

CHEMICAL SCIENCES includes commodity chemicals, fine chemicals and speciality chemicals. As one of Scotland's top exporters the chemical sciences sector makes a significant contribution to the economy. Total sector exports reached £4.2bn in 2016, with chemical sciences being the second largest export behind only food and drink, and accounting for 16% of all manufacturing exports in Scotland. Over 10,000 people are employed directly in the industry base of 200+ companies supported by a steady flow of scientific and technical employees from Scottish universities, higher education institutions and further education colleges. It is estimated that a total of 70,000 jobs in Scotland are dependent on the sector. World-scale companies such as INEOS, MacFarlan Smith, FUJIFilm, CalaChem, BASF, GlaxoSmithKline and Syngenta have Scottish operations. Business Enterprise Research and Development (BERD) expenditures in Chemical sciences (including pharma) accounts for 28% of all Scottish manufacturing BERD and 16% of all Scottish BERD (2016). The sector is supported by Scotland's world class academic base and in particular [ScotCHEM](#), the collaborative venture for the pooling and enhancement of resources for chemistry research in Scotland, bringing together the major players in research in chemical sciences. Over 80% of chemistry research carried out in 6 key Scottish Universities (Edinburgh, St Andrews, Glasgow, Strathclyde, Aberdeen, Heriot Watt) is internationally excellent or world leading (RAE 2014). Industrial biotechnology is also an important growing area of activity for the sector both in terms of research and industrial base. Testament to the dynamism of the sector is Ineos investment of over £300m, which has supported development of Ineos Grangemouth plant for processing of US shale gas. This investment places the site among the premier league of European petrochemical plants and will bring it back into profitability.

CONSTRUCTION The construction industry encompasses a wide range of sub sectors and specialisms; from a supply chain of materials producers (timber, aggregates, cement/concrete etc), through component producers (mechanical/ electrical, building products and construction systems), major, minor and specialist contractors; to architecture/ design/finance/project management/engineering knowledge. In total, there are over 31,000 businesses (though less than 3000 employ more than 50 people, and only around 300/350 are of significant scale), and it employs 170,000 people (10% of total Scottish jobs) in the construction sector itself, and a further 38,000 people in its materials supply chain. The construction industry delivers £21.4bn (9%) of Scotland's GDP, and £8.7bn (10%) of Scotland's GVA. Its supply chain delivers further significant GVA impact (e.g. the timber supply chain delivers a further £1.1bn) Industry output "enables" a significant proportion of other industries' to contribute to the economy (e.g. via road/rail, built environment, or specialist construction relating to energy, water, etc). The industry is spread throughout Scotland, with concentrations in the central belt and north east, but significant employment exists in all parts of Scotland, including all rural areas where these jobs are of significance and importance. The industry's dominant key market is the UK (with £1.1bn exported the rest of the UK). Scotland has an international reputation for Architecture and Design, Value Engineering and Project Management, and increasingly Low Carbon Products and Technologies, key markets include Western Europe; Middle East; USA/Canada, and Eastern Europe; these account for £80m of (non-UK) exports, with significant potential for further future expansion in the medium term. The built environment accounts for nearly 50% of all Scotland's carbon/CO2 emissions, arising from a wide range of activities relating to the construction and operation of buildings (encompassing extraction and processing of raw materials, production & use of products & materials, site operations, as well as heating, lighting and running of buildings). In addition, the industry is responsible for around 40% of all waste to landfill. Sustainable construction/low carbon built environment are vitally important to the industry, to the Scottish economy and in delivering Scotland's low carbon targets. Business and public awareness and concern over rising energy costs, environmental, planning and building standards considerations, and initiatives such as Scotland's low carbon targets and Green Deal will continue to demand increasing innovation in both products and systems – creating a competitive advantage in other UK and international markets. [Construction Scotland](#) (the industry leadership group) has launched an industry led Construction Scotland Innovation Centre, and in 2017 opened its Advanced Construction factory. The CSIC focuses and delivers HEI support/expertise and accelerate development of new construction products, systems and services by businesses. Innovation demand, supported by Scotland's HEI construction expertise, will deliver significant competitive advantage. It is estimated that up to 14,000 businesses in Scotland are already involved in Low Carbon Built Environment activity. With the UK leaving the EU, the Construction sector is experiencing uncertainty mainly as a result of private sector investors (to commercial/office/hospitality developments) reconsidering investment decisions considering potentially lower commercial (rental)

returns. In Scotland around 60% of the industry's turnover originates from the public sector in various forms (infrastructure, social housing, and public buildings). SG and UKGov announcements, and City Deals with regard to social and affordable housing over the next 10 years (social, affordable & private across the UK add up to some 2m new homes), are likely to result in a significant upturn of housebuilding activity, however this will take some while to come to fruition due to lengthy planning and financing constraints. In 2016 publicly funded infrastructure construction peaked and is expected to decline over the next few years until UK wide projects such as Heathrow Runway 3, and HS2 begin.

CREATIVE INDUSTRIES This sector makes an important contribution to the Scottish economy employing 73,600 people in 2015 with a turnover of £7.1 billion while contributing £4.6bn in GVA to the economy. Scotland has world class companies in all areas of the creative industries; from international leaders in games development and interactive platforms to national broadcasters and successful production companies. Scotland has global centres of research excellence which develop next generation technologies to support ongoing growth in the digital media environment, and a well-developed infrastructure to support company growth. Scottish Enterprise's key focus is on high growth digital media. Scottish Enterprise maintains close relationships with many key partners and stakeholders; Innovate UK, Tech City UK, Creative Scotland, trade bodies such as PACT, TIGA and the broadcasters BBC/STV/Channel 4. Scottish Enterprise also works with a number of academic institutions including Abertay University and Edinburgh's School of Informatics. Major projects include Informatics Ventures, a knowledge exchange programme that inspires and develops globally ambitious software start-ups across Scotland, DEEP with TRC Media which provides a range of world class training initiatives to develop digital media leaders and Data Lab which enables industry, public sector and world-class university researchers to innovate and develop new data science capabilities.

DIGITAL ECONOMY includes software, information technology, digital communications, digital media, electronics, sensors and photonics. There are approximately 3,500 Digital Economy companies in Scotland employing almost 88,000 people in total. Examples of leading companies in the sector include Skyscanner, Leidos Innovations UK, Rockstar North, BT, Leonardo, Thales and Cirrus Logic. Annually the sector exports £2.6bn and contributes a gross value added (GVA) of £5.9bn to the Scottish economy. Business expenditure on R&D is significant at £342M per annum. The sector's highly skilled workforce produces £78,462 GVA per head, well above the Scottish average. The sector is active across Scotland but Edinburgh is the "Digital Capital" with the University of Edinburgh's School of Informatics ranking among the best in the world and fostering a dynamic start-up scene attracting global capital. Given Scotland's established capabilities, there is a strong focus on addressing growing opportunities in Sensor Systems and Data Analytics, while related areas such as "Mobility as a Service" and Fintech also present exciting opportunities. The sector is supported by Innovation Centres including CENSIS for Sensor and Imaging Systems and the Data Lab for big data applications. These are complemented by the Fraunhofer Centre for Applied Photonics and QuantIC for Quantum Technologies. The development of the sector is championed through the sector's trade bodies Scotland IS and Technology Scotland.

EDUCATION

Scotland's education sector comprises a set of high value and globally recognised assets which supports growth and productivity in the economy in diverse ways. With an annual economic impact of over £7 billion GVA, the Universities sector (there are 19 autonomous higher education institutions) is the third largest by value in Scotland's economy. Universities directly employ 38,000 and indirectly support 140,000 jobs in the Scottish economy. The sector boosts innovation and attracts significant international revenue, both from contract research projects and the 40,000 overseas students who study in Scotland. There were 292,620 students in higher education in Scotland in 2016-17, creating an important talent pool for potential foreign investors to Scotland. This is an increase of 7,170 (2.5%) from 2015-16, with the largest increase in students at first degree level. There are 26 colleges in 13 regions across Scotland and this allows them to plan regionally and deliver locally. Fraser of Allander estimates that Scotland's colleges will generate additional value worth £20 billion for the Scottish economy in the long term. In 2016-17, HE entrants at colleges accounted for 27.5% of all HE entrants in Scotland. SFC invests around £1.8 billion a year in Scotland's universities and colleges for learning and teaching, skills development, research and innovation, staff, buildings and equipment. SFC's total funding in the academic year 2017/2018 for universities will be £1,013.9 million*, and for colleges will be £549.9 million**. Overseas trade of Scottish education rose from £745m in 2015 to £770m in 2016. Five Scottish universities feature in the world's top 200 higher education institutions.

*Sources: [Higher Education Students and Qualifiers at Scottish Institutions 2016-2017 - Mar 2018 \(SFC\)](#); [*Outcome Agreements Funding for Universities – final allocations for 2017-2018 \(SFC\)](#); [**Outcome Agreements Funding for Colleges – final allocations for 2017-2018 \(SFC\)](#); [The value of college graduates to the Scottish economy Sept 2017 \(Fraser of Allander\)](#) [Biggar Economics for Universities Scotland 2013](#); [Export Statistics Scotland 2016](#); [Times Higher Education university rankings 2017](#)*

ENGINEERING INCLUDING AEROSPACE, DEFENCE AND MARINE There are approximately 17,000 engineering companies in Scotland including those in the Aerospace, Defence and Marine sector, employing 127,000 people in total. The contribution to the Scottish economy is considerable with GVA of £10bn and exports of around £6bn. Business expense on R&D is considerable at around £150m pa. Key application markets include oil and gas, transport, aerospace, defence and marine. Examples of leading companies in the sector include Engineering companies such as the Weir Group, SPX Clyde Union and Doosan Babcock and also major players in automotive and rail including Alexander Dennis, Allied Vehicles and Progress Rail. To refocus attention on achieving real term growth of the sector over the next five years, the Aerospace, Defence, Marine and Security Industrial Strategy for Scotland 2016 has been developed by the Scottish Aerospace, Defence, Marine and Security Industry Leadership Group (ADMS-ILG). The Scottish AD&M sector includes a number of global industry companies, including defence companies such as Leonardo MW, Thales, Raytheon and BAE Systems and aerospace manufacturing and MRO (maintenance, repair and overhaul) companies such as Rolls-Royce, Spirit AeroSystems, GE Aviation, UTC, Woodward, Teledyne and Vector Aerospace. In addition, there is a growing range of world leading niche players in the Space industry, such as Clyde Space, Spire and Star-Dundee. Scotland's Aerospace, Defence, Marine and Security (ADMS) companies operate in a globalised industry open to intense competition. A world-renowned centre of engineering expertise and technical capability has attracted leading companies to locate operations in Scotland in order to tap into the skills and expertise that are in abundance here. As these businesses and their suppliers continue to grow and develop, the ADMS sector makes a strong contribution to the Scottish economy. Most recent figures (Report commissioned for Scottish Enterprise and the ADMS-ILG [2013]) show that the ADMS industry in Scotland consists of 825 Companies, employing 38,408 people, generating £5.563 billion sales, and contributing £1.756 billion GVA to the economy, of which the Marine sector consists of 424 companies, employing 22,450 people, generating £2.817 billion sales, and contributing £889m GVA annually to the economy. These activities are estimated to have generated over £540 million in tax revenue, through a combination of corporation tax, employee income and NICs, and other indirect taxes such as VAT. The sector benefits from the presence locally of the Advanced Forming Research Centre which is part of the UK High Value Manufacturing Catapult and additionally with links to the various Innovation Centres across the country. Ambitious plans have been announced to establish a National Manufacturing Institute for Scotland and the recently announced Lightweight Manufacturing Centre is seen as a first step towards realising this ambition. The institute is expected to act as a catalyst for the development of an Advanced Manufacturing Innovation District in the area, which aims to attract ambitious companies both locally and internationally. The development of the sector is championed through the Industry Leadership group and trade bodies such as Scottish Engineering.

ENERGY & LOW CARBON TECHNOLOGIES The energy and low carbon technologies sector incorporates: Oil and Gas, Thermal Generation, Renewables, Environmental Activity and Low Carbon Industries. An estimated 12,000 companies' active in the low carbon and renewable energy sector, including 2,500 companies' active in renewable and low carbon electricity, 500 companies in low carbon heat, 500 in bioenergy and alternative fuels, 6,000 in energy efficiency, and 1,000 providing low carbon financial and advisory services. Direct and indirect employment in Scotland's renewable energy & low carbon sector was estimated at 49,000 FTEs as of 2016. The Climate Change (Scotland) Act 2009 sets a target of an 80% reduction in greenhouse gas emissions by 2050, a significant proportion of which will be met by decarbonising Scotland's electricity supply. The Scottish Government's Scottish Energy Strategy includes the target to meet 100% of Scotland's own electricity demand from renewable resources by 2020, and includes a new 'all-energy' target for the equivalent of 50% of Scotland's heat, transport and electricity consumption to be supplied from renewable sources by 2030. Scotland is making steady progress towards these targets and met 54% of its own electricity demand from renewables in 2016 (accounting for the fact that 20% of all electricity generated was exported). The full breakdown of electricity generated in 2016 was: 42.9% renewables, 42.8% nuclear, 6.8% gas, 4.9% coal, 1.5% oil & other. Investment in renewables was £910.6m in 2015. The Skills Investment Plan for Energy indicates there is likely to be demand for up to 40,000 jobs in renewable heat and electricity generation by 2020. Therefore, maintaining Scotland's oil and gas industry, boosting renewable energy and the application of low carbon technologies will make a significant and important contribution to a sustainable economy. Last year, oil and gas provided 76% of the UK's primary energy and will still provide two thirds of total primary energy by 2035. The UK oil and gas sector supports over 300,000 jobs in the UK with 115,000 in Scotland. The Scottish oil and gas supply chain continues to be highly regarded, servicing both domestic and global markets. Even though the last few years have been challenging for the industry, there has been an increase in demand for our skills and expertise globally, with international activity still accounting for over 50% of total sales.

FINANCIAL & BUSINESS SERVICES Employment in the Financial and Business Services sector was 232,000 in 2016. F&BS contributes to a number of drivers of economic growth including around £16bn in GVA to the economy. Scotland is internationally recognised as the most complete financial centre in the UK outside London and the South East, and is recognised globally as an internationally competitive destination and attractive place for F&BS companies to locate and expand. Many of the world's leading financial services firms have operations in Scotland across each of the sub-sectors of the industry including:- Asset Management and Servicing: (Standard Life Aberdeen, Blackrock, CitiGroup, BNP Paribas), Banking (Lloyds Banking Group, Royal Bank of Scotland, Tesco Bank, Barclays and HSBC), General Insurance (Aviva, Direct Line, Esure), Life and Pensions (Aegon UK, Prudential Standard Life).

FOOD & DRINK Taking the whole supply chain into account, from agriculture, fishing, aquaculture through to the manufacturing base, Scotland's food and drink sector makes a significant contribution to the economy in terms of turnover (approx £13.5bn) and GVA (approx £5.2bn)*. In 2017, Scotland Food & Drink launched a new industry strategy '[Ambition2030](#)' with the intention of driving turnover to £30bn by 2030 via UK and International markets, by focussing on three priorities: Innovation, Supply Chains and People & Skills. Overall, the sector has experienced significant turnover growth in recent years, with an increase of circa 17% between 2008-2015. The largest share of the sector's turnover (72%) and GVA (74%) comes from food and drink manufacturing, which enjoyed growth of 13% between 2008-2015. Food exports have achieved significant growth in recent years and now account for over £1.6bn of exports, with 2017 seeing Scottish Food and Drink exports reach £6bn for the first time ever. This is encouraging news for the Scotland Food & Drink partnership which is supporting the industry's ambitions to sell a wider range of food products to more international markets - aiming to significantly grow exports and build Scotland's international reputation as a 'Land of Food & Drink'. The Scotland Food & Drink Export Plan focuses the partnership's collective support on those markets which offer the greatest opportunity for Scotland and includes a team of 11 in-market specialists in the top prospect markets - North America (Canada and US), France, Germany, Middle East, Mainland China and Hong Kong, Japan and South East Asia (Singapore & Thailand) and Nordics (predominantly Norway, Sweden and Denmark). The Scotland Food & Drink Export Partnership involves SDI, Scotland Food & Drink, Quality Meat Scotland, Seafood Scotland, Scottish Salmon Producers' Organisation, and Scottish Bakers, with significant financial support from Scottish Government. *Turnover, GVA (2015) and Exports (2017).

FOREST AND TIMBER TECHNOLOGIES This carbon-positive sector incorporates the growing of tree seedlings within nurseries to the planting, managing and harvesting of forests plus value-added downstream activities such as sawmilling, pulp and paper production, and panel and board manufacturing. It also includes the development and production of higher value goods such as engineered sustainable construction products and businesses that serve the Energy and Tourism markets. Opportunities in the future include the supply of forest by-products as feedstock for Industrial Biotech. Half of the UK's forests are in rural Scotland, covering 17% of Scotland's land area (target 25% by 2050) and as a result, the sector supports many rural communities. Around 40% of the Scottish forests are publicly owned and are managed for commercial timber production (and tourism/amenity use) by Forest Enterprise. The remaining forests tend to be owned by estates or investment companies, with their maintenance management, and cropping contracted to large management companies. The sector consists of 1,700 businesses contributing £1bn in GVA to the Scottish economy (£771million from Forestry and Timber Processing and £183million from Forest Recreation and Tourism) employing around 25,000 people (19,555 in Forestry and Timber Processing and 6312 in Forest Recreation and Tourism). Demand for good quality timber has recently increased according to a report from Bidwells. However, 80% of our timber is imported, which has led to the encouragement of more landowners use land for commercial forestry. A report from SAC Consulting also highlighted that the economic impact of forestry compared to farming is three times greater without subsidies. Currently, timber supply is forecast to peak in 2025/30 as existing planting matures. The sawmilling/processing industry (dominated by 3 large firms in Scotland) has invested significantly in recent years in sophisticated and efficient processing equipment, however concerns have been expressed that additional planting is required to maintain materials supply beyond this peak. Scottish Government has committed to the encouragement of new (as well as replacement) planting to sustain and increase Scotland's long-term timber supply – some additional 20,000ha.

LIFE SCIENCES Scotland is home to one of the most sizable clusters in Europe, with a significant international presence including Charles River Laboratories, Thermo Fisher, GSK, Johnson & Johnson, Millipore, and ClinTec. The sector employs over 37,000 people across some 700 organisations - ranging from Higher Education Institutions to companies (2015). Latest Scottish Government figures for 2015 show company turnover in excess of £4 billion and GVA of about £2 billion. Scotland's two stronger subsectors in

terms of industrial employment and turnover are medical technologies and pharmaceutical services. Scotland is also at the forefront of research in regenerative medicine, precision medicine and animal health. In addition, there are several emerging areas where Scotland has been building strength including digital health, agritech (crop research, aquaculture) and industrial biotechnology. A number of Scotland's life sciences companies are also strengthening their local manufacturing base (e.g. GSK). Edinburgh BioQuarter is a keystone investment at the heart of Scotland's national life sciences strategy, bringing together public healthcare, academic research and extensive commercial laboratory space in one location to accelerate translational medicine and facilitate large scale life science collaborations. Investment within the Scottish Life Sciences sector stood at a record £152 million in 2017. With about 28% of its portfolio in life sciences, the Scottish Investment Bank has been a great stimulus for the sector.

TEXTILES The Scottish textile industry today is flexible, innovative and market driven - producing for fashion, interior and performance markets in over 150 countries. The Scottish textile industry is worth approx. £942m to the Scottish economy and the sector has increased R&D spend and GVA per employee significantly in the last few years. There are over 500 textile companies in Scotland, employing approx. 10,900 people and with textile exports valued at over £335m. Some of the world leaders in luxury and performance textiles are based in Scotland - taking advantage of niche and premium markets where Scottish product is considered to offer higher levels of both quality and authenticity. Companies such as the Scottish Leather Group (who provide low carbon leather to some of the largest aircraft brands) to Bute Fabrics (interior fabric manufacturers for airports all over the world) and Mackintosh (manufacturers of world-renowned contemporary, rainwear) all choose Scotland

TOURISM is an important underpinning sector for the Scottish economy. In 2016:- Just under 14.5 million overnight tourism trips were undertaken in Scotland, GB overnight visitors took 11.5 million overnight visits to Scotland, International visitors made 2.75 million overnight trips to Scotland and spent £1.9 billion in 2016, The USA was Scotland's largest international market, whilst England was Scotland's largest domestic market, 'Holidays' were the most popular type of trip by both domestic and international markets in 2016. International inbound visits performed strongly in 2016, increasing by 6% on visitor numbers in 2015. International inbound spend also showed increases of 9.1%. North American visitors showed the largest increase, with visitors from USA increasing by 10% and visitors from Canada increasing by 52% - making Scotland's top five 2016 international markets in terms of volume USA, Germany, France, Poland and Canada. The sector makes a major contribution to employment levels across a wide range of occupations, age groups and skills sets with over 207,000 jobs supported by 14,145 tourism related businesses in Scotland which is 8% of Scottish employment. Jobs in tourism are particularly important in non-urban communities where often as many as 15% of the population work in the sector. The sector directly influences Scotland's international profile and premium market image and provides major support to other key sectors such as Food and Drink, Retail, Transport and Construction.