



# FORGING OUR FUTURE

INDUSTRIAL STRATEGY  
THE STORY SO FAR



HM Government





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**“Our challenge as a nation, and my determination as Prime Minister, is not just to lead the world in the fourth industrial revolution, but to ensure that every part of our country powers that success.**

That is what our modern Industrial Strategy is all about.

Investing in science and research to keep us at the forefront of new technologies and the benefits they bring.

Nurturing the talent of tomorrow – through more outstanding schools, world-leading universities and the technical skills that will drive our economy.

And transforming the places where people live and work – the places where ideas and inspiration are born – by backing businesses and building infrastructure not just in London and the South East but across every part of our country.”

**Theresa May, Prime Minister**



Birmingham University  
is leading the ReLIB  
project to recycle  
electric vehicle  
battery components



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# Foreword

*One year after the publication of our Industrial Strategy, we have already seen significant progress.*

Over the past year there have been important achievements across the five foundations of productivity set out in the strategy. We now have record levels of public investment in research and development, matched by sustained growth in private sector spending. We have the fastest wage growth in nearly a decade and a record number of people are now in work. We have had major upgrades to our infrastructure, with the fastest growth in infrastructure spending in the G7 and big decisions taken for the nation such as the expansion of Heathrow. And we are delivering the biggest shakeup to technical education and retraining in a generation to make sure we have the skills we need.

We have also struck six Sector Deals, long-term strategic partnerships between government and industry, in sectors from construction to creative industries. These deals are not only about attracting investment and growth: they are ensuring we have the skilled, diverse workforce we need for the future.

As our Industrial Strategy acknowledges, the way we live continues to be transformed by the technological advances of what is a fourth industrial revolution.

The UK needs to make the most of the benefits this can bring. This is why we set ourselves four Grand Challenges: Artificial Intelligence and Data, Clean Growth, the Future of Mobility and Ageing Society. We have already announced four missions to focus attention on long-term targets, from five extra year of healthy life for all, to halving the energy use of new buildings.

The Industrial Strategy is more than a set of policies and commitments. It is a new way of working for Government, working across departments to build long-term partnerships with business, academia, and local leaders – from mission-focused policy-making to our newly-established Industrial Strategy Council. It is an ongoing priority, which will adapt as delivery progresses and our needs change. What will not change is its core objective: to build a Britain fit for the future.

The Industrial Strategy is designed to secure our success, looking beyond our departure from the European Union to the future of the UK and the global economy.

**Rt Hon Greg Clark MP**

Secretary of State for Business, Energy and Industrial Strategy

# Introduction

*Our modern Industrial Strategy is a long-term plan to boost productivity and earning power for people throughout the United Kingdom.*



*“The Industrial Strategy is one of the most critical strands of work taking place across government. It has the potential to raise living standards across the whole of the UK, boost people’s earning powers and put the UK at the forefront of future industries internationally. One year from its original publication, I look forward to working with the members of the newly-formed Industrial Strategy Council to provide an independent evaluation of the impact the Industrial Strategy is having up and down the country.”*

**Andy Haldane**, Chief Economist at the Bank of England and Chair of the Industrial Strategy Council

## STRENGTHENING THE FOUNDATIONS

We are strengthening the five foundations of productivity. These are the main drivers of a successful economy.

- ▶ **Ideas** – how we make the UK the world’s most innovative economy.
- ▶ **People** – how we build a successful, high-calibre workforce, now and in the future, ensuring good jobs and greater earning power for all.
- ▶ **Business Environment** – how we secure the UK’s position as the best place to start and grow a business.
- ▶ **Infrastructure** – how we drive improvement to the country’s connections, delivering a major upgrade to the UK’s infrastructure.

- ▶ **Places** – how we put our national strategy on a local level, creating prosperous communities across the UK.

## BUILDING LONG-TERM STRATEGIC PARTNERSHIPS

Partnership between the government and industry on sector-specific issues can create significant opportunities to boost productivity, employment, innovation and skills. Sector Deals call for sectors to set out proposals to transform productivity in their area. The government then works with leadership in the sector to ensure that the proposal is robust and transformative, and deals are announced as and when agreements are reached on an ongoing basis.

We are working with key UK industries to agree Sector Deals, with six already published: Life Sciences, Automotive, Creative Industries, AI, Nuclear and Construction, and three more due shortly: Aerospace, Rail and Food & Drink Manufacturing.

## TAKING ON GRAND CHALLENGES

We are positioning the UK at the forefront of tackling four global Grand Challenges where we can build on our strengths and lead the industries of the future. We have picked specific ‘missions’ within the Grand Challenges – addressing clearly defined problems by setting an inspiring and stretching goal to focus the efforts of industry, researchers and government.

- ▶ **Artificial Intelligence and Data:** We will put the UK at the forefront of the AI and data revolution.

Our first mission is to use data, artificial intelligence and innovation to transform the prevention, early diagnosis and treatment of chronic diseases by 2030.

- ▶ **Clean Growth:** We will maximise the advantages for UK industry from the global shift to clean growth.

Our first mission is to at least halve the energy use of new buildings by 2030.

- ▶ **Future of Mobility:** We will become a world leader in the way people, goods and services move.

Our first mission is to put the UK at the forefront of the design and manufacturing of zero emission vehicles, with all new cars and vans effectively zero emission by 2040.

- ▶ **Ageing Society:** We will harness the power of innovation to help meet the needs of an ageing society.

Our first mission is to ensure people can enjoy at least five extra healthy independent years of life by 2035, while narrowing the gap between the experience of the richest and poorest.

Each Grand Challenge will have a Business Champion with relevant industry experience, and missions which are goals we can all work towards.

As we leave the European Union we are looking to global opportunities, with policies to sustain and enhance our competitiveness and productivity.



# The Industrial Strategy is working for the UK economy

**£45bn**

already committed across the UK through the Industrial Strategy



**78,000**

smaller UK businesses boosted by the British Business Bank

**5%**

increase in private sector expenditure on research and development<sup>1</sup>

**76,000**

new jobs created by foreign direct investment<sup>2</sup>



**£7bn**

record increase in public spend on research and development<sup>3</sup>



**#1**

fastest growing infrastructure investment of the seven largest advanced economies in the world<sup>4</sup>

**£2.3bn of private investment and 1,600 new jobs were announced as part of London Tech Week**



**AI TECHNOLOGIES COULD ADD AN ADDITIONAL £630bn TO THE UK ECONOMY BY 2035<sup>5</sup>**

We are backing research and development for data science and AI. **£300m** has been allocated by the Engineering and Physical Sciences Research Council to fund relevant projects

**THE UK IS NOW RATED 4<sup>TH</sup> IN THE WORLD FOR INNOVATION, OVERTAKING THE USA<sup>7</sup>**

We are driving research and innovation through the Industrial Strategy Challenge Fund. **602 different projects** have already received **£652m** in funding support

**OVER 1,100 BUSINESSES START EVERY DAY IN BRITAIN – ONE EVERY 75 SECONDS<sup>6</sup>**

We are helping small businesses to grow. This year, the British Business Bank launched **four new programmes** and is now supporting over **78,000 smaller businesses** with more than **£5.5bn**

**IN THE FIRST HALF OF 2018, 1 IN 5 ELECTRIC VEHICLES SOLD IN EUROPE WAS MADE IN THE UK<sup>8</sup>**

We are committed to reducing emissions, with **£1.5bn** investment for ultra low emission vehicles by 2020

**MORE THAN 30 AUTOMOTIVE MANUFACTURERS BUILD VEHICLES HERE IN THE UK<sup>9</sup>**

We are agreeing partnerships with industry to boost productivity, employment, innovation and skills. The Automotive Sector Deal will boost the level of UK-made parts in UK-built vehicles so that at least **half of their value is manufactured in this country by 2022**



**THE UK WILL BENEFIT FROM  
£600bn INVESTMENT IN  
INFRASTRUCTURE OVER  
THE NEXT 10 YEARS<sup>10</sup>**

We are investing in sustainable and public transport. The Transforming Cities Fund will provide **£2.5bn** for local projects

**THE £92bn CREATIVE  
INDUSTRIES SECTOR IS  
GROWING AT TWICE THE  
RATE OF THE ECONOMY<sup>11</sup>**

We are supporting cultural contributions to our local economies. **£20m** will be awarded to cities and towns for creative, cultural and heritage projects through the Cultural Development Fund

**THOSE AGED 50+ NOW MAKE  
UP NEARLY A THIRD OF THE  
ENTIRE UK WORKFORCE<sup>12</sup>**

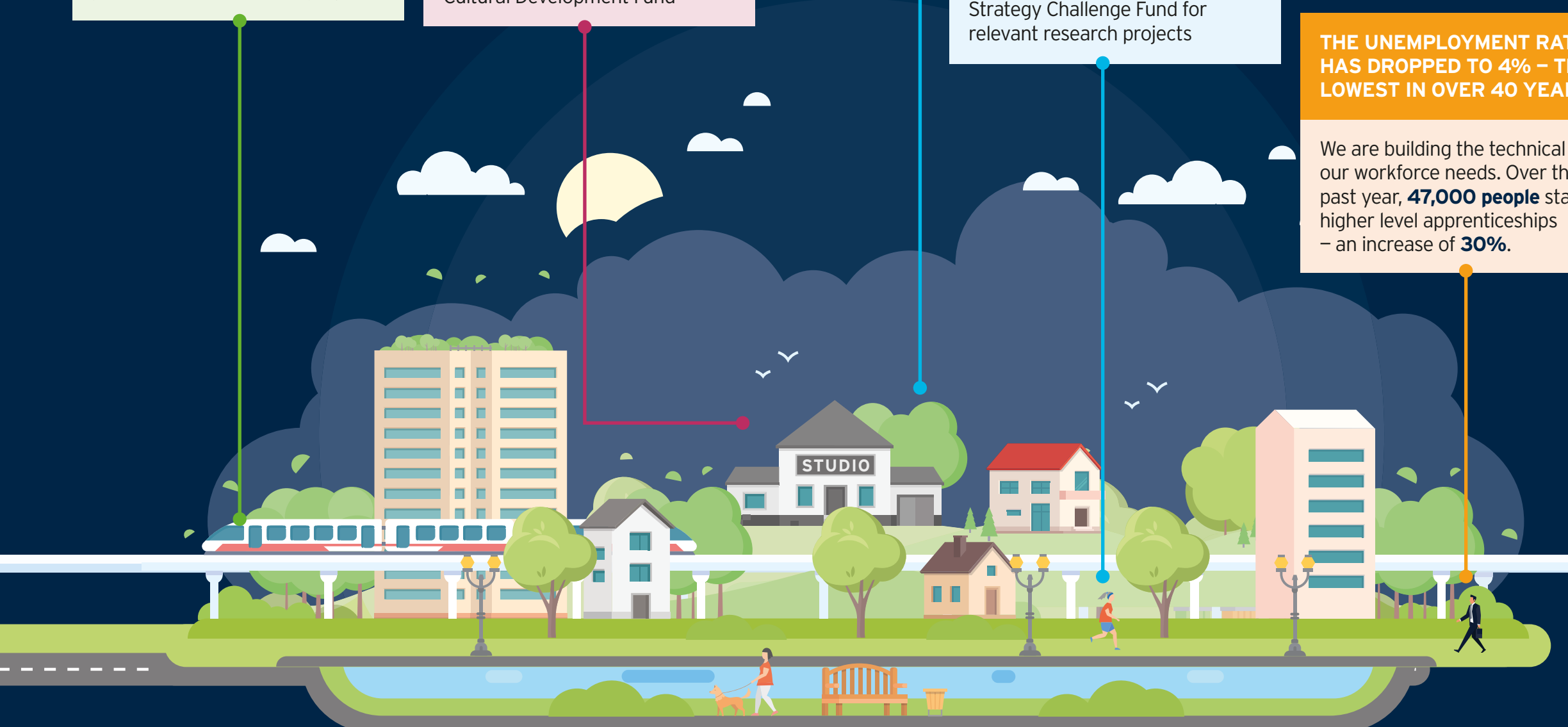
We are developing technologies and industries to support our ageing society, with **£300m** from the Industrial Strategy Challenge Fund for relevant research projects

**2017 WAS THE UK'S CLEANEST,  
GREENEST YEAR YET<sup>13</sup>**

We are partnering with business to maximise the opportunities from clean growth. The first Green GB Week in October 2018 saw **67 pledges**, from organisations including HSBC, Tesco and John Lewis


**THE UNEMPLOYMENT RATE  
HAS DROPPED TO 4% – THE  
LOWEST IN OVER 40 YEARS<sup>14</sup>**

We are building the technical skills our workforce needs. Over the past year, **47,000 people** started higher level apprenticeships – an increase of **30%**.





# The Industrial Strategy is having an international impact




The **UK-Canada AI Innovation Challenge** is inspiring AI solutions in aerospace from companies in both countries.




**13,000 delegates** welcomed to the International Business Festival in Liverpool to see UK start-ups involved in the Grand Challenges.



Some of the UK's most innovative businesses met their US counterparts on board the **HMS Queen Elizabeth** in New York, for a trade mission on cyber security and AI.




The **Newton Prize** is funding scientists in the UK and Chile to develop ways to strengthen energy infrastructure so that it can withstand extreme weather and natural disasters.



**\$500m** invested by Japan's Softbank in Improbable, a London-based company crafting virtual worlds.



**£32m** invested in Technology Accelerators to build innovative business links between Africa and Britain.



**Novo Nordisk** is investing **£115m** in a new centre for development of medicines that will transform the lives of people with diabetes.




The UK is chairing the **EUREKA programme** for 2018/19. This intergovernmental network supports innovation-driven entrepreneurship in Europe.



In May 2018, the UK signed **agreements for science and innovation with Israel**, for greater collaboration in shared priority areas including advanced materials and Ageing Society.




**£35m** planned for investment in British AI start-ups by Japan's AI-focused Global Brain.




Chinese robotics company JEE Automation Equipment is investing **£6m** in the UK to establish an assembly and testing facility in Birmingham.



The second **UK-India Energy for Growth Dialogue** took place in September 2018.



**\$72m** co-invested with South Africa in our Clean Growth ambitions for battery storage.



**£10m** invested by the UK and Singapore in a joint quantum space programme.

IDEAS

# Becoming the world's most innovative economy



*Innovation is about ideas, new ways of doing things, new products and services, new technologies and new business models.*

We are a global leader in science and research, but we need to drive the biggest increase in investment in research and development (R&D) in our history. We must become better at turning exciting ideas into strong commercial products and services, and build on excellence across the whole country.

We are ensuring the UK is the best place for researchers and innovators, and are driving partnerships between the best minds and businesses throughout Britain. We are already delivering record increases in public sector R&D investment – over £7bn so far – with a target to reach 2.4% of GDP across the whole economy by 2027.

**HIGHLIGHTS INCLUDE:**

**602** new research and development projects supported by government funding

**£2.7bn** addressing R&D challenges through the Industrial Strategy Challenge Fund

**£110m** to support international collaboration in science and research

**NEXT STEPS**

- ▶ Continue to drive investment in R&D, launching an **R&D Roadmap** to set out how public, private and voluntary sectors will meet the 2.4% target
- ▶ Launch a **Knowledge Exchange Framework** to benchmark how well universities are sharing knowledge and commercialising research
- ▶ Announce the first winners of the **Strength in Places Fund**, who will receive funding to build on their science and innovation strengths and develop stronger local innovation networks
- ▶ Go further to support international research and innovation programmes, including the second stage of the **Fund for International Collaboration**
- ▶ Help **industry transform great ideas into new products and services** through investing £1.2bn more public funding in the Catapult network

**LONG TERM GOALS**

- ▶ By 2030 we want the UK to be **the most innovative country in the world**: a home to the most dynamic businesses at the cutting edge of new technologies and processes
- ▶ We want **2.4% of GDP** to be invested in R&D across the whole economy by 2027, increasing to 3% in the longer term



**DEVELOPING CUTTING-EDGE BATTERY TECHNOLOGIES**

A team at Birmingham University is leading a project to recycle electric vehicle battery components.

The goal of the ReLiB project is to establish infrastructure in the UK that makes the recycling of lithium-ion batteries from the automotive sector as efficient as possible. Currently, electric vehicle recycling capabilities are limited in the UK and many materials are not recycled.

Projects like ReLiB are of importance if the UK is to meet carbon emissions targets, but it also addresses issues with current battery technology.

Birmingham University's project is one of four fast-start projects run by the Faraday Institution, the £78m centre funded by the Industrial Strategy Challenge Fund.



PEOPLE

# Generating good jobs and greater earning power for all



*We are putting people at the heart of our Industrial Strategy to ensure that everyone can improve their skills throughout their lives, increasing their earning power and opportunities for better jobs.*

We are equipping citizens for jobs shaped by next generation technology. As the economy adapts, we want everyone to access and enjoy good work.

Investing in our people across their lifetimes is fundamental to our shared success, from strong foundations for children and young people in schools and relevant high-quality education and training in our further and higher education systems to career-long learning and enabling employers to invest in their workforce. We are already leading the biggest transformation to technical education in a generation.

**HIGHLIGHTS INCLUDE:**

**£1,200** paid to schools and colleges for each additional pupil taking **Maths A level**

**25%** increase in **A level computer science entries** since 2017

**47,000** people started **higher-level apprenticeships**

**NEXT STEPS**

- ▶ Advance reforms to technical education, including through a new **£170m network of Institutes of Technology** across the country
- ▶ Establish 21 new basic maths **Centres for Excellence**, alongside a £16m programme to increase participation and attainment in level 3 mathematics
- ▶ Set out our commitments to improve modern working practices and protect workers' rights in a new **Good Work Plan**
- ▶ Expand the network of **Maths Hubs** to support schools and teachers, as well as continuing to upskill computer science teachers through a new £84m programme
- ▶ Support **fair pay for all**. All eligible employers now publish their gender pay gap data, and we are consulting on being the first country in the world to mandate ethnicity pay reporting



**SUPPORTING WOMEN IN ENGINEERING**

When Daisy Coombes left school she had five offers from universities. But she decided that she wanted to take a different route to becoming an engineer, with a Higher Apprenticeship in Design Engineering with JCB. The company pays her a salary and also paid for her degree at Sheffield Hallam University, which she studies for one day a week. Through the Industrial Strategy, we are accelerating a transformative programme to increase the number of higher apprenticeships, improve employment outcomes for young people, and meet the skills needs of our economy.

**LONG TERM GOALS**

- ▶ We will be introducing the **new T levels** – technical education equivalent to A levels – from September 2020, backed by an additional £500m per year once fully rolled out
- ▶ We are developing a **National Retraining Scheme**, with a further £100m investment announced in the 2018 Budget

to ensure it is underway by the end of the current Parliament

- ▶ We are **reforming apprenticeships to make them world-class**, helping employers create high quality programmes that give them the skills they need. By 2020 we will be investing nearly £2.5bn in apprenticeships per year

INFRASTRUCTURE

# Delivering a major upgrade to the UK's infrastructure



*The country's economic geography will be transformed through Industrial Strategy investment – from full-fibre broadband, new 5G networks and smart technologies such as autonomous vehicles, to high-speed rail connecting people to jobs and opportunities, the regeneration of stations and airports and upgrades to the road network.*

We will also improve people's lives where they live and work with high quality housing and clean, affordable energy. Much of this investment is large scale and long term, and we will consider this strategically to support wider objectives as well as delivering resilient infrastructure and value for money. We have already initiated the highest growth in infrastructure spending out of the world's seven most industrialised countries.

**HIGHLIGHTS INCLUDE:**

**£37bn** for **productivity investment**, including better transport and digital connections

**200** trains fitted with the latest **digital signalling technology** by the end of 2018

**650,000** new homes created through the Housing Infrastructure Fund

**NEXT STEPS**

- ▶ Trial high-speed digital connectivity in a rural area, with a large-scale **Rural Connected Communities Project**
- ▶ Set out our strategy for **addressing the UK's top infrastructure needs and priorities**, as identified by the National Infrastructure Commission's recent assessment
- ▶ Invest in **public and sustainable transport links** to centres of employment, allocating nearly £2.5bn to projects in up to 18 cities
- ▶ Work with the Highlands and Islands Enterprise to develop plans for a **vertical launch spaceport in Sutherland**, which will create hundreds of jobs and boost the UK's commercial space sector
- ▶ Put the Government's responsibility to look after the natural environment into law with the introduction of an **Environment Bill**



**BOOSTING BUSINESS THROUGH DIGITAL INFRASTRUCTURE**

Sun Salads is a family business in Dorset that grows, packages and supplies watercress. Due to slow broadband speeds in the area, downloads from customer ordering systems were often running overnight. At busy times the connections were so slow they were unworkable. With local supplier Wessex Internet, Sun Salads applied for a £3,000 gigabit voucher to offset the cost of a full fibre connection. This was installed in May 2018, and the improvement has been dramatic. The option to upgrade to faster speeds in the future will be vital for growing their business further.

**LONG TERM GOALS**

- ▶ We will continue to build our **National Infrastructure and Construction pipeline**, which is currently worth **£600bn**. Public investment will have doubled by 2022/23
- ▶ We will **end the sale of new conventional petrol and diesel cars and vans** by 2040
- ▶ We will work to **halve the effects of air pollution on health by 2030**, by meeting targets to reduce emissions
- ▶ We will continue to work with **industrial sectors to reduce their carbon impact**, including through the new Industrial Energy Transformation Fund



BUSINESS ENVIRONMENT

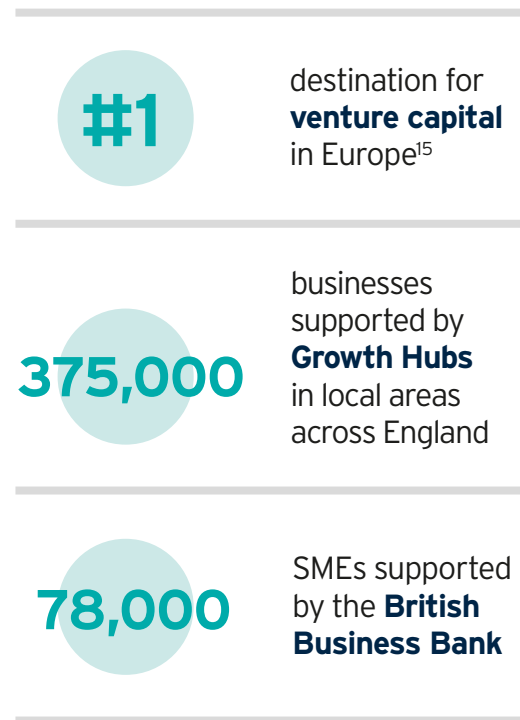
# Becoming the best place to start and grow a business



*The UK has a global reputation as a great place to do business, and our Industrial Strategy aims to make the country the best place to start and grow a business, and a global draw for innovators.*

We are driving productivity in businesses of all sizes by increasing collaboration, building skills and ensuring everyone has the opportunity of good work and high-paying jobs. We are ensuring the financial sector is better connected to the rest of the economy, driving impactful investments. We are creating a business environment equipped for the challenges and opportunities of new technologies and ways of doing business. In the past year the Government has put in place all the building blocks to deliver a £20bn action plan in support of innovative high-growth-potential businesses.

HIGHLIGHTS INCLUDE:



NEXT STEPS

- ▶ **Introduce new programmes**, such as leadership and management training, to help improve the productivity of 5.7m British businesses
- ▶ **Improve conditions for small businesses** with measures to tackle late payments
- ▶ Consider how UK businesses can **boost their supply chain capabilities** to match the best in Europe and beyond
- ▶ Ensure the competition regime is working to **support an enterprise economy**, publishing a review in Spring 2019
- ▶ Develop our plans to tackle barriers facing **UK businesses looking to export** or export more

LONG TERM GOALS

- ▶ We will generate over **£20bn investment** into high-growth-potential businesses by 2027
- ▶ We will provide management training to 10,000 small business leaders by 2025 through the **Small Business Leadership Programme**
- ▶ We will **increase total UK exports** from 30% of GDP (as of June 2018) to 35%. This will add over £100bn worth of exports



IMPROVING THE PRODUCTIVITY OF SMALL BUSINESSES

Be the Business, an initiative led by businesses and supported by Government, has launched programmes to help SMEs adopt and share best practice.

Cumbria Crystal, a manufacturer of bespoke hand-made crystal, completed the Productivity through People programme in Lancaster. This is a 12-month SME leadership programme supported by large businesses and delivered by business schools.

Cumbria Crystal Managing Director Chris Blade said: *“We spent more time on the business, not in the business. One of my challenges was to think of small changes all staff could make to increase productivity, margins or efficiency by 1%. That sounds quite easy – and in fact it wasn’t that difficult. But add up all those small gains month-by-month and you can create a big effect.”*

PLACES

# Developing prosperous communities throughout the UK



*The UK has world-leading businesses located around the country. Our cities, towns and rural areas in England, Scotland, Wales and Northern Ireland have competitive advantages essential to shaping our economic future.*

We are building on the strong foundations of our City, Growth and Devolution Deals and continue to work in partnership with local leaders to drive productivity. We are introducing new policies to improve skills, shaped around the needs of different parts of the country, create more connected infrastructure, back innovation strengths, ensure land is available for housing growth and strengthen our cultural assets. We are already working with areas to develop Local Industrial Strategies, which will set out priorities to drive growth locally.

**HIGHLIGHTS INCLUDE:**

**£675m**

for local plans to make high streets and town centres **fit for the future**

**18**

cities benefiting from **£2.5bn** to improve intra-city transport

**£120m**

to fund **local innovation** through the Strength in Places Fund

**NEXT STEPS**

- ▶ Work in partnership with strengthened local institutions across the country to agree the first **Local Industrial Strategies**, including for including Greater Manchester, West Midlands and partners across the Oxford-Cambridge Arc
- ▶ Roll out **Skills Advisory Panels** across England to better coordinate skills provisions for over 16s
- ▶ Drive clusters of business across the country to innovate or adopt new technologies through the **Strength in Places Fund**
- ▶ Invest in our culture, heritage and creative industries across the country through the **£20m Cultural Development Fund**
- ▶ **Refresh strategies** for the Northern Powerhouse and Midlands Engine



**SUPPORTING LOCAL SKILLS**


Plans are underway for 'Maths Month' on the North Yorkshire Coast, as part of a wider programme to create a 'love of Maths' across the district. The establishment of a Scarborough-based maths centre ensures that local schools and teachers have access to continuous professional development to aid their understanding and delivery of teaching for mastery. The maths centre will host teachers from Shanghai as part of an exchange programme, which will provide teachers with an opportunity to learn from specialists.

**LONG TERM GOALS**


- ▶ By early 2020, we will agree **Local Industrial Strategies** for all places in England, with support for places in Scotland, Wales and Northern Ireland that want one
- ▶ Build up to **1m high-quality homes by 2050** to maximise the economic growth of the Oxford-Cambridge Arc
- ▶ Deliver more **City and Growth Deals** across the devolved nations, in addition to those already agreed with regions in Scotland and Wales



# The Industrial Strategy is supporting business, research and training throughout the UK




**W5** is an interactive discovery centre in Belfast. The Inspiring Science Fund awarded it £3m to create new immersive exhibitions, encouraging young people to consider science careers.




We are helping Swansea University develop new building materials which generate electricity from light and heat, with a £36m grant for the **Active Building Centre**.



Through the Better Business for All programme, **Lynher Dairies Cheese Company** in West Cornwall received support to pass food inspections by US regulators. This allowed them to start exporting their handmade cheese to the USA.




**Bloomsbury AI** used supercomputers to test new AI ideas through a programme run by the Digital Catapult. The resulting technology, called Cape, converts text to knowledge with close to human performance.



**Bio Technics Ltd.** exports innovative hygiene solutions to 17 global markets. They have worked with the Department for International Trade, Scottish Enterprise and Scottish Development International to help them reach their global expansion goals quicker.



The **Nissan Leaf** car plant in Sunderland currently has capacity to manufacture 50,000 electric vehicles per year. Sunderland builds Leafs for 23 markets, including Western Europe, Argentina and Israel.



**Greater Manchester** will boost the contribution of older workers through its Local Industrial Strategy. Building on the Working Well programme, their objective is for 5,000 more 50-64 year olds in employment by 2020.




We have launched a **Local Digital Skills Partnership** between regional business, local authorities and educational institutes in the West Midlands to boost digital skills and opportunities and support the growth of the local economy.



As part of the High Value Manufacturing Catapult, supported by Innovate UK, the **Nuclear Advanced Manufacturing Research Centre** in Rotherham is boosting the competitiveness of the UK civil nuclear manufacturing industry.



**Consortiq**, based in Southampton, are expert drone professionals providing bespoke unmanned technology solutions. They have clients in Canada, UAE, Kenya and South Africa.



**THURN Group** is using robot submarines to enable engineers to see hazards that ice may cause to infrastructure, pipelines and ships around the Arctic. They have received project funding from the Industrial Strategy Challenge Fund.

SECTOR DEALS

# Building long-term partnerships with businesses



*Partnership between the government and industry on sector-specific issues can create significant opportunities to boost productivity, employment, innovation and skills.*

Sector Deals call for sectors to set out proposals to transform productivity in their area. The Government then works with leadership in the sector to ensure that the proposal is robust and transformative, and deals are announced as and when agreements are reached on an ongoing basis. Sector Deals published to date include commitments to create thousands of highly skilled jobs around the country, and support for innovative and entrepreneurial work.

**DEALS TO DATE:**



**LIFE SCIENCES**

The Life Sciences Sector Deal (December 2017) focuses on ensuring new pioneering treatments and medical technologies are produced in the UK, improving the lives of patients and economic growth.

- ▶ Over **£1.5bn co-investment** in long-term medical challenges and early diagnostics and precision medicine
- ▶ **Accelerate approval for clinical trials** and a Digital Health Catalyst to help SMEs work with NHS to develop new technologies
- ▶ A new **state-of-the-art research and development hub** from pharmaceutical company MSD

*"This Life Sciences Sector Deal ... represents a significant change in both pace and culture ... that can lead to the discovery and implementation of novel innovations for healthcare."*

**Sir John Bell**, Regius Professor of Medicine, University of Oxford, Industry lead for Sector Deal

**IMPROVING THE HEALTH OF THE NATION**

As part of the Life Sciences Sector Deal, we issued a £30m contract for a Vanguard Study, the first phase of a programme to sequence the genomes of all 500,000 participants in the UK Biobank.

By looking at whole genomes, scientists will discover new insights into human biology, with the potential to prevent disease and save lives through earlier diagnosis and targeting of treatment throughout the country.

The Life Sciences Sector Deal ensuring that the next wave of breakthrough treatments, innovative medical research and technologies, and high skilled jobs are created in the UK.





## AUTOMOTIVE

The Automotive Sector Deal (January 2018) ensures that the UK continues to reap the benefits from the transition to ultra-low and zero-emission vehicles by continuing to build agile, innovative and cost competitive supply chain needed to secure international investment.

- ▶ £1bn co-investment in the next generation of **electric, connected and autonomous vehicles**
- ▶ Ambition for **50% UK suppliers** as part of programme to improve the competitiveness of UK supply chain
- ▶ Flagship projects to support the next generation of **driverless and low-carbon vehicles** led by major industry leaders

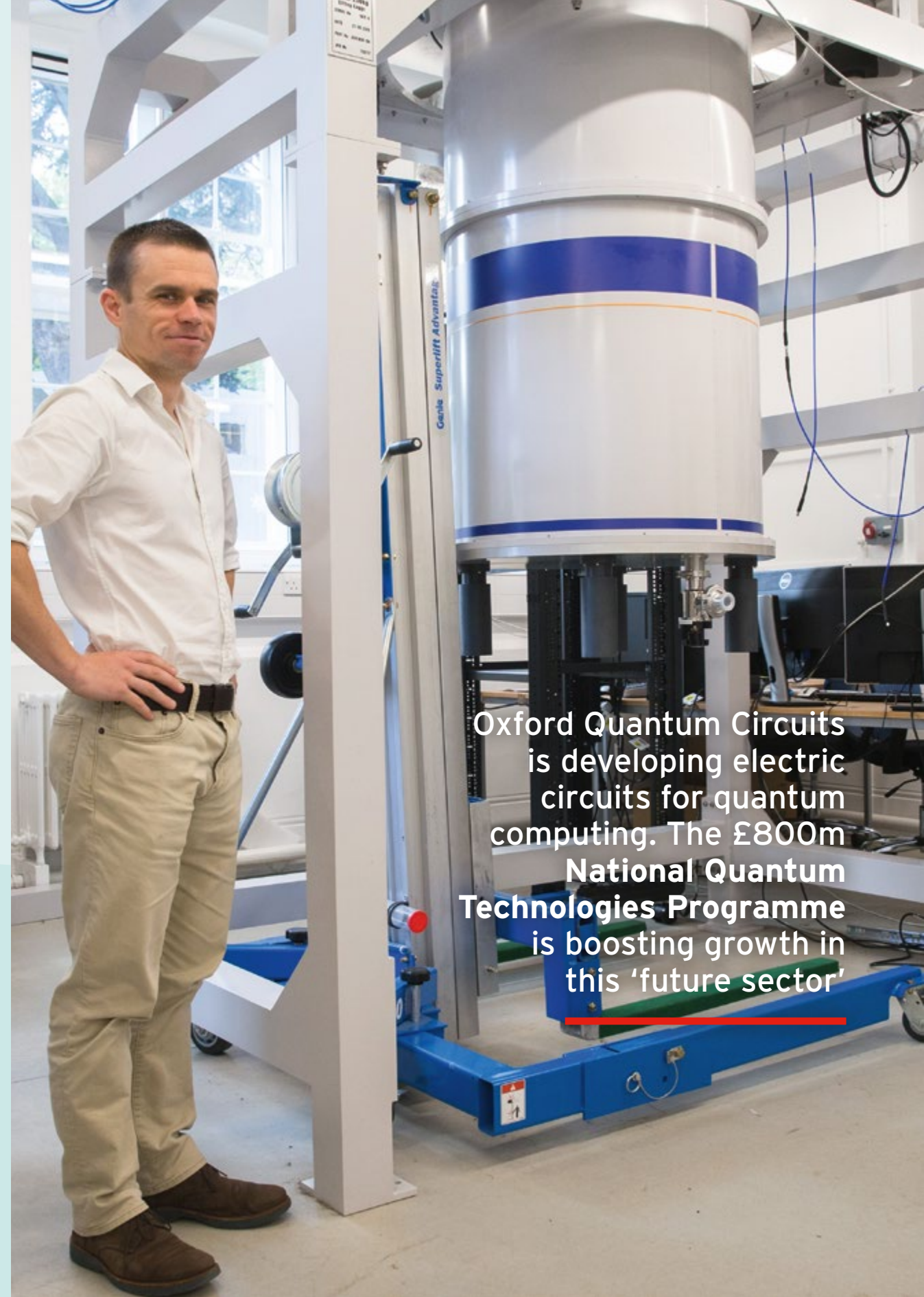
*"The deal strengthens our long-standing partnership with government to keep the UK at the forefront of electric, connected and autonomous vehicles."*

**Mike Hawes**, Chief Executive SMMT

## DELIVERING NEW TECHNOLOGY FOR ELECTRIC VEHICLES

The Advanced Propulsion Centre (APC) has invested £80m in the UK Battery Industrialisation Centre, which is scheduled to open in March 2021. This will help commercialise the battery technology needed for electric vehicles.

Since it was launched in July 2013, the APC has awarded £345m government funding to 41 collaborative research and development projects, worth £715m. Almost 150 individual organisations are being supported through the APC programme, which will help to secure or create over 23,400 jobs and avoid the creation of 40m tonnes of carbon dioxide. The technologies they are working on are initially for the automotive sector but will have wider application.



Oxford Quantum Circuits is developing electric circuits for quantum computing. The £800m National Quantum Technologies Programme is boosting growth in this 'future sector'

## CREATIVE INDUSTRIES

The Creative Industries Sector Deal (March 2018), led by the Creative Industries Council and with input from the Creative Industries Federation and others across the sector, is boosting growth for creative business.

- ▶ **£150m joint investment** including a Cultural Development Fund to support creative clusters across the UK
- ▶ Industry-led creative careers programme to reach **600,000 students** and development of new apprenticeship standards
- ▶ A new campaign to increase awareness of **online intellectual property rights**

*“The Creative Industries Sector Deal was a major landmark for our sector which underlines its importance to the UK economy, and provides a platform for further success over the coming years. Implementation is now well underway and I look forward to continued collaboration within the Council, and with many others across industry and Government, to deliver and build on the commitments of the deal.”*

**Tim Davie**, Chief Executive Officer of BBC Studios and industry chair of the Creative Industries Council

## RESEARCHING THE CHALLENGES FACING CREATIVE INDUSTRIES

The Creative Industries Clusters Programme (CICP) is a five year scheme to foster research and development, with £80m of Industrial Strategy funding as part of the Sector Deal.

As part of this programme, nine creative research and development partnerships between universities and industries are receiving funding to take on unique challenges faced by a range of creative sectors including screen industries, fashion technology, video games, animation and storytelling.

These partnerships span the UK including Cardiff, Edinburgh, Ulster, Dundee, Leeds and in the south of England. It incorporates over 1,000 projects, creating an expected 700 new jobs and 150 new business ventures.



## ARTIFICIAL INTELLIGENCE

The Artificial Intelligence Sector Deal (April 2018), is boosting the UK’s global position as a leader in developing AI technologies by taking tangible actions to advance our AI and Data Grand Challenge and ensure the UK is the go-to destination for AI innovation and investment.

- ▶ **£1bn co-investment** in innovation such as Govtech, next generation services or the role of AI technologies in the creative industries
- ▶ Actions to **increase data availability** and boost high level skills
- ▶ Funding for specialist AI research, including **1,000 AI PhDs**

*“The sector’s formal inclusion in the industrial strategy [is] crucial to a thriving production industry in the UK.”*

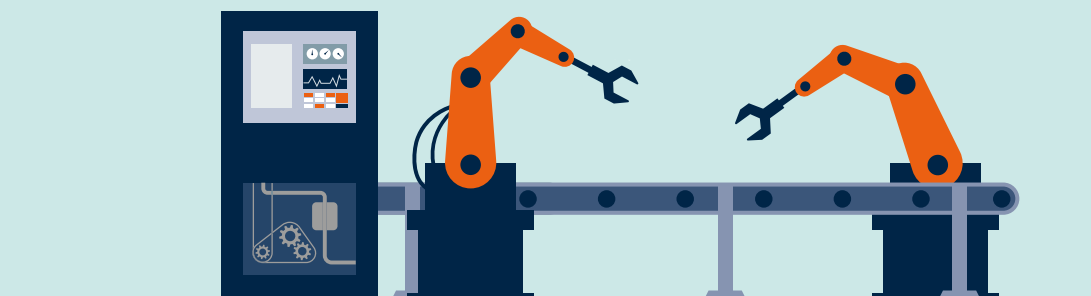
**Josh Berger**, President, Warner Brothers UK

## COLLABORATING INTERNATIONALLY TO MAKE AIRCRAFT MORE EFFICIENT

A new AI Innovation Challenge calls on innovators to use artificial intelligence to make aircraft less costly and more eco-friendly by burning less fuel.

Start-ups and researchers can pitch ideas for AI to help improve the systems used to prevent ice build-up on wings and help aircraft reach their optimum performance.

Applicants will be invited to pitch their ideas directly to Bombardier’s Belfast-based wing factory and industry experts. The winner will have the opportunity to meet with Bombardier to explore a potential future collaboration.





## NUCLEAR

The Nuclear Sector Deal (June 2018), ensures that the UK's nuclear sector remains cost competitive with other forms of low-carbon technologies to support our Clean Growth Strategy and Grand Challenges.

- ▶ **£200m co-investment** programme in emerging nuclear technologies including small and advanced nuclear modular reactors

Industry has committed to stretching targets including:

- ▶ **30% reduction** in the cost of new build projects
- ▶ **20% savings** in the cost of decommissioning compared with current estimates
- ▶ **40% women in civil nuclear** by 2030 (approximately 22% today)

*"This ambitious deal between industry and government will ensure nuclear plays a key role in providing the UK's low-carbon energy supply for the future, maximising opportunities in overseas markets, leveraging technology and innovation and increasing competitiveness."*

**Tom Greatrex**, CEO of the Nuclear Industry Association

## IMPROVING NUCLEAR DECOMMISSIONING

Sellafield Ltd is carrying out essential nuclear decommissioning work, using cutting edge technology enabling it to meet the highest safety standards.

We want to achieve greater value for the taxpayer in the way we conduct nuclear decommissioning in the UK, and have set a target of a 20% reduction in the costs of decommissioning by 2030.

A joint government and industry review is underway to establish a national decommissioning and waste management pipeline. This aims to create opportunities for the UK economy by reducing barriers to entry for the supply chain.



The online *Export Opportunities* service showcases more than **20,000 export opportunities** for UK businesses

## CONSTRUCTION

The Construction Sector Deal (July 2018), sets out a partnership between government and industry that aims to transform the sector's productivity through innovative technologies and a more highly skilled workforce.

- ▶ **£450m joint investment** in digital construction and offsite manufacturing to deliver 50% reduction in time taken to deliver new build
- ▶ **25,000 construction apprenticeship starts** and 1,000 Construction T level placements from September 2020

*"The new construction industry Sector Deal is to be welcomed, and its focus on digitising the construction industry, as well as off-site manufacturing, will be a shot in the arm for the sector."*

**Graham Robinson**, Global Business Consultant and Director of Global Construction Perspectives, Pinsent Masons

## TEACHING CONSTRUCTION SKILLS

60 new construction apprenticeship standards are now in place, covering essential trade skills such as bricklaying, carpentry and plumbing as well as degree level apprenticeships in architecture and civil engineering. This already exceeds the Sector Deal target of 50 standards by the end of 2018.

The Construction Skills Fund also has £24m, plus funding from the Construction Industry Training Board, to establish 27 onsite training hubs for 18,000 students by 2020.

## HIGHLIGHTS INCLUDE:

**£3bn** investment by both Government and Industry in key UK sectors

**200** individual commitments across sectors to boost productivity

**16%** of the UK workforce employed in the six sectors with early Sector Deals

## RAIL SECTOR DEAL

We are in advanced negotiations on mutual commitments to deliver and deploy new technologies, encourage investment, incentivise greater collaboration, and increase export potential.



## AEROSPACE SECTOR DEAL

We will look to conclude a Sector Deal which will support advances in how we power flight, increase the competitiveness of the supply chain, improve the diversity of the sector, and boost the number of aerospace apprenticeship starts.



## NEXT STEPS

We will continue analysis of Sector Deal proposals to ensure that the most transformative bids are taken forward

- ▶ We will **monitor the implementation of published Sector Deals** to ensure that maximum value is extracted
- ▶ We will **continue engagement with industry** to ensure that the Sector Deals are designed in the most beneficial way possible
- ▶ We will **review each Sector Deal at the one year point** to maintain momentum and refresh ambition if necessary

## FOOD & DRINK MANUFACTURING SECTOR DEAL

We have launched formal negotiations with the Food and Drink manufacturing sector. An agreed deal would include commitments to support manufacturers to export to new markets and accelerate the diffusion of productivity-enhancing technologies.





AI AND DATA GRAND CHALLENGE

# Putting the UK at the forefront of the AI and data revolution



*Artificial intelligence and machine learning are already transforming the global economy, using vast datasets to perform complex tasks.*

These range from helping doctors diagnose medical conditions more effectively to allowing people to communicate across the globe using instantaneous speech recognition and translation software.

The AI and Data Grand Challenge is seeking to build the best environment for developing and deploying AI and data technologies in a positive way for people and society. It is focusing on building the skills, talent and leadership in the UK, promoting adoption across sectors, and ensuring AI and data technologies are used safely and ethically.

**HIGHLIGHTS INCLUDE:**

**£1bn**

package from the AI Sector Deal which will strengthen the **UK's position as a global leader**

**£300m**

allocated to **fund data science and AI research**

**£50m**

to be invested in AI Fellowships to bring the **best AI researchers to the UK**

**FIRST MISSION**

Use data, Artificial Intelligence and innovation to transform the prevention, early diagnosis and treatment of chronic diseases by 2030.

**NEXT STEPS**

- ▶ Launch **Data Trust pilot(s)** to explore frameworks and mechanisms for safe, ethical and fair sharing of data
- ▶ Set up the **AI Council** to galvanise support and maximise the ethical uptake of AI technologies across the UK
- ▶ Review how the Government can use AI, automation and data in new ways, to **drive public sector productivity** and wider economic benefits
- ▶ **Collaborate with global partners** on shared AI and data opportunities and challenges formulating responses that have international traction and credibility



**FIGHTING TERRORIST CONTENT ONLINE USING AI**

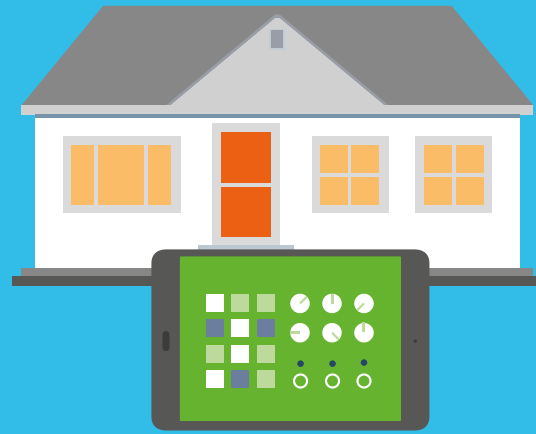
The Home Office worked with company ASI Data Science to develop machine learning technology that can automatically detect terrorist video propaganda on any online platform, ensuring the majority of content is stopped before it reaches the internet. Tests have shown this tool can automatically detect 94% of terrorist propaganda with 99.9% accuracy - if it analyses one randomly selected video, only 50 would require additional human review. The tool can be deployed by smaller platforms that are increasingly deployed by terrorists and their supporters and that often do not have the resources to develop automated detection technology.

*"Artificial intelligence has the potential to transform our world for the better but to be successful we need to galvanise people in businesses right across the country. I'm honoured to be named chair of the AI Council because I'm passionate about championing the rapid and responsible adoption of this cutting-edge technology. By focusing on skills, data ethics and diversity, we can boost innovation and funding and put the UK at the forefront of this exciting and revolutionary sector."*

**Tabitha Goldstaub**, co-founder of CognitionX, AI Council Chair, and AI Business Champion

AGEING SOCIETY GRAND CHALLENGE

# Harnessing the power of innovation to help meet the needs of an ageing society



*In the UK and globally, we have made significant progress in supporting people to live longer.*

One in three children born in the UK today can expect to live to 100. An ageing society profoundly impacts our society and economy. It means thinking differently about work, finances, housing, communities and health.

The Ageing Society Grand Challenge aims to harness the significant economic opportunities, including technologies, products and services more suited to our future. We want everyone to lead fuller, healthier and more active lives, and support a new generation of businesses to thrive in the growing market for products and services that support older people.

HIGHLIGHTS INCLUDE:

**£98m** invested to **support innovation for healthy ageing**

**£40m** from Newcastle University and the Government for a **National Innovation Centre for Ageing**

**5,000** more **50-64 year olds expected** to be employed in Greater Manchester by 2020

FIRST MISSION

To ensure that people can enjoy at least five extra healthy, independent years of life by 2035, while narrowing the gap between the experience of the richest and poorest.



NEXT STEPS

- ▶ Work with national centres of expertise and local areas to **address the opportunities and challenges of an ageing society**, encouraging a range of approaches in Local Industrial Strategies
- ▶ Publish a new **Prevention Green Paper** outlining our plans to delivery five extra healthy independent years of life for all
- ▶ Launch a competition to **design the home of the future** – building more energy efficient and suitable homes for all generations, with high-quality affordable design
- ▶ Open up **UK business opportunities** across this new Longevity Economy, through work to develop international research and innovation collaborations

IMPROVING CARE THROUGH NEW TECHNOLOGIES

Internet of things (IoT) technologies can help people remain independent for longer if they have a care need, such as remote monitoring sensors to alert friends and loved ones when there is an emergency. They can also be used to collect vital data that enables preventative action.

Vodafone's new V-SOS wristband is one example. This product can detect falls, and features an SOS button and a simple interface. The wristband will alert family members if the wearer needs help, whether they are out and about, at home or even in the shower.

*“At Vodafone we believe that technology and innovations like IoT will help us live longer, safer, more enjoyable lives. The Ageing Society Grand Challenge is an example of the political leadership needed to encourage people to take up and spread the word about the opportunities available.”*

**Anne Sheehan**, Enterprise Director, Vodafone



FUTURE OF MOBILITY GRAND CHALLENGE

# Becoming a world leader in the way people, goods and services move



*We are on the cusp of a profound change in how we move people, goods and services around our towns, city and countryside.*

This is driven by extraordinary innovation in engineering, technology and business models. New technologies can transform public transport.

The UK's road and rail network could dramatically reduce carbon emissions and other pollutants, congestion could be reduced through higher-density use of road space enabled by automated vehicles, and mobility could be available when we want it, where we want it and how we want it.

**HIGHLIGHTS INCLUDE:**

46

new measures to **boost take up of electric vehicles** included in our Road to Zero strategy

£106m

funding for research and development into **zero emission vehicle technology**

13

governments committed to a **zero emission future for road transport**

**FIRST MISSION**

We will put the UK at the forefront of the design and manufacturing of zero emission vehicles and for all new cars and vans to be effectively zero emission by 2040.

**NEXT STEPS**

- ▶ Respond to changes in technology and trends in our urban environments with a **Future of Urban Mobility Strategy** in 2019
- ▶ Establish a suitable regulatory framework for new technologies such as electric and autonomous vehicles, starting by conducting a **Future of Mobility Regulatory Review**
- ▶ **Support and enable the development of drone technology** in the UK in a way that responds to society's needs
- ▶ Continue work towards our goals for **50-70% of new cars to be ultra low emission by 2030**, as a step towards achieving the first mission



**INVESTING IN ELECTRIC VEHICLES**

LEVC is the manufacturer of the iconic black cab. It has invested £325m in a dedicated electric vehicle manufacturing facility in Coventry, which will create 1,000 new jobs.

The company's first product, a range-extended electric taxi which will be able to go further without running out of power, is currently on sale and LEVC will be bringing an electric van to market next year that uses the same range-extended EV technology.

*"A transport revolution in the way people and goods move around will see more changes in the next 10 years than the previous hundred. As the Future of Mobility Grand Challenge Business Champion, I'm looking forward to working with the Government to help the UK build on its existing strengths and capitalise on that opportunity."*

**Ian Robertson**, BMW UK Chief Executive, and Future of Mobility Business Champion

CLEAN GROWTH GRAND CHALLENGE

# Maximising the advantages for industry from the global shift to clean growth



*The global drive to reduce carbon emissions will transform all sectors of the economy, including power, transport and construction.*

It is estimated that the UK's low carbon economy could grow by as much as four times the rate of the rest of the economy between now and 2030. The UK is already a global leader in key low carbon sectors, including the world's largest offshore wind sector, leading in the manufacture of electric vehicles, in innovative 'smart systems' and services such as green finance.

The Clean Growth Grand Challenge builds on this, aiming to put the UK at the global forefront of the development, manufacture and use of low carbon technologies, systems and services needed to tackle climate change.

HIGHLIGHTS INCLUDE:

£273m

to develop **smart systems** and **transform construction**

60+

**businesses pledged to take clean growth action** during Green GB week

£320m

**government funding** for low carbon heating, matched by industry

FIRST MISSION

We will use new technologies and modern construction practices to at least halve the energy use of new buildings by 2030.



NEXT STEPS

- ▶ Support clean growth through implementation of the policies and commitments in our **Clean Growth Strategy**
- ▶ Develop the UK's place at the forefront of green finance by publishing a **Green Finance Strategy** in Spring 2019
- ▶ **Launch a design competition** for the 'Home of the Future' in 2019, supporting innovation in housing design and delivery, key to our Buildings mission
- ▶ **Build on our first annual Green GB Week** with a second week and ongoing Green GB campaign planned for 2019, and establish a new panel with a Clean Growth Business Champion

GROWING THE GREEN ECONOMY GLOBALLY

Coventry-based company Organics, has developed over 300 low carbon projects in 21 countries around the world. These include Covered Lagoon Bioreactors (CLBR); anaerobic digestion facilities that are used to treat agricultural wastewater from cassava mills; and sustainable palm oil facilities to produce power.

One facility for a large tapioca conglomerate in south Sumatra treats wastewater from a 200 tonne-per-day starch facility and generates 1500 m<sup>3</sup>/hour of biogas for use in the milling process. It also has the benefit of avoiding pollutants entering the environment and reducing greenhouse gas emissions.

*"The Industrial Strategy's Clean Growth Grand Challenge can play a key role in moving the UK to a competitive, low carbon economy by supporting the roll out of existing technologies at scale, as well as innovation in new equipment and processes for sectors that have been more difficult to tackle to date, such as buildings, industry and long-distance transport."*

**Nick Molho**, Executive Director of the Aldersgate Group



# Industrial Strategy Council

*An independent view on our success*



*The first meeting of the Industrial Strategy Council took place on 1st November 2018 in Downing Street.*

This new body is comprised of leading figures from business, academia and civil society with a wide range of local, national and international perspectives.

The Council is independent of the Government and will provide impartial and unbiased evaluation of progress in delivering the aims of the Industrial Strategy. The remit of the Council includes reviewing the impact of the Industrial Strategy to date and its contribution to UK economic growth.

It is chaired by Andy Haldane, the Chief Economist at the Bank of England. The Prime Minister, the Chancellor and the Business Secretary also attended this first meeting.

*“Our modern Industrial Strategy is key to building a successful economy that works for everyone and creating high-quality jobs across the UK. This Council gathers some of the most influential figures in business, academia, and civil society. Together, they will share their expertise and skills to measure the progress of our strategy and ensure it is boosting people’s wages and improving productivity of British businesses.”*

**Theresa May**, Prime Minister

## INDUSTRIAL STRATEGY COUNCIL MEMBERS:

- ▶ **Andy Haldane** (Chair) – Chief Economist, Bank of England
- ▶ **Dame Kate Barker** – Commissioner of the National Infrastructure Commission and recently Chair of the Industrial Strategy Commission
- ▶ **Emma Bridgewater** – Founder of Emma Bridgewater Ceramics
- ▶ **Professor Diane Coyle** – Bennett Professor of Public Policy at the University of Cambridge
- ▶ **Jayne-Anne Gadhia** – Ex-Chief Executive, Virgin Money, member of the Scottish Business Taskforce
- ▶ **Christine Gaskell** – Local Enterprise Partnership (LEP) Chair, Cheshire and Warrington
- ▶ **Rupert Harrison** – Managing Director of BlackRock
- ▶ **Dame Vivian Hunt** – Managing Partner UK and Ireland, McKinsey, Chair of CBI London Council
- ▶ **Dame Rotha Johnston** – Chair of Northern Ireland Screen, non-executive director of Northern Ireland Electricity, board member of the Department of Justice and Belfast Harbour Commissioners
- ▶ **Professor Juergen Maier** – Chief Executive of Siemens plc
- ▶ **Sir Paul Marshall** – Co-founder and Chairman, Marshall Wace LLP
- ▶ **Sir Charlie Mayfield** – Chairman, John Lewis Partnership, Chair of Be the Business
- ▶ **Nicola Mendelsohn** – Advertising executive; Vice-President for Europe, the Middle East and Africa for Facebook. Non-Executive Director of Diageo
- ▶ **Archie Norman** – Chair, Marks & Spencer. Formerly Chief Executive of Asda, Chair of ITV, McKinsey Consultant and Director at GEEST, Railtrack and Kingfisher
- ▶ **Hayley Parsons** – Entrepreneur and investor, founder of GoCompare, and adviser to the Welsh government
- ▶ **Roy Rickhuss** – General Secretary of Community union and member of the General Council of the Trades Union Congress
- ▶ **Professor Dame Nancy Rothwell** – President and Vice-Chancellor of the University of Manchester and Professor of Physiology, Co-chair of the Council for Science and Technology and past President of the Royal Society of Biology
- ▶ **Professor Jennifer Rubin** – Executive Chair of the Economic and Social Research Council (ESRC), Professor of Public Policy at Kings College London
- ▶ **Rohan Silva** – Co-founder of Second Home, Senior Visiting Fellow at LSE Cities
- ▶ **Matthew Taylor** – Chief Executive, Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA)

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## Image references

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