

# Making a Good Living

A 2030 Blueprint  
for Scotland



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# Foreword

## by Shonaig Macpherson

What might the global economy of 2030 in which Scotland aims to be successful look like?

In *2030: How Today's Biggest Trends Will Collide and Reshape the Future of Everything*<sup>1</sup> Mauro F. Guillén brings together a range of forecasts which highlight major changes, including:

- There will be more computers than human brains, more sensors than eyes, and more robotic arms than human labour in manufacturing.
- A majority of jobs will require the use of social skills and creativity.
- Half of all entrepreneurs may be in the senior age group, and nearly half of all new business ventures in the world will be launched by women.
- Nearly half of our spending will be in the form of “collaborative” or “shared” consumption, which will include cars, homes, offices, gadgets, and personal items of all types.
- Europe and the United States of America will be home to a smaller middle class and a more polarised society.
- The global economy will be driven by the non-Western consumer for the first time in modern history.
- South Asia and sub-Saharan Africa will be vying for the title of the world's most populous region.
- Almost 4 billion people – half of the world's projected population – will live in areas with serious water shortages, mostly in East Asia, South Asia,

and the Middle East, precisely where cities are growing fastest.

As COVID 19 tore around the world last year, it put a brake on progress in many areas and accelerated progress in some others. But it did not fundamentally alter these trends, profound changes which demand Scotland's attention.

What is now important is that we again begin to dream and plan for 2030 and the country that Scotland can be. How can we ensure that Scotland's economy grows to take advantage of developments in technology, whether for health or to achieve net zero? How can we ensure that our economy and society is resilient to future shocks? How can we build a more inclusive society which reduces the inequalities in Scotland?

While many of us will be keen to forget 2020 our collective experience has taught us a great deal about ourselves, our economy, our society and the interdependence and interconnection of the world we live in. We have a better understanding of what we value as individuals, businesses, social enterprises and in civic society. It is no longer acceptable to compartmentalise economic success, environmental sustainability, social cohesion and individual wellbeing in a world of increasing inequalities. We are all and will increasingly be mutually dependent. SCDI's Blueprint 2030 has proposals and recommendations to ensure that Scotland can thrive in world of 2030 by working together across sectors, geographies and interests.

1 Guillén, Mauro F., 2030, *How Today's Biggest Trends Will Collide and Reshape the Future of Everything*

Work began on our Blueprint in 2019. The passion and commitment of SCDI's members and partners shone through as we joined together in constructive discussion in challenging circumstances. The pandemic brought a heightened impetus and imperative to our work, determined to take bold steps to build a successful and resilient Scotland for 2030. As we all grappled with new ways of working, one benefit was the ability to engage with more of our members throughout Scotland as past investment in digital infrastructure and skills in organisations and nationally reaped unexpected dividends of allowing us to connect, listen and engage.

In our discussions, our members reflected on Scotland's strengths: its highly skilled people, its culture, abundant natural resources, award winning enterprises, cutting-edge research in both businesses and our leading education institutions, effective public services and a vibrant civic society. However, we also recognised the pressing imperative to grow our economy, address the transition to net zero and a truly digital society, deal with demographic challenges of an ageing population, embed resilience and tackle social and regional inequalities.

Our deliberations also took place against the backdrop of a policy environment brimming with Strategies and Plans from its governments which intend to tackle many of these issues. As we publish the Blueprint the Scottish Government elected in May 2021 plans to create a Council for Economic Transformation. The UK Government is establishing new hubs in Scotland to deliver new investment and initiatives. In preparing the Blueprint in that context, SCDI has identified 3 themes and 12 recommendations, informed by its membership, which it believes provides a focus for our collective efforts to build on Scotland's strengths and to ensure everyone can prosper by 2030.

Scotland must become a living lab for innovations which create economic growth while being socially and environmentally useful. Scotland has to provide opportunities and a culture which values learning throughout life. To foster economic growth and address inequalities, Scotland must be a healthy place to live and work, attracting and retaining investment, global business and highly skilled citizens. All of this will require partnership and stewardship from each of us,

for our communities at work and at home, locally and globally. SCDI stands ready to play its part.

Our principal proposal recommendations include:

- The creation of Innovation Neighbourhoods across Scotland to catalyse place-based net zero growth, including knowledge creation, scale ups, skills formation and local manufacture.
- The introduction of Skills Wallet, with a strong focus on digital, data and green skills, to enable life-long investment in skills and training by individuals and their employers.
- The creation of 20-minute neighbourhoods with infrastructure, jobs, services, active travel and green spaces for people to live, work and play locally, along with 500 remote working hubs in rural and urban areas with supporting entrepreneurial, innovation and collaboration networks and support services.

To drive progress with the Blueprint's themes and proposals, SCDI will continue to develop its Productivity Clubs which we have launched in partnership with Scottish Government. Our new International Business Committee will take forward support for our members to identify and grasp international trade opportunities, contributing to the creation of a living lab for innovations. For learning throughout life, SCDI's Young Engineers and Science Clubs will play a key role, including through our Future Voice initiative, which will bring together young peoples' ideas to address the three themes of our Blueprint. We plan to explore support for purpose-led businesses to accelerate their growth and sustainability, and to promote Scotland as a healthy place to live and work.

SCDI wants to work in partnership to deliver its recommendations. Those partnerships need to extend beyond governments to include all of SCDI's memberships and others with a shared belief in Scotland's future. We look forward to building new relationships in the coming years to bridge the gaps and build an inclusive, successful Scotland.

The creation of the Blueprint would not have been possible without the support and encouragement of SCDI's Blueprint partners, Openreach, Shepherd &

Wedderburn, Skills Development Scotland and Zero Waste Scotland, for which we are all grateful. Fraser of Allander Institute provided economic analysis which has informed our deliberations and which we greatly appreciate.

SCDI is nothing without its members. This Blueprint is the product of their collective determination to build a better Scotland through bringing their own voice, expertise and opinion to bear. The level of engagement has been extraordinary, particularly in the context of the last 15 months.

SCDI and its members hope that you will join with us to make our recommendations real and look forward to hearing from you as to how you can help us build a better Scotland.

**Shonaig Macpherson CBE FRSE**

President  
SCDI



3min  
7min  
15min

CAFFÈ NERO

Fraser Signs  
Inverness  
frasersigns.co.uk

Inverness Street Theatre Festival

PUBLIC TOILETS

aybc young  
TO LET  
ALL ENQUIRIES  
0131 226 2641

CAUTION  
AUTOMATIC BOLLARDS  
(RAISE & LOWER)  
IN OPERATION  
STOP  
WAIT FOR GREEN LIGHT  
BEFORE PROCEEDING  
DO NOT  
FOLLOW THE VEHICLE  
IN FRONT UNLESS THE  
GREEN LIGHT HAS BEEN GIVEN  
FAILURE TO COMPLY MAY RESULT  
IN DAMAGE TO YOUR VEHICLE

# Executive Summary and Main Recommendations

## Executive Summary

In our Blueprints, SCDI proposes our vision and 10-year economic strategy for Scotland. The Blueprint is founded on research and engagement with all sectors and regions of Scotland. SCDI has published two Blueprints on a 5-year cycle. The latest refresh started in mid-2019, was paused from the start of the COVID-19 pandemic and recommenced at the end of 2020.

[Read More in \*Developing Blueprint 2030\*, p.101](#) 

The Fraser of Allander Institute have set the scene for the strategy with commentary about the impact of the crisis on the Scottish economy and the challenges it will face in the years up to 2030. These key challenges include:

- Transition to net zero carbon emissions
- Slower growth in Scotland's population and an ageing society
- Impact of the pace of technological change on businesses, consumers and workers
- Slow growth rates and the need to improve Scotland's productivity
- Significant inequalities, many exacerbated by the COVID-19 crisis
- Determination of outcomes, priorities and the long-term framework for policy

[Read More on Fraser of Allander's Commentary](#)

[– \*Scotland's Starting Point\*, p.21](#) 

The overarching question we asked in our research was: "What should Scotland aim to be known for in the global economy of 2030?" We did so because Scotland is part of a rapidly changing and (despite reactions against it) still integrating global economy. How the world and Scotland respond to 'global megatrends' will be the main influence on Scotland's future. These include the shift in the centre of the world's economic gravity east and south, climate change, differentially ageing populations, inequality, Fourth Industrial Revolution technologies, and, potentially, more frequent pandemics with higher rates of excess mortality.

[Read More on Global Megatrends](#)

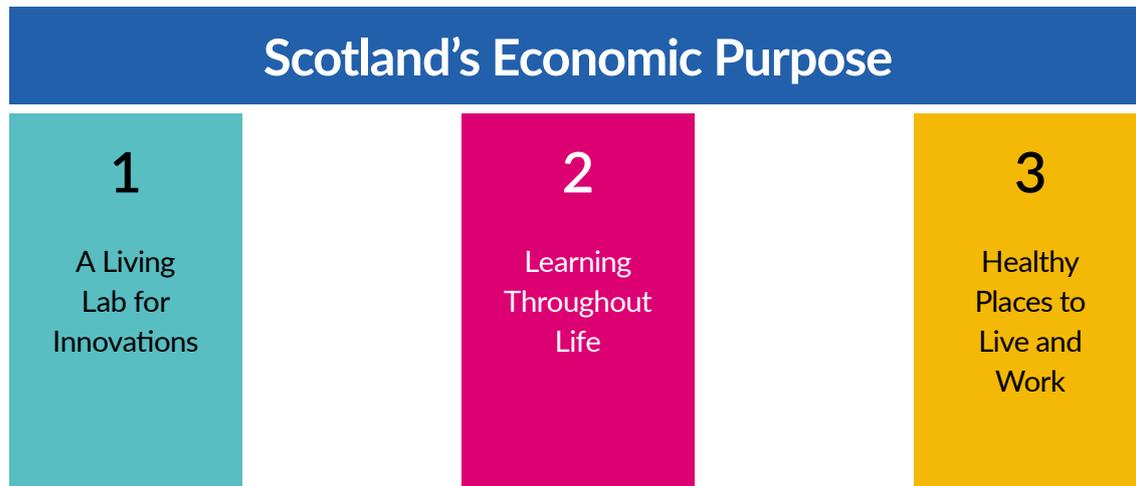
[– \*The Global Economy of 2030\*, p.19](#) 

We firmly believe Scotland should have an agenda for leadership, but, along with all but the largest countries, its ambitions must be focussed, build on its strengths and be achievable.

This Blueprint calls for a high-productivity, high-investment, high-innovation, high-skill model for the Scottish and UK economies, with increased levels of social protection and resilience with a net zero carbon footprint. Flourishing economies in 2030 will be those unlocking the capacity of their people for entrepreneurship and market creation with widely available, accessible and resilient economic, learning,

caring and sustainability infrastructures fit for the 21st century.

We describe our priorities, how Scotland is performing now, the opportunities and risks, and what needs to change for Scotland to make progress towards this model in four chapters:



Scotland's Economic Purpose is the introductory chapter. Our vision is of shared mission in which Scotland's economic success is driven by productive, purpose-led businesses and learning institutions which trade profitably on solving global and local challenges for people and the planet, and by resilient systems and networks of modern, high-quality public services, voluntary organisations, empowered people, and healthy places and natural environments.

A living lab for innovations is the focus of the first themed chapter. Our vision is of a Scotland where beneficial innovations are generated collaboratively in every place and sector by businesses, academia and government, investors and innovators come to Scotland for opportunities, innovations are swiftly scaled-up, more of the economic benefits are retained and fairly shared, and our solutions, such as in clean growth or health, are exported globally.

The second theme is learning throughout life. Our vision is of a Scotland which invests in, develops and fully harnesses the skills of people at all stages of their lives, raises leadership skills and fair work to the levels of the best, and scales up work-based learning with a focus on digital, green and meta-skills, including self-management, collaboration and innovation.

Healthy places to live and work is the third theme. Our vision is of a Scotland where our quality of life and work available in diverse and sustainable communities, easy access to nature and culture, successful revitalisation of city and town centres and rural areas, and good digital connectivity are unique selling points to retain, develop, and attract people and businesses.

The chapters of the Blueprint are full of recommendations which would improve Scotland. SCDI will continue to call for and develop the proposals over the next five years. However, we are prioritising 12 recommendations which have had widespread support in our discussions and which would make a positive impact across the fundamentals of our economic system. Standalone implementation of each of them would be to the benefit of Scotland, but, as they are mutually reinforcing, their implementation as a package would optimise their potential.





# 12 Recommendations for an Economic Enlightenment for Scotland

## Scotland's Economic Purpose

### 1. Scotland should aim to be a global hub for purposeful businesses that profitably solve the problems of people and planet.

Industry should work with the UK and Scottish governments to review current ownership, governance, regulation, taxation and investment frameworks for businesses, and recommend reforms that build on existing initiatives and incentivise and reward productive and purposeful growth, for example in areas like Ethical Finance, Artificial Intelligence (AI) and data, and clean growth.

[Read More on Purposeful Businesses](#)  
– *Scotland's Economic Purpose, p.30* 

### 2. Scotland should aim to establish a world-class 'Scottish model' for allied improvements in productivity and fair work, health and quality of life.

The Scottish Government should establish a Scottish Productivity and Wellbeing Commission as an independent statutory advisory body, for example on investments to strengthen the fundamentals of economic competitiveness and resilience, increase productivity and wellbeing (especially in low-income areas), and preventative spending.

[Read More on a Scottish Productivity and Wellbeing Commission](#) – *Scotland's Economic Purpose, p30* 

### 3. Scotland should increase the share of its economy that comes from exports from 20 to 25% through growth in free, fair and climate-friendly trade.

The UK and Scottish governments should work with industry to reduce and remove trade and investment barriers between the UK and key and emerging markets, unlock growth in low carbon and digital trade, and increase the capacity of Scottish businesses to inform and benefit from trade deals, for example by funding shared trade policy expertise.

[Read More on International Trade](#)  
– *Scotland's Economic Purpose, p.35* 

## A Living Lab for Innovations

### 4. Scotland should aim to be a leading location where globally critical net zero solutions are brought into being and capture fair shares of the benefits.

Governments at all levels, industry, finance, universities, colleges and innovation centres should attract and accelerate investment in leveraging strategic opportunities based on where Scotland's physical and knowledge assets offer comparative advantages and offer strong export prospects (such as the North Sea transition, Blue Economy and bioeconomy), and agree binding commitments to maximise the home-grown opportunities for Scotland's businesses, people and places.

The UK Government should ensure a rising price on UK carbon emissions and progressively introduce a World Trade Organization-compliant carbon border tax on imports, with revenues reinvested in the innovations, infrastructures and natural restorations needed to achieve net zero and accelerate opportunities for clean growth.

[Read More on Clean Growth](#)

– [A Living Lab for Innovations, p.60](#) 

[Read More on Carbon Pricing](#)

– [A Living Lab for Innovations, p.47](#) 

## **5. Scotland should drive its productivity and innovation performance through its foundational economy and SMEs, as well as industries of the future.**

The UK and Scottish governments, colleges and universities, and industry should expand the demand and supply of innovation for the foundational economy and small and medium-sized enterprises (SMEs), for example via Innovation Vouchers or new innovation incentives including challenge competitions, outcome-focused public procurement, Community Wealth Building, and management and technical skills development. These should deepen collaborations between businesses on business models, digital transformation and net zero.

The UK and Scottish governments, industry and universities, should increase spending on Research and Development (R&D) to 2.4% of GDP by 2027 to match the average for advanced economies then to 3% in the long-term. This should raise investment from blue skies to applied R&D, and level-up investments across the country.

[Read More on the Foundational Economy](#)

– [A Living Lab for Innovations, p.53](#) 

[Read More on Research & Innovation](#)

– [A Living Lab for Innovations, p.49](#) 

## **6. Scotland should create a new generation of innovation ecosystems, Innovation Neighbourhoods, to catalyse place-based net zero growth.**

The UK, Scottish and local governments, businesses and local anchor institutions including colleges and universities should design and incentivise Innovation Neighbourhoods to stimulate and scale-up knowledge

creation and diffusion, entrepreneurial and business collaboration, and skills formation across Scotland. These should link to place-based policies such as 20-minute neighbourhoods, Remote Working Hubs, ‘Repopulation Zones’, and circular economy exchanges and workshops.

Manufacturing Innovation Neighbourhoods should be created to capitalise on Industry 4.0 and 3D printing, net zero, the circular economy and ‘remakeries’, and the global focus on supply chain resilience, to strengthen, regenerate and modernise local productive capacity and increase investment in Scotland’s ‘industrial commons’.

[Read More on Innovation Neighbourhoods](#)

– [A Living Lab for Innovations, p.51](#) 

[Read More on Manufacturing Innovation Neighbourhoods](#)

– [A Living Lab for Innovations, p.59](#) 

## **Learning Throughout Life**

### **7. Scotland should transform its workplaces by closing its leadership skills gap with other countries and becoming a world leading fair work nation.**

The Scottish Government, employers, and colleges, universities and training providers should make a major push to raise leadership and management skills, including expansion of bitesize training, especially for SMEs and the third sector, for example on innovation processes, progressive working practices and organisational resilience. This should build on the existing activity of stakeholders in the leadership and management training space.

Employers, employees and the Scottish and UK governments should work in partnership on plans, backed by significant investment, to develop modern workplaces, including support for workplaces and workforces to adopt technologies to increase their productivity in accordance with fair work principles.

[Read More on Leadership and Management Skills](#)

– [Learning Throughout Life, p.77](#) 

[Read More on Fair Work”](#)

– [Learning Throughout Life, p.74](#) 

**8. Scotland should scale-up demand for and participation in work-based learning, with an immediate focus on digital, data and green skills.**

The Scottish Government should establish an ambitious, universal and flexible Upskilling & Life Lifelong Fund as part of a new Skills Wallet, enabling everyone to invest in education and training throughout their working lives, and supporting just technological and net zero economy transitions. The Scottish Government, Skills Development Scotland, learning providers and employers should build on the apprenticeship family, help more SMEs to take on apprentices and introduce new flexi-job apprenticeships.

[Read More on Work-based Learning](#)  
 – *Learning Throughout Life*, p.77 

**9. Scotland should transform content, delivery and investment in education and skills to meet the future needs of learners and the economy.**

The Scottish Government, education authorities, schools, colleges and universities, and digital firms should rapidly develop a new digital utilisation plan for education and training, including workforce skills, digital, data and technology infrastructures, and teaching models and learning, to harness opportunities to renew progress on excellence and equity in Scottish education. There should be access for all to social innovation, entrepreneurial and nature-based learning.

[Read More on Education, and Digital Learning and Teaching](#)  
 – *Learning Throughout Life*, p.81 

[Read More on Social Innovation and Entrepreneurship](#)  
 – *A Living Lab for Innovations*, p.52 

## Healthy Places to Live and Work

**10. Scotland should aim to be a fully digital and data-enabled society, with world-class, future-proofed, accessible and affordable coverage for all.**

The UK and Scottish governments and industry should accelerate the rollout and adoption of full fibre broadband, 4G and 5G networks, and smart technologies, in all of Scotland. Business and public services should plan now as to how they will harness digital and data technologies for economic growth,

social inclusion and climate action, for example in Innovation Neighbourhoods, advanced manufacturing, remote working hubs and ‘Repopulation Zones’.

[Read More on Digital Communications](#)  
 – *Healthy Places to Live And Work*, p.95 

**11. Scotland should build more sustainable homes of all tenures to meet the economic, demographic and environmental needs of every community.**

The Scottish Government, local government and industry should aim to build at least 25,000 homes each year, with a focus on affordable homes for workers and families in all communities and driving innovation in net zero homes and offsite construction. This should include delivery of rural housing, the conversion of vacant properties for city and town centre living, and designating ‘Repopulation Zones’ for sustainable development in areas facing an acute loss of people.

[Read More on Housing](#)  
 – *Healthy Places to Live And Work*, p.92 

**12. Scotland should work with communities and local organisations to renew the purpose of places to create prosperous, healthy, green and resilient economies, enabling people to live locally and work anywhere.**

The Scottish Government, local government and local partners should commit to the rapid delivery of 20-minute mixed economy neighbourhoods across at least 10 geographically and socioeconomically diverse locations, with the infrastructure, jobs, services, active travel and green spaces for people to live, work and play locally.

The Scottish Government, local government and industry should invest strategically in a network of 500 digitally enabled remote working hubs in rural and urban areas, that enable people to work productively in their communities and strengthen local entrepreneurial, innovation and collaboration networks.

[Read More on 20-minute neighbourhoods](#)  
 – *Healthy Places to Live and Work*, p.91   
[Read More on remote working hubs](#)  
 – *Learning Throughout Life*, p.75 

## Next Steps

This Blueprint makes clear and actionable proposals to unlock economic opportunities. To achieve these, we are committed to working in partnership with national and local governments, all of our members and all those who share our vision for Scotland's future.

SCDI will fulfil our role as a positive influence on policy-making, an integrator of organisations and actions across Scotland's economic system, and a leader of changes on the ground.

Following consultation, we will publish our proposals for primary accountable owners for each recommendation, highlighting those who should be closely involved in their design and development, with key milestones through which to track delivery towards target dates..

We believe that there are immediate opportunities to work with our governments to develop and implement them, such as the Scottish Government's planned 10-year National Strategy for Economic Transformation, and the UK Government's forthcoming Innovation Strategy and levelling up agenda. SCDI's regional committees are ready to work with their regional and local partners on the place-based recommendations that are priorities for their economies.

In addition to our main recommendations, governments should work with stakeholders to make urgent progress on:

- A digitalisation acceleration policy
- Addressing financial sustainability of tertiary education to retain its world-class reputation
- Completing the local governance review
- Recovery of Scotland's international connectivity
- Bringing forward a Circular Economy Bill to advance Scotland's ambitions

Aligned with this Blueprint, our Productivity Clubs, supported by the Scottish Government, will drive a business-led approach to five priority themes: digital transformation; leadership, strategy, purpose and wellbeing; net zero carbon and sustainability; innovation; and exporting.

Our new exporter-led International Business Committee will support Scottish businesses and organisations to tackle post-Brexit challenges and develop international trade opportunities.

SCDI also plans to review how to increase purpose-led businesses and improve the business environment for them so that they can unleash higher, inclusive and sustainable growth.

Through our 'Future Voice' initiative, led by SCDI's Young Engineers and Science Clubs (YESCs) programme and in partnership with Shepherd and Wedderburn, we have invited young people in Primary 7 classes and secondary schools across Scotland to create ideas about how Scotland can be a better place in 2030 and to present them to SCDI members at our Forum. We have asked them to take the Blueprint's themes and propose new policies for Scotland.

We will also develop our existing YESCs network to diversify and align its projects so that young people are equipped with the skills and attributes to be successful in and lead Scotland's progress towards learning throughout life, living labs for innovations and *healthy places to live and work*.

SCDI looks forward to strengthening existing and forging new partnerships to connect Scotland domestically and internationally, transform our economy, and build a Scotland which is globally known for its prosperity, inclusivity and capacity to solve the problems of our planet.

# The Global Economy in 2030

## – Megatrends



### FOURTH INDUSTRIAL REVOLUTION

- Productivity could grow by at least 2% annually, with 60% coming from digital opportunities
- 200bn devices and sensors will be connected to the Internet of Things
- AI adoption could raise global GDP by as much as \$13tn
- 15% of the global workforce, about 400m workers, could be displaced by automation
- A majority of jobs will require the use of social skills and creativity



### CONSUMER MARKETS

- Total middle-class consumption will grow by about 55 per cent
- The middle-class in emerging markets will outnumber those in the US, Europe and Japan by 5 to 1
- Nearly half of our spending will be “collaborative” or “shared” consumption



### POPULATION AND DEMOGRAPHICS

- South Asia or sub-Saharan Africa will be the most populous region and Europe will fall from 4<sup>th</sup> to 6<sup>th</sup>
- African agriculture will be a trillion-dollar sector
- The urban population will rise by almost 790m with 43 ‘megacities’ of over 10m people
- There will be have 400m more people over 60 years old, mostly in Europe, North America and China
- Japan, Italy, Spain and Portugal will have more citizens over the age of 50 than under it
- The average seventy-year-old will live like today’s average fifty-year-old
- Healthcare, home care, assisted living and other service industries will thrive



### GENDER

- More global wealth (55%) will be owned by women than men (up from 15% in 2000)
- The middle-class in emerging markets will outnumber those in the US, Europe and Japan by 5 to 1
- Nearly half of all new business ventures will be launched by women



### CLIMATE CHANGE

- Average global temperatures may have risen by 1.5°C



# Scotland's Starting Point

## Economic Context by Fraser of Allander Institute

### Introduction

As restrictions begin to ease in the Spring, we look ahead to a new future with hope that the vaccine programme will lead to a return to normality – albeit a new normal – at some point during 2021. With furlough schemes now in place into the Autumn, it is clear that the economy will continue to need as the recovery gets under way.

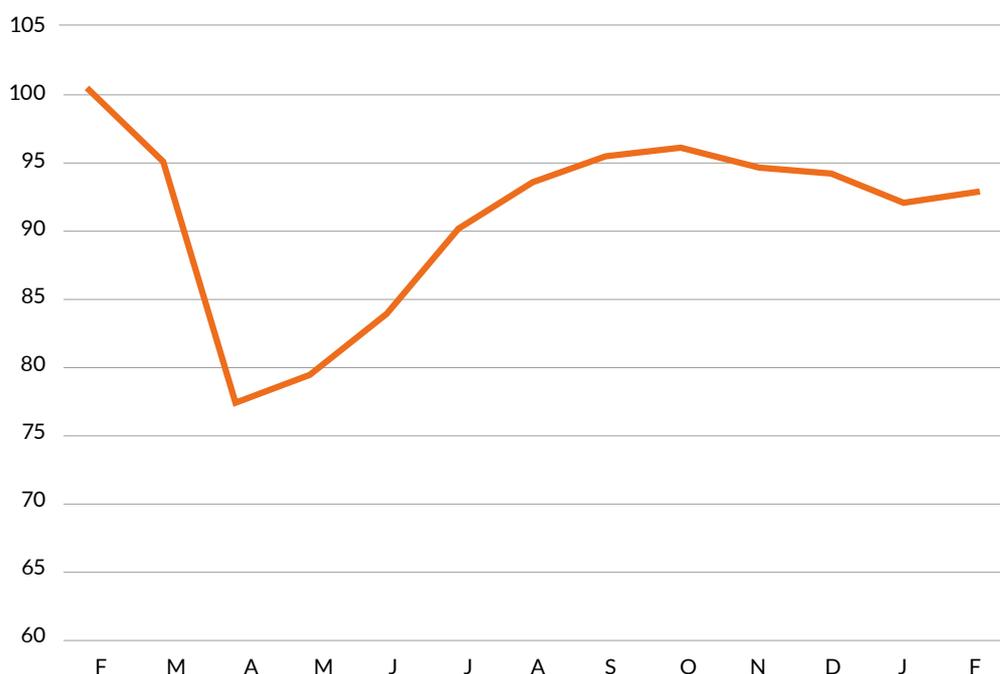
Of course, the forthcoming economic recovery could take many shapes, and policymakers in all levels in government will have a role in shaping the recovery.

### A tumultuous year

The Scottish economy has been through an unprecedented year: the contractions we have seen during lockdown periods are enormous by historical standards. After a fall in GDP of 23% between February and April, we saw rapid growth through the Summer as the economy opened back up. The recovery flattened off during the Autumn as restrictions were re-imposed, and a fall moving into January 2021 as we moved into the post-Christmas lockdown.

The expectations for early 2021 are for growth to

Chart 1: Scottish Monthly GDP, February 2020 –February 2021



Source: Scottish Government

return in the Spring as restrictions are able to be eased.

**The “K-Shaped” recovery to come?**

One of the features of this economic crisis has been the differential impacts on different sectors. Businesses which have been able to adapt quickly to do much of their business remotely have been much less harder hit, whereas those who rely on social spending and face to face interaction have been much more severely impacted.

may top out at around 6.5% during 2021.

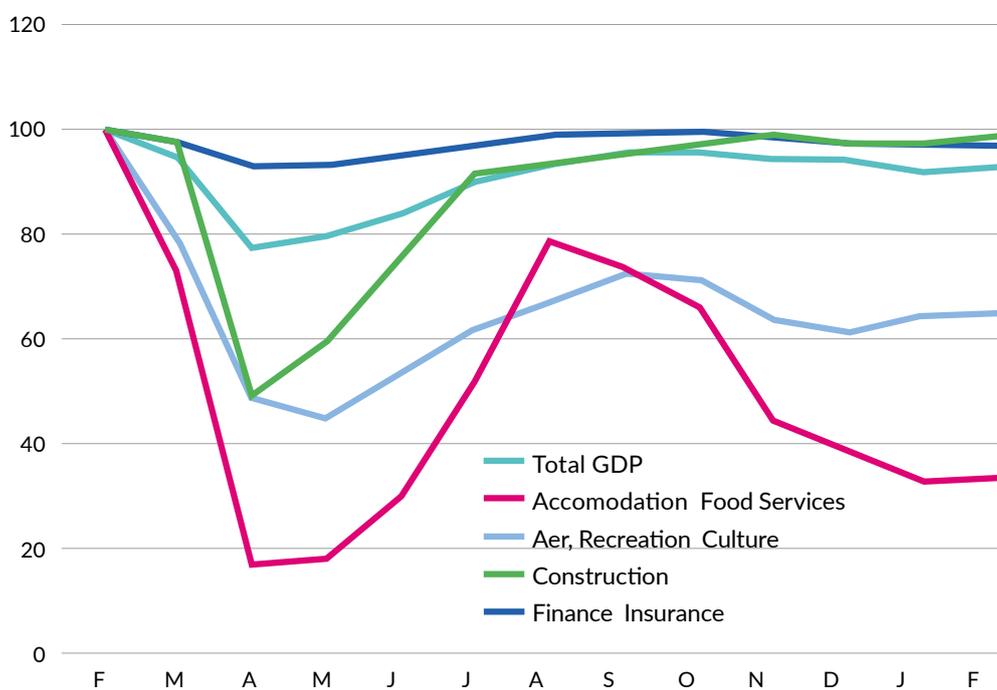
**Longer Term Challenges remain**

The crisis has not changed some of the key challenges that face the Scottish Economy; and in fact, many of them have been exacerbated. But the recovery also provides opportunities to consider these challenges afresh.

**Transition to net zero**

It is now widely accepted that the global economy

Chart 2: Sectoral GDP: February 2020 to February 2021



Source: Scottish Government

With restrictions likely to continue for some sectors for at least the first half of 2021, it is likely that this “twin-track” recovery will continue. Of particular concern are the impacts on the hospitality sector, which employs generally younger and lower paid workers.

Of course, Government policy interventions, in particular through the Job Retention Scheme, have protected millions of jobs throughout the period of the pandemic. Despite this, we know that thousands of jobs have been lost. Much of the impacts on employment are likely to manifest down the track as Government policy initiatives are rolled back. The Scottish Fiscal Commission and the Office for Budget Responsibility are both predicting that unemployment

needs to fundamentally change if climate change is to be tackled. The UK and Scottish Government’s commitments to net zero by 2050 and 2045 respectively is likely to require that the transformation of the economy is at the heart of economic recovery.

Firstly, it is clear that if Scotland (and the UK) are to meet their climate change ambitions, there will need to be a drive towards ever more renewable energy production. Significant progress has been made. In 2020, around 97 per cent of Scotland’s electricity demand was met from renewables – well above figures for the EU and UK. The digital transformations which have been accelerated during the COVID-19 pandemic have also highlighted the potential to harness technologies for a digital-led green transition.

For all of Scotland’s recent successes in renewables, we have much distance to travel. We lie bottom in the EU for renewable heat production, for example. And surface transport – road, aviation and shipping – is now an increasing source of emissions. With COP26 in Glasgow this Autumn, all eyes will be on Scotland and the nature of the green recovery.

### Demographic Change

Over the next few decades, Scotland’s population will grow more slowly than in the past, and it will age.

The population of Scotland is crucial to the sustainability and vibrancy of its economy. We can be pretty confident of what drives population change over the long-term. That is, rates of migration from overseas and within the UK; and natural change (i.e. births vs. deaths). The outlook for both of these looks challenging over the next 25 years.

Of course, an ageing population brings some challenges as more pressure is put on government budgets with a potentially shrinking tax base. Caring for those who are living increasingly longer, but often with some health issues, will fall on both the paid for care sector, and unpaid carers. Finding a way to better manage this future reality was part of the reason for the Independent Review of Adult Social Care<sup>3</sup>,

published earlier this year and the new government will face the challenge of implementing change.

### Technological change

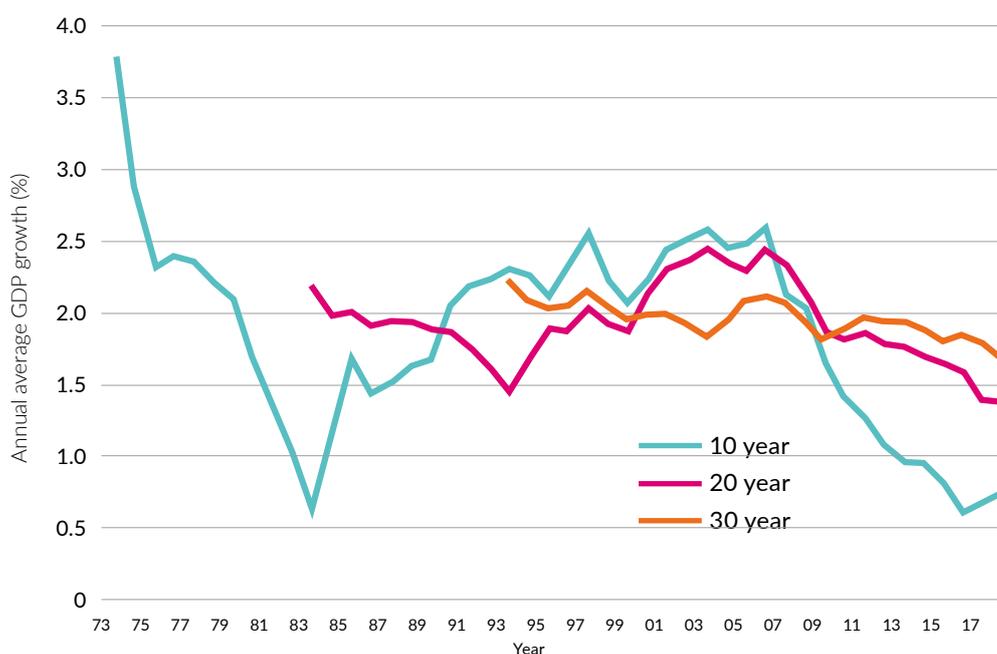
The pace of technological change is transforming the way in which businesses operate. It is also turning on its head how consumers shop and interact with each other. For many sectors, particularly those in the services industry, there is the potential that certain tasks may be automated in the future.

Our own modelling suggests that around 3 in 10 current jobs in Scotland contain tasks that have high potential to be automated. The digital adoption that we have seen in the wake of the pandemic has the potential to have long-lasting consequences for our economy.

### Economy and Growth Challenge

The above discussion highlights some of the particular structural changes that will impact our economy in the years to come. Many of these changes are already shaping both the pace and balance of growth in Scotland. After a period when most advanced economies grew at a steady pace – at around 2% per annum – growth rates have, over the past decade, slowed significantly. Chart 3. Add on top of this a major downturn as a result of this global pandemic

Chart 3: Average annual GDP growth, Scotland, 1973 – 2018



Source: Scottish Government

and it is not difficult to imagine that a world of limited economic growth will continue for the foreseeable future.

Of course, what lies behind this is productivity. It has been the aims of successive Governments in Scotland to improve Scotland’s international productivity ranking – but Scotland has remained stubbornly in the third quartile of OECD countries for productivity ranking.

The lack of improvement in productivity is a very complex policy problem. There are many drivers of productivity: including business and public sector investment, the openness of our economy, and investment in skills and training.

### Inequalities

Despite being a rich and prosperous economy, Scotland is home to significant inequalities, many of which will have been exacerbated by the economic crisis we are currently experiencing. The nature of the differential crisis and recovery to come mean we know that young people, women and the low paid are more likely to have been hit hardest.

Of course, deprivation in Scotland is not evenly spread geographically. For example, 30% of the most deprived datazones in Scotland are in Glasgow City. Chart 5.

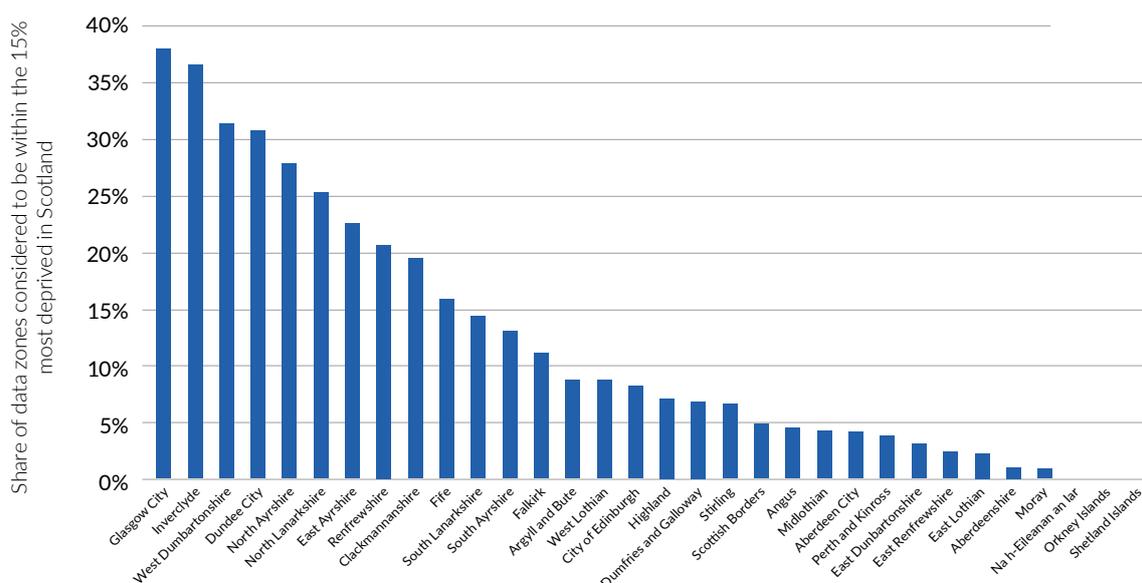
Even before the pandemic, 1 million people in Scotland were living in poverty in Scotland, which equates to 20% of the population: in addition, 25% of children in Scotland live in poverty.

### An evolving policy landscape

The economic policy landscape has continued to evolve in Scotland: the debate continues about what constitutes success for Scotland and what the main priorities should be.

Over the last 15 years, we have had the introduction of the National Performance Framework, with the National Outcomes and National Indicators, which introduced a different way of measuring success. We are also ten years on from the Christie Commission, which led to the concordat between SG and local government, and a call for a focus on preventative spend.

Chart 4: Percentage of the most deprived datazones in Scotland by local authority



Source: Scottish Government

In recent years, building on the wider measures of success debate, there has been an increasing focus on “Inclusive growth”: the idea that growth must benefit everyone more equally. In addition, the Climate Emergency has shot up the agenda – so that intergenerational equality should also be considered in the type of growth we encourage in the economy.

More recently, there has been a focus on “Wellbeing Economy”: that policy should be focussed in terms of human and ecological wellbeing, not simply economic growth.

It is fair to ask what these evolving approaches to policy making and prioritisations have actually meant in terms of policy initiatives and improving outcomes. The new Scottish Government will have significant statutory targets to meet in the next parliament for both Child Poverty and reductions in Carbon Emissions. The UK Government have also launched new initiatives to address regional inequalities across the UK, potentially spending in devolved areas which may cause inter-governmental tensions.

Whatever the long-term framework for policy making is though, it is likely that economic recovery will be the focus for the early part of this parliament. How much this will be done with “green” or more equal growth in mind remains to be seen.



# Scotland's Economic Purpose

## Planet, People, Profit

### What should Scotland aim to be known for in the global economy of 2030?

When we first started to put that question to people in organisations, in industries and places around our country a year and a half ago no-one had a global pandemic on their radar. The last year has taken a truly terrible toll and at times it has seemed that all has changed utterly.

After pausing work to focus on the COVID-19 pandemic, we found, however, on restarting these conversations at the end of last year that most of what we had heard before remained valid. The crisis had reinforced the case and broadened the coalition for the changes Scotland needs to make. It demanded not so much a different direction of travel, but an acceleration in pace. We have become a far more fully immersed digital society since the start of 2020 and it is urgent that we ensure that all the building blocks of our society, most of all its people, are digitally enabled.

We framed our question in the way we did because Scotland is part of a rapidly changing and (despite recent reactions against it) still integrating global economy. How the world responds to the global megatrends of the shift in the centre of its economic gravity east and south, climate change, differentially ageing populations, inequality, Fourth Industrial Revolution technologies, and, now, potentially more frequent pandemics, will be the main influence on

Scotland's future.

Projecting ourselves forward to 2030 also focuses thoughts on changes within Scottish society. A new cohort of young people will have entered and started to make progress in the world of work or launched their business, and become both active consumers and citizens in society alongside older generations. They will have brought their values and expectations into the Scottish economy and the places where they live. Some will have pursued opportunities elsewhere in the UK or in another country, just as their international peers will have chosen to develop their livelihoods here. However, another group of young Scots will – if actions are not taken – have become more deeply mired in a lifetime of poverty, exclusion and alienation.

We firmly believe Scotland should have an agenda for leadership, but, along with all but the largest countries, its ambitions must be focussed, build on its strengths and be achievable. A 10-year horizon is a realistic timescale over which to make the changes that this Blueprint calls for, but not so distant that Scotland does not need to start taking actions immediately.

## Scotland's Goals

### What should be our aim for all of Scotland's people by 2030?

Our conversations highlighted three themes as central to Scotland's future economic success:

- *A Living Lab For Innovations*
- *Learning Throughout Life; and*
- *Healthy Places To Live And Work.*

This Blueprint makes recommendations under each of these themes.

As our conversations have shown that there is a commonly shared conviction that accelerating an inclusive transition to net zero will shape Scotland over the next 10 years to 2030, and beyond. We believe that clean growth is not just possible on the path to net zero, it is essential. Clean growth, a just transition for workers and communities currently dependent on high carbon industries and net zero emissions must be mutually reinforcing or we will not have the economic, social and environmental outcomes we need.

Investing for change will also create opportunity and a flourishing private sector will be critical for Scotland's communities and the Scottish economy as a whole, creating prosperity, job opportunities and tax revenues for public investment and services. The impact of higher productivity is not limited to the profitability of businesses themselves, but would be an essential enabler of a wellbeing economy through higher wages and better working lives, and of the transition to net zero through a reduction in and an efficient use and reuse of resources. **The UK Government's Plan for Growth<sup>4</sup>, the new Scottish Government's planned 10-year National Strategy for Economic Transformation and government at all levels will need to have a deep and unwavering focus on creating the conditions for thriving businesses and entrepreneurship in every place in Scotland.**

The UK and Scottish governments have set ambitious climate change targets and with the international community gathering in Glasgow for COP26 later this year. Now is the time to follow-through this leadership and implement policies for net zero. The UK's Government The Ten Point Plan for a Green Industrial Revolution and the Scottish Government's Update to the Climate Change Plan both recognise the leadership role which many businesses are already playing and the integral role which all businesses will need to play, and commit to working with industry and

businesses to drive investment in skills, infrastructure and innovation.

Industry should prepare and implement decarbonisation transition plans, supported by governments, to identify and exploit their clean growth opportunities. They should enable, empower and reward behavioural change by consumers, and begin immediately to plan a just transition for workers and communities. The UK and Scottish governments should also set out the role of all public bodies, including regulators and local authorities. Net zero should be made explicit in the Scottish Public Finance Manual.

**Many other countries – all countries, it must be hoped – will also be on that same path to net zero by 2030. Scotland's ambitions for what it should be known for need to be more targeted, for example in knowledge and skills, specific technologies and infrastructures, or in land and water use, and nature restoration. For instance, the North Sea has the potential to lead the world in the transition from a hydrocarbon basin to a net zero basin, and the wider Blue Economy could generate innovation and inclusive growth in islands, coastal communities and cities around Scotland.**

Nevertheless, Scotland should not prioritise net zero to the exclusion of everything else. The global megatrends of growing and ageing populations, poor health, the impact of digitalisation and the Bio Revolution, and social inequality, are critical challenges and opportunities for Scotland too.

There is a need for a truly holistic view of where these megatrends relate to each other and to Scotland's ambitions to be a leader in areas such as productivity, wellbeing, learning and digital.

The UK is one of the most unequal developed countries as measured by the Gini coefficient. Regional inequality rose rapidly in the 1980s with deindustrialisation, technological change, globalisation, changes in bargaining power, and diverging property values, although it has been broadly unchanged since the early 1990s<sup>5</sup>. While regional inequality in Scotland

4 Build Back Better: our plan for growth – GOV.UK ([www.gov.uk](http://www.gov.uk))

5 The-IFS-Deaton-Review-launch\_final.pdf

is lower, at local levels the inequalities between the richest areas and former industrial and remote rural areas are as stark<sup>6</sup>. Low productivity and a lack of high-paying jobs distinguish low income regions<sup>7</sup>.

Since the Great Recession of 2008-2010, median real wages have not increased, there have been rising ‘deaths of despair’ (from suicide, drug overdoses and alcoholism) in middle age and – in contrast to every previous post-war generation – young people have been earning less than the generation before them.

There have been some improvements in relative poverty in the UK and Scotland since the late 1980s, but 1 in 4 children and 1 in 5 working people in Scotland still live in poverty<sup>8</sup>.

The COVID-19 crisis has exposed the inequalities in society between the high and low paid, employed and self-employed, pupils from better-off and poorer households, different ethnic groups, non-disabled and disabled people, and (on average) older and young generations<sup>9</sup>.

Wide inequalities harm individuals, and weaken communities and society, lowering long-term economic growth<sup>10</sup>. Immediate and underlying causes – such as low productivity and pay, and the education attainment gap – must be systemically tackled by the UK and Scottish governments and all parts of society.

**The road to recovery from the COVID-19 crisis must progress through solutions for an ageing society, healthier lives, homes and places, and just transitions for workers and communities for technological change and the journey to net zero.**

While it is too soon to be definitive and the dynamics are many and complex, countries which have fared relatively well in the pandemic had invested in their public health infrastructures and had a focus on public health improvements, have more purposeful and collective leaderships<sup>11</sup>, and have closer cooperation across the public, private and voluntary sectors. The pandemic has again shown the key role that informal economies play in times of stress<sup>12</sup>. As economic recoveries begin, those national and local economies which are more balanced, with more productive and diverse businesses, are expected to bounce back more quickly.

**Resilience of organisations, systems and governments will be vital in future. The lesson from recent history is that countries which have complementary mix of strong public sectors, productive businesses, active voluntary organisations and socially-beneficial informal economies<sup>13</sup> will be the most resilient.**

### Shared purpose, improving performance

Successful countries – just like successful organisations – have a clarity of purpose, a plan to achieve it backed by the resources required, and data with which to track progress and improve implementation, all of which they can explain clearly and in the right level of detail to people internally and externally. Building on recent reports including those by the Advisory Group on Economic Renewal<sup>14</sup>, Social Renewal Advisory Group<sup>15</sup>, and Infrastructure Commission for Scotland<sup>16</sup>, and on its Climate Change Plan 2018-2032<sup>17</sup>, the Scottish Government’s National Strategy for Economic Transformation should set a vision and plan for what

6 Scotland’s Relative Income | Fraser of Allander Institute

7 Catching up or falling behind? Geographical inequalities in the UK and how they have changed in recent years | Inequality: the IFS Deaton Review

8 Poverty in Scotland – Poverty & Inequality Commission

9 IFS-Deaton-Review-New-Year-Message.pdf

10 Wilkinson, R. G. & Pickett, K., *The Spirit Level: Why More Equal Societies Almost Always Do Better*

11 The Best Global Responses to COVID-19 Pandemic, 1 Year Later | Time

12 Lessons in resilience from extreme economies | The OECD Forum Network (oecd-forum.org)

13 Davies, R. *Extreme Economies, Survival, Failure, Future, Lessons From The World’s Limits*

14 Working towards economic recovery – gov.scot (www.gov.scot)

15 If not now, when? – Social Renewal Advisory Board report: January 2021 – gov.scot (www.gov.scot)

16 Infrastructure Commission for Scotland

17 Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update – gov.scot (www.gov.scot)

Scotland will be known for in the global economy of 2030.

Scotland's National Performance Framework, refreshed in 2019 and now incorporating the UN Sustainable Development Goals, provides a comprehensive lens through which Scotland's progress is tracked. It sets a purpose for Scotland which aims to create a more successful country for all through increased wellbeing, and sustainable and inclusive economic growth<sup>18</sup>.

**This dual focus on higher productivity and wellbeing is a fundamental one for 2030. Countries which can develop a virtuous cycle of improvements in productivity and wellbeing, and can successfully resolve any tensions between them, will be in a better position to be successful.**

**Countries such as Australia and New Zealand have established a Productivity Commission, an independent advisory body reporting to their governments which produce evidence-based, high-quality analysis and advice on ways to improve productivity. Scotland should adopt this approach and create a Scottish Productivity and Wellbeing Commission which performs the same role but with a clear remit across the dual aims of the National Performance Framework.**

In 2030, we believe that Scotland should be widely known as a force for good on our planet, with Scotland's governments, businesses and people embodying traits such as openness, justice and positivity about the future, and holding long-term and responsible perspectives.

**Inclusive economic growth is not only compatible with this future but it is, unambiguously, one of the key enablers of it. But this must be growth based on ideas, science and technology within the envelope of sustainable global consumption levels<sup>19</sup>. There is a need to harness the potential of all sections of society and geographies of Scotland and share prosperity.**

But there are just as significant measures of national

economic success which need to be developed into official economic statistics, and tracked and profiled alongside economic growth for a fuller, more future-focussed understanding of economic performance and policy.

In particular, the challenges of climate change, inequality and ageing populations will make Social Capital – the links, shared values and understandings in society that enable individuals and groups to trust each other and so work together – and Natural Capital even more significant. Social and Natural Capitals should be fully incorporated into Scotland's and the UK's national accounts. This will help us put our physical and financial capitals to better use.

Scotland's National Performance Framework is familiar to policy-makers, but it is more difficult for those outside government in Scotland, including businesses and the public, and those outside Scotland, to gain a strong sense from it what it is that Scotland is aiming to achieve and how it is currently performing. There are many indicators measuring progress in different ways and while some outcomes in Scotland are improving – and some are not – Scotland's relative performance compared to the best performing countries, which may be improving at a faster rate, is not immediately apparent. **A dashboard of Distance to Frontier scores (where 100 = the frontier and 0 = the lowest performance) for key aims would provide a clear and high-profile sense of Scotland's current performance and rate of progress in comparison with the best countries, and of where it is focussing its national endeavours to be among the best. This format should be adopted in the next refresh of the National Performance Framework, which will take place in 2023.**

Underlying the national outcomes, and supporting their delivery, Scotland also has a need to develop well-defined, real-time measures which supply information on and generate momentum in what is being achieved in specific policy areas, such as net zero and the return on investment on city region and growth deals, and what is happening at local levels. Better data for rural and remote areas and the islands is important because the geographic spread

18 National Performance Framework | National Performance Framework

19 Helm, D., *Net zero, How We Stop Causing Climate Change*

and diverse nature of different parts of the country can lead to data which superficially appears similar, but which is generated by very different underlying causes, in response to which different policy actions are required.

## Purposeful Businesses, Entrepreneurial State, Empowered People

Business As Usual in the private and public sectors will be incapable of rising to the scale of the challenges to deliver clean growth, and long-term investments in innovation, people and places. There is a need to focus on the purpose and structures of private, public and voluntary bodies, break down barriers between the sectors, and develop business models and partnerships which are best suited to the challenges and which will most empower people.

Many businesses are forces for good – from global businesses which scale-up innovative solutions quickly for customers around the world to micro businesses in their communities. They also recognise that the world is not on a sustainable path and many people in society are struggling, that this is not disconnected from actions by some businesses and that environmental degradations and social divisions will ultimately undermine the markets in which all businesses operate and hope to be successful. They know that there is a need to redefine and better harness the role of businesses in society<sup>20</sup>.

Major challenges, such as net zero, longer-term investment and fair work, are closely linked with reforms in corporate goals and cultures. Investors and businesses are increasingly committed to change, and work such as by The Purposeful Company Taskforce<sup>21</sup> and through The British Academy’s The Future of the Corporation programme<sup>22</sup>, have set out principles and recommendations.

The core principle is that businesses should profit from providing solutions for people and planet, with profits an essential and justified outcome rather than their sole business purpose.

Businesses with a clear purpose which balances their responsibilities to investors, employees, customers, suppliers, and society, deliver better value over the long-term for them all and are more resilient<sup>23</sup>. Employee motivation is higher and they are better able to attract and retain talent. Highly-engaged customers will choose to buy from them above their competitors. Partnerships with businesses which share the same values are closer and more enduring. They are more likely to attract long-term investment, including from the growing number of Environmental, Social and Governance (ESG) funds, and investors are more likely to support productivity-enhancing investments funded by external finance<sup>24</sup>.

The major ownership, corporate governance, regulation, taxation and investment levers in the ecosystem for businesses in Scotland are UK Government responsibilities. Building on its decision to make Taskforce on Climate-related Financial Disclosures mandatory across the economy by 2025, and linked to its ‘levelling up’ priority for prosperity across the UK, we believe that the UK Government should encourage a race to the top by businesses. This should include changes to applicable laws and regulations as well as reporting to set out how businesses should identify and measure their purposes<sup>25</sup>, encouraging investment in purposeful businesses, and working with sectors and businesses to help them increase the fairness of pay for their workforces. Government should shape markets for purposeful businesses with profitable solutions, including via business support, procurement and innovation challenge competitions.

Ownership is one area of long-term interest to the Scottish economy. Foreign-owned manufacturing in the UK is often substantially more productive than

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20 Business Roundtable – Opportunity Agenda  
 21 Microsoft Word – Feb 24\_TPC\_Policy Report Final\_weekend.docx  
 22 Future of the Corporation | The British Academy  
 23 Microsoft Word – Feb 24\_TPC\_Policy Report Final\_weekend.docx  
 24 Low interest rates, investment strategies and the productivity puzzle | Industrial Strategy Council  
 25 The Triple Bottom Line accounting framework

UK-owned manufacturing<sup>26</sup>. However, takeovers of businesses and a lack of corporate headquarters may negatively affect investment in innovation, higher value jobs and supply chains in Scotland, as well as removing leaders and future leaders from the Scottish economy and society.

Scotland has many responsible businesses, of all sizes, which make positive contributions to society and the environment, and a significant share of the UK’s ESG funds<sup>27</sup>. Scotland has the potential to be a global hub for purposeful business, in areas like ethical and sustainable finance, Artificial Intelligence and data, and clean growth (including clean energy generation, decarbonisation and biodiversity), and lead how its principles are turned into practices.

The Scottish Government – informed by work by the Enterprise and Skills Strategic Board, Fair Work Convention and the Advisory Group on Economic Recovery – have instigated welcome initiatives, such as the Scottish Business Pledge, to promote fair work, progressive business models, workplace innovation and collective bargaining<sup>28</sup>. The Scotland CAN B programme was established to help businesses measure and manage their social and environmental impacts<sup>29</sup>. However, Scotland’s key economic strategies have not explored the purpose of business in the 21st century and what this will mean for the evolution of current forms and patterns of ownership and governance.

**We believe that the Scottish Government should work with businesses to develop a positive framework for the future of business and its purpose in Scottish society.** This should release the potential of businesses to support the delivery of outcomes in the National Performance Framework and UN Sustainable Development Goals profitably, recommend what should be done to support allied improvements in business ownership models and governance, and facilitate mutually beneficial working relationships between businesses which share these values.

UK and Scottish government economic, social and environmental regulation should ensure that purposeful and responsible businesses can compete fairly and effectively with other businesses on a level playing field.

As with business, the role of the public sector as a whole in the economy should be recast. Government activity in the economy is traditionally viewed and measured as an expenditure to correct market failures rather than productive investment in a dynamic market economy. This is despite the key role of public investment in the high-risk R&D of, for example, many of the innovative technologies which businesses have combined and developed into innovative products, in innovative drugs and in energy innovation.

As the UK and Scottish governments implement mission-orientated approaches to innovation, they should articulate how public investment and services create value and how public bodies are planning to create and enable, alongside the private sector, greater wealth in the economy of the future by building the ‘four capitals’ of economic, social, human and natural capital<sup>30</sup>. This will focus all public bodies on this role, bring transparency to the value for money investment in our public services bring, and empower them to form collaborative partnerships with the private sector.

Scotland has excellent examples of governments, agencies, colleges and universities, industry and trade unions working purposefully and innovatively together to revitalise economic activity and jobs in response to a crisis and with a focus on specific assets, such as the Michelin Scotland Innovation Parc. Mobilisation has, however, been, generally, less effective around economic or export opportunities. This needs to change, for instance to achieve net zero, an R&D led productive economy and in post-Brexit trade policy.

Small countries are well-placed to agree their goals and execute them quickly. **The key people in Scotland can be gathered in one room, but Scotland is not yet taking advantage of this in every respect and,**

26 How to solve a puzzle like productivity | Industrial Strategy Council  
 27 Investing with Purpose: Scotland’s Global Capital Investment Plan (www.gov.scot)  
 28 fair-work-action-plan.pdf  
 29 About Scotland CAN B – Scotland CAN B  
 30 Mazzucato, M., *The Value of Everything, Making and Taking in the Global Economy*

**outside that room, early progress can sometimes become bogged down between institutions. There is a need for systemic thinking and joined up policy objectives across different directorates and agencies of governments, industries, not-for-profit organisations, and colleges and universities which can together develop the outcomes we seek in a policy area and connect these outcome with coordinated actions by all those who can influence them.**

Many of the opportunities in this Blueprint – to be a living lab for innovations and clean growth, connect people with lifelong learning and job opportunities, and create healthy and more resilient places to live and work – are catalysed at the place-based level in which local government is a key player. Local government would be at the heart of the design, development and delivery of proposals such as Innovation Neighbourhoods and 20-minute neighbourhoods. However, at present the ‘connectivity tissue’ for local economic development and regeneration is often weak at local and community levels, in terms of governance, funding and capacity. The Scottish Government and Convention of Scottish Local Authorities should complete the Local Governance Review,<sup>31</sup> and consult on a route map to strengthen local decision-making and strategy and delivery partnerships which drive innovation and inclusion. This should be joined-up with the roll out of Community Wealth Building and work with local anchor institutions, such as key businesses, colleges and universities, and public services, to capture and harness more economic benefits locally and support the growth of SMEs<sup>32</sup>.

All of this depends on empowering Scotland’s people in their jobs, lives and communities, and leadership roles. It is sometimes asked how people will find purpose without work if large swathes of jobs are automated. The COVID-19 pandemic has, however, writ large the vital importance of placing human capital at the core of organisations<sup>33</sup> and society in a

complex world. As this Blueprint shows, there need be no shortage of useful things for people to do for planet, people and profit. The task is to equip people with the skills, agency and support they will need for this programme for public works and service, and for purposeful businesses.

## Scotland’s economic and social model

This Blueprint calls for a high-productivity, high-investment, high-innovation, high-skill model for the Scottish and UK economies, with higher levels of social protection and resilience with a net zero carbon footprint. Flourishing economies in 2030 will be those unlocking the capacity of their people for entrepreneurship and market creation with widely available, accessible and resilient economic, learning, caring and sustainability infrastructures which are fit for the 21st century.

This will require higher levels of savings and investment, and creating economic conditions that enable the attraction of investment.

The UK’s budget deficit for the current fiscal year is forecast to rise to a peacetime high of 16.9% of GDP (£355bn). Headline debt will rise and remain above 100% of GDP. However, extremely low interest rates mean that the costs of servicing it are currently at historic lows<sup>34</sup>.

While borrowing rates are at historically low levels it is sensible to continue to borrow to invest in economic recovery and renewal. If budget deficits remain high and interest rates start to return towards more normal levels, for example if there is a sharper and more sustained rise in UK inflation than expected<sup>35</sup>, it is possible that interest payments on government debt may eventually rise rapidly<sup>36</sup><sup>37</sup>. Persistently high deficits would be more difficult to sustain if other countries are reducing their deficits.

31 Improving public services: Local Governance Review – gov.scot (www.gov.scot)

32 If not now, when? – Social Renewal Advisory Board report: January 2021 – gov.scot (www.gov.scot)

33 The social enterprise in a world disrupted | Deloitte Insights

34 CP 387 – Office for Budget Responsibility – Economic and fiscal outlook – March 2021 (obr.uk)

35 Inflation: a tiger by the tail? – speech by Andy Haldane | Bank of England

36 Fiscal Rules, OK? Managing the Public Finances After COVID-19 | Institute for Global Change

37 Ultra-low interest rates have huge consequences for the country and its citizens – Institute For Fiscal Studies – IFS

Younger and future generations will benefit from efficient, long-term investment, but it is not fair to fund all of the current investment required through future long-term debt. A balance need to be struck in borrowing to be repayed by future generations who will reap the benefits and current generations who are also contributing to the cause.

Scotland's ability to retain, grow and attract businesses, and retain and attract key workers, is absolutely pivotal in generating the rates of growth which will make its public finances sustainable and fund improvements in public services and spending. Scotland competes with other parts of the UK and other countries to attract investment and talent, and tax rates are one of the factors.

However, **the competitiveness of an economy is principally the result of its productivity and living standards, which is linked to the international competitiveness of its businesses and the ability of its employers to create and pay the wages of a wide supply of good quality jobs.** If tax rates are broadly similar, efficient investment to strengthen the pillars of economic competitiveness, like innovation, skills and infrastructure, is more important than the rates<sup>38</sup>.

**Countries such as the Nordic states invest efficiently to increase their productivity and living standards, and in preventative spending which addresses problems at an early stage rather than a late stage when the costs are more expensive and the consequences more severe.**

Many countries are facing difficulties because tax collection and government revenue generation is not keeping pace with government spending, which has risen – and will need to rise – to support individuals cope with global trends and meet challenges such as net zero. Digitalisation of the economy is altering the tax base and increasing the scope for avoidance<sup>39</sup>.

Tax revenues as a percentage of GDP in the UK are around the OECD average, but significantly below many other northern European countries<sup>40</sup>. Following Budget 2021, revenues will rise to 35% of GDP in 2025-26, the highest level since the late 1960s. Revenues raised from corporation tax are already around the OECD average<sup>41</sup> because the tax base has been widened over the last 10 years, and the planned increase in the corporation tax rate is projected to take revenues as a percentage of GDP to their highest level since the late 1980s<sup>42</sup>.

In Scotland, 31% of tax revenue is made up of devolved taxes and local property taxes (including assigned VAT revenue). The Scottish Parliament has used its powers to diverge from the UK on income and property taxes and make these moderately more progressive<sup>43</sup>. Scotland's local government has limited fiscal autonomy in comparison with other countries<sup>44</sup>.

To enable wealth-creating businesses to thrive, the UK and Scottish governments should ensure that the tax system in Scotland is efficient, fair and competitive. Alongside the UK Budget and the draft Scottish Budget, they should produce annual impact statements on what their proposals will mean for each of these themes. They should review tax rates in response to economic conditions and changes, as they have done during the COVID-19 crisis, but also in view of trends within society and the economy. Tax-payers should ensure that they are fully compliant and socially responsible with payments.

The independent Mirrlees Review made recommendations in 2011 for how the UK tax system could be reformed to increase people's welfare and improve long-term economic performance by tackling inefficiencies and complexities and by increasing fairness<sup>45</sup>. Its conclusions continue to be sound, but, 10 years since its publication, we believe that the UK Government should commission a full review

38 What is a "Competitive" Tax System? | READ online (oecd-ilibrary.org)

39 Combating international tax avoidance – OECD

40 Highlights brochure: Revenue Statistics (oecd.org)

41 Putting up corporation tax is a risk the chancellor may come to regret – Institute For Fiscal Studies – IFS

42 CP 387 – Office for Budget Responsibility – Economic and fiscal outlook – March 2021 (obr.uk)

43 Tax and devolution | The Institute for Government

44 Local Governance Review – public service governance: analysis of responses – gov.scot (www.gov.scot)

45 Tax by design – Institute For Fiscal Studies – IFS

of its own into tax structures and act upon the recommendations.

In general terms, we believe that, while UK tax revenues as a percentage of GDP should be broadly in line with OECD averages and Scottish tax rates must be broadly competitive with the rest of the UK's, there is scope for significant reforms in the UK and Scottish tax systems. The impact of reforms on long-term economic objectives should be fully and transparently evaluated before implementation:

- Increase taxes on carbon emissions and carbon embedded in products, including a carbon border tax – with actions to protect poorer members of society and rural areas
- Make existing taxes on wealth more progressive and prevent avoidance and evasion<sup>46</sup>
- More accurately reflect value generated in the UK in corporation tax through multilateral solutions to the challenges of digitalisation and tax avoidance<sup>47</sup>
- Improve work incentives, especially for people on low and middle incomes, parents of school age, people around pension age, and people with more than one job
- Reduce the differences in tax rates between earned and unearned income

Most importantly, higher tax revenues should be invested efficiently to strengthen the fundamentals of Scotland's economic competitiveness and – 10 years after the 'Christie' Commission On The Future Delivery Of Public Services<sup>48</sup> called for it – make a decisive shift to preventative spending which produces better outcomes for people, planet and the economy.

The overall size of the public sector has grown (while most other sectors have significantly declined) and delivery models have been changed in response to the COVID-19 pandemic. Government will need to be more innovative to meet the scale and complexity of the economic, social and environmental challenges ahead, and to take advantage of the opportunities for it of the technological revolution. Despite steps in the right direction the pace of digitisation of many public

services has been slow.

**Scotland should develop and implement positive plans for modern, high quality public services, supported by reforms which increase their productivity, innovation levels and responsiveness to citizens, setting out how they will progressively transform themselves, particularly around enabling infrastructures and skills such as AI, data and digital. Procurement budgets should include ring-fenced funding to stimulate innovative solutions with new approaches to procuring innovation badly needed.**

The Scottish Productivity and Wellbeing Commission should provide analysis, advice and monitoring for these plans.

## International Trade

If Scotland's ambition is to profitably solve the problems of planet and people, we need to be in the business of hosting the living labs for the innovations which will offer these solutions and of increasing our low carbon tangible and intangible exports to markets around the world.

The mutual benefits of trading in an open and connected European economy has benefited thousands of businesses and jobs in Scotland and the consumers who have enjoyed lower prices and more choices. While the EU-UK Trade and Cooperation TCA has been independently forecast to reduce the costs to the UK economy of leaving the EU by about a one-third compared with a no-deal scenario, exports of value added are still expected to fall by nearly 5.5% of relative to a pre-Brexit forecast<sup>49</sup>. Friction at the border has added additional costs, threatening the viability of exporting to the EU for some businesses. The UK Government and the EU must work together to solve the serious trading problems which have emerged, for example for exports of seafood, and ensure that future disruption is minimised before any transition arrangements are ended. A UK/ EU veterinary agreement would resolve many of

46 Wealth Tax Commission (ukwealth.tax)

47 OECD Secretary-General Tax Report to G20 Finance Ministers and Central Bank Governors (Italy, February 2021)

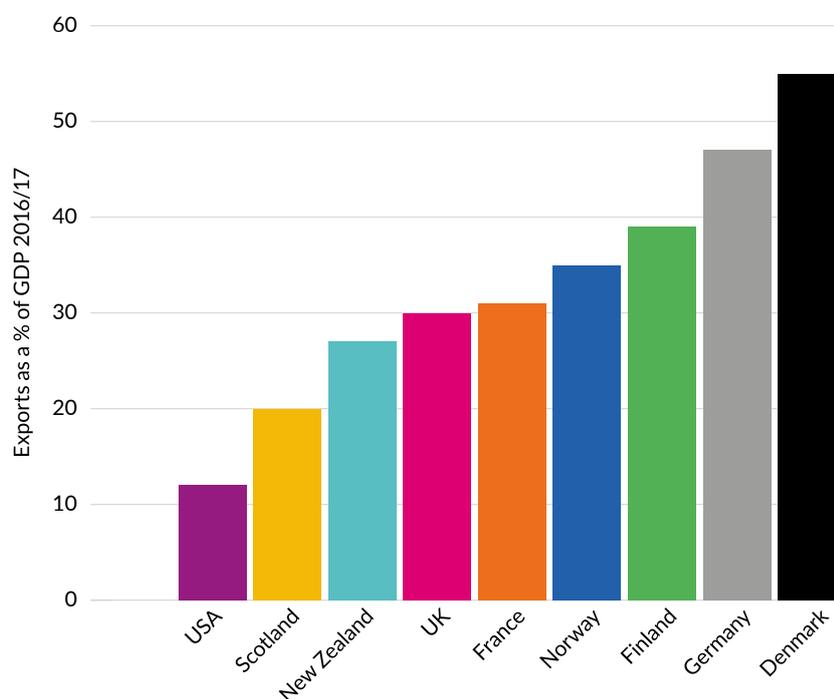
48 Christie Commission on the future delivery of public services – gov.scot (www.gov.scot)

49 The Costs of Brexit « UK Trade Policy Observatory (sussex.ac.uk)

these issues.<sup>50</sup> Critically, forthcoming negotiations must urgently address gaps in the Agreement to support trade in services. Working through the Joint Partnership Council and subsidiary bodies, the UK should also ensure that difficulties arising in the implementation of the TCA are addressed quickly, while both the UK and Scottish Governments must ensure that Scottish export sectors are not caught up in cross-sectoral retaliation or rebalancing measures under the TCA.

remain uncertain, and existing exporters will need assistance to re-establish market access and potential exporters will need extra assistance to start to take advantage of the new opportunities which exist. The UK and Scottish governments need to implement their plans to support growth in private sector exports in partnership with industry and ensure that these are joined-up. E-commerce has become an even more important export channel and upskilling businesses should be a priority.

Chart 5: Exports as a % of GDP – Scotland, UK and Selected Countries



Sources: UK Government, Scottish Government

Following the deal, the UK will operate an independent trade policy for the first time in 50 years. We welcome the UK Government’s commitment to strike new Free Trade Agreements and expand opportunities in the global growth of digital trade, services trade and green trade<sup>51</sup>.

Businesses which export are more productive on average and exports support high wage paying sectors<sup>52</sup>. The COVID-19 pandemic has affected the operations of exporters, supply chains and export markets. While economies will recover conditions will

**Scotland – and the UK – can learn from exemplar countries like New Zealand where there is a collaborative approach between government and industry on exports. Their roles may be different, but they combine to unlock trade barriers, and both accurately and successfully represent their shared national and commercial goals internationally. Scottish and UK governments and industries, involving public agencies and regulators as the need demands, should adopt models of agile, solutions-orientated partnerships which rapidly tackle emerging opportunities and challenges. For this**

50 The EU has a number of such agreements with a range of trading partners, such as Canada, New Zealand and the United States: [https://ec.europa.eu/food/safety/international\\_affairs/agreements\\_en](https://ec.europa.eu/food/safety/international_affairs/agreements_en)

51 Board of Trade report: global Britain, local jobs – GOV.UK ([www.gov.uk](http://www.gov.uk))

52 How does trade support jobs in the UK? | FAI ([fraserofallander.org](http://fraserofallander.org))

**to happen, Ministers in both governments need to engage actively and openly with industry in strategic conversations around issues and goals.**

The UK and Scottish governments should join-up their trade and climate change policies to capitalise on the export opportunities from leadership in clean growth. This is estimated to be worth up to £170bn a year by 2030<sup>53</sup>. New Free Trade Agreements should include climate commitments and facilitate trade in low-carbon goods and services<sup>54</sup>. We support a UK carbon border tax and the reinvestment of its revenues in innovative net zero technologies, infrastructures and nature-based solutions, all of which can be exported. This should be designed to be compatible with World Trade Organisation rules and the UK Government should start talks with the EU, US and other potential partners with the objective of reaching agreement on an international system. We welcome the principles of inclusive growth, wellbeing, sustainability and net zero in the Scottish Government’s Vision for Trade<sup>55</sup>.

The UK plans to re-orientate its international trading relationships to prioritise high-growth emerging markets. There will be a strong focus on the Indo-Pacific region because 65% of the world’s 5.4bn middle class consumers are expected to be in Asia by 2030<sup>56</sup>. Sub-Saharan Africa will also be high-growth region and by 2030 may be the world’s most populous<sup>57</sup>. It will have a burgeoning middle class and environmental, social and economic needs, such as food and water, agri-tech, education, health, digital, energy and infrastructure. There will be a need to reprofile the overseas footprints of the Department for International Trade and Scottish Development International (SDI). Although well represented in Asia, of SDI’s more than 30 offices, only one is currently in Africa and one in Latin America. Trade policy as well as trade promotion is a long-term game and needs to be guided by a long term strategy and delivered

consistently over time. To take one example, the UK Government’s GREAT programme was launched in 2012 and, for some sectors, has taken some years to bed in and deliver meaningful benefits. While the Scottish Government’s Vision for Trade, and the export and investment plans that underlie it, should flex in order to take into account new market opportunities, Scotland’s overall trade strategy should be consistent over time if it is to be effective.

Should trade with the EU decline as has been forecast and as the UK negotiates Free Trade Agreements (FTAs) with a range of less familiar markets, government and industry in Scotland will need to increase their capacity to influence and benefit from trade policy, including existing preferential trade agreements. As well as addressing tariffs, comprehensive FTAs deal with non-tariff issues which require engagement between government and many stakeholders before negotiations begin in order to identify priorities and defensive ‘red lines’<sup>58</sup>. Meanwhile everyday market access work is a highly technical, often long-term process that requires significant expertise. With the Scottish Government’s Vision for Trade, and exports and investment plans, in place, there is a need to clearly identify where and how FTAs and other trade policy interventions will help to deliver their overall and sector-specific priorities.

Scotland currently lacks government, academic and commercial expertise in trade policy. **The Scottish Government should establish a Scottish Trade Policy Observatory linked with economics and international relations research excellence which, like the UK Trade Policy Observatory, is an independent expert group which analyses trade policy, taking a long-term perspective, and offer training to policy-makers and others. The Scottish and UK governments and industry should jointly fund shared commercial policy**

53 Board of Trade report: global Britain, local jobs – GOV.UK (www.gov.uk)

54 The UK must develop a cross-cutting strategy for trade and climate policy in order to become a world leader in both « UK Trade Policy Observatory (sussex.ac.uk)

55 The Scottish Government Vision for Trade – gov.scot (www.gov.scot)

56 Board of Trade report: global Britain, local jobs – GOV.UK (www.gov.uk)

57 Guillén, Mauro F., 2030, *How Today’s Biggest Trends Will Collide and Reshape the Future of Everything*

58 The UK-Japan Comprehensive Economic Partnership Agreement: Lessons for the UK’s future trade agreements « UK Trade Policy Observatory (sussex.ac.uk)

### expertise in trade associations in Scotland which businesses can access<sup>59</sup>.

The Scottish Government, its agencies and overseas hubs should work pragmatically with UK and international partners to secure improved market access for Scottish exporters. Although the UK is no longer an EU Member State, there are opportunities to work with the EU on shared market access goals in third countries. The Scottish Government's Scotland House Brussels office should, therefore, have as one of its core functions liaison with relevant European Commission Directorates-General, including but not limited to DG TRADE and DG AGRI, and with the UK Mission to the EU.

We welcome plans to scale up, connect and mobilise more effectively the GlobalScot network of senior international business leaders who are Scottish or have an affinity with Scotland. In the UK's new trading environment, the insights, advice and introductions it offers to the Scottish Government, businesses and non-private organisations need to be both more strategic and more proactive. The outcomes it achieves also need to be more tangible and visible to encourage more Scottish exporters and non-exporters to engage with the network.

Scotland has many non-private organisations, including universities and colleges, public bodies, Third Sector and charities which export. Some carry out this work directly, some establish in-country partnerships and others establish wholly-owned subsidiaries. Other than in the education sector, they are not a focus for the Scottish Government's export plan<sup>60</sup>.

These organisations are in a strong position to support and encourage exporting in their supply chains and can provide support and assistance to private companies in markets and countries. They have often developed social capital in the countries in which they work, particularly those who contract with foreign

governments. Such social capital can assist Scotland's international relations, and businesses in winning more traditional commercial contracts, particularly for purposeful businesses which demonstrate the same values. The Scottish Government should create the focus for, and enable and encourage non-private bodies to grow their exports.

### Constitutional issues and improving policy-making

With powers being repatriated from the EU to the UK and Scottish parliaments, this reinforces an existing need to refresh their policy-making processes, procedures and practices.

In the current and any future constitutional arrangements, it is essential that the UK and Scottish governments work together collaboratively and consultatively not competitively. This includes the forthcoming joint review of the Fiscal Framework for the Scottish Parliament, the Shared Prosperity Fund which will replace EU Structural Funds and the UK Internal Market Act. The complex challenges of economic and social recovery and renewal and net zero will require collaborative partnerships between all governments, purposeful businesses and civil society. While UK consultative structures are still settling down, the ideas set out by the Scottish Government in 2018 on how devolved institutions can best participate in trade negotiations would be worth revisiting<sup>61</sup>. These would need to go further in scope, to include other trade policy fields, such as market access, disputes and trade defence, while taking a realistic view on the capacity constraints that exist in the light of experience elsewhere, such as Canada and Australia<sup>62</sup>.

In the Scottish Parliament, there is a need to ensure that decisions are reached following thorough evidence-based assessments and consultations with stakeholders, particularly in relation to the Scottish Budget and budget negotiations, the Programme

59 An example of successful partnership working in a different context is the overseas network of SDI food and drink specialists, part-funded by industry through Scotland Food and Drink. A similar model could enable Scottish exporters to understand and engage effectively in trade negotiations and market access more generally.

60 <https://www.gov.scot/publications/scotland-a-trading-nation/>

61 <https://www.gov.scot/binaries/content/documents/govscot/publications/corporate-report/2018/08/scotlands-role-development-future-uk-trade-arrangements/documents/00539758-pdf/00539758-pdf/govscot%3Adocument/00539758.pdf>

62 See, for example, <http://irpp.org/wp-content/uploads/2018/10/Federalism-and-International-Trade-Policy-The-Canadian-Provinces-in-Comparative-Perspective.pdf>

for Government, and amendments to legislation at committee and full parliamentary stages. The Scottish Budget 2021 presents a positive model for the future. To equip the Scottish Parliament for the challenges of its third decade, this suggests a need for a joined-up framework for assessments which returns to the original consultative approach envisaged for its policy-making.

All policies and spend should be subject to a genuine requirement for post-implementation evaluation, and policies which do not work should be thoroughly reviewed to ensure that any lessons are identified, shared and learned to improve future policy-making. Alongside existing impact assessments there should be a prosperity impact assessment for new policies.

Decentralisation of some powers to regional or local levels is a direction of travel which, in the main, our consultations show is supported but which should not be presumed. There are opportunities for better linkages across our themes of a living lab for innovations, learning throughout life and *healthy places to live and work*. But there is concern that this should happen in a coherent, rather than a piecemeal, way. There is a need for a strategy which is properly informed by dialogue with stakeholders and allows all those affected to plan for any changes. The Scottish Government and local government should progress exploration of the proposed Fiscal Framework for local government to help define its future functions and financing.

## Main Recommendations

### **1. Scotland should aim to be a global hub for purposeful businesses that profitably solve the problems of people and planet.**

Industry should work with the UK and Scottish governments to review current ownership, governance, regulation, taxation and investment frameworks for businesses, and recommend reforms that build on existing initiatives and incentivise and reward productive, purposeful growth, for example in areas like Ethical Finance, Artificial Intelligence (AI) and data, and clean growth.

### **2. Scotland should aim to establish a world-class ‘Scottish model’ for allied improvements in productivity and fair work, health and quality of life.**

The Scottish Government should establish a Scottish Productivity and Wellbeing Commission as an independent statutory advisory body, for example on investments to strengthen the fundamentals of economic competitiveness and resilience, increase productivity and wellbeing (especially in low-income areas), and preventative spending.

### **3. Scotland should increase the share of its economy that comes from exports from 20 to 25% through growth in free, fair and climate-friendly trade.**

The UK and Scottish governments should work with industry to reduce and remove trade and investment barriers between the UK and key and emerging markets, unlock growth in low carbon and digital trade, and increase the capacity of Scottish businesses to inform and benefit from trade deals, for example by funding shared trade policy expertise.



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# A Living Lab for Innovation

## Background

### What is this priority?

Scotland has the skills, capability, natural resources and opportunity to capitalise on the current disruptive transformation of how we live, work and travel. To realise the opportunity, Scotland will have to drive innovation, entrepreneurial growth, and supply chain diversification, expand and build on our extensive skills base, and create a living lab within Scotland.

The agricultural and industrial revolutions which have, over the last 250 years, led to unprecedented rises in the world’s population, economic growth and standards of living started in the UK. Many of the technologies were invented in Scotland and it has been at the forefront of the industries which have powered the expansion of production, provided raw materials for products that people and businesses need daily, and fuelled modern societies and lifestyles.

The transition to a global economy based on sustainable development and prosperity for all is the key challenge of the 21st century<sup>63</sup>, and Scotland has a responsibility and opportunities to show leadership. This has been described as “the only growth story of the 21st century”.

Over the next 10 years there will be seismic changes in the world’s demography, economy, technology, and environment. The world of 2030 will be very different from the world of today.

Scotland can be a Living Lab<sup>64</sup> for the transition to an economy which profitably solves the problems of people and planet – creating a wellbeing economy and a sustainable society.

The next 10 years will be shaped by the interface between the transition to net zero and a complexity and combination of new technologies. These include Artificial Intelligence, robotics, the Internet of Things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, materials science, energy storage, quantum computing<sup>65</sup>, FinTech, space tech, climate tech, clean tech and health innovations.

Businesses will need to experiment, test, develop and deploy innovations in real world environments. Places which offer innovative and enabling ecosystems will be highly attractive.

Scotland has many strengths and strategic assets which can be harnessed, including its highly-skilled people, universities, colleges, NHS, innovative businesses and entrepreneurs. It has a range of places and geographies in which innovations can be tested

63 <https://sustainabledevelopment.un.org/?menu=1300>

64 “Living Labs are defined as user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings” About us – European Network of Living Labs European Network of Living Labs (enoll.org) . We use the term more loosely.

65 The Fourth Industrial Revolution: what it means and how to respond | World Economic Forum (weforum.org)

– on land, on, in or under water or in the air – and natural resources which are advantageous for clean growth. The potential to address its significant real-world healthcare challenges are also a key area of interest for the life sciences sector.

Scotland has relatively high levels of public trust which make it more open to innovation. These levels of trust will need to be maintained by purposeful businesses and responsible innovation. Innovation should be in the public interest – creating opportunities for people to work in high-quality jobs and live in healthy places, providing excellent care and education, and improving the environment for future generations.

Becoming a living lab will require a system-wide approach, with actions across investment, regulation, research and innovation, and entrepreneurship. Key missions and opportunities for innovation will need to be identified and pursued collaboratively. Scotland will need to nurture the creativity and innovation of organisations and businesses of all sizes and sectors, and people of all ages and backgrounds.

No part of Scotland should be left behind. Industrial and former industrial areas, and rural and island communities, public and private, have untapped potential for innovation – unleashing it would help to address their social challenges and charge up national inclusive growth. The digital and physical infrastructures living labs need will have to be available everywhere.

Our vision is of beneficial innovation taking place in every part of Scotland – with engaged and empowered people, businesses and organisations, the most positive innovations swiftly scaled-up across the country, more of the economic benefits retained and fairly shared here, and exports of our solutions to markets around the world.

## How is Scotland performing now?

Scotland has an international reputation for excellence in research and science, but some way to go before it can be recognised as a world-leading entrepreneurial and innovative nation.

Scotland has an innovation infrastructure including universities and colleges, research institutes, Research and Technology Organisations (RTOs), innovation initiatives, and innovation and technology incubators. Five of the top 250 ranked universities in the world are in Scotland<sup>66</sup>. Scotland's share of citations in the world's top 1% most cited publications is one of the highest of comparator countries<sup>67</sup>.

**However, Scotland had the lowest percentage of innovation-active businesses in the UK in 2016-18 – 33% of businesses were innovation-active compared with 39% in England. This was a fall from 45% of Scottish businesses in 2014-16, the largest percentage drop in the UK<sup>68</sup>.**

The proportions of innovation-active Scottish businesses fell across all forms – product, process and wider innovation. The percentage investing in both computer software and training was lowest in the UK<sup>69</sup>. Innovation activity by both large and small businesses fell. Businesses in the life sciences sector were most likely to be innovation-active and those in tourism and construction were least likely<sup>70</sup>. The biggest barriers to innovation for Scottish businesses were the cost of finance, availability of finance, and the direct cost of innovation<sup>71</sup>. The relatively low number of businesses which export may mean that there is less competitive pressure to innovate and lower exposure to international peers from which they can learn.

Scotland's spend on R&D has increased in the past decade to 1.65% of GDP but its total spend on R&D lags behind the UK and other leading OECD countries<sup>72</sup>. The UK's figures, although higher at 1.71%

66 World University Rankings 2020 | Times Higher Education (THE)

67 Publications | The Scottish Science Advisory Council

68 UK Innovation Survey 2019 – Results for Scotland

69 UK Innovation Survey 2019 Main Report (publishing.service.gov.uk)

70 UK Innovation Survey 2019 – Results for Scotland

71 UK Innovation Survey 2019 Main Report (publishing.service.gov.uk)

72 National Indicator Performance | National Performance Framework

of GDP, are inflated by the high levels in the ‘Golden Triangle’ of Cambridge, London and Oxford.

Scotland’s higher education spending as a percentage of GDP was the 7th highest in the OECD in 2017 and the highest proportion of total spending on R&D of any OECD country. Business spending on R&D has been increasing, but as a percentage of GDP it is still in the third quartile in the OECD. In 2017, five businesses accounted for more than one third of Scottish R&D expenditure. Business spending on R&D in innovative sectors was lower than in the UK<sup>73</sup>, and needs urgently to be addressed.

The diffusion of innovation (how quickly and widely existing and new ideas and technologies spread through the economy) is especially weak in the UK and Scotland. The UK is in the Top 5 on the Global Innovation Index<sup>74</sup>, but was ranked 38th globally for diffusion in 2017<sup>75</sup>.

Entrepreneurial Activity<sup>76</sup> in Scotland has been increasing and reached 7.2% in 2019, but it was significantly higher in England at 10.5%. It was higher amongst men (8.9%) than women (5.5%)<sup>77</sup>.

There was a small increase in the digital maturity of Scottish businesses between 2014 and 2017, but most were still classified as Basic Browsers or Tentative Techies<sup>78</sup>. The COVID-19 crisis has accelerated technology adoption by some SMEs<sup>79</sup> – early in the pandemic this was put at one in five Scottish SMEs<sup>80</sup>. This has mainly been of ‘plug-and-play’ systems rather than more complex technologies<sup>81</sup>.

## What are the opportunities and risks?

### Net Zero Carbon

There are major policy drivers for innovation. Economic growth will be needed to create jobs and reduce government debt. The Scottish and UK governments have committed to net zero emissions, which will require massive investment and innovation over the next 25 years. They are increasing investment in innovation, and in new innovation and investment institutions.

### Covid Recovery

The COVID-19 crisis has had a profound impact on the businesses, the economy and society. It has changed many peoples’ way of living, learning and working, perspectives and priorities. However, there is the potential that these changes could unleash a wave of economic, social and environmental innovation. Most people in Scotland understand the importance of innovation and the benefits of change. They particularly support innovation when it is for the good of society<sup>82</sup>. Technologies offer people and businesses more opportunities to connect and innovate together. Economic recovery can be joined-up with new business models and skills. Young people have been more likely to lose their jobs and are now finding it harder to get a job. There will be an opportunity to support young people with innovative ideas.

More businesses understand the importance of innovation to their resilience and many have successfully adopted innovations over the last year. There will be the opportunity to build innovation capacity across the country. However, businesses also have less money to invest. Businesses which are unable to innovate will be exposed to competition and disruption.

73 Muscatelli Report published (sfc.ac.uk)

74 Global Innovation Index 2020

75 The UK’s Productivity Problem: Hub No Spokes (bankofengland.co.uk)

76 The proportion of the adult working age population that is actively trying to start a business, or that own/manage a business which is less than 3.5 years old.

77 National Indicator Performance | National Performance Framework

78 Scotland’s Digital Economy Maturity Index 2017 (www.gov.scot)

79 The-UKs-Technology-Moment.pdf (bethebusiness.com)

80 Crisis forces Scottish smaller firms to adapt | FSB, The Federation of Small Businesses

81 Parliamentary-Brief-AI-in-the-post-covid-economic-recovery.pdf (biginnovationcentre.com)

82 NESJ7903-Scot-Summary-Findings-FINAL.pdf (nesta.org.uk)

## Brexit

In the EU-UK Trade and Cooperation Agreement it was agreed that the UK will associate to Horizon Europe, the EU research and innovation programme that will run from 2021 to 2027. This has a proposed budget of €100 billion which UK scientists, researchers and businesses will be able to access. This will help Scotland to attract leading scientists and collaborate internationally. However, this is likely to be more challenging than before the UK left the EU.

EU funding has also supported public investment in businesses, innovation and start-ups in Scotland, for example through Venture Capital funds, and this will need to be replaced.

## Regulation

Changes in technologies and business models may be rapid or revolutionary, but legal and regulatory frameworks which govern innovation evolve slowly. The digital and bio revolutions will bring sweeping change to economies and societies which will increase this challenge.

The UK's departure from the EU may lead to deregulation which may increase both innovation and risk. Regulatory divergence could be to the advantage or disadvantage of innovative sectors. It will, at least, offer the potential to target R&D schemes on specific sectors and for bespoke regulatory reforms which enable testing of innovations in real world environments.

## What needs to change for Scotland to make progress?

### Investment

#### Purposeful Capital

Investments in technological changes and business model and workplace innovations are the principal source of long-term improvements in productivity and growth in economies.

The outcome of an innovation is, however, uncertain and it may take many years for any benefit to be realised. These risks may make it less attractive for businesses and investors to fund innovation. Lack of patient capital is a significant barrier to growth by innovative firms<sup>83</sup>. In recent decades, changes in financial markets, including in banking and in the primacy of shareholder value<sup>84</sup>, and in the structure of the economy, have increased this challenge.

Assets can be divided into tangible and intangible assets. Tangible assets are physical, like property, plant and buildings, while intangible assets are non-physical, like R&D, software and training. Investment in tangible rather than intangible assets in developed economies was historically higher. However, investment in intangible assets overtook tangible assets from the 1990s onwards in some of them, including some Nordic countries, the US and the UK<sup>85</sup>.

The properties of an intangible economy tends to favour very large and profitable firms, and reduce investment and restrict adoption of innovations by lots of less productive businesses<sup>86</sup>.

It may also be harder to finance an intangible economy because banks are less likely to lend to businesses without tangible assets. Equity finance is more likely to fund investment by businesses with intangible assets, but equity markets are criticised as too short-termist to support investment, for example in R&D<sup>87</sup>.

83 Microsoft Word – PCR\_Response\_v091017.docx (publishing.service.gov.uk)

84 Mazzucato, M., *The Value of Everything, Making and Taking in the Global Economy*

85 Haskell, J. & Westlake, S., *Capitalism Without Capital, The Rise of the Intangible Economy*

86 Haskell, J. & Westlake, S., *Capitalism Without Capital, The Rise of the Intangible Economy*

87 Mazzucato, M., *The Value of Everything, Making and Taking in the Global Economy*

Venture Capital is highly successful for the tech and biotech sectors and in some places, but less successful for countries without large Venture Capital sectors and in sectors which, like energy, require higher investment<sup>88</sup>. Scotland has one of the most developed business angel marketplaces for early-stage businesses in Europe. However, it is not able to provide the larger level of funds businesses need to scale-up and business angel investment does not seamlessly lead to Venture Capital investment in Scotland. This is because of differing preferences on business ownership and interests in financial risks, Scottish Venture Capital businesses mostly invest in businesses outwith Scotland and too few Scottish growth businesses attracting investment from Venture Capital businesses outwith Scotland<sup>89</sup>. While there was increased Venture Capital funding for Scotland's tech sector in 2020<sup>90</sup>, the ladder from business angel investment to Venture Capital investment needs to be fixed.

The Scottish National Investment Bank (SNIB) will help to increase the provision of debt and equity finance for businesses and it will be important to develop its capabilities, capital and partnerships. The SNIB will invest in the three missions of a just transition to net zero, place and regeneration, and innovations for a healthier population. But governments will not be able to bridge all of this investment shortfall particularly for smaller investments.

The UK Government should, as recommended by the Mirrlees Review<sup>91</sup>, equalise the tax treatment of equity and debt finance over time to encourage more small-scale equity investments. It should also promote longer-term shareholding, and more informed and supportive investors. In order to bridge funding gaps for innovation driven enterprises, it should reform investor protections for business angel investment to reduce their financial risks, and help to build partnerships or consortia to increase the availability of

Venture Capital funding.

The Scottish Government should reform Scotland's outdated, unclear and unduly restrictive moveable transactions law (which enables businesses and individuals to use their property other than land and buildings to access finance)<sup>92</sup>, and the SNIB should develop ways for firms to value and leverage their intangible assets for finance. The SNIB should also create a pre-seed fund to help turn innovative ideas into investable assets. Scotland should also aim to grow, spin-out and attract more intangible-intensive businesses. For example, the Scottish Arbitration Centre could be positioned as a world-leader for intangible asset cases.

Public investments have been essential to technological advances for decades<sup>93</sup>. Due to the rise of the intangible economy, it seems likely that governments will have to increase further the public share of investment – including funding for R&D and lifelong learning, tailoring incentives, and acting as an intelligent end-customer for innovative technologies and encouraging recipients of public funding to take more calculated risks to test and learn what works with innovative processes or tools<sup>94</sup>.

Public support will be required if significantly higher public funding is to be delivered in the long-term. People will need to believe that there will be benefits and rewards for society. Government, industry and education should, therefore, ensure that innovation strategies and spending, such as the forthcoming UK Innovation Strategy, will be substantially directed towards peoples' priorities, the results will be utilised for public goods and, if appropriate, financial returns will be shared by private investors and the public purse<sup>95</sup>.

88 Haskell, J. & Westlake, S., *Capitalism Without Capital, The Rise of the Intangible Economy*

89 Financing Scotland's recovery: analysis – gov.scot (www.gov.scot)

90 Scotland continues to impress as UK tech attracts record VC investment (digit.fyi)

91 IFS Press Release

92 Report on Moveable Transactions – Volume 1 (Report 249) (scotlawcom.gov.uk)

93 Mazzucato, M., *The Value of Everything, Making and Taking in the Global Economy*

94 Haskell, J. & Westlake, S., *Capitalism Without Capital, The Rise of the Intangible Economy*

95 Mazzucato, M., *The Value of Everything, Making and Taking in the Global Economy*

## Green Finance

The investment gap is especially large between what we are currently able or preparing to spend at Scottish, UK and global levels, and what we will have to spend, to decarbonise the economy. Government, businesses and individuals will all need to invest at higher levels.

There will be two necessary elements in the shift: ‘Financing Green’ in which funds move away from investments which have a negative impact on the environment towards those which align with net zero and ‘Greening Finance’ in which climate and environmental factors are fully integrated into mainstream financial decision making across all sectors and asset classes<sup>96</sup>.

Scotland’s new Climate Change Plan identifies the finance challenges and opportunities, and sets out commitments to work with Green Finance and investors in Scotland, the UK and globally, into both private sector and public sector-led opportunities in technologies, infrastructure projects and natural capital<sup>97</sup>.

Scotland is one of Europe’s leading financial centres, with a strong and diverse sector responsible for over 160,000 jobs from banking, insurance and FinTech to asset management, pensions and professional services. Over £800bn of funds are managed in Scotland.

Scotland’s financial services sector should further increase its commitment to sustainability and establish Scotland as a world leader in ethical, responsible and sustainable investment. The need to develop innovative financing solutions for net zero technologies – in which progress is often slow because of the need for early stage investment – is a significant opportunity. The sector should think more innovatively about how financing structures are put together and risk is assessed, and ensure that Environmental, Social and Governance (ESG) factors are fully integrated into their decision-making.

Following COVID-19, Governments, the public sector and publicly-owned banks will need to lead

the way by raising public investment, and unlocking and accelerating private investment, such as blended finance where public and private investment is combined to share risks. The new UK Infrastructure Bank should transform the financing landscape for major projects which deliver net zero solutions and climate resilience, as well as supporting a just transition for workers and community renewal. There is a particular gap in financing low carbon projects between £2m and £10m, which the SNIB can help to fill.

The UK and Scottish governments will also need to work with industry to develop the business models and commercial funding mechanisms for some technologies and sectors, particularly for Carbon Capture Utilisation and Storage, hydrogen and nature restoration or conservation. Utilities should also help to de-risk projects where they have the expertise and the balance sheet to explore and develop the newer technologies such as hydrogen. This work should look at these processes through the lens of the circular economy, and identify and implement circular business models.

Decision-making by global business and industry about where to locate and invest will also increasingly consider environmental factors as they look to minimise or eliminate emissions. The Scottish Government will need to continue to develop its green investment proposition and position Scotland as the home of ‘pace, place and space’.

The global demand for and supply of ethical, responsible and sustainable financial products is growing strongly across the world. Countries which are highly sustainable will be increasingly attractive to investors. Investment based on ESG criteria rose to \$30.7 trillion across major markets in 2018, an increase of a third in 2 years<sup>98</sup>.

The Task Force on Climate-related Financial Disclosures has developed a framework for public companies to report their climate-related impacts, which the UK will make mandatory for large companies by 2025. This will be a significant

96 Green finance strategy – GOV.UK ([www.gov.uk](http://www.gov.uk))

97 \*Update to the Climate Change Plan 2018 – 2032: Securing a Green Recovery on a Path to net zero ([www.gov.scot](http://www.gov.scot))

98 Trends Report 2018 | GSIA ([gsi-alliance.org](http://gsi-alliance.org))

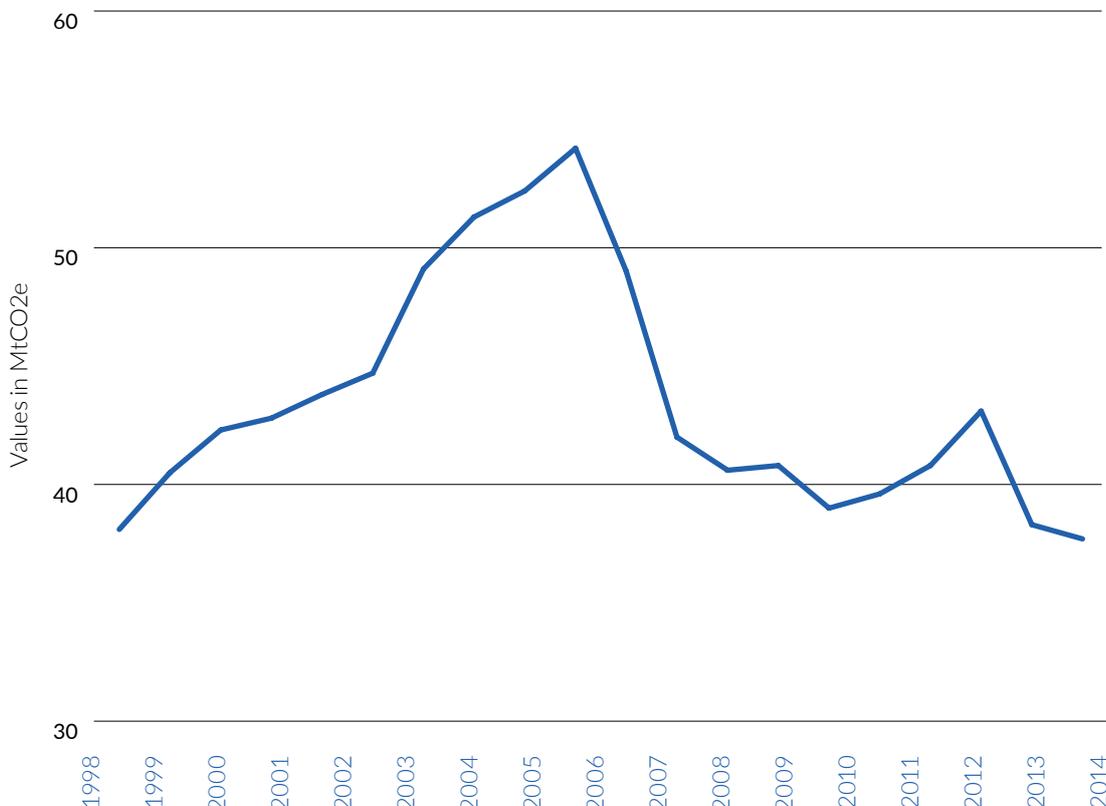
opportunity for Scotland to firmly establish itself as a world leader in ethical, responsible and sustainable investment, establishing new co-investment platforms.

Scotland is one of the major FinTech hubs in the UK and the world with leading universities, start-ups, SMEs and large financial services companies. The application of new technologies and data can create opportunities in a wide range of areas. For instance, the adoption of FinTech innovation could increase productivity in the foundational economy (the parts of the economy which provide the services and products on which people most rely in their daily lives) and clean growth sectors discussed later in this chapter, green finance, entrepreneurship and financial inclusion. To realise these ambitions in Scotland and the UK in the face of rising global competition, there will be a need to step up research and innovation in the financial services sector and FinTech, to build future talent and grow exports<sup>99</sup>. For instance, the Global Open Finance Centre of Excellence, based at the University

of Edinburgh and with partners from industry and academia across central Scotland, has recently been funded by UK Research and Innovation to help create citizen-focused financial services solutions through open banking and financial data<sup>100</sup>.

**Putting a rising price on carbon – applied consistently, fairly and predictably across the economy – will be essential in accelerating and intensifying investment decisions by governments, businesses and individuals towards achieving net zero. It will also generate substantial new revenues. The International Energy Agency has said that roughly half of the reductions that the world will need to achieve net zero emissions must come from technologies that have not yet reached the market<sup>101</sup>. As existing technologies seem unlikely to deliver net zero, a significant part of these revenues should be reinvested in innovation, infrastructure and natural capital<sup>102</sup>.**

Chart 6: Scotland's Carbon Footprint – Embedded Greenhouse Gases in Imports, 1998-2017



Source: Scottish Government

99 RandlinUKFinTech-FullPaper.pdf (fintechscotland.com)  
 100 The Global Open Finance Centre of Excellence | GOFCoE  
 101 Clean Energy Innovation – Analysis – IEA  
 102 Helm, D., *Net zero, How We Stop Causing Climate Change*

Although emissions produced in Scotland have fallen significantly in the last 30 years, one of the reasons for this has been the shift in the Scottish economy from manufacturing to services, with more of the goods we buy now produced in countries like China with higher emissions. Scotland’s territorial emissions almost halved between 1990 and 2015, but its carbon footprint, which reflects global emissions, only fell by 8% between 1998 and 2015. Consumption of products and materials accounts for an estimated 74% of Scotland’s carbon footprint<sup>103</sup>. The US and the EU are now considering carbon border taxes to reflect the carbon caused by our consumption of these goods and ensure the competitiveness of their domestic economies.

The UK Government should introduce a carbon border tax to address emissions created in manufacturing and transporting goods regardless of where the emissions arise. This should start with the most carbon-intensive and progressively being extended to all imports, while increasing pay and benefits to protect the poor from price rises. This should be designed to be compatible with World Trade Organisation rules and the UK Government should start talks with the EU, US and other potential partners with the objective of reaching agreement on an international system. This would generate further revenues for reinvestment, including in innovation, and promote the reindustrialisation of the economy, especially when combined with Scotland’s low carbon energy and water supplies.

The UK and Scottish governments should also introduce a form of road user pricing to replace revenues from fuel duty, which will disappear as zero carbon vehicles displace combustion engines, and fund the significant investments required to decarbonise transport connectivity.

## Agile Regulation

One of the main factors which influences innovators and investors when they make decisions about where to research and develop emerging technologies is the regulatory framework.

Regulation has the constant challenge of striking the right balance between offering stability and certainty for investment decisions and the need to adapt to changing circumstances. Forward-thinking and responsive regulation can anticipate how industries are changing and help to create and shape new markets, expanding best practice and a level playing field across businesses, as well as demonstrating in international markets the high standards to which Scottish businesses operate.

In past waves of technological change, regulation has emerged, at times slowly, in response to innovations. However, the Fourth Industrial Revolution is characterised by its speed, scope, “fusion of technologies that is blurring the lines between the physical, digital and biological spheres” and transforming “entire systems of production, management and governance”<sup>104</sup>.

Regulators have struggled to keep pace and regulations designed for last century have become impediments to progress today. While emerging technologies may generate benefits across a spectrum of areas, their regulation may be siloed in one regulator. There is a need to reform the governance of technologies to a proactive, multidisciplinary approach which aims to facilitate beneficial innovation while protecting citizens and the environment<sup>105</sup>.

The UK Government has been changing the regulatory landscape<sup>106</sup> and while many technologies are regulated at a UK level **the Scottish Government should also take action to accelerate beneficial innovation in the Scottish economy. It should set up a Centre of Future Regulation expertise in Scotland to advise on emerging regulatory issues from innovations and new industries; the impacts of evolving UK and international frameworks on Scotland and ways to influence them; opportunities to stimulate innovation (for example, through the design and use of standards or offering testbeds for innovation outwith existing regulatory processes); and legislation and regulation which is obsolete and a barrier to innovation.**

103 ZWS1444 ZWS Corporate Plan 2020 UPDATE.pdf (zerowastescotland.org.uk)

104 The Fourth Industrial Revolution: what it means and how to respond | World Economic Forum (weforum.org)

105 Renewing Regulation: ‘anticipatory regulation’ in an age of disruption | Nesta

106 Reforming the governance of technological innovation – GOV.UK (www.gov.uk)

The Scottish Government and Scottish industry should also promote business leadership on responsible innovation standards and regulation. Adoption of the BSI's guidance for innovative technologies should be encouraged<sup>107</sup>. The Scottish Government and devolved regulators should also introduce a means for Scottish industry to propose new regulatory approaches.

## Research and Innovation

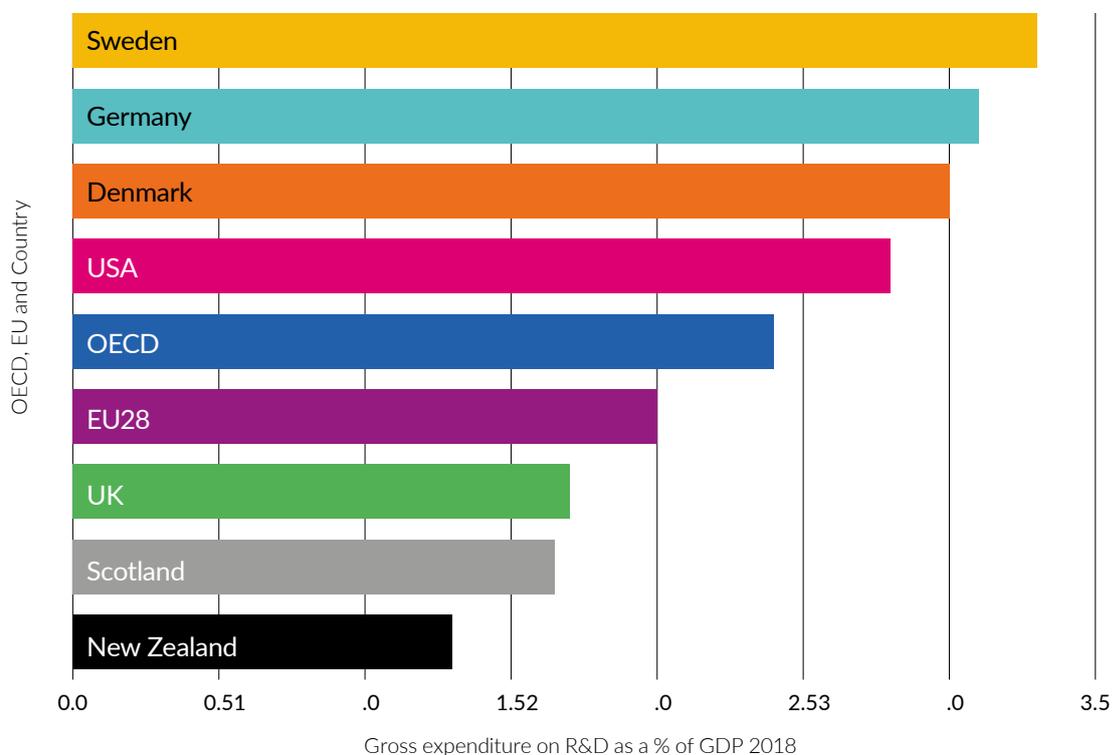
In response to the need for significantly higher public investment, the UK Government will increase spending on R&D from 1.7% of GDP to 2.4% of GDP, which is currently the average for advanced economies<sup>108</sup>, by 2027 and to 3% in the longer term. It will launch an Advanced Research & Innovation Agency (ARIA) to fund high-risk, high-reward scientific research<sup>109</sup>.

The Muscatelli Review<sup>110</sup> of how universities can improve their support for business innovation and the Cumberford-Little Report<sup>111</sup> on the economic impact of colleges, both for the Scottish Government, called for a 'National Innovation Mission', supported by long-run investment.

The evidence suggests that investment will be needed across all stages, from blue skies to applied research. We must ensure that increased investment in new areas does not undermine our competitive advantage in existing areas of research excellence.

Although the swiftness of changes in the technologies we use in our lives and work often astounds us, there is evidence of a long-term slowdown in radical scientific breakthroughs<sup>112</sup>. The causes are not certain, but explanations include less academic freedom for world-leading scientists and lower investment by businesses in science. It, in turn, may be one of the

Chart 7: Gross expenditure on R&D as a % of GDP



Sources: UK Government, Scottish Government

107 First corporate governance guide for responsible innovation | BSI (bsigroup.com)  
 108 UK Research and Development Roadmap (publishing.service.gov.uk)  
 109 UK to launch new research agency to support high risk, high reward science – GOV.UK (www.gov.uk)  
 110 Media\_700300\_smxx.pdf (gla.ac.uk)  
 111 TheCLreport\_210x260\_AW\_ALTS\_EDlogo\_SQA\_edits\_moreZ.indd (pagetiger.com)  
 112 Are Ideas Getting Harder to Find? (stanford.edu)

reasons why productivity growth has been lower in advanced economies over the same period<sup>113</sup>.

Furthermore, in Scotland and the UK this is compounded by a widening gap between the pace at which different businesses start to use new technologies and change their business processes and products to make best use of them. Compared with many other advanced economies, a relatively small group of businesses are quick on the uptake and show high levels of performance, while a far larger and growing 'long tail' of businesses are not. This is one of the main reasons why productivity growth in the UK has been especially weak<sup>114</sup>.

Research funding has also tended to be lab-based, which concentrates it on a small group of research-intensive institutions based in more innovative places. Funding has been higher for the origins and biology of diseases than for syndromes, such as dementia, for instance.

Innovation policies usually focus supporting those people who are already innovating. There is less attention on significantly expanding the people in society who are actively innovating, for example by developing innovation skills in education<sup>115</sup> or by utilising them in the workplace<sup>116</sup>. This matters not only because it means lower productivity, innovation and quality jobs. Public support for higher public investment in innovation and for a risk-aware (rather than risk-averse) approach to regulation will be built through a wider understanding of the benefits of innovation. As the greatest gains from innovative technologies are achieved when they are combined with complementary changes, such as in the workplace or in social behaviours, a wider group of innovators will also help to translate this higher investment into real benefits.

Scotland's National Innovation Mission should, therefore, be both ambitious and inclusive. **It should support Scotland's universities and colleges as world-class research and innovation powerhouses, and locations for RTOs in Scotland (such as the**

**Innovation Centres, technology centres and Catapult Centres).** The RTOs are already playing critical roles as intermediaries which bridge the gap between research and industry, accelerating practical technologies to meet the demands of and reduce the risks for businesses and sectors, and creating a pipeline of investable opportunities which are aligned with the wider economic, social and environmental agenda.

Scotland should adopt the targets of increasing spending on R&D to 2.4% of GDP by 2027 to match the average for advanced economies and 3% in the longer term.

The UK and Scotland should also adopt a goal for the private funding which it is aimed to leverage through public funding. Scotland should set targets to attract research funding from external sources, including UK-wide public funding, EU research and innovation programmes, and charitable, industrial and commercial funding.

The launch of the UK ARIA could have a transformational impact if it is established with a distinct, yet complementary approach to the UK's current research and innovation system. Funding must be additional to that for existing RTOs. The UK ARIA should fund high-risk, high-reward advanced technology on a 10-15 years horizon, focussing on a small number of critical missions. It must also have a role in the UK Government's levelling-up agenda and support higher R&D outwith the Golden Triangle. The UK Government should commit the UK ARIA to building clusters across UK nations and regions linked to its missions.

Scotland's National Innovation Mission must be shared by government, education and employers, mission-orientated and with a focus on translation and inclusion in the economy.

The missions in the UK Government's new Innovation Strategy (which will replace its Industrial Strategy and its Grand Challenges), the Scottish National Investment Bank's missions, and the nine opportunity

113 Is innovation slowing down? If so, what can be done about? | Nesta

114 Speech given by Andy Haldane at the Guild Society, University of Oxford, on Wednesday 23 May 2018 (bankofengland.co.uk)

115 Who Becomes an Inventor in America? The Importance of Exposure to Innovation | NBER

116 Enterprise and Skills Board: strategic plan – gov.scot (www.gov.scot)

areas identified in Scotland's Inward Investment Plan<sup>117</sup>, should be high priorities for research and its translation into new products and processes by firms of all sizes.

University commercialisation processes should be improved to match the best and support innovation driven enterprises. This should include faster responses, efficient processes, business-friendly contracts and reductions in the high share of Intellectual Property (IP) retention required by some institutions. They could also leverage RTOs with their more direct connections to industries and abilities to co-invest.

Scotland should aim to create a world-class innovation ecosystem, widening and deepening the interactions between the triple helix of academia, industry and government, with a population of networked living labs.

As places and spaces in Scotland's cities, towns and rural communities are repurposed following COVID-19, it should pilot new Innovation Neighbourhoods which bring together translational research and innovation. These should be designed and led by partnerships including local authorities, businesses, and colleges and universities, and third sector organisations. They should link to anchor institutions – such as university and college education and RTOs, health, government or major employers – to facilitate knowledge diffusion, skills formation and learning throughout life, and support for entrepreneurship and business-to-business, business-academic and private-public collaboration. There should be testbeds to test and scale-up innovations, based on advice from the proposed Scottish Centre of Future Regulation.

Moreover, **Scotland's new Innovation Neighbourhoods should be hives for 21st century living, learning and working. They could be co-located with the planned 20 Minute Neighbourhoods, networks of mixed use and remote working hubs, and circular economy exchanges and workshops for repairing, remanufacturing and leasing/hiring services. This would make Innovation**

**Neighbourhoods perfect locations to experiment with joined-up ways to invest across technological innovations, business model innovations and social behaviour innovations.** Not all innovations are based on new technologies – they would also facilitate 'recombinant' innovation, new applications from a combination of existing technologies.

Scotland has been developing its range of place-based economic and community development initiatives and clusters, such as Glasgow City Innovation District, Aberdeen's ONE Tech Hub, Edinburgh BioQuarter, CAN DO places, Community Wealth Building pilots and Development Trusts, on which Innovation Neighbourhoods would build.

There should be a determined push to disperse research and innovation into more geographies, sectors and sizes of firms, and equally committed drive to help them pull in more. Expanding the number of Scottish businesses which trade internationally would increase their need and demand for innovation to bolster their competitiveness.

UK R&D tax relief for SMEs has been found to generate benefits for businesses and the economy as a whole<sup>118</sup>, and this dispersal could be boosted by the reform of and significant investment in UK R&D credits to vary them based on economic and social value and geographic location in order to stimulate innovation in more sectors and more places<sup>119</sup>.

Research and innovation funding should be increased for the challenges of people living in poor health and environments, and for prevention and addressing the causes of poor health, which will mean that they happen in a wider diversity of areas.

**In the short-term, an expansion in Innovation Vouchers in both value and volume should be tailored to enable businesses in more sectors to work closely with universities, colleges or other experts outside the education sector on their challenges at a time when many businesses have significantly less capacity and resources to invest in such innovation.**

117 scotlands-inward-investment-plan-shaping-scotlands-economy.pdf

118 R&D Tax Relief for SMEs Evaluation (publishing.service.gov.uk)

119 Condoc\_-\_RD\_review\_.pdf (publishing.service.gov.uk)

The Interface match-making knowledge exchange service should be scaled-up with funding rounds extended beyond short term funding allocations to allow for longer term partnerships.

Challenge prizes should be developed in a wider range of areas by governments at all levels to stimulate and support a large number of innovative early stage solutions. **Public procurement should be used to drive innovation by innovative SMEs. This should include removing barriers for them across all elements of the procurement system, piloting innovation-led procurement by government departments or public bodies in which government acts as their first customer, and enabling them to build and retain IP created through government contracts**<sup>120</sup>. Governments should set targets for the procurement of innovative solutions of 5% of their spending, and reform their procurement processes where necessary so that they are outcomes rather than outputs-focused and promote more collaborative commercial models.

Scotland's CivTech Alliance<sup>121</sup> and the UK's GovTech Catalyst are positive examples of the ways governments can engage with innovative businesses and harness innovation through public contracts, such as open challenges, to streamline procurement, facilitate collaborations and solve social and environmental challenges. We welcome the new Scottish Government's plans to scale-up CivTech to work with more innovative Scottish businesses and position Scotland as a leader in the global GovTech sector, enabling Scottish businesses to gain a share of this £400bn market.

Both governments and larger businesses should stimulate innovative low carbon products and services using their buying powers. This could include adding, during evaluation processes, the carbon cost of a bid onto the price quoted.

## Social Innovation and Entrepreneurship

Scotland's National Innovation Mission should also inspire and empower its people. Scotland's schools should engage all young people with innovation from early years, especially those from more disadvantaged backgrounds, and developing their confidence and skills. Innovative businesses should actively support schools with this aim in these communities. Programmes of opportunities to develop and participate in social innovation should be available for all, such as the National Service for net zero programme proposed in the Learning Throughout Life chapter. Social innovation education and practice could be embedded in all education and training opportunities<sup>122</sup> throughout life starting with schools.

Entrepreneurship skills should be part of this work. There is evidence that university entrepreneurship programmes do not increase entrepreneurship rates, but do help students better identify their potential and improve the quality of entrepreneurship. Influence from workplace peers or from mentors has been found to increase the rates of entrepreneurship<sup>123</sup>. This could suggest that a combination of expanding entrepreneurship training for tertiary education staff and students with exposure to peers or mentors would be effective. **New routes with a mix of start-up funding, entrepreneurship skills and mentoring, and student support should be offered for young people who want to start and grow a business while learning through an accelerated course or a full diploma or degree, including by blended learning.**

The number of new businesses being started in the UK and other major economies has increased significantly since the beginning of the COVID-19 pandemic. Unemployment and underemployment have been drivers of entrepreneurship by individuals, but so have the new opportunities created by rapid economic changes and the increased time and space, new technology skills and motivation which more people have had to pursue their business ideas. A wave of entrepreneurship could be a foundation of economic

120 IEG response to Cabinet Office's Green Paper on Transforming Public Procurement (publishing.service.gov.uk)

121 CivTech – The CivTech Alliance

122 A Generation of Changemakers (ssir.org)

123 Do university entrepreneurship programs promote entrepreneurship? – Eesley – 2021 – Strategic Management Journal – Wiley Online Library

recovery, but many start-ups may flounder, especially as emergency support measures are withdrawn by governments.

The UK, Scottish and local governments, and their agencies, and the financial sector, should aim to help businesses through this potential challenge towards resilience and growth, for example by providing digital access to support and advice, and by increasing the availability of a range of forms of finance for SMEs. This must be inclusive of entrepreneurship by people from all backgrounds. It should also encourage those who do not succeed first time in their business start-ups and who want to take their learnings forwards into second chance entrepreneurship<sup>124</sup>.

Social networks of innovators have been key to progress in previous industrial revolutions. Building on the Scotland CAN DO movement<sup>125</sup> and Productivity Club Scotland<sup>126</sup>, and informed by the recommendations in the recent review of Scotland's technology ecosystem to strengthen the social infrastructure for start-up education, propagation of best practice, networking and peer-support<sup>127</sup>, businesses should be engaged in vibrant innovation networks.

## Productivity

### Foundational Economy

Scotland's economic strategy focussed on key growth sectors for most of the last 10 years. Other sectors of the economy have has a lower profile. **This includes sectors such as retail, housing, and health and social care, which often employ many more people and have a nationwide footprint.** Lower productivity in many of the organisations and businesses in these sectors and perceptions of lower potential for innovation, exports and growth were behind this lower

profile.

This collection of sectors have been given different names, including the foundational economy<sup>128</sup> and the everyday economy<sup>129</sup>. But during the COVID-19 pandemic many of their employees have become known as 'key workers'. The sectors are often based on human capital. They draw strength from and are strengthened by the communities in which they are based. While it is classified as a key sector, many tourism businesses share these qualities. The emerging place-based approach to the economy is shifting more focus to these sectors.

During the COVID-19 crisis 'innovation' has come more clearly into view for all sectors as 'resilience'. McKinsey has found that the pandemic has exposed weaknesses around half of companies' strategic resilience, and business-model innovation has been by far their most important response, with innovations focussed on the customer-facing parts of businesses<sup>130</sup>. This will create a window of opportunity in the economic recovery to recharge productivity. McKinsey estimates that the rate of annual productivity growth could potentially be more than double the rate after the global financial crisis<sup>131</sup>.

The UK and Scottish governments and these sectors should work closely to establish a policy environment which will enable recovery, and investment in business change and adaption. This will include providing help to firm for skills and jobs, and the places in which they operate, as covered in the *Learning Throughout Life and Healthy Places To Live and Work* chapters.

UK and Scottish government innovation policies and support should include the foundational economy, and technological and non-technological innovation. In order to make the widest impact, these should be a particular focus on sharing learnings across industries and technologies and solutions with cross-domain

124 One year of SME and entrepreneurship policy responses to COVID-19: Lessons learned to "build back better" (oecd.org)  
 125 Home – CANDO.SCOT  
 126 Productivity Clubs – - SCDI  
 127 Scottish technology ecosystem: review – gov.scot (www.gov.scot)  
 128 The foundational economy | GOV.WALES  
 129 cej-industrial-strategy-steering-change-in-the-uk-economy-november-2017.pdf (ippr.org)  
 130 Strategic resilience during the COVID-19 crisis | McKinsey  
 131 Will productivity and growth return after the COVID-19 crisis? | McKinsey

applications. For many businesses, innovation can be realised by integrating available technologies and processes, the demand for and success of which often depends on the capacities and skills of leaderships, managements and workforces. There should be a specific target for scaling up the proportion of Scottish businesses buying or selling goods and services by e-commerce.

There should be support for the tech sector to develop products for those parts of the economy in which their availability and applicability is currently limited<sup>132</sup>, allied to support for businesses to incorporate them and upskill their workforces.

Ways to access innovation support from colleges, universities and, crucially, other expert help, such as Innovation Vouchers, should be expanded. As highlighted in the Learning Throughout Life chapter, offering accessible, bitesize opportunities for SMEs to enhance their leadership, management and technical skills will be key to higher rates of innovation and adoption of innovation. Lifting the long tail of lower productivity businesses by spreading the use of new and existing technologies, products and practices would be transformational for the economy.

SMEs outwith innovation driven sectors have often struggled because alone they were too small to stimulate the supply of applicable innovation or to absorb the innovation available. More collaborative business models, such as innovation networks, business-to-business sharing economy, and cooperatives, are now starting to take root. These should be built upon to help businesses to innovate to improve their competitive and environmental performance, and strengthen their resilience against competition from global tech firms, future shocks and resource scarcity.

This should be guided by two related points, focussing on: supporting businesses which are taking complementary steps to change their organisations and to increase their technological maturity; and on encouraging greater cross-business and cross-industry collaboration.

The UK and Scottish governments should encourage cooperation between businesses through business support and incentives, open innovation, challenge competitions and public procurement. Businesses should jointly apply based on the changes that will take place between them in their business models, digital transformation and/or circular solutions to waste streams. Firms which pay the apprenticeship levy should be able to transfer funds to their supply chains.

Public contracts should be redesigned to increase opportunities for local supply chains to offer innovative and holistic solutions, and help to grow and harness wealth within communities.

**Local networks for repair, servicing and maintenance can strengthen local economies. Scotland should develop a diverse localised network of reuse exchanges, maintenance, repair and remanufacture workshops, and recycling facilities. These would build more local, resilient and sustainable supply chains, reindustrialise local economies, and create secure jobs.**

The many frontline workers in these sectors and their direct relationships with customers mean that people are at the centre of the successful design and implementation of innovations. New business models and technologies should be co-designed and adopted by employers and employees in partnership, and training provided to support employers and employees to think differently about their organisation and its purpose. This is covered in the *Learning Throughout Life* chapter.

Productivity Club Scotland and trade unions, supported with some initial funding from the Scottish Government, should launch a national campaign aimed at all employers and employees which promotes a shared mission to increase productivity based on the principles of fair work. Productivity Club Scotland should also be tasked with developing and offering a self-assessment tool to help businesses fully appraise their productivity-related practices, attitudes to and capacity to innovate providing guidance around where to get support.

## Industry 4.0

### Digital, Artificial Intelligence and Data

Digital, Artificial Intelligence (AI) and data are rapidly transforming our economies, jobs and societies. Within the global economy of 2030, there will be more computers than humans, more sensors than eyes and more robotic arms than labour in manufacturing<sup>133</sup>. Global technological competition is a powerful and intensifying dynamic in international relations<sup>134</sup>.

Scotland and the UK have internationally-competitive strengths in digital, AI and data – Scotland has the most tech start-ups in the UK outside of London and South East England<sup>135</sup>. Estimates show that Scotland's GDP could be 8.4 – 9.8% higher in 2030 due to AI alone<sup>136</sup>. As for many other countries, these have, rightly, been the focus for a range of recent reviews, at Scottish<sup>137 138</sup> and UK levels<sup>139</sup>, and are the focus for initiatives such as Edinburgh's Data-Driven Innovation.

The impacts of data and AI, good and bad, have also been at the centre of public discourse. The widespread misuse of personal data and data breaches has eroded public trust in data sharing, and many people are worried that AI will increasingly replace people in some jobs. The digital-enabled collaborative economy has created ways for people to share goods and services, but have also generated concerns about platform companies exploiting gig workers and communities.

Scotland's economic prospects will be strongly influenced by whether it is at the forefront of technological innovations, and stimulates and accelerates the maturity of its 'Technology Ecosystem'. Rapid implementation of the Scottish Technology Ecosystem ('Logan') Review's recommendations<sup>140</sup> on a national backbone network of "Tech-Scalers", social infrastructure, funding and talent will be important.

This should be built on with a technology roadmap for technologies, especially those which have the potential to be 'general purpose technologies', like blockchain and Virtual Reality. Public agencies should be actively encouraged to test and learn from what works.

For Scotland to stay at the forefront of digital, AI and data in an increasingly competitive global market, technological innovation and business growth from early start-up to full maturity will need to be integrated with ethical standards, security, and social and environmental benefits.

**There should be rapid progress to establish collective leadership on innovative and ethical AI and data, and create the foundations of success, as is planned in Scotland's first AI strategy<sup>141</sup>. Scotland should leverage AI and data in each of the missions for the SNIB, and across the UN's Sustainable Development Goals and Scotland's National Performance Framework, with an immediate priority being net zero emissions.**

While multinational platform companies are often in the spotlight, most networks in the collaborative economy function optimally at local or regional rather than national or global levels. This will offer Scotland the opportunity to pilot new mechanisms for responsible data stewardship at regional or local levels, which could include data trusts, data cooperatives, and corporate and contractual models<sup>142</sup>. These could help to increase public trust, making people more comfortable with sharing their data and unlocking the potential of data for social good. With the advice of the new Scottish AI Alliance, Scotland should also pilot ways in which people can ethically co-design AI technologies.

Cyber security resilience will also be critical as technological advances and increased scale and speed of adoption produce new challenges. Scotland

133 Guillén, Mauro F., 2030, *How Today's Biggest Trends Will Collide and Reshape the Future of Everything*

134 Lee, Kai-Fu., *AI Superpowers, China, Silicon Valley and the New World Order*

135 Scottish tech sector thriving despite pandemic – Scottish Financial News

136 The economic impact of artificial intelligence on the UK economy (pwc.co.uk)

137 Scotland's AI Strategy – Scotland's AI Strategy (scotlandaistrategy.com)

138 Scottish technology ecosystem: review – gov.scot (www.gov.scot)

139 AI Roadmap – GOV.UK (www.gov.uk)

140 Scottish technology ecosystem: review – gov.scot (www.gov.scot)

141 Scotlands\_AI\_Strategy\_Web\_updated\_single\_page\_aps.pdf (squarespace.com)

142 Legal-mechanisms-for-data-stewardship\_report\_Ada\_AI-Council-2.pdf

should aim to strengthen its own resilience and be a global leader in the market for cyber security products and services, which is expected to grow to £248bn in 5 years. It should develop a Scottish Cyber Security Innovation Hub, which is accessible by all of Scotland's universities and colleges, and early stage cyber security companies, and linked to reskilling and upskilling opportunities for careers in cyber security for a diverse range of people. STEM education programmes such as the Young Engineers and Science Clubs should be expanded to incorporate an understanding of cyber security for all young people.

Scotland can also attract investment in green data centres to service domestic and global customers. The UK and Scottish governments should develop the national and international connectivity and energy infrastructure needed, support the growth of Scottish datacentre clusters and promote Scotland's potential for climate-friendly data centres. Both governments should migrate public sector data in Scotland to this Scottish cloud.

As new technologies are adopted, high-performance computing can help solve the world's most complex and pressing issues, and be accessed by businesses, including SMEs, to help solve their problems, increasing Artificial Intelligence innovation in the wider economy. With data volumes increasing at local levels, smaller, edge data centres will need to be developed close to communities to improve services for people and businesses, which might be integrated into the post-COVID-19 repurposing of buildings.

## Health and Data

Long-term, strategic investment in health and social care innovation will be critical. New and emerging technologies – enabled and underpinned by ethical, robust and secure data – can and should play a vital role in transforming health and social care. As Scotland looks to recover and build public health resilience after the COVID-19 crisis, it has never been more important.

Scotland has many of the ingredients to be a living lab for health data. Our nationally integrated NHS, which will be integrated with the proposed National Care Service<sup>143</sup>, collects a wealth of data. Scotland has strengths across the public, private and third sectors, including its data, life sciences and tech sectors, research and teaching excellence, and Innovation Centres. It can also offer clear public health and geographic challenges in which to trial new technologies.

The COVID-19 pandemic has transformed the way in which healthcare is accessed across Scotland. Telemedicine services which were developed for rural and remote areas of Scotland were rapidly expanded across the country and have become familiar for many more health and social care staff and patients<sup>144</sup>. Remote consultations are expected to continue to represent a significant percentage of appointments.

Moreover, remote clinical monitoring – including consumer and health grade wearables, and at-home testing kits – will become ever more common in society. This will significantly increase the availability of real-time data on public health – including information on patients with, at-risk from or recovering from illnesses, elderly people with dementia, and communities during an epidemic or pandemic<sup>145</sup>. This will improve patients' lives and treatments, support the work of staff and reduce demand on health and social care, and protect health and the economy<sup>146</sup>.

The key will be to collate all of this front-line data and turn it into usable intelligence. Openness, integration and interoperability of data sets and systems across a single architecture underpinned by common standards would facilitate ethical and secure national sharing. Businesses should be encouraged and enabled to access this data if they commit to and demonstrate the mandatory ethical standards, cyber security and delivery for the public good.

The NHS estate and Scotland's wider health and social care infrastructure will urgently require significant investment to provide good quality technology, equipment and connectivity. This will also unlock

143 Independent Review of Adult Care in Scotland ([www.gov.scot](http://www.gov.scot))

144 Remote GP consultations being escalated – Scottish Rural Medicine Collaborative

145 Wearable technology: COVID-19 and the rise of remote clinical monitoring | The BMJ

146 The hammer and the trance – Progress ([substack.com](http://substack.com))

opportunities to prepare for an accelerated transition to a high-tech future.

Building on the development of the National Digital Platform for health and social care, this would allow for the creation of a single, comprehensive digital health record for everyone. The primary purpose would be to enable clinicians to predict ill-health in and make better informed decisions for individuals. Anonymised and aggregated, the information can, furthermore, help to manage services, and guide improvements in health and social care services, medicines and therapies, for the long-term benefit of all. With clear public benefit for this sharing and appropriate safeguards to maintain public confidence, third-party companies should be actively encouraged to access this data to generate commercial benefits where social value can be demonstrated.

Scottish leadership in health data would require the expansion of new skills in the health and social care workforce, which would support higher job quality, pay and in-work development. It will also attract people with research and innovation skills, and investment, to Scotland. There will be the potential to grow clusters of research, innovation and entrepreneurship in care across Scotland, including in geographies and communities which most need them.

It has been estimated that Scotland's health and social care data could be worth £800m every year, and deliver an estimated £5.4bn in savings for NHS Scotland – 38% of its current budget and three times its predicted budget shortfall by 2025<sup>147</sup>.

**The Scottish Government's new Data Strategy for Health and Social Care should be backed by a Health and Social Care Transformation Fund which invests in these infrastructures and skills, including making health wearables available to many more people in society who want them. The aim should be to create healthier places to live, healthier workforces and healthier ageing, and improve Scotland's public health to among the best in Western Europe by 2040.**

## Manufacturing

The COVID-19 pandemic has shifted how governments and international businesses think about global supply chains. While globalisation is here to stay, the crisis starkly revealed the weaknesses of some global supply chain to an economic shock in both supply and demand. Both governments and businesses want to make supply chains more resilient and protect the public interest and their customers – from models based on 'just-in-time' to 'just-in-case'.

Many governments will now view self-sufficiency in key products, such as pharmaceuticals and medical manufacturing, as critical infrastructure, and fund and regulate national capacity.

Some businesses were already re-evaluating their dispersed supply chains. The increasing adoption of industrial digital technologies has been transforming industry<sup>148</sup>. The cost advantages of manufacturing in emerging markets have shrunk, as the digitalisation and automation of factories have cut labour cost differences, and shipping costs have increased. The COVID-19 crisis accelerated the adoption of advanced manufacturing technologies, for example 3D printing, to transform scale-based activity into flexible production and meet local supply needs rapidly.

The benefits of proximity to customers in fulfilling their changing demands more quickly have become clear. Trade within regional blocs had started to grow more rapidly than global trade<sup>149</sup>. More international trade disputes have disrupted global supply chains. The recent blockage of the Suez Canal also drew attention to the vulnerability of global supply chains to such events. Public concerns about the higher emissions of production in and shipping from emerging markets have risen, which has increased the interest of governments in carbon border taxes and the opportunities to encourage more homegrown manufacturing with skilled jobs, especially where low carbon energy is available.

Emissions from production, including materials, products and food, account for 45% of the global

147 Mind the Gap: Data, Digital and Technology in Health & Social Care – SCDI – SCDI

148 Made Smarter Review – GOV.UK (www.gov.uk)

149 COVID-19 and supply-chain recovery: Planning for the future | McKinsey

total. These are harder to abate than the 55% from Energy<sup>150</sup>. A Circular Economy aims to replace the ‘take-make-waste’ model of production with one which designs out waste and pollution, and keeps products and materials in use. Circular business models could reduce emissions from carbon-intensive products like aluminium, plastics and steel by 40% or more.

Trends in the manufacturing sector are increasing the scope for the circular economy. Digital technologies which give businesses more visibility of the resilience of their supply chains can also enable them to track materials and products more closely. Businesses are able to take a more active interest in the material and products they are selling into the market and the opportunity that they could reuse them at the end of their first life cycle. Advanced manufacturing technologies and local low carbon energy systems could further enhance this by promoting more localised production and markets, and making repairs more feasible as individuals and businesses are able to manufacture spare parts locally.

Making Scotland’s Future is the framework for delivering a collaborative approach to supporting the manufacturing sector in Scotland. With industry and academia, an initial focus for this partnership has been on the development of Scotland’s recovery plan for manufacturing which aims to secure a strong and sustainable future for the sector<sup>151</sup>.

The National Manufacturing Institute Scotland (NMIS), based with the Medicines Manufacturing Innovation Centre in the Advanced Manufacturing Innovation District Scotland, will support businesses in digital transformation with access to expertise, testbeds and smart factory assets, and will operate through a hub-and-spoke model with other centres of excellence. The plan is also seeking to reproduce Scotland’s successful repurposing of non-medical supply chains and capacities during the COVID-19 crisis in other supply chains<sup>152</sup>. This will need to identify products for which there is a clear demand signal, such as health,

construction, and low carbon technologies, and use public procurement creatively and flexibly.

**Scotland should aim for a recovery in its manufacturing sector which does not simply return it to its pre-COVID-19 starting point, but reset it in a more productive and competitive, digitally-enabled, and environmentally sustainable state. There are opportunities across large and SME manufacturers and industry sectors to increase productivity, innovation, and resilience and to re-shore and decentralise production. There is a need to retain and grow Scotland’s industrial base, including through collaboration and networks between manufacturers of all sizes to build their capabilities, strengthen Scottish supply chains, and increase international and domestic sales.**

Following decades of underinvestment, modernising outmoded industrial property and machinery in Scotland for Industry 4.0 and net zero will be critical. A recent review has found that the average age of manufacturing accommodation is around 35 years, beyond the 30-year design life of many buildings<sup>153</sup>. Plant and machinery is often similarly dated. This will be challenging at scale because of the density of SMEs in the Scottish manufacturing sector. There will need to be increasing availability of funding support for refurbishments and replacements, and the adoption of innovative manufacturing technologies.

This should not replace like with like. The repair, refurbishment and remanufacturing of products, and advancing manufacturing technologies such as robotics, modern methods of construction, and 3D printing, will offer opportunities for Scotland to create more mini-factories, with more flexible and less wasteful production, closer to customers and local communities.

Scotland’s offer in the availability of clean energy and water, and circular waste streams, will be increasingly attractive to sectors with climate change and resource challenges in their operations. It should develop a net

150 emf\_completing\_the\_picture.pdf (europa.eu)

151 Making Scotland’s Future – recovery plan for manufacturing – draft: consultation – gov.scot (www.gov.scot)

152 Making Scotland’s Future – recovery plan for manufacturing – draft: consultation – gov.scot (www.gov.scot)

153 Based on the Scottish Manufacturing Advisory Service’s reviews with companies of over 600 Capital Assets as part of the Scottish Government’s Manufacturing Action Plan: A Manufacturing Future for Scotland.

zero proposition for investment and reindustrialisation. Support for investment in new and repurposed sites should be coordinated by integrating planning and infrastructure development, and by building local management and workforce skills, and supply chains.

Without a plan for manufacturing which takes advantage of Scotland’s innovation ecosystem, Scotland will have to import the technologies which we will need to deploy to achieve net zero emissions from the rest of the UK or overseas, imperilling a just transition of jobs from high-carbon industries. With a plan, Scotland can accomplish this journey, generate clean growth, and export the technologies, products and know-how globally.

Industry will need to develop and implement new design, construction and manufacturing techniques to minimise waste and maximise life cycles. This will require significant investment in innovation, learning and research to understand the potential and scale-up technologies and skills. Regulation will be essential to provide clarity and a level playing field for business. Cost differences between sustainable and non-sustainable products – for example in health and beauty, clothing, electrical appliances, food, building materials and vehicles – will need to be removed.

Deepening these extra-firm infrastructures for collaborative partnerships across business models, production capabilities and skills formation will be key to reindustrialising Scotland<sup>154</sup>. There will be a need to promote business models which increase productivity through value creation<sup>155</sup>, and support firms to develop both their core and complementary capabilities<sup>156</sup>.

Manufacturing is at a crossroads. Industry 4.0 and 3D printing, net zero and the circular economy, and supply chain resilience, will offer a window of opportunity for Scotland to develop stronger local productive capacity and regenerate its ‘industrial commons’. Local industrial digitalisation and decarbonisation, and related skills development, will be essential if there is to be a just transition to a net zero economy for industrial and post-industrial areas.

There is a need to increase the demand for and the supply of investment in Scotland’s manufacturing businesses, attracting patient capital and green finance from the financial services sector in Scotland, the rest of the UK and beyond, and innovation funding, into the sector.

City Region Deals and Growth Deals, agreements between local government and partners, and the UK and Scottish governments, are investing in projects to meet the property and infrastructure needs of growing manufacturing businesses.

**Following the launch of the NMIS, Scotland should create a dispersed and diverse ‘national backbone’ of Manufacturing Innovation Neighbourhoods within and around city, town and rural areas to catalyse these opportunities and start to reindustrialise more communities across Scotland.**

These would be modern, connected facilities for Industry 4.0 and clean growth innovations. Businesses would be offered tailored support for innovation and entrepreneurship and through public procurement opportunities. They would be centres for peer-to-peer networking and business mentoring, and would be linked to regional and local anchor institutions including education to support translational research and innovation, and learning throughout life. Businesses would be expected and incentivised to work collaboratively in areas such as open innovation, skills and waste streams, and respond positively to procurement opportunities.

**Pilots of Manufacturing Innovation Neighbourhoods in smaller communities should aim to develop partnerships between college and universities, and SMEs, as engines for higher productivity. These could be focussed around innovation and clean growth in rural industries, such as food and drink, textiles, and timber, and on emerging opportunities for rural areas to attract low carbon manufacturing.**

The Scottish and UK governments should work together to offer financial packages for this network of Manufacturing Innovation Neighbourhoods.

154 Best, Michael H., *How Growth Really Happens: The Making of Economic Miracles Through Production, Governance and Skills*

155 Business model innovation is key to beating COVID-19 debt | Institute for Manufacturing | IfM Insights (medium.com)

156 Best, Michael H., *How Growth Really Happens: The Making of Economic Miracles Through Production, Governance and Skills*

This should include UK R&D capital allowances and tax credits, incentives for cluster investment in clean energy and carbon capture and storage, and allowances for non-domestic rates and council tax payments in Scotland. The removal of plant and machinery investments from business rates should be considered, as was recommended by the Barclay Review of non-domestic rates<sup>157</sup>.

### Clean Growth

Key technologies in a successful Climate Change Plan for Scotland to become a net-zero society by 2045 will also be critical at UK and international levels. This will create significant opportunities for

the Scottish economy in global markets. Scotland has internationally competitive strengths and assets in its energy industry, other sectors, RTOs, universities and colleges, and government agencies, on which to build. Many of the opportunities for the Scottish economy will be in leveraging and applying these capabilities in adjacent markets.

Reducing the costs of these technologies so that they are at least as cheap without subsidies as their fossil fuels equivalents is likely to be necessary to achieve the global climate change target. There will be also be a need to mitigate the embodied carbon in many of these new technologies. Innovation partnerships will therefore be essential. By leading

157 Non-domestic tax rates review: Barclay report – gov.scot (www.gov.scot)

**Chart 8: Key elements/viable pathways/main routes to net zero for Scotland, UK and World**

Committee on Climate Change (CCC) – Scotland 2019 Progress Report	UK Energy Systems Catapult – Innovating To Net Zero – UK Net Zero Report	Energy Transitions Commission – Reaching net-zero carbon emissions from harder-to-abate sectors
Decarbonisation of transport & climate-friendly travel choices	Low Carbon Technology 1. Carbon Capture & Storage with Bioenergy 2. Hydrogen – which may need to grow from virtually zero to levels equivalent of today's electricity 3. Electricity generation – which will need to double (or perhaps treble)	Reducing demand for Carbon-Intensive Products & Services
Energy efficiency of buildings & low-carbon heating		Improving Energy Efficiency
Changes in land use, including agriculture, tree planting & peatland restoration		Deploying Decarbonisation Technologies Across All Sectors  Four Main Technologies: 1. Electricity 2. Biomass 3. Carbon Capture 4. Hydrogen
Low-carbon heat & energy & resource efficiency in industry		
CO2 transport & storage; hydrogen clusters; & renewable electricity support		
Tackling skills gaps in industry	Land Use, including Livestock, Tree planting and Biomass (coupled with CCS)	
Lifestyle changes in society	Lifestyle, including Meat/dairy consumption and Aviation demand growth	

<https://www.theccc.org.uk/publication/reducing-emissions-in-scotland-2019-progress-report-to-parliament/>  
 Mission Possible | Energy Transitions Commission (energy-transitions.org)  
<https://es.catapult.org.uk/reports/innovating-to-net-zero/>

these advances through significant investments in the innovation ecosystem, implementing a plan for local manufacturing and local supply chains rather than imports, and deploying the technologies, Scotland and the UK will create generate exportable technologies, products and skills.

Coordinated policy, cross-sectoral collaboration and integrated energy systems will be needed onshore and offshore<sup>158</sup> to maximise the opportunities and manage environmental pressures.

### The Blue Economy

The size of the global Blue Economy, all economic activities related to the oceans, seas and coasts from established to emerging sectors, is expected to double between 2010 and 2030<sup>159</sup>.

Scotland's marine area is six times its land area. The Blue Economy is worth nearly £14bn and supports over 84,000 jobs in Scotland, many in coastal and rural communities. Scotland's forthcoming Blue Economy Action Plan should aim to double the size of its sector and position Scotland as a global leader in innovation and sustainability. It should be national in vision, but with regional differentiation and delivery to support inclusive growth, and build on existing networks to develop cross-sectoral, interdisciplinary collaboration, investment, research and skills.

Scotland has strengths in established and emerging marine sectors which will offer opportunities for growth, such as offshore wind, low carbon shipping and aquaculture. These can be best realised through cross-sectoral cooperation on space, co-location, and joined-up technology and skills plans. For example, Scotland has the opportunity to research, develop and build electric and hydrogen-powered port and offshore infrastructure for ships and ferries and

offshore industry vessels and workboats. This could create low carbon hubs at ports around the country which can help to decarbonise places and other transport modes.

Government, regulators and industry should develop and deliver a joint action plan for decarbonisation, the environment and nature restoration with agreed targets and milestones, which would permit sustainable growth in areas including marine energy, seaweed farming and aquaculture<sup>160</sup>, and offset carbon emissions. Industries which use the marine environment should consider making voluntary commitments to investment in projects which enhance its natural capital through the new Scottish Marine Environmental Enhancement Fund<sup>161</sup>.

### Renewable Energy

Scotland will need to continue to maximise its potential in renewable energy onshore and offshore, especially in offshore wind, next generation technologies like floating wind, and water resources.

Scotland has an ambition to increase offshore wind capacity in Scottish waters from 1GW to 11GW by 2030<sup>162</sup>, with further major deployments continuing beyond 2030. Floating wind will be key to unlocking deeper water sites. The UK has 56% of the relatively limited supply of global floating offshore wind capacity<sup>163</sup>, with two operational test and demonstration scale projects in Scotland. The UK could deploy 1-2GW of floating wind in the period to 2030<sup>164</sup>. The total global market is expected to grow to at least 4GW in 2030 and 55GW in 2050<sup>165</sup>.

This will be an immense opportunity to build an internationally competitive domestic supply chain, create high-value jobs and transition workers from carbon intensive industries – if governments and

158 [integrated-energy-vision\\_30-nov\\_final.pdf \(ogtc.com\)](#)

159 [Microsoft Word – PolicyNote\\_OceanEconomy\\_FINAL.docx \(oecd.org\)](#)

160 [Scottish Salmon Sector Publishes Sustainability Charter | Scottish Salmon Producers Organisation](#)

161 [Scottish Marine Environmental Enhancement Fund \(SMEEF\) | NatureScot](#)

162 [Offshore wind policy statement – gov.scot \(www.gov.scot\)](#)

163 <https://www.gov.scot/publications/draft-offshore-wind-policy-statement/pages/4/>

164 [https://www.scottishrenewables.com/assets/000/000/475/floating\\_wind\\_the\\_uk\\_industry\\_ambition\\_-\\_october\\_2019\\_original.pdf?1579693018](https://www.scottishrenewables.com/assets/000/000/475/floating_wind_the_uk_industry_ambition_-_october_2019_original.pdf?1579693018)

165 <https://www.crownstatescotland.com/media-and-notices/news-media-releases-opinion/study-reveals-long-term-uk-floating-wind-potential-17-000-jobs-and-ps33-6bn-by-2050>

industry learn from previous disappointments. Due to the location of many projects, many of them could be based in regions of the country which most need them. This opportunity includes the refurbishment and remanufacture of existing wind turbines, as part of the circular economy.

There is a need to conclude the ScotWind Leasing round quickly to secure billions of pounds of investment and new supply chain and operations infrastructure. Consenting authorities which have the resources they need to deliver efficient and effective consenting processes will be important if the UK and Scottish governments' ambitions to increase offshore renewables capacity are to be achieved.

Future seabed leasing rounds and contractual agreements for projects should include minimum requirements for local content in equipment and people. The Offshore Wind Sector Deal includes a local content aspiration of 60%. Governments and industry must work together to build this capacity, including through a new flexible and tailored system of subsidies<sup>166</sup>.

Higher levels of renewable energy generation and accelerated electrification of much of our economy will create new challenges for the power system. The Committee on Climate Change has recognised the need for further investment in the capacity, flexibility and resilience of the grid and energy networks. There are several pumped hydro storage developments in planning or awaiting construction which can create economic opportunities in communities across rural Scotland. The UK Government should support a suitable market mechanism to enable investment in them.

### Carbon Capture Utilisation and Storage (CCUS)

Scotland is a potential world leader in CCUS because of the geology in the North Sea, existing infrastructure, and the experience and expertise of Scotland's supply chains and workforce.

CCUS in Scotland could play a key role in decarbonising Scottish, UK and European industry.

**The North Sea should be an international exemplar for the transition from a hydrocarbon basin to a net zero basin, the aim of the Transition Deal agreed between the UK Government and the industry<sup>167</sup>. Research by Wood Mackenzie has found the potential for a decarbonise, integrated energy system to more than double the economic impact of the basin, contribute £2.5 trillion to the UK economy and create more than 200,000 new jobs<sup>168</sup>.**

Oil and gas will remain a part of Scotland's energy mix beyond 2045 with some products and services still dependent on fossil fuels. Pioneering CCUS at scale will be essential to enable sequestration of high volumes of CO<sub>2</sub> and utilisation of CO<sub>2</sub> for new products and services. Scotland could capture a third of our annual industrial emissions today from the mid-2020s.

Scotland holds 35% of European geological storage resources suitable for CO<sub>2</sub>. CO<sub>2</sub> from Europe's industrial heartlands could be transported for storage in offshore sites in the North Sea – or for utilisation by industry in the production of animal feed, chemicals and biofuels.

Furthermore, Scotland's pioneering carbon storage services could be sold to other countries which lack similar domestic capacity. There are only 26 CCS facilities in commercial operation worldwide at present, but if all the new projects announced since 2017 proceed, global CO<sub>2</sub> capture capacity would more than triple<sup>169</sup> and the International Energy Agency has forecast that the need for CO<sub>2</sub> storage will grow from around 40 Mt/year today to more than 5000 Mt/year by mid-century<sup>170</sup>.

There will also be the potential for industry to relocate to Scotland to eliminate or store their emissions and achieve net zero – or to utilise captured CO<sub>2</sub> in new industrial processes.

166 Business Secretary sets out new subsidies system that works for the UK – GOV.UK (www.gov.uk)

167 North Sea Transition Deal – GOV.UK (www.gov.uk)

168 Plotting A Course To A net zero North Sea | Wood Mackenzie

169 Carbon capture, utilisation and storage – Fuels & Technologies – IEA

170 The world has vast capacity to store CO<sub>2</sub>: net zero means we'll need it – Analysis – IEA

Progress in the deployment of CCUS infrastructure in the UK has been slowed by two major barriers: capital costs and the lack of a commercial model. Regulation will be needed to create new markets and simulate innovation. Public investment can provide policy certainty and market confidence, support economies of scale and reduce risks to unlock private investment.

Developing a viable business model will require a carbon pricing mechanism which creates strong financial incentives for businesses to invest in reducing and storing their emissions.

The Acorn CCS Project would establish a CCS Hub in Scotland at St Fergus. This should be accelerated through the UK Government’s funding to create two CCS clusters by the mid-2020s and another two by 2030<sup>171</sup>, and through an integrated Scottish Energy Strategy<sup>172</sup>.

## Hydrogen

Scotland is one of Europe’s leading early adopters of hydrogen technologies and solutions for homes<sup>173</sup> and transport<sup>174 175</sup>. It has the opportunity to build a world-leading hydrogen economy with high-value jobs across energy, engineering, manufacturing and transport. The hydrogen economy could add up to £22.5bn of Scotland’s GDP and create up to 28,900 jobs by 2040<sup>176</sup>.

Hydrogen has many potential applications, including as an alternative, particularly for larger vehicles, to batteries in transport, and a replacement for fossil fuels in industry and heating.

The UK’s gas network companies aim to create the world’s first zero carbon gas grid by 2050 by speeding up the switch from natural gas to hydrogen for properties connected to the gas grid<sup>177</sup>. Significant technical and regulatory barriers to its use for

domestic and non-domestic heat will need to be addressed, including restrictions on its use in the gas grid. The National Transmission System may need to be upgraded, perhaps with dedicated hydrogen pipelines.

Levels of domestic zero- and low-carbon hydrogen production are very low at present and will need to be expanded vastly to meet domestic demand and capture future export potential.

The forthcoming UK Hydrogen Strategy and Scottish Hydrogen Action Plan<sup>178</sup> should scale-up both supply and demand, strengthen partnerships and improve coordination between key hydrogen initiatives<sup>179</sup>. The production of blue hydrogen from fossil fuels with CO<sub>2</sub> emissions captured, stored or reused, would also accelerate progress with green hydrogen from renewable energy. Incentives should be created for industrial scale energy users to adopt hydrogen-fuelled technologies. A national network of hydrogen refuelling stations should be rolled-out. Moreover, strong domestic supply chains with skilled people should be developed.

## Bioeconomy

The bioeconomy is the production of renewable biological resources from land and sea and the conversion of these resources and waste streams into valued-added food, feed, products and energy. Developing the bioeconomy can stimulate rural economy supply chains, increase innovation in rural areas and create good jobs, while addressing climate change, sustainable food production and fossil fuel dependency.

A significant challenge will be to transition away from petrochemicals as the key means or ingredients to manufacture chemicals, pharmaceuticals, fuels and everyday consumer goods.

171 The Ten Point Plan for a Green Industrial Revolution (publishing.service.gov.uk)

172 The future of energy in Scotland: Scottish energy strategy – gov.scot (www.gov.scot)

173 H100 Fife | Future of Gas | SGN

174 World’s first hydrogen double deckers to start their routes tomorrow in Aberdeen (aberdeencity.gov.uk)

175 Green hydrogen for Glasgow – ScottishPower

176 Microsoft Word – Hydrogen in Scotland – The role of Acorn Hydrogen in Enabling UK net zero (theacornproject.uk)

177 Gas Goes Green – supporting hydrogen – Energy Networks Association

178 Scottish Government Hydrogen Policy Statement – gov.scot (www.gov.scot)

179 Mission – Hydrogen Accelerator (st-andrews.ac.uk)

Grangemouth, centred on a major petrochemicals plant and Scotland's only crude oil refinery, is Scotland's largest and the UK's third largest industrial cluster, supporting thousands of direct and indirect jobs. The cluster also contributes 30% of Scotland's total industrial emissions.

Industrial biotechnology offer solutions to transform petrochemical-based industries along with CCUS. New biofuels can be developed from agricultural crops, while waste from local value chains can be used as feedstock. This will be a growth opportunity for Scotland due to the expertise, experience and infrastructure of its energy, life sciences and manufacturing sectors.

Scotland's National Plan for Industrial Biotechnology has set a £900m turnover target to be achieved by 2025<sup>180</sup>. The global market is projected to reach \$577bn by 2026<sup>181</sup>.

The transformation of the Grangemouth petrochemicals site into a biorefinery would be the key enabler, accelerator and cornerstone of an internationally significant Scottish bioeconomy. Private and public investment will be needed to pilot, demonstrate and scale-up facilities, with incentives, innovation support and a focus on addressing the UK's relatively high energy costs.

Industry should build sectoral and cross-sectoral partnerships to develop new supply chains for reuse materials or repairs, share best practice and pool and share resources or risks. Waste or by-products from one sector can be valuable resources for reuse in another sector. Public bodies can play an intermediary role to identify potential opportunities for collaboration.

## Land Use and Agriculture

Agriculture is the third largest employer in rural Scotland with 8% of the workforce. Scotland's farming produces products which have a domestic and global

reputation for quality and sustainability. It also supplies products for production in Scotland's key food and drink sector.

Agriculture is the third largest source of emissions in Scotland. These will have to fall by at least 35% by 2045 for Scotland to achieve net zero<sup>182</sup>. Importing more food would damage Scotland's rural economy, offshore emissions rather than end the climate crisis and threaten food security.

Following the challenges for agriculture of the UK's exit from the EU, Scotland's new farm support payment system will need to be designed to support its pathway to low emission production and potential to deliver a range of positive outcomes for biodiversity and nature<sup>183</sup>.

Changes in land use and management will be needed to play a pivotal role in Scotland's Climate Change Plan by offsetting emissions elsewhere in the economy.

**Transitioning appropriate farmland to mixes of food production, agro-forestry and peatland restoration could also attract investment and create new, well-paid jobs in rural areas<sup>184</sup>, as well as delivering benefits including flood protection, recovery of native wildlife, and healthy places for people to live, work and visit.**

Changes will be needed in the way food is produced, distributed and consumed. This should include the use of renewable energy and renewable biological resources, guided by the development of a new Scottish sustainable protein plan. It will also need to involve moving to low carbon logistics by reducing freight demand, shifting more food distribution from road to rail freight, increasing efficiency through logistics centres, warehouse management and fleet operations, and decarbonising Heavy Goods and delivery vehicles.

This transformation should be integrated with the delivery of Scotland's food and drink growth targets and investment in a modern processing capacity to

180 National-Plan-for-IB-2019-PDF.pdf (lifesciencesscotland.com)

181 Shaping Scotland's economy: inward investment plan – gov.scot (www.gov.scot)

182 Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf

183 e828e0\_59d8fc00569642acac0b21c1cd83186c.pdf (filesusr.com)

184 Nature-based jobs and skills for net zero – an initial assessment | NatureScot

increase the value of exports.

Scotland will have the opportunity to help feed the world's growing population sustainably. Scotland has scientific leadership in livestock genetic improvement programmes and in the gene editing of crops which can be designed to reduce greenhouse gas emissions. Unlike Genetic Modification, these techniques are based on processes that can happen naturally. They would improve food and the environment, reinforce the reputation of Scotland's larder for quality produce and create opportunities to export food and technologies. They should be supported through innovation and the regulatory framework<sup>185</sup>.

Scotland also has significant opportunities in R&D and export of digital, renewable energy and irrigation technologies for the indoor 'vertical farming' sector which is growing rapidly globally<sup>186</sup>.

## Mobility

Scotland has an ambitious series of targets to reach net zero in transport through behavioural change and technological advances in cars and vans, buses, passenger railways, lorries, ferries, and regional aircraft. Digitalisation and automation will also be key technological advances in global mobility<sup>187</sup>. While Scotland has a roadmap<sup>188</sup> and pilot projects<sup>189</sup><sup>190</sup> for these, its ambitions are less clear.

Transport's contribution to net zero will only be delivered if decarbonisation and digitalisation are brought together to support a shift to more people using public and shared transport as well as the decarbonisation of private vehicles. Scotland can be a living lab for technology and data-led transport solutions, such as Mobility as a Service, demand responsive transport and smart logistics, for which there are growing international markets.

The electric, hydrogen and digital infrastructure which

will need to be developed are discussed in the *Healthy Places to Live And Work* chapter and hydrogen section. The construction of these will offer major economic opportunities – as will the testing and manufacturing of specific vehicles, technologies and fuels across decarbonisation, digitalisation and automation.

Scotland should aim to develop tech sales into the global automotive supply chain. It should also build on its capabilities in the manufacturing and retrofitting of buses, ships, taxis and farm/industrial vehicles. This should be driven by the creation of a new circular or scrappage scheme to reuse or replace thousands of these vehicles with hydrogen and electric vehicles.

It should also aim to create testbeds for automated and decarbonised small planes and ships.

The development of sustainable aviation fuels will be vital to the reduction of emissions from the global aviation industry and, therefore, Scotland's domestic and international connectivity. Scotland has the industrial sites at St Fergus and Grangemouth<sup>191</sup>, and the renewable and waste feedstocks, to establish itself as a global hub for green aviation technologies and fuels. The UK and Scottish governments and industry should create refining and production facilities at these sites through investment, support for innovation and mandatory sustainability targets.

## Main Recommendations

### 1. Scotland should aim to be a leading location where globally critical net zero solutions are brought into being and capture fair shares of the benefits.

Governments at all levels, industry, finance, universities, colleges and innovation centres should attract and accelerate investment in leveraging strategic opportunities based on where Scotland's physical and knowledge assets offer comparative advantages and offer strong export prospects (such

185 The regulation of genetic technologies – Defra – Citizen Space

186 Scotland's first vertical indoor farm unveiled at Hutton Dundee site | The James Hutton Institute

187 Future of Mobility the transport system (publishing.service.gov.uk)

188 A CAV Roadmap for Scotland (transport.gov.scot)

189 <https://www.transport.gov.scot/our-approach/mobility-as-a-service/maas-investment-fund-mobility-as-a-service/>

190 Project CAVForth (transport.gov.scot)

191 SustainableAviation\_FuelReport\_20200231.pdf

as the North Sea transition, Blue Economy and bioeconomy), and agree binding commitments to maximise the home-grown opportunities for Scotland's businesses, people and places.

The UK Government should ensure a rising price on UK carbon emissions and progressively introduce a World Trade Organization-compliant carbon border tax on imports, with revenues reinvested in the innovations, infrastructures and natural restorations needed to achieve net zero and accelerate opportunities for clean growth.

Manufacturing Innovation Neighbourhoods should be created to capitalise on Industry 4.0 and 3D printing, net zero, the circular economy and 'remakeries', and the global focus on supply chain resilience, to strengthen, regenerate and modernise local productive capacity and increase investment in Scotland's 'industrial commons'.

## **2. Scotland should drive its productivity and innovation performance through its foundational economy and SMEs, as well as industries of the future.**

The UK and Scottish governments, colleges and universities, and industry should expand the demand and supply of innovation for the foundational economy and small and medium-sized enterprises (SMEs), for example via Innovation Vouchers, challenge competitions, outcome-focussed public procurement, Community Wealth Building, and management and technical skills development. These should deepen collaborations between businesses on business models, digital transformation and net zero.

The UK and Scottish governments, industry and universities, should increase spending on Research and Development (R&D) to 2.4% of GDP by 2027 to match the average for advanced economies then to 3% in the long-term. This should raise investment from blue skies to applied R&D, and level-up investments across the country.

## **3. Scotland should create a new generation of innovation ecosystems, Innovation Neighbourhoods, to catalyse place-based net zero growth.**

The UK, Scottish and local governments, businesses and local anchor institutions including colleges and universities should design and incentivise Innovation Neighbourhoods to stimulate and scale-up knowledge creation and diffusion, entrepreneurial and business collaboration, and skills formation across Scotland. These should link to place-based policies such as 20-minute neighbourhoods, Remote Working Hubs, 'Repopulation Zones', and circular economy exchanges and workshops.





# Learning Throughout Life

## Background

### What is this priority?

Skilled people are critical in every opportunity and challenge that Scotland faces. Countries with smaller populations have a bigger need to support all of their people to fulfil their potential.

How, where and why we learn and work has always evolved, but digital technologies have made changes in societies quicker. Further acceleration has come in the COVID-19 pandemic.

Over the next ten years, Scotland's population will continue to become older. By 2043, the number of people of working age is forecast to start to shrink<sup>192</sup>. Following Brexit, fewer people are likely to come to Scotland from overseas to work. Scotland will have to retain and attract skilled people, and support more of its people to get jobs and make the most of their talents.

International competition will continue to accelerate as more countries develop their economies. The pace of the transformation of societies and economies due to the need to end climate change and the use of technologies like Artificial Intelligence, data and biotech will increase.

Some established industries will be radically disrupted and some large employers will disappear. Some jobs may no longer exist. There will be far fewer 'jobs for life'. But there will also be many new jobs created by new businesses and businesses which are changing, for people with the skills the economy and society will need – like digital, green and health and care. The demand for social and emotional skills will rise due to the COVID-19 pandemic too<sup>193</sup>.

Learning and work in Scotland will need to change. We need to prepare people for job opportunities and support them to adapt to significant changes in their jobs and their careers. This includes workers, younger and older people, and people who currently do not have jobs. We will all have to learn to work far more closely everyday with technologies and machines<sup>194</sup>.

Scotland will need its employers, employees and educators to rise to the challenge of investing in and developing the skills of its people at all stages of their lives. These talents must be harnessed better and rewarded fairly in their workplaces to increase the prosperity of society.

Scotland should set an ambition to be a nation of learning (and earning) throughout life. Scotland should be renowned internationally for its skilled people, for fairness inside (and outside) of work, and for forging a just transition for its people in an era of economic change.

192 Migration: helping Scotland prosper – gov.scot ([www.gov.scot](http://www.gov.scot))

193 The future of work after COVID-19 | McKinsey

194 Carl Benedikt Frey (2019) *The Technology Trap: Capital, Labour and Power in the Age of Automation*

## How is Scotland performing now?

Scotland's population has been growing for nearly two decades and is at a record high of 5.46 million people. In recent years, this has been driven by people moving to Scotland, mainly from the EU and from the rest of the UK. However, the birth rate in Scotland is falling at the fastest rate of all of the countries of the UK. Scotland's population is ageing, with nearly one in five people aged 65 or older<sup>195</sup>.

The steady growth in Scotland's national population does not tell the full story. Scotland's population has been shifting from the west of the country to the east. It has also been growing strongly in and around Scotland's cities while declining in many of Scotland's rural areas. Scotland's major cities have been more attractive for younger people and have younger populations. This has created challenges both for centres of population growth and for areas of population decline. For cities and their regions there have been pressures due to the demand for housing and services. For rural areas there have been problems due a lack of skilled people available to work which has threatened the viability of businesses, organisations and services<sup>196</sup>.

More of Scotland's population are working than ever before. Over the last 10 years the number of people aged 65 and over in jobs has almost doubled. The gap between the numbers of men and women in work is still significant but it has continued to close over the last 10 years. However, the picture is not as positive for some groups in Scotland's society. **People in the minority ethnic population and – in particular – people with disabilities are far less likely to have jobs than Scotland's population as a whole. Nearly three-quarters of a million people of working age do not have a job and are not looking for a job, many of whom have long-term health conditions<sup>197</sup>.**

Scotland has a highly qualified and a highly skilled workforce. This has been improving over time. More people have a university or college qualification than any country in the EU. However, more than one in 10 people of working age have low or no qualifications. While these numbers had consistently been going down, progress has stalled in the last few years<sup>198</sup>.

Scottish education has historically had a strong reputation around the world. There are more world-class universities per head of population in Scotland than in any other country in Europe. The number of people going to colleges has been increasing again in recent years and nearly 95% of qualifiers moved into jobs, education and training. Many schools provide a good quality education for children. However, international studies suggest that progress across Scotland's schools has stagnated and is now around the average, especially in maths and science<sup>199</sup>. Children who grow up in poverty do significantly worse at all levels in schools, with the gap starting in early years and getting wider over time. This harms their life and work prospects<sup>200</sup>. While there has been some progress in closing this gap at Higher Level in the last decade, the difference in children achieving at least one qualification is still 36 percentage points and at Advanced Higher Level there has been scarcely any progress over the same period<sup>201</sup>.

Encouragingly, Scottish schoolchildren compare well with their international peers in their knowledge of global issues, how they relate to people from different backgrounds and take constructive actions in areas like sustainable development and improving the lives of others<sup>202</sup>.

**Compared with many other developed economies, the qualifications and skills of Scotland's workers have not been fully harnessed across our economy to improve its performance. Relatively high qualifications and skills levels and low productivity**

195 Scotland's Population | National Records of Scotland (nrscotland.gov.uk)

196 Internal migration in Scotland and the UK: trends and policy lessons – gov.scot (www.gov.scot)

197 Scotland's Labour Market: People, Places, and Regions – Statistics from the Annual Population Survey 2019 – gov.scot (www.gov.scot)

198 Future Skills Action Plan for Scotland: evidence and analysis annex – gov.scot (www.gov.scot)

199 Programme for International Student Assessment (PISA) 2018: highlights from Scotland's results – gov.scot (www.gov.scot)

200 www.povertyalliance.org/wp-content/uploads/2021/02/The-Poverty-related-Attainment-Gap-A-Review-of-the-Evidence-2.pdf

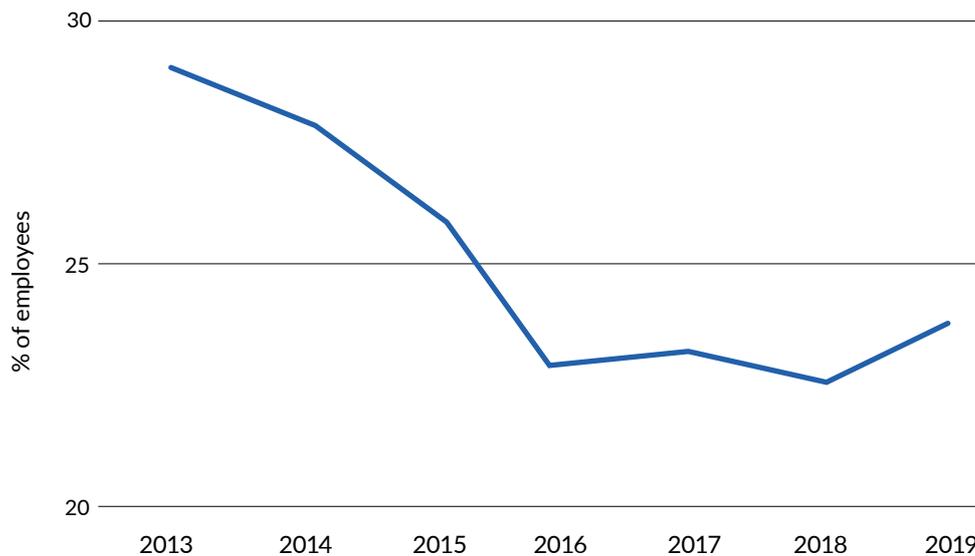
201 Election 2021: Attainment Gaps | Fraser of Allander Institute

202 Programme for International Student Assessment (PISA) 2018 – global competence: results – highlights – gov.scot (www.gov.scot)

**in the economy has resulted in skills under-utilisation<sup>203</sup>. Over a third of establishments report at least one employee with skills and qualifications more advanced than required for their current role<sup>204</sup>.** There has been little progress in increasing how productive people are in work in the past decade<sup>205</sup>.

2000s. Solo self-employment – including independent contractors and gig economy workers – has grown in the UK. These workers typically earn less than people who are employed and work fewer hours, although on average they report higher levels of wellbeing<sup>208</sup>.

Chart 9: % of employees who received on the job training in the last 3 months



Source: Scottish Government

This is partly due to under-investment in capital, our workforce and their skills. Just under 1 in 3 Scottish employers provide no training for their staff, with employers in the private sector, especially small businesses, even less likely to provide any training<sup>206</sup>. Yet only 1 in 5 of UK workers report feeling very well equipped to do their job to the best of their ability<sup>207</sup>. The number of apprentices in Scotland’s Modern and Graduate apprenticeship programmes has continued to grow with places offered for an increasing variety of occupations, however work-based learning is still far more common in countries such as Germany and Switzerland.

The forms of work people do have been changing, especially since the Great Recession of the late

Young workers are far more likely than older ones to be employed on zero-hours contracts<sup>209</sup>.

Concerns about ‘precarious work’ are part of broader concerns around the quality, dignity and security of some jobs in Scotland. Over one in ten Scottish workers, 350,000 people, are paid less than the real Living Wage, the minimum wage which meets peoples’ everyday needs<sup>210</sup>. Most people who live in poverty in Scotland are in a household where someone is in employment<sup>211</sup>.

As highlighted by Scotland’s Fair Work Convention, in the 5-year period prior to the COVID-19 crisis, there was no improvement in access to flexible working or in the number of illnesses caused by work, the

203 Future Skills Action Plan for Scotland: evidence and analysis annex – gov.scot (www.gov.scot)

204 National Indicator Performance | National Performance Framework

205 National Indicator Performance | National Performance Framework

206 Scottish Employer Perspectives Survey 2019: research report – gov.scot (www.gov.scot)

207 www.recruitment-international.co.uk/blog/2019/06/disengaged-uk-workforce-calls-for-bespoke-approach-to-training

208 What does the rise of self-employment tell us about the UK labour market? – Institute For Fiscal Studies – IFS

209 www.stuc.org.uk/files/Policy/Research-papers/precarityreport.pdf

210 www.povertyalliance.org/real-living-wage-increases-to-9-50-in-scotland

211 www.jrf.org.uk/report/poverty-scotland-2019

use of zero hours contracts increased, the effective use of skills decreased and workers' participation in workplace learning decreased<sup>212</sup>.

The COVID-19 pandemic has fundamentally changed the ways in which the majority of people have learned and worked. Remote learning in digital classrooms and virtual workplaces became mainstream in 2020. This has further exposed urgency of improving digital skills and inclusion across society – progress is being made, but it is not at present quick enough.

Many workers and employers have seen the advantages of flexible working and a better work-life balance for people, which they want to maintain when life and work return to normal. However, average working hours and the risk of staff burnout have increased significantly<sup>213</sup>.

Moreover, the experience has been very different for people who cannot learn and work at home, who live in poverty or who have caring responsibilities – most of whom are women.

While there has been no large increase in people without jobs, unemployment is expected to rise when the UK Government ends its major financial support for employers to retain jobs.

## What are the opportunities and risks?

### People

As Scotland's population continues to age and its working age population starts to shrink within the next 25 years, employers will find it increasingly difficult to recruit the skills that they need. Because other countries face the same issues, competition for skilled people will intensify. The end of free movement with the EU and the UK's immigration policies will increase their challenge. Some rural areas have been losing people for years and are likely to be hit hardest.

If there are increasing skills shortages, businesses

would find it tougher to grow, government will find it more difficult to provide services and places will find it harder to stay prosperous. There will not be enough workers to care for an increasing number of elderly people in care.

Scotland will need to make the most of all the skills and talent it has available, including those who face multiple disadvantage. We need to better support people with long-term health conditions or disabilities into jobs, and those who are beyond the traditional working age who want to carry on in jobs or voluntary work. The use of technologies can enable a wider group of people to find and perform these jobs. Many can offer skills, ways of thinking and insights which would benefit businesses and the economy<sup>214</sup>. As Artificial Intelligence is increasingly deployed across many sections of the labour market, including many professions, the added value of these will increase. For example, autistic people and people with other neurodiversity are already represented disproportionately highly in Scotland's gaming industry.

If Scotland can meet people's wishes for a high quality of learning and work, with a great quality of life, place and environment, it can retain and attract people from other parts of the UK and other countries.

### Net Zero Carbon

Ending Scotland's contribution to climate change will transform all aspects of our lives and work. The expansion of green industries – for example, renewable energy, energy efficiency, recycling and the circular economy, natural resources conservation and restoration, and environmental consultancy – will only be possible if we take up the immense opportunity to create skilled, well-paid and secure jobs for people in every part of Scotland. Making green jobs our 'new normal' in every industry will increase resilience in both recessions and pandemics.

Investment by the public and private sectors in areas which will require lots of jobs – such as the bioeconomy, the decommissioning and recycling of

212 Fair Work in Scotland Report – The Fair Work Convention

213 [www.robertwalters.co.uk/content/dam/robert-walters/country/united-kingdom/files/whitepapers/Burning%20the%20candle%20-%20a%20guide%20to%20preventing%20workplace%20burnout.pdf](http://www.robertwalters.co.uk/content/dam/robert-walters/country/united-kingdom/files/whitepapers/Burning%20the%20candle%20-%20a%20guide%20to%20preventing%20workplace%20burnout.pdf)

214 A Fairer Scotland for Disabled People: employment action plan – gov.scot ([www.gov.scot](http://www.gov.scot))

oil rigs and older windfarms, building and maintaining active travel infrastructure, rail electrification, reducing emissions from buildings, peatland restoration and the remanufacturing of products – should go hand-in-hand with programmes to train and develop workers and people not in work.

Oil and gas production and the oil and gas supply chain is a significant contributor to the Scottish economy and a major employer, particularly – but not only – in North East Scotland. The industry is mature and will decrease over time as production declines. Scotland also has growing green industries, including parts of the oil and gas supply chain which have diversified into renewable energy.

However, if this transformation becomes an economic shock rather than a just transition, or Scottish industries do not win enough of the work, it could seriously threaten jobs and earnings. There will be a need to build on Scotland’s current industrial strengths, to build new supply chain capacity, to support businesses, organisations and people to make changes to their areas of work and to develop new skills. In short, we should not let change happen to us but proactively engage and support it in ways that are beneficial to individuals and society.

#### Fourth Industrial Revolution

Digital technologies will continue to change the economy at an accelerating speed. This is likely to mean that there is constant disruption in one or more parts of the economy. More people will face more frequent and greater changes in their jobs throughout their careers. The Bio Revolution is merging demand for digital skills with biological skills, such as genomics, molecular biology, biochemistry and neuroscience.

Scotland’s digital technologies industry is itself a rapidly growing sector of the economy which will offer tens of thousands of job opportunities. Furthermore, it has been forecast that Artificial Intelligence will

help to create slightly more jobs than are cut across the economy. However, for some sectors it will be far more positive, while jobs in other sectors will substantially fall<sup>215</sup>.

When businesses have tried to recover from previous recessions they have saved money by automating more tasks and laying off workers. There are signs that this will happen following the COVID-19 pandemic<sup>216</sup>. Middle-skill and middle-income jobs have fallen in recent years, which has forced more people into lower paid jobs<sup>217</sup>. However, automation after the Covid-19 pandemic may make it more difficult for low-wage workers to find other low-wage jobs<sup>218</sup>. People without the skills required, especially digital, will find it ever more difficult to get a job.

There will be a need to equip young people with the skills and attributes that they will need for these jobs and careers, as well as equipping employers to recognise the talent, values and expectations of young people. There will also be a need to provide the skills development and social protections for the estimated nearly 400,000 workers who will need to retrain and almost two and a half million workers who will need to develop new or improve existing skills as their jobs are changed. These are not new issues, but they now require policies which match the scale of the challenges, with stretching targets, and coordinated and funded actions.

#### Nature of Learning and Work

The ways we work and learn will not go back to how they were before the COVID-19 pandemic. While locations of work will not be different for frontline workers in a range of sectors – such as manufacturing, personal services, construction, and health and care – the 9-to-5 physical office space is unlikely to be as dominant again. More work and learning will be done remotely or from home, and we will communicate and collaborate with people using technologies. Between 1 in 4 and 1 in 5 workers may work remotely or from

215 <https://www.pwc.co.uk/who-we-are/regional-sites/scotland/press-releases/More-than-500000-Scottish-jobs-could-be-created-through-Artificial-Intelligence.html>  
 216 The future of work after COVID-19 | McKinsey  
 217 Technological Unemployment: Much More Than You Wanted To Know | Slate Star Codex  
 218 The future of work after COVID-19 | McKinsey

home between 3 and 5 days a week<sup>219</sup>.

Some businesses and organisations will be able to reduce their property costs and access a wider range of skills from across society and from different parts of Scotland and beyond. Some people will be able to adopt new working patterns or split their jobs to better meet their individual needs and preferences, including, for example, disabled people who are, at present, not able to access or get jobs.

However, as the experience of the COVID-19 pandemic has shown, there is a risk that for some other people a lack of contact with their colleagues and an ‘always on’ culture will increase their levels of stress and damage their mental health. If an employer can access skills digitally from anywhere in the world, increasing remote working will also threaten more people’s jobs.

Furthermore, changes in the nature of work risk widening the divisions between those who can work remotely or from home and those who cannot, and those in secure work and those who are not. Some people may be forced to adopt working patterns they do not want or to take more than one job.

These risks – and the key roles during the COVID-19 pandemic played by many lower-paid workers and by people in their communities who are unpaid – do give us the opportunity to reconsider how work should be valued by society, and made fairer and more fulfilling for all.

Many of the same issues face places of learning and learners. There is the opportunity to build on the rapid shift to online learning by schools, colleges, universities and training providers in the COVID-19 pandemic. More people will be able to access a mix of face-to-face and remote learning when and how they need it. However, the kinds of courses people want will change, there may be fewer international students, and Scotland’s places of learning will face increasing competition from businesses and their education peers in the global market for education. The COVID-19 pandemic has revealed that the virtual

learning environments which had been developed in Scottish educational institutions following considerable investment are often no longer state-of-the-art and will need further upgrading.

## What needs to change for Scotland to make progress?

### Work

Technology platform-based businesses have re-imagined work in the last decade – with government<sup>220</sup> and employment law<sup>221</sup> (often belatedly) responding to these changes. This has been largely due to governments in the UK being hesitant about making policy interventions in the workplace. A result has been that discussions about skills have often been blind to whether or not people are able to make best use of them in their workplaces. This reluctance on the part of governments had started to be overcome, especially in Scotland with its fair work agenda.

Following the COVID-19 pandemic, with the expansion of remote and home working, re-imagining work should become a collective endeavour for employers, employees and governments. Work and workplaces will be transformed over the next decade thanks to the incorporation of technologies such as Artificial Intelligence, the need to modernise most of Scotland’s commercial and industrial buildings to meet climate change targets, and the rise of remote working. Rather than react to changes in the market, Scotland should have a vision and plan for its workplaces, and how people will be able to make the fullest use of their skills in them.

Employers will need to offer workplaces and locations of work which are attractive for their employees and potential employees to retain and attract the skills that they will need to be successful. Purposeful businesses understand that workers value a strong sense of meaning and community in their day-to-day work. People – especially younger people – are often motivated by work which makes a positive difference to society and to the planet, such as by being environmentally friendly. Government should support

219 The future of work after COVID-19 | McKinsey

220 Good work: the Taylor review of modern working practices – GOV.UK ([www.gov.uk](http://www.gov.uk))

221 Uber drivers are workers not self-employed, Supreme Court rules – BBC News

these businesses by creating the dynamic conditions in the Scottish economy which make it attractive for purposeful businesses to invest in and grow their businesses here.

A closer partnership between employers, workers and government should be formed to develop the plan for Scotland's workplaces and take forward the actions agreed within it.

Building on the Scottish Government's fair work agenda and its plan for a new Centre For Workplace Transformation, it should provide significant funding for a partnership that will support employers and their workforces to jointly develop workplaces which are characterised by progressive leadership, fair work and innovation.

Working patterns and workplaces should be increasingly flexible and diverse, but they should all be designed around improving business and organisational performance as well as people's skills and wellbeing. With a diversifying mix of people and widening range of ages within workforces, work will have to meet the needs of people, such as caring, in different circumstances from youth to older age. Employers and their workforces should be encouraged to pilot new working patterns, best practice should be shared, and government, trade unions and employers should jointly produce guidelines.

For remote workers, human contact will still be important to discuss work and provide support. Government and employers should develop mixed use and remote working hubs to bring workers together in communities, near services like skills development and childcare. **Ireland's new high-profile Our Rural Future framework will invest strategically in a network of up to 400 remote working hubs in rural and urban areas, offering shared back-office services and a centralised booking system, and creating an entrepreneurial ecosystem to encourage business start-ups, mentoring, collaboration, cross-fertilisation and knowledge spill-overs<sup>222</sup>. Scotland should develop a comparable network.**

There is a need for a New Deal between government,

employers and employees on the jobs market. The UK's flexible labour market has benefited some employers and some workers, helping to create new jobs in new, fast-growing sectors and maintain higher employment levels than some other European countries. As changes in the jobs market become more rapid, for example due to digital technologies, flexibility for employers and especially for people will continue to be important. However, this will need to be matched by greater protections for workers from the negative impacts of flexibility and with more active support for people to stay in work or find new jobs. Unemployment benefits in the UK are relatively low compared with most European countries<sup>223</sup> which can make it more financially challenging for people to retrain for new jobs.

Nordic countries have struck a successful balance between a flexible labour market and active labour market policies. During the COVID-19 pandemic, Germany's Kurzarbeit system – in which private sector employees accept a temporary reduction in working time and pay, with the government making up for all or part of the lost wages – has again helped to protect jobs. The new deal between government, employers and employees should include similar policies.

The UK and Scottish government should also consider the case for a Job Guarantee Programme which would offer socially-useful jobs to anyone willing and ready to work, but unable to secure a position. This would expand at times of economic need and create a pool of labour which could, for example, enable government to scale-up health and community services rapidly in future pandemics or net zero priorities.

There is a need to rebalance workplace relations with more robust safeguards to better protect, support and value all workers in all occupations in all sectors of the economy. Fair and responsible employers and business models will be able to thrive on this playing field.

We should maintain the sense of control, flexibility and wellbeing which attracts many self-employed workers, but ensure that they have a safety net if economic conditions deteriorate. **The UK Government should equalise employment rights and protections for all**

222 gov.ie – Our Rural Future – Rural Development Policy 2021-2025 (www.gov.ie)

223 Welfare\_States\_Touchstone\_Extra\_2015\_AW\_Rev.pdf (tuc.org.uk)

**workers to ensure that self-employed workers and workers in the gig economy have equal access to the minimum wage, sick pay and holiday pay. While some workers choose the flexibility offered by zero-hours contracts, exploitative zero-hours contracts should be banned.**

High-quality careers advice should be extended to everyone for all stages of their lives and careers. Accessible support and advice services should be provided within communities for the self-employed. High Street buildings left empty after the COVID-19 pandemic could be repurposed.

Government support and subsidies for businesses will need to be targeted. They should be directed to businesses and organisations with these values. The Scottish Government should implement fair work First criteria and conditionality in all public sector contracts, procurement and licensing. The funding available should be sufficient to support businesses in the implementation of the criteria.

We should be ambitious about raising earned income, above all for the lower paid. However, it must be understood that many organisations will only be able to afford this if their productivity increases, which will require significant investments in areas such as technologies and skills, and their other costs, not least those controlled by government including taxes, are kept in check. Workers should be given more say over when they are paid, for example being able to choose to be paid weekly or fortnightly rather than monthly<sup>224</sup> or to draw down some pay on demand<sup>225</sup>.

Based on this partnership, its commitment to fair work and its growing technologies sector, Scotland will have the opportunity to demonstrate leadership on Artificial Intelligence technologies and access to collective data in the workplace. It should develop ethical standards and guidelines. It should also promote the opportunity for Scottish technology companies to develop products which meet these high ethical standards and support Scotland's public services and businesses to increase productivity while increasing wellbeing.

There can be a mutually reinforcing positive relationship between levels of innovation and levels of job quality at both country and company levels. Trade union representation can play a major role in making this relationship a positive one<sup>226</sup>. There will be a need to reduce fears among workers about the impact of Artificial Intelligence and robotics technologies on their jobs, show the benefits to them such as the automation of tasks<sup>227</sup>, and familiarise them with how to use them positively.

The Scottish Government, STUC and trade unions, with input from employers and the technologies sector, should develop an Innovation Lab, supported by significant funding from the Scottish Government, to improve understanding and skills among workers and employers about these technologies. A model which should be considered is the HK Lab, a project of Denmark's HK trade union. Working with commercial partners, this develops practical ways of demonstrating the benefits of new technologies.

Scotland must support everyone in its society to flourish and make best use of their skills. The current waste of talents is unacceptable. It will also be unsustainable with an ageing population. This will be good for employers because teams, in which people with a diversity of backgrounds and perspectives collaborate, are better able to understand their customers, innovate and come up with (profitable) solutions to problems within society and of the planet. It will also reduce the overall costs of providing benefits and protect the fabric of our society.

There must be equal access for all to learning and jobs and equal opportunities to progress in work. There will be a need to increase all forms of diversity in workforces across the economy by building on successful action by government, businesses, organisations and sectors. Employers should review their recruitment practices for unconscious bias and make sure that they recruit a diverse workforce. People from these backgrounds often have skills and attributes which existing and often automated recruitment processes do not recognise so a system

224 A new settlement for the low paid • Resolution Foundation  
225 ey-on-demand-pay.pdf

226 IER – research project – Research to Inform the development of an employment relations model in Northern Ireland (warwick.ac.uk)

227 www.forbes.com/sites/bernardmarr/2017/10/16/the-4-ds-of-robotization-dull-dirty-dangerous-and-dear/?sh=246a3de83e0d

should be developed which includes informal and non-formal learning.

**This vision for the workplace will only become a reality by raising leadership and management skills to the levels of the best. One of the reasons that the UK has a larger gap than some other countries between its best businesses and a 'long tail' of businesses with low productivity is the differences in their management skills and practices<sup>228</sup>. There will need to be a focussed effort close this gap.**

Further accessible, bitesize learning should be developed by colleges, universities and other peer to peer providers for leaders and managers, especially from SMEs and the third sector, offering distance and part-time Diplomas on subjects such as productivity processes and organisational resilience. The leadership programmes offered by Scotland's enterprise networks, business schools and business networks should include opportunities to learn from international peers, including online meetings and short international business visits.

The Nordic Leadership Model is highly regarded for the way in which employees are given a voice in decision-making and the opportunity to take the initiative with their work. Scotland's business schools should explore international partnerships with business schools in order to develop more of Scotland's leaders and managers in this model and mainstream the teaching of fair work and progressive working practices. This should also be a priority for staff and student exchanges as the Scottish Government considers how Scotland can retain the benefits of the Erasmus+ programme.

**Scotland should also aim to interest experienced managers and entrepreneurs from overseas in opportunities in Scotland. It will need to articulate a clear and compelling offer – and offer comprehensive support – to attract people to live, work and lead businesses or organisations here and not elsewhere. Ireland's Back for Business initiative<sup>229</sup>, aimed at fostering and supporting entrepreneurial activity among recently returned**

**emigrants and those planning to return, is a model which could be replicated.**

## Skills

Scotland has long talked of the need to extend its current important focus on pre-employment education and early-career skills to lifelong learning for everyone at all stages of their lives and careers. The opportunities and risks for people and employers caused by longer working lives and changes in jobs due to digital technologies and the transition to a green economy now make this transformation in how we think about and invest in learning an urgent priority.

We should aim to increase participation in lifelong learning significantly to the levels of countries such as Sweden, Finland and Denmark<sup>230</sup>, and learn from their cultures and systems. In Sweden, people in work and people who are losing their jobs, for example due to automation, can access opportunities from job security agencies (partnerships between trade unions and employers) to change their skills. In Germany, workers are entitled to paid leave for education, which does not have to be related to their job, in addition to their annual leave.

Scotland will need to raise both public and private investment in our people to expand adult learning opportunities for those who are in-work and at middle or later stages of their career. There will be a need for a new culture, models of investment and a system of employment laws and practices in which people are supported to improve their skills regularly or retrain for new jobs if their job changes.

Government should expect that businesses and organisations which benefit from public support for inward investment or which secure a public contract make a contractual commitment to investment in skills.

**Participation in work-based learning opportunities will need to be scaled-up substantially, including working with employers to develop them for more subject areas and sectors. This will be a key building**

228 Productivity puzzles (bankofengland.co.uk)

229 Back For Business – Home

230 www.scdi.org.uk/policy/skillsleadershipgroup

**block for an economy with better skills, productivity, jobs and wages. This will include building upon Scotland’s apprenticeship family to make sure that it offers the places, skills, jobs and flexibility that people and businesses (including SMEs) will need and ensuring barriers to expanding the take up of the scheme are addressed.** The UK Government has recently proposed new flexi-job apprenticeships for apprentices to work across a range of employers and with different employers in sectors with flexible employment patterns and short-term roles in which individual businesses have struggled to offer a full apprenticeship<sup>231</sup>.

It will be critical that Scotland develops a demand-led, high-quality, diverse and flexible offer. Scotland’s workers will need to be able to direct and access learning and development opportunities. Most workers will be unable to fund their own learning fully but will have a contribution to make. Government and employers will therefore have to work together to raise levels of investment in the workforce, building on the Young Person’s Guarantee and the National Transition Training Fund. The flexibility, scale and ambition of the Flexible Workforce Development Fund should be enhanced. There should be greater transparency about what the apprenticeship levy has funded and firms which pay the apprenticeship levy should be able to transfer funds to their supply chains.

**Moreover, there will be a need to develop a new investment fund which is available to all. The Scottish Government should create an Upskilling & Lifelong Learning Fund which delivers a universal right to lifelong learning for Scotland’s people. It should enable every adult in Scotland to fund changes to or improvements in their skills at any stage of their life or career.**

People could potentially choose to use the Fund to partly or wholly fund a diversity of bitesize, modular or more traditional learning opportunities, if and when they need them, from colleges, universities, Community Learning and Development (CLD) organisations and voluntary organisations, or other accredited learning providers, digitally or in-person. For example:

- Bitesize digital upskilling courses in their early career in their 20s; and then,
- A further or higher education qualification to develop their leadership and management skills through part-time study in mid-career in their 30s or 40s; and then,
- Online or distance learning from institutions or businesses globally to reskill in late career in their 50s or 60s to keep pace with technological change or support career change, perhaps in response to redundancy or sector growth and decline

**A new Skills Wallet for all should be created, of which the Fund would be a central part. The Wallet would give every citizen a personal learning account through which they can combine and draw down public, business and personal funding throughout their lives and careers.**

A key challenge will be to build demand from people, from all backgrounds and at all stages of their careers, to understand the value of and be motivated to participate in learning. Scotland’s National Retraining Partnership of employers, unions, colleges, universities and training bodies should be tasked with drawing up a consultation on how this can be achieved. Nesta’s Mapping Career Causeways project which is applying data science to make recommendations on job transitions and retraining to workers, especially in jobs which may change or be lost as a result of automation, could offer insights into the stimulation of demand.

Scotland’s universities, colleges and CLD organisations need to accelerate the development of their ability to offer short courses in a flexible way to enable more people to access skills learning. More modules from existing undergraduate and postgraduate qualifications will need to be unbundled to offer ‘micro-credentials’ of a high level and quality. The digitalisation of what have been less digital jobs will mean that more people need training from colleges and universities as well as on-the-job training and industry experience.

Current funding models for higher and further education will need to be reformed to support and incentivise further progress, with colleges and universities given more flexibility to respond to what

231 Flexi-job apprenticeships consultation (education.gov.uk)

people want. Green industries and jobs will vary between regions depending on local opportunities and needs so education and skills training providers will need to have the flexibility to meet them. The Scottish Funding Council's ongoing Review of Coherent Provision and Sustainability provides a significant opportunity to begin a process of reform to achieve these aims.

There will also be a need to make it simpler than it currently seems for learners, those advising them and employers to understand and navigate learner pathways or career journeys.

New, more flexible approaches to student loan funding will be needed as the options for learning become more personalised, diverse and flexible. For example, it could be tailored to support young people who want to start a business and learn at the same time. Social innovation opportunities should be available in all education and training, including all apprenticeships.

Skills development at all ages and stages must be inclusive of all learners and all communities by improving access, widening participation and increasing diversity. It must be personalised wherever possible to individual needs and priorities. An Adult Learning Innovation Challenge Fund should be created for new approaches to reach groups who, at present, are hard-to-reach, with funding open to CLD organisations, voluntary organisations, training providers, colleges and universities, potentially working in partnership with the technologies sector. CLD options would enable disadvantaged adults to access flexible support from a partnership of college, CLD and voluntary sector staff before they progress to further education qualifications.

Scotland should harness the value of wisdom in the workforce – increasing 'healthspans', utilising technologies and changing working practices to enable, support and train those older workers who want or need to work for longer. This would also help employers to improve their products and services for older consumers in ageing societies at home and around the world. Employers should also ensure that the knowledge of experienced staff is passed on to

younger workers by earmarking more of their time to training colleagues as they approach retirement. Mentoring of a younger worker or entrepreneur by an experienced counterpart can be beneficial for both the mentee and mentor, and help to increase the rates of successful innovation and start-ups.

**The opportunities and risks of the changes in the nature of learning and work, and the unpredictability of the demand for jobs in the future due to the Fourth Industrial Revolution and net zero Carbon, mean that we need to focus on not only when and how skills are learned, but which skills are learned. To thrive in this changing world of work, people will increasingly need a different set of skills, known as 'meta-skills'.<sup>232</sup> These skills will include:**

- **Self-management – for example, adaptability and resilience**
- **Social intelligence – for example, collaborative skills to work with diverse teams; and**
- **Innovation – for example, creativity**

**These skills and attributes, including the ability to learn and relearn, will be needed across the labour market so developing them will not only increase the adaptability of individuals to different roles over the course of their careers, but wider societal resilience and wellbeing, especially in times of economic disruption. They will need to be integrated at scale in all learning and employers' recruitment, training and workforce planning. These must be sensitive to the diversity of needs of people at different stages of their lives and in different circumstances to improve their meta-skills. Fostering meta-skills will build Scotland's human capital and help organisations shift their mindsets from survival to "the pursuit of thriving"<sup>233</sup>.**

Embedding Interdisciplinary Learning, which combines different disciplines to focus on an issue, across education and skills would support people to gain these higher-order skills. There will be a need to develop quickly and easily understood language, and formal qualifications, by the Scottish Qualifications Authority and others, to describe them that can be used to engage employers, workers and learners.

232 [www.skillsdevelopmentscotland.co.uk/what-we-do/skills-planning-alignment/skills4-0](http://www.skillsdevelopmentscotland.co.uk/what-we-do/skills-planning-alignment/skills4-0)

233 [2021\\_human-capital-trends.pdf \(deloitte.com\)](https://www2.deloitte.com/uk/en/pages/industry/articles/2021-human-capital-trends.pdf)

Digital, data, green and (after the COVID-19 pandemic) health skills will also be needed by everyone. Core knowledge and skills in these areas should be built across all learning and skills training and development. Flexible work-based learning models will need to be scaled up significantly.

Furthermore, by aiming to train a larger number of people who are most interested in these areas to a higher level and encouraging them to share their knowledge, it will be possible to spread understanding more widely in their homes, workplaces, communities and society.

Finland has pioneered this approach in Artificial Intelligence basics, initially to 1% of its own people and now to 1% of the world's population<sup>234</sup>. This includes a specific focus on courses for women and older people. Scotland should introduce a free-access online course to familiarise a large part of Scotland's people with Artificial Intelligence technologies and issues.

Green jobs will be a mix of new and emerging jobs that relate directly to the transition to net zero, jobs affected by the transition that will need enhanced skills and competencies, and existing jobs that will be needed in (many cases significantly) greater numbers in the transition.

All workers will need new green skills to shift to new, more sustainable business practices. People in all jobs should be able to identify how they support a low carbon economy. These skills will include knowledge to understand climate change, the impact of their work and how to reduce emissions and waste and improve nature – at home, at work and in the community.

Workers in high emissions sectors whose jobs will no longer be possible in the future will need support to transition into new jobs in growing, low emissions sectors as part of a just transition.

This transition should sit within a wider social change – sustainability should be everyone's business. Scotland must find bold ways of inspiring people to act for the common good and harnessing the ambition, passion and talent which exists across society. Scotland

should coordinate a voluntary, accessible and inclusive 'National Service for net zero' programme.

This should match people with employment opportunities in green sectors of the economy or volunteering opportunities in local communities. A mix of paid and unpaid, short-term and longer-term, formal and informal opportunities could be provided, but with alignment to the highest standards of fair work. Young people could, for example, choose to develop their green skills and explore a green job in a gap year, while older people could participate in the programme to learn new skills following loss of a job or time away from work. Their learning and development would be accredited, and their skills would be attractive to employers.

People moving to Scotland from the rest of the UK and other countries have made a highly-valued contribution to Scotland's economy and society. While supporting more people into work will provide new skills at a time when the end of free movement of people between the UK and the EU is leading to skills shortages, Scotland will still need, and benefit from, the attraction of talent, especially as its population ages. Its distinctive needs should be met in a differentiated system of immigration for Scotland which makes it an attractive destination. Ways of facilitating migration to remote and rural areas should also be piloted and rolled out<sup>235</sup>.

Healthy places to live and fair work will be key factors in the choices that people will make. The ability to combine work with access to Scotland's environment and culture will be attractive to people from the rest of the UK and other countries. The availability of quality housing and public services in their communities, such as childcare, will be especially important for working age families. However, incentives and support for younger workers and workers with key skills, including business leadership, to stay or relocate to Scotland will also need to be considered.

The Scottish Government's new Talent Attraction and Retention service will need to be able to compete with countries such as Ireland which are highly successful in attracting and retaining workers and their families, and

234 Elements of Artificial Intelligence course gives basic introduction to AI | Shaping Europe's digital future (europa.eu)

235 Designing a pilot remote and rural migration scheme for Scotland – analysis and policy options: our response – gov.scot (www.gov.scot)

attract people to the proposed Repopulation Zones in those areas facing acute decline in their populations discussed in the *Healthy Places To Live And Work* chapter.

## Education

The changes brought about in Scottish formal education by the COVID-19 pandemic provide a platform to reimagine it and renew its ambitions for excellence and equity to meet future challenges.

The most critical skill for children to learn will be the ability to learn new skills throughout their lives – but this will only be valuable to them in the long-term if an appetite to learn is also instilled. As the pandemic has illustrated, many of the challenges and opportunities in the 21st century will require an ability to make connections across learning – Interdisciplinary Learning. This will need to be embedded, in age-appropriate ways, in all learning across education.

The evidence shows that the impact upon children of their early years is critical for their whole lives affecting not just education but health. The expansion of free early learning and childcare hours, and the proposals to extend eligibility to younger children, have been very welcome but it will require continued investment in facilities and, especially, staff<sup>236</sup>. **Learning for all children in early learning and younger children in primary schools should become play-based and should regularly take place within the natural environment if possible. Where access to nature is not nearby, arrangements should be made by education authorities and schools to make it possible.** Creativity should be nurtured in children at all stages of education.

Literacy and numeracy will remain fundamental skills and improvements in standards will urgently need to be made. However, learning digital and green skills, as well as about digital and climate change issues – digital and carbon literacy – will be as important for young people. Technologies such as Artificial Intelligence, Virtual Reality and Augmented Reality should become commonly used by children in their classrooms across

a wide range of lessons. **Significantly scaling up Science, Technology, Engineering and Maths (STEM) skills, especially coding and software programming, in all learners will be a key part of equipping young people for both economic opportunities and social challenges. Social innovation and entrepreneurship skills should be nurtured among all learners.**

Some children in the senior phase of secondary schools have had a reduced choice of subjects in recent years. Children should be able to choose a broad education so that they can draw from different subjects to deepen their learning and prepare for the increasing complexity of issues and industries – like the ethics of Artificial Intelligence or climate change. School-College Partnerships and Foundation Apprenticeships can provide powerful opportunities for senior phase pupils to develop up-to-date industry experience and skills whilst still at school. There is a need to continue to reduce early school leaving and support early entrants to the jobs market with access to continued learning.

Exams are still a major way of assessing how well children have done in their learning. The cancellation of exams during the COVID-19 pandemic has prompted discussion about whether this should continue to be the case, especially as employers increasingly value skills such as creative-thinking, teamwork and the ability to make connections between different subjects. Exams should continue to have a role, at least in the short term, but there will be a need for qualifications to be largely based on (validated and verified) assessments of the progress made by children in learning knowledge, competences and skills through their course work. The OECD's Independent Review of the Curriculum of Excellence, which will be published this summer, will include recommendations on the future of assessments<sup>237</sup>.

Teachers will need to be able to spend more time with pupils on these higher-value activities. Building on the rapid adoption of technologies to enable remote learning, there is the opportunity to incorporate a range of technologies into the education system to transform support for teachers and learning. This is a moment of change which must not be let slide. All

236 Realising the Ambition | Learning resources | National Improvement Hub (education.gov.scot)

237 OECD Independent Review Of Curriculum For Excellence 2020-2021 – Initial Evidence Pack (www.gov.scot)

technologies have had promising results in enabling personalised learning and in alleviating some of the administrative tasks for teachers. As part of the delivery of its Scotland's AI Strategy, the Scottish Government should encourage the tech sector to develop safe and effective AI applications to help deliver the Curriculum for Excellence and ensure equitable access to AI technologies in all schools<sup>238</sup>.

As with universities and colleges, schools and teachers will need to have more flexibility over their funding to experiment with new ways of learning which work best for their communities.

There will be a constant need to improve the digital, carbon literacy and outdoor learning skills of and resources for the full teaching workforce, and increase their understanding of how to teach Interdisciplinary Learning. There is a specific need for further action now to train and recruit more computer science teachers through the Education and Talent pillar of Scottish Technology Ecosystem Review<sup>239</sup>.

The Developing the Young Workforce programme has improved partnerships between some employers, schools, colleges and universities, and made it easier for young people to move within and between education, training and jobs. The interactions between employers and education should be examined closely with all unnecessary barriers to partnerships removed. There is a need to increase knowledge in education of local and national industry opportunities and the skills which are in demand, and for this to inform what children learn in classrooms. Employers should be encouraged to actively develop their own talent pipelines whilst supporting young people develop industry recognised qualifications in their senior phase in schools and offer the opportunity for entry into the workplace via work based learning route of Foundation Apprenticeships which have been developed to support Scotland's growth industries. Central hubs and resources should be provided to simplify the development and deepening of these relationships. The potential to learn from other models, such as Germany's apprenticeship system, should also be considered.

Just as – for many people – the COVID-19 pandemic has broken down the barrier which separated home and work, it has also dismantled the divide between family life and education. The priorities set out in this chapter, and across the Blueprint, can best be achieved if this wall is not rebuilt, and learning which is blended in its teaching, technologies and settings becomes the standard way, whilst recognising the flexibility required to meet diverse needs and circumstances of children, young people, families, workers and employers.

In this digital world, the use of learning spaces, along with that of many buildings and places, will need to be rethought. This offers an opportunity to be innovative and integrative, repurposing educational institutions, libraries and community centres as flexible hubs within communities, and creating meeting places for young people in different stages of their education, with employers, and with older generations – all as integral parts of 20-minute neighbourhoods.

This kind of thinking is explored further in the *Healthy Places To Live And Work* chapter.

## Main Recommendations

### 1.Scotland should transform its workplaces by closing its leadership skills gap with other countries and becoming a world leading fair work nation.

The Scottish Government, employers, and colleges, universities and training providers should make a major push to raise leadership and management skills, including expansion of bitesize training, especially for SMEs and the third sector, for example on innovation processes, progressive working practices and organisational resilience. This should build on the existing activity of stakeholders in the leadership and management training space.

Employers, employees and the Scottish and UK governments should work in partnership on plans, backed by significant investment, to develop modern workplaces, including support for workplaces and workforces to adopt technologies to increase their productivity in accordance with fair work principles.

238 Parliamentary-Brief-Education-18-Oct-2020.pdf (biginnovationcentre.com)

239 Scottish technology ecosystem: review – gov.scot (www.gov.scot)

**2. Scotland should scale-up demand for and participation in work-based learning, with an immediate focus on digital, data and green skills.**

The Scottish Government should establish an ambitious, universal and flexible Upskilling & Life Lifelong Fund as part of a new Skills Wallet<sup>240</sup>, enabling everyone to invest in education and training throughout their working lives, and supporting just technological and net zero economy transitions.

The Scottish Government, Skills Development Scotland, learning providers and employers should build on the apprenticeship family, help more SMEs to take on apprentices and introduce new flexi-job apprenticeships.

**3. Scotland should transform content, delivery and investment in education and skills to meet the future needs of learners and the economy.**

The Scottish Government, education authorities, schools, colleges and universities, and digital firms should rapidly develop a new digital utilisation plan for education and training, including workforce skills, digital, data and technology infrastructures, and teaching models and learning, to harness opportunities to renew progress on excellence and equity in Scottish education. There should be access for all to social innovation, entrepreneurial and nature-based learning.

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240 A Skills Wallet is a description for a personal learning account which would allow every adult to combine and draw down public, business and personal funding for education and training throughout their lives and careers.



# Healthy Places to Live and Work

## Background

### What is this priority?

Scotland has always had a strong sense of the history of its communities, land, and waters, but its places have been made and remade with social, industrial, and environmental change. The COVID-19 pandemic has accelerated some trends, like the shift from High Street to online shopping. It has also brought drops in workplace activity, student life and tourism negatively affecting many places, the longevity of which is more uncertain. It has shown the resilience of many of our places, infrastructure and people but also laid bare some of the inequalities.

Scotland will have to recover from the legacy of the COVID-19 pandemic and tackle the economic and social damage done. We will need to invest in our places and we cannot afford waste this chance to bring about fresh thinking on how we build, repair and renovate places, support communities, and collaborate on their long-term renewal.

We have a once in a lifetime opportunity to embed sustainable and inclusive principles. We can ‘level up’ to share economic prosperity across rural and urban places and to reduce inequalities within places. Scotland’s economic, social, and environmental fabric should feel noticeably different by 2030.

Scotland’s emissions reduction target of 75% from 1990 levels by 2030 is stretching and the Fourth

Industrial Revolution and the automation it brings will both present opportunities and challenges. We will have the opportunity to reconfigure our lifestyles, work, and public services in ways previously not possible. Accordingly, Scotland will need to regenerate, modernise, and transform its homes, commercial and industrial premises, public places, and other economic and social infrastructure. This needs to happen at pace and scale if it is also to increase wellbeing and achieve growth which is inclusive to all our people.

Digital and climate technologies will have to be integrated right across Scotland’s places and infrastructure. Resilience in our public health system, cyber resilience in our digital systems and climate resilience in our infrastructure will be critical.

**Scotland’s places will be where our goals to be a living lab for innovation and a skilled society come together. Scotland’s regional and local economies can become more circular in terms of supply chains, but Scotland will also need to be outward facing, connected and attractive internationally to bring investment. Our good quality of life and work available, in diverse and sustainable communities with easy access to nature and culture and good digital connectivity should be a unique selling point to retain, develop, and attract people and businesses.**

Scotland has once in a lifetime opportunity for a great rebalancing – in our lives as well as socially and geographically. We can rethink what sustainable living and working looks like, making healthier life choices

easier to make. We have rediscovered the value of our parks, shared public spaces and nature for our outdoor recreation, relationships and friendships, and physical and mental health and wellbeing. We should consider equitable access to these a right and look to preserve and enhance them. We have an opportunity to redesign our places and services for a mixed and multi-use economy of homes, offices, shops, factories, learning and leisure, and for inclusive and intergenerational living.

Underpinning this needs to be a commitment to a wellbeing economy and to putting people first in the development of place-based public policy and budgeting, set out publicly in action plans with clear timetables.

### How is Scotland performing now?

Scotland's population has been growing, although at rates below the UK. However, our birth rate is falling meaning Scotland's population is ageing, with nearly one in five people aged 65 or older<sup>241</sup>. We must either reverse this trend or find ways to increase output and prosperity with fewer people. Scotland also has the lowest average life expectancy in Western Europe even before the pandemic improvements had stalled. There are also stark inequalities, with men living in the 10% of most deprived areas expected to die 13.1 years earlier than those living in the 10% of least deprived areas.

Scotland's population growth has been uneven with rapid growth in the east and central belt contrasting with depopulation in parts of the west, rural areas and the islands<sup>242 243</sup>. This imbalance explains the disparity in house prices between the highest average house price, in Edinburgh, and the lowest, in East Ayrshire<sup>244</sup>.

Scotland has some of the most successful places in the UK in Edinburgh and the Aberdeen city-regions, though these fall short of Europe's best-performing city-regions. Productivity is lowest in very remote areas and areas like the South of Scotland<sup>245</sup>.

The latest measurements, taken before the COVID-19 pandemic, of Scotland's social capital – the strength of the relationships between people who live and work together – showed a slight decrease in recent years<sup>246</sup>. Wellbeing was still generally higher than many parts of the UK with people on Scotland's islands and in some rural areas reporting the highest levels of wellbeing in the UK<sup>247</sup>.

While the numbers of homes have gone up, not enough suitable homes are being built in some cities and rural areas, and rents have risen well above inflation in most areas. Housing is unavailable or unaffordable for a proportion of our population including some key workers, families, and young people<sup>248</sup>. Despite historic investment two in five homes, mostly in the social housing and private rented sectors, still fail to meet the Scottish Housing Quality Standard, mostly due to a lack of effective insulation or central heating<sup>249</sup>.

Investment in Scotland's infrastructure has increased significantly, for instance in major roads, the expansion and electrification of Scotland's railways and in digital connectivity. **However, Scotland has underinvested as a percentage of its GDP in its infrastructure for decades compared with the average for developed economies (by around 1%)<sup>250</sup>.**

Economic infrastructure accounted for over half of total UK carbon emissions (embodied and operational) in 2013 and this proportion is growing. Its share

241 Scotland's Population | National Records of Scotland (nrscotland.gov.uk)  
 242 <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2019>  
 243 A Scotland for the future: opportunities and challenges of Scotland's changing population – gov.scot (www.gov.scot)  
 244 <https://www.gov.uk/government/publications/uk-house-price-index-scotland-january-2020/uk-house-price-index-scotland-january-2020#price-change>  
 245 UK Regional Productivity Differences: An Evidence Review | Industrial Strategy Council  
 246 Social capital in Scotland: report – gov.scot (www.gov.scot)  
 247 Wellbeing – Office for National Statistics (ons.gov.uk)  
 248 <https://www.gov.scot/publications/homelessness-scotland-2019-2020/pages/4/>  
 249 Scottish household survey 2019: annual report – gov.scot (www.gov.scot)  
 250 [https://infrastructurecommission.scot/storage/281/Phase1\\_FullReport.pdf](https://infrastructurecommission.scot/storage/281/Phase1_FullReport.pdf)

is even higher when social infrastructure is also included<sup>251</sup>. As climate change has increased the frequency and intensity of extreme weather events the resilience of this infrastructure is being tested more often and with more disruptive impacts.

Transport is currently Scotland's largest sectoral emitter, accounting for 37% of all greenhouse gases in 2017. Increases in vehicle kilometres driven were largely responsible. While train travel has grown by 30% in 10 years, bus use has declined<sup>252</sup>. Transport, especially road transport, also has adverse impacts on air quality and therefore health. Pre-pandemic there were signs of fewer people travelling and more homeworking<sup>253</sup>.

The improvements in Scotland's digital connectivity are a key reason why many people have been able to work from home. Superfast broadband coverage has reached 98% of homes in urban areas, although more than one in four homes in rural areas do not yet have coverage and they and their employers have been disadvantaged during the COVID-19 crisis<sup>254</sup>. Affordability of online services – data poverty – is also a barrier for disadvantaged people<sup>255</sup>.

Scotland is the most successful region outside of London and the South East in attracting Foreign Direct Investment. However, there are challenges facing Scotland's industrial property stock much of which is outdated with many large sites in need of regeneration<sup>256</sup>. More than 1 in 4 people live within 500 metres of a derelict site. In deprived communities, which also have the worst health outcomes, that increases to over half<sup>257</sup>. There has been progress in reducing emissions from our buildings, but homes still represented 15% and commercial buildings 6% of Scotland's total and the built environment is still a major consumer of the world's extracted materials.

Many of Scotland's town centres and some of its city centres have struggled as the rapid growth of internet shopping and out-of-town retail has resulted in shop closures. This has also reduced the number of meeting spaces, reducing their social capital.

Scotland's natural assets have been valued at a third of the UK's total<sup>258</sup>. Scotland's natural capital – a measurement of the social, environmental, and economic benefits of its habitats – is at its highest level since 2000 but is a long way below its historic high pre-1950s<sup>259</sup>. Scotland's environment and cultural assets are two of the main attractions for visitors. Scotland has been very successful in attracting both domestic and overseas tourism.<sup>260</sup> However, this success has generated concerns about overcrowding in some locations.

It is too early to be certain about whether the immediate impacts of the COVID-19 pandemic on Scotland's places will become longer-term trends. Place-making and infrastructure will need to meet these needs and address the needs of the most disadvantaged communities with less diverse and less resilient economies, most especially in the provision of public health, social care and childcare facilities.

## What are the opportunities and risks?

### Resilience

**The COVID-19 pandemic has fundamentally recast the priority that governments and organisations give to resilience, and the prominence within resilience that they place on health.** While public health has appeared on the UK and Scotland's national risk registers and there were preparedness strategies for a major global health crisis, the impact of the COVID-19

251 [https://infrastructurecommission.scot/storage/281/Phase1\\_FullReport.pdf](https://infrastructurecommission.scot/storage/281/Phase1_FullReport.pdf)

252 [national-transport-strategy.pdf](https://www.transport.gov.scot/publication/national-transport-strategy.pdf)

253 <https://www.transport.gov.scot/publication/transport-and-travel-in-scotland-2019-results-from-the-scottish-household-survey/infographic-summary/>

254 [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0024/209373/connected-nations-2020.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0024/209373/connected-nations-2020.pdf)

255 <https://www.nesta.org.uk/report/what-data-poverty/>

256 [ISGI\\_Report\\_2.qxp\\_Layout 1 \(scottishfuturetrust.org.uk\)](https://www.scottishfuturetrust.org.uk/ISGI_Report_2.qxp_Layout_1)

257 [5f73555fbfe93\\_VDL Task Force Recommendations.pdf \(landcommission.gov.scot\)](https://www.landcommission.gov.scot/5f73555fbfe93_VDL_Task_Force_Recommendations.pdf)

258 [Scottish natural capital – Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk)

259 [Scotland's Natural Capital Asset Index 2020 – Update summary.pdf \(nature.scot\)](https://www.nature.scot)

260 <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf>

pandemic has been on scale not experienced worldwide and by most countries for a century.

Governments declared public health emergencies, and implemented, adapted and improvised unprecedented cross-governmental responses to try to save lives, safeguard health and wellbeing, and protect livelihoods, jobs, businesses, education and others public services. Public bodies and businesses rapidly refreshed and executed business continuity plans. People from many walks of life were called upon and rose to challenges including treating patients, caring for the vulnerable, manufacturing supplies of Personal Protective Equipment, maintaining and enhancing digital services, and delivering groceries to shops and homes.

**The aftermath of the COVID-19 pandemic will offer the opportunity to strengthen national and local resilience, and prioritise a programme of investment and training that will allow societies, organisations and businesses to cope better with future crises.** The lessons must be learned. The public inquiries which will take place will have critical roles in examining the evidence and making recommendations. These must strike a balance between breadth and timeliness<sup>261</sup>.

Scotland will need a complementary mix of a strong public sector, productive businesses, active voluntary organisations and a socially-beneficial informal economy. It should take a world-leading approach to the provision of public services and facilities and a world-leading approach to wellbeing through the provision of quality and affordable housing. **Health, accessibility and sustainability principles should be embedded in new or improved infrastructure.** These would also create a strong incentive for talent retention and attraction.

There is a risk that the lessons of the COVID-19 pandemic are not properly learned or addressed by governments should their priorities change or they have concerns, as they start to repay the record borrowing that they needed to fight the pandemic and support the economy, about the costs of taking the necessary actions to improve public health resilience.

Pressure on the UK's and Scotland's public finances will mean that choices must be made in creating new private sources of finance and models of investment, and in taxation policy.

## Digital Society

The future of Scotland's places will be shaped in a digital world. Digital technologies and platforms have become more deeply woven into the fabric of our daily lives and communities, and highlighted the social risks of digital exclusion and the importance of leaving no places or people behind. Scotland will have the opportunity to build a digital society through widespread and universal availability of fast and resilient digital connectivity, smart places, digital maturity of businesses, digital public services, digital skills and digital inclusion. On the other hand, a failure to find and implement at pace affordable solutions to unlock digital connectivity would constrain growth, especially in rural areas, and further exacerbate urban digital divides.

## Net Zero Carbon

Scotland has the opportunity join-up its priorities for public health resilience, a digital society and inclusive growth with its net zero strategy in a positive vision for local living and working.

Climate actions can deliver a wide-range of co-benefits which reinforce behaviour change and empower communities. Scotland needs to target these 'no regrets' policy opportunities.

These should include growth in places that minimises the use of resources and encourages circularity, balancing the economic, social and environmental objectives of place development. Decarbonisation of residential, public and commercial, and industrial buildings, should be phased with property renewals to optimise investments, addressing the 'green premium' v 'brown discount' in pricing. **New sustainable travel trends should be supported by active and affordable travel options. Given the evidence that local green spaces and natural spaces supported people's wellbeing in lockdowns and that use of the outdoors**

**depends on access, there will be a need to protect these places and show leadership in creating new green spaces in towns and cities, as well as changing how developers and others contribute to them<sup>262</sup>.**

There will be risks, however, to the future of places and the wider climate change targets if the transition to a net zero economy is not a just one and communities are not able to reap the returns of climate actions in their areas through business growth, jobs and local investment.

### **Inclusive Growth**

Increasing economic competitiveness and tackling inequality are mutually supportive ambitions. Growth which improves the living standards and shares the benefits of increased prosperity more evenly across society is strongly associated with longer and stronger periods of economic growth<sup>263</sup>. The priorities for economic and social recovery from the COVID-19 pandemic are well-aligned with increasing Scotland's economic competitiveness and creating a more resilient economy by achieving inclusive growth. This need not be at the expense of constraining economic opportunity in sectors or locations that are experiencing rapid growth. Similarly, growth should not be at the expense of the common good and the environment.

Investment through city and growth deals can help to unlock sustainable growth ambitions and to address disadvantages within areas making them more resilient for the future. There will be an opportunity for city and town centres to renew their purposes, including for housing, visitor experiences and innovation, and their relationships with their suburbs and nearby communities. Sustainable development and prosperity in rural areas should be unlocked by creating new green businesses and through the 'greening' of existing jobs and industries, enterprise opportunities, sustainable tourism, and critically creating a level digital playing field.

However, dealing with the immediate impacts of the COVID-19 pandemic and Brexit may undermine the commitment to build back better and to address inequalities in our places. With a high demand for investment to support recovery, competition with cities and towns in other parts of the UK for the UK Government's 'levelling up' funds could limit investment in Scotland.

Attracting investment and people of working age and with key skills to all parts of Scotland are essential elements of healthy places – failure to address a potentially falling active economic population would put at risk our future economic success and the viability of some places.

## **What needs to change for Scotland to make progress?**

### **Place-making – Strategy and Delivery**

Scotland will need to create places where economic, social, and natural capital can thrive.

The focus now needs to be how to level up the productive capacity of places in Scotland for the long-term. We need new measures of economic wellbeing such as the quality of local jobs and levels of satisfaction with the places we live in. Moreover, we will need to build on our success in creating jobs whilst addressing the significant disparities between places<sup>264</sup>.

For Scotland's city-regions there is a need to focus on increasing both productivity and wellbeing, with actions around housing, jobs, the environment and communities. Issues in rural areas vary, but for those communities where wellbeing is high, actions to raise their productivity will also need to protect what makes them healthy, happy and inclusive.

The differences in productivity and wellbeing across Scotland highlights the importance of the application of the Place Principle – a shared understanding, local

262 How has lockdown changed our relationship with nature? – Office for National Statistics

263 Microsoft Word – Inclusive Growth Report FINAL-V5.docx (oecd.org)

264 <https://www.gov.scot/publications/scotlands-labour-market-people-places-regions-statistics-annual-population-survey-2019/pages/3/>

flexibility and a collaborative approach<sup>265</sup>.

Places will have to maximise their local distinctiveness, as people increasingly value localisation – distinctiveness, authenticity and identity – following the trend to globalisation.

Scotland's next National Planning Framework<sup>266</sup> will be where the long-term plan for the country is articulated. Its success will be judged on whether it is an effective catalyst for change. It will need to map out where national ambitions fit together with regional and local initiatives, including City and Growth Deals, in the delivery of the new plan. Local planning policies need to stay more up to date with the latest thinking on sustainability to be able to flex where developers may be proposing more radical but ultimately sustainable approaches, and to ensure all development meets sustainability standards.

Place-based assessments should be mandated and targets should be set for protecting valuable land, including green spaces, employment, residential, commercial, and industrial.

The role of regulation through Building Regulations, but also regulators and planning conditions, will be essential to reach the strategic objectives of the framework but also necessary to ensure a level playing field for all parties and to support the development of supply chains that are able to respond to the challenges it sets. Government targets can help to provide certainty for industry and skills providers which unlocks investment in recruitment and training. The Construction Industry Training Board has found that the equivalent of 350,000 new roles will need to be created by 2028 to reduce carbon emissions from buildings and that this can increase productivity and make the industry a more attractive career option<sup>267</sup>.

There will be a need to enable Scotland's places to thrive in a way that incentivises and encourages sustainable development and builds the resilience

of communities for the future. Regional economic partnerships and local governments should have access to enabling infrastructure funds for the development of land and assets.

There is a pressing need to focus on the public and green spaces which people now value even more highly and which are important to social capital and health and wellbeing<sup>268</sup>. The challenge will be to protect, revitalise and re-purpose what we have, while finding ways to create and incentivise new green spaces in future developments. Local authorities should, with the support of the Scottish Government, develop Green Town or Green City Plans for their spaces and encourage innovative thinking.<sup>269</sup> New approaches to carbon offsetting, which encourage and enable domestic or international firms to invest in certified permanent carbon offsetting activities in Scotland, should be explored to increase private investment in biodiversity and carbon storage through native tree planting or other projects.

**We must maximise engagement with communities in their place-making. Scotland's CAN DO Places programme supports groups who want to repurpose spaces in their community, helping restore and maintain economic vibrancy.** Transferring public assets to communities or the third sector organisations or social enterprises that support them has the potential to empower more communities to develop new and imaginative solutions to local challenges. Design thinking which solves for one to the benefit of many needs to be better embedded in design, policy development and consultation processes.

Cultural assets play the same important role, especially where they are present in rural areas and are at the centre of social networks, community cohesion and social participation.

With low carbon policies encouraging an increased volume of wheeled vehicles, such as micro mobility, it will be very important that places are mandated

265 Place Principle: introduction – gov.scot ([www.gov.scot](http://www.gov.scot))

266 Fourth National Planning Framework: position statement – gov.scot ([www.gov.scot](http://www.gov.scot))

267 Building Skills for net zero – CITB

268 <https://www.gov.scot/publications/npf4-analysis-reponses-call-ideas/>

269 <https://www.nesta.org.uk/project/rethinking-parks/>

to implement comprehensive, safe, accessible and integrated separate spaces<sup>270</sup>. We should aspire to being the most bike friendly country in Europe and commit to long-term funding to build and maintain the required infrastructure, including charging stations for e-bikes.

Through the Scottish Government's Place Based Investment Programme, the Scottish Government and local government should commit to the rapid delivery of a first phase of 20-minute mixed economy neighbourhoods across at least 10 locations including cities, towns and rural communities, and more deprived communities. These demonstrators should inform the development of a roadmap for larger scale rollout. These initial schemes should draw on the Place Standard toolkit and Universal Basic Service principle. These should be designed and led by partnerships including local authorities, communities, local businesses, anchor institutions such as colleges, universities and public services, and the third sector, linking places to live with places to work.<sup>271 272</sup>

Future needs assessments should also consider the potential demand in any community for remote working or meeting spaces. This could result in more shared community hub spaces<sup>273</sup> including schools. *The Learning Throughout Life* chapter highlights the potential to match Ireland's new rural blueprint and invest strategically in a network of hundreds of remote working hubs in rural town centres, supported by shared back-office services and a centralised booking system, and available for community-based activities<sup>274</sup>.

To make these neighbourhoods a reality will require planning to determine greater density and diversity of land use and adequately funded integrated sustainable and active travel options.<sup>275</sup>

The 20-minute neighbourhood policy will only work if the public services that people need to access are available locally and are accessible. Sufficient and affordable childcare (50 hrs per week for children between 6 months and 5 years) and social care are needed, properly funded by government, that will allow both women and men to fulfil their full potential in the local workforce<sup>276</sup>. The availability of shared/leased goods and services for repair and refurbishment supported by local collection and sorting policies will give households more choice to repair before replacing, supporting circular principles and local jobs. Links could also be made with Community Wealth Building projects in Scotland to explore where local supply chains including third sector or social enterprises could be encouraged or capacity developed.

It will be more challenging to adopt 20-minute neighbourhoods in rural areas so its neighbourhoods should have higher funding per person to allow for housing, co-working or social spaces. Widespread and universal availability of fast and resilient digital connectivity will be essential for rural places.

Vacant and derelict land should be brought back into use and the recommendations of the Scottish Land Commission adopted and scope to bring private investors in remediation into the equation explored.<sup>277</sup> To unlock more unused assets public bodies need to change their approach to disposals, to prioritise the economic, social and environmental benefits of proposed use rather than just the financial returns<sup>278</sup>.

Planning should be streamlined and the Scottish Government and COSLA commit to a rapid 12-week turnaround for infrastructure and developments that meet net zero carbon criteria and are otherwise acceptable. The Scottish Government should bring

270 <https://www.sustrans.org.uk/our-blog/news/2020/september/three-out-of-five-uk-parents-currently-do-not-enjoy-the-school-run-with-congestion-the-main-reason-why/>

271 <https://www.gov.scot/publications/not-now-social-renewal-advisory-board-report-january-2021/>

272 <https://view.pagetiger.com/inlhij/1/PDF.pdf>

273 'Potential case study' with 'For example, the Inverurie Community Campus <https://www.hubnorthscotland.co.uk/projects/inverurie-community-campus>

274 gov.ie – Our Rural Future – Rural Development Policy 2021-2025 ([www.gov.ie](http://www.gov.ie))

275 <https://theconversation.com/people-love-the-idea-of-20-minute-neighbourhoods-so-why-isnt-it-top-of-the-agenda-131193>

276 <https://www.gov.scot/publications/not-now-social-renewal-advisory-board-report-january-2021/>

277 [https://www.landcommission.gov.scot/downloads/5f73555fbfe93\\_VDL%20Task%20Force%20Recommendations.pdf](https://www.landcommission.gov.scot/downloads/5f73555fbfe93_VDL%20Task%20Force%20Recommendations.pdf)

278 'Potential case study' with 'For example, Cuningar Loop Woodland Park, Rutherglen' <https://www.robertson.co.uk/project/cuningar-loop-woodland-park-rutherglen>

forward demand assessment guidance to ensure appropriate employment land for rural places and that mixed economy outcomes, which include retail, are achieved in urban places.

Scotland can distinguish itself by having targets for blue and green nature protection and enhancement alongside its ambitious climate targets for net zero by 2045. This would help to improve public health and wellbeing and provide a distinctive comparative advantage.

Investment and regulation to transform the infrastructure sector to net zero is a critical step towards meeting our net zero objectives<sup>279</sup>. Significant public investment is required although this will also create job opportunities supporting economic recovery. Our colleges and universities sector will play a key role in training the existing and future workforce required.

**Decision-making about infrastructure investment priorities and place-making should be driven by the triple bottom lines of financial, social and environmental capital. Scotland's National Infrastructure Mission and Investment Plan should be updated to add public health resilience and cyber resilience as a key priorities.** The Scottish Government should publish a smart operating plan to improve performance, measurement, and planning of infrastructure delivered under the plan.

Private sector utilities make many of the investments in infrastructure. They are regulated by UK economic regulators who have prioritised costs to today's consumers in their decisions. New duties should be placed on UK utilities regulators to support net zero, whole life and place-based priorities enabling increased anticipatory business investment and R&D. Devolved and regional partners need to be involved in decisions made. An example of this is the increased capacity in the National Grid required to support electrification and the investment needed by both public and private providers in sufficient charging infrastructure.

**An 'infrastructure first' approach should be adopted to ensure infrastructure providers, developers and local authorities work together to ensure the required infrastructure for developments to proceed is in place.** There is also a need to think more creatively about the model of developer or land-owner contributions in terms of meeting a range of objectives including infrastructure, active travel and restoring or contributing to positive biodiversity, and rethink who pays for infrastructure and when.

## Living, Working and Visiting

Scotland's population is growing and more households are forecast over the coming decade including more older and single person households<sup>280</sup>. Everyone in Scotland should be able to find suitable, affordable, good quality housing and digital connectivity wherever they live and in homes and neighbourhoods that are designed to support healthy and net zero carbon living. The right to an adequate home should be incorporated in Scots Law<sup>281</sup>.

Housing investment creates skilled jobs and improves wellbeing for the residents of the homes. Scotland's new housing strategy needs to allow for changing needs around working from home, supports the development of new quality places, deals with a legacy of poor quality housing in some places and assures the future quality of new housing.

Housing supply across all tenures including affordable and social housing, should be increased to meet the diverse economic, social and environmental needs of people across Scotland. Scotland should deliver at least new 25,000 new homes each year, with a clear focus on providing housing which meets the demand from workers in all areas so that the economy in every part of Scotland has access to the local skills it needs.

Increasing supply to consistently deliver this volume of quality homes annually will require a range of related actions, including on planning policy, infrastructure, skills and the transition to net zero buildings. The public sector may need to play a more active role in

279 Microsoft Word – ICE net zero Infrastructure Plan Paper (final draft) proofread

280 <https://www.nrscotland.gov.uk/files//statistics/nrs-visual/hh-proj-18/household-proj-18-info.pdf>

281 <https://www.gov.scot/publications/not-now-social-renewal-advisory-board-report-january-2021/>

the supply of development ready sites in the right places and at the right times.

Housebuilders, the third sector and the Scottish Government should collaborate to support intergenerational and communal housing communities. These can support new models of independent living and shared facilities, help to meet the different needs of residents and provide company, addressing issues of loneliness. They are well-suited to development in town centres. We should support innovation which encourages the integration of technologies into housing, for instance to enable the delivery of better, more affordable levels of care within communities.

**Housing is one of the biggest challenges throughout Scotland, but rural and remote areas have some distinct challenges. These make it more difficult to attract and retain people, which is a key factor in the acute population decline some parts of Scotland are facing. The housing challenges for rural areas should be addressed through more flexible grants for social housing, appropriate planning policies, building regulations and technical conditions, and lower VAT to bring back into use older buildings<sup>282</sup>.**

A multidimensional response is required for remote areas where the problem of depopulation is most acute. Local authorities in the Highlands and Islands and Highlands and Islands Enterprise have developed the concept of development-orientated Repopulation Zones. These would be based on packages of interventions in business growth and jobs, infrastructure (including housing, competitive digital connectivity and transport links), and localised access to Higher and Further Education, healthcare, childcare and culture. There would be a focus on green and nature-based growth, Community Wealth Building and local supply chains. There would be the opportunity to site new remote working hubs in them and host a pilot of a UK Remote Rural Migration Scheme<sup>283</sup>.

While fast and resilient digital connectivity will mean the people can 'live local – work global', people in all

rural areas should also have a transport option which enables them to undertake a meaningful working day in Scotland's largest cities and in London.

New models of off-grid communities, building on those elsewhere in Europe, should be developed to increase resilience in rural places, with, for example, sustainable local production of power and food.

Factory-built homes offer the advantage of reducing carbon emissions by reducing waste, factory-controlled quality including air tightness, optimised manufacturing processes and reduced transport pollution<sup>284</sup>. They also mitigate against the challenges of construction skills shortages and offer the opportunity to attract a more diverse workforce.

**The Scottish Government should develop an offsite housing strategy to support and invest in innovation. New procurement incentives should prioritise suppliers who embed net zero carbon design, adopt circular economy principles, modern methods of construction, bio-based materials and a commitment to fair work.**

A percentage of procurement on contracts for offsite fabrication should be set<sup>285</sup> and an overarching body should be assigned to drive forward a change in standards, for example the Construction Innovation Centre. The enterprise agencies should implement the strategy including the expansion of the domestic supply chain. A skills strategy is also required to build capacity and support transition of workers from other sectors.

Across all infrastructure we should see procurement as an opportunity to innovate and to bring multiple agencies together to collaborate with business and the finance sector. Our departure from the EU creates new opportunities in this context.

Many city and town centres have struggled in the COVID-19 crisis as High Street footfall has fallen and many more people have worked from home. This has exacerbated pre-existing challenges due to the rapid

282 SCDI-RC-Report\_final\_small.pdf

283 Designing a pilot remote and rural migration scheme for Scotland – analysis and policy options: our response – gov.scot (www.gov.scot)

284 Offsite Solutions Scotland, National Planning Framework Consultation, Position Statement

285 ibid

growth in internet shopping and out-of-town retail. Shops and hospitality businesses have closed and the future of urban centres is uncertain.

**There will be a need to be innovative and flexible about city and town centre planning. Scotland should aim to repurpose surplus retail and commercial space for new uses including more flexible office space, housing, independent or high-end retail space and leisure space.** The economics of housing developments in city and town centres has previously been unattractive in parts of the country and this will need to be addressed. There is the opportunity to develop affordable hubs for social enterprises, start-ups, learning outreach and community groups. Local partners and the Scottish Government should be creative in piloting a range of approaches to attract people back to city and town centres as destinations for days out, such as cultural festivals, events and activities, and farmers markets.

A new and ambitious net zero Standard, should be introduced for all buildings and infrastructure by 2023. For example, cycling storage, electric vehicle charging points, the use of circular or sustainable materials like timber, all hard surfaces to be permeable, natural capital solutions to cooling and water management such as tree planting and access to green space should be standard on a consistent basis nationwide. To enable this a clear signal needs to be given to the property and infrastructure sectors now to enable them to plan for this seismic shift. This also needs to be supported by finance and much more significant support for R&D and capital investment. The Scottish Government should gradually tighten construction standards through Building Regulations and require forecasts for and reporting of performance against emissions embodied in their components and during construction, in operation and against waste landfilled or reused.

Addressing fuel poverty in Scotland will require major investment in retrofitting social housing, raising energy efficiency standards for the private rented sector and bringing forward new mechanisms to incentivise owners to upgrade their properties through the adoption of a private rented sector housing standard

to be introduced on a phased basis starting with the largest landlords.

Smaller clean growth projects will struggle to attract major investors unless aggregated into larger portfolios. To fund the retrofit of social housing required the Scottish Government, local authorities and housing associations should work together to develop a model to aggregate social housing retrofit projects and other investment opportunities, which would deliver the scale necessary to unlock green finance.

VAT on retrofitting is 20% compared to a zero rating for new build. This is a disincentive to energy efficiency measures. The UK Government should lower the rate to 5% in stages and look to phase in increases in the rating on new builds.

**The condition of commercial and industrial property is also in critical need of attention. Much of the current stock is not suitable to modern organisational needs, does not meet environmental standards and is unviable for refurbishment. The private, third and public sectors should launch a joint transformational programme to regenerate, modernise and decarbonise Scotland's commercial and industrial properties. This should include the creation of public-private-third sector joint ventures in which share the risks and returns.**

We will need to ensure we have enough industrial space for makers. At present there is an undersupply in most of Scotland's cities. The risk is that small and medium sized manufacturers, a key focus of Scotland's recovery plan for manufacturing, are unable to find modern and affordable space near where they operate and their workforces live, and which connect to export routes<sup>286</sup>. Local authorities and enterprise agencies should engage early with the private sector and ask themselves how they can incentivise the market to create maker spaces (including remakeries) where there are shortages. The repurposing of city and town centres, and empty units, post-COVID-19 are key opportunities.

**We are proposing that Scotland should develop**

**a network of Innovation Neighbourhoods and Manufacturing Innovation Neighbourhoods in a range of new locations to attract new employers, start-ups, third sector employers and investors to rural places, city centres, towns and neighbourhoods, including those which have suffered most in the pandemic.** The objective would be to encourage co-creation and innovation amongst businesses and organisations of all sizes and sectors. These could potentially be co-located with planned 20-minute neighbourhoods and thought should be given to more than just the property aspects. Social spaces and new people networks are vital to facilitate collaboration. Incentives, for example through lower business rates and enhanced capital allowances, should be contingent on investment by owners in net zero buildings and in low-cost data and digital connectivity for tenants. Long-term capital could be provided at portfolio level by SNIB.

Further and Higher Education institutions have a key role to play here in developing these proposals, acting as anchor employers, driving innovation, attracting talent and supporting local businesses. Ensuring the success of innovative city deal projects such as the Data Driven Innovation initiative will help drive talent attraction and local jobs. Local authorities should consider how land value appreciation in these zones is captured and recycled for the benefit of the wider community – for example to engage more young people in STEM activities.<sup>287</sup>

Building owners will be required to invest to meet net zero carbon standards but should also look to collaborate with telecoms and related service providers to competitive low-cost digital connectivity in new more flexible leases or contracts. Employers should also protect ‘good work’ considering how job quality issues could affect staff working remotely, allowing for the fact that for some staff working from home is not possible for a variety of reasons<sup>288</sup>.

The Scottish tourism sector is one of the most

important for the Scottish economy, particularly in rural areas. Around 1 in 12 of all jobs and all registered businesses in Scotland works in the tourism sector<sup>289</sup>. The third sector also plays an important role in running many of Scotland’s visitor attractions.

As in many popular destinations around the world, there are increasing local concerns about the cumulative impact of tourism on local communities. Scotland’s tourism sector has set out a new responsible approach to communities and the environment<sup>290</sup>. Scotland’s recovery plans for the return of domestic and international visitors, including the aviation sector, should be aligned with the transition to this long-term strategy.

There will be a need to protect assets for future generations of people in Scotland and visitors. However, these are also assets that support livelihoods and economic recovery. We will need to find new ways to support communities, protect the environment and welcome visitors. Coordinated local plans and significant multi-year commitments from the Scottish Government will be needed to fund local tourism infrastructure. This should be backed by a marketing campaign encouraging responsible visitor behaviour to protect our natural capital.

**The Scottish Government, VisitScotland, and the tourism sector should collaborate to commit a plan to achieve sustainable tourism by 2025 across a set of core principles like those set out in New Zealand.** This plan should be built into support for the economic recovery of the sector and support for the sector should become contingent on it making steps towards the sustainability objectives which have been agreed<sup>291</sup>.

## Communications and Mobility

Mobility of people, goods and data is fundamental to the functioning of a modern economy. High-quality

287 <https://www.nesta.org.uk/blog/innovation-districts/>

288 Good Work for Wellbeing in the Coronavirus Economy ([carnegieuktrust.org.uk](http://carnegieuktrust.org.uk))

289 Tourism in Scotland: The Economic Contribution of the Sector, April 2018 – A report commissioned by the Tourism Leadership Group ([scottishtourismalliance.co.uk](http://scottishtourismalliance.co.uk))

290 Scotland Outlook 2030 – Scotland’s tourism strategy ([scottishtourismalliance.co.uk](http://scottishtourismalliance.co.uk))

291 <https://www.sustainabletourism.nz/>

Chart 10: Progress with Fixed broadband and 4G coverage in Scotland

Fixed broadband and 4G coverage	May 2020	Jan 2021
Access to full fibre	13%	20%
Access to Ultrafast services	50%	54%
Access to Superfast services	93%	94%
Unable to receive 10 Mbit/s download and 1 Mbit/s upload services	3%	3-4%
Premises (outdoor) covered by all 4G operators	96%	96%
Geographic area not covered by any 4G operator	20%	19%
All roads not covered by any 4G operator	9%	8%

Source: Ofcom

transport infrastructure is critical. All parts of Scotland need access to this infrastructure and services to enable people, employers, and communities to thrive. All forms of connectivity to the global economy are vital to our success in trade, investment and tourism.

We are living in an increasingly digital world and digital technologies are also transforming the demand for and the means of other forms of mobility. Transport and Digital are significant sources of emissions and will need to be decarbonised to meet the net zero target. Transport, digital and energy infrastructures will have to be planned and operated in a joined-up way.

**Digital infrastructure is critical national infrastructure which will continue to be increasingly central to economic and social resilience, and fundamental to economic competitiveness. We will need to move as quickly as possible to accelerate our digital roll out. Future Scottish building regulations**

**should mandate that new housing has the necessary infrastructure for a gigabit capable fibre connection and that each home is connected to a provider on occupation.**

The UK Government will need to up its ambition and investment and the legislative framework to make this happen rapidly. There should be a ‘dig once’ approach to enabling infrastructure. The Scottish Government should encourage new solutions from a range of providers including non-regulated providers such as network specialists and create incentives for collaborative delivery and procurement in those locations which are the hardest to reach. Only by doing this will the potential of combined network infrastructure, 4G and 5G last mile connectivity for both households and employers be achieved. This is critical to unlock to potential that now exists for remote working and living right across Scotland.

**Access alone is not enough. We will also need to address the data poverty by providing free or very low-cost data to the most disadvantaged households through new collaborative commercial models which bring together a range of providers able to support these.** Businesses, particularly SMEs, and third sector organisations, will need to become more digitally enabled to achieve increases in productivity. The digital strategy needs to bring forward new multi-year investments to bring many more SMEs up to a good digital competency standard.

We will not succeed in the Fourth Industrial Revolution without advanced connectivity. We need to plan now how public services, the third sector and industries will use their full potential and integrate smart technologies into public and private infrastructure. The COVID-19 pandemic has demonstrated the potential that advanced digital connectivity has in areas such public health resilience, remote healthcare and monitoring of supply-chain resilience. It will also be essential in reducing carbon emissions. We will not be sure of the levels of economic and social opportunity we will unlock, and the Scotland 5G Centre’s new 5G Innovation Hubs will, therefore, need to help build use cases.

Many people have appreciated not making a daily commute and begun to think more carefully about

their travel options, health, and environment. Scotland should make it easy for that trend to continue and reduce the need to travel unsustainably, by better design of places for safe active travel and by investing in a range of alternative and affordable and accessible transport options for people wherever they live<sup>292</sup>. This should include more flexible season ticketing options for hybrid home-office working, more demand responsive services and more local mobility hubs.

**Active and sustainable travel connecting people, learning and jobs will be pivotal to the success of 20-minute neighbourhoods and to our future health and wellbeing. We should aspire to being the most bike friendly country in Europe and commit to long-term funding to maintain the required infrastructure. Scotland should create high-quality Active Freeways to connect centres of cities and towns and other busy locations with outlying neighbourhoods, with space for cyclists, walkers, and wheelers, as well as for cycle parking.** These should incorporate green infrastructure to make them attractive to use and green arteries in the urban environment for both leisure and business purposes. There is also a need for transport infrastructure to provide access for people to nature as a key destination.

There are an increasing number of successful city centres around the world that are moving towards the creation of more attractive and liveable city centres including pedestrianisation and green infrastructure, improvements to active travel and public transport, and prohibition or severe restrictions of cars within zones. Following the establishment of the Low Emission Zones in Scotland's major cities, they should very closely work with local businesses and third sector organisations on plans for car-free city centres. To enable the behaviour change needed to support this, cities should look to low-cost integrated transport options modelled on the Vienna 365 (1 euro per day) season pass<sup>293</sup>.

It will be critical to restore many peoples' familiarity with using public transport and digital platforms can

not only help them with integrated travel, but provide public health-related information which will boost their confidence, such as real-time capacity and crowding, COVID-19 precautions and times of last cleaning.

Scotland's people and businesses and third sector employers will continue to need travel and transport, for example for access for people to job opportunities and routes to market for our export businesses. Scotland will need to improve connectivity across and outwith Scotland. There will be large regional and social differences in these needs and no one-size-fits-all solutions. We will need to invest in high quality, reliable, resilient, and increasingly decarbonised infrastructure, based on the Sustainable Investment Hierarchy which aims to maintain and make best use of existing infrastructure before making improvements<sup>294</sup>. This will enable Scotland's places to achieve economic growth that minimises its impact on the environment.

Scotland should deliver many of the transport projects in Scotland's Infrastructure Investment Plan<sup>295</sup> and Phase 1 recommendations from the Strategic Transport Projects Review 2<sup>296</sup>: These include:

- A strategic plan for freight and infrastructure to encourage rail freight
- Decarbonisation of Scotland's rail services by 2035
- Faster, more frequent intercity rail services for the North of Scotland
- Significant investment in major railways and roads in the South of Scotland
- Enhancing facilities at major rail stations
- Phased development of Glasgow 'Metro' and Edinburgh Mass Transit strategies
- Investing in bus priority infrastructure and a zero-emission fleet
- Phasing out of the need to buy petrol and diesel engine cars and vans by 2032
- Enhancing the capacity of the electric vehicle charging network
- Connecting all of Scotland's cities by dual carriageway to improve accessibility
- Access to Argyll and Bute due to the regular

292 [https://infrastructurecommission.scot/storage/276/Phase2\\_Delivery\\_Findings\\_Report.pdf](https://infrastructurecommission.scot/storage/276/Phase2_Delivery_Findings_Report.pdf)

293 <https://www.theguardian.com/world/2019/jul/09/vienna-euro-a-day-public-transport-berlin-365-annual-ticket>

294 [national-transport-strategy.pdf](#)

295 A National Mission with Local Impact: Infrastructure Investment Plan for Scotland 2021-22 to 2025-26 – gov.scot (www.gov.scot)

296 Update and Phase 1 Recommendations – February 2021 – STPR2 (transport.gov.scot)

- landslides on the A83
- Introducing Low Emissions Zones in Scotland's four largest cities
- Development and delivery of Active Freeways (high quality active travel corridors)
- Investment in Mobility as a Service for multi-modal planning, booking and paying
- Creating a long-term investment plan for new ferry vessels and ports
- Implementing Scotland's Accessible Travel Framework across the network
- Create the world's first zero emission aviation region in the Highlands and Islands
- Expand hub capacity at Heathrow to safeguard slots for Scottish airports

Buses will be a key component of connectivity in and for communities in towns, cities and rural areas. There will need to be more tailored demand responsive transport services for people in rural areas<sup>297</sup>. We also need to ensure that Scotland has a better network of ferries to support Scotland's island and coastal communities. Scotland should carry out a long-term ferry plan to modernise and decarbonise the fleet by building zero emission vessels and to consider where new freight and leisure connections could be made to Europe.

Freight deliveries will be a particular priority. Online shopping has driven a big rise in vans on the roads. We will need to design low or zero emissions national-to-neighbourhood haulage solutions for goods and services using the best mobility technology and design available.

Transport is crucial for our trade and competitiveness, within Scotland, across the UK and internationally, and tourism. Improving gateways (such as airports, ports, and major transport hubs) and the surface access to these gateways will support Scotland's exporters to access these markets, and Scotland's tourism businesses to attract international and domestic visitors.

**Scotland's forthcoming aviation strategy will be vital in supporting an immediate recovery in the connectivity at Scottish airports which the Scottish**

**economy and regional economies need now, both direct and with UK and international hubs, and the development of the connectivity Scotland will need in the longer-term. Government support for the sector should be closely linked to an agreed trajectory for the delivery of Scotland's airports net zero carbon plan.** The UK and Scottish governments and industry should work together on the development of the proposed early-stage sustainable aviation fuel clusters at Grangemouth and St Fergus.

HS2 construction is now underway in England. The UK and Scottish governments should meet their joint commitment to reducing the journey time from Edinburgh and Glasgow to London to 3 hrs through combinations of new high-speed infrastructure and upgrades to existing lines in Scotland and the North of England. This will attract people to shift from air to rail travel, release capacity for more passenger and freight services, and better connect the UK's cities. It will also improve connectivity between Scotland and the north of England.

The phased development of infrastructure between Edinburgh and Newcastle could reduce the journey time to 45 minutes (around the same time as the journey between Glasgow and Edinburgh) which would significantly improve economic links between the city regions. Moreover, along with improvements between Edinburgh and Aberdeen, this would reduce the journey time between Aberdeen and Newcastle to under three hours.

**Scotland should aim to be at the forefront of the net zero and digital mobility revolutions. The building of a national network of electric vehicle and ultra-fast charging stations and hydrogen refuelling points is an urgent priority.** New models of finance for this infrastructure will be needed. Charging stations will also need to be rolled-out for e-bikes.

Switching from internal combustion engine to electric vehicles alone will not be enough and reduced demand for car journeys should still be a priority, including to improve air quality. The circularity of electric vehicle manufacturers processes should also be in focus so as not to introduce new resource depletion and disposal issues.

Just as the Scottish Government has developed a series of ambitious targets for transport decarbonisation linked to industrial opportunities, it should do the same for Intelligent Mobility. Scotland should aim to be a living lab for the testing and development of Connected and Autonomous Vehicles for personal and commercial uses and continue to pilot Mobility as A Service applications. Some or all micro mobility vehicles, such as e-scooters, should be legalised, supporting rapid adoption of shared services and allocating infrastructure for them.

Where new roads are required procurement must be used to ensure that infrastructure providers are using the most up to date permeable construction materials, pre-fabrications and digital tools to ensure new roads are more durable, can be delivered with less waste and embedded carbon, and reduce flooding.

The planned ban on sales of new petrol and diesel cars by 2030 and plug-in hybrids from 2035 will reduce the £30bn annual revenues from fuel duty to nearly zero. Replacement funding will be needed to invest in the maintenance and decarbonisation of the transport system. The UK and Scottish governments should work together to revisit the potential for a national model of road user pricing or similar measures to tackle congestion and fund mobility infrastructure. This should be implemented in stages and it should not, in aggregate cost, more than the current system<sup>298</sup>. Such a scheme could offer discounts or exemptions to those, such as disabled drivers, who have a particular need to drive, and be designed to reduce payments for the use of less congested roads or from driving at a time of day when there are fewer vehicles on the road.

## Main Recommendations

### 1. Scotland should aim to be a fully digital and data-enabled society, with world-class, future-proofed, accessible and affordable coverage for all.

The UK and Scottish governments and industry should accelerate the rollout and adoption of full fibre broadband, 4G and 5G networks, and smart technologies, in all of Scotland. Business and public services should plan now as to how they will harness

digital and data technologies for economic growth, social inclusion and climate action, for example in Innovation Neighbourhoods, advanced manufacturing, remote working hubs and 'Repopulation Zones'.

### 2. Scotland should build more sustainable homes of all tenures to meet the economic, demographic and environmental needs of every community.

The Scottish Government, local government and industry should aim to build at least 25,000 homes each year, with a focus on affordable homes for workers and families in all communities and driving innovation in net zero homes and offsite construction. This should include delivery of rural housing, the conversion of vacant properties for city and town centre living, and designating 'Repopulation Zones' for sustainable development in areas facing an acute loss of people.

### 3. Scotland should work with communities and local organisations to renew the purpose of places to create prosperous, healthy, green and resilient economies, enabling people to live locally and work anywhere.

The Scottish Government, local government and local partners should commit to the rapid delivery of 20-minute mixed economy neighbourhoods across at least 10 geographically and socioeconomically diverse locations, with the infrastructure, jobs, services, active travel and green spaces for people to live, work and play locally.

The Scottish Government, local government and industry should invest strategically in a network of 500 digitally enabled remote working hubs in rural and urban areas, that enable people to work productively in their communities and strengthen local entrepreneurial, innovation and collaboration networks.

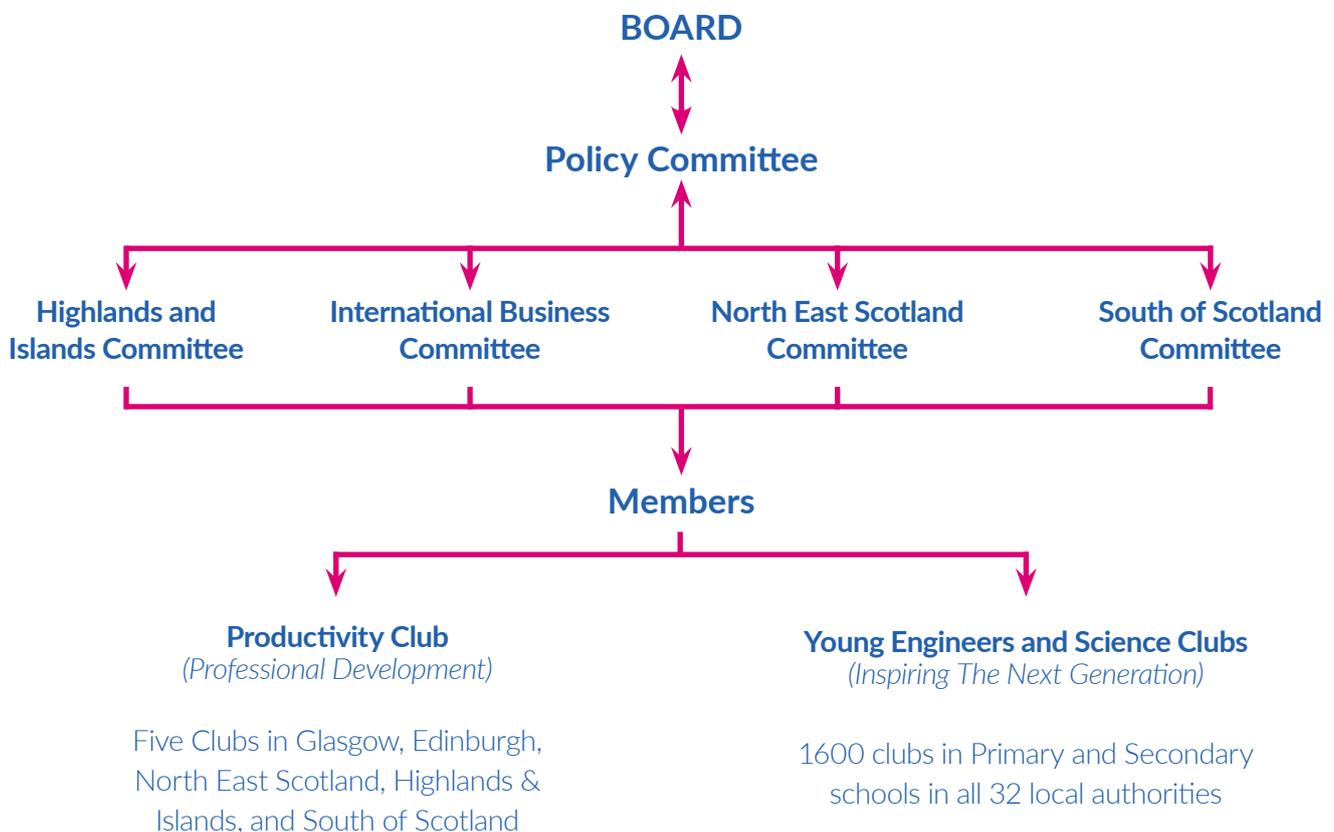


# Developing Blueprint 2030

## About SCDI

SCDI wants Scotland to be a world-leading economy, one which benefits its people and the planet. Member organisations share that vision and we are working together to build a better Scotland.

We are a unique coalition of interests which unites public, private and civil society under a single banner. Members come from all sectors and industries, private, public and social economy, and all parts of Scotland.



## About the Blueprint

In our Blueprints, SCDI proposes our vision and 10-year economic strategy for Scotland.

The Blueprint is founded on research and engagement with all sectors and regions of Scotland

## Blueprints 2010 and 2015

Blueprint for Scotland – Action Plan for Growth (2010)	From fragile to agile: A blueprint for growth and prosperity (2015)
<b>An Outward and Enterprising Nation</b> – four 5-year priorities and four 10-year priorities	<b>Productivity</b> – 17 recommendations
<b>Maximising Scotland’s Assets</b> – four 5-year priorities and four 10-year priorities	<b>Innovation</b> – 11 recommendations
<b>Realising the Potential of Our People</b> – three 5-year priorities and three 10-year priorities	<b>Internationalisation</b> – 14 recommendations
	<b>Infrastructure and Place</b> – 23 recommendations
	...plus 3 ‘first 100 days’ actions

SCDI has published two Blueprints on a 5 year cycle:

When starting work on the latest refresh of the Blueprint we were challenged to review and reflect on whether or not the recommendations from our previous Blueprints had been implemented or the issues addressed successfully in another way – and, if not, why not.

Specific outcomes from the recommendations in SCDI’s Blueprint of 2015 included:

- ✓ Creation of industry-led Productivity Clubs
- ✓ Establishment of an independent National Infrastructure Commission for Scotland
- ✓ Reform of Business Rates
- ✓ Review of the Planning System
- ✓ Agreement to City Region and Growth Deals for all of Scotland

However, while there has been progress with a range

of the recommendations from the Blueprint in 2010 – for example, on offshore wind developments and high-speed broadband – what is also evident is that many of the priorities are consistent with those in 2021, for example:

- Broaden the business base of Scottish exporters
- ...support for higher business investment and manufacturing
- Refocus innovation schemes
- ...ring-fence 0.5% of the procurement budget to stimulate innovation
- ...prioritise places in STEM subjects
- Begin construction of...Carbon Capture and Storage, marine energy parks
- Scottish supply chains [for offshore wind]
- Commence construction of high-speed rail in Scotland

It is true that some of these areas are likely to need a refreshed focus on a 5-year cycle. Progress with others has been slower than was forecast in 2010

not only in Scotland. Some long-term challenges can perhaps only be wholly addressed and some major new infrastructure can only be delivered on timescales beyond 5 or even 10 years. However, it is evident that Scotland, as a community, has not managed to achieve key outcomes – a statement which is borne out in official statistics and in the National Performance Framework.

What lessons did we take from this finding? In this Blueprint, we need to build a clearer and more compelling case for change, and a coalition of organisations actively committed to our shared cause. We set out to produce a maximum of 12 recommendations, with even more clarity about the aims, actions and actors who could together make these a reality, and how SCDI would support their implementation. The COVID-19 pandemic has only increased the need for us all to drive the structural changes that Scotland has long required. As others have asked, ‘If Not Now, When?’

## Blueprint 2030

The latest refresh of the Blueprint started in mid-2019 with a plan to publish it in 2020.

The refresh was supported by a Blueprint Partners Group of SCDI members: Openreach, Shepherd and Wedderburn LLP, Skills Development Scotland and Zero Waste Scotland.

Policy research reports published by SCDI since the Blueprint in 2015 provided evidence and recommendations which have informed the work on the new Blueprint. These were:

- Four digital reports<sup>299</sup>, including *Automatic... For the people?* and *Building a World-Leading AI and Data Strategy for an Inclusive Scotland*
- *Productive Places: Creating spaces for the new economy to thrive*
- *An Economy for All of Scotland* by SCDI Rural Commission
- *Scotland’s Big Mo* by SCDI Connectivity Commission
- *Upskilling Scotland* by SCDI Skills & Employability

Leadership Group

- *Building Scotland’s Green Recovery* by SCDI Clean Growth Leadership Group
- *Manifesto for Clean Growth* by SCDI Clean Growth Leadership Group
- *Mind the Gap: How data, digital and technology can help Scotland recover from COVID-19, transform health & social care and boost our economy*

A wide research and engagement plan was implemented to develop the Blueprint, including:

- 60 in-depth face-to-face interviews across diverse sectors and geographies
- An online survey which attracted a further 112 responses
- Discussions at the SCDI Board, Policy Committee, Highlands & Islands Committee, North East Scotland Committee, and South of Scotland Committee
- Two focus groups on clean growth and Internationalisation

As a result, three themes were identified and agreed for the Blueprint’s vision of 2030:



Following the onset of the Covid-19 pandemic, the partners agreed to pause work on the Blueprint until such a point as the immediate shock had passed, the implications for the Scottish economy had become clearer and there was a renewed political focus on long-term economic strategy.

Work recommenced in December 2020 at the virtual SCDI Forum 2020. We have undertaken further intensive research and engagement with organisations across Scotland, including:

- Discussions with over 200 delegates from over 100 organisations at the Forum
- A Blueprint Workshop with 24 participants
- A fresh call for evidence with 39 responses
- 15 in-depth virtual meetings
- Discussions of drafts at 11 meetings of SCDI’s

Board and SCDI’s Policy, Highlands & Islands, North East Scotland, South of Scotland, and International Business committees with 138 representatives from across Scotland

- Discussions of drafts with and/or written feedback from Scottish government policy leads and UK Government departments (Scotland Office, Department for Business, Energy and Industrial Strategy, HM Treasury and Cabinet Office)
- A series of four Blueprint Talks with 93 participants and the following speakers:

Business Purpose	A Living Lab for Innovations	Learning Throughout Life	Healthy Places to Live and Work
Ian Walker, Johnson and Johnson  Jamie Maxton, SSE Renewables	Jarmo Eskelinen, Data-Driven Innovation initiative  Jane Morrison-Ross, (then) ScotlandIS and (now) South of Scotland Enterprise	Professor Sir Gerry McCormac, Universities Scotland and University of Stirling  Audrey Cumberford MBE, Colleges Scotland and Edinburgh College  Gemma Gourlay, Robertson Group	Ann Allen MBE, Architecture + Design Scotland, and Chartered Institution of Civil Engineering Surveyors  Rachel Skinner, Institution of Civil Engineers and WSP

The level of engagement of SCDI members and partners throughout the development of the Blueprint has been truly exceptional and we would like to thank everyone for their efforts.

# Glossary of Terms

Blue Economy	The Blue Economy is the sustainable use of the resources of oceans, seas and coasts in established and emerging economic activities, while protecting and preserving their environmental and ecological health.
Community Wealth Building	Community Wealth Building is a model that harnesses the wealth that exists in places and recirculates it as investment into local economic development, empowering and increasing benefits for local communities.
Circular Economy	The circular economy is an economic system that designs out waste and pollution, repairs, refurbishes and recycles products and materials to keep them in use for as long as possible, and regenerates natural systems.
Foundational Economy	The foundational economy is a concept that describes those parts of the private, public and third sectors of the economy that provide the essential services and products on which people most rely in their everyday lives.
Industrial Commons	The ‘industrial commons’ are the R&D, engineering, manufacturing capabilities and supplier infrastructure of an economy, which are key to its ability to innovate, compete and maintain a high skill, high value economy.
Industry 4.0	Industry 4.0, or the Fourth Industrial Revolution, is a term for the present economic era in which the fusion of and interactions between new technologies in the physical, digital and biological worlds are driving rapid change.
Remakery	A remakery is a local workshop which repairs, refurbishes and recycles products in a circular economy.
Remote Working Hubs	Remote Working Hubs, as planned in Ireland, are a network of workspaces in rural and urban areas which will be created by converting vacant and under-utilised buildings to allow more people to live and work locally.
Repopulation Zones	Repopulation Zones are a proposed development-orientated concept to address depopulation in Scotland’s rural and remote areas through interventions in business growth and jobs, infrastructure and access to services.
Skills Wallet	A Skills Wallet is a description for a personal learning account which would allow every adult to combine and draw down public, business and personal funding for education and training throughout their lives and careers.
20-minute Neighbourhoods	20-minute neighbourhoods are a model of place-making in which most of people’s daily needs in life, work and play can be met within a short walk or cycle in complete, compact and connected communities.



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