solar and wind power, but the tide is finally turning. After years of startups relying on Government funding, the big energy players have started to take the potential of WECs seriously (see Israeli startup Eco Wave Power's partnerships with Siemens and EDF). June 2021 even saw construction begin of a new grid-connected wave energy test site, PacWave.

CalWave is uniquely positioned to ride the impending wave of sector growth. This is because numerous xWave™ devices have the potential to work together, be smaller or larger in size, and are deployable in a variety of depths and distances from shore. This scalability and adaptability will allow CalWave's technology to serve a diverse range of energy users, from small or large coastal populations to marine-based industries or researchers.

CARBFIX

CARBFIX IS TURNING TO STONE INCREASING VOLUMES OF CARBON DIOXIDE EMISSIONS

COMPANY SUMMARY

- Year Founded: 2019
- Revenue growth from 2020 to 2021: 50%
- Lead investors: Carbfix is a subsidiary of Reykjavik Energy
- HQ: Reykjavik, Iceland
- FTEs: 10-20
- Key clients/partners: SORPA (Icelandic Regional Waste Management Association), Government of Iceland, ON Power, Climeworks, Elkem, Aker Carbon Capture, Rio Tinto, Dan-Unity CO₂
- Key executives: Dr. Edda Sif Pind Aradóttir, CEO, PhD in Theoretical Chemistry, previously Head of Innovation and Strategic Planning at Reykjavik Energy; Dr. Bergur Sigfússon, Head of CO₂ Capture and Injection, PhD in Soil Science; Dr. Kári Helgason, Head of Research & Innovation, PhD in Astrophysics, previously at NASA; Dr. Sandra Ósk Snæbjörnsdóttir, Head of CO₂ Mineral Storage, PhD in Geoscience; Kristinn Ingi Larusson, MBA, Head of Business Development

PROFILE

Since it became evident that projected emission cuts alone would not slow global warming in line with targets, the scientific endeavour to capture and store carbon dioxide (CO₂) has accelerated. [Technologies](#) have developed to capture CO₂ emitted from power stations and industrial processes; the gas is then compressed and transported for storage. Storage typically involves injecting pure CO₂ into underground rock that is particularly reactive. Over thousands of years the CO₂ will naturally react with the rock to form a solid mineral, a process called mineralisation.

Carbfix's technology accelerates the mineralisation by dissolving CO₂ in water prior to or during injection, which essentially fast forwards the first few steps of the natural underground process. Carbfix then injects the carbonated (sparkling!) water underground, where the mineralisation process [rapidly completes](#). The shortened time frame (years versus millenia) eradicates the risk of CO₂ leakage, which gives CO₂ producers confidence that their emissions have been securely and permanently stored.

Carbfix's development pace is impressive: three years from concept to pilot, then four years from pilot to industrial scale. However, [global annual](#) CO₂ emissions are upwards of 35 billion tonnes, whereas the [annual capacity](#) of Carbfix's storage site at the Hellisheidi geothermal power plant, for example, is 20,000 tonnes. Large cost reduction in the carbon capture and storage chain is needed to achieve the scale up necessary for Carbfix, and other carbon storage technologies, to play a meaningful role in reaching net zero. A developed, internationally-coordinated market for CO₂ avoidance, including incentives, will be essential in making carbon capture and storage technologies [viable](#).

PLANS FOR 2022

Prepare for full-scale implementation of the carbon capture and storage system at Hellisheidi power plant supported by a EUR 3.9 million [EU grant](#); Drill first injection well for their flagship storage facility, the Coda Terminal, which will store CO₂ shipped in from different capture sites in Northern Europe; Three other pilot injections at new sites across Europe.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public and private owners of power plants who are aiming to reduce their net emissions (power plants are ideally suited to maximise carbon capture and storage technologies). Public sector organisations, companies, or individuals looking for exciting carbon offsetting options.

COMPANY IN ACTION

In [September 2021](#), Carbfix and Climeworks began operating the world's first commercial direct air capture and storage chain. [Climeworks](#) is a Swiss company specialising in direct air capture of CO₂ through a fan and filter system. Climeworks built a direct air capture system, called Orca, at the Hellisheidi geothermal power plant in Iceland. Carbfix then built the transportation and storage infrastructure to inject the captured CO₂ into the basalt rock underground near to the power plant.

[Multimedia](#): Watch an explainer of how Carbfix works [here](#)

STATEUP VIEW

Carbon offsetting incentives will form an essential part of financing the scale up necessary for carbon capture and storage technologies. Climeworks (Carbfix's direct air capture partner) has a CO₂ removal subscription service for individuals or companies, which the likes of Microsoft have invested in. However, the cost of removing CO₂ through the subscription service ([€1000/tonne](#)) is currently an order of magnitude greater than the price of an EU carbon permit ([<€100/tonne](#)). In 2022, Carbfix [plans](#) to launch their own offsetting service. Carbon offsetting incentives will form an essential part of financing the scale up necessary for carbon capture and storage technologies.

Some climate scientists and activists are concerned that the assumptions made in emissions projections about future carbon capture and storage capabilities are too optimistic and ultimately distract from actions to cut emissions. While these concerns are valid [to an extent](#), StateUp believes that carbon capture and storage will play a role in achieving net zero and that [government action](#) to address [market failures](#) can accelerate this, as it did for [wind power](#).

ECONCRETE

ECONCRETE DEPLOYS GREENER, MORE RESILIENT MARINE INFRASTRUCTURE

COMPANY SUMMARY

- Year Founded: 2012
- HQ: Tel Aviv
- FTEs: 11-50
- Key clients/partners: Brooklyn Bridge Park, NYC; Neptune, NJ and more communities; Island Global Yachting (IGY); Port of San Diego; Port of Rotterdam
- Key executives: Dr Ido Sella PhD, CEO & co-founder: Marine Biologist with 20 years experience in ecological engineering

PROFILE

Sea levels are rising at a rate of about one-eighth of an inch per year, due to thermal expansion caused by warming of the ocean and the increased melting of land-based ice such as glaciers. This increase in sea levels is likely to accelerate coastal erosion. Eight of the ten largest cities in the world are near a coast, and coastal erosion is already estimated to cost \$500 million every year in the US alone. Scalable, environmentally-responsible solutions are sorely needed to combat the threats accompanying rising tides.

ECONcrete has developed a bio-enhancing concrete technology that provides ecological advantages and superior structural performance for any marine infrastructure project. The technology meets international concrete standards (i.e., EN, BS, ASTM and AS standards) and integrates seamlessly into any project. It includes a multi-layered approach:

- The proprietary ECONcrete admix seals the concrete to improve impermeability and increases lifespan of the structure. The concrete composition also creates an environment beneficial for the colonization of the surface by marine organisms.
- The surface complexity and micro/macro design of the concrete elements are based on biological studies and biomimicry design principles. The design is adapted to any project's local environment to support the natural development of local species.

The application of the technology results in a healthy ecosystem developing on the concrete, quickly generating a layer of bio-protection, strengthening and protecting the structure and reducing maintenance. The increased biodiversity also improves water quality and serves as a natural carbon sink, actively sequestering CO₂ during the lifetime of the structure.

This approach ensures that the concrete works with, rather than against, their surrounding natural environment. This stands in stark contrast to the one-size-fits-all concrete blocks typically used in these contexts. "Nature does it better than we do," Adi Neuman, head of design at ECONcrete, explains in *Time*.

One application of this concrete is shoreline protection, which helps protect communities from coastal erosion. ECONcrete's product is also used to construct seawalls, moorings, and piles for waterfront infrastructure such as ports, marinas, and urban waterfronts. It also has offshore applications, helping protect cables and pipes while regenerating eroded seabed habitat. Since ECONcrete was founded in 2012, they have been working on R&D, commercialisation, and various projects including with the Brooklyn Bridge Park Corporation (2013), Port Everglades (2017), and the Port of Rotterdam (2018).

PLANS FOR 2022

Grow US and European sales teams, and scale operations to meet the demand of large ports and offshore industries; Launch a product that protects offshore wind turbines from erosion, helping enable the Biden Administration's goal of 30 gigawatts (GW) of offshore wind capacity by 2030 (a thousand-fold increase relative to 2020 levels); Expand to new regions, including New Zealand and China.

WHO SHOULD CONNECT WITH THIS COMPANY?

Municipalities and port managers looking to use concrete that lasts longer and is better for the environment and local marine ecosystem.

COMPANY IN ACTION

The Port of San Diego in California is one of the largest ports on the US west coast, with a \$9.4 billion economic impact. It is responsible for upwards of 70,000 (or one in thirty) jobs in San Diego County. The Port is protected from storm flooding and erosion using a traditional structure known as a riprack rock mound. However, this system does not foster a diverse habitat for marine life.

The Port engaged ECONcrete through its Blue Economy Incubator to install its COSTALOCK Tide Pool Armor: a series of 72 interlocking pieces of green concrete 'armor' units. This reinforces the structural protection of the Port while promoting the restoration of local ecosystems and repopulation of marine organisms.

"By mimicking natural rock pools with beautiful water retaining features, the project will sustain valuable marine life while coping with climate change and urbanization," Commissioner Rafael Castellanos, Port of San Diego Board of Port Commissioners, said in a statement.

STATEUP VIEW

Written by StateUp Expert Affiliate Rehema Msulwa

Concrete is the most commonly used man-made material on Earth and, after water, it is the second most widely used substance on the planet. It is an important construction material used extensively in buildings, bridges, roads and dams. Each year four billion tonnes of concrete are produced for construction and infrastructure of all types, with a considerable carbon impact. Decarbonising infrastructure is, therefore, key to reaching 'Net Zero' and transitioning to low carbon concrete will be central in achieving this.

Analysts expect the green concrete industry to grow 9.8% between 2021 and 2026. This growth is welcome: traditional concrete has been labelled "the most destructive material on earth," responsible for upwards of 8% of global CO₂ emissions, the primary driver of climate change. Further, infrastructure can be linked to 70% of the world's carbon dioxide emissions. Coastal and marine infrastructure, in particular, i.e., seawalls, bulkheads and breakwaters, can harm naturally occurring, abundant and diverse marine life and promote the dominance of opportunistic and invasive species.

The green concrete space is crowded, with both startups and incumbents chasing more sustainable alternatives. ECONcrete's promise lies in its unique, validated products that address a key need for coastal regions. Not only is the technology stronger than conventional concrete, its intricate surface textures and chemical composition promotes biodiversity and marine life including the growth of seaweed, coral, algae and oysters. All this while complying with the industry standards of strength and durability and simplifying the manufacturing process. While it will be years before we can assess the full impact of their concrete technology, it is no small feat that their product exceeds levels of CO₂ reduction among both the new and legacy companies working in the field.

ELECTREON

ELECTREON'S TECHNOLOGY CHARGES ELECTRIC VEHICLES WIRELESSLY, HELPING CHARGING INFRASTRUCTURE MEET RISING EV DEMAND

COMPANY SUMMARY

- Year Founded: 2013
- Funding: £ million, Post-IPO Equity £43.4 million
- Revenue growth from 2020 to 2021: 100%
- Lead investors: Capital Nature Ltd., Psagot Investment House, Altshuler Shaham Ltd., Dan Public Transportation Company Ltd.
- HQ: Tel Aviv, Israel
- FTEs: 80-100
- Key clients/partners: Dan Public Bus Company & the Municipality of Tel Aviv, Brebemi Toll Road Operator, The Swedish Transport Administration, The German Federal Highway Research Institute (BAST).
- Key executives: Oren Ezer, CEO and co-founder: 20+ years of experience in Israeli Tech. Hanan Rumbak, CTO and co-founder: 35+ years of experience in Electrical Engineering.

PROFILE

A vehicle fleet owner seeking to transition to electric faces a major constraint: the difficulty of electric vehicle (EV) charging. Public charging stations are limited in number, load the grid, and may be incompatible with a given EV. This difficulty plays out in the data; charging inconvenience was a [key reason](#) why one in five Californian EV owners went back to internal combustion cars between 2015 and 2019.

Electreon looks to solve this through inductive or wireless EV charging. It installs copper coils under roads and ground infrastructure like loading docks and bus terminals. These coils send a current to receivers fitted under EVs, charging them wirelessly whether they are stationary or in motion. Wireless charging provides regular top-ups that increase EV range, free up charging stations, and ultimately enable smaller vehicle batteries. Top-ups are especially salient for heavy-duty vehicles whose high energy needs make electrification difficult.

The global EV stock is [projected](#) to expand from 11 million currently to up to 230 million by 2030. Electreon's wireless charging will gain from the mismatch between rising EV demand and inadequate charging infrastructure. Its focus on electrifying the heavy-duty segment could reduce transportation emissions, as heavy-duty vehicles [contribute](#) a disproportionately large amount of transportation-related GHG emissions. EV battery manufacturing [produces](#) emissions, so smaller batteries reduce EVs' total emissions.

PLANS FOR 2022

Expanding into the US; Expanding current pilots; Increasing the range of supported vehicles

WHO SHOULD CONNECT WITH THIS COMPANY?

Public transportation companies, mobility and transport planners, EV and EV battery manufacturers

CASE STUDY¹

The Municipality of Tel Aviv Jaffa was worried about rising air pollution. Noting the significant contribution of transportation to the city's air pollution levels, it partnered with Electreon and Dan Bus Company to initially pilot Electreon's wireless charging technology. In this arrangement, Electreon installed conductive coils under a 600 metre portion of a two kilometre bus route, and fit one electric bus with its receivers.

The pilot was a success. Regular top ups enabled the special Dan Bus Company bus to reduce its vehicle battery capacity by 90% and less time spent charging increased hours of operation. These results led to an expansion of the partnership; in late 2021, Electreon inked a \$9.4 million, five-year agreement to supply 200 Dan Buses with wireless charging at city terminals.

STATEUP VIEW

Electreon's technology is gaining traction with government transportation actors. Frost and Sullivan, a global consultancy, [sees](#) Electreon installing its technology in more than 150 locations in Israel and Europe by 2025. This is no mean feat considering governments are often hesitant to engage innovation. While some of this success is rightly attributed to its unique product, we believe it also derives from a smart government engagement playbook.

Electreon has chosen B2B2G arrangements for its pilots, leveraging more established players' reputations and connections. This has enabled it to get work across Europe despite not having a prior local presence. We've also seen GovTech startups hire experienced public servants for the network and reputational effects. Here, Electreon is hard to beat – it recently [hired](#) former Israeli President Reuven Rivlin as Company President.

Electreon's future success depends crucially on the electric battery. Michael Webber, an energy expert, [warns](#) that disruptive innovation in battery capacity could hurt its fortunes. Electreon tells us it expects exponential improvement, but not large enough to render its offering obsolete. We see another hedge against this – governments prefer to give long-term contracts. As it enters and expands pilots now, it is securing work for between five and ten years into the future.

¹ [Tel Aviv-Jaffa aims to be world's first city with network of recharging roads; Israeli 'smart road' startup to deploy charging infrastructure in Tel Aviv](#)

FAIRTIQ

SEAMLESS MOBILE TICKETING ACROSS MULTIPLE TRANSIT MODES, WITH BENEFITS FOR BOTH PASSENGERS AND OPERATORS

COMPANY SUMMARY

- Year Founded: 2016
- HQ: Bern, Switzerland
- FTEs: ~70
- Key clients/partners: Swiss Federal Railways (SBB), the French National Railway Company (SNCF), Regionalbus Lenzburg, Aktiv Bus Flensburg
- Key executives: Gian-Mattia Schucan, founder & CEO, McKinsey & Co; DPhil in Physics at Oxford; Head of Alliances, then Head of Distribution and Services, for SBB's passenger division; left SBB in 2013 to start a consultancy firm, before setting up Fairtiq in 2016.

PROFILE

Even for the most seasoned public transport user, transit ticketing can often seem illogical and confusing. Regular users are forced to make stressful choices between buying a ticket, a day pass, or a long-term pass, while irregular users may be unsure how a new system works or how to get the best deal. Fairtiq aims to solve these problems, enabling a smooth, seamless transit experience for passengers in the process.

On Fairtiq's mobile ticketing app, users simply check in at the start of each journey, and check out at the end. Fairtiq uses location data to track the journey and modes of transport used (their data privacy policy is available [here](#)), and then calculates the best ticket price after the journey is completed. If you forget to check out at the end of your journey, the app will automatically prompt you to do so.

Not only does the simplicity of Fairtiq's market-leading smart ticketing software benefit customers, but public transport operators can gain valuable insights from the platform. Fairtiq's check-in/check-out function means journeys are tracked from exact origin to exact destination, something which is not always possible using traditional season or paper tickets. Operators can use these insights to improve service provision, and to reform overly simplistic fare structures without negatively impacting passenger experience.

Fairtiq's industry-leading mobile ticketing product offers an excellent solution for both transit agencies with a mission to grow ridership, and for passengers looking to overcome uncertainty about their travel habits.

PLANS FOR 2022

Fairtiq is continuing to expand its trial programs, whilst also converting pilots to long-term clients and expanding geographic coverage. The company is also exploring new B2B options aimed at employers, who can use the app to subsidise transit for employees.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public transport operators, national and regional transport authorities, cities interested in MaaS

COMPANY IN ACTION

In Erfurt, Germany, the successful rollout of Fairtiq has enabled a switch to digital and contactless ticketing. Starting in 2022, the municipal transport authority is expected to save €2.2 million by not having to update or replace on-vehicle ticketing machines.

In Halle, Germany, 99.8% of users surveyed claimed they were satisfied with the app, with its most popular attributes being the simplicity of use and best price guarantee. Most notably, 1/3 of respondents stated that their public transport use had increased since they started using the app, all of which demonstrates Fairtiq's value proposition.

As well as operating their own app, Fairtiq's software powers automated ticketing apps on behalf of third parties, usually transport operators. SBB's EasyRide is an example of one such application. EasyRide utilises Fairtiq's check-in/check-out functionality, and has successfully introduced the product to over 5 million existing users on SBB's mobile app.

STATEUP VIEW

Fairtiq's mobile ticketing software is industry-leading, with clear benefits to both users and operators. An app which simultaneously simplifies and improves the passenger experience, whilst also feeding back useful data to operators and authorities (which can be used to improve services), is a powerful combination.

As the next few years look set to be characterised by part-time and flexible working, traditional transit ticketing options like pre-purchased season tickets are becoming less attractive. Fairtiq is well placed to take advantage of this situation, and their guarantee that you will always pay the lowest price is a compelling reassurance to users.

Incentivising more public transport usage is a key means by which governments are addressing the climate crisis. Fairtiq's solution makes public transport more attractive, complementing these overarching policy aims.

Fairtiq has considerable potential for growth. Having pioneered a successful product, the company is well placed to expand beyond Switzerland, and its new development for B2B clients has considerable growth potential, especially when coupled with the political and economic contexts noted above. As part of an established trend towards Mobility as a Service in the transport tech space, Fairtiq's future looks bright.

IVIX

IVIX IS DEVELOPING AI TO HELP GOVERNMENTS IDENTIFY AND COLLECT \$6 TRILLION IN LOST TAX REVENUE EACH YEAR

COMPANY SUMMARY

- Year Founded: 2020
- Total Funding: \$13 million (seed round, July 2021)
- Lead investors: Team8 Capital, Cardumen Capital, Citi Ventures
- HQ: Tel Aviv, Israel
- FTEs: 11-50
- Key clients/partners: Several OECD countries
- Key executives: Matan Fattal, co-founder and CEO: started his career in an elite unit of the Israeli Intelligence Corps, co-founded and led cybersecurity scaleup Sliverfort; Doron Passov, co-founder and CPO: served in a secret technology unit in the Israeli Defence Forces, senior product manager at cybersecurity R&D startup Gita Technologies.

PROFILE

Strengthening the economy and combating tax evasion are priorities for policymakers around the world. Former Secretary of the US Treasury Larry Summers [asserts](#) that over the next 10 years, the Internal Revenue Service (IRS) is on track to collect \$7 trillion less than is owed – around 3 percent of the country's GDP.

"[The Internal Revenue Service's] technology is woefully outdated," notes Summers. However, the Biden administration's plans to Build Back Better aim to change that by funneling \$80 billion to the IRS, part of which would enable the tax authority to use technology to collect all the payments that they are owed.

Globally, tax evasion is estimated to cost governments \$6 trillion in lost revenue each year. Israeli startup IVIX, which is currently in stealth mode, has developed an artificial intelligence-powered platform to help governments identify tax infringements by analysing both their own and publicly-available data.

Already active in several OECD countries, IVIX secured a \$13 million seed round led by Team8 in July 2021. "Our ability to scale, combined with our accuracy rate that exceeds 98%, is transforming authorities' ability to deter tax evasion, increase compliance, and level the playing field," [notes](#) Co-founder and CEO Matan Fattal.

PLANS FOR 2022

IVIX has their eyes on growth for 2022. They [plan](#) to recruit employees, particularly in sales and marketing.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public sector tax authorities that are looking to collect revenue more efficiently and reduce tax non-compliance.

COMPANY IN ACTION

IVIX published an [analysis](#) of the US short term rental (STR) market and found that tax authorities are losing an estimated \$3 billion each year from \$8.6 billion in unreported STR revenue. When IVIX's algorithms examined anonymised data on millions of public hosts' profiles on websites like Airbnb and VRBO, they uncovered that the real size of the STR market is close to \$30 billion a year – almost double previous estimates of the STR market.

In the US, STR providers are only required to issue tax forms for hosts that exceed \$20,000 in yearly revenue or have more than 200 transactions per listing. However, IVIX's research shows that over one third of hosts make less than \$20,000 per year and that the average listing has 20 bookings per year. Without these tax forms, it is more likely for hosts to under-report earnings. The relatively small amount of revenue per listing, and the fact that many transactions involve parties that are residents of different states, makes them difficult for tax authorities to track.

- [Read more about the issues with tax collection for the short term rental market by downloading IVIX's report.](#)

STATEUP VIEW

In the current policy environment, governments are looking for ways to increase their revenue to offset expenditure. In October 2021, The Organisation for Economic Co-operation and Development (OECD) announced that 136 countries had reached an agreement to impose a 15% minimum tax rate on multinational enterprises. The timing is right for the launch of IVIX's tool to help governments more efficiently collect taxes.

IVIX's early success is a good indication of its product-market fit. Its board of advisors include three former IRS executives with extensive experience in private sector tax law, signalling a strong position to enter the US market.

IGNITE POWER

CONNECTING THOUSANDS OF RURAL COMMUNITIES IN SUB-SAHARAN AFRICA TO OFF-GRID SOLAR POWER

COMPANY SUMMARY

- Year Founded: 2014
- HQ: Rwanda
- FTEs: 50
- Key clients/partners: Government of Rwanda, Government of Mozambique
- Key executives: Yariv Cohen, co-founder and CEO, President of Camco Clean Energy and has background in impact investment in Africa; Seth Merrin co-founder, background in investment; Angela Homsy, co-founder, background in infrastructure investment in Africa

PROFILE

Sub-Saharan Africa (SSA) accounts for 75% of the world's population without access to electricity. Furthermore, population growth in the region is out-pacing the rate of electrification. Extending electricity grid networks to reach rural and remote regions of SSA is not feasible. A lack of safe electricity supply makes it challenging for families, farmers, and entrepreneurs to affordably utilise high-quality health clinics, innovative agriculture technologies, and newly possible internet connectivity. The vast number of people living in these rural and remote areas are instead best served by decentralised (or 'off-grid') solutions.

Ignite Power is connecting rural communities across SSA to decentralised 'solar home systems', which consist of a commercial solar panel unit and wiring such that the system can power several lights or small devices. Ignite Power has collaborated with state and local governments and entities, and employed over 3500 local workers to deploy solar home systems reaching over 1 million people, predominantly in rural Rwanda. Ignite Power developed inclusive financing models that best serve the needs of consumers in rural communities. For example, the startup established a 'pay-as-you-grow' scheme that allows farmers to pay only during the harvest season when they are earning. The startup's data-driven smart operations also mitigate risk and decrease prices. Ignite Power's inclusive financing schemes and innovative smart operations allow them to offer solar home systems for under \$1 a month, making clean electricity accessible to many households for the first time.

Increased attention from investors serious about reaching Sustainable Development Goals and the continued reduction in the cost of manufacturing solar power units provides the ideal conditions for continued growth at Ignite Power. The company is also continuing to innovate, expanding their range of product offerings to complement the electrical infrastructure they provide to consumers; this includes tools for connecting to the internet and powering medical technologies.

PLANS FOR 2022

Expand to additional countries across Africa.

Deploy 250,000 new systems to connect a further 1.2 million people to power for the first time.

WHO SHOULD CONNECT WITH THIS COMPANY?

Governments of sub-Saharan African countries and investors with an interest in energy and infrastructure in African countries.

CASE STUDY

At the end of 2021, researchers working with Ignite Power assessed the impact of a solar home system on a family living in Karambi village, North Rwanda. The family of three (a husband and wife and their 6 year old child) make a living from growing and selling sugar canes. Since purchasing a SHS from Ignite Power, the family report that:

- The switch to powerful and reliable solar-powered lighting in their home has reduced the amount they spend on lighting each month by almost 90%
- Coughing and frequent breathing problems have significantly decreased since they stopped using harmful, flame-based sources of lighting inside their house.
- The ability to safely cook after dark has extended the number of hours they can spend doing other productive work during the day. So far, this has translated into a 30-40% increase in revenue.

STATEUP VIEW

Supplying electricity to remote rural areas in African countries is achieved in the least-cost way using decentralised solutions, such as the small-scale solar home systems delivered by Ignite Power. A 2021 report by the International Renewable Energy Agency highlighted that provision of these decentralised solutions has been dependent on startups and SMEs, and that government policy support for and collaboration with such initiatives must grow if rural populations are to be adequately served. Despite tough conditions for off-grid solar power provider startups during the pandemic, there are now signs of a recovery. Researchers from UCL caution that governments must actively support this through subsidy schemes. Rwanda has been a leader in this area of development, and Ignite Power will be well-placed in replicating their collaborative achievements elsewhere in SSA. Furthermore, the market for electrification of rural regions in African countries will remain large: the IEA forecasts that in 2030 there will still be over half a billion people without access to electricity in Africa, predominantly in rural regions of SSA.

OLIO

SINCE 2015, 5 MILLION PEOPLE HAVE SHARED 40 MILLION PORTIONS OF FOOD THROUGH OLIO'S APP

COMPANY SUMMARY

- **Year Founded:** 2015
- **Total Funding:** Over £50 million, including a £43 million Series B (September 2021)
- **Revenue growth from 2020 to 2021:** 200%
- **Investors include:** Octopus Ventures, VNV Global, Accel
- **HQ:** London
- **FTEs:** 70
- **Key clients/partners:** Tesco, **Compass Catering**, Pret A Manger, Selfridges
- **Key executives:** Tessa Clarke, co-founder and CEO: former BGC consultant, executive at content company EMAP; Saasha Celestial-One, co-founder and COO: former VP at American Express and McKinsey consultant

PROFILE

Globally, approximately a third of food produced is never eaten. A significant portion (40-50%) of food waste happens at home. In the US, the average family of four throws away upwards of \$1,600 (£1,200) of food annually. That figure is £730 in the UK. Meanwhile, 1 in 9 people around the world are starving or malnourished. Food waste is also detrimental to the environment.

OLIO has developed an app that enables households and local businesses to reduce their food waste **by giving it away instead of throwing it away**. Users with food to spare can take a picture of their items and set a pickup location. Users seeking food can browse listings and request items. The two parties then agree on a place and time to meet, and the food is shared. Additionally, the 40,000 volunteers in OLIO's Food Waste Heroes programme save food from local shops, including 2,700 Tesco stores across the UK.

PLANS FOR 2022

OLIO plans to rapidly accelerate the roll out of its Food Waste Programme with supermarkets, quick service restaurants, contract caterers, and quick commerce companies; as well as grow its international presence.

WHO SHOULD CONNECT WITH THIS COMPANY?

Local councils that are looking to reduce food waste. Consumers and businesses that are interested in sharing food and making more environmentally-friendly choices.

COMPANY IN ACTION

Items on OLIO's platform include food nearing its sell-by date in local stores, home-grown vegetables, bread from neighbourhood bakers, and spare household groceries. According to OLIO, half of all food added to the app is requested within 21 minutes of posting.

OLIO has redistributed 40 million portions of food through their app. That has the equivalent environmental effect of taking 118 million car miles off the road or saving 6 billion litres of water. Since the beginning of the pandemic, the number of listings on the app has increased fivefold. Half of OLIO's 5 million users are based in the UK, but the app is active in more than 62 countries.

Recently, OLIO launched its 'goals' feature. The app prompts users to make minor changes in their daily habits ('goals') to lead a more environmentally-friendly life, **and the community has successfully completed over 1 million goals to date**. OLIO has also launched a new 'borrow' section that connects neighbours to lend and borrow everyday household items.

STATEUP VIEW

There is a clear need to reduce food waste globally, and OLIO has already demonstrated the role it can play in helping consumers to do their part. OLIO benefitted from consumers' increased involvement in their local communities during the pandemic. Having attracted tens of thousands of volunteers, their large, fast-growing, and global user base gives them an edge over competitors.

Tesco's recent adoption of OLIO's platform reflects businesses' increasing focus on ESG commitments. "Incoming inquiries from major retailers, grocery delivery services and fast-food brands are coming in thick and fast," OLIO co-founder and CEO Tessa Clarke reveals.

OLIO now finds itself in a period of expansion, with plans to scale from 70 to 175 employees. The development of its 'goals' **and 'borrow'** features signals OLIO's intention to move beyond food sharing to further help its users lead more environmentally-friendly lives.

OPEN COLLECTIVE

OPEN COLLECTIVE PROMOTES FINANCIAL TRANSPARENCY AND COLLABORATION WHILE ENABLING ORGANISATIONS TO WORK ACROSS BORDERS

COMPANY SUMMARY

- Year Founded: 2015
- Total Funding: \$3 million
- Revenue growth from 2020 to 2021: 500%
- Lead investors: General Catalyst, Bloomberg Beta, Ricardo Gorodisch (President of youth-focused charity Foundation Kaleidos)
- HQ: None, fully remote
- FTEs: 11-50
- Key executives: Pia Mancini, co-founder and CEO; previously started a political party in Argentina, founder of a Y Combinator-backed digital governance platform; Alanna Irving, COO; participatory tech and cooperative governance expert; Co-founder Xavier Damman, who is no longer working at the company but remains on the board, also founded social media curation platform Storify.com, which was acquired in 2013.

PROFILE

We increasingly work remotely, across borders, time-zones, and cultures. Digital spaces are being developed to reduce the friction of virtual interactions in [professional](#) and [personal](#) contexts.

However, there are still practical issues hindering the transition to a more digital existence. People still need to pay their rent, be employed, pay taxes; companies need to have legal structures, oversight, and pay taxes of their own. Open Collective aims to bridge the gap between the virtual world and legacy financial structures. Their financial management platform reduces the friction inherent to collaboration by making it easier to collect and spend money, including across borders, while promoting transparency. But the real innovation in Open Collective is in connecting 'fiscal hosts,' umbrella organisations that can hold third-party funds, and the community organisations that need a place to hold their funds.

Open Collective has developed a platform containing tools to help organisations – from local nonprofits and caused-based collectives to civic hackers and open source associations – collect, spend, and manage money. Groups can receive contributions, manage their expenses, and share their budget, and converse on community discussion forums. They can also generate monthly reports containing information about their goals, contributors, and expenses.

The code powering Open Collective is open source, and third-party developers regularly contribute through its GitHub page. Open Collective itself is also open: its financial documents, metrics, and growth plans are shared with the public. And organisations' profiles on the platform are designed to be transparent, clearly displaying their financial information like inflows and outflows. This promotes accountability and collective financial oversight.

PLANS FOR 2022

Open Collective [plans](#) to move towards an "Exit to Community," whereby the company is owned and governed by their stakeholders. They are rapidly scaling globally throughout the anglosphere and EU, which should enable this exit.

WHO SHOULD CONNECT WITH THIS COMPANY?

Decentralised organisations working across borders – from groups of international tech hackers and builders to nonprofits and community organisers – and the companies and individuals who would like to support them. Organisations such as [Google](#) and the [Ford Foundation](#) use Open Collective to identify and contribute to collectives and initiatives that align with their goals.

CASE STUDY

[Bushwick Ayuda Mutua](#), a grassroots organisation, promotes solidarity and mutual aid amongst residents of its Brooklyn community. They use Open Collective to manage their finances, including recurring contributions from individual donors and other local organisations. The community can see who the top financial contributors are and analyse the collective's budget. This stands in stark contrast to legacy financial systems, in which an organisation's books are confidential and controlled by a few executives without oversight from all stakeholders. Bushwick Ayuda Mutua also leverages the Open Collective platform to engage with their community and publicise events.

- [Learn more by watching this explainer video from Open Collective.](#)

STATEUP VIEW

Years ago, Argentine activist Pia Mancini founded a political party, Partido de la Red (Net Party), which aimed to use digital technology to disrupt legacy bureaucracies, with the aim of democratic improvement, in her home country. The shift to democratising financial systems on a global scale is a natural next step.

Open Collective is compatible with the principles of the rapidly-growing Web3 movement, which advocates for decentralised, collaborative networks. The platform accepts cryptocurrency donations. However, COO Alanna Irving differentiates Open Collective from some aspects of Web3: "Open Collective is focused squarely on solving the very hard and painful problems that crypto solutions try to leapfrog, namely how to interface with and work in legacy legal and financial systems." In this way, Open Collective aims to augment and operate within the framework of states rather than to circumvent them.

PORTAL DE COMPRAS PÚBLICAS

40% OF BRAZILIAN MUNICIPALITIES REPORTEDLY USE THIS DIGITAL MARKETPLACE TO RUN MORE EFFICIENT PROCUREMENT PROCESSES

COMPANY SUMMARY

- Year Founded: 2016
- Funding: £340,000 (seed)
- Revenue growth from 2020 to 2021: 76%
- Lead investors: Cedro Capital
- HQ: Brasília
- FTEs: Approx. 100
- Key clients/partners: 2,200 municipalities in Brazil, five of which are state capitals
- Key executives: Leonardo Ladeira, co-founder and CEO: software engineer by trade who previously worked at UNALE, Brazil's National Union of State Legislators and Legislatures; Bruno Ladeira, co-founder and Chief Marketing Officer, also CEO of communications agency Moringa

PROFILE

OECD countries spend 12% of their GDP on public procurement. In Latin America and the Caribbean, that figure rises to 20%. However, as BCG notes, public procurement processes often stretch over months and years. Delays and heightened compliance requirements add uncertainty and drive up costs.

Portal de Compras Públicas, a public procurement marketplace, helps make procurement more efficient through its digital platform that streamlines the way government organisations purchase from suppliers. The Brasília-based startup reports that it speeds up procurement processes by 76% through connecting buyers and suppliers, and reduces public sector organisations' costs by about 28%.

Portal de Compras Públicas is far from the only public procurement platform on the market. What is remarkable about the company is its recent growth. The company had approximately 100 municipalities as customers in early 2020 and now reportedly serves 2,200 of Brazil's 5,500 municipalities, including some of the country's largest like the City of São Paulo. Collectively, the company reports that these organisations transact approximately USD\$50 million every day on the platform.

In April 2021, the Brazilian government enacted a new public procurement law that affects public entities at the federal, state and municipal level. This new legislation follows OECD guidelines on public procurement, such as promoting wider participation for RFPs and reducing corruption. Digital tools like Portal de Compras Públicas are integral to these initiatives, enabling transparency in public procurement and spreading the word about RFPs. Furthermore, this growth tracks with Brazil's public sector digitalisation efforts, catalysed in part by a \$1B credit line from the Inter-American Development Bank.

As Leonardo Ladeira, Portal de Compras Públicas' co-founder and CEO, describes, their rapid growth comes down to being at the right place at the right time: "We, as entrepreneurs, always believed that digital was the way to go when we thought of public RFPs," he asserts. "As such, we were ready and we had the necessary tools when our country's laws finally confirmed our beliefs on the subject."

PLANS FOR 2022

Internationalisation: opening their first overseas office in Portugal and certifying their platform to comply with EU regulations; Product development: making it easier to sign and execute public contracts through the platform, and deploying a machine learning API to more effectively connect buyers and suppliers

WHO SHOULD CONNECT WITH THIS COMPANY?

Public sector agencies in Brazil and Portugal that regularly issue RFPs. Private sector organisations that are looking to sell to these agencies.

COMPANY IN ACTION

RFPs submitted through Portal de Compras Públicas' platform are automatically categorised and distributed to relevant companies via email and through in-app push notifications. The entire bidding lifecycle happens on the platform: questions and answers related to each process, proposal management, public bidding procedures, digital signatures and more. Once each step is complete, all official documents are made public and sent automatically to the relevant federal oversight bodies.

Public sector organisations can choose to join Portal de Compras Públicas in conjunction with a consortium of municipalities, independently, or both. For example, the municipality of Fraiburgo in the state of Santa Catarina chooses to engage Portal de Compras Públicas both on their own and through CINCATARINA, the state's consortium of 295 municipalities. Using Portal de Compras Públicas through CINCATARINA lets Fraiburgo take advantage of bulk purchasing, while engaging independently ensures that all the municipality's needs are met.

This year, to deal with the increasing volume of RFP and corporate users, Portal de Compras Públicas developed and tested a machine learning API to improve its recommendation system. The ML API is expected to be integrated into their recommendation system later in 2022 to complement their human-curated classification system.

STATEUP VIEW

There is growing awareness of the benefits of effective public procurement: from creating more inclusive and open local governments to enabling climate innovation. The rapid growth of Portal de Compras Públicas reflects this trend. But even in this context, the scale of Portal de Compras Públicas reach is notable. Investors Danilo Zelinski of KPTL and Alessandro Machado from Cedro capital describe this growth as what has most impressed them, noting that currently 200,000+ suppliers are active on the platform. In a political environment that has been fraught with corruption, they call Portal de Compras Públicas a "no-brainer tool for buyers, sellers and even compliance bodies" who "trust the platform with over 30 billion BRL in bids per month."

As tracked on StateUp's Nebula public-purpose tech intelligence platform, there has been substantive growth in investment activity across Latin America over the last year – including a \$5 billion pledge from Softbank to invest in startups from the region. Nubank's global footprint hints at the capacity for Brazilian tech internationalisation. While Portal de Compras Públicas has only been active in the Brazilian market so far, they have plans to expand to Portugal next year. Marketplaces are some of the most valuable businesses on the Internet. Aided by a favourable EU-Mercosur trade agreement that includes government procurement, the company could become a case study in the internationalisation of Brazilian tech.

RENSOURCE

RENSOURCE'S SOLAR MICRO-UTILITIES ARE PROVIDING AFRICAN SMES WITH RELIABLE POWER

COMPANY SUMMARY

- Year Founded: 2015
- Funding: £20.3 million; Early Stage VC, £2.2 million
- Revenue band: £5-10 million
- Lead investors: PROPARCO, CRE Venture Partners, TRINE, Amaya Capital Partners, Omidyar Network
- HQ: Lagos
- FTEs: 50-100
- Key clients/partners: Rural Electrification Agency (Nigeria)
- Key executives: Ademola Adesina, CEO and co-founder: 15+ years of experience in Investment Banking and Impact Investing.

PROFILE

Depending on who you ask, small and medium-sized enterprises (SMEs) are responsible for 67 to 80 percent of employment in sub-Saharan Africa. They have driven growth and created a fledgling middle class. And African SMEs would contribute even more but for binding constraints like unreliable energy supply. Irregular electricity results in increased operational costs, for example, as SMEs resort to diesel generators which are three to six times more expensive than grid power. Ultimately, power outages lower SME productivity and survival rates--hindering African growth.

Rensource Energy aims to ease this pain point for SMEs operating in open air markets. It offers mini grids that produce reliable power through a mix of solar energy and diesel (as a fail safe). Visiting a Rensource-powered market, one would see rooftops lined with solar panels, batteries in alleyways, smart metres in shop stalls, and Rensource agents collecting payments and carrying out maintenance. It currently powers eight markets in Nigeria but has ambitions to scale across Africa.

Rensource was hit hard by the pandemic, which saw prolonged market shutdowns. But it had already been working on a follow-on service for traders. They tend to use manual, unwieldy management methods, and Rensource developed an Enterprise Resource Management system to digitize and improve their workflows. COVID-19 gave Rensource time to flesh out the service, and it has now spun out this arm into another startup, Sabi. It has also begun developing power plants for commercial and industrial (C&I) clients.

PLANS FOR 2022

Increase C&I clientele.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public energy ministries, agencies and departments, Commercial agricultural and industrial operators

CASE STUDY

To assist Nigerian SMEs in plugging their energy deficit, the Nigerian government launched the Energizing Economies Initiative (EEI) in 2017. EEI is implemented by the Rural Electrification Agency (REA) and enlists private energy companies in providing off-grid electricity to economic clusters: markets, shopping centers and agricultural/industrial parks.

As part of EEI, REA partnered with Rensource Energy to power the Sabon Gari market in Kano state. With more than 10,000 traders, Sabon Gari is one of Nigeria's largest markets.

Prior to the project, traders were spending up to half their incomes fueling generators; they were also exposed to toxic fumes and occasional fire outbreaks.

Rensource provided its decentralised system of panels, batteries and power management systems to Sabon Gari. In the process, it had to educate traders on the benefits of solar to get their buy-in. Rensource's intervention has reduced traders' energy costs by more than 30 percent. It has also created more than 200 skilled jobs.

STATEUP VIEW

Rensource began as a solar homekit seller, one of many. Its shift to providing energy to economic clusters did more than define an underserved niche for it though. CEO Ademola Adesina notes that "[in] our residential model, deploying systems at a hundred different locations meant we had a hundred different sets of problems. The markets model concentrates all of our problems in one location."

Rensource's story also shows the power of a willing public partner to empower innovative startups. When commissioned to power Sabon Gari, the REA gave Rensource access to a power audit that helped it determine optimal price points and understand energy demand. The REA also provided guidance on obtaining different government permits and reduced bureaucratic hurdles, saving precious time.

Rensource makes money by charging traders daily, weekly or monthly fees. Economies of scale derive from the sheer number of traders using its power; in 2019 this number was 10,000. This and cheapening solar panels have enabled it to generate substantial revenue and even be profitable (in 2018 it did \$7 million and made a small profit), rare for a Series A stage African startup. Although the pandemic affected its markets business, its C&I segment is picking up the slack--Rensource recently inked a deal to develop and maintain the largest poultry solar project in Nigeria.

THE FUTURE FOX

ENABLING COMMUNITY-DRIVEN URBAN PLANNING AND POLICYMAKING

COMPANY SUMMARY

- Year Founded: 2017
- Revenue growth from 2020 to 2021: 60%
- HQ: London
- FTEs: 1-10
- Key clients/partners: Scottish Government; UK Government, South Cambridgeshire and Cambridge City Councils, Glasgow City Council; Devon County Council
- Key executives: Annette Jezierska, CEO and co-founder; previously Head of Business Development at advocacy and engineering group Sustrans and on Westminster City Council's recycling communications team.

PROFILE

Last year, the UK government released a [white paper](#) outlining its vision for 21st century urban planning. The proposal, which would be the first major update to planning legislation since the 1947 Town and Country Planning Act, aims to bring economic prosperity by developing Britain's built environment. Analysts [note](#) that the plan faces significant criticism from architects, local authorities, and anti-homeless advocates. However, the conversation around this white paper makes it clear that rethinking how we design our communities will play a key role in global post-pandemic recovery efforts.

Annette Jezierska, CEO and Founder of London-based startup The Future Fox, underscores that "people feel locked out of the planning system." Furthermore, Jezierska notes that "public opposition to housing and infrastructure costs the UK £42 billion in GDP."

With these issues in mind, the Future Fox has developed PlaceBuilder, a citizen engagement platform that empowers municipal governments and their residents to collaborate and make data-driven urban planning decisions. Using PlaceBuilder, public sector organisations – with the support of The Future Fox's team of engagement experts – can quickly deploy inquiries to gauge community sentiment on planning initiatives.

PlaceBuilder guides The Future Fox's clients to focus on finding or building consensus amongst community members and identify what and where schemes could be built with support. According to The Future Fox, this outcomes-based approach enables local governments to find solutions that build the lasting trust that makes communities thrive.

PLANS FOR 2022

- Launch new product features to help with trade-offs in spatial decisions, and incorporate wider data sources like land values and social media, for more meaningful collaboration
- Work on more net zero and carbon-reducing schemes
- Grow as a leader in the UK PropTech scene, onboarding new clients in adopting data-driven practices in engagement, and releasing a paper based on their work with HM Government on the UK's first digital engagement on strategic regional planning, that produced a unique spatial community preference map to inform responsive policymaking

WHO SHOULD CONNECT WITH THIS COMPANY?

Local governments that would like to collaborate with citizens to make better urban planning decisions in their communities.

CASE STUDY

In 2019 and 2020, the London Borough of Lewisham [engaged The Future Fox](#) to collect and analyse citizen feedback on the design of a low-traffic neighbourhood. The Future Fox helped Lewisham develop a survey that was sent to 8,785 households in the project area through The Future Fox's digital platform. Approximately 800 people responded and left thousands of comments flagging their highest priority traffic-related issues and voting on different proposed solutions. The Borough directly used this citizen feedback data in spatial plans, leveraging a range of advanced analytical techniques and visualisations to enable citizen-led planning decisions.

Ultimately, the Borough used the data collected through The Future Fox to develop a traffic reduction masterplan. This plan was implemented in June 2020. Since then, the council has mostly kept the changes it made – except for removing a few closures due to increased traffic levels since the height of the pandemic.

STATEUP VIEW

The main advantage of The Future Fox's offering is that it is purpose-built for urban planning, unlike alternatives that engage citizens across all local issues. PlaceBuilder's templates make it quicker to deploy inquiries and lead to more effective results because their reporting features are fine tuned for urban planners.

The Future Fox has also proved tenacious in its navigation of the complexities of UK public sector procurement, having secured contracts with DLUHC / MHCLG, Scottish Government, Devon County Council, and Glasgow City Council as well as Equans (Engie). PlaceBuilder is currently being used to devise a [long-term sustainable growth plan](#) for the region encompassing Oxford and Cambridge.

The current UK policy environment, including the Levelling Up agenda, indicates that the interest in community-building platforms will only increase. Moreover, the use case for this software has the potential to expand far beyond Britain as global leaders grapple with post-pandemic urban planning.

TOKA

TOKA EMPOWERS GOVERNMENTS TO LEVERAGE THE IOT LANDSCAPE FOR INTELLIGENCE AND OPERATIONAL PURPOSES

COMPANY SUMMARY

- **Year Founded:** 2018
- **Total Funding:** \$37.5 million; latest round: \$25 million Series B in October 2021
- **Lead investors:** Andreessen Horowitz, Dell Technologies Capital, Entrée Capital, Eclipse Ventures
- **HQ:** Tel Aviv and Washington, D.C.
- **FTEs:** 50+
- **Key clients/partners:** law enforcement, homeland security and defense agencies
- **Key executives:** Alon Kantor, co-founder and co-CEO: previously VP of business development for cyber security developer Check Point; Kfir Waldman, co-founder and co-CEO: former Cisco executive, 3x startup founder, EMBA from Northwestern University; Yaron Rosen, co-founder: former Chief of the Israel Defence Force's Digital & Cyber Transformation Process, Brigadier General in the Israeli Air Force.

PROFILE

Toka has one overarching goal: to provide trusted governments with the tools needed to keep citizens safe and defend against terror and crime. Today's digitally connected world offers Law Enforcement, Defence, and Security agencies many opportunities – as well as risks. Toka empowers government agencies by tackling both fronts, developing novel, lawful solutions for Digital Forensics, Intelligence, and Force Protection. Toka's software platforms leverage the IoT landscape to enable faster, safer, and easier investigations and operations; they suit multiple missions, including forensic investigations, targeted intelligence, covert operations, and quick response: they are simple to use and expedite time-to-insight, helping agencies enhance their effectiveness and ultimately save lives.

Toka's software products are designed to be used by non-technical staff rather than forensics labs. Unlike traditional offerings, Toka's digital forensics and intelligence-gathering platforms do not require hardware tools or risky installations. This software-based system enables users to collect evidence more quickly than hardware-based methods, while also leaving no trace. Toka's approach is both safer and more cost- and time-efficient.

Founded by leaders with unique experience in the defense world, Toka works across the strategic, operational, and tactical levels, and has a deep, hands-on technical experience to address the full breadth of its clients' needs.

PLANS FOR 2022

Expand and continue to develop their products.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public sector leaders and government agencies looking to level up their cybersecurity initiatives.

COMPANY IN ACTION

Toka has partnered with international organisations to lead national-level cyber strategy and capacity building projects in Europe, Africa, and Latin America.

In 2018, hackers attacked the second largest bank in Chile, stealing \$10 million. This digital heist served as a wakeup call for executives from the country's public and private sectors, who promptly accelerated the implementation of its national cybersecurity strategy. As part of these efforts, in 2020 the Inter-American Development Bank (IDB) tasked Toka with supporting this strategy by providing tools, infrastructure, and training programmes to help the country develop its cybersecurity resilience.

Toka has since undertaken similar partnerships, including World Bank-sponsored initiatives in conjunction with the governments of Moldova and Nigeria.

- *Watch Lior Susan, founder of Eclipse Venture Capital, interview Toka's co-founders about Toka's mission, vision, and growth trajectory.*

STATEUP VIEW

Toka is addressing one of governments' most pressing needs: protecting crucial data and infrastructure. Instead of preaching techno-solutionism, their approach is to develop an overall cyber strategy and then find or develop technology that is most appropriate for each client. The digital forensics and information gathering tools Toka develops have a direct impact on fighting cyber crime effectively and quickly using a minimal amount of resources.

The team behind Toka is particularly strong. Retired Brigadier General Yaron Rosen, Toka's co-founder, spent more than three decades in the Israeli military and led the Israel Defence Force's digital transformation and cybersecurity processes. Co-founder Alon Kantor has direct experience in the cybersecurity industry, and co-founder Kfir Waldman has a strong business background. Ehud Barak, former Israeli Prime Minister and Minister of Defense, was also on Toka's founding team.

URBANFOOTPRINT

URBANFOOTPRINT CAN HELP POLICYMAKERS DEVISE AN IMPLEMENTATION STRATEGY FOR POST-PANDEMIC RECOVERY

COMPANY SUMMARY

- **Year Founded:** 2014
- **Funding:** \$18 million; Series A (\$11.5 million in February 2020)
- **Lead investors:** Social Capital, Valo Ventures, and Radicle Impact
- **HQ:** Berkeley, California
- **FTEs:** 11-50
- **Key clients/partners:** Community-based advocacy and relief organizations including Greater Baton Rouge Food Bank, Los Angeles Local Initiatives Support Corporation (LISC LA), Louisiana Fair Housing Alliance, and Oklahoma Food Bank; and state and local agencies including California Office of Emergency Services (CalOES), the Louisiana Governor's Offices, the California Department of Food and Agriculture (CDFA), and the California Department of Housing and Community Development (HCD)
- **Key executives:** Joe DiStefano, co-founder and CEO: spend 20 years as an urban planner, with a focus on disaster response; Peter Calthorpe, co-founder: prominent urban planner; Daniel Phung, COO: experienced operator, formerly at Yahoo, SoFi, and J.P. Morgan, MBA from MIT

PROFILE

In October, the US Congress approved a \$1 trillion infrastructure bill. Over half of these funds will go towards new federal spending items, from repairing and constructing roads and bridges (\$110 billion) and expanding high-speed internet access (\$65 billion) to improving airports (\$25 billion) and revamping rail services (\$66 billion). A bipartisan group of lawmakers spearheaded this bill, reflecting the broad consensus in the US that infrastructure plays a key social and economic role in President Biden's "Build Back Better" framework.

This allocation of funding is just a first step. Policymakers and civil servants now face the challenge of implementing these ambitious plans. UrbanFootprint, a California-based startup, may be able to help.

The company has developed a series of digital tools to help urban planners and public officials make data-driven decisions. Its *Analyst* platform contains hundreds of datasets (e.g., transit lines, flood and fire risk, poverty indexes) that can be overlaid on top of a map. Users test different scenarios to better understand the impacts of policy decisions like land use changes and mobility investments. Through the platform, users can export polished maps and datasets to share their findings with stakeholders.

Another product from UrbanFootprint, *Explorer*, has fewer features but is more straightforward to use. Through its web-based portal, users can track data trends, conduct risk assessments, and make more data-driven decisions around initiatives like where to locate vaccine or food distribution sites. UrbanFootprint asserts that these platforms help governments "prioritize infrastructure investments to bolster community resilience" while simultaneously analysing the downstream impacts of these resource allocations.

An integral part of UrbanFootprint's offering is the data itself. Co-founders Joe DiStefano and Peter Calthorpe *noted* in their Series A announcement that the funding will enable them to deploy more machine learning algorithms "to increase accuracy, coverage, and localisation" of their datasets. UrbanFootprint has already leveraged

machine learning to collect and analyse the data fuelling their maps for food security and eviction risks. Users can also integrate UrbanFootprint's data into their own application through an API.

PLANS FOR 2022

Expand its offerings more broadly into new verticals, including solutions for the energy industry to optimize infrastructure investments for minimal risk to assets, environment, and communities; and for the finance industry to improve risk-adjusted returns in support of a more sustainable economy.

WHO SHOULD CONNECT WITH THIS COMPANY?

Urban planners, energy providers, or government agencies that are looking for insights about urban planning, climate change, and community resilience.

CASE STUDY

Louisiana is experiencing a severe food access crisis. UrbanFootprint's data played a key role in developing its Food Security Index, which supports government agencies, cities, and food banks across the state. Some of the insights gleaned from UrbanFootprint's platform include:

- More than 1 in 3 Louisiana residents now live in food insecure communities due to the pandemic.
- Approximately 65% of residents in Louisiana's two biggest urban areas, New Orleans and Baton Rouge, live in food insecure communities.
- Nearly half of newly food insecure communities are in small towns and rural areas.

Using UrbanFootprint's data, government officials and local groups are able to identify households and neighbourhoods at a high risk of food insecurity, and more effectively target the provisioning of their resources.

- *Read more about UrbanFootprint's work by visiting [their website](#).*

STATEUP VIEW

Using data to better inform policy decisions is nothing new. Alex Engler, a fellow at the Brookings Institution, *notes* that data science methodologies have been used in public policy contexts since at least the latter half of the 20th century. However, the recent rise and increased accessibility of artificial intelligence-powered tools has ushered in a new era of data science. UrbanFootprint's platform is an excellent example of how policymakers can leverage the latest in digital tools to improve citizens' lives.

The US infrastructure bill, and accompanying social spending and climate bill, call for ambitious responses to pressing problems, from crumbling bridges to soaring inequality. Similar policy decisions are being made around the world, from the [UK](#) and [Europe](#) to [Latin America](#) and beyond. UrbanFootprint can help leaders more effectively deploy resources and successfully implement these goals.

While there are a host of similar software offerings in the marketplace, UrbanFootprint's platform stands out for its proprietary datasets and sector-specific insights. Going forward, we could imagine UrbanFootprint specialising even further, targeting a particular niche like 2021 StateUp 21 member [Remix](#) has done with the mobility sector.

WEWALK

WEWALK'S HARDWARE AND SOFTWARE PRODUCTS ENABLE VISUALLY IMPAIRED PEOPLE TO NAVIGATE URBAN ENVIRONMENTS

COMPANY SUMMARY

- Year Founded: 2017
- Funding: Pre-seed, \$750,000
- Revenue growth from 2020 to 2021: 110%
- Lead investors: Vestel Ventures; former executives from Unilever France, Goldman Sachs, and the UNICEF's Turkish National Committee
- HQ: London and Istanbul
- FTEs: 11-50
- Key clients/partners: Microsoft, Moovit, Imperial College, the Royal National Institute of Blind People
- Key executives: Sadık Ünlü, previously co-president of a nonprofit promoting youth technology; Gökhan Meriçtiler, engineer by trade with experience in international business development; and Kürşat Ceylan, marketing and communications expert

PROFILE

Approximately [300 million people](#) around the world experience moderate to severe vision impairment. A further 43 million people can be considered blind.

Devices that aid people with vision impairments are nothing new. The white cane, which is used by as many as [eight percent](#) of people with vision difficulties, has existed in some form for centuries, and in its current form since the early 1920s.¹

Entrepreneurs have recognised the opportunity for innovation in this space. A recent study of global patent findings by the World Intellectual Property Organisation (WIPO) [found](#) that mobility was the largest and fastest growing subsector of assisted technology, with a particularly significant growth rate in patent filings for technologies the organisation considers 'emerging'.²

The co-founders of WeWALK have innovated on the ubiquitous white cane, with the ultimate goal of improving its users' lives. The startup, based in the UK and Turkey, has developed a hardware device that attaches to a standard white cane and helps users navigate urban environments. This so-called 'smart' cane provides obstacle detection through ultrasonics (silent vibrations) and haptic feedback. Connecting the smart cane to WeWALK's proprietary app allows for voice control and the ability to hear information about the user's surroundings, keeping users safe and moving in the right direction.

PLANS FOR 2022

Secure more funding to expand the team; Increase accessibility by registering WeWALK with social security systems and insurance companies as a medical device, making it free for consumers; Launch a project for indoor navigation in locations like airports and shopping malls

WHO SHOULD CONNECT WITH THIS COMPANY?

Municipalities looking to make their towns and cities more accessible to visually impaired people. Users who feel they could benefit from WeWALK's SmartCane technology. Mobility-focused companies looking for partnerships. Healthcare organisations interested in procuring WeWALK's technology for their clients.

COMPANY IN ACTION

WeWALK's device calculates the best route for journeys and provides users with voice-guided, turn-by-turn walking navigation. WeWALK has API access to public transport data for 1,500 cities globally. When routes involve public transportation in these cities, it automatically checks timetables and ensures that users board and alight at the right stop. WeWALK can also notify the user of nearby landmarks on a journey (e.g., "Starbucks is 20 metres away at 2 o'clock").

Local authorities can also provide points of interest for WeWALK to add to their map, and, via the app, users can submit accessibility issues that are then routed to the relevant local authority. WeWALK sends usage reports and heat maps to municipalities to show their visually impaired citizens' mobility and highlight areas that need to be more accessible.

STATEUP VIEW

From a product perspective, WeWALK stands apart from its direct competitors because it develops both hardware and software. The software component connects the hardware component to a vast array of internet-based resources, while the hardware component integrates the tool more meaningfully into the daily lives of its users.

WeWALK boasts an impressive roster of investors and partners. Notably, they have partnered with Microsoft to use the smart cane's built-in sensors to better understand how visually impaired people are moving. These 'data-for-good' partnerships could enable WeWALK to positively impact the visually impaired community beyond its direct users.

WeWALK is focused on the core aim of enabling independent movement for the visually impaired. On top of improving its users' daily lives, the company notes an economic benefit to this independence. Oğulcan Başkan, WeWALK's Global Expansion Manager, describes how "in the UK, only 1 in 10 blind people are employed, costing the UK £28.1 billion per year."

Brian Kemler, a Product Manager at Facebook with experience in developing accessible technology, [notes](#) that it is challenging for assistive technology companies to achieve economies of scale. However, WeWALK is pursuing diverse public and private-sector procurement opportunities to help reach the scale required for long-term success.

¹ Pissaloux and Velazquez, eds., *Mobility of Visually Impaired People: Fundamentals and ICT Assistive Technologies*, Springer, 2017.

² WIPO Technology Trends 2021: Assistive Technology, pp. 164-5

WINDWARD

FROM ILLEGAL FISHING TO DRUG SMUGGLING, WINDWARD'S AI-POWERED PLATFORM HELPS AUTHORITIES MANAGE MARITIME RISK

COMPANY SUMMARY

- Year Founded: 2010
- Funding (pre-IPO): \$32.2M
- Lead investors (pre-IPO): Aleph, Horizons Ventures, XL Innovate, Marc Benioff, and Lord Browne
- HQs: Tel Aviv, London, Washington D.C.
- FTEs: 100-150
- Key clients/partners: The UN Security Council; the US Drug Enforcement Administration (DEA); the US Coast Guard; Frontex, the European Border and Coast Guard Agency; the Israeli Navy; the Indian Navy
- Key executives: Ami Daniel, co-founder and CEO, former naval officer, expert commenter on maritime issues; Matan Peled, co-founder and Head of US business, former naval officer

PROFILE

At this very moment, there are 200 million containers, 500 thousand ships, and 10 thousand ports in operation powering \$14 trillion worth of global economic activity. Maritime trade poses a complex set of challenges for governments, from information scarcity and overload to geopolitical tensions and interdependencies. Governments aim to enable economic activity while preventing illicit activities.

Windward, whose co-founders draw on their experience in the Israeli Navy, operates in this high-stakes environment to help public and private sector organisations manage the risk associated with maritime trade. The company has developed a predictive risk modelling platform powered by deep learning algorithms.

The platform tracks 10 billion data points across thousands of parameters, including ownership and management structures of companies active in the maritime space, vessel routes, and cargo locations. The algorithm analyses this data to detect anomalies such as unusual changes in course. It flags potential illicit activities and shares detailed information with the relevant public sector organisations that use the platform. The 15 artificial intelligence models forming the base of Windward's tech stack use hundreds of proprietary behavioural analytics models to help authorities make data-driven decisions in real-time. The platform also has an environmental management component, which uncovers risks associated with carbon emissions, oil spills, and illegal fishing.

PLANS FOR 2022

Bring two new products to market: one to monitor carbon emissions and the other to increase supply chain efficiencies; Deploy its Predictive Intelligence solution to more public sector organisations.

WHO SHOULD CONNECT WITH THIS COMPANY?

Public and private-sector organisations responsible for managing maritime risk.

COMPANY IN ACTION

In August 2021, Windward helped a group of European police and customs officers to intercept a cargo ship, NATALIA, on suspicion of narcotics trafficking. Through this investigation, authorities seized \$470 million worth of drugs.

The vessel appeared on Windward's radar for three reasons: it had changed the country where it was registered, it deviated significantly from its typical routes (see figure 1), and it was traveling slower than usual. A graph generated in Windward's platform (see figure 2) shows that the vessel's risk level, while consistently high since 2018, had spiked in July 2021. The platform flagged these anomalies with its public sector partners, who quickly responded and initiated the successful drug bust.

- [Learn more about the NATALIA case by visiting Windward's blog.](#)

STATEUP VIEW

Recovery from the Covid-19 pandemic has shown the fragility of global supply chains. In this landscape, maritime trade will come under increasing scrutiny. Windward can help government agencies more effectively manage a range of risks associated with international maritime shipping. Additionally, there are clear border protection and customs use cases. U.S. Customs and Border Protection, which has an annual budget of **\$17.7 billion**, has recently **pledged** to invest in technology and partnerships to confront emergency threats like those that Windward detects.

Since being selected for StateUp 21, Windward has issued an IPO on the London Stock Exchange. Windward's decision to become a publicly traded company signals a broader shift in what an IPO means for rapidly-scaling startups: less of a traditional 'exit' and more akin to another mechanism to raise money to catalyse growth.

ZZAPP MALARIA

ZZAPP MALARIA'S MALARIA ERADICATION PLATFORM HAS THE POTENTIAL TO SAVE 627,000 LIVES A YEAR

COMPANY SUMMARY

- Year Founded: 2016
- Total Funding: \$4 million; most recently won \$3 million from the IBM Watson AI XPRIZE in 2021
- Revenue growth from 2020 to 2021: 50%
- Lead investors: the Bill and Melinda Gates Foundation, the Innovative Vector Control Consortium, Sight
- HQ: Tel Aviv
- FTEs: 1-10
- Key clients/partners: the governments of Kenya, Zanzibar, and São Tomé and Príncipe
- Key executives: Arnon Houry-Yafin, co-founder and CEO; formerly lecturer in statistics at the Hebrew University of Jerusalem; Michael Ben Aharon, VP of Partnerships and Growth; political risk consultant for public and private sector leaders

PROFILE

According to the World Health Organisation, more than 627,000 people died of malaria in 2019. While nearly half the world's population lives in areas at risk of malaria transmission, approximately 97% of those deaths were in Africa. Malaria takes an economic toll as well. Direct annual costs (e.g., illness, treatment, premature death) have been estimated at a minimum of \$12 billion.

Zzapp Malaria has developed a software platform that helps inform malaria elimination strategies. Their app, which can work offline, analyses satellite images and topographical maps using artificial intelligence to determine malaria transmission hotspots. It then optimises malaria elimination strategies in these locations. These initiatives typically involve using a chemical spray to control the mosquito population, which is responsible for spreading malaria.

The company calls their algorithms "AI with mud on its boots" because the platform works in tandem with experts on the ground. However, the usefulness of the platform extends from out in the field to in the lab. In collaboration with Zzapp, data scientists from IBM have developed a [weather analysis model](#) that allows for users to better time interventions and determine the resources required to implement them.

PLANS FOR 2022

Complete the malaria elimination operation they launched in the island nation of São Tomé and Príncipe.

WHO SHOULD CONNECT WITH THIS COMPANY?

Governments looking to eradicate malaria, and international organisations interested in helping.

CASE STUDY

In 2020, Zzapp [launched](#) an anti-malaria initiative in the city of Obuasi, Ghana (population: 200,000). They worked in collaboration with malaria control company AGAMal, which uses an insecticide to control mosquito populations. AGAMal leveraged Zzapp's GPS-enabled mobile app to guide one group of technicians towards mosquito breeding sites, while another group did not use the app. The group that used Zzapp detected 28% more bodies of water (major breeding sites) than the non-Zzapp group. Additionally, AGAMal cut their house spraying operations by 20% by using Zzapp's platform to digitise data entry. Collectively, Zzapp's tools lead to a more efficient deployment of resources and a large reduction of the mosquito population. Previously, AGAMal had vetted Zzapp through a randomised, controlled trial that validated the platform.

KEY FACTS AND FIGURES

60% reduction in mosquitos; 20% reduction in spraying operation time; 90% increase in coverage (areas sprayed that wouldn't have been sprayed without the app), including 28% more water bodies \$0.20: cost of the operation per person protected, compared to \$5 for traditional house spraying.

STATEUP VIEW

Zzapp Malaria has developed a tool that is saving lives. Zzapp Malaria's approach is community-based rather than focused on the individual. This ensures that anyone in the area would plausibly benefit, regardless of their economic status or access to health facilities. Importantly, this innovation did not take place in a silo, but rather by deploying and iterating on the platform and approach alongside community partners. Zzapp Malaria's founders note additional externalities too: their app reportedly increases local employment since Zzapp Malaria's campaigns employ twice the number of people with the same budget as other methods.

Unlike other companies working in the malaria eradication space, Zzapp is an entirely digital platform that works offline and is available to most smartphone users. This makes Zzapp more accessible than other mosquito controlling solutions, which require investment in physical products. For developing contexts – Zzapp's primary market, where the need is most acute – acquiring physical products is not as viable an option as downloading an app.

Zzapp Malaria has won two prestigious prizes: the Cisco Global Problem Solver Challenge 2021 (\$250,000) and IBM Watson XPRIZE AI for Good (\$3,000,000). This funding puts Zzapp in a strong position to continue refining its tool for different contexts and scaling to help to eradicate malaria on a global scale.

CONTACT US



Stateup21@stateup.co



[@StateUpHQ](https://twitter.com/StateUpHQ)



[StateUp](https://www.linkedin.com/company/stateup)

www.stateup.co

