

Research Connections

Polymer Workshop

22nd April 2009

Athlone

1. Introduction

During the current economic downturn greater linkages with academia throughout the island can play a major role in helping businesses to survive and build for the future.

This meeting of academics and industrial representatives from the Polymer and Plastics sector on the island was arranged as part of the InterTradelreland Research Connections initiative. This initiative aims to bring together research groups in relevant areas to develop North/South relationships and partnerships. Such partnerships are expected to support the development of the all-island research base to underpin future economic development.

The event was held at 2pm in the Hodson Bay Hotel, Athlone on Wednesday the 22nd April 2009 and was scheduled to precede the Institute of Materials conference being held there on the following day.

There was academic representation from seven institutions, including Athlone Institute of Technology, Queen's University Belfast, Sligo Institute of Technology, Trinity College Dublin, University College Dublin, University of Limerick and Waterford Institute of Technology. Apologies were received from the University of Ulster.

Five companies were directly represented – Valois Ireland Ltd, GNG Engineering, Trend Technologies, Clarehill Plastics and Athlone Extrusions. The wider sector across the island was represented through the Northern Ireland Polymer Association and Plastics Ireland speakers.

For a full list of workshop participants, see Appendix 1.

2. Workshop Format

The meeting opened with an overview of the InterTradelreland Research Connections initiative. This was followed by presentations outlining the polymer and plastics industry North and South, with a focus on the need to remain competitive. Each of the academic institutions then provided a presentation on their research interests and facilities.

The slides accompanying these presentations are available on the All-Island Polymer and Plastics Network website (www.polymernetwork.com). This website also contains many useful papers including the InterTradelreland publication *A Competitiveness Analysis of the Polymer and Plastics Industry on the Island of Ireland* which was referenced by both industry speakers.

The final session was a roundtable discussion to determine what initial steps should be taken to improve collaboration with academia and increase innovation in industry.

3. Polymer and Plastics Industry Overview

3.1 Presentation by Brian McCann representing Northern Ireland Polymers Association (NIPA)

The Polymer and Plastics sector in Northern Ireland is a £625m industry, comprising 78 companies and employing 6,000 personnel which represents 5% of manufacturing employment. The polymer industry is largely 'invisible' as most industries are specified by their application or product and not their raw material.

Queen's University Belfast and the University of Ulster play an important role in empowering innovation in the sector. The South Eastern Regional College also plays a key role in providing a Level 3 NVQ in polymers for staff training. Technology linkages are a main feature of successful companies within NIPA.

The innovation and research needs of the sector had been identified in a market scoping exercise conducted as part of a competence centre proposal to be submitted to Invest NI. These include:

- Raw materials, substitution and recycling
- Upskilling staff on product / process / technology development
- Energy sustainability and cost reduction
- Material technologies e.g. plastics reinforced with other materials, two-shot moulding
- Process technologies e.g. reinforced polyurethanes, PET, advanced composites

3.2 Presentation by Kenny O'Brien representing Plastics Ireland

The Polymer and Plastics sector in Ireland is a €1.5bn industry, comprising 280 companies and employing 9,600 personnel (1997). There is a predominance of small plastics companies throughout Ireland and the medical sector plastics companies have been relatively insulated from the economic downturn so far.

Companies are typically strong in the areas of efficiency, quality, productivity, cost control, human resources, management, safety, customers, suppliers, environmental etc. It was suggested that the industry 5 year target should be at least 50% growth with a substantial proportion of this made up from new products.

Company wish list includes innovation, product development, R&D and marketing.

- Working with 3rd level institutions, customers and suppliers is a source of new product development
- Upcoming legislative changes may also drive the development of new plastics products
- Benefits to both industry (e.g. access to specialised equipment and expertise) and academia (e.g. development of practical skills based education) from collaboration
- Sector needs ideas generation but often too busy firefighting. It was suggested that it would be useful for a group of companies to come together and recruit someone to generate ideas (possible role for Centre for Design Innovation in Sligo IT).
- Industry wants academia to proactively sell their services to industry – it would be useful to establish a central database of academic contacts, resources and solutions.

4. Polymer & Plastics Academic Overview

The 7 institutions present outlined their research interests and polymer/plastics processing capabilities. They jointly provide a huge diversity of equipment and capability, and also cover several very interesting niche areas, for example:

- AIT polymer research activities include applied biomedical research, material and property modification, contract testing and rapid prototyping
- UCD has a focus on research in machining processes, micro injection moulding, composites and surface engineering. UCD also has the first micro injection moulding machine of its kind on the island which will be made available to interested companies.
- QUB specialise in polymer processing (advanced extrusion, rotational moulding and thermoforming technologies), modelling and the development of polymeric materials including use in medical applications.
- TCD has a focus on energy efficiency and also offer eco-friendly nano composites and polymer foams.
- WIT has Raman spectroscopy for determining material properties and are currently investigating microwave processing to replace autoclaves for composite processing. They also have a new X-ray micro-tomography machine.
- UL has a broad range of polymer processing facilities and a composites research centre which is currently being expanded.
- Sligo IT reported that they are preparing a new course in Polymers to upskill personnel. They also have a Centre for Design Innovation which provides practical advice and tools on how to implement and manage innovation in the firm. The centre will also place personnel into a company to embed new design skills, with a view to overcoming barriers to innovation such as lack of time or skill.
- The Nanotechnology & Advanced Materials Research Institute at UU (NAMRI) brings together a multi-disciplinary group of staff to undertake various forms of advanced materials research, including composites, materials characterisation, sensors, biomaterials, plasma processing, metal forming, nanoscience and nanofabrication.

The academics recognised that the needs of companies are very diverse and thus it was important to group like minded, focused companies with common needs together if effective academic/industry collaboration was to be achieved. It was also important not to ignore the potential of academia to assist the sector through upskilling and lifelong learning at various levels in the workforce.

5. Discussion on Initial Opportunities to Improve Collaboration between Academics and Industry in an All-Island Context

Following the industry and academic overviews the group discussed how to maximise the opportunity for academic and academic/industrial collaboration across the island. The following points arose:

- It was strongly agreed that companies need innovative products and services and must increase the added value (knowledge content) of their products and services if they are to compete with the low cost economies who are increasingly taking over the commodity end of polymer manufacturing.
- Companies recognise the benefits of collaboration with academia and are broadly aware that there is a comprehensive research capability in most aspects of polymer/plastics design and processing across the island of Ireland. However companies lacks specific detail on the academic expertise and skills available across the island and how this might positively impact on their business
- 3 key elements of collaboration were identified:
 - Knowledge: of research and processing capability, suitability etc
 - Funding: identifying relevant sources and how to access these quickly
 - Partners: identifying relevant partners in industry and academia

The group then identified the following key barriers inhibiting collaboration, and thus innovation, in the sector:

1. Insufficient knowledge of what research is taking place in academic institutions across the island, i.e. what new knowledge is available, what new technologies/systems are available, what consulting and technical services are available, what assistance can be offered to support innovation activity
2. Research activity is not perceived by industry as easily accessible. Possible solutions proposed include development of a sector-specific brochure/CD, greater industry-academic networking and site visits.
3. Insufficient knowledge of what industry needs – academia cannot position its offerings without a comprehensive knowledge of the innovation and research challenges facing companies
4. Not all companies have innovation capability – some are involved in rudimentary research activity, while others have the potential for engaging in collaborative research. It is necessary to group companies on the basis of a variety of criteria (material used / process used / end user market) and match groups of companies to relevant academic interests and capabilities.
5. Lack of understanding of the funding sources available for academia and industry to support collaborative activities

The general feeling from this workshop was that it would be beneficial to have a much larger industrial representation at a future meeting with academics and that they should be selected with the aim of bringing together companies and academics with similar or complementary interests e.g. across a supply chain.

It was also noted that the work that is of strategic value to a company (whilst generally not at the cutting academic edge) is most stimulating and rewarding to the academics. There is no major fulfilment for academics in industrial work that is perceived as firefighting.

Finally, it was highlighted that it was important not to overlook the potential for academia to serve the sector via upskilling of workforce and lifelong learning.

6. Immediate Next Steps

1. At the next meeting of the All-Island Polymer and Plastic Network Steering Group, the process of identifying companies interested in innovation and with common research interests will be discussed. Once these segmented groups have been identified, their barriers to innovation may be refined and focused meetings with interested and appropriate academics could be arranged to develop specific research plans. This step probably has the largest potential for broadening innovation in the industry.
2. The All-island Polymer & Plastics Network should be considered as a hub of information for academia and industry. This had the potential of starting to address items (1), (2), (3) and (5) above.

Research Connections: Polymer Research Workshop

Appendix 1 Workshop Attendees

Academic Attendees

Mr Paul Blackie	Athlone Institute of Technology
Dr Clem Higginbotham	Athlone Institute of Technology
Dr James Kennedy	Athlone Institute of Technology
Mr Gerry McNally	Queen's University Belfast
Mr Frank Carter	Sligo Institute of Technology
Dr Biqiong Chen	Trinity College Dublin
Mr Peadar Golden	Trinity College Dublin
Mr Donal Hughes	University College Dublin
Prof Martin Buggy	University of Limerick
Dr Austin Coffey	Waterford Institute of Technology
Dr John O'Dwyer	Waterford Institute of Technology

Industry Attendees

James Murtagh	Athlone Extrusions
Kenny O'Brien	Athlone Extrusions
Robert Kearney	Athlone Extrusions
Brian McCann	Clarehill Plastics
Siobhain Cunniffe	First Polymer Training
Roland Groepler	GNG Engineering
Marian Byron	Plastics Ireland
Catherine Joyce	Plastics Ireland
Justin Wallace	Trend Technologies
John Murphy	Valois Ireland Ltd

Agency Attendees

Bernadette McGahon	InterTradeIreland
Marion McAneney	InterTradeIreland
William Morris	Morris Consulting