



Department for the
Economy
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10X TECHNOLOGIES AND CLUSTERS - SUPPORTING DATA AND BASELINE ANALYSIS



SEPTEMBER 2023

10X Priority Sectors / Clusters

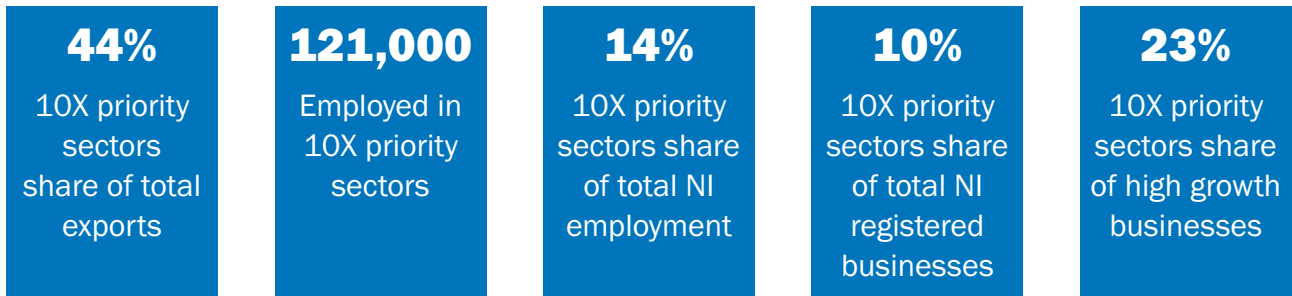
The ‘10X Economy – an Economic Vision for a Decade of Innovation’ provides the basis for an innovation-led economic transformation and provides long term plans on how to make Northern Ireland (NI) a world leading economy by 2030. The ambition is centred on refocusing on the core technologies and priority sectors where NI can be a global leader within the next decade. Seven sectors have been identified as providing particular opportunities for NI:



In order to measure progress against the 10X objectives, a baseline position of these priority sectors has been established in terms of labour force, business counts and trade.

Key Messages

Our research has shown that businesses operating in the 10X priority sectors tend to be more internationally focused than their counterparts in the overall economy, with 56% of sales from businesses in the 10X priority sectors being made outside of NI compared to 32% for the overall economy. Despite making up 10% of the total number of registered businesses in NI, 10X sector businesses account for just under a quarter of local high growth businesses. As of 2021, 121,000 are employed in the 10X priority sectors representing 14% of total NI employment. However, significant gender imbalances are prevalent when comparing employment in the sectors against the overall economy.



The data displayed in this paper have been taken from NISRA and adjusted for the definition of 10X priority sectors supplied by the Department for the Economy. Data from the Northern Ireland Economic Trade Statistics and from the Annual Business Inquiry (ABI) do not cover Fintech / Financial Services. DfE considers innovation within food and drink processing companies as falling within the definition of Agri-Tech. As it was not possible to separate out this data in respect of processors, innovation within food processing has not been included for the purposes of these statistics.

1. TRADE

NI businesses exported¹ (£12.2 billion) more goods and services than it imported (£7.7 billion) in 2021, resulting in a trade surplus of £4.5 billion. This trend was also true of businesses in the 10X priority sectors, which exported £5.4 billion and imported just £2.0 billion, creating a surplus of £3.4 billion. Not surprisingly, given its relative size, Advanced Manufacturing, Materials and Engineering was the biggest exporting sector, accounting for three quarters of all the 10X sector exports and a third of exports in the whole economy.

Table 1: Trade in 10X priority sectors, 2021 (000's)

Sector descriptor	Total Sales	Total Purchases	Exports	Imports
Software	£1,310,076	£267,271	£525,256	£47,863
Screen Industries	£93,513	£42,979	£28,787	£22,473
Low Carbon (including Green Hydrogen)	£833,666	£491,150	£66,108	£34,864
Life and Health Sciences	£1,608,296	£1,034,634	£633,850	£334,286
Agri-tech	£442,608	£313,793	£117,993	£75,057
Advanced Manufacturing, Materials and Engineering	£13,178,329	£7,696,425	£4,024,735	£1,447,165
Total 10X priority sectors	£17,466,489	£9,846,251	£5,396,729	£1,961,707
Total Economy	£77,100,000	£48,700,000	£12,200,000	£7,724,000

Source: DFE developed interpretation of Northern Ireland Economic Trade Statistics, 2021

1.1 Sales and Exports

In 2021, total sales by companies in NI were estimated to be £77.1 billion². The 10X priority sectors account for around 23% of these sales at £17.5 billion. Of the 10X sectors, Advanced Manufacturing, Materials and Engineering was the largest with 75% of the total 10X sales.

Total sales are made up of external sales³ plus internal sales⁴. Approximately 56% of sales in the 10X priority sectors went outside of NI. This compares to just 32% of sales for all sectors across the whole NI economy. This is largely driven by Software; Screen Industries; Life and Health Sciences; and Advanced Manufacturing, Materials and Engineering, where the majority of sales are made outside of NI. Agri-Tech companies in NI make half of their sales externally and Low Carbon (including Green Hydrogen) is below the NI economy average with just 21% of sales being outside NI.

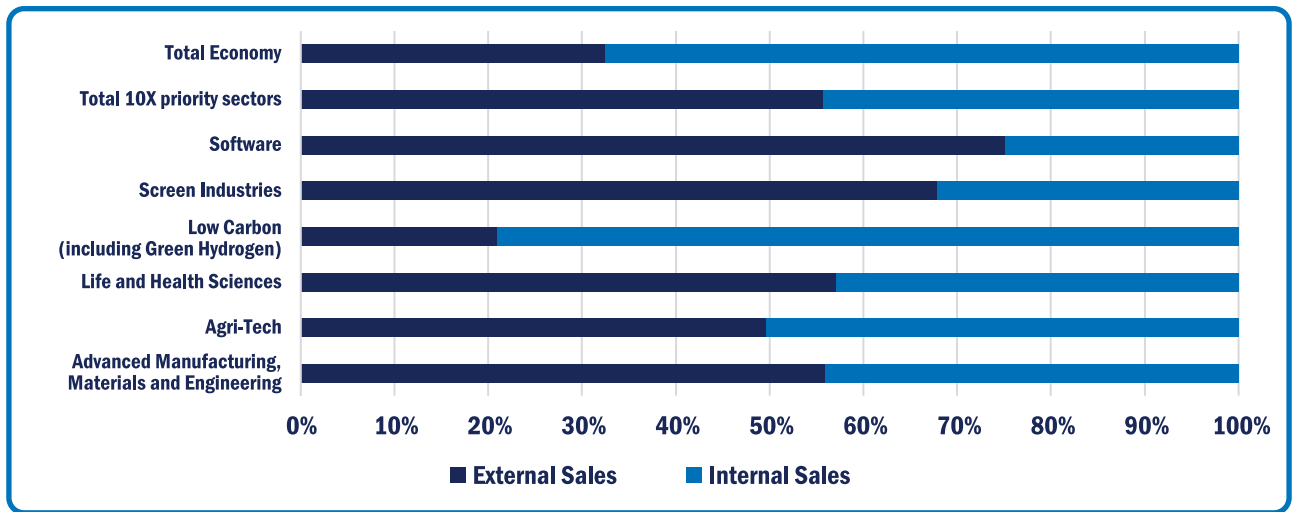
1 Exports are sales outside of NI and GB

2 [Northern Ireland Economic Trade Statistics, 2021](#)

3 External sales are GB sales + sales outside of the UK

4 Internal sales are sales within NI

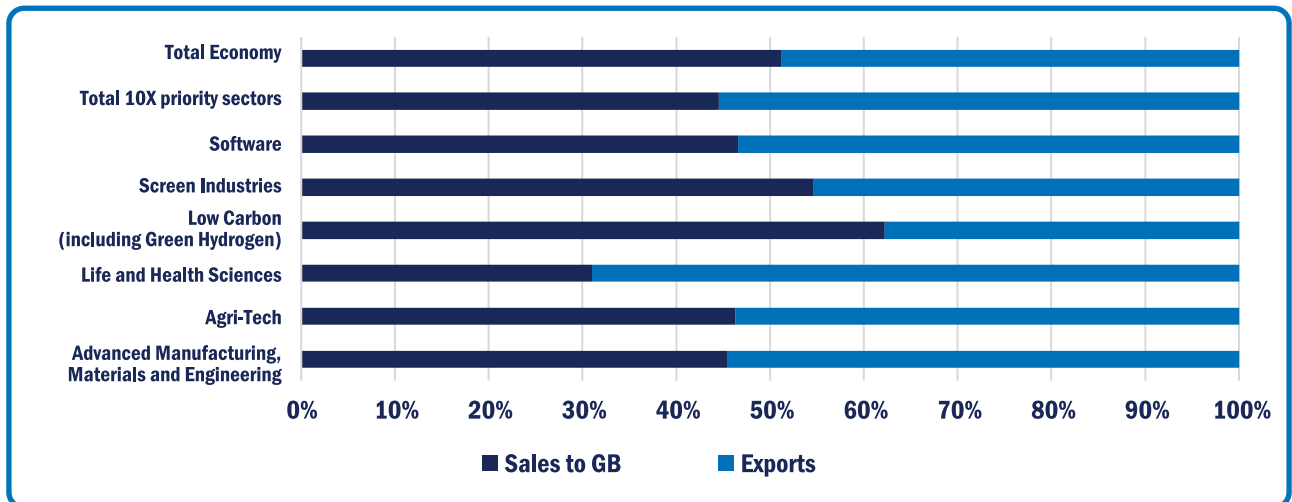
Figure 1: Sales in 10X priority sectors, 2021



Source: DFE developed interpretation of Northern Ireland Economic Trade Statistics, 2021

Breaking this down a little further shows that slightly more of the external sales of 10X priority sectors are exports (55%) than for the economy as a whole (49%). With the exception of Life and Health Sciences (where 69% of external sales were exports) and Low Carbon (including Green Hydrogen) (where only 38% of external sales were exports), there is a fairly even split between exports and sales to GB.

Figure 2: External sales of 10X priority sectors, 2021

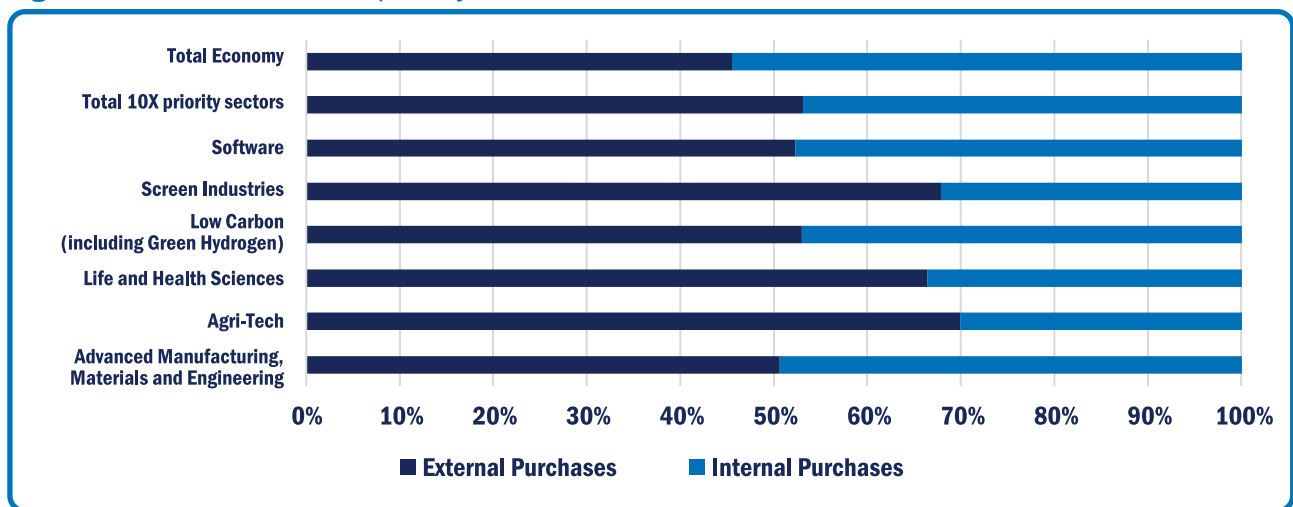


Source: DFE developed interpretation of Northern Ireland Economic Trade Statistics, 2021

1.2 Purchases and Imports

Purchases were lower (36%) for the 10X priority sectors than the whole economy (39%). This is particularly true for Software whose purchases were just 17% of total trade. External purchases⁵ were a significantly higher proportion (53%) of total purchases for the 10X priority sectors than for the economy as a whole (46%). All of the sectors purchased more externally than locally. This was particularly true for Agri-Tech, Screen Industries and Life and Health Sciences.

Figure 3: Purchases in 10X priority sectors, 2021

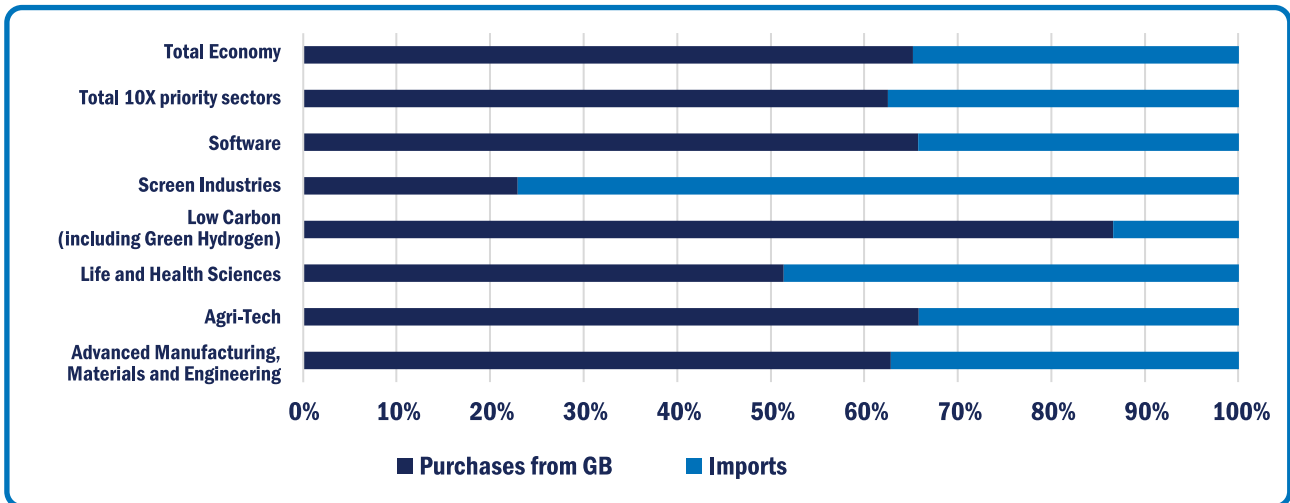


Source: DFE developed interpretation of Northern Ireland Economic Trade Statistics, 2021

⁵ Purchases from GB + Exports

Not surprisingly, companies in NI purchased more from GB than they imported from the rest of the world and the same was true for the 10X priority sectors with 62% of external purchases coming from GB. The Low Carbon (including Green Hydrogen) sector was particularly reliant on GB for external purchases at 87%. The opposite was true for Screen Industries with only 23% of external purchases coming from GB.

Figure 4: External Purchases of 10X priority sectors, 2021

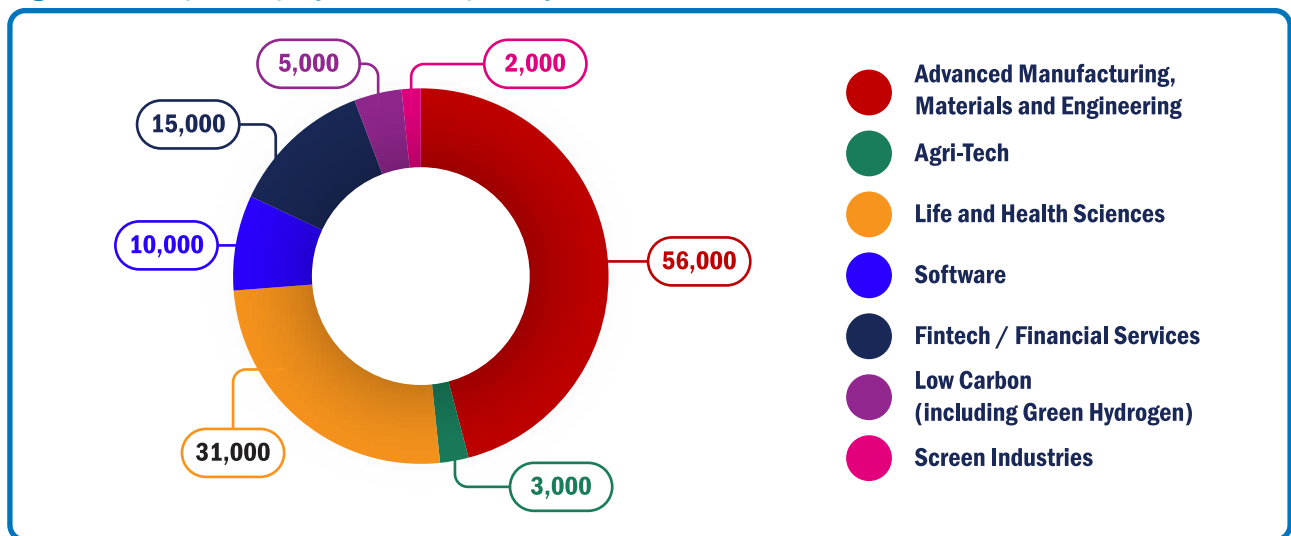


Source: DFE developed interpretation of Northern Ireland Economic Trade Statistics, 2021

2. LABOUR FORCE

In 2021 there were 849,000 people employed in NI. Around 121,000 (14%) of these were employed in 10X priority sectors. The majority of jobs are in Advanced Manufacturing, Materials and Engineering, and Life and Health Sciences. Agri-Tech and Screen Industries were very small sectors with only 5,000 jobs across both.

Figure 5: People employed in 10X priority sectors, 2021

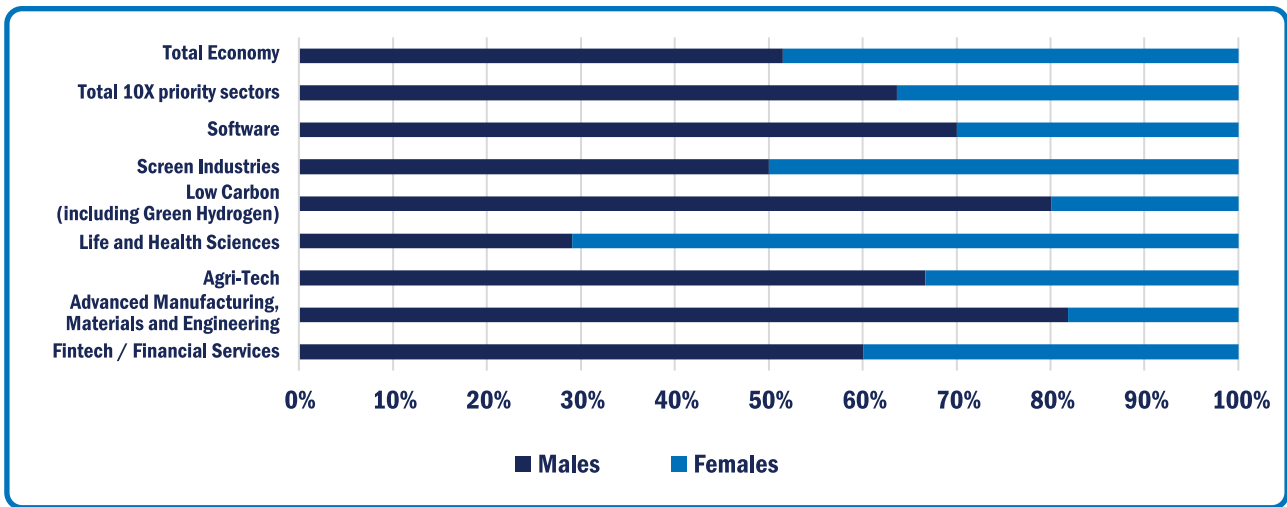


Source: DFE developed interpretation of Labour Force Survey, 2021

2.1 Inclusivity

Just over half (51%) of total employment in NI is occupied by males and 49% by females. This fairly even split, however, it is not reflective of the 10X priority sectors which are on average more male dominated (64%). This average is being driven by the large proportion of males in Advanced Manufacturing, Materials and Engineering which is the largest of the 10X priority sectors. Five of the 7 sectors are dominated by male workers with the exception of Screen Industries which is evenly split and Life and Health Sciences in which females are the majority (71%).

Figure 6: Employment in 10X priority sectors by sex, 2021



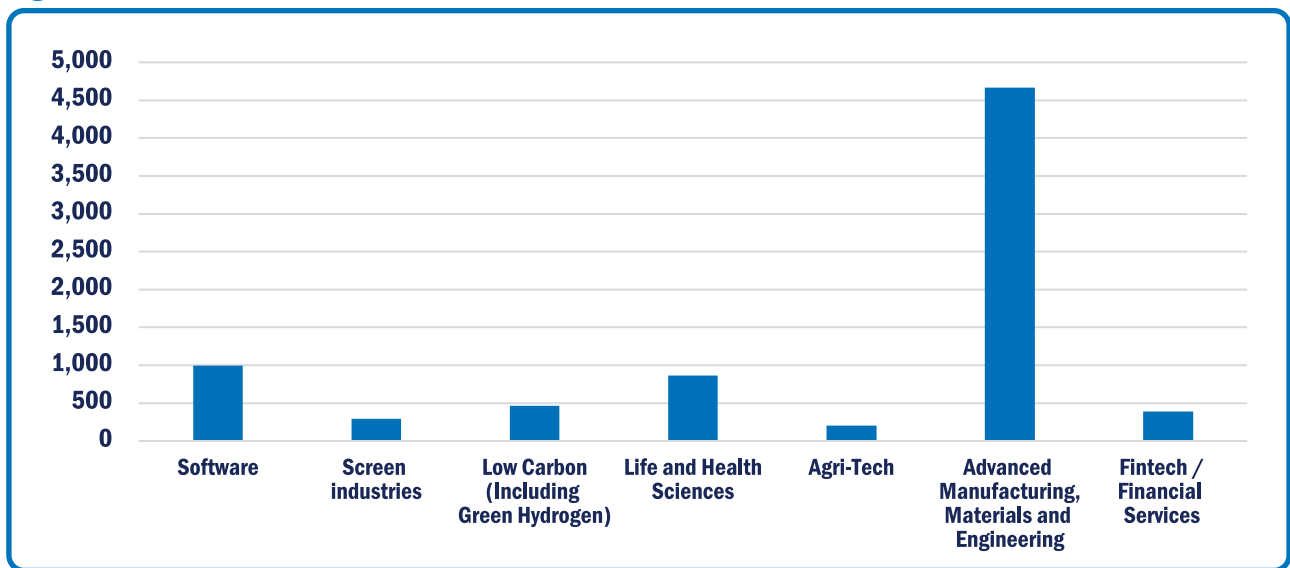
Source: DFE developed interpretation of Labour Force Survey, 2021

The 10X priority sectors employ a lower proportion of people with disabilities (10%) than the whole NI economy (12%). Due to sample sizes, it is not possible to see this split broken down for all 7 of the sectors.

3. DOING BUSINESS

Around 59% of the businesses operating within the 10X priority sectors are in Advanced Manufacturing, Materials and Engineering. This sector has 4,665 businesses which makes up 6% of the whole economy. Software accounts for 13% of businesses in the 10X priority sectors and Life and Health Sciences accounts for 11%.

Figure 7: Business counts, 2021



Source: DFE developed interpretation of Interdepartmental Business Register (IDBR), 2021

Interestingly, while Software accounts for just 13% of businesses in the 10X priority sectors, it makes up 22% of high growth businesses in the 10X sectors, 18% of businesses surviving more than 5 years and 22% of business deaths, suggesting that it is more exposed to the forces of competition. Indeed, figure 8 shows that while 10% of all businesses are in 10X priority sectors, they make up 23% of high growth businesses in the economy.

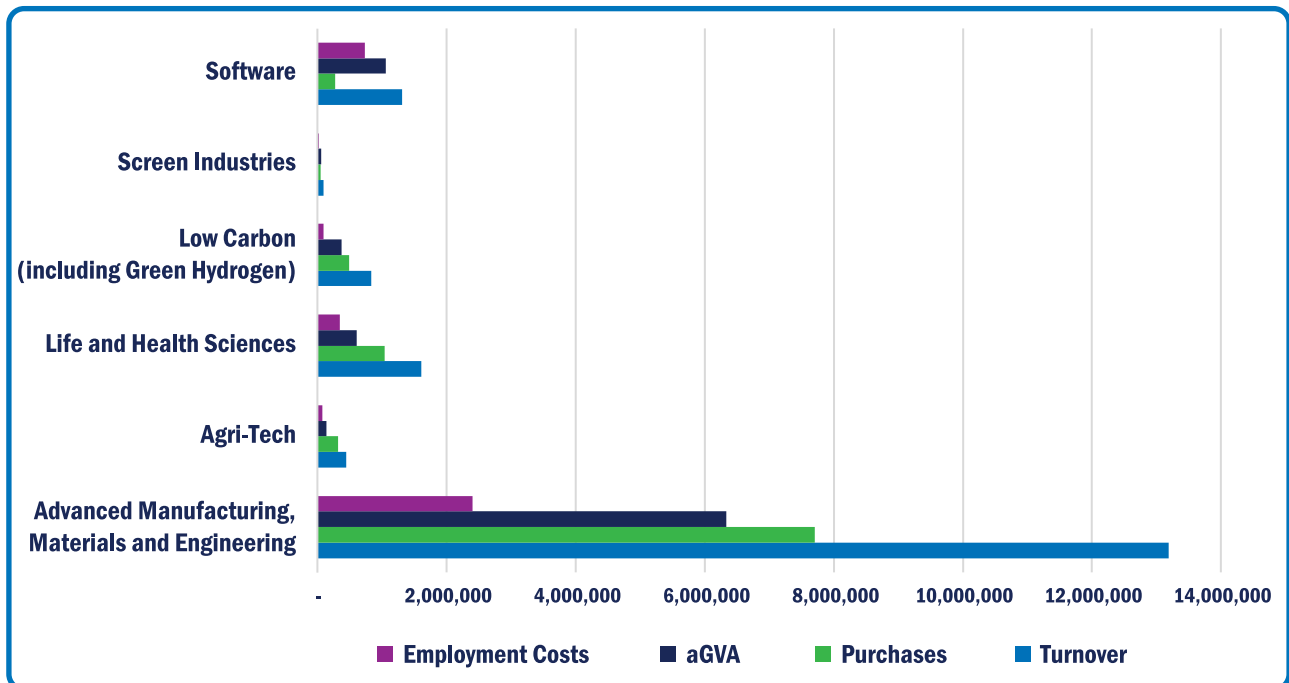
Figure 8: 10X priority sectors as a proportion of economy totals, 2021



Source: DFE developed interpretation of Interdepartmental Business Register (IDBR), 2021

It is not surprising that Advanced Manufacturing, Materials and Engineering contributes more to approximate Gross Value Added (aGVA) than any other 10X sector at £6.3bn given its relative size. This was followed by Software (£1.1bn), Life and Health Sciences (£0.6bn), Low Carbon (including Green Hydrogen) (£0.4bn) Agri-Tech (£0.1bn) and Screen Industries (£0.05bn). Advanced Manufacturing, Materials and Engineering also dominates in terms of purchases, turnover and employment costs but this would be expected due to the size of the sector.

Figure 9: Doing business in the 10X priority sectors, 2021 (£000s)



Source: DFE developed interpretation of Annual Business Inquiry (ABI), 2021

Conclusion and Next Steps

The baseline data shows that businesses operating in the 10X priority sectors tend to be more internationally focussed than the NI economy in general. They also make up a substantial amount of high growth businesses and make a significant contribution to GVA and employment. However, there are also areas where they do not fare so well when compared to the whole economy, like the employment of women and of people with disabilities. That said, the proportionally higher employment of men is largely (but not totally) driven by the Advanced Manufacturing, Materials and Engineering sector which has historically had issues in attracting women into its workforce⁶.

The information in this paper has in some cases raised more questions and highlighted the need for more baseline data. For example, it would be interesting to see how the 10X priority sectors fare in terms of labour productivity, wages, skills & education and investment in research & development. The next step would be to investigate to see if this information would be possible to get using the definition of sectors set out in Annex A.

Establishing a varied and thorough baseline is vital because it is imperative that the Department can periodically measure progress against the ambitions set out in 10X, so that policy levers can be adjusted to support the sectors as appropriate to maximise impacts. Having a clear and solid baseline and an ongoing understanding of which policy levers have the greatest impact to these sectors will be an important aspect of helping NI on its way to becoming a world leading economy by 2030.

⁶ This number of girls pursuing STEM to employment has remained low (at just 21% of all young people moving to STEM careers) and unchanged since 2008 despite significant government, business and school efforts to encourage them to do so. For more information please click [here](#)

Annex A

The priority sectors identified as being strategically important to NI do not fit neatly into the Standard Industrial Classification (SIC) 2007 system. To counter this issue, the Department undertook an exercise to define these seven sectors by 4 and 5 digit⁷ SIC, attributing all or part of relevant SICs to sectors.

This baseline was developed with input from a wide variety of sources including information from Data City as well as engaging key stakeholders such as policy leads, statisticians, economists and industry specialists. This was necessary to ensure our developed SIC sector definitions are as clear and as accurate as possible, enabling the Department to gain a vital understanding of what these sectors currently look like.

This process highlighted the importance of analytical staff engaging colleagues with local industry knowledge. For example, the 5 digit SIC “manufacture of trailers and semi trailers” at first glance seems to fit neatly into the Advanced Manufacturing, Materials and Engineering sector, not only because of the description but also because the list of companies that trade under that code do not stand out as Agri-Tech focused. However, engagement with policy and industry leads revealed that some of the trailer businesses did in fact engage in Agri-Tech activities. A fair amount of the companies are involved in designing and producing goods such as agricultural trailers, agricultural equipment and machinery, including silage block-cutters and slurry tankers, pumps and mixers.

It was then agreed that around 20% of the activity in this SIC could be attributed to Agri-Tech and the remaining 80% could be classed as Advanced Manufacturing, Materials and Engineering, avoiding any overlap/double counting of 10X businesses. This type of information sharing was typical in the process of weighing and absolutely vital in arriving at a definition that is as detailed and accurate as possible.

This annex provides the resulting composition of each of the seven sectors based on SIC 2007.

⁷ The most detailed level of classification

Advanced Manufacturing, Materials and Engineering

SIC	DESCRIPTION	WEIGHT
1623	Manufacture of other builders' carpentry and joinery	20.0%
2011	Manufacture of industrial gases	10.0%
2012	Manufacture of dyes and pigments	33.0%
2013	Manufacture of other inorganic basic chemicals	20.0%
2016	Manufacture of plastics in primary forms	75.0%
2059	Manufacture of other chemical products n.e.c.	50.0%
2060	Manufacture of man-made fibres	75.0%
2219	Manufacture of other rubber products	90.0%
2221	Manufacture of plastic plates, sheets, tubes and profiles	100.0%
2222	Manufacture of plastic packing goods	95.0%
2223	Manufacture of builders' ware of plastic	100.0%
2229	Manufacture of other plastic products	80.0%
2343	Manufacture of ceramic insulators and insulating fittings	100.0%
2351	Manufacture of cement	100.0%
2361	Manufacture of concrete products for construction purposes	100.0%
2420	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel	100.0%
2453	Casting of light metals	100.0%
2454	Casting of other non-ferrous metals	100.0%
2511	Manufacture of metal structures and parts of structures	100.0%
2512	Manufacture of doors and windows of metal	100.0%
2521	Manufacture of central heating radiators and boilers	100.0%
2540	Manufacture of weapons and ammunition	100.0%
2561	Treatment and coating of metals	100.0%
2562	Machining	100.0%
2573	Manufacture of tools	80.0%
2592	Manufacture of light metal packaging	20.0%
2593	Manufacture of wire products, chain and springs	50.0%
2594	Manufacture of fasteners and screw machine products	90.0%
2599	Manufacture of other fabricated metal products n.e.c.	100.0%
2611	Manufacture of electronic components	90.0%
2612	Manufacture of loaded electronic boards	100.0%
2620	Manufacture of computers and peripheral equipment	100.0%
26511	Manufacture of electronic instruments and appliances for measuring, testing, and navigation, except industrial process control equipment	100.0%
26512	Manufacture of electronic industrial process control equipment	100.0%
26701	Manufacture of optical precision instruments	50.0%
26702	Manufacture of photographic and cinematographic equipment	75.0%
2680	Manufacture of magnetic and optical media	100.0%
2711	Manufacture of electric motors, generators and transformers	100.0%
2712	Manufacture of electricity distribution and control apparatus	100.0%
2720	Manufacture of batteries and accumulators	100.0%
2731	Manufacture of fibre optic cables	100.0%

SIC	DESCRIPTION	WEIGHT
2732	Manufacture of other electronic and electric wires and cables	100.0%
2740	Manufacture of electric lighting equipment	100.0%
2790	Manufacture of other electrical equipment	90.0%
2811	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	100.0%
2812	Manufacture of fluid power equipment	100.0%
28132	Manufacture of compressors	100.0%
2814	Manufacture of other taps and valves	100.0%
2822	Manufacture of lifting and handling equipment	75.0%
28302	Manufacture of agricultural and forestry machinery (other than agricultural tractors)	50.0%
2841	Manufacture of metal forming machinery	100.0%
28921	Manufacture of machinery for mining	97.5%
28922	Manufacture of earthmoving equipment	100.0%
2893	Manufacture of machinery for food, beverage and tobacco processing	100.0%
2899	Manufacture of other special-purpose machinery n.e.c.	85.0%
2910	Manufacture of motor vehicles	100.0%
29201	Manufacture of bodies (coachwork) for motor vehicles (except caravans)	100.0%
29202	Manufacture of trailers and semi-trailers	80.0%
29203	Manufacture of caravans	100.0%
3030	Manufacture of air and spacecraft and related machinery	100.0%
3099	Manufacture of other transport equipment n.e.c.	100.0%
3315	Repair and maintenance of ships and boats	100.0%
3320	Installation of industrial machinery and equipment	97.5%
3511	Production of electricity	50.0%
3512	Transmission of electricity	90.0%
3513	Distribution of electricity	100.0%
3521	Manufacture of gas	97.5%
3600	Water collection, treatment and supply	100.0%
3900	Remediation activities and other waste management services	25.0%
41201	Construction of commercial buildings	100.0%
4299	Construction of other civil engineering projects n.e.c.	100.0%
4321	Electrical installation	97.5%
4329	Other construction installation	10.0%
43999	Specialised construction activities (other than scaffold erection) n.e.c.	25.0%
8422	Defence activities	100.0%

Agri-Tech

SIC	DESCRIPTION	WEIGHT
161	Support activities for crop production	5.0%
1629	Support activities for animal production (other than farm animal boarding and care) n.e.c.	75.0%
163	Post-harvest crop activities	5.0%
1721	Manufacture of other paper and paperboard containers	5.0%
2020	Manufacture of pesticides and other agrochemical products	50.0%
2110	Manufacture of basic pharmaceutical products	5.0%
2120	Manufacture of pharmaceutical preparations	10.0%
2219	Manufacture of other rubber products	5.0%
2222	Manufacture of plastic packing goods	5.0%
2229	Manufacture of other plastic products	10.0%
2611	Manufacture of electronic components	10.0%
2822	Manufacture of lifting and handling equipment	5.0%
2829	Manufacture of other general-purpose machinery n.e.c.	15.0%
28301	Manufacture of agricultural tractors	50.0%
28302	Manufacture of agricultural and forestry machinery (other than agricultural tractors)	50.0%
2899	Manufacture of other special-purpose machinery n.e.c.	10.0%
29202	Manufacture of trailers and semi-trailers	20.0%
2931	Manufacture of electrical and electronic equipment for motor vehicles	10.0%
4661	Wholesale of agricultural machinery, equipment and supplies	20.0%
4799	Other retail sale not in stores, stalls or markets	5.0%
52243	Cargo handling for land transport activities of division 49	5.0%
62012	Business and domestic software development	2.5%
6209	Other information technology and computer service activities	2.5%
74909	Other professional, scientific and technical activities (not including environmental consultancy or quantity surveying) n.e.c.	5.0%
7500	Veterinary activities	10.0%

Life and Health Sciences

SIC	DESCRIPTION	WEIGHT
13950	Manufacture of non-wovens and articles made from non-wovens, except apparel	10%
13960	Manufacture of other technical and industrial textiles	5%
20590	Manufacture of other chemical products n.e.c.	45%
21100	Manufacture of basic pharmaceutical products	95%
21200	Manufacture of pharmaceutical preparations	90%
22290	Manufacture of other plastic products	10%
26600	Manufacture of irradiation, electromedical and electrotherapeutic equipment	100%
26701	Manufacture of optical precision instruments	50%
27900	Manufacture of other electrical equipment	5%
28220	Manufacture of lifting and handling equipment	5%
28990	Manufacture of other special-purpose machinery n.e.c.	5%
32500	Manufacture of medical and dental instruments and supplies	100%
32990	Other manufacturing n.e.c.	5%
33190	Repair of other equipment	5%
46180	Agents specialised in the sale of other particular products	5%
46460	Wholesale of pharmaceutical goods	100%
46690	Wholesale of other machinery and equipment	5%
46900	Non-specialised wholesale trade	5%
47749	Retail sale of medical and orthopaedic goods (other than hearing aids) n.e.c., in specialised stores	100%
47990	Other retail sale not in stores, stalls or markets	5%
62012	Business and domestic software development	5%
62020	Computer consultancy activities	2.5%
62090	Other information technology and computer service activities	5%
64209	Activities of other holding companies (not including agricultural, production, construction, distribution and financial services holding companies) n.e.c.	2.5%
70229	Management consultancy activities (other than financial management)	10%
71122	Engineering related scientific and technical consulting activities	5%
71200	Technical testing and analysis	25%
72110	Research and experimental development on biotechnology	100%
72190	Other research and experimental development on natural sciences and engineering	25%
74909	Other professional, scientific and technical activities (not including environmental consultancy or quantity surveying) n.e.c.	5%
82990	Other business support service activities n.e.c.	2.5%
86220	Specialist medical practice activities	100%
86900	Other human health activities	50%
96090	Other personal service activities n.e.c.	5%

Software

SIC	DESCRIPTION	WEIGHT
58210	Publishing of computer games	80%
58290	Other software publishing	90%
62011	Ready-made interactive leisure and entertainment software development	45%
62012	Business and domestic software development	75%
62020	Computer consultancy activities	60%
62030	Computer facilities management activities	40%
62090	Other information technology and computer service activities	50%
63110	Data processing, hosting and related activities	30%
63120	Web portals	5%

Fintech / Financial Services

SIC	DESCRIPTION	WEIGHT
64191	Banks	100%
64192	Building societies	100%
64201	Activities of agricultural holding companiesw	100%
64202	Activities of production holding companies	100%
64203	Activities of construction holding companies	100%
64204	Activities of distribution holding companies	100%
64205	Activities of financial services holding companies	100%
64209	Activities of other holding companies (not including agricultural, production, construction, distribution and financial services holding companies) n.e.c.	95%
64301	Activities of investment trusts	100%
64302	Activities of unit trusts	100%
64303	Activities of venture and development capital companies	100%
64304	Activities of open-ended investment companies	100%
64305	Activities of property unit trusts	100%
64306	Activities of real estate investment trusts	100%
64921	Credit granting by non-deposit taking finance houses and other specialist consumer credit grantors	100%
64922	Activities of mortgage finance companies	100%
64929	Other credit granting (not including credit granting by non-deposit taking finance houses and other specialist consumer credit grantors and activities of mortgage finance companies) n.e.c.	100%
64991	Security dealing on own account	100%
64992	Factoring	100%
64999	Other financial service activities, except insurance and pension funding, (not including security dealing on own account and factoring) n.e.c.	100%

Low Carbon (including Green Hydrogen)

SIC	DESCRIPTION	WEIGHT
20590	Manufacture of other chemical products n.e.c.	5%
28921	Manufacture of machinery for mining	2.5%
28990	Manufacture of other special-purpose machinery n.e.c.	10%
33200	Installation of industrial machinery and equipment	2.5%
35110	Production of electricity	50%
35120	Transmission of electricity	10%
35140	Trade of electricity	10%
35210	Manufacture of gas	2.5%
35220	Distribution of gaseous fuels through mains	50%
38110	Collection of non-hazardous waste	50%
38210	Treatment and disposal of non-hazardous waste	25%
38220	Treatment and disposal of hazardous waste	50%
38320	Recovery of sorted materials	50%
39000	Remediation activities and other waste management services	33%
42220	Construction of utility projects for electricity and telecommunications	5%
43210	Electrical installation	2.5%
43220	Plumbing, heat and air-conditioning installation	2.5%
46770	Wholesale of waste and scrap	10%
64209	Activities of other holding companies n.e.c.	2.5%
70100	Activities of head offices	2.5%
71122	Engineering related scientific and technical consulting activities	5%
71200	Technical testing and analysis	5%
72190	Other research and experimental development on natural sciences and engineering	2.5%
74901	Environmental consulting activities	33%
74909	Other professional, scientific and technical activities n.e.c.	2.5%
82990	Other business support service activities n.e.c.	2.5%

Screen Industries

SIC	DESCRIPTION	WEIGHT
59111	Motion picture production activities	75%
59112	Video production activities	50%
59113	Television programme production activities	50%
59120	Motion picture, video and television programme post-production activities	75%
62011	Ready-made interactive leisure and entertainment software development	50%
74100	specialised design activities	2.5%
85520	Cultural education	2.5%
90020	Support activities to performing arts	5%
90030	Artistic creation	75%
93290	Other amusement and recreation activities n.e.c.	5%