Scottish Technology Ecosystem Review: Towards The Tipping Point

30 November 2022

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Ministerial Foreword

In August 2020, when Kate Forbes, Cabinet Secretary for Finance and Economy commissioned Professor Mark Logan, former COO of Skyscanner, to develop a short-life review on Scotland's technology sector we were certain the resulting report would help propel us towards a more globalised and innovative future for Scotland.

The STER report was developed in a difficult year like no other. The coronavirus pandemic impacted every facet of our lives, economy and businesses. The publication of the Scottish Tech Ecosystem Review ('STER' for short) received critical acclaim due to its depth, creativity and above all vision and ambition.

As Professor Logan writes in his report, Scotland for all its resilience and history of reinvention and innovation, cannot yet boast a world-class tech ecosystem. Professor Logan diagnosed Scotland as being at pre-tipping point, with the stage of arrival at post-tipping point being when the ecosystem hosts a critical mass of viable start-ups and scale-ups.

Two years on, as we emerge from the pandemic, his assessment still holds.

Scotland's entrepreneurial activity has gradually improved over time: Scotland's Total Early-stage Entrepreneurial Activity (TEA) rate in 2021 was 9.5%, compared with 4.2% in 2010. However, Scotland's TEA rate remains below that of some other advanced economies and we still need more high growth firms which disproportionally drive growth, productivity and innovation. We know we can and should be doing better and STER aims to vastly increase the rate of tech entrepreneurial activity and associated wider economic impacts.[1]

During a time when we find ourselves in an incredibly challenging economic position, compounded by the impact of the pandemic, our exit from the EU and other global challenges, there has never been a more important time for transformative economic direction that benefits all. Evidence shows that supporting the growth of start-ups is one of the most effective ways to boost our economy and unlock sustainable growth and better career opportunities.[2]

However, changes of this scale are a long-term process that involve transforming culture and mind-set as much as it involves transforming the physical and financial landscape. Recognising the need for a cultural shift, and led by the advice from our top entrepreneurs and experts, we have also embedded the necessity for entrepreneurial thinking as a key theme in our 10 year National Strategy for Economic Transformation. I am delighted that Professor Logan is now Scotland's Chief Entrepreneur and that we continue to benefit from his valuable expertise, support and challenge.

Speaking with start-up founders and organisations across the Scottish ecosystem, I was enthused to find that one of the key achievements of STER has been its ability to better bridge and collaborate across specialisms and domains. The STER Advisory Board, made up of some of Scotland's top entrepreneurs and tech leaders, has provided crucial advice and constructive challenge that has helped with exactly this.

STER was never going to be a quick-fix solution to a somewhat fragmented landscape but many can agree that the clear overarching mission and argument Professor Logan presents has helped focus, connect and inspire our ecosystem for the better.

1 Strathclyde University Global Entrepreneurship Monitor, 2021
2 MIT University Who Creates Jobs Small versus Large versus Young The Review of Economics and Statistics

Since launching the STER programme in 2020 to implement the report's recommendations, we have made strong progress and have invested over £60m to date. Some highlights include:

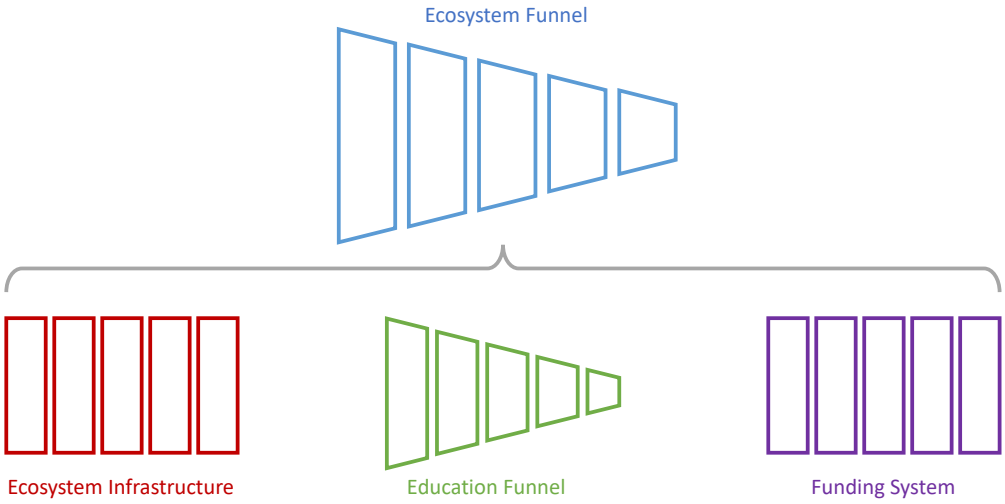
- The formation of **STACS (Scottish Teachers Advancing Computing Science)**, an organisation run for and by Computing Science teachers;
- An investment of over £1 million for additional **Computing Science hardware** for schools;
- Our £1 million **Ecosystem Fund** which has made strategic investments in the organisations and activities that create the best possible environment for start-ups to succeed;
- And the award of a five year £42m contract to CodeBase for the delivery of a national **TechScaler** network; seven tech hubs delivering world-class commercial education to start-ups.

We are encouraged by the progress that has been made on the STER recommendations so far and the level of collaboration this programme has created across Scotland. I am pleased to share the detail of the progress we've made so far, and the stories of those who have benefited first hand. Whilst there is much to be proud of, we also acknowledge that there is much more left to do to reach our post-tipping-point goal, but bolstered by investment, strategy and the collective will of the ecosystem we are on our way.

Introduction

The Scottish Tech Ecosystem Review (STER) is structured around three areas that will enable our tech ecosystem to reach its 'tipping point': education, infrastructure, and investment.

This report provides a summary of the key developments in each of these areas to date.



1. Education

STER recognises that high-quality education at the right stage of the ecosystem funnel is key to success. Recommendations in this area tackle the foundational talent pipeline, including the way Computing Science is taught in schools and universities, the role of 'funnel wideners' and extra-curricular organisations, and the attraction of external talent and experience into the ecosystem. Section one of this report provides an overview of activity to improve the foundational talent pipeline.

2. Infrastructure

Section two covers interventions which support the physical and social infrastructure our ecosystem needs. STER explains there are broadly two meanings to infrastructure – the physical realm which includes support like our TechScaler network and co-location, and the social 'market square' realm. The latter helps hone a sense of community, collaboration, confidence and identity.

This section covers why and how we established our TechScaler network, and the success of, and learnings from, our Ecosystem Fund.

3. Investment

This chapter covers funding and investment and the steps being taken to increase the quantum of early-stage and Series A investment, to smooth the path for start-ups and venture capital firms to access funding, and to better align grant funding with the needs of start-ups.

We are working with a range of partners including Scottish Enterprise, Scottish National Investment Bank and others to ensure the financial investment landscape is fit for purpose and fair.

1. Education

We know education is vital if the Scottish tech ecosystem is to reach its tipping point. STER draws a simple correlation between young people learning programming knowledge and skills at school and start-up businesses having the talent they need to draw on in future, to ensure they can flourish and grow.

Through our education work-stream, driven by a Senior Steering Group led by the Cabinet Secretary for Education and Skills and comprised of senior leaders from the Scottish Qualifications Agency, Skills Development Scotland, Education Scotland, and the Scottish Funding Council – we have delivered key interventions to improve participation in Computing Science in schools all over Scotland. This includes:

- A new teacher-led organisation called STACS (Scottish Teachers Advancing Computing Science),
- A national upskilling plan for computing science teachers,
- A new teacher resource repository,
- More than £1 million of investment in computing science hardware for schools, and
- Resources to bring the tech industry into schools, so pupils can learn first-hand what the subject and a future career in tech has to offer.

Scottish Teachers Advancing Computing Science (STACS)

In partnership with the University of Glasgow, two of Scotland's leading Computing Science teachers (Toni Scullion and Brendan McCart) are putting teachers at the heart of delivery by acting as critical friends to the STER programme and leading the teacher upskilling agenda through the development of a new repository of teaching resources and a new national upskilling plan.

Toni Scullion & Brendan McCart

A first priority for STACS was to form a Computing Science Teacher Reference Group made up of current teachers with a variety of backgrounds and experiences, ensuring that their voices are heard throughout the development of initiatives to improve the discipline.

STACS is also working to promote Computing Science to pupils and their parents as a desirable subject choice and career option while also analysing trends in provision including course uptake and gender participation to help inform future projects.

Upskilling Scotland's Computing Science teachers

STACS are leading the development of a national upskilling plan for Computing Science teachers in Scotland, which will help transform how the subject is taught by building teachers' confidence and helping them keep pace with change. Content will be delivered through 'bite-sized' videos, tutorials led by experienced teachers, and in-person events. An initial pilot will be delivered this year, before a full scale roll-out in 2023.

New teaching resource repository

STACS' website will enable teachers to access a new suite of teaching resources which is due to launch this year.

These resources, which include materials for S1 to S3 classroom use, will upskill teachers while also encouraging best practice, saving teachers' time in creating classroom resources and making lessons more engaging for pupils.

STACS will support teachers, helping them make best use of materials which are currently being tested by our Teacher Reference Group.

New Computing Science equipment for schools

Through our investment in computing science equipment, we aim to inspire young people with the 'magic' of Computing Science, encourage wider and deeper study of the subject, and equip the next generation with digital skills for the future.

We have invested over £1 million to add to schools' existing stocks of computing hardware, putting more kit into classrooms and into the hands of teachers and pupils.

We established a fund for all secondary schools to bid for grants of up to £2,500 each, giving them the flexibility to choose equipment that would best suit their needs. Around 300 secondary schools benefited from this funding and purchases included devices, software and teaching resources.

> Miss Mutter, Falkirk High School
>
> "We purchased Sphero's and Meobit's and have developed courses for our S1 and S2 pupils which we will be running this year. We wouldn't have been able to buy all of these without the funding."

> Mr Brown, Inverness High School
>
> "We have bought 12 top end Raspberry Pis and hoping to be able to do some proper Ethical Hacking in Cyber Security."

> Mrs Swan, Carnoustie High School
>
> "We bought Kitronik Arcade packs which will allow the pupils to play the games they make in S3. We have also bought Kitronik :Move kits so that we can do more physical computing with our S2-3s using Microbits and the :MOVE buggies."

Ms MacDonald, Pitlochry High

"I used my Raspberry Pi Cameras to roll out a stop-motion animation project for S1/S2 in May/June (S3 crash tested it for me beforehand). It was a nice little introduction to using the Raspberry Pi as well as animation and the classes enjoyed it. I also bought some sensors for growing plants that I thought might be interesting since our school has a thriving rural skills ethos!"

Mrs Ezziane, Uddingston Grammar School

"We purchased a few iPads to allow us to do some coding with Lego Mindstorms and allow us to teach some of the Cyber courses where pupils can connect a device to routers. The iPads will open up some other opportunities like stop-motion animation and much more."

In addition, we delivered 20 Micro:Bits (pocket-sized computers that introduce pupils to how software and hardware work together) to every primary, secondary, and additional support needs schools in Scotland.

Children from Methilhill Primary School showing their Micro:Bit.
Picture by Micro:bit Educational Foundation.

In May 2022, the Cabinet Secretary for Education visited Methilhill Primary School in Fife to see first-hand the difference that this additional equipment was making in classrooms.

Children from Methilhill Primary School with the Cabinet Secretary for Education and Skills. Picture by Micro:bit Educational Foundation.

We provided additional funding to expand the FIRST® LEGO® League class packs with additional hardware and workbooks, to extend the project to more pupils. The FIRST® LEGO® League, provides programmable robotic equipment to classes to give young people hands-on coding experience.

We have funded the University of Edinburgh to extend the Notable platform across all secondary schools in Scotland. Notable is a flexible, easy-access learning environment which allows users to experiment with multiple programming languages and to see code running in real-time.

Supporting the curriculum: tech industry into schools

Exposing young people to the tech industry is a vital part of improving participation in computing science – and the tech community has been forthright in offering up this help to schools.

Working with partners including Developing the Young Workforce, Digital Technology Education Charter, ScotlandIS and Education Scotland, our national skills agency, Skills Development Scotland, have developed a Tech Industry In Schools Toolkit which brings together resources and programmes like Tech Industry in the Classroom.

The Toolkit also includes materials to help employers prepare for their classroom experience such as Classroom Fundamentals which provides guidance on being a role model in the classroom, tips on talking about their job and how to work with young people in groups.

The participation of girls in Computing Science

On average, 84% of students studying higher Computing Science in any given year are male. This represents a loss of talent for future generations as well as a barrier to opportunity and success for women in tech.

That is why, we are taking actions to raise awareness of gender bias with parents, families and teachers at all stages of the education process.

This includes providing resources to help teachers tackle gender stereotyping and unconscious bias, improving career advice and preparation for work within schools, and working with colleges and higher education institutes to narrow gender gaps in participation in courses.

We are building on this by working with the Improving Gender Balance and Equalities team at Education Scotland who support long-term sustainable work in schools to address gender imbalance and promote equalities.

Investment in extracurricular activity

STER identifies the important role that extra-curricular organisations play in encouraging the participation of underrepresented groups and highlights the lack of support available for these organisations.

In February 2022, we awarded £100,000 to Digital Xtra to provide grants to organisations delivering extra-curricular computing and digital technology activities for young people across Scotland.

Broadening the digital talent pool

We know that we need 13,000 new recruits to fill digital technology roles every year to meet demand.[3]

We cannot rely on our traditional education pipeline to provide these recruits, which is why we have invested over £4 million since 2020, via Skills Development Scotland, to broaden the digital talent pool.

This has included the delivery of reskilling programmes such as the Digital Start Fund, a programme which supports people on benefits or low incomes, and the Digital Skills Pipeline, a modular set of courses running from beginner level all the way through to advanced coding.

By giving grant funding to Code Your Future, another training organisation, we have also helped vulnerable people, including refugees, with the skills and networks necessary to progress in education and employment.

Going forward, a new Digital Economy Skills Action Plan for Scotland, which is being developed in partnership with industry and stakeholders, will identify the activity that will best support the needs of the digital economy going forward, aligning with the recommendations from STER and NSET.

3 ScotlandIS Scottish Technology Industry Survey 2021

STER Grant Recipient Case Study: Code your Future

Colette grew up in a housing development in Linwood in the 1980s. She only discovered in adulthood that she had dyslexia and as a result of this the challenges that came with her circumstances, she did not receive any secondary qualifications.

At first, Colette tried to get a job in design. She compiled a portfolio and secured a place on a HND Graphic Design course but could not find work in her chosen field.

Colette found a temporary job in IT and discovered she enjoyed the industry.

> "Life carried on and I got married and had my two daughters. I stepped away from IT in order to be a part-time working mum with jobs that worked around my family's needs."

Colette eventually returned to education and earned a degree in IT, but she faced a new obstacle. She was rejected at every interview because she wasn't proficient in any coding language.

She heard about CodeYourFuture and after some initial struggles, made it onto the CodeYourFuture Software Development course. At the same time, she secured a full-time job just as COVID-19 was becoming a frightening reality. It was extremely challenging for her to manage a full-time job and a full-time course while looking after her family.

With perseverance, and the support of her family and CodeYourFuture, Colette overcame her challenges. She says, "with the amazing volunteers at CodeYourFuture, who encouraged me to continue with the course, I successfully graduated in March 2022."

> "I learned that doing my best was good enough. I am valued and have a very varied unique skill-set. Not to give up trying to reach my potential."

More success followed her graduation and newfound self-belief when Capgemini, an international IT company, offered her a full-time position as a Test Analyst.

Next Steps

- STACS launch of the new teaching resource repository
- Pilot the national upskilling plan for Computing Science teachers in Scotland, with the full roll out in 2023
- Continued working with the Improving Gender Balance and Equalities team at Education Scotland
- Publishing a Digital Economy Skills Action Plan

2. Infrastructure

Funding social infrastructure

Technology ecosystems depend on social infrastructure to propagate best practice by facilitating start-up education, networking and peer-support. Vibrant communities which exchange ideas, learn from each other and collaborate play an integral part in building an ecosystem that removes barriers to access and opportunity and is open to everyone.

That is why, we launched the **£1 million Ecosystem Fund** in October 2021, to support the community elements of the Scottish tech ecosystem, helping to create the best possible learning environment for technology start-ups to grow and succeed.

Applications were open to proposals which would support tech meet-ups, events and broader activities to assist with education, networking, collaboration, and the exchange of ideas.

The ecosystem responded to the fund with great enthusiasm. Over 100 applications were received and, while it was an extremely challenging selection process due to the quality of applications, we were delighted to offer over 30 projects grant funding.

Projects funded include:

- Visits to Silicon Valley, delivered by FutureX and Startup Grind Scotland. This exposed cohorts of Scottish start-up founders to international investors.
- An event at the London Stock Exchange, delivered by The Bayes Centre's EIE Team, showcasing Scotland's start-ups to London-based investors and enablers,
- A 10-week programme, delivered by Female Founder Squad, to encourage more women into tech and help them create start-ups,
- Scottish Games Week, delivered by Scottish Games Network, to showcase and promote the incredible work being carried out across Scotland's rapidly evolving and diverse games ecosystem. This has connected industry and academia, to Esports, applied games and showcased the transformative power of games technologies for our creative future, and
- Mint Ventures' 'Increasing Access to Capital for Women' project, designed to educate more women in Scotland to become angel investors using gender-specific learning techniques to build confidence.

The Ecosystem Fund received positive feedback from many across the tech community. Demand surpassed expectations and we have been able to demonstrate value for money through investment which might otherwise not have been made.

Lessons taken from our experience in operating the fund include the need to think more carefully about how we can reach and support smaller-scale organisations, how to maximise impact amongst ecosystem builders offering similar activities, and how to utilise funding to address barriers to entry and opportunity.

Ecosystem Fund recipient case study: Startup Grind

On 9 April 2022, the Startup Grind Scotland team travelled to Silicon Valley with 20 of Scotland's tech entrepreneurs. There, we were immersed in the entrepreneurial mecca: visiting leading global tech companies Nvidia and UserTesting, learning about the Silicon Valley mentality at venture-backed Alchemist Accelerator, and connecting with fellow founders at Startup Grind Global's Conference. Alongside our partner SDI, the final night saw our cohort pitch at Werqwise in central San Francisco to a packed room of 50+ US-based investors.

We developed this experience, with Mark Logan's STER vision in mind: to see Scotland take its place as a global tech hub. To contribute to this vision, we created a programme focused on building peer connections, accessing a global community, supporting learning about international opportunities, and raising Scotland's profile as a world-class technology ecosystem.

Startup Grind Scotland cohort. Picture by Startup Grind

We are delighted to report that this trip exceeded our wildest expectations. At a glance:

- We received 178 applications from Scottish founders from diverse walks of life across 26 locations
- Our cohort created over 62 new investor connections
- Our message was published in 20 articles with a UK-wide reach
- 60% of delegates were confident in their business' success before the trip; now, 93% are.

Founders on the trip said:

> "Holoxica's visibility and credibility was boosted massively in Scotland and internationally. Through the trip, we connected with a prominent US-based Global Scot who acts as a mentor and helps us to develop visibility, and connections in Space Tech and Defence." – Wendy Lamin, MD, Holixica

> "A huge win for TZAR! was our new relationship with Metaplex, an NFT partner for the major blockchain provider, Solana. Without that relationship, I couldn't have had such high-level access to Web 3.0 capabilities." – Tzaritsa Asante, Founder, TZARI

> "Hard to provide a full account of the extent of the learning I experienced on the trip but I can say for sure that it was life-changing. It had such a positive effect on me and my business that I travelled back out a couple of weeks later to follow up on some leads and to make some new contacts which are likely to be game-changers for us." – Allan Cannon, Krucial (formerly R3-IOT)

Ecosystem Fund recipient case study: Startup Grind – continued

Startup Grind Scotland is operated by a passionate group that volunteers their evenings and weekends. This funding not only allowed for the Silicon Valley Programme to take place, but also for our team to take an active role in supporting Scotland's entrepreneurial ecosystem to connect further with Silicon Valley, cross-pollinating insights and learning across the Atlantic Ocean.

We firmly believe that more programmes of this kind will only serve to connect Scotland's tech ecosystem worldwide, reinforcing learning and creating feedback loops across our local and national hubs. Matching the Valley's ambition with Scotland's high-impact mindset will be critical to cementing Scotland on the global stage - but our entrepreneurs can't do it alone. We are immensely grateful to the Scottish Government for making this trip a reality: our mission now is to continue collaborating across our ecosystem and beyond to elevate, educate and inspire our founders and show the world what Scotland has to offer.

Startup Grind Scotland Cohort.
Picture by Startup Grind.

Anna Brow, Caro Melendez, Emma Loedel, Dec McLaughlin & Nick Murray – The Startup Grind Scotland Team

Following the success of the Silicon Valley programme, the Scottish Government has now funded Startup Grind to take 10 tech founders to the Slush conference in Helsinki in November. Labelled "The World's Best Startup Event", the select founders will have the opportunity to network with over 4,000 startups and over 2,000 investors.

The overarching aim of the programme remains the same – to broaden experience for our founders so they can connect and learn from international best practice.

Our new national TechScaler network

In July 2022, First Minister, Nicola Sturgeon and Kate Forbes, Cabinet Secretary for Finance and Economy announced our national TechScaler network, delivered by CodeBase and backed by £42 million of funding, to support Scottish start-ups with world-class commercial education, mentoring and a vibrant peer community.

Launch of our TechScaler network. (L-R) Mark Logan (STER Advisor and Chief Entrepreneur), Stephen Coleman (CodeBase), Nicola Sturgeon (First Minister), Steven Drost (CodeBase), Kate Forbes (Cabinet Secretary for Finance and Economy).

Opening for business from November 2022, TechScaler will offer opportunities for start-ups to co-locate in Aberdeen, Dumfries, Dundee, Edinburgh, Glasgow, Inverness and Stirling.

Hubs will be delivered in partnership with universities, local authorities and businesses - for example, in Glasgow, there will be a hub based at the new Barclays campus beside the River Clyde.

STER recognises that not enough businesses in Scotland possess the 'start-up skill-set' (sometimes referred to as the 'Silicon Valley Playbook'), and that a lack of these essential skills is one of the root issues which is preventing our tech ecosystem from reaching its tipping-point.

That is why our TechScaler network will offer, free of charge, cutting edge education on the key principles of successfully scaling up internet economy businesses to any and all tech start-ups in Scotland that want it.

The TechScaler programme will be delivered in partnership with world-leading organisations such as Reforge, Silicon Valley's most prestigious education programme for tech scale-ups.

Courses will be offered to companies at different stages of development – from individuals thinking of founding a start-up, to larger businesses close to achieving competitive advantage and scale.

Education will also be provided on business essentials such as:

- Business operations,
- People leadership,
- Technical leadership, and
- Technology strategy development.

TechScaler is an investment not just in physical infrastructure and facilities but in people – the single most important factor in the success of any business venture.

TechScaler will also develop a national calendar of events, to harness and foster the sense of community already present across our tech sector in Scotland.

This is part of our ecosystem's 'market square' – meaning physical, in-person or online spaces in which communities, founders and entrepreneurs can come together, to learn from each other while enjoying meet-ups, events and other activities.

Working with our enterprise agencies

We know we will only transform our ecosystem by working across government, public sector, academia and industry to deliver on the recommendations in STER.

Our enterprise agencies have been actively engaged in the implementation of the recommendations, ensuring that activities delivered align with our goal to reach the post-tipping point state.

Like other agencies, when the STER report was published, Highlands and Islands Enterprise (HIE) was delivering emergency funds to clients and organisations across its region - including a digital enablement grant that highlighted significant demand for accelerated adoption of technologies and related skills.

Following the announcement of our national TechScaler network, HIE has been in discussions with TechScaler service provider, CodeBase, on an operating model for the Highlands and Islands, which will ensure TechScaler support and programmes are available to businesses and enterprises all over Scotland, including in our most remote and rural areas.

South of Scotland Enterprise has been developing an Entrepreneurial Roadmap to help build a pipeline of potential enterprises for scale-up. This support is not specific to any particular sector or industry and will help local enterprises and entrepreneurs engage with sectoral, regional and national programmes – including the TechScaler hub planned for Dumfries.

Scottish Enterprise has established a 5-year national programme in response to STER. Digital Scale-up Level-up aims to significantly improve the quality and quantity of digital tech scale-up businesses in Scotland with a specific focus on increasing digital innovation in Scotland's regions. The programme is working with stakeholders to establish regional digital tech action plans, developing market opportunities in FinTech and Climate Tech, encouraging international digital talent attraction and helping to internationalise digital tech conferences.

Next Steps

- Launching the National Network of TechScalers from November 2022
- Further policy development on the physical and social infrastructure identified in STER

3. Investment

Scottish Government's Global Capital Investment Plan sets out an approach to 'crowd in' private capital to build new markets and deliver a Net Zero, Wellbeing Economy.

We want to work with investors who share our aim to address the "grand challenges" that we face in Scotland and around the world - by providing targeted, direct intervention as and where appropriate, strengthening connections and making the funding landscape easier to navigate overall.

We know there are two particular investment challenges for Scottish start-ups trying to raise growth capital – which are raising funds at the Early-Seed and Series A stages of their company's journey.

STER makes a series of proposals to address these issues based on better engagement with the investor community in support of a partnership approach between the public and private sectors.

In parallel, Scottish Enterprise has aligned its support offer to early-stage high-potential companies by combining its entrepreneurship and investment teams – bringing expertise in unlocking investment together with specialist services to help companies raise growth capital, while also offering wrap around advisory support to help companies scale up.

Progress on STER recommendations on investment includes:

- Progress towards the establishment of a new Series A fund, supported by the Scottish Government through the Scottish National Investment Bank,
- Work to develop a new £150 million fund for Scottish businesses in partnership with the British Business Bank, to address gaps in the supply of growth capital,
- A new fund for female-founded companies in Scotland, delivered through collaboration between Investing Woman Angels and the Scottish National Investment Bank, and
- A strategic review of funding available to Scottish businesses, which includes support with external fund-raising expenses, to ensure that funding is offered in ways that best support company growth.

Other work delivered to date includes an initiative to map the activity that is already taking place to address funding gaps, including work ongoing outside of the public sector.

For example, Barclays Eagle Labs has developed a Demo Directory that sends short video clips featuring start-up companies seeking investment to a group of over 260 active investors.

300 founders have created demos to date and 44% of the companies involved have been successful in raising investment within six months. Eagle Labs are scaling this platform further and will launch a new platform before the end of this financial year.

Ecosystem Fund recipient case study: Mint Ventures

Gillian Fleming, Mint Ventures

In Spring 2022 Mint Ventures was supported by a Scottish Government grant, to deliver inspiring regional events to encourage more women to learn about angel investing, consider becoming angel investors and provide much needed capital for women-led companies to grow.

For early-stage companies to grow, angel investment is a critical source of capital however, less than 12% of business angels in Scotland are women. Women are 50% more likely to invest in women-led businesses than men, so increasing the number of women business angels will help more women-led and diverse teams access the capital they need.

Key outcomes

This pilot project was highly successful in both creating a growing community of like-minded women angel investors and demystifying the process of angel investment for women entrepreneurs.

Three 'Women Backing Women' face-to-face roadshows took place in the Borders, Edinburgh, and Perth for women to learn about angel investing with an impressive 70% attendance rate despite COVID-19 restrictions having just been lifted. An online roadshow was held for women unable to attend in-person due to COVID-19 and caring commitments. Plus, two 'Inspiring Women' online events were held with international business angels sharing their journeys and expertise.

Participant feedback

> "Excellent mix of speakers and participant questions. Really honest and friendly atmosphere. Not at all intimidating and very inspiring."
> – event participant

Next steps and plans for the future

Continuing to build a community of women angel investors is key to changing the current ecosystem and will be achieved through:

- Continued follow up, taking time to build relationships and provide further information to reach the goal of more women business angels.
- Further 'Women Backing Women' roadshow events, with a particular focus on additional regional areas to grow the community throughout

Scotland.

Ecosystem Fund recipient case study: Mint Ventures – continued

- Collaboration with support organisations and joint events to build financial confidence and support the journey to becoming a business angel.
- Continuing to work with partner angel groups to support women into angel investing.

> Gillian Fleming, Chief Executive Officer of Mint Ventures
>
> "Mint Ventures was delighted to receive recent support from the Scottish Technology Ecosystem Fund.
>
> This support allowed us to deliver an initial regional education program to help women understand what is involved in becoming an angel investor. Crucially it allowed us to collaborate within the ecosystem and develop new networks, connecting potential angel investors with socially, ethically or environmentally responsible business start-ups looking for funding.
>
> Our mission is to democratise angel investing and make it more accessible to business women from all walks of life. By doing this, we will not only empower women to make their own investment decisions, we will also unlock more early-stage equity investment, especially for women-led businesses which have for too long been under-represented and under-funded."

About Mint Ventures

Mint Ventures are a women-led business angel investment group offering capital for women entrepreneurs and diverse executive teams or boards.

They support women to become angel investors with online training and investing from as little as £2,000 per deal.

Next Steps

- Develop more investment vehicles to support entrepreneurship with our key partners including The Scottish National Investment Bank, Scottish Enterprise Growth Investments, Scottish Growth Scheme and the British Business Bank. Our objective will be to create the best possible funding environment for Scotland's tech start up community.

4. Addressing Barriers of Entry

We understand that our work to transform the Scottish tech ecosystem creates opportunities to dismantle long-standing barriers to entry and opportunity, creating a tech sector that truly recognises and supports everyone's talent.

We know that people from disadvantaged backgrounds face structural barriers in trying to get their start-up ideas off the ground. For example, people with lower household incomes have fewer resources to develop and invest in their ideas.[4]

With the pandemic and cost of living crises worsening these inequalities, it is even more crucial that entrepreneurial support is accessible in every sense of the definition. So, as we introduce internet economics and the 'Silicon Valley Playbook' to our ecosystem, we must also ensure that we do not repeat mistakes made elsewhere.

Some of the issues found across the UK include:

- 42.72% of UK venture capital invested at seed stage between 2009-2019 was invested in founding teams with at least one member from an elite educational background. Elite was classified as Oxford, Cambridge, Harvard, Stanford and their respective business schools.[5]

- The UK's Black and Multi-Ethnic communities comprise 14% of the UK population, yet all-ethnic teams received an average of 1.7% of the venture capital investments made at seed, early and late stage between 2009 and 2019. In the UK, over the past 10 years only 38 black entrepreneurs have received venture capital funding,[6] and

- One-fifth of all UK tech investment went to just 10 scale-up firms in 2020.[7]

At the same time as we are seeing these challenges and barriers, it is also clearer than ever that more diversity makes tech more profitable and more innovative.

Research carried out by the management consultancy McKinsey has found that companies with the most gender diversity in their executive teams are 25% more likely to experience above-average profitability than those with the least.[8]

Furthermore, recent research by Tech Nation has found that boards with gender diversity experience a £70,000 turnover premium and that there is 453% higher investment for directors sitting on internationally diverse boards.[9]

4 British Business Bank: Alone Together Report
5 Extend Ventures: Diversity Beyond Gender
6 Extend Ventures: Diversity Beyond Gender
7 Extend Ventures: Diversity Beyond Gender
8 McKinsey & Company: Diversity Wins
9 Tech Nation: Paving the way for diversity and inclusion

The Ana Stewart Review on women's entrepreneurship

The Scottish Government has launched a review of the entrepreneurship landscape for women in Scotland.

This work is necessary and important because we already know that women struggle to get the right funding and support, that there is already a recognised gender gap in business participation in Scotland - and that this gap is widening.

Women in Scotland are around half as likely to be early-stage entrepreneurs as men and research has shown that there has been a statistically significant decline in the number of women-led SME employers in Scotland from 20% in 2015 to 14% in 2019.

In order to unlock the ambitions of female entrepreneurs in Scotland and ensure they are able to reach their full potential, in February 2022, Kate Forbes, Cabinet Secretary for Finance and Economy, commissioned an independent whole system review of women in enterprise that would examine the barriers facing female led businesses.

This Review is currently underway, led by experienced entrepreneur and investor, Ana Stewart with support from Chief Entrepreneur Mark Logan.

The Stewart Review will identify the root causes of the continuing under-representation of women in enterprise and propose specific actions required to address the needs of female-led businesses in Scotland.

The Scottish Government is committed to responding to the recommendations of the review following publication, which is expected in early 2023.

Support for everyone through our TechScaler network

Our national TechScaler network will support more diverse founding teams while promoting diversity, inclusion and accessibility throughout the Scottish tech ecosystem.

The process for entry to TechScaler will have diversity and inclusion at its heart.

Applications by companies led by women and minorities, who are currently significantly under-represented among tech start-ups, will be prioritised in order to help remove the barriers to participation which people from under-represented groups often face.

These companies will also get extra support in recognition of the greater challenges they currently face in raising investment, and developing peer networks.

Access to TechScaler will be offered both online and offline to improve accessibility and to ensure people with different working patterns and caring responsibilities are able to participate.

Recruitment processes have been redesigned to be more inclusive, for example, application review processes are anonymous to prevent unconscious bias and job adverts changed to remove masculine-coded words.

CodeBase has partnered with Radiant and Brighter, an organisation that promotes diversity through education, inspiration and changing perceptions, to help ensure that diversity and inclusion is embedded in every aspect of TechScaler.

This includes plans to connect regional and national stakeholders, and connecting our ecosystem with international start-ups.

Next Steps

- Publication of the Ana Stewart review. The Scottish Government is committed to responding to the recommendations of the review once it has been published later this year.

- Strengthening TechScaler's role in building a diverse and inclusive tech ecosystem; including through supporting organisations working in this space.

5. Forward Look & Next Steps

As we continue to deliver the STER recommendations, our priorities include mobilising our national TechScaler network and ensuring we support communities, start-ups and businesses across our tech sector as much as possible.

Next, we will:

- Open the TechScaler network from November 2022 to all tech start-ups in Scotland
- Publish the Ana Stewart Review on Women's Entrepreneurship
- Deliver Computing Science teacher upskilling and recruitment initiatives
- Develop more investment vehicles to support entrepreneurship
- Deliver a new innovative way to embed entrepreneurship in colleges, and universities, through Entrepreneurial Campuses.
- Bring all of our work on entrepreneurship - as set out in STER, NSET and the forthcoming Stewart Review - together under a single national programme to establish Scotland as a leading Start-Up Nation

In keeping with this broader focus, our 10 year National Strategy for Economic Transformation also commits to eventually broadening out the support offered through our national TechScaler network to all start-ups in Scotland, regardless of sector or type of business.

In July 2022, Professor Mark Logan was appointed as Scotland's Chief Entrepreneur. Recruiting the right person into this post was a key commitment in the National Strategy for Economic Transformation in order to ensure entrepreneurship is embedded in our economy, and partnerships with industry and investors are prioritised and strengthened.

The Chief Entrepreneur will:

- Engage with Scotland's existing community of start-up founders, entrepreneurship programmes and small businesses to ensure that government policy and operational delivery meets the needs of businesses
- Ensure that entrepreneurship is embedded in the education and skills systems with clear routes established for entrepreneurs who want to set up a business
- Support increased diversity and inclusion in business start-up and scaling, and
- Embed an 'entrepreneurial-first' approach across the public sector.

Afterword – Mark Logan, STER author and Chief Entrepreneur

I'm particularly encouraged by two aspects of how key recommendations contained in STER are being implemented. The first is the collaborative partnership approach being adopted between government, education and industry stakeholders.

The second is the systems-oriented approach being applied, which recognises that we must both create the best possible environment for today's start-ups (for example through initiatives such as Ecosystem Fund and our TechScaler network), while also preparing for the longer term (for example, through our educational initiatives designed to improve the supply of talent into the ecosystem.)

These efforts bring together infrastructural, educational and funding components to create an enhanced platform for technical entrepreneurship in Scotland. Our opportunity now is to continue to build upon and extend that platform, providing a world-class environment for entrepreneurship in all its forms.

This work will continue through the delivery of the National Strategy for Economic Transformation, the implementation of the upcoming Stewart Review, and further initiatives currently in development under the auspices of the Chief Entrepreneur initiative.

For Scotland's people to thrive, we must create opportunity. In the current uncertain environment, that is more important than ever. Creating opportunity depends on people starting new things. We have a responsibility as a nation to create an outstanding environment in which to do so.

This report is an important milestone on our journey. It illustrates that such a goal is achievable when we work together with ambition, purpose and clarity. It's now time to move forward again, to make our next update just as compelling.

Glossary

Ecosystem

Within the STER report the tech ecosystem refers, in its widest sense, to a system that supports and nurtures technology businesses in Scotland, from the early start-up phase through to fully scaled maturity. Participants in that ecosystem include Government, start-ups, investors, universities, enterprise agencies, conferences, ecosystem builder and corporate companies.

Internet Economics & Silicon Valley Playbook

We use this term to characterise a certain approach to product development and management. It is characterised by a strong focus on speed of iteration within a business context, on organisational agility at all levels of scale, on a relentless pursuit of product-market fit, on the application of modern growth engineering techniques such as the exploitation of compounding growth mechanisms, and on a very high degree of data-driven experimentation, to highlight just a few examples. Another short-hand term that could be applied to summarise these practices is The Silicon Valley Playbook. The Silicon Valley Playbook, though many of these techniques originated in the tech sector, increasingly, high growth companies across all sectors are seeking to apply them to scale their businesses.

Tech Start-up

Start-ups are generally early-stage companies with growth potential that exhibit – or aspire to exhibit – certain attributes and characteristics common to successful tech start-ups internationally. These attributes are:

- Develops a product or service with a high degree of software engineering required to develop it.
- Aspires to operate according to Internet Economy methodologies (see definition of Internet Economics).

Scale-up

Scale-ups are companies that are further along the growth trajectory compared to early-stage start-ups and will have already experienced growth, with a commitment to continue on that growth-trajectory.

TechScaler

World-class incubation and developmental environments for high-growth internet economy start-ups. Tech-scalers will provide a mix of commercial education, physical co-location, peer learning, networking and the capacity for full virtual access to high-growth businesses all over Scotland.

Tipping-point

Technology ecosystems exist in one of two states. The ‘tipping-point’ is the point at which the ecosystem hosts a critical mass of viable start-ups and scale-ups attracting external talent and investment.

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