Knibb Gormezano & Partners

International Management & Technology Consultants


# Mapping of the East Midlands Automotive Industry & Identifying the Main Innovation Drivers

**Prepared for the Transport iNet**

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# INTRODUCTION

This document is submitted by Knibb, Gormezano & Partners (KGP) in response to the brief issued by David Pickering on Dec 1 2008.

Loughborough University has been selected by *emda* to design, develop and deliver a programme in the East Midlands that will raise the standards and practice of innovation among SMEs. The programme will focus on five sectors: Aerospace, Automotive, Motorsport, Rail and Marine. This proposal covers a research project that will focus on Automotive & Motorsport.

The brief (see next section) requested the creation of a database of companies in the east Midlands that are predominantly involved in the target sectors together with commentary and observation on the factors driving innovation and the likely needs of individual companies. This initial piece of work was entirely desk-based, using KGP knowledge, previously researched information and data from the public domain. Some telephone interviews were involved but no extensive field research was carried out.

The bulk of the effort was committed to building the database of circa 1000 relevant companies in the region, identifying their activities and segmenting into appropriate positions in the supply chain.

The width and depth of relevant expertise possessed by KGP team members in this field (see appendix) has been gained working for SMEs and major automotive companies regionally and worldwide. Key team members have also worked for other English regions in the field of innovation.

## Background to project

The East Midlands Transport Equipment iNet needs to understand the make-up and needs of the automotive industry in the East Midlands. It has received less attention as a potential key industry in the East Midlands, perhaps overshadowed by the West Midlands where the

automotive sector has been the principal industrial driver. Many East Midlands companies are believed to participate in automotive supply chains linked to other UK regions including the West Midlands. However, since 1995 Toyota has made significant investments in the region.

As the neighbouring automotive industry has suffered from a period of relative decline Toyota has continued to invest. Some of the region's automotive strengths are linked to motorsport. Companies such as Ilmor Engineering and Mahle Powertrain apply expertise developed in motorsport to high performance automotive applications. Several vehicle manufacturers have established demonstration and sales facilities at circuits in the region. Automotive engineering expertise in the region's universities includes motorsport as the industry's cutting edge, notably at Loughborough. The university is also home to Cenex, the UK's first Centre of Excellence for low carbon and fuel cell technologies.

The automotive sector is believed to employ an estimated 8,000 people in addition to those in motorsport - approximately 5,000 of whom work at Toyota.

## Objectives

1. Map the various elements of the automotive sector supply chain in the East Midlands, assessing the importance of each element, estimating the number of companies comprising each element, the estimated total turnover and number of employees of each element, how each element is organized (trade body or otherwise) and how the future innovation demands of the industry are presently communicated to the sector.
2. Undertake a desk top research exercise identifying any global, UK or regional research which highlights the main innovation drivers for the automotive industry and which elements of the supply chain would benefit from this knowledge and take advantage of equipping themselves for the future with innovation support.
3. Draw conclusions from this work of the main opportunities and potential new markets for East Midlands companies, and rank the

elements of the supply chain that would gain the most benefit, and the most effective ways of communicating with them.

4. Provide a list of potentially relevant SMEs in the East Midlands within each element of the supply chain which by previous knowledge or more recent information would make them likely prospects for innovation assistance, and enable the Transport Equipment iNet to offer targeted and effective innovation support.

## Scope

The scope as defined in KGP's proposal aimed to cover the vast majority of the automotive sector, including off-road and specialist vehicles and the Motorsport sector. Aftermarket manufacturers were also included.

- On and off-road vehicle manufacturers and their supply chain
- Material suppliers and converters
- Motorsport companies
- Capital equipment and tooling suppliers

## Methodology

KGP has been monitoring the automotive and motorsport sectors in the UK for some years. This has included developing a comprehensive database of automotive and motorsport related manufacturers and service companies in the region.

The first and most time consuming step in the research on this occasion was to re-visit, completely update and re-structure a database created in 2004 for a previous study conducted for emda and AWM. The purpose of that work was related to identifying potential inward investment partners.

1. In parallel, the team considered the generic requirements of the various sub-sectors in relation to innovation and especially those aspects of innovation that are being driven by external forces such as climate change, safety and legislation;
2. Alongside steps 1&2, the team also reviewed published research and analysis on the innovation drivers in the target sectors.

3. Categorizing firms into groups related to innovation requirements was then undertaken.
4. The results of 1 thru 4 were consolidated into a report in Microsoft PowerPoint format supported by an Excel file containing the detail of firms in the region
5. This report incorporates the content of the presentation and some detail from the database. The full database is included on an accompanying CD.
6. The presentation will be repeated for iNets Strategic Advisory Panel (SAP) at which we can debate:
    - relevant case studies;
    - observations on the actions of other regional development agencies in the field based on our team members' experience;
    - relevant follow-up research that might be required to support the programme.

# THE INNOVATION PROCESS

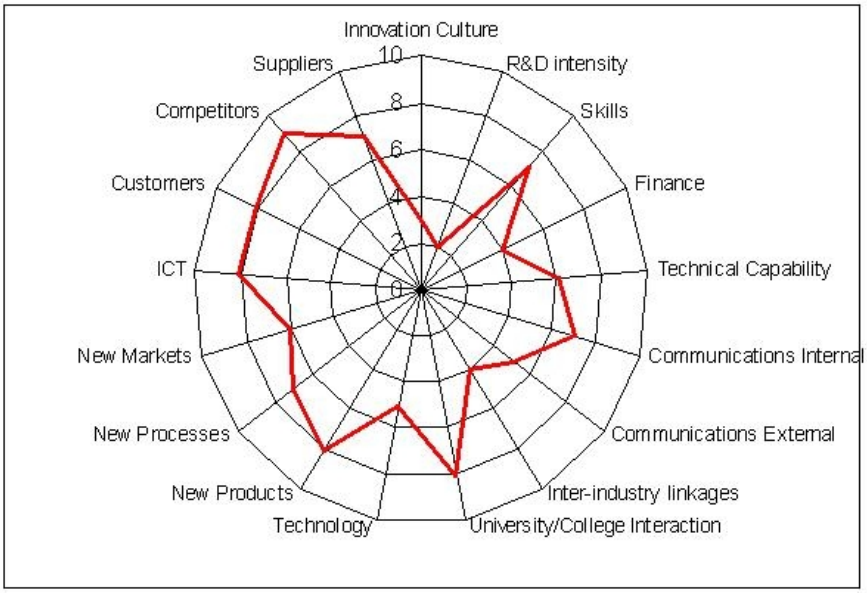
At the outset of the project KGP assessed previous projects and its consultant's experience to define 'What is innovation' in respect of the *emda* region companies we were mapping. The team defined three areas where companies can innovate, each with its own elements that may be applied across the various automotive industry segments, These are illustrated in Figure 1 below.

**Figure 1. The Innovation Process – areas for innovation**

| Process Innovation | Product Innovation | Strategic Innovation |
|---|---|---|
| Manufacturing process | Specification/Features | Market Development |
| Supply chain | Design | Management |
| R&D | Materials | Knowledge Management |
| Service Delivery | | |

The following figure illustrates a tool that could be used to evaluate a company's innovation status and potential as part of the iNets programme. It is one developed and used by KGP team members in the past and can be adapted to suit individual segments or circumstances.

**Figure 2. Innovation Measurement Tool**



# MAPPING THE SECTOR

KGP has allocated the region's automotive companies into a number of segments. These are loosely aligned with industry practice and examples are given in Figure 3. To simplify the analysis we have only allocated each company to one group although clearly some companies, particularly the larger ones may be spread across more than one. In these cases we allocated to the segment we considered most important to the company and/or regional activities of the company.

**Figure 3. Automotive Industry Segments**

| Segment | Examples |
|---|---|
| Vehicle Manufacturers | Toyota |
| Tier One | JCB Power Systems, Eminox, Futaba |
| Tier Two | Otter Controls, Guilford Europe |
| Tier Three | Autofil Yarns |
| Material Suppliers | HJ Enthoven |
| Niche Vehicle Mfrs | Caterpillar |
| Capital Equipment suppliers | Hardinge, Forst |
| Engineering Services | Romax, Zytek |
| Technology Start-ups | Flybrid Systems, Amberjac |
| **Trailers and other mobile equipment** | SDC Trailers, Freuhauf, Caterpillar |
| **Motorsport** | Cosworth |
| **Service Companies** | Toyota Tsusho |

* Based on KGP's definition for this project. Excludes Sales and Distribution, Aftermarket sales, Academia

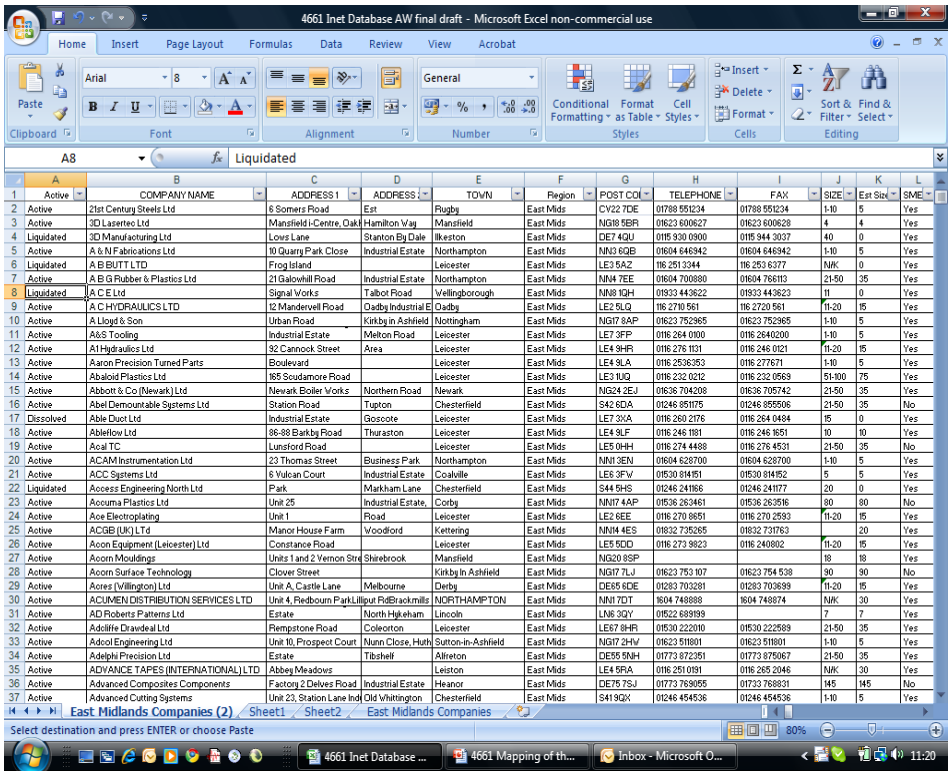
## Database Summary

KGP's database of companies in the automotive industry in the sector was revisited and completely refreshed for this exercise. This identified companies that had fallen into bankruptcy since our last review but more importantly allowed us to categorise companies as SMEs or not. SMEs are the target of the iNet programme and it was important to evaluate their role in the *emda* region automotive industry. The sector as a whole consists of over 900 companies according to our analysis, which is provided in a spreadsheet containing the analysis, contact details, brief notes and segmentation of each company. An extract is shown in Figure 4.

The database includes:

- Over 900 East Midlands companies
- Estimates of total turnover, employees, and automotive share calculated
- Contact address, telephone and website added
- Categorised by primary sector, whether or not it is an SME

**Figure 4. Example of the Sector Database**



The sector is also summarised in the following three figures. The first, Figure 5, shows the relevant segments. As on goes down the segments, from the vehicle manufacturers into the tier three and service categories the role of the companies, and their ability to innovate changes. This is discussed later in this report. Figure 6 quantifies the number of companies in the segments, split out SME and non-SME. In this case we used the standard EU definition for an SME, as applied by *emda*, as companies with 250 or less employees.

**Figure 5. The Automotive Sector Structure in the *emda* region**

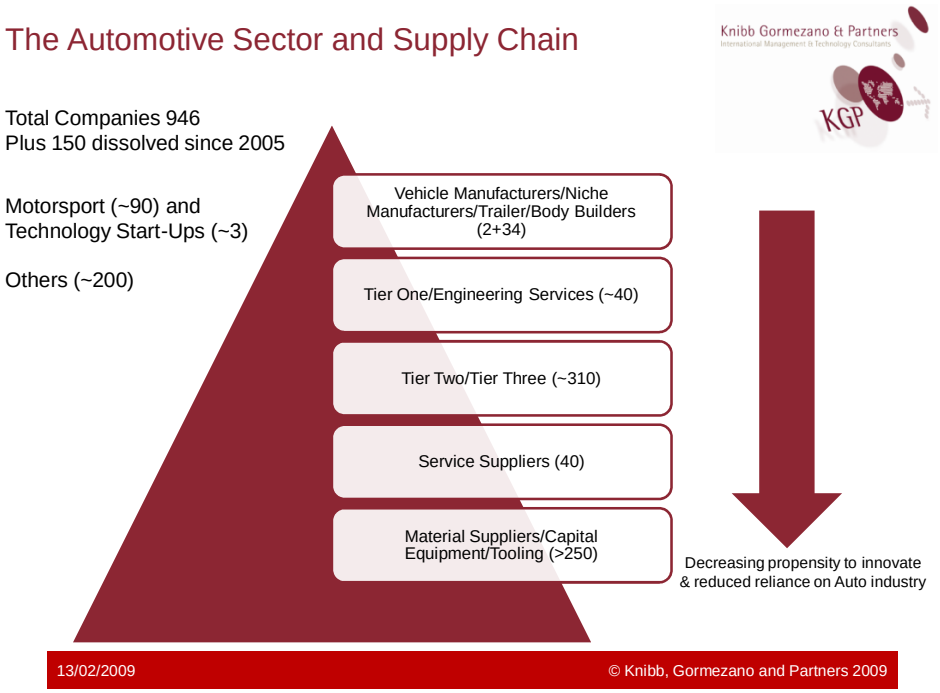


**Figure 6. The Automotive Sector Stucture in the *emda* Region (Detailed)**

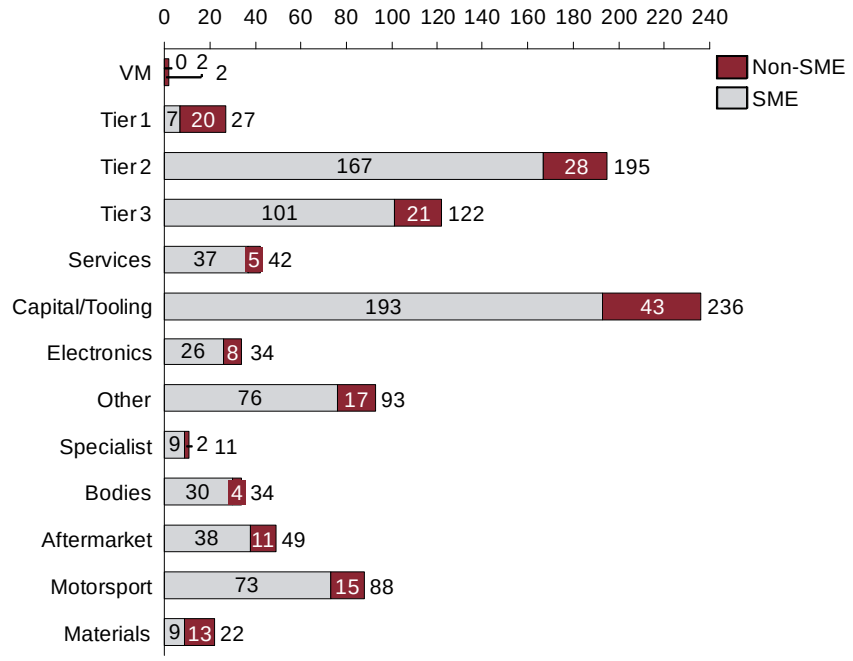



**Figure 7. Summary of Employement in the *emda* Automotive Sector**

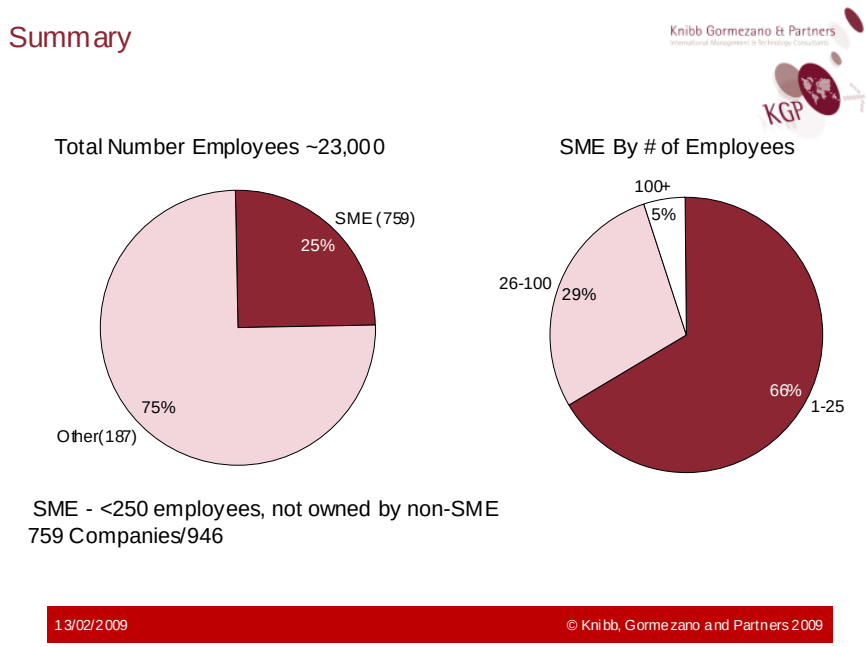



Figure 7 quantifies the automotive sector in the *emda* region, splitting out the SME companies. Our calculations suggest that 25% of the employment in the regions is in SMEs, accounting for over £440m turnover. 759 companies were assessed as being in the SME segment, around 6,000 out of 23,000 employees. The turnover of the sector as a whole was estimated at around £4.5Bn largely due to the presence of

Toyota which accounted for around £3Bn. We believe these estimates are representative of the sector but statistics are unreliable. An alternative to assess Gross Value Added (GVA) was considered but our review of the statistics available showed these to be less accurate than our estimates for turnover.

# MAJOR INDUSTRY DRIVERS

The second major objective of this project was to provide an insight into the key drivers facing the industry. These drivers are the drivers for innovation that need to be addressed by the automotive sector.

We did not find exceptional published research on the subject but the main drivers, based on KGP's experience, are:

- Environment – Emissions, re-cycling, GHG ($CO_2$)
- Energy security
- Safety
- Competitiveness

The response of the industry to each of these drivers is given in the following paragraphs.

## Environment

- Legislative targets driving reduction in noxious emissions, $CO_2$ (greenhouse gases) and recycling (ELV)
    - Focus on advanced powertrain technologies, including varying degrees of hybridisation and some electric vehicles
    - Optimisation of vehicle – including electrical system, aerodynamics and rolling resistance
    - Vehicle construction and material development to reduce weight, cost, increase recycling and recovery rate
    - Alternative fuels, including bio-fuels, being slowly introduced
    - Ban on specific materials, processes, reduced CO2 from manufacturing phase of vehicle life

## Energy Security

- Reduced reliance on fossil fuels

  - Focus on advanced powertrain technologies, including varying degrees of hybridisation and some electric vehicles
  - Alternative fuels, including bio-fuels, being slowly introduced

## Safety

- Reduced road fatalities and serious injuries
  - Increased active safety adoption, long term integration with road infrastructure likely
  - Conflicting targets with weight reduction ($CO_2$)

## Competitiveness

- Financial competitiveness of vehicle manufacturers and the supply chain
  - Innovation need to reach conflicting targets of environmental and safety legislation
  - Cost down pressure due to increasing material costs, increasing feature content and legislative targets
  - Platformisation and modularisation of vehicles
  - Restructuring and consolidation of the supply chain

The following table, Figure 8, provides an analysis of the principal product groups of the industry, the drivers and trends.

**Figure 8 Vehicle Technology Drivers for Change and Developments by Component Group**

| Application Area | Driver(s) for change | Technology/ Trend |
|---|---|---|
| • Vehicle Security | * Reduced auto-theft<br>* Increased security | * Improved locking systems<br>* Keyless access<br>* Driver recognition<br>* Unbreakable glass |
| • Braking | * Improved safety<br>* Ease of driving<br>* Reduced components | * Brake by wire<br>* EHB, EMB |
| • Vehicle Electrical Systems | * Increased power requirements | * 42?Volt systems<br>* Liquid cooled alternators |
| • Fuel & Engine Management Systems | * Fuel economy<br>* Reduced emissions<br>* Increased use of diesel | * GDI, Common rail injection<br>* Engine management<br>* Variable valve timing, Cooled EGR |
| • Engine | * Fuel economy<br>* Performance<br>* Cost<br>* Emissions | * Material changes<br>* Variable Valve Timing<br>* HCCI/CAI combustion<br>* Modularity |

| **Application Area** | **Driver(s) for change** | **Technology/ Trend** |
|---|---|---|
| • Alternative Power | * Reduced emissions | * Electric/hybrid vehicles<br>* Fuel cells |
| • Exhaust systems | * Reduced emissions<br>* Improved NVH | * Particulate Traps<br>* De-Nox catalyst<br>* On board diagnostics/sensors<br>* Active silencers |
| • Climate Control | * Improved passenger comfort<br>* Increased usage | * Adaptive environmental control<br>* Auxiliary heating<br>* Cabin filtration |
| • Materials | * Reduced weight<br>* Ease of manufacture/forming<br>* Recycling | * Magnesium, Aluminium, Plastics, Ceramics,<br>* Powdered Metals |
| • Safety systems | * Increased safety<br>* Increased air bag adoption | * Side impact, knee bags, Belt bags, Inflatable curtains/ carpets<br>* Adaptive activation<br>* Pre-tensioning |

| **Application Area** | **Driver(s) for change** | **Technology/ Trend** |
|---|---|---|
| • Transmission | * Increased demand<br>* Ease of use<br>* Outsourcing by VMs | * Automatic, automated manual transmissions |
| • Chassis/ Suspension | * Improved vehicle dynamics<br>* Improved stopping distance<br>* Safety | * Electronic stability systems<br>* Traction Control<br>* Active Damping |
| • Telematics | * Enhanced communications<br>* Driver information<br>* Safety | * Collision warning & avoidance<br>* Adaptive cruise control<br>* Internet access Navigation systems |
| • Seating | * Modularisation | * Belts to seat<br>* Integrated electronics<br>* Cooling/ heating |

# SEGMENT CHARACTERISTICS & INNOVATION PROPENSITY

For each of the segments identified in the region our research considered the key characteristics, how they are organised and opportunities for innovation. These are summarised below.

### VMs

- Driven by global or regional HQ, limited opportunity to innovate locally
- 100% focussed on automotive sector
- Likely to be member of automotive industry association – e.g. SMMT, ACEA, JAMA
- Local VM's supply chain could be targets
- Often cited as innovation exemplars

### Tier Ones

- Respond to customer requirements and industry drivers
- A key source of product innovation globally
- Typically deliver higher technology, systems or modules
- Local operations more likely to be part of a larger, global company
- Some local innovation
- Opportunity to drive process innovation at a local level
- Membership of industry and component association, potentially other networks
- Local Tier One supply chain could be targets

### Tier Two

- Significant opportunity for process and strategic innovation
- Largest number of companies and employment
- Some companies operate across various industries
- May be smaller, locally owned, more likely to be SME

- Less likely to be member of automotive trade association, more likely industrial trade association
- Produce sub-assemblies or semi-finished parts including stampings, castings, mouldings
- Management often too busy to innovate
- Opportunity to learn from VMs and Tier One suppliers in other regions and/or sectors, could innovate in process, product and strategy

### Tier Three

- Small service companies
  - Heat treatment, coating, machining etc.
- Less likely to be member of major support networks
- Privately owned, largest share of
- Management often too busy to innovate
- Opportunity to learn from other regions and/or sectors
- Limited innovation, opportunity to innovate process and strategy
- Training needed in basic skills

### Niche Vehicle Manufacturer

- Number of small specialist companies of cars, specialist on and off-road vehicles
- Mix of tradition and innovation
- Likely to be an SME
- Active in a range of vehicles from cars, specialist vehicles
- Often innovative in terms of product and process, less so in strategy

### Motorsport

- Hi-tech small, motorsport focussed companies
- Cultural differences from mainstream automotive important consideration
- Opportunity to educate mainstream automotive companies
- May be member of specific associations – like MIA, other support organisations, like Motorsport Academy
- Often innovate in terms of product and process, could innovate more strategically

### Material Suppliers

- Limited presence in East Midlands

- Innovation concentrated in central laboratories
- Members of material trade associations
- Innovators in process and product, less so in strategy
- Could drive innovation in tier two and three
- Mostly non-SME, some SMEs in recycling and materials distribution

### Capital Equipment Suppliers

- Wide range of suppliers in capital equipment sector supply tools, machinery, fixtures and fittings, process equipment
- Active in wide range of industries
- Members of industrial trade associations
- Some innovation in product, less so in process and strategy
- Size ranges from large companies to SME

### Trailer/Body Builders

- Significant number of SME specialist trailer and body builders, some large companies
- Automotive focussed
- Limited innovation, but potential for process, product and strategic innovation
- Opportunity to learn from other industries

### Service Companies

- Logistics and trading companies, may be specialising in the automotive industry
- Many large companies
- Innovation driven by customer requirements

### Technology Start-ups

- Hi-tech companies, often funded by private equity or venture capital
- Often focussed on process or product innovation, not both
- Assistance required in strategic innovation and bring product to market
- Most receptive to innovation and seeking support
- Need clear strategy to succeed

## East Midlands Exemplars

During the course of our research, KGP identified a number of companies that were leaders in their particular technologies and may be good exemplars for the innovation programme. We appended a number of companies to this list, and provide a short overview of their activities as we felt they may provide some insights into the innovation process, and may provide guidance to other companies in the region.

- Amberjac – Electric vehicle drivetrains
- Cosworth – Motorsport Engines
- Eminox – CV exhaust and emissions control
- Fibretech – developed new process for metal fibres in automotive applications
- Groeneveld – developing company in commercial vehicle safety
- HJ Enthoven – battery Recycling
- HR Adcock – Rolled components
- Intelligent Energy - Fuel cell systems
- Lubrizol – Lubricant additives
- Meridian – Automotive magnesium castings
- Otter Controls – Automotive Controls
- Pektron – Automotive electronics systems
- Romax Technology – Transmission Engineering
- Tsubakimoto – engine and drivetrain chains
- Zytek – Engines, powertrain electronics, alternative power systems

## Exemplars - Summary Case Studies

- Amberjac – start-up – 2+ years experience of vehicle hybrid conversions. Shorter lead times compared to VM projects. Early prototype of Prius Plug-In

- Cosworth – long time leader in motorsport engines ranging from F1 down, Now independent, a local SME. Split from Cosworth Technology (now Mahle Powertrain)
- Otter Controls - Leader in bimetallic controls, supplying automotive companies worldwide. Global locations, works for most VMs and a number of tier ones worldwide, based in Buxton
- Fibretech – metallic fibre/materials company – expanding into automotive with innovative specialist fibres
- HJ Enthovens - Europe's largest lead recycler, mainly from car batteries
- Eminox - Leader in aftermarket/retrofit/specialist after-treatment solutions, for heavy vehicles. Part owned by Johnson Matthey located in Gainsborough
- Groeneveld – specialist European company focussed on new/innovative products for commercial vehicle/transportation based in Shepshed
- HR Adcock – developed new process to reduce cost for seat adjusters, supplying to major tier ones
- Intelligent Energy - Fuel cell systems, spun off Loughborough University
- Lubrizol – Lubricant additives – European R&D headquarters of global lubricant additive company, production operations now closed
- Meridian – Automotive magnesium castings – global leader in large magnesium castings, based in Nottingham
- Pektron – Automotive electronics systems – based in Derby, supplying VMs and tier ones worldwide
- Romax Technology – Transmission Engineering based near Nottingham. Supplying transmission engineering to global transmission manufacturers
- Tsubakimoto – engine and drivetrain chains – European operations for leading global Japanese company, based in Nottinghamshire
- Zytek – Engines, powertrain electronics, alternative power systems, part owned by Continental

## Networks (not exhaustive) that have greater or lesser relevance to the innovation process

As part of the project we also identified organisations, that provide innovation support to companies at a regional or national levels. These include automotive and non-automotive related bodies

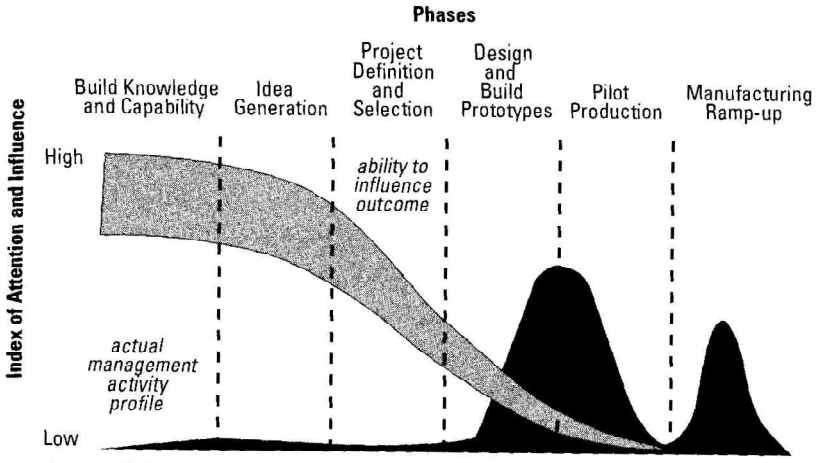
- iNets
- NTI – New Technology Initiative www.eastmidlandsnti.co.uk
- $CO_2$ and Fuel Cell KTN
- Materials KTN
- Electronics KTN
- Hydrogen and Fuel Cell KTN
- SMMT Industry Forum
- Cenex
- LowCVP
- MIA
- SMMT
- Foresight Vehicle
- Motorsport Academy Network
- Growth Investment Network East Midlands
- Connect Midlands
- Others – GTMA - Gauge & Tool Makers Association, BPF British Plastics Federation

# CONCLUSIONS

It is our view that prime focus for support should be on the Tier Two, Tier Three and Motorsport segments. All are generally SMEs and 340+ firms fall into this category.

All three segments rank equally highly, for different reasons.

Tier Two and Three suppliers are important in the industry but often respond only to their current customer requirements and are less likely to be driven to innovate or to take part in current industry development initiatives without more support. Executives need support and incentives to devote time to the subject rather than being 'too busy' to consider to consider things outside of day to day operations. The diagram below depicts the oft-confronted pattern of attention given by executives to the innovation process throughout its progress. Influence on outcomes is




*Source:* S.C. Wheelwright and K.B. Clark, *Revolutionizing Product Development* (New York: The Free Press, 1992), 33. Reproduced with permission.

greatest towards the left but most actual attention is given towards the right.

Motorsport companies have a different challenge, in that they are often too motorsport focussed and do not perceive the benefit from addressing market requirements in the mainstream automotive sector or other

industrial sectors, despite the fact they often have an excellent background in advanced technology and performance engineering.

It is this performance engineering (synonymous with High Value Manufacturing) that can be fostered in the three segments. It does not apply to all companies in the target segments; others can be assisted through innovation support but this may need to be a longer term plan to help them bring in new technologies from outside the UK or emda's region.

The tier two/three and motorsport segments would all benefit from:

1) Education on the industry drivers, potentially through initial workshops and on-going information gathering and support
2) Diagnostic audits to assess status and potential to innovate
3) Management education and training to develop the company culture and foster innovation in their companies. This could include exemplar visit programmes.
4) Business coaching in the innovation process

It is not to be assumed that the other segments of the supply chain should be ignored, simply that the value of outputs to cost and effort required are likely to be less.

*"What all the successful entrepreneurs I have met have in common is not a certain kind of personality but a commitment to the systematic practice of innovation"*

*Peter F Drucker*
*The Discipline of Innovation*

*"I think that anybody that says it's impossible to come up with new ideas now ought to go off and do something else".*[1]

*Patrick Head*
*Technical Director*
*Williams F1*

[1] Taken From Performance at the Limit. Business Lessons from Formula 1 Motor Racing (Mark Jenkins, Ken Pasternak and Richard West)

# APPENDIX – KGP TEAM

## Brian Knibb

Brian Knibb is a mechanical engineer by training but gained most of his industrial experience in the manufacturing engineering field. This included fifteen years with Perkins Engines where he worked in manufacturing development, product and business planning.

He spent seven years with international management consultants A T Kearney before setting up his own practice in 1985. He was also Vice President of Berkt Management, a US/Swiss consultancy. His consultancy experience has included participation in and leading assignments concerned with diverse technologies for both developed and developing economies With Joe Gormezano he was a founding partner of KGP.

During his time as a consultant Brian Knibb has managed numerous assignments, of which many have been international, deploying locally based and multi-disciplinary teams. Recent assignments have included work in Western Europe, North America, India, Indonesia, China and Eastern Europe.

## Alex Woodrow

Alex joined KGP in 1994, shortly after completing a four-year degree in Manufacturing Engineering and Economics at Birmingham University.

Since joining KGP as a Research Consultant, he has completed a wide range of projects covering both technical and commercial issues. This experience, which has been gained working for clients worldwide, lead to his appointment as a Director of KGP, and Head of Research.

He is a member of the Institute of Engineering and Technology (formerly the Institute Of Electrical Engineers), the Society of Automotive Analysts, Engineering Society of Detroit, and IMC.

Alex has overseen KGP development into the 21st century, enabling both web-based interaction and a truly global virtual office through which KGP's international team can and do undertake projects throughout the world using both local resource and KGP's central research expertise.

## Walter McKinlay

Walter is a Physics graduate and a visiting professor in the Design Manufacturing and Engineering Management Department at the University of Strathclyde. He has over twenty five years senior management and consultancy experience. He was a senior manager in the product development group for a major UK truck and bus manufacturer and was responsible for a portfolio of Advanced Technology projects As a senior executive manager he advised the Land Rover Leyland technology strategy panel on the impact and benefit of advanced technology in product development and manufacturing.

He then moved into management consultancy and led the development of a major manufacturing improvement programme called World Class Manufacturing which was sponsored by the UK government, before returning to the National Engineering Laboratory an ex DTI Engineering Laboratory, now owned by the German company TUV where he directed NEL's Renewable Energy activities and Structures and Mechanical Systems Test and Consultancy Services.

As a senior consultant Walter has undertaken many projects in the automotive, aerospace and advanced technology sectors including a number of industry and sector due diligence studies and projects to develop sectoral growth and sustainability strategies. The innovation process has played a major part in many of these studies and features as one of the modules in his teaching at the university.

## Andrew Woodward

An experienced MBA qualified Business Development professional, Andrew has spent over 20 years in industrial R&D, Product Development, Marketing and Business Development.

Originally a scientist and engineer, he has held board level and senior management positions in subsidiaries of a number of major plcs including T&N plc, a major Tier One supplier of powertrain

components, where as Director of Product Technology he managed a £5 million R&D project portfolio across European and US operating sites of a £400M turnover Division. He worked as Group Innovation Manager at Caradon plc where he implemented a new product development process across £200 million turnover Business Division.

He has also worked at Freidland Ltd where as Product Development and Quality Director he Developed and launched a major new product range, reducing development time by more than 40%, subsequently reducing material spend by 15%, through value engineering, quality improvements and development of more competitive Far Eastern manufacturing sources. More recently he has worked for L G .Philips Displays where he devised and implemented a market strategy to deliver turnover growth in new technology sectors.

Over the last 4 years he has helped predominantly SMEs through:

- Implementation of market focussed strategies to deliver turnover growth.
- Management of all aspects of the Innovation process
- Management of specific projects to deliver new products, processes and services

For the past 18 months Andrew has been involved as a consultant in the delivery of the North West regional Development Agency's 'Knowledge to Innovation' (K2i) programme. He has also written extensively on the subject of innovation.

## Jane Woodward

A languages graduate, Jane has been with KGP for nineteen years. Her original role was as a researcher whereas now she has also progressed into client and professional network liaison. Jane is responsible for the Knibb Gormezano database and produces AutoBriefing whilst providing administrative support to all the directors and consultants. As a researcher and analyst, for this particular project Jane was responsible for constructing the database and following up companies to generate additional information.

## Overall Team experience

KGP can cite the following relevant experience from our proposed team for this assignment. The experience in delivering professional support to public sector organisations include:

- Sectoral competitiveness analysis for engineering sectors (DTI)
- Cluster mapping studies for automotive, food and drink, chemicals, plastics (Various RDAs)
- Interim Executive management (NWDA Automotive Cluster Body)
- Strategic Reviews of industry sectors Food & drink, Construction Equipment (earthmoving, off road machinery etc), (North West Food Alliance, Construction Equipment Association)
- Review of Innovation Practices in Middle market manufacturing Companies (Manufacturing Foundation /Advantage West Midlands)
- Due diligence assessments (DTI, Highlands and Islands Enterprise)
- Interim project management (Waste Recycling Action Programme)
- Strategic support to Science and Industry Council secretariat (One North East)
- Review of regional provision of finance and access to finance (One NorthEast)
- Strategic review of opportunities for hub and spoke contact centres in a rural community (Highlands and Islands Enterprise)
- Project monitoring strategic technology programme (Technology Strategy Board)
- EU Framework evaluations and project monitoring in the Computer Integrated manufacture and Project Monitoring (EU)
- National Roadmap for the Titanium industry (NZ)
- Industrial Strategy for High Temperature Superconductivity (NZ)
- Commercialisation support for MUSIC engine technology (ex members of Coventry University)
- Commercialisation support for Pivotal Hydrogen engine (NZ client)
- Competitive evaluation of commercial vehicle R&D operations in Germany and Sweden together with recommendations on future systems and management (Korean client)

- Strategic review of the Romanian automotive industry post communist rule and advice on future privatisation. (Romanian Govt. / Euro Commission).
- Business turnaround at the Ikarus bus company in Hungary (Hungarian Govt. / Euro Commission)
- High Growth coaching programme essentially supports SMEs seeking to grow the businesses.