West Midlands Regional Observatory

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# First Steps in Measuring Regional Innovation

## Baseline sector analysis and the Innovation Dashboard

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European Regional Development Fund

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Investing in jobs and skills

# First Steps in Measuring Regional Innovation

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# 1 Background

The West Midlands Regional Economic Strategy reveals a £10bn GVA output gap between the region and the UK average. It identifies the region's relatively poor performance around innovation as one of the key challenges that the region faces in closing that output gap. As a result, Advantage West Midlands has commissioned the Observatory to carry out a programme of research to develop the evidence base around innovation, to inform future policies.

This paper proposes an approach to the on-going monitoring of innovation activity in the West Midlands. It sets out current approaches to measuring innovation and highlights projects commissioned nationally to improve the metrics for measuring innovation.

The paper includes three main elements:

1. An analysis of the scale and performance of the industrial sectors which correspond to the West Midlands clusters and ITC themes in the West Midlands and nationally

2. A proposed dashboard of indicators of regional innovation performance in terms of inputs, links and outputs

3. An outline of the further analysis of the Community Innovation Survey commissioned to provide richer evidence about the involvement of regional businesses in innovation activities

# 2 Economic characteristics of West Midlands' Clusters and selected ITC Innovation themes

## 2.1 Introduction

This section provides an analysis of the economic position of key sectors within the region. The sectors cover the West Midlands clusters and the majority of the Innovation Technology Council (ITC) priority innovation themes. Some of the data was commissioned from the Office for National Statistics Annual Business Inquiry, a two-part survey of a representative sample of employers in the UK. ABI/1 collects information on employment and ABI/2 collects financial information. The analysis below uses data from the ABI/2 component of the survey.

Our ultimate aim is to be able to quantify, for each of the sectors within the region, measures such as:

- Total output (GVA)
- Total employment
- Productivity (GVA per employee)
- Growth (historic and projected)
- Market size
- External tradeability

The data presented in this report, particularly in Tables 2-4 cover many of these measures for most of the sectors. Further work will be required to establish figures for market size and external tradeability. We propose that this should form part of the next stage of this work. Many of the figures presented below relates to 2006. Obviously the current economic recession will have had an impact on the key sectors outlined in Table 1. However, comparative results using ABI/2 data for 2008 or 2009 will not be available until 2010 or 2011. To get an earlier assessment of the latest economic conditions would need primary research.

Table 1 shows the sectors covered within this analysis. The cluster industries have been defined using the sectors listed in the recent Evaluation of AWM's Cluster Programme undertaken by EKOSgen. The parallel ITC themes have been agreed in discussion with colleagues from Advantage West Midlands. A full table outlining the individual Standard Industrial Classification (SIC) codes that make up the sectors is included in Annex 4.

An important distinction should be made between clusters and sectors. There are three important differences in approach between sectors and clusters:

## Annex 2 Priority Indicators Metadata

| category | variable | source | latest data |
|---|---|---|---|
| inputs | proportion of businesses making innovation-related expenditure | CIS | 2004-2006 (CIS5) |
| inputs | R&D performed within businesses as proportion of GVA | ONS BERD / regional GVA | 2007 |
| inputs | proportion of businesses investing in external knowledge creation | CIS | 2004-2006 (CIS5) |
| inputs | proportion of pupils achieving 5+ A*-C grades including English & mathematics GCSEs | DCSF, GCSE and Equivalent Results in England (table 18, row 75) | 2007/2008 |
| inputs | higher education qualifications obtained per 10 000 population | HESA | 2007/2008 |
| inputs | proportion of employed working age residents participating in job-related training in past 13 weeks | APS | Oct 2007-Sep 2008 (quarterly release of annual data) |
| links | broadband take-up rate amongst SMEs | Ofcom | 2006; irregular update |
| links | proportion of businesses with co-operation agreements | CIS | 2004-2006 (CIS5) |
| outputs | knowledge intensive business density | IDBR, based on OECD definition of KI sectors as transport, post and telecommunications, finance, property and business services, education, health, public administration and other services | 2008 |
| outputs | proportion of innovation active enterprises | CIS | 2004-2006 (CIS5) |
| outputs | overall proportion of firms introducing novel products | CIS | 2004-2006 (CIS5) |

| category | variable | source | latest data |
|---|---|---|---|
| outputs | overall proportion of firms introducing novel processes | CIS | 2004-2006 (CIS5) |
| outputs | overall proportion of firms introducing existing products | CIS | 2004-2006 (CIS5) |
| outputs | overall proportion of firms introducing existing processes | CIS | 2004-2006 (CIS5) |

## Annex 3 Secondary Indicators Metadata

| category | variable | source | latest data |
|---|---|---|---|
| inputs | BERD R&D personnel as proportion of workforce | ONS BERD / APS total workforce | 2007 |
| inputs | proportion of businesses investing in 'tangibles' | CIS | 2004-2006 (CIS5) |
| inputs | proportion of employers providing staff with either on or off the job training in 12 month period | NESS (National Employer and Skills Survey) | 2007 (next update 2009) |
| links | proportion of households with broadband internet connections | Ofcom | 2008; irregular update |
| links | total funding for business-university research and consultancy per 100 academic staff | | |
| outputs | successful IPO patent applications per 10 000 population | IPO / ONS mid-year population estimates | 2007 |

# Annex 4 Cluster SIC codes

## Building Technologies

| 4 Digit SIC | Description |
|---|---|
| 1411 | Quarrying of stone for construction |
| 1413 | Quarrying of slate |
| 1421 | Operation of gravel and sand pits |
| 2010 | Saw milling and planning of wood, impregnation of wood |
| 2020 | Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards |
| 2030 | Manufacture of builders carpentry and joinery |
| 2430 | Manufacture of paints, varnishes and similar coatings, printing ink and mastics |
| 2523 | Manufacture of builders ware of plastic |
| 2622 | Manufacture of ceramic sanitary fixtures |
| 2626 | Manufacture of refractory ceramic products |
| 2630 | Manufacture of ceramic tiles and flags |
| 2640 | Manufacture of bricks, tiles and construction products, in baked clay |
| 2651 | Manufacture of cement |
| 2652 | Manufacture of lime |
| 2661 | Manufacture of concrete products for construction purposes |
| 2662 | Manufacture of plaster products for construction purposes |
| 2663 | Manufacture of ready-mixed concrete |
| 2664 | Manufacture of mortars |
| 2665 | Manufacture of fibre cement |
| 2666 | Manufacture of other articles of concrete, plaster and cement |
| 2670 | Cutting, shaping and finishing of stone |
| 2681 | Production of abrasive products |
| 2721 | Manufacture of cast iron tubes |
| 2722 | Manufacture of steel tubes |
| 2732 | Cold rolling of narrow strip |
| 2733 | Cold forming or folding |
| 2811 | Manufacture of metal structures and parts of structures |
| 2812 | Manufacture of builders' carpentry and joinery of metal |
| 2821 | Manufacture of tanks, reservoirs and containers of metal |
| 2822 | Manufacture of central heating radiators and boilers |
| 2863 | Manufacture of locks and hinges |
| 2923 | Manufacture of non-domestic cooling and ventilation equipment |

| 4 Digit SIC | Description |
|---|---|
| 3150 | Manufacture of lighting equipment and electric lamps |
| 4511 | Demolition and wrecking of buildings; earth moving |
| 4512 | Test drilling and boring |
| 4521 | General construction of buildings and civil engineering works |
| 4522 | Erection of roof covering and frames |
| 4523 | Construction of highways, roads, airfields and sports facilities |
| 4524 | Construction of water projects |
| 4525 | Other construction work involving special trades |
| 4531 | Installation of electrical wiring and fittings |
| 4532 | Insulation work activities |
| 4533 | Plumbing |
| 4534 | Other building installation |
| 4541 | Plastering |
| 4542 | Joinery installation |
| 4543 | Floor or wall covering |
| 4544 | Painting and glazing |
| 4545 | Other building completion |
| 4550 | Renting of construction or demolition equipment with operator |
| 5113 | Agents involved in the sale of timber and building materials |
| 5153 | Wholesale of wood, construction materials and sanitary equipment |
| 5154 | Wholesale of hardware, plumbing and heating equipment and supplies |
| 5182 | Wholesale of mining, construction and civil engineering machinery |
| 7132 | Renting of construction and civil engineering machinery and equipment |
| 7420 | Architectural and engineering activities and related technical consultancy |

## Digital Media

| 4 Digit SIC | Description |
|---|---|
| 2231 | Reproduction of sound recording |
| 2232 | Reproduction of video recording |
| 2233 | Reproduction of computer media |
| 2465 | Manufacture of prepared unrecorded media |
| 9211 | Motion picture and video production |
| 9212 | Motion picture and video distribution |
| 9220 | Radio and television activities |
| 9231 | Artistic and literary creation and interpretation |
| 9251 | Library and archive activities |

## Environmental Technologies

| 4 Digit SIC | Description |
|---|---|
| 2830 | Manufacture of steam generators, except central heating hot water boilers |
| 2911 | Manufacture of engines and turbines, except aircraft, vehicle and cycle engines |
| 2912 | Manufacture of pumps and compressors |
| 3110 | Manufacture of electric motors, generators and transformers |
| 3120 | Manufacture of electricity distribution and control apparatus |
| 3710 | Recycling of metal waste and scrap |
| 3720 | Recycling of non-metal waste and scrap |
| 4011 | Production of electricity |
| 4012 | Transmission of electricity |
| 4013 | Distribution and trade in electricity |
| 4021 | Manufacture of gas |
| 4022 | Distribution of gaseous fuels through mains |
| 4030 | Steam and hot water supply |
| 4100 | Collection, purification and distribution of water |
| 5157 | Wholesale of waste and scrap |
| 9001 | Collection and treatment of sewage |
| 9002 | Collection and treatment of other waste |
| 9003 | Sanitation, remediation and similar activities |

## Food and Drink

| 4 Digit SIC | Description |
|---|---|
| 1511 | Production and preserving of meat |
| 1512 | Production and preserving of poultry meat |
| 1513 | Production of meat and poultry meat products |
| 1520 | Processing and preserving of fish and fish products |
| 1531 | Processing and preserving of potatoes |
| 1532 | Manufacture of fruit and vegetable juice |
| 1533 | Processing and preserving of fruit and vegetables not elsewhere classified |
| 1541 | Manufacture of crude oils and fats |
| 1542 | Manufacture of refined oils and fats |
| 1543 | Manufacture of margarine and similar edible fats |
| 1551 | Operation of dairies and cheese making |
| 1552 | Manufacture of ice cream |
| 1562 | Manufacture of starches and starch products |

| 4 Digit SIC | Description |
|---|---|
| 1571 | Manufacture of prepared feeds for farm animals |
| 1572 | Manufacture of prepared pet foods |
| 1581 | Manufacture of bread; manufacture of fresh pastry goods and cakes |
| 1582 | Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes |
| 1583 | Manufacture of sugar |
| 1584 | Manufacture of cocoa, chocolate and sugar confectionery |
| 1585 | Manufacture of macaroni, noodles, couscous and similar farinaceous products |
| 1586 | Processing of tea and coffee |
| 1587 | Manufacture of condiments and seasonings |
| 1588 | Manufacture of homogenised food preparations and dietetic food |
| 1589 | Manufacture of other food products not elsewhere classified |
| 1591 | Manufacture of distilled potable alcoholic beverages |
| 1592 | Production of ethyl alcohol from fermented materials |
| 1593 | Manufacture of wines |
| 1594 | Manufacture of cider and other fruit wines |
| 1595 | Manufacture of other non-distilled fermented beverages |
| 1596 | Manufacture of beer |
| 1597 | Manufacture of malt |
| 1598 | Manufacture of mineral waters and soft drinks |
| 1600 | Manufacture of tobacco products |
| 2953 | Manufacture of machinery for food, beverage and tobacco processing |
| 5111 | Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods |
| 5117 | Agents involved in the sale of food, beverages and tobacco |
| 5121 | Wholesale of grain, seeds and animal foods |
| 5122 | Wholesale of flowers and plants |
| 5123 | Wholesale of live animals |
| 5124 | Wholesale of hides, skins and leather |
| 5125 | Wholesale of unmanufactured tobacco |
| 5131 | Wholesale of fruit and vegetables |
| 5132 | Wholesale of meat and meat products |
| 5133 | Wholesale of dairy produce, eggs and edible oils and fats |
| 5134 | Wholesale of alcoholic and other beverages |
| 5135 | Wholesale of tobacco products |
| 5136 | Wholesale of sugar and chocolate and sugar confectionery |
| 5137 | Wholesale of coffee, tea, cocoa and spices |

| 4 Digit SIC | Description |
|---|---|
| 5138 | Wholesale of other food including fish, crustaceans and molluscs |
| 5139 | Non-specialised wholesale of food, beverages and tobacco |
| 5188 | Wholesale of agricultural machinery and accessories and implements, including tractors |

**Interiors & Lifestyle**

| | |
|---|---|
| 4 Digit SIC | Description |
| 1751 | Manufacture of carpets and rugs |
| 1810 | Manufacture of leather clothes |
| 1821 | Manufacture of workwear |
| 1822 | Manufacture of other outerwear |
| 1823 | Manufacture of underwear |
| 1824 | Manufacture of other wearing apparel and accessories not elsewhere classified |
| 1830 | Dressing and dyeing of fur; manufacture of articles of fur |
| 1920 | Manufacture of luggage, handbags and the like, saddlery and harness |
| 1930 | Manufacture of footwear |
| 2613 | Manufacture of hollow glass |
| 2621 | Manufacture of ceramic household and ornamental articles |
| 2741 | Precious metals production |
| 3350 | Manufacture of watches and clocks |
| 3611 | Manufacture of chairs and seats |
| 3612 | Manufacture of other office and shop furniture |
| 3613 | Manufacture of other kitchen furniture |
| 3614 | Manufacture of other furniture |
| 3621 | Striking of coins and medals |
| 3622 | Manufacture of jewellery and related articles not elsewhere classified |
| 5115 | Agents involved in the sale of furniture, household goods, hardware and ironmongery |
| 5116 | Agents involved in the sale of textiles, clothing, footwear and leather goods |
| 5141 | Wholesale of textiles |
| 5142 | Wholesale of clothing and footwear |
| 5143 | Wholesale of electrical household appliances and radio and television goods |
| 5273 | Repair of watches, clocks and jewellery |

## ICT

| 4 Digit SIC | Description |
|---|---|
| 3002 | Manufacture of computers and other information processing equipment |
| 3210 | Manufacture of electronic valves and tubes and other electronic components |
| 3220 | Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy |
| 3230 | Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods |
| 5184 | Wholesale of computers, computer peripheral equipment and software |
| 6420 | Telecommunications |
| 7133 | Renting of office machinery and equipment including computers |
| 7210 | Hardware consultancy |
| 7221 | Publishing of software |
| 7222 | Other software consultancy and supply |
| 7230 | Data processing |
| 7240 | Data base activities |
| 7250 | Maintenance and repair of office, accounting and computing machinery |
| 7260 | Other computer related activities |

## Specialist Business Services

| 4 Digit SIC | Description |
|---|---|
| 7310 | Research and experimental development on natural sciences and engineering |
| 7320 | Research and experimental development on social sciences and humanities |
| 7411 | Legal activities |
| 7412 | Accounting, book-keeping and auditing activities; tax consultancy |
| 7413 | Market research and public opinion polling |
| 7414 | Business and management consultancy activities |
| 7415 | Management activities of holding companies |
| 7440 | Advertising |
| 7487 | Other business activities not elsewhere classified |

## Medical Technologies

| 4 Digit SIC | Description |
|---|---|
| 2441 | Manufacture of basic pharmaceuticals |
| 2442 | Manufacture of pharmaceutical preparations |
| 3310 | Manufacture of medical and surgical equipment and orthopaedic appliances |
| 3340 | Manufacture of optical instruments and photographic equipment |
| 5146 | Wholesale of pharmaceutical goods |

## Tourism & Leisure

| 4 Digit SIC | Description |
|---|---|
| 3630 | Manufacture of musical instruments |
| 3640 | Manufacture of sports goods |
| 3650 | Manufacture of games and toys |
| 5510 | Hotels |
| 5521 | Youth hostels and mountain refuges |
| 5522 | Camping sites, including caravan sites |
| 5523 | Other provision of lodgings not elsewhere classified |
| 5530 | Restaurants |
| 5540 | Bars |
| 5551 | Canteens |
| 5552 | Catering |
| 6120 | Inland water transport |
| 6322 | Other supporting water transport activities |
| 7110 | Renting of automobiles |
| 7122 | Renting of water transport equipment |
| 9213 | Motion picture projection |
| 9232 | Operation of arts facilities |
| 9233 | Fair and amusement park activities |
| 9234 | Other entertainment activities not elsewhere classified |
| 9252 | Museum activities and preservation of historical sites and buildings |
| 9253 | Botanical and zoological gardens and nature reserve activities |
| 9261 | Operation of sports arenas and stadiums |
| 9262 | Other sporting activities |
| 9271 | Gambling and betting activities |
| 9272 | Other recreational activities not elsewhere classified |

## Transport Technologies

| 4 Digit SIC | Description |
|---|---|
| 2511 | Manufacture of rubber tyres and tubes |
| 2512 | Retreading and rebuilding of rubber tyres |
| 2751 | Casting of iron |
| 2752 | Casting of steel |
| 2753 | Casting of light metals |
| 2754 | Casting of other non-ferrous metals |
| 2840 | Forging, pressing, stamping and roll forming of metal; powder metallurgy |
| 2851 | Treatment and coating of metals |
| 2852 | General mechanical engineering |
| 2874 | Manufacture of fasteners, screw machine products, chains and springs |
| 2914 | Manufacture of bearings, gears, gearing and driving elements |
| 2951 | Manufacture of machinery for metallurgy |
| 3140 | Manufacture of accumulators, primary cells and primary batteries |
| 3161 | Manufacture of electrical equipment for engines and vehicles not elsewhere classified |
| 3410 | Manufacture of motor vehicles |
| 3420 | Manufacture of bodies (coachwork) for motor vehicles |
| 3430 | Manufacture of parts and accessories for motor vehicles and their engines |
| 3511 | Building and repairing of ships |
| 3512 | Building and repairing of pleasure and sporting boats |
| 3520 | Manufacture of railway and tramway locomotives and rolling stock |
| 3530 | Manufacture of aircraft and spacecraft |
| 3541 | Manufacture of motorcycles |
| 3542 | Manufacture of bicycles |
| 3543 | Manufacture of invalid carriages |
| 3550 | Manufacture of other transport equipment not elsewhere classified |

# Annex 5 DCMS SIC codes

**Department for Culture Media and Sport – DET SIC Definition for Audio Visual**

Those in bold form part of the ITC Digital Media SIC definition.

*Indicates SIC is part of other ITC theme

| 4 Digit SIC | Description |
|---|---|
| 22.14 | Publishing of sound recordings |
| **22.31** | **Reproduction of sound recordings** |
| **22.32** | **Reproduction of video recordings** |
| **22.33** | **Reproduction of computer media** |
| 24.64 | Manufacture of photographic chemical material |
| **24.65** | **Manufacture of prepared unrecorded media** |
| 32.10* | Manufacture of electronic valves and tubes and other electronic components |
| 32.20/2* | Manufacture of TV and radio transmitters |
| 32.30* | Manufacture of TV and radio receivers, sound or video recording or reproducing apparatus etc |
| 33.40/3 | Manufacture of cinematographic equip |
| 36.30 | Manufacture of musical instruments |
| 51.43/1 | Wholesale of records tapes CDs videos and playback equipment |
| 51.43/9 | Wholesale or radios and TVs and other electrical appliances nec |
| 51.47/5 | Wholesale of musical instruments |
| 51.47/6 | Wholesale of photographic goods |
| 52.45 | Includes retail sale of TV goods and radios |
| 52.48/2 | Retail sales of photographic, optical and precision equipment and office supplies |
| 71.40/3 | Renting of radios, TVs, video recorders and DVD players |
| 71.40/4 | Renting of records and other prerecorded media |
| 71.40/5 | Renting of video tapes and DVDs |
| 72.21* | Software publishing |
| 72.22* | Other software consultancy and supply |
| 74.40 | Advertising |
| 74.40 | Advertising |
| 74.40 | Advertising |
| 74.81/2 | Portrait photographic activities – previously other portrait photographic activities |
| 74.81/3 | Other specialist photography |
| 74.81/4 | Film processing |
| 74.81/9 | Photographic activities NEC |

| | |
|---|---|
| **92.11/1** | **Motion picture production on film or video tape** |
| **92.11/9** | **Other motion picture and video production activities** |
| **92.12** | **Motion picture and video distribution** |
| 92.13 | Motion picture projection |
| **92.20/1** | **Radio activities** |
| **92.20/2** | **Television activities** |
| 92.72/1 | Motion picture, tv and other theatrical casting |

# Annex 6 Frontier Economics Creative Industries Definition

### Advertising

| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 74.40/2 | Planning, creating and putting in place advertising campaigns |
| 5 | 74.40/9 | A "catch all" code for advertising, including handing out free samples and aerial advertising |
| 5 | 74.40/1 | Selling or leasing advertising space or time |

### Architecture

| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 74.20/1 | Architectural design and construction supervision |
| 1 | 74.20/2 | Urban planning and landscape architecture |
| 2 | 74.20/4 | Engineering advice and design for construction projects |
| 3 | 74.20/6 | Scientific consultancy like weather and geological surveying |
| 3 | 74.15/3 | Construction holding companies and head offices |
| 3 | 70.11 | Real estate developers |
| 3 | 45.21/1, 45.21/2, 45.21/3, 45.22, 45.23, 45.24, 45.25 | All types of construction work, like residential buildings, bridges, roads, sports facilities, dams and related work like laying foundations and putting up scaffolding. |
| 4 | 74.20/3 | Quantity surveying |
| 4 | 51.54 | Wholesale of hardware, plumbing and heating equipment and supplies |
| 4 | 51.53 | Wholesale of construction materials and sanitary equipment (e.g. toilets and sinks) |
| 4 | 51.13 | Agents who sell timber and building materials |
| 4 | 45.41, 45.42, 45.43, 45.44, 45.45 | All types of building completion like plastering, painting and glazing, Floor and wall covering and installing swimming pools |
| 4 | 45.31, 45.32, 45.33, 45.34 | All types of building installation like electrical work, insulation work and plumbing |

### Arts, antiques and crafts

| Layer | 4/5 Digit SIC | Description |
|---|---|---|

| | | |
|---|---|---|
| 2 | 74.87/3 | Exhibition and fair organisation |
| 2 | 52.50/1, 52.48/6 | Retail sale of antiques and retail sale in commercial art galleries |
| 3 | 36.63/9 | Catch all SIC code for "other manufacturing" (potentially some craft firms, if they are large enough to be covered by the IDBR) |
| 3 | 36.22, 36.61 | Manufacture of jewellery and dinnerware made of precious metals and imitation jewellery |
| 3 | 36.30, 33.50 | Making musical instruments and watch & clock making |
| 3 | 28.75, 28.61 | Making various metal products like swords but also ship propellers etc. and making cutlery |
| 3 | 27.54, 27.41, 26.82/9 | Casting and production of heavy and precious metals and manufacture of mineral products |
| 3 | 26.30, 26.25, 26.21, 26.70 | Making ceramic tiles, pots, jars, tableware, statuettes etc. and cutting stone for building and ornamental use |
| 3 | 17.51/9, 17.51/2, 17.51/1 | Carpet and rug making |
| 4 | 51.47/9 | A catch all SIC code that includes the wholesale of floor coverings but also stationary and sportswear etc. |
| 4 | 51.44, 51.47/8 | Wholesale of china and of travel and fancy goods |
| 4 | 51.47/3, 51.47/4 | Wholesale of jewellery and imitation jewellery |

**Design**

| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 74.20/5 | Engineering design for industry |

**Designer fashion**

| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 74.87/2 | Fashion design but also interior design and graphic design |
| 2 | 17.53, 17.71, 17.72, 18.10, 18.22/1, 18.22/2, 18.23/1, 18.23/2, 18.24/1, 18.24/3, 18.24/9, 18.30, 19.20, 19.30 | Manufacture of clothing items like hats, shoes, outerwear and underwear or accessories like bags and luggage. |

| | | |
|---|---|---|
| 3 | 17.11, 17.12, 17.13, 17.14, 17.15, 17.16, 17.17, 17.21, 17.22, 17.23, 17.24, 17.25, 17.30, 17.54/1, 17.54/2, 17.54/9, 17.60, 19.10 | Manufacture of fibres, textiles, prepared fur and prepared leather |
| 3 | 51.16, 51.24/1, 51.24/9, 51.41, 51.42/1, 51.42/2, 51.42/3, 51.42/9 | Wholesale of, and activates of agents involved in the sale of, fabrics, fur and clothing, |
| 4 | 52.42/1, 52.42/2, 52.42/3, 52.42/4, 52.43/1 | Retail sale of cloths, accessories and footwear |

### Film, video and photography

| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 74.81/3 | Specialist photography (e.g. underwater) |
| 1 | 74.81/9 | Photos for commercials, fashion, tourism etc. |
| 1 | 92.11/1 | Producing films, cartoons and documentaries |
| 1 | 92.11/9 | Dubbing, editing, post production etc. |
| 2 | 74.81/2 | Portrait photos (mainly passport photo companies, although doesn't include photo machines) |
| 3 | 92.12 | Motion picture distribution |
| 3 | 74.81/4 | Film processing |
| 3 | 52.48/2 | Retail sale of cameras but also office equipment |
| 3 | 51.47/6 | Wholesale of photographic goods |
| 3 | 33.40/3 | Manufacture of cameras, projectors etc. |
| 3 | 24.65 | Manufacture of unrecorded media (also includes unrecorded media for computers) |
| 3 | 24.64 | Manufacture of photographic chemicals |
| 3 | 22.32 | Reproduction of DVD's and tapes |
| 5 | 92.13 | Cinemas |

### Music and the performing arts

| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 92.31/1 | Live theatrical presentation |

| | | |
|---|---|---|
| 1 | 92.31/9 | Artistic and literary creation and interpretation |
| 2 | 92.72/1 | Casting for theatres, motion pictures or television |
| 2 | 92.32 | Theatres, concert halls, arts facilities and ticket agencies |
| | 22.14 | Music publishing |
| 3 | 92.34/9 | "Other entertainment activities" code that includes VUE and Tussauds |
| 3 | 51.47/5 | Wholesale of musical instruments |
| 3 | 22.31 | Reproduction of sound recording |
| 4 | 51.43/1 | Wholesale of records, CD's etc. and players |
| 5 | 92.72/9 | "Other recreational activities" code |

**Publishing**

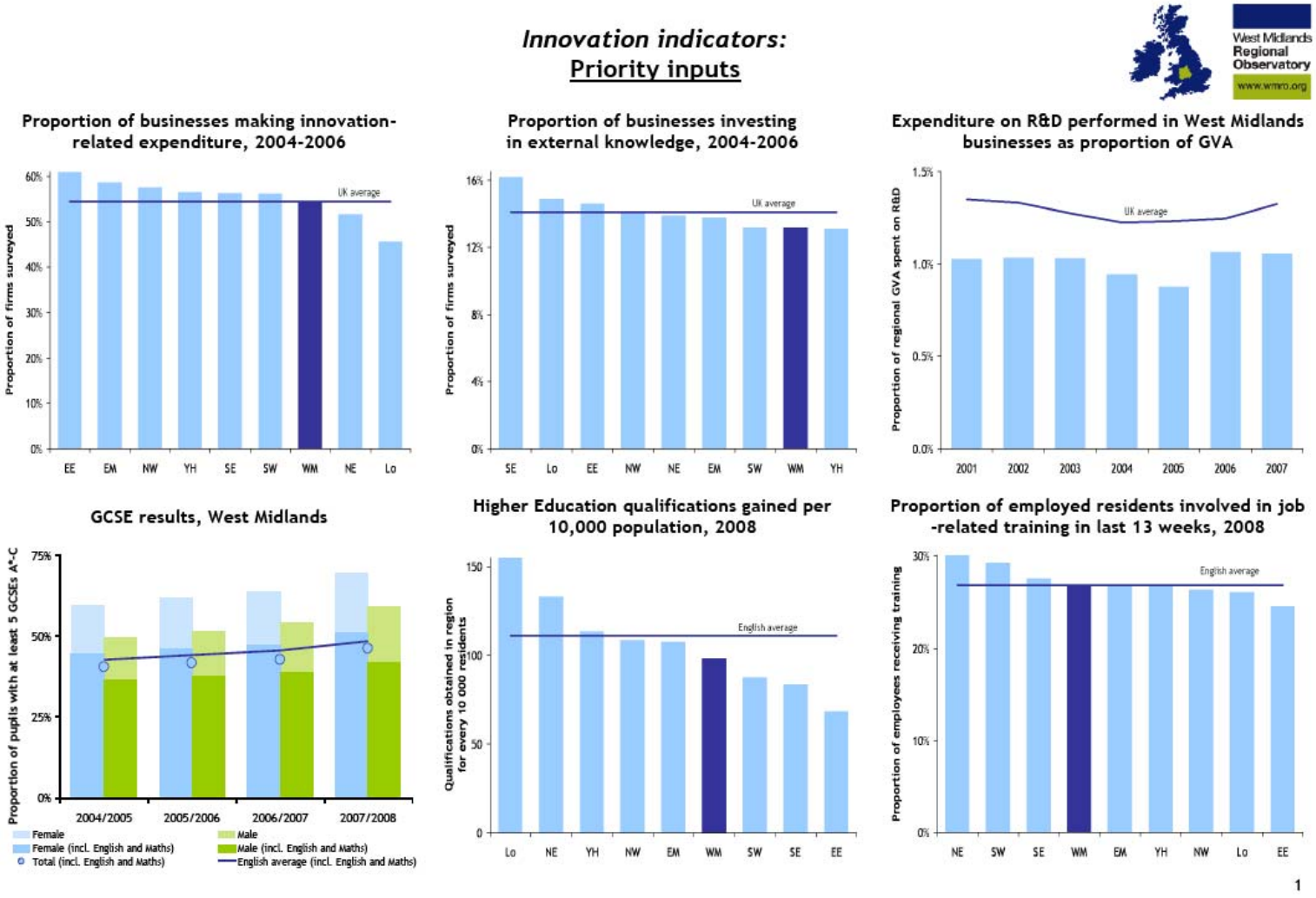
| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 92.40 | Journalists, press photographers and news syndicates |
| 2 | 22.13 | Publishing journals |
| 2 | 22.12 | Publishing newspapers |
| 2 | 22.11 | Publishing books |
| 3 | 74.87/9 | Business activities note covered by other SIC codes, including author's agents but also consultants etc. |
| 3 | 22.25 | Activities like embossing and laminating |
| 3 | 22.24 | Pre-press work, like composition and typesetting |
| 3 | 22.23 | Bookbinding |
| 3 | 22.22 | Printing maps, magazines, music manuscripts, diaries and similar items |
| 3 | 22.21 | Printing newspapers |
| 3 | 22.15 | Publishing photos, posters, timetables etc. |
| 4 | 24.30/2 | Manufacture of printing ink |
| 4 | 21.12 | Manufacture of paper and paperboard |
| 4 | 21.11 | Manufacture of pulp |
| 5 | 52.47 | Retail sale of books, newspapers and stationery |
| 5 | 52.11/1 | Retail sale by newsagents, confectioners etc. |

**Software and computer games**

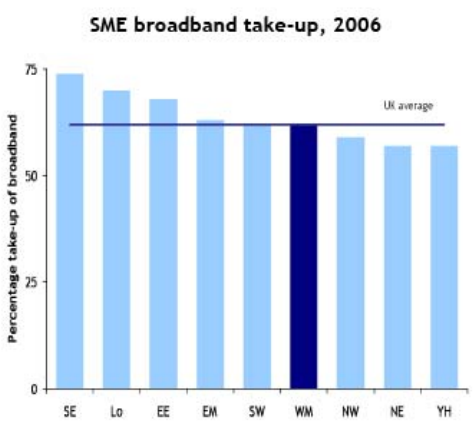
| Layer | 4/5 Digit SIC | Description |
|---|---|---|
| 1 | 36.50/9 | Manufacture of video game machines but also chess sets, dolls, playing cards etc. |
| 1 | 72.21 | Development and supply of ready made software "off the shelf" |

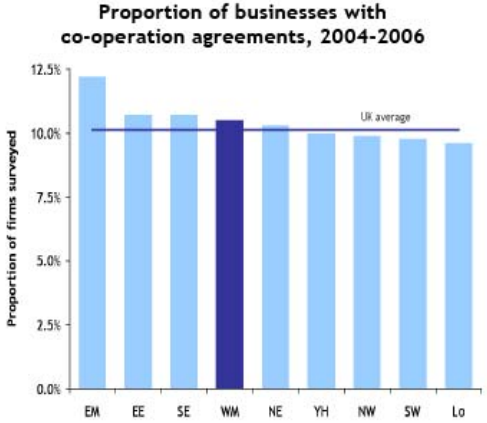
| | | |
|---|---|---|
| 1 | 72.22 | Development of made to order software, software consultancy and web page design |
| 2 | 72.60 | Computer related work not covered under other SIC codes |
| 3 | 72.10 | Hardware consultancy |
| 3 | 22.33 | Reproduction of software |
| 4 | 51.84 | Wholesale of computers, peripherals and software |
| 4 | 51.47/7 | Wholesale of toys, including video games |
| 4 | 36.50/1 | Manufacture of arcade games, including billiards etc. |
| 5 | 52.48/5 | Retail sale of toys (including video games), spots goods, stamps and coins |

# Annex 7 – Innovation Dashboard



## *Innovation indicators:*
## Priority links



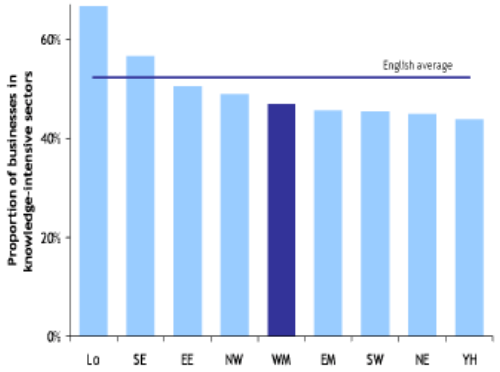




2

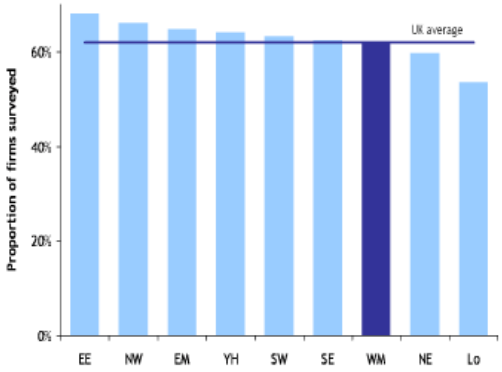
## *Innovation indicators:* Priority outputs

West Midlands Regional Observatory
www.wmro.org

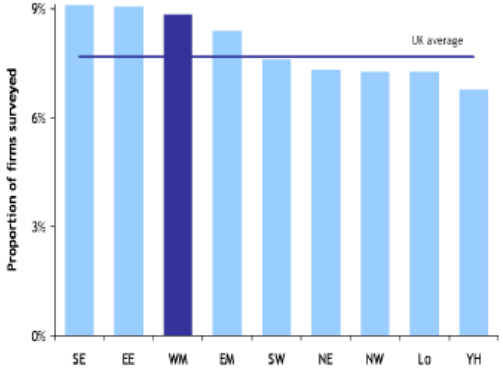
### Knowledge intensive business density, 2008



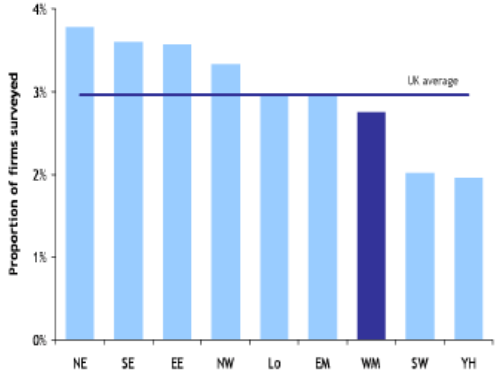

### Proportion of businesses which were innovation-active, 2004-2006



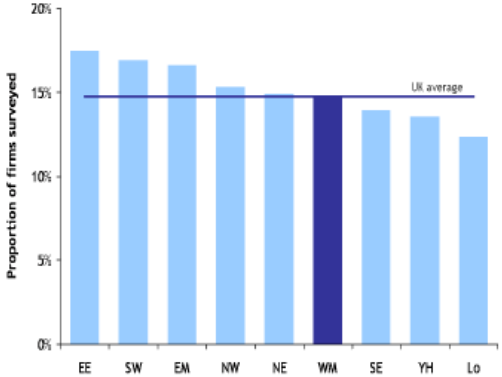

### Proportion of businesses introducing novel products, 2004-2006



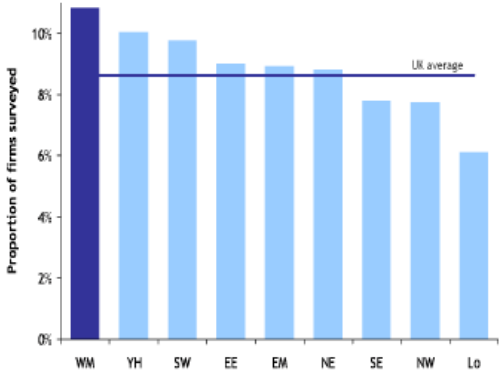

### Proportion of businesses introducing novel processes, 2004-2006




### Proportion of businesses introducing existing products, 2004-2006




### Proportion of businesses introducing existing processes, 2004-2006

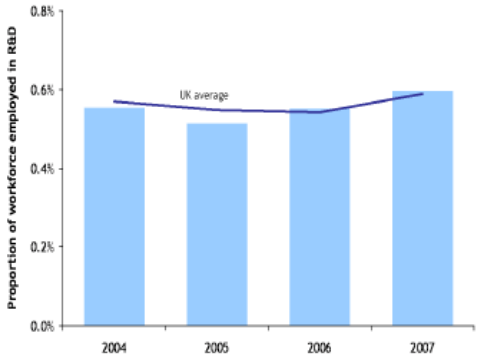



3

## *Innovation indicators:*
## Secondary indicators

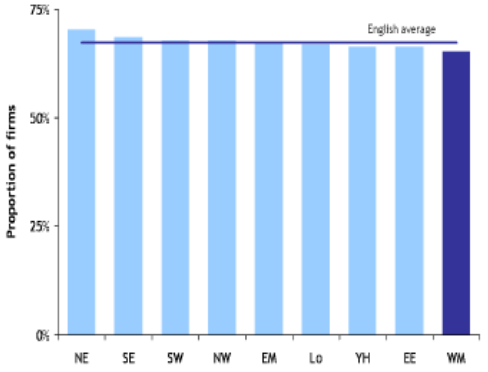
West Midlands Regional Observatory
www.wmro.org

**Employment in R&D as a proportion of total workforce, West Midlands (input)**

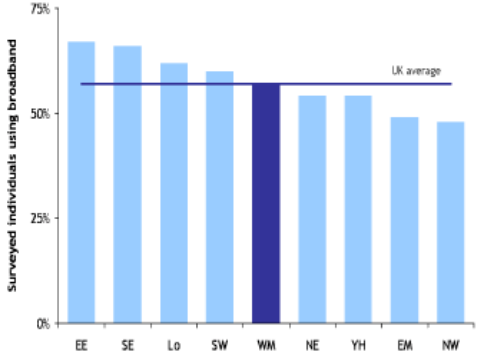



**Proportion of businesses investing in machinery and software, 2004-2006 (input)**

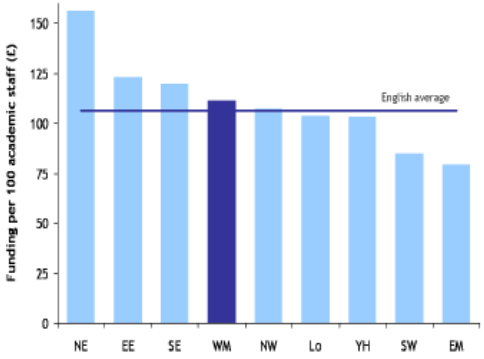
**Proportion of employers providing staff with training in 12 month period, 2007 (input)**



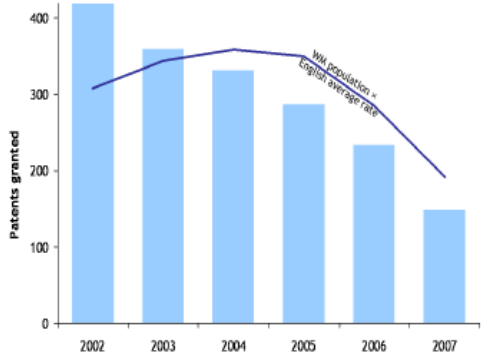

**Broadband take-up, 2008 (link)**




**Funding for business-university research and consultancy, 2006 (link)**




**Patents granted, West Midlands (output)**




5

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