

Industry Clusters

The key to identifying the economic strengths, opportunities and threats in your region



Foreword

With Brexit on the horizon we are entering an unprecedented and exciting period for trade and investment across the UK. Together with the devolution agenda, the end of central government funding for local councils, and increased competition between regions to attract and retain businesses and investment, it is becoming imperative for regions to articulate and evidence their “proposition” to business and those who are advising them. But how can this be done?

Key to successfully articulating and evidencing why businesses should invest in your region is to first have a really good understanding of what is currently driving your local economy. By understanding which sectors make your region unique, and which industries represent the best potential for development, you can place yourself in a far better position to demonstrate to businesses how they could benefit from being in your region.

We have recently developed a new mechanism for achieving this understanding, quickly and simply. **Industry Clusters** are a way of grouping the sectors of a local economy together, in such a way that makes identifying the best opportunities for growth a relatively straightforward exercise. In turn, this makes it far easier for you to get down to the business of developing a sound strategy for retaining, growing and attracting business in your region.

This short report is designed to take you through both the theory and the practical applications of industry clusters. On pages 3-4, we look at why we have created the clusters, and how we have created them. On page 5 we show how we have then divided the clusters into two distinct categories, which enable us to really define what is driving a local economy. Page 6 demonstrates how the industry clusters can be used to gain rich insights on your local economy. And in the appendices on pages 9-11, we show how each cluster has been defined.

Most crucially, however, are pages 7-8. This is where we move away from industry clusters as a mere concept, and demonstrate some of the practical ways you can use them to articulate and evidence a proposition to business for your region.

We hope you find this useful. If you’d like to find out more, you can contact us using the details on the back of this report, or visit our Local Sector Strengthfinder website at:

www.economicmodelling.co.uk/local-sector-strengthfinder

About Emsi

Our goal is to help local, regional and national economies function more effectively through helping people make better decisions relating to the world of work. We provide the best quality, most useful and appropriately detailed data and insight for our customers ready for the point that they make key decisions. This data is delivered through easy to use tools and services to the education, economic development and employment sectors.

The why and how of industry clusters

As we mentioned in the Foreword, any local economic developer wanting to develop a sound growth strategy must have a good understanding of their region's economy. But what do we mean when we use the word understanding? Which industries are the biggest? Which employ the most people? Which are the most profitable?

We would suggest that a really good understanding of a local economy means being able to answer the following questions:

- **Which industries give us a comparative advantage over other regions?**
- **Which sectors present us with the best opportunities to grow?**
- **Which industries might be under threat?**

These are important questions, and successfully answering them will shape the approach a developer takes, and provide a solid foundation for a sound local growth strategy. However, in practice, being able to answer these questions is not exactly very straightforward.

THE LIMITATIONS OF THE STANDARD INDUSTRY CLASSIFICATIONS

Perhaps the most obvious way to attempt an answer to these questions is by using local industry data. But aside from the problem of getting hold of data which is granular enough to give an accurate picture of a local economy, the big problem in using this method is the sheer number of industries. The Standard Industrial Classification system (SIC) categorises 563 different sectors at the 4-digit level, making it extremely hard to identify trends, let alone understand which industries are driving the economy.

One possible answer is contained within the SIC system itself. 4-digit classes are added up to form groups (3-digit SIC), which are then added up to make divisions (2-digit SIC), which are themselves grouped together to form sections (1-digit SIC). And so an economic developer attempting to answer the above questions could make things easier by looking at industries at the 1, 2 or 3, rather than 4-digit level.

However, the groups, divisions and sections within the SIC classification system are severely limited and don't give a very good picture of what is actually driving an economy. The reason for this is that the higher level groupings are driven by similarity of activity, rather than by any economic linkages between them. This may be a convenient way to cluster industries together, but it doesn't actually make very much sense when trying to understand how a local economy works. For example, if there is a large food and drink industry, the size of the total manufacturing workforce, which is what the SIC system identifies, is of far less significance than the links between manufacturing and distribution centred around food and drink.

A better solution would be to take those 4-digit SIC industries, and group them together not according to similarity of activity, but rather according to their economic links with one another. If this could be done, we would not only have a far more simplified process of identifying trends than trying to make sense of the 563 industries, but more than that we would have a far more accurate way of identifying which sectors are driving a local economy than using the SIC 1,2 or 3 classifications.

THE METHODOLOGY BEHIND INDUSTRY CLUSTERS

If the intention is to understand the economic diversity of a region, grouping industries together according to their economic links with one another would seem to be a sensible approach. After all, in today's connected economy, it is not isolated product and process that matter, but the connections from supply to demand. As Delgado et al. (2016) argue, "the agglomeration of related economic activity is a central feature of economic geography".¹ But how can this be done in practice?

Back in 2016, a major project was undertaken at Harvard Business School's Institute for Strategy and Competitiveness, with the aim being to define a benchmark set of clusters. But rather than looking at similarity of activity – for example, grouping manufacturing industries together as the SIC classification system does – they instead grouped sectors together based on a number of criteria that link them together economically. These include:

- **Industries which tend to co-locate in the same areas**
- **Industries that share a similar workforce**
- **Industries which tend to have supply chain connections**

Emsi has applied a similar methodology to industries in the UK. Beginning with the 563 4-digit SIC industries, we have identified those that are most economically linked according to the criteria established by the Harvard study. This has resulted in a set of 49 'coherent' industry clusters. Pages 9-11 show in detail how each of these clusters is defined.

In addition, as the following section explains in more detail, we have then divided these clusters into two distinct groups, in order to offer really rich insights into the forces driving local economic development.

¹ Classic references to agglomeration are Marshall (1920) and Krugman (1991). For the role of clusters in measuring agglomeration, see *inter alia* Ellison and Glaeser (1997), Porter (1998) or Delgado et al. (2014).



Dividing industry clusters into local and tradable

Grouping the 4-digit industries into 49 clusters in the way described in the previous section does two things. Firstly, it makes it far easier to get a handle on what is happening in an economy than trying to make sense of all 563 sector classifications. Secondly, it gives us a much better sense of real economic activity in an area than looking at the higher levels – 1,2 or 3-digit – in the SIC classification system.

However, when we look at the 49 clusters, it becomes clear that there are two distinct kinds:



- **Local Industry Clusters** – These are made up of industries which tend to serve local needs, and which don't have much in the way of national or international exports. They make up 14 out of the 49 clusters, with examples including retail, health, schools and restaurants.
- **Tradable Industry Clusters** – These are made up of industries that tend to export both nationally and internationally. They make up 35 out of the 49 clusters, and include activities such as manufacturing and business and professional services.

Although there are only 14 local industry clusters, they tend to be the largest employers in each region, simply because they often constitute essential parts of day to day life. By contrast, although there are 35 tradable industries, these tend to be sectors that are focused in particular regions, rather than spread across all areas, and generally tend to employ fewer people than the local clusters. Across Britain as a whole, for instance, in 2016 18.82 million people (63.18%) were employed in local clusters, whilst 10.97 million people (36.82%) were employed in tradable clusters.

Another big difference between the clusters is in pay and productivity. Whereas the local clusters tend to be highly labour-intensive and low paid, the tradable clusters tend to have higher pay and productivity. Evidence also shows that their growth brings sustained 'multiplier' effects – that is, they multiply wealth and therefore generate growth throughout a local economy². For all these reasons, and most especially that by their nature they are creating value to sell across the country and to the wider world, so bringing wealth into the area, it is the tradable clusters that tend to be the real drivers of local economic growth.

But although industry clusters with their local/tradable split may seem like an interesting and useful way of looking at an economy, how can we actually use them to answer the questions we began with on page 3?

² See e.g. Moretti (2010) and Faggio and Overman (2014).

How can Emsi’s industry clusters give you insight into your local economy?

Emsi’s data is distinctive for its high level of granularity. This is not just at the sector level, where we have accurate and robust insight down to the 4-digit SIC level, but also in terms of geographical levels too, where we can dig right down to local authority level. What this means is that having defined our industry clusters, we can use them to really lift the lid on what is driving not just the national economy, or even regional economies, but economies at the most local level.

In terms of the metrics we might use to achieve this, we can look at a number of things such as jobs, current job growth and even projections of future job growth. But in terms of being able to articulate and evidence a “proposition” to business, what matters most is being able to determine what it is that makes your location unique. To do this, we use a measurement called Location Quotient (LQ), which is a statistical measure of industry concentration in a particular area when compared to the rest of the country. How we calculate this is as follows:

First, we first measure the number of jobs in an industry within a given area, and then work out the percentage of total jobs it accounts for. We then compare this to the percentage of jobs the sector accounts for across the nation as a whole, assigning the national level a benchmark figure of one, from which the local level figure can be measured against. The resulting figure tells us how much that industry can be considered as a specialisation of the region, with any LQ figure over 1.2 typically meaning that the area being measured has a comparative advantage in that sector.

By way of example, the following table shows the Top 5 tradable industry clusters in a region of the country that is ordinarily known for being home to a lot of businesses in the tech sector. This is borne out by the LQ for the Digital cluster (3.18), but as you can see, the measurement also uncovers a number of other niche sectors including Education and knowledge creation, Downstream chemical, Precision technology, and Passenger transport:

Industry	Location Quotient	Jobs in 2016	Jobs in 2021	Projected growth in region 2016-2021	Projected growth in Britain 2016-2021
Education and knowledge creation	3.53	13491	15568	15.40%	-0.14%
Digital	3.18	18875	19353	2.53%	7.02%
Downstream chemical	2.45	2908	2792	-3.99%	-1.66%
Precision technology	1.84	2913	2751	-5.56%	-2.10%
Passenger transport	1.71	1578	1637	3.74%	-0.22%

In addition to the LQ figure, we have included a number of other metrics relating to the region, as well as projected growth for Britain as a whole from 2016 to 2021. Put together, this can inform us where there might be opportunities for local economic developers to invest. For example, this particular region has a comparative advantage in the Digital cluster, yet growth in the region is projected to be far lower than growth in the nation as a whole. What this indicates is that focusing efforts on attracting more businesses to the region from the Digital sector over the next few years may well be a good use of resources.

In other words, the data can help identify areas of a local economy that are particular strengths, as well as those that present opportunities, and indeed threats. The next section will cover this in more detail.

What can we do with this insight?

Having defined our clusters, divided them into tradable and local, and used the Location Quotient and projected national growth metrics, we are now in a position to identify the sectors which give a region an edge over other areas (strengths), the sectors which they could be focusing on developing (opportunities), and the sectors which could be in danger (threats).

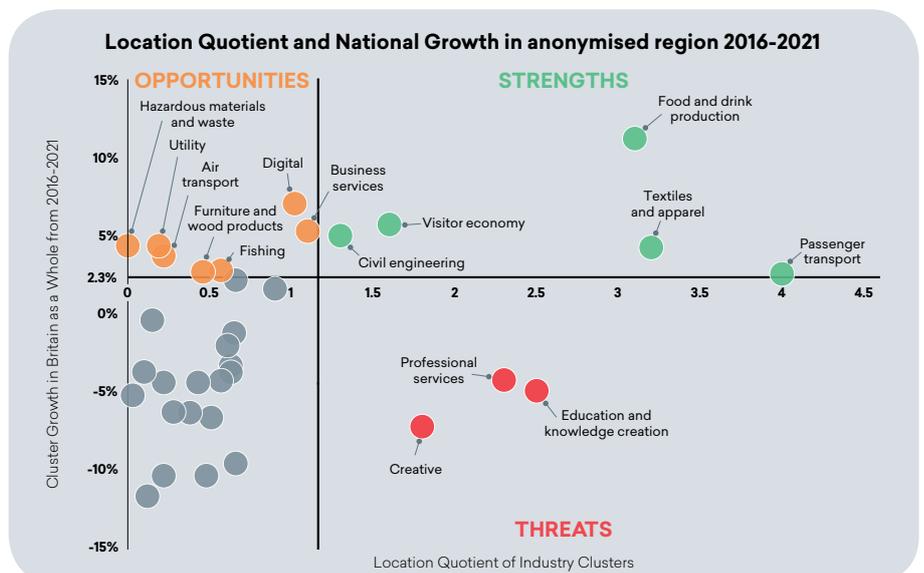
STRENGTHS, OPPORTUNITIES AND THREATS

What do we mean by strengths, opportunities and threats? We would define them as follows:

- **Strengths** – Industries that are growing nationally, and in which your region has a comparative advantage over other areas of the country, meaning that your region is well placed to benefit.
- **Opportunities** – Industries that are growing nationally, but which your region does not yet enjoy a comparative advantage, meaning that you could look to potentially grow them.
- **Threats** – Industries in which your region enjoys a comparative advantage over other areas, but which may be under threat as nationally they look set to decline in the coming years.

Using our data, we can therefore plot out the clusters according to these definitions. In the graph below, we have used data from an anonymised region to show how this can be done. In the upper right quadrant are clusters which have a comparative advantage (i.e. LQ over 1.2) and which are projected to grow significantly nationally (which we have marked as being anything over 2.3% growth). These can rightly be considered the region's strongest sectors. In the lower right quadrant are clusters which the region has a comparative advantage in, but which are projected to decline nationally. These sectors can therefore be considered under threat. And in the upper left quadrant are clusters which are set to grow nationally, but which the region does not currently have a comparative advantage in. These can be considered to present the best opportunities for growth. The lower left quadrant are clusters that are set to decline nationally, but because they have a low LQ, any decline will not constitute a huge threat to the region.

Mapping out strengths, opportunities and threats like this is a helpful way to get a sense of which sectors to prioritise investment of time and resources. Yet, as we demonstrate over the page, we can then dig even deeper into the data to gain much more useful insight into the workings of the local economy.



DIGGING DEEPER

As we have pointed out above, our industry clusters are made up of 4-digit SIC industries. This means that once we have identified a cluster as being of interest, we can delve into it to get far more granular details. In the table below, for example, we have opened up one of the “opportunity clusters” from the bubble chart on page 7 – Business Services – to reveal data on the underlying industries:

Description	Location Quotient	Jobs in 2016	Average Wages	Projected Growth in region 2016-2021	Projected growth in Britain 2016-2021
Translation and interpretation activities	2.22	106	£16,545.44	18%	13%
Activities of business and employers membership organisations	2.12	280	£45,552.71	18%	1%
Organisation of conventions and trade shows	1.19	257	£41,957.98	-5%	4%
Other business support service activities n.e.c.	0.87	2,291	£39,402.12	-1%	4%
Activities of call centres	0.47	497	£45,656.00	1%	7%
Combined office administrative service activities	0.44	110	£37,079.99	0%	15%
Other reservation service and related activities	0.27	18	£46,593.34	Insf. Data	-17%
Activities of professional membership organisations	0.15	43	£42,226.71	2%	4%
Activities of collection agencies and credit bureaus	0.06	10	£48,208.45	40%	9%

What this does is helps us identify further opportunities for developing this particular cluster. Those industries where there is a comparative advantage in the region, and which are projected to grow nationally can be considered the cluster’s strengths (green), whilst those industries which do not yet have a comparative advantage in the region, but which are projected to grow nationally, can be seen as opportunities (orange). Since the opportunity sectors are connected to the strength industries, either by a similar workforce or supply chain connection, this indicates that there may well be room for these to grow.

HOW TO USE THE DATA

What we have shown above has demonstrated how industry clusters can be used to lift the lid on your region’s strengths, opportunities and threats. However, the true value ultimately lies in how you can use it to retain, grow and attract business to your area. Below are just three ways that you could use industry clusters and the type of data shown above to develop a sound strategy for growth:

- **Broaden your industries** – Having identified the clusters and underlying industries that are strongest in your region, you can use the insight to make the case that other, similar businesses would benefit from the skilled workforce and supply chain connections that your region has to offer.
- **Diversify your economy** – After identifying the best opportunities for growth, you can also use data for the rest of the country to identify where these industries are located, which in turn can help you to learn from those areas, and put your region ahead of the curve in terms of anticipating growth.
- **Manage Your Risks** – By identifying the clusters that are most under threat in your region, because they have a comparative advantage over other areas, but are declining nationally, you are in a far better position to plan a contingency strategy to deal with potential business closures.

Appendix A – local cluster definitions

AUTOMOTIVE SERVICES – Retail sale and support of motor vehicles including maintenance and repair, wholesale and retail sale of parts and accessories and the retail sale of automotive fuel.

BUILDING SERVICES – Preparation, completion and finishing of building sites, including the provision of supporting skilled trades (including electricians, plastering, plumbing, heating and air conditioning, painting, flooring, wall covering, glazing and roofing), and the manufacturing and supply of equipment and materials.

COMMERCIAL SERVICES – Various commercial services ranging from cleaning and facilities to event catering, security, photography, accounting, stationery and document preparation.

EDUCATION AND CHILDCARE – School-age education (nursery, primary and secondary), child daycare and training for the workplace.

FOOD AND BEVERAGE – Supply, selling and serving food and beverages, including pubs, restaurants and mobile food services, food and drink wholesale and retail, as well as local food production including bakeries.

GOVERNMENT – Administration of local and central government services.

HEALTH AND CARE – Activities delivering medical, dental and residential care to patients, including general practice and dispensing chemists.

HOUSEHOLD GOODS AND SERVICES – Retail and wholesale of a range of household goods including furniture, carpets, lighting, audio-visual, cosmetics, hardware, appliances and others, as well as services to the household such as gardening and shoe repair.

LOCAL ENVIRONMENTAL SERVICES – A local cluster managing the collection and disposal of non-hazardous waste, including sorting, recycling and other treatment.

LOCAL TRANSPORT – Transport services including urban and suburban bus and rail, taxis, car and van hire, and driving schools.

PERSONAL SERVICES – Including social work, funerals, fitness facilities, hairdressing, travel agencies, postal deliveries, as well as membership organisations, churches and trade unions.

PROPERTY DEVELOPMENT – Purchase, development and sale of real estate, including new developments and removal services.

RETAIL – Retail services including shops for clothing, books and media, computers and accessories, perfumes and cosmetics.

SPORTS AND LEISURE – Including cinemas, sports clubs, sports facilities, the sale of sporting equipment, and casinos and other gambling activities.

Appendix B – tradable cluster definitions

AGRICULTURAL INPUTS AND SERVICES – Production and wholesale of the range of crop and livestock farming, as well as supporting activities including the manufacture and supply of machinery and feeds, and veterinary services.

AIR TRANSPORT – Transporting freight and passengers by air and space, including the renting and leasing of supporting equipment.

APPLIANCES AND PERSONAL GOODS – Manufacturing, wholesale and repair of electrical and electronic goods, including household appliances, computers, telephones, as well as heating and lighting, and a range of personal goods including sporting goods, kitchenware, toys, and watches and jewellery.

BUSINESS SERVICES – Administrative and other business services ranging from translation to debt collection, including conventions and trade shows, call centres, and business and professional membership organisations.

CIVIL ENGINEERING – Technical construction services, including those concerned with major transport and utility infrastructure, including architecture, engineering consultancy, demolition, sewerage and renting and leasing of supporting equipment.

CONSTRUCTION PRODUCTS AND SERVICES – Manufacturing and preparation of construction materials including brick, plaster, concrete, fibres and mortars.

CREATIVE – Covers a range of creative production activities, including those in motion picture, television and radio, but also the development and management of media content, advertising, design, and market research.

DIGITAL – Including telecommunications, software, and computer services, including data processing and hosting, and the development and management of web portals.

DOWNSTREAM CHEMICAL – Production and supply of finished chemical products, including pharmaceuticals, soaps, detergents, household and personal sanitary products, glues and explosives.

DOWNSTREAM METAL – Production and supply of finished metal products, including doors, windows, bearings, gears, packaging, cutlery, tools, locks, hinges, fastenings, coins, and bicycles.

EDUCATION AND KNOWLEDGE CREATION – Further and higher education, especially research and development across the social and natural sciences.

EXTRACTIVES – Mining, quarrying and extraction of ores, aggregates and other natural resources (except oil and gas), including support and operational activities.

FINANCIAL AND LEGAL SERVICES – Financial, insurance, legal and supporting activities.

FISHING – Management of aquaculture, processing, preservation and wholesale of fish, crustaceans and molluscs.

FOOD AND DRINK PRODUCTION – Processing, manufacture and preserving of food, drink and tobacco products, including the operation of dairies and distilleries, the productions of oils and fats, and the wholesale of some products.

FORESTRY – Management and use of forests, including the saw-milling and planing of wood.

FURNITURE AND WOOD PRODUCTS – Manufacture, supply and repair of furniture and wood products, including kitchens, office furniture, parquet floors, and others.

HAZARDOUS MATERIALS AND WASTE – Specialist services for the management, processing and disposal of hazardous waste, including nuclear fuel.

LOGISTICS AND E-COMMERCE – Collection, storage and distribution of goods by road and rail, including direct retail sale online or via mail, including the rental and leasing of trucks.

MARITIME – Construction and use of ships and boats for sport and transport, including freight and passengers.

METALWORKING TECHNOLOGY – Manufacture and supply of tools and machines to form, treat and machine metals.

OIL AND GAS – Exploration and production of oil and natural gas, and the manufacture of refined petroleum products.

PAPER AND PACKAGING – Manufacture of paper and packaging materials, and their use in packaging goods.

PASSENGER TRANSPORT – Provision of passenger transport services by road, rail and inland water, and the repair and maintenance of transport equipment.

PLASTICS AND VULCANISED PRODUCTS – Production of plastics, rubbers, glass, ceramics and related products.

PRECISION TECHNOLOGY – Manufacture, repair and supply of precision equipment including wires, fibre optics, optical equipment, musical instruments, medical instruments, as well as technical testing and analysis.

PRINTING AND PUBLISHING – Creation and production of printed media including newspapers, books, journals, periodicals and directories.

PRODUCTION TECHNOLOGY – Production, supply and maintenance of machinery and equipment for use in production processes, including industrial equipment, material handling equipment, and power generation equipment.

PROFESSIONAL SERVICES – Professional management and supporting services, including corporate head offices, management consultancy, public relations and human resources services.

TEXTILES AND APPAREL – Manufacturing, preparation and supply of textiles, clothes, footwear, luggage, carpets and rugs.

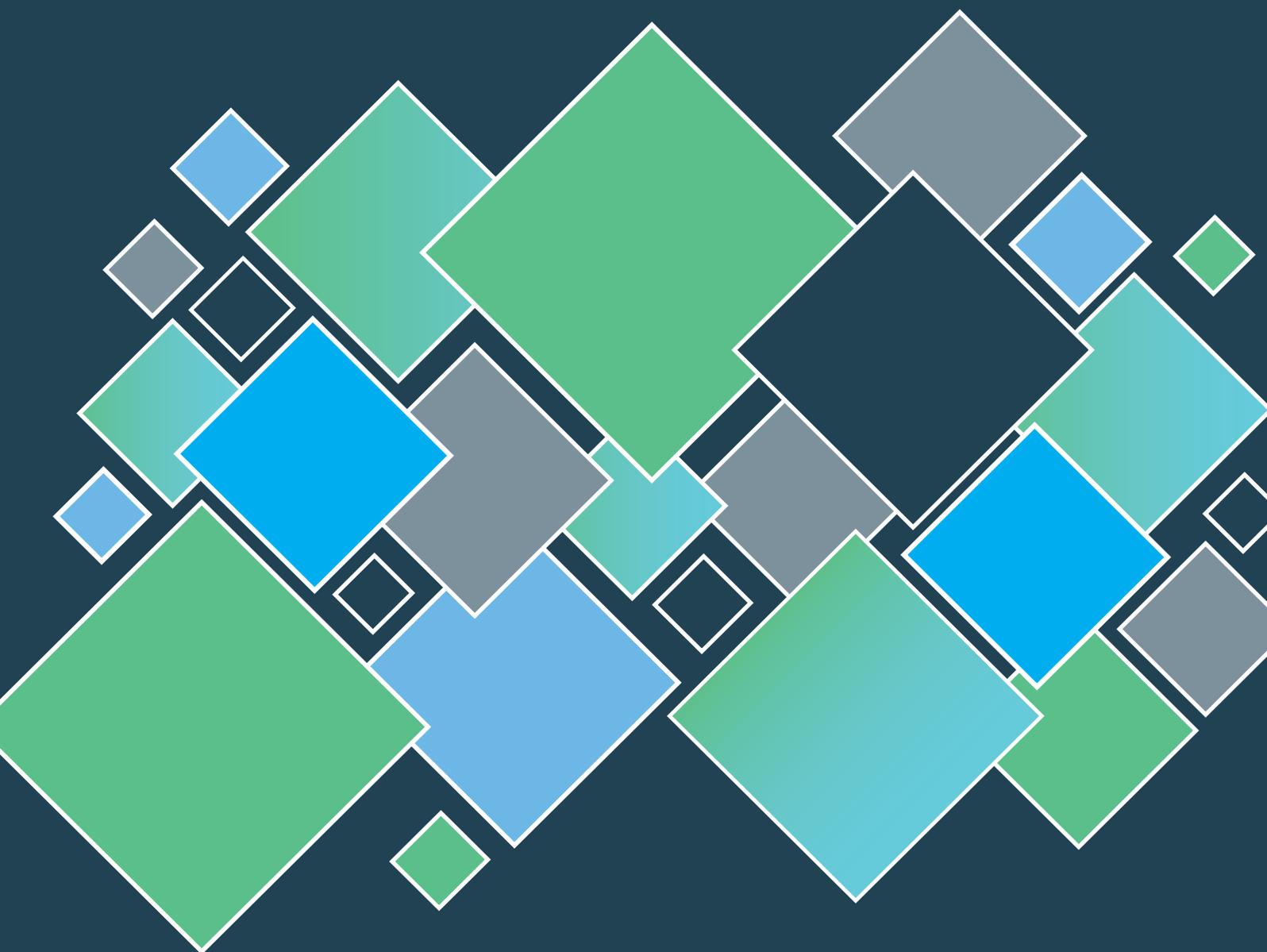
UPSTREAM CHEMICAL – Production and supply of primary chemicals, rubbers and gases.

UPSTREAM METAL – Production, supply and casting of metals in different forms, including precious metals.

UTILITY – Production, distribution and trading of gas, electricity and water, and the construction of electrical utility projects.

VEHICLE AND DEFENCE TECHNOLOGY – Production of motor vehicles, railways, fighting vehicles, aircraft, spacecraft and weapons and ammunition, and supporting parts.

VISITOR ECONOMY – Management of various historic, artistic, cultural, and leisure facilities, including hotels, amusement parks, and performing arts venues.



For more information about how we can help you grow your local economy, contact Will Cookson, BDM for Economic Development:

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You can also find out more about your region's clusters by going to our dedicated Local Sector Strengthfinder website at:

www.economicmodelling.co.uk/local-sector-strengthfinder