Ibec Networks
Engineering Group

Engineering in Ireland and your network to success

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Introduction

The Ibec Engineering Network is the Ibec group which represents this diverse industry comprised of leading multinationals and homegrown businesses. The group is part of the Ibec division representing discrete manufacturing sectors specifically.

Engineering is crucial to all manufacturing sectors with companies spanning a broad range of markets, including; automotive, aerospace, energy & environmental, construction, and agriculture. As well as core elements of sub supply including, machinery and equipment markets, paper and printing as well as basic and fabricated metals.

Engineering in Ireland is a strong vibrant sector and a significant contributor to Irish exports. The success of the industry is driven by worldclass talent, investment in research and innovation and regulatory competence.

The engineered products and sub supply sector is growing with exports of €7 billion worth of product annually across 1,200 companies, employing 42,000 people. 75% of the companies are indigenous. There is a broad range of engineering companies, in terms of size, scale and product, across both Irish and foreign owned firms, based throughout the regions in Ireland.

Ibec Medtech and Engineering Director Sinead Keogh

Economic potential

Ireland is the 7th most competitive economy in the world according to the IMD World Rankings. The economy is expected to continue to perform well with 4% growth forecast by Ibec in 2019, but there are possible challenges ahead with uncertainty around Brexit and labour market constraints.

Ibec membership helps businesses grasp growth opportunities and prepare for adverse events with the Ibec Engineering Network, our Employer Relations Unit, and Policy Division.

Ireland ranks first in the world in terms of productivity in industry and in flexibility and adaptability of the workforce. Additionally, we've one of the most educated workforces in the world, with the share of 30-34 years olds having a third level qualification is 53.5% compared to the EU average of 40%.

This puts Ireland in a strong position to grow and solidify its position as a leader in engineering innovation and growth.

As the economy grows, there continues to be high demand for engineers in Ireland and internationally across a range of sectors in a variety of interesting and exciting roles from aeronautical engineering and biomedical engineering, to civil engineering and electronic engineering.

Almost 30% of students here are enrolled in Science, Technology, Engineering and Maths (STEM), courses. As the industry grows, the demand for skills will rise further and continuous learning will become an essential part of the high-tech industries like engineering.

The Ibec Engineering Network offers member access to unrivalled training and upskilling programmes at a subsidised rate with Skillnets, as well as new apprenticeships developed by industry to combine strong qualifications with on the job training.

Engineering and your network to success

To showcase the depth and breadth of this innovative sector, the Ibec Engineering Network developed this special publication "Engineering in Ireland and your network to success". As part of this important work we engaged with our members to identify our vision and priorities, as well gauge business sentiment as we look to future.

To bring it to life we've brought together member companies to build case studies in key areas spanning, innovation, talent, sustainability, and standards. Additionally, we brought together key opinion leaders working with the sector along with Ibec experts to showcase how we represent businesses and can help them achieve their potential.

This publication will be used to highlight the attractiveness and strength of the sector with key stakeholders such as Ministers and international policy makers, key sectors where there are opportunities for business development, and for attracting talent.

Thank you to all the business leaders, Ibec experts, and key players from the engineering and manufacturing ecosystem who shared their insights to help us create this unique guide to Ireland's engineering sectors. Additionally, on behalf of the network I would like to thank Ibec Medtech and Engineering Executive Ciara Finlay who led this project and managed the development of this publication and would like to welcome Pauline O'Flanagan, the newly appointed Ibec Head of Engineering to her role.

We encourage you as members to get engaged in the Network and we look forward to working with you over the years ahead.

Latest Ibec Engineering survey results

In a recent Ibec Engineering survey, more than 8 out of 10 rated the overall business environment as good or very good. Nearly 7 out of 10 rate their own business as good or very good. 2 out of 5 feel more confident about their business in Ireland and as many feel the same

3 out of 5 said they were planning to invest in skills, notably apprenticeships, engineering, and leadership training. In terms of their current skills needs, business are concerned with engineering roles and leadership in particular. As businesses look to the future they are also product design engineers and people with the programming robots capabilities.

1 in 2 engineering members said that they expected their export sales to increase this year. But 8 out of 10 expect Brexit to have a negative impact on their business. The Ibec Engineering Network supports members with industry foresight, representation, events with experts and networking opportunities, as well as business-led training programmes.

The sector is confident about the future, but with challenges ahead in a changing global environment, it's more important than ever to engage with the Ibec Engineering Network as part of a membership organisation that brings together leading businesses.

"As the economy grows, there continues to be high demand for engineers in Ireland and internationally across a range of sectors in a variety of interesting and exciting roles from aeronautical engineering and biomedical engineering, to civil engineering and electronic engineering."

Ibec Engineering Network Head Welcome

I'm delighted to join the Ibec Medtech and Engineering Team as the Head of the Ibec Engineering Network. I look forward to meeting and working with you the members to ensure that the right supports are in place to help you achieve your potential. As part of work undertaken by the Network over the past year, I am delighted to present our vision, strategic pillars and key areas of activity for the year ahead.

Ibec Engineering Network Head Pauline O'Flanagan

Our strategic pillars are:

- Provide industry foresight to member companies to foster growth
- Drive engagement with key stakeholders to grasp opportunities and manage challenges
- Support a vibrant business environment with the right infrastructure to deliver growth
- Connect businesses with networking events and training programmes

Key areas of activity

- **Industry foresight:** Provide information that matters to engineering companies and access to experts on issues such as exporting, trade, energy, employer relations and skills
- **Leadership and representation:** Bring members together to share best practice as part of working groups, participation in the Ibec Engineering Network and Ibec
- **Promotion of engineering companies:** Develop communications and publications that help people understand the role of engineering in driving innovation, jobs and economic growth
- **Conferences, events and networking:** Lead and develop worldclass conferences with key opinion leaders, provide networking opportunities, and site visits
- **People, training and skills:** Provide industry-led training and upskilling through Skillnets and apprenticeships, as well as promote engineering careers to attract mobile talent and students

Organisational structure

The Ibec Engineering Network's work programme is agreed by the network and focuses on key issues relevant to the sector.

Ibec Engineering Network working groups

- Ibec Engineering Forum
- End to End Manufacturing Working Group
- Gender Leadership Development Taskforce
- OHS/EHS Forum
- IR/HR Forum
- Irish Medtech Skillnet
- First Polymer Skillnet
- Polymer Apprenticeship
- Manufacturing Apprenticeship

Ibec policy working groups

- Digital Economy Policy Committee
- Innovation, Science and Technology Committee
- EU Affairs and Trade Policy Committee
- Economics and Taxation Committee
- Diversity Forum
- Transport and Infrastructure Committee
- Environment Policy Committee
- Energy Policy Working Group

This structure allows members to work on strategic issues for the industry and share best practice across leading business.

"Our vision is for Ireland to be a thriving, dynamic engineering hub, where multinationals and homegrown companies collaborate strategically, with access to worldclass research centres and business supports, to help companies innovate, prosper and drive economic growth."

A new age of innovation in engineering

Innovation is driving collaboration between businesses and engagement with leading research centres. Ireland is ranked 12th most innovative economy in the world in the Global Innovation Index, and 14th according to the Bloomberg Innovation Index. According to the later index it rates first for manufacturing capability and productivity. Industry 4.0, for example, is transforming manufacturing, with companies embracing new technologies from AI and augmented reality, to process engineering and digital twinning. Automation is already driving higher productivity and better business performance. Now digitisation is also creating value as companies develop services around the latest products. Ireland is recognised as a European high performer in terms of digital technologies, but there's more to be done in business digitisation. As we look to the future it's Ibec's ambition for Ireland to be a leading, globally competitive digitalised economy that delivers jobs and growth.

Digital ambition and the new national digital strategy

While Ireland is performing well in Europe when it comes to digital technologies, as a country we have more to do, including investing in industry 4.0 supports. Ibec has outlined what needs to happen to embrace the full potential of a Digital Single Economy and help businesses here better compete internationally.

The European Commission ranks Ireland in a cluster of EU states which are high performers in terms of digital progress. Its latest Digital Economy and Society Index issued this year places Ireland in seventh position for overall digital performance across the EU28 and first in terms of the 'integration of digital technology by business'.

As Erik O'Donovan, Ibec's Head of Digital Economy Policy explains, this top ranking is a weighted average of two scores, 'business digitisation' and 'the implementation of ecommerce'. "Our high ranking is due to our relative ecommerce adoption, which reflects that we are an island. However, if you drill into it, we still have more to do in business digitisation compared with the countries which are currently best at this such as Finland, Denmark and The Netherlands," he says.

Erik O'Donovan
Head of Digital
Economy Policy, Ibec

Ibec highlighted this point in its submission to Government on its new National Digital Strategy, which was put out for public consultation in October 2018.

"Europe is trying to encourage all industries to adopt digitalisation as more automation will result in higher productivity. It is a race that never stops, every other country has the same idea as we do – they all have SMEs, manufacturing and technology sectors," says O'Donovan. "We're very lucky as we have lots of high tech companies, but we're competing on a global stage. Technology is one of those areas where we have to stay ahead of the game in order to remain competitive."

In its recently produced paper 'Accelerate Ireland's digital ambition', Ibec highlighted that an effective Digital Single Market and the full adoption of emerging digital technologies could add up to €27 billion and 140,000 net jobs to the Irish economy, according to a Boston Consulting Group study.

In this context, Ibec's ambition is that Ireland advances as a leading, globally competitive digitalised economy that delivers jobs and growth.

"There needs to be a twin-track approach that delivers on the national digital agenda but also at EU level," says O'Donovan. "We are asking the Government to provide leadership and coherence in this area. An awful lot of Government departments are involved in different aspects of digitalisation, such as infrastructure, education and innovation."

Ibec recommends that there should be a dedicated Minister of State for digital affairs tasked with coordinating with the Taoiseach and the different ministries in delivering the national digital agenda as well as encouraging intensified collaboration with other digital front-runners in Europe. "Whether it's at national or EU level, we must further develop our digital capabilities in a coherent way and engaging businesses on that is important," notes O'Donovan

Reflecting the fact that digital cuts across so many policy areas and sectors, Ibec has a cross-sectoral group focused on promoting its digital ambition. One of the Digital Economy Policy Committee's objectives is to ensure the delivery of a new national Industry 4.0 strategy, which has been promised by Government later on this year.

"We want this to be a robust strategy that has metrics. Businesses are going to be on different journeys as regards Industry 4.0 and this must be accommodated in terms of supports. There will be differences between companies, sectors and within sectors based on company size. For example, for those businesses not aware of the concept, the first step will be to demystify the potential of digital applications," explains O'Donovan.

"Other companies at the stage of applying or testing out the digital applications will need different skills and could be formed into clusters. For all boats to rise together, we have to design a strategy that helps people at different stages of the digitisation journey."

Helping companies to enter into the Industry 4.0 era with targeted advice and skills has to be the most important aspect of the new strategy, in Ibec's view. Otherwise, it is encouraging investment in advanced manufacturing, accelerated capital allowances for computer aided design and robotics and a reduction in the complexity of the R&D Tax Credit particularly for SMEs. Underfunding at third level also needs to be addressed in this context.

"A lot of great stuff is already happening in terms of supporting digital transformation, including technology centres, research centres and the Disruptive Technology Innovation Fund," says O'Donovan. "We are promoting the idea of intensifying support for applied research to allow more Industry 4.0 projects to be demonstrated and piloted."

" We are asking the Government to provide leadership and coherence in this area. An awful lot of Government departments are involved in different aspects of digitalisation, such as infrastructure, education and innovation."

Industry calls for an advanced discrete manufacturing centre of scale

Manufacturing accounts for nearly a third of Irish GDP. “To fully realise the sector’s potential, sustain and build our vital manufacturing mandates we need the right infrastructure and business environment. To achieve this we’re calling on the Government to invest in a discrete advanced manufacturing centre of scale”, says Sinead Keogh, Director of Ibec’s Medtech and Engineering sectors. Otherwise, Ireland risks losing out to competitor economies that are already investing aggressively in this space.

The discrete manufacturing centre has identified this as a major gap in the advanced manufacturing ecosystem here. Recent investment in manufacturing research centres are a positive step to drive innovation in this space, but it does not go far enough. “We are calling for an additional €30million to be invested in the centre in addition to the €12 million already announced by IDA Ireland”

According to Keogh, “IDA Ireland recently announced a new Advanced Manufacturing Centre to support companies in the de-risking, deployment and commercialisation of advanced manufacturing and digital technologies within their operations. This initiative will be a key enabler of the skills uplift needed for the future, and a natural home for collaboration between SMEs, FDI companies and technology providers.”

Our recommendations for the Government are to: Invest strategically in a discrete Advanced Manufacturing Centre of scale. A funding model the same as or similar to the 1:1:1 funding model, like a Research Technology Organisation (RTO) should be adopted. The focus should be on the higher Technology Readiness Levels (TRL) levels (5 – 9) to address the gap that currently exists in the research, development and innovation ecosystem.

To be competitive long term, Ireland must take a leadership position in this space. Ibec’s Medtech and Engineering sectors, are calling on the Government to act now and lead on the delivery of this critical national infrastructure.

Making digital sense at Siemens Ireland

With a focus on automation and digitalisation, Siemens Ireland is tackling Industry 4.0 head-on by embracing all the latest technologies including artificial intelligence and data analytics. The pace of innovation is expected to pick-up in the next two to three years in advanced manufacturing but getting ahead of the curve, Siemens expects to outperform key competitors.

Siemens Ireland is currently working on a project in collaboration with the National Institute for Bioprocessing Research and Training (NIBRT) which provides a strong insights into what digitalisation in manufacturing can achieve in a bio pharma environment. It involves researchers and engineers using artificial intelligence and data analytics to improve the understanding of manufacturing processes from a data perspective, with the goal of improving efficiency in drug production.

In Ireland since 1925, Siemens is one of the world's leading electronics and electrical engineering companies, operating in the industry, energy and healthcare sectors as well as providing infrastructure solutions for cities and metropolitan areas. Siemens in Ireland employs around 700 people with facilities in Dublin, Donegal and Clare.

"We are talking to our customers about the whole spectrum of technologies from artificial intelligence (AI), to augmented reality, process reengineering and digital twinning," says Siemens Chief Executive Gary O'Callaghan. "More flexible production, greater productivity, and the development of new business models are all possible today thanks to digital solutions. But the future of industry offers even more potential: Cutting-edge technologies will create new opportunities and insight for both discrete and process industries to fulfil their customers' individual requirements.""

Globally, Siemens is working with car manufacturers and in the aeronautical industry in the area of digital twinning. "When an aeronautical company is building a jet engine for example, it could end up destroying real prototypes six or seven times to make sure it is resilient against bird strikes. By building a digital twin, we can simulate the effect of a bird strike and destroy the virtual engine at no cost," O'Callaghan explains.

The highest take-up of Siemens digital solutions is among manufacturing industry but O'Callaghan also sees digitalisation impacting in more traditional sectors such as power generation. "We have dramatically increased the number of sensors on a power generation asset and the different data streams they can be measure, such as temperature, hotspots, imaging and vibration. In this way, we can predict the likely sequence of events that leads to a component failure," says O'Callaghan.

"Some years ago, you might have had one power generating asset connected to a remote support centre, but now practically every asset across the globe is connected. As soon as a failure with one occurs, we can analyse the data to see what led to this and then quickly analyse hundreds of others to predict the likelihood of the same fault occurring in other assets."

Understanding robots and AI in Industry

The engineering profession will have to embrace the changes that digitalisation brings, and engineers will increasingly have to understand technologies such as robotics and artificial intelligence. O'Callaghan believes the requirement for engineering graduates to have a greater understanding of the full spectrum of technologies associated with Digitalisation will continue to grow. He expects this to be mainstream in the third-level engineering syllabus in five years' time.

"Engineers are going to have to get much more comfortable with ambiguity. When dealing with data analytics, we analyse to see if additional insight and therefore value can be found. Building solid business cases can sometimes be difficult and ambiguous. We're moving into an area of adaptive solutions and servitisation," he says.

Servitisation involves creating value by adding services to products or even replacing a product with a service, for example, the maintenance of an electrified rail network using intelligent data where the customer is charged per passenger or per kilometre travelled.

Ultimately, for O'Callaghan, the very nature of the role of an engineer is to build solutions such as this which enhance society. "I am seeing more and more in my own organisation that the reasons people join a company are changing. They want to get involved in activities that help improve society and contribute to this goal in a real way. Digitalisation and Industry 4.0 should make engineering more attractive and we should see a much more diverse engineering community as a result in the coming years."

Dr Ann O'Connell
Senior EU Programme Manager, IMR

Irish Manufacturing Research centre collaboration to support business

A feature of Irish Manufacturing Research (IMR) work over the past three years has been collaborative projects between likeminded innovative companies, both SMEs and MNCs, with a view to engaging in and understanding the gains to be made by implementing advanced manufacturing technologies into defined areas of their process.

IMR have over 60 employees including researchers with both Industry expertise and also from some from an academic background, working in areas such as 3D printing, Data Analytics, Knowledge Management, Sustainable Manufacturing, Advanced Robotics and the Industrial Internet of Things. IMR activities span national and European (H2020) research collaborations and coordination. While the in-house research includes design and prototyping services as well as training and the expansion of Industry networks.

Irish Manufacturing Research (IMR) is a leading manufacturing Research and Technology Organisation with labs and industrial pilot lines in Dublin and Mullingar. IMR is funded primarily by Enterprise Ireland and IDA, while they also have achieved success in the competitive funding arena (both nationally and in the EU) and from private Industry for direct research or membership of the organisation. They work with leading global and indigenous brands to de-risk and de-mystify new and emerging advanced manufacturing technologies and to deliver high impact collaborative research to enable Irish Industry to achieve global leadership in advanced manufacturing technologies.

"We work closely with academics, European and industry partners to establish best-in-class knowledge and behaviours as the starting point for future research," says Dr Ann O'Connell, the senior EU Programme manager with IMR where she also works in business development engaging with Industry groups such as the Vehicle of the Future cluster.

With IMR as a facilitator and test bed facility, ten companies in the Midlands came together to create a platform to understand how to engage in 3D printing. These included SteriPack and Mergon. "The companies applied for innovation partnerships from Enterprise Ireland and contributed to the research with funds and in-kind into the project, to gain greater insight and technical know-how in Additive Manufacturing (ie 3D printing)" says O'Connell. "They really benefitted from it and this kicked off further projects with IMR in other areas."

One such project for Mergon led to IMR sitting on the steering committee of a group called Vehicle of the Future. "There are now 100 different companies attending this cluster meeting, which explores the different technologies that feed into autonomous vehicles, smart cities and the connectedness of society," says O'Connell. IMR is also now linked into Connected Autonomous Vehicles Ireland, which brings small players together with tier one companies with a view to providing technologies to the automotive industry.

O'Connell notes that IMR has done a lot of work over the years in the energy space, using advanced manufacturing technologies to enable industry to operate more cost effectively and consume less energy leading to sustainable manufacturing.

Bubbling with potential at BOC Gases

With nearly 150 years of experience doing business in Ireland BOC Gasses has established itself as an industry at the forefront of innovation. From putting the bubbles into a pint of stout to investing in innovation to grow its customer base in the medtech and biopharma industries, BOC Gases is a trusted partner for a broad spectrum of manufacturers.

BOC Gases Ireland's connection to Ireland goes back to 1882 when Carl von Linde received an order from the Guinness brewery for a carbon dioxide liquefaction plant. The founder of the company's parent, the Linde Group, was the inventor of the fridge and the air separation process.

With a head office in Bluebell in Dublin for 85 years, as well as major production sites in Cork and Belfast, BOC Gases Ireland is the Irish market leader in industrial and medical gases. It employs 400 people, mostly working in production, distribution and sales. Around 15% of the Irish workforce has an engineering background. Most of its regional leaders and board members are chemical engineers.

"We are the only industrial gases company that is producing on the island of Ireland which gives our customers security of supply, especially in the times of Brexit," says Managing Director Andreas Bieringer.

> “ Our clients are using this data to fine-tune their processes to minimise defects, which ultimately makes their welding operations more efficient.”

Andreas Bieringer
Managing Director,
BOC Gases Ireland

BOC Gases Ireland manufacturers liquefied gases including nitrogen, oxygen, carbon dioxide, argon and hydrogen. These are supplied by a fleet of 160 cryogenic tankers in large bulk volumes to customers to be stored on-site in storage systems or tanks, which are installed and maintained by BOC Gases Ireland.

“When it comes to engineering, we are a solutions provider to our customers around design, installation, maintenance and support – ultimately so that our gases support their processes in the best possible way,” says Bieringer.

“Specifically, in Ireland, an important part of our business is in maintaining medical gas distribution equipment in hospitals. Our medical oxygen is used in hospitals around the country, while our Entonox gas [nitrous oxide] is used for pain relief such as when giving birth and our helium cools down high-powered magnets in MRI scanners.”

BOC Gases Ireland’s gases are used in all of the country’s large industries for a wide range of applications, from CO2 and nitrogen mixed gases to give drinks fizz, to oxygen to support optimal fish growth in fish farming to nitrogen being used to avoid the degradation of products in pharmaceutical manufacturing. “Our gases might mostly be invisible, but become visible in the solutions they provide for our customers,” notes Bieringer. “We put the bubbles into a pint of stout.”

Innovation core to future growth

One of the exciting new areas BOC Gases Ireland has engaged in recently is innovation in additive manufacturing. Its argon gas can support 3D printing processes for medical implants such as orthopaedic knee and hip joints.

In response to the digitalisation trend, the Linde Group launched its pioneering cloud-based welding management solution Avanto in 2016. This enables BOC Gases Ireland customers to capture, monitor and analyse real-time data on the amount of gas they are using in their welding processes.

“Our clients are using this data to fine-tune their processes to minimise defects, which ultimately makes their welding operations more efficient. It also allows them to demonstrate compliance to regulators as they can prove how a weld was done,” Bieringer explains.

“We continuously develop new applications and innovations to support our customers. For example, in the area of clean energy, BOC Gases Ireland has developed the world’s first commercially viable, low-carbon hydrogen fuel cell generator. This portable generator is a flexible alternative to small petrol and diesel generators or large battery banks and its only bi-product is water.”

In general, according to Bieringer, BOC Gas Ireland customers are becoming more demanding as they are under pressure to innovate while also being cost effective. “We help our customers to remain successful while understanding and improving their processes. For this we have a dedicated team of application sales engineers who collaborate with our customers to redesign processes and provide innovative solutions that make our gases a value-add to their business,” he says.

“The world today is all about addressing challenges and being able to quantify and solve problems by coming up with solutions. The majority of engineers within our business are mechanical, manufacturing, chemical and civil engineers. But it is also important for us to have account managers with a strong technical understanding as this is key to building strong relationships.”

Currently going through a US$90 billion merger with Praxair, the Linde Group is the largest industrial gases company in the world. It employs 80,000 people in over 100 countries and has more than 2 million customers.

“Engineers who join us have the opportunity for a global career. Our gases touch so many dimensions of people’s lives and are used in every industry you can think of. We are dealing directly with the top ten foreign direct investment companies in Ireland. A career with BOC Gases Ireland gives people terrific exposure to a full range of businesses,” says Bieringer.

“The engineer of the future will need to engage in lifelong learning, be technology driven and have good communication skills and the ability to work in teams.

“In the next ten years, we definitely expect BOC Gases Ireland to still be the preeminent supplier of industrial and medical gases in this country, although there may be a shift in our customer base away from heavy bulk manufacturing towards sectors such as biopharmaceuticals and medical devices.”

Advanced manufacturing research support at I-Form

I-Form, the Science Foundation Ireland Research Centre for Advanced Manufacturing, involves partnerships with seven research institutions and over 30 companies, split between indigenous SMEs and multinationals.

Launched by SFI in September 2017, I-Form's mission is to shape the future of manufacturing through high-impact research into the application of digital technologies to materials processing.

Hosted at University College Dublin, I-Form's partner research institutions are Dublin City University, Trinity College Dublin, Institute of Technology Sligo, National University of Ireland Galway (NUI Galway), Maynooth University and Waterford Institute of Technology. I-Form represents Government and industry investment of €22.2 million.

The centre brings together key expertise in materials science, engineering, data analytics and cognitive computing to improve the understanding of complex materials processing and to develop user-friendly process control systems for the manufacturing industry.

Denis Dowling
Director, I-Form

"Manufacturing is extremely broad and we are very focused on one aspect – materials processing. This involves how you go about selecting raw materials, fabricating them into a part and inspecting that part by incorporating sensorised processes," explains I-Form Director Denis Dowling *(pictured right)*. "Part of I-Form's role is to identify the key sensorised elements and pieces of information coming off the process, and then to use cognitive computing to interpret and understand this. By cognitive we mean computer systems that interpret the context in which a question is asked."

Looking at the manufacturing process nowadays, Dowling notes that it is increasingly moving towards smaller and shorter runs individualised for the customer, and away from traditional large-scale manufacturing.

"There is a push towards individualised components, which means manufacturing systems have to become more flexible and more sensorised. There is a need to reduce waste and not hold large amounts of components in reserve. One of our research focus areas is 3D printing, which facilitates this, as it has the ability to print complicated shapes cheaply and with minimum post-processing or finishing."

I-Form currently employs an operations team of nine people, along with over 40 PhD/postdoctoral researchers and the plan is to ramp this up to over 100 researchers within the next five years.

"Manufacturing is being revolutionised by digital technologies. We're seeing such a dramatic change with the convergence of a whole series of technologies, including the Internet of Things and augmented reality, which is having a transformative effect," says Dowling. "Technologies such as 3D printing have improved the economic viability of customisation in manufacturing, opening the door to new production processes for Irish manufacturers.

"Industry and academia need to work together to develop and take advantage of these new means of production. Through collaboration, Irish manufacturers can gain access to leading edge technology for the development of worldclass products. Ireland needs the skillsets to be able to use digital technologies as effectively as possible in manufacturing. The combination of engineering, science and computer science skills at I-Form is unique."

An R&D hub at Cargotec

Companies around the world from diverse industries are using Cargotec's ground breaking Moffett truck mounted forklift solution, which was originally invented in Dundalk, Co Louth in 1986. As the company looks to the future it is embracing the digital age and the fourth industrial revolution and investing in skills of the future to remain at the forefront of industry trends.

In the mid 1980s Moffett Engineering in Dundalk, Co Louth created a revolution in the transport industry with the introduction of the truck mounted forklift. This three-wheel drive machine can be carried on almost any truck or trailer without the loss of load space, resulting in significantly faster and more cost effective deliveries than ever before.

Now the global market leader and branded as Hiab Moffett, the truck mounted forklifts continue to be manufactured at the Dundalk facility, which currently employs more than 350 people. Around 5,000 units are produced each year and last May the company announced it had delivered its 75,000th Hiab Moffett truck mounted forklift.

"This is a logistics rather than just an equipment solution. Instead of having two or three people on a truck helping to unload pallets and waiting on a forklift at the point of delivery, there is one driver operating both the truck and the forklift and no need for equipment or operators on site," says Conor Magee, Senior Vice President, Truck Mounted Forklifts at Cargotec, Ireland. "The beauty of the solution is its ability to transfer deliveries directly to the point of use or consumption."

With a lift capacity of 1.5 to 3.5 tonnes, the Hiab Moffett model range includes specialist machines for a wide range of applications from construction, building supplies, landscaping, poultry, FMCG and beverage to various other commercial and industrial uses.

"We operate in lots of different segments. In the beverage segment, for example, all the big drinks brands and breweries are customers of ours. Our truck mounted forklifts pick up pallets of their products and distributes them both to customers' warehouses and end point of use as needed," says Magee.

Digitalisation and artificial intelligence

Cargotec's Dundalk facility is a hub for truck mounted forklift research and development (R&D), and is the sole assembly unit for all Hiab Moffett truck mounted forklifts.

"We have engineers in R&D and Production Engineering and a large proportion of the headcount is related to assembly operators and fitters. There are also the usual support functions including customer support, logistics, finance and HR," says Magee.

"Our R&D guys are continuously working on modifications and options to suit special applications as it is not a case of one size fits all. The bottle gas industry will need different sized pallets to the window manufacturing industry for example. We have to adapt how goods are loaded and unloaded from the truck for each segment."

In 2015, Cargotec, Ireland was the first on the market with an electric truck mounted forklift solution, giving emissions free operation and near silent operation, which allows for night-time deliveries in residential areas.

"A lot of companies want to operate 24/7 and at times when there is less traffic in congested areas," explains Magee. "There is Clean Air Zone legislation coming to all our major cities in relation to the use of diesel engines in congested areas. As diesel becomes more and more of a barrier, people's behaviour will change and technology will have to keep improving to address the current distance and range anxiety associated with electric vehicles."

Conor Magee
Senior Vice President,
Truck Mounted Forklifts,
Cargotec, Ireland

“ The skillset has changed as everything is more data-driven. We’re hiring more software, electronic and electrical engineers now.”

Another area Cargotec’s R&D engineers are looking at is digitalisation and artificial intelligence. “Our equipment will need to become more intelligent to give customers the ability to manage fleets and see how the equipment is used by the operators. The smart phone took ten years to be in everyday use but the digital revolution is happening much faster and on a much larger scale so we have to align ourselves with such industry trends,” notes Magee.

A qualified mechanical engineer, Magee started as General Manager of the Dundalk facility in 2009. He then spent three years working for Cargotec in China and a further three in Finland before returning to the Irish plant.

“It has been interesting to see the changes here in Dundalk over the past six or seven years. The skillset has changed as everything is more data-driven. We’re hiring more software, electronic and electrical engineers now,” he says.

“Pursuing a career in engineering means you’re involved in developing something tangible that will create value and benefit businesses and everyday life in general. One of the things I point out to young people is that all of the goods delivered by the likes of Amazon arrive on time by virtue of our equipment. There is a lot of engineering behind things that we take for granted. Innovative design and engineering is focused on making everyday life easier and better.”

Go smart to get ahead at CONFIRM

The research-driven innovation that will come out of the CONFIRM centre will enable mass customisation, where future Irish products will be tailored to individual consumer needs and delivered directly to them just hours after placing orders.

So says Director of the new centre Professor Conor McCarthy. “Consumers increasingly want personalised products that they can spec out and order on say their smart phones. Already, consumers can almost become part of the design process and be involved in the supply chain, as technology allows them to know where a product is made and track its progress,” he explains.

“This changes the whole business model. Manufacturing has to be more flexible and companies have to find a way to be commercially viable by producing bespoke products at the same rate as normal. This is the holy grail which will all be enabled by the emergence of ICT with manufacturing.”

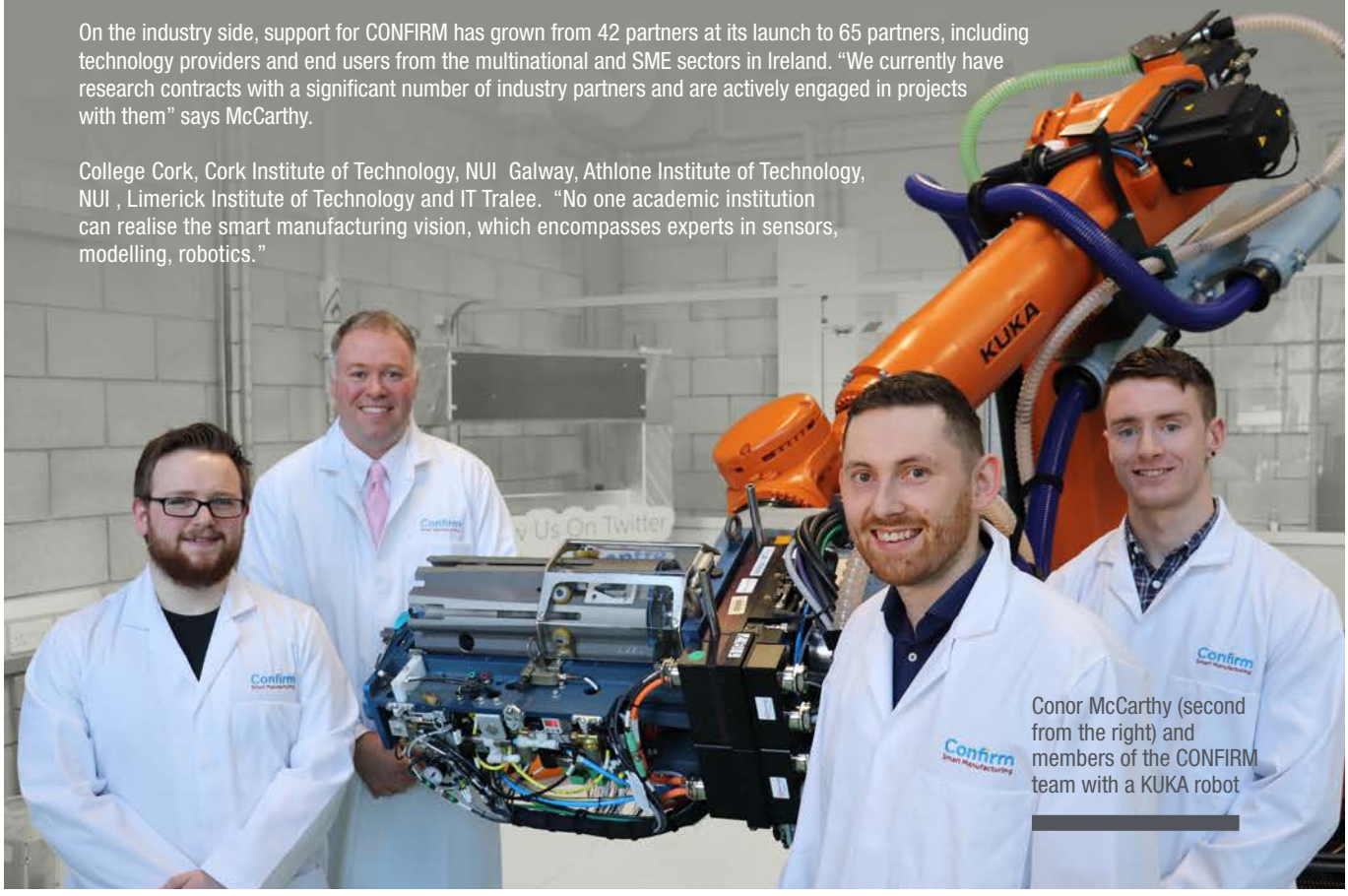
Established by Science Foundation Ireland in October 2017, the €47 million CONFIRM research centre is bringing top researchers across higher-level institutes in Ireland together with key industry partners to drive the future of smart manufacturing. “Our mission is to fundamentally transform the landscape to the digital paradigm by making Ireland’s manufacturing base more digitised,” says McCarthy.

“Around €10 million of our funding is for basic research into new technologies such as artificial intelligence in manufacturing, which is not mature yet but coming down the line in three to four years. This funding is providing a foundation for us to carry out about another €10 million exploratory research on industry targeted projects in the four pillars of, smart products, smart machines, smart production systems and smart supply chains, all of which are generally aligned.” In practice, this could translate into an operator talking to a robot, which is capable of making decisions in the manufacturing process, similar to how consumers use Siri on the iPhone.

CONFIRM will be headquartered at the Digital District at Park Point, University of Limerick (UL), by the end of this year. More than 100 researchers in smart manufacturing will be based at the new state-of-the-art facility. Led by UL, CONFIRM is a consortium including the Tyndall National Institute, University control, software and cyber security. We come together as a consortium, but by its nature CONFIRM will continue to be distributed across the country. We also intend to bring in international talent through EU-funded programmes,” says McCarthy.

On the industry side, support for CONFIRM has grown from 42 partners at its launch to 65 partners, including technology providers and end users from the multinational and SME sectors in Ireland. “We currently have research contracts with a significant number of industry partners and are actively engaged in projects with them” says McCarthy.

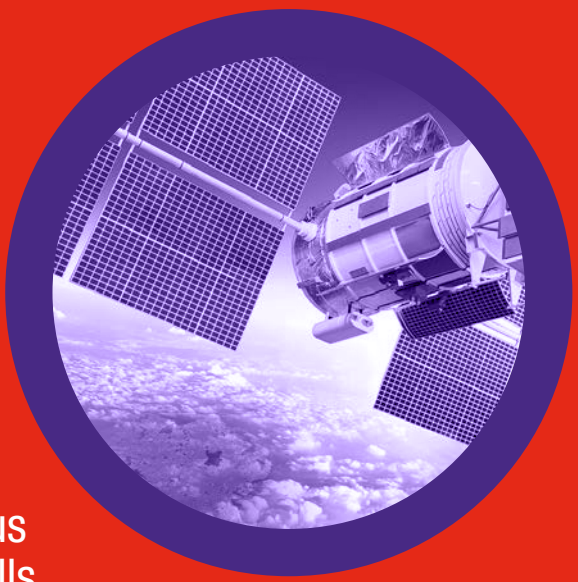
College Cork, Cork Institute of Technology, NUI Galway, Athlone Institute of Technology, NUI , Limerick Institute of Technology and IT Tralee. “No one academic institution can realise the smart manufacturing vision, which encompasses experts in sensors, modelling, robotics.”



Conor McCarthy (second from the right) and members of the CONFIRM team with a KUKA robot

The journey to engineering careers starts with skills

Ireland's rich talent pool boasts more people with third level education than the EU average. Engineering graduates with their inquisitive minds and demonstrable ability to solve problems are highly south after by both leading multinationals and dynamic SMEs. Apprenticeships offer an alternative route to manufacturing and engineering careers by combining worldclass qualifications with company experience. But as the world of work changes, people will need a broad range of skills to compete. This will require continuous learning as well as the development of soft skills such as marketing and business management.



Conscious of competitiveness

In order for Ireland's manufacturing and engineering sectors to remain competitive, there needs significant investment in infrastructure and stay ahead of employee trends, writes Danny McCoy, CEO, Ibec.

Ireland has become a significant manufacturing hub ranging across the biopharmaceutical, medtech, automotive and food and drink sectors and driven by a competitive engineering sector. It is a hidden success story in many ways. For about seven years since the economic downturn, the big factors determining the success of engineering in Ireland were a combination of a muted cost structure and dramatically increased productivity.

Relative to other jurisdictions, Ireland still offers a compelling story, but it is now more driven by the productivity side than the cost competitiveness aspect. The cost structure has ramped up significantly in the past couple of years, as labour, rents and business services costs have increased. If this trend continues, it will be hard to see productivity growth justifying that type of cost growth and we could start to lose competitiveness in the next three to four years.

If that is inevitable, the best thing we can do during that phase is look at the resources we have at our disposal which should leave us in a better place at the end of that period than we are today. A sustainable business model for the future requires better public infrastructure defined by motorways, public transport systems and broadband delivery.

The Government is going in the right direction with Project Ireland 2040, but in Ibec's view we need to show more ambition. The plan is predicated on a 1 million increase in population, but we believe the increase could even be 2 million. Population predictions in the past five years have been poor; there are 600,000 more people in Ireland since the start of the economic downturn. Meanwhile, employment levels are back at record highs, with around 2.3 million people at work. These demographic changes mean more dependents and a greater need for public infrastructure including hospitals and schools.

Increased affluence

Engineering companies are competing for scarce resources. They have great investment plans, but are coming up against the reality that people are more affluent now and are choosing to withdraw their labour for lifestyle reasons. The rather inconvenient fact is that Irish households have the money right now and the Government needs to take money off them to deliver the critical public infrastructure. For example, there isn't a mechanism to pump money into tertiary education. Rather than increasing taxes, a more innovative approach would be to borrow money off people for a fixed period of time – similar to the Special Savings Incentive Account (SSIA) scheme. It could go towards increasing Irish university rankings internationally. That way, households would have a stake in improving education at a macro level.

One statistic that is often not properly understood is the unemployment rate. The tendency is to think it is 4.5% of the overall working age population, whereas it is actually 4.5% of the labour force. What is important to consider is the scale of engagement in the labour force – today, the participation rate among Irish adults aged between 18 and 65 is 62%, compared to 76% in the UK and 80% on average in the EU. There is a whole range of reasons why 38% of the labour force doesn't participate, including child and elderly caring, but increasingly it is the case that people feel affluent enough to choose leisure over employment.

Technical skills shortage

To illustrate the situation Ireland's engineering sector is currently facing, I picture two stylised 35 year olds in my head. Both left school at 18, one went the university route (type 1) and the other followed the apprenticeship route (type 2). Given that most school leavers in Ireland go down the tertiary education route, type 1 is not as scarce in supply as type 2. The individual who started as an apprentice became self employed, is likely to have more money, purchased property, have their own business. Whilst both types are working the rewards are often quite different. While type 1 can have similar technical skills, it is type 2 that is scarcer and can demand a higher premium for their labour.

Ibec does a lot of work in employer relations to help businesses maximise their capacity to win talent and help more women succeed in the workplace. Through our KeepWell Mark and campaigns such as Smarter World, Smarter Work, we are striving to create workplaces of the future and to give companies the support they need to compete for and win talent. We need to get over the idea of presenteeism and find ways to overcome productivity issues when people want to work four days a week, for example.

Future of Europe

Brexit is more than likely going to happen and that in itself is very significant. Ultimately it will mean Ireland will find a new equilibrium and relationship with the UK, which is by far our biggest competitor in the manufacturing and engineering space. It is a highly productive, highly globalised country on our doorstep and we are going to have to pull out all the stops to ensure the relationship continues to our advantage.

The absence of the UK dramatically changes things. Europe is evolving in a very uncertain way, with some countries on the eastern flank treating the rule of law arbitrarily. There is also a movement towards right-wing extremism.

The departure of the UK will be like removing a block in a game of Jenga. Things are going to be very unstable I would think in the next ten years. The security of Ireland and its business model will all have to be fought for again. The future of Europe is a dramatic backdrop to all of our plans going forward.

Danny McCoy
CEO, Ibec

"For about seven years since the economic downturn, the big factors determining the success of engineering in Ireland were a combination of a muted cost structure and dramatically increased productivity."

Futureproofing with apprenticeships

Ibec was at the forefront of the Department of Education and Skills wider national strategy to introduce modern apprenticeships. These new apprenticeships reflect international best practice and Ibec's manufacturing apprenticeships and polymer technology apprenticeship were selected by the Government for launch in the first phase.

Manufacturing Engineering Apprenticeship (Level 6):

This 2 year programme combines on the job training with 15 week block academic release that covers key subjects such as computer aided design, engineering science, and lean manufacturing.

Manufacturing Engineering Apprenticeship (Level 7):

This 3 year programme combines on the job training with 15 week block academic release that covers key subjects such as advanced manufacturing processes, engineering software systems and operations management.

Polymer Technology Processing Apprenticeship (Level 7):

This 3 year programme combines on the job training with 15 week block academic release that covers key subjects such as polymer processing, automation, as well as quality and good manufacturing practise.

These programmes have enjoyed strong success to date since the launch with more than 200 apprentices registered over the past couple of years along with both leading multinationals and homegrown SMEs taking part.

Greg Reddin, Johnson & Johnson; Sinead Keogh, Ibec; Barry Comerford, Cambus Medical; Minister of State for Higher Education Mary Mitchell O'Connor TD; Aislinn Smith, Johnson & Johnson; Aisling Nolan, Mergon; and Pauline O'Flanagan, Ibec, celebrating the first graduating class of the Manufacturing Engineering Apprenticeship (Level 6).

Space to grow

InnaLabs® is an Irish SME with an ambition to grow out of this world. Having built up strong expertise and proprietary technology in the specialised field of inertial sensors, InnaLabs® already has three major contracts with the European Space Agency under its belt after less than seven years in business.

Based in a state-of-the-art facility in Dublin since 2012, InnaLabs® was recently awarded the contract to design and manufacture the first-ever European space grade accelerometer by the European Space Agency. "We are quite a young company in terms of space heritage, but lately our product range and engineering capability have attracted some of the world's biggest space companies," says CEO John O'Leary.

"The European Space Agency was an early adopter and now has us working on a gyroscope unit for deep space missions and another measurement unit for the emerging new space market segment – as well as the accelerometer for orbit transfer of spacecrafts and other missions."

InnaLabs® is a technology company which designs, develops, manufactures and sells highly-complex navigation aids known as inertial sensors. It has successfully completed the full design and industrialised processes for its tactical grade Coriolis Vibratory Gyroscopes and navigation grade Quartz Servo Accelerometers.

John O'Leary
CEO, InnaLabs

With 29 US and international patents for its best-in-class products, InnaLabs® offers solutions for the aerospace, subsea, marine, space, energy, industrial, civil engineering and transportation markets.

Being awarded the contracts for projects such as those from the European Space Agency has attracted interest from prime companies in the US, Asia and Europe, O'Leary notes.

"The space sector was always dominated by government agencies, where funding and commercialisation were not always a priority. Man's need to be continually connected has brought about the speed of change, and many new private companies have emerged globally," he explains. "They are now starting to challenge the former giants, as they operate under normal trading conditions, where cost, performance and time-to-market are key to success. This change has allowed a small Irish SME such as InnaLabs® to compete and win on a global scale and create our own space heritage."

With a background in new product development and as general manager at three different US multinational firms, O'Leary established InnaLabs® with Jose Beitia, who is its Chief Technical Officer. Beitia is a technologist who previously worked in Sagem, a Safran group company in France focused on electronics and communication systems.

"It's a great combination as Jose is a subject matter expert on inertial sensors, while I have spent my time industrialising concept ideas across many business sectors," says O'Leary. "Both of us have been very lucky to work with some amazing people, so when we formed InnaLabs® many people in our network were extremely willing to join the company to develop new innovative technology."

A highly skilled team

There are currently 58 people working at InnaLabs® facility in Blanchardstown, mainly in engineering roles, ranging from research/design engineers to industrial, software, automation, electronic and quality engineers. The manufacturing function comprises a very experienced group of process engineers, test technicians, buyers, planners, operators and high precision re-workers.

"When you are attracted to a career in engineering, it is usually because you have an exploring mind that wants to investigate how things work and whether there is a better way of doing things," says O'Leary. "At InnaLabs®, there are so many opportunities to work on new technologies that are an improvement on what already exists in the knowledge that your technology could be used on a space mission or telecommunications satellite."

InnaLabs® people need to problem-solve to overcome the various challenges that each development stage brings. They must be driven and passionate, with a commitment to want to succeed, according to O'Leary. "Especially in the new space market, the customer wants the product to be high performing under stressful conditions, yet we need to be mindful of size and weight while keeping to the highest quality standards," he explains. "If you have these skills and drive, then it is most rewarding as you plan a concept, and eventually your creation is in space."

In O'Leary's opinion, Ireland is a great place to set up a technical business for several reasons, including its strong industrial background, a good ecosystem in terms of support from government agencies and collaboration with academia.

"Our inertial sensors are manufactured to the highest levels possible, but during the qualification cycles we had many different types of hurdles to jump," he says. "With the help of Enterprise Ireland, Tyndall National Institute, Crann and the University of Limerick, we solved all of these issues. I think it is imperative to continue to build a strong link between industry and academia. This relationship needs to be dynamic, as many other countries are investing heavily in technology and education."

O'Leary believes the next ten years will be very exciting for the engineering sector in Ireland. "When you consider the possible opportunities yet to be realised in commercial space, missions to the moon and Mars, landing on asteroids, autonomous vehicles, artificial intelligence, the internet of things and 3D printing, I think it is one of the most exciting times ever to be involved in engineering."

The engineering sector in Ireland at a glance

The engineered products and sub supply sector is growing with:

+ **€7 billion in exports annually**
+ **1,200 companies**
+ **42,000 people employed**

Ireland has one of the **most educated workforces in the world** with:

+ **53.5% of 30-34 year-olds have a third level qualification**
+ **Almost 30% of students are enrolled in Science, Technology, Engineering and Maths courses**

Graduate case study

Name:
Éadaoin McLoughlin

Organisation:
ESB

What is your job title?
Power System Studies Consultant Engineer, Engineering and Major Projects, ESB

What was your previous role (3 roles)
Power System Studies Engineer,
ESB International Bahrain Office
Graduate Electrical Engineer, ESB

What did you study and what educational qualifications do you hold?
I studied Electrical Engineering in UCD. I did the 5 year program which is a 3 year Bachelor of Science (BSc – Engineering Science) and a 2 year Masters (ME, Electrical Energy Engineering). I graduated from UCD in 2014.

What first attracted you to working in engineering?
I liked maths and physics in school and how they applied to the world around us. I was attracted to the idea of using science to solve real world problems. The huge challenges facing the energy industry made it seem like a very exciting, dynamic industry in which to work.

Also I liked the fact that an engineering degree gives you with a professional qualification which is recognised worldwide was very attractive.

What do you like about your job?
I really enjoy how varied my job is and the wide range of projects I work on with different clients and different project teams. One day I could be working on electrical infrastructure development in Bahrain and the next I could be examining a new wind farm connection in Ireland. I enjoy working as part of a multi-disciplinary team.

It is a very exciting time to be working in the electricity industry and there are great opportunities to be involved in innovative projects which are not only shaping the future of the industry but also impacting on the way people will live in the future.

How has engineering changed since you started working in the industry e.g. new technologies, skills, processes, business growth etc?
It has only been 4 years since I graduated so there have not been any major changes but one change which I have noticed is the focus on data analytics in the industry. This is a very fast developing area and a lot of the projects in which I am involved now include some aspect of data analytics.

Evolving skills for high-tech industries

Globalisation, rapid digitalisation, changing lifestyles and new consumer preferences mean jobs and careers are being transformed. Ibec has responded with a comprehensive and forward-thinking campaign.

Over 60% of children today will work in jobs that currently don't exist and estimates suggest that students currently in the education system will have held an average of 10-12 jobs by the time they reach the age of 38. It's a reality that will affect hi-tech sectors like engineering.

"In the longer term, we will see fewer people stay with one organisation, or even one profession, for the whole length of their careers. People will want greater variety of work in their longer working life," says Ibec Director of Employer Relations Maeve McElwee.

"As a nation, we need to look at the skills we need to develop, particularly in graduates, to capture the sense that education is not just about a primary degree such as engineering. It is necessary to embed fundamental learnings around the nature of work itself and the key attributes people can apply to different areas. This could be how to translate an area of science into marketing or using softer skills for managerial roles."

Ibec launched its *Smarter World, Smarter Work* campaign, to offer a roadmap for the future of work with a range of actions across four key areas:

- Investment in skills and employability;
- Flexibility at all life stages;
- A dynamic labour market; and
- Smoother career transitions.

The initiative started with a report entitled *'Future ready: improving graduate employability skills'*, which sets out detailed recommendations on how business can work with educators to ensure the necessary employability skills are brought into the curriculum.

Maeve McElwee
Director of Employer Relations, Ibec

"The new world of work is more exciting, but also less predictable. To address this, public policy must focus on investing in an individual's employability rather than maintaining roles that will eventually become redundant," Ibec CEO Danny McCoy stated in the report.

"Every time we look towards the future, education is always the foundation on which we must build," says McElwee. "Given that a lot of aspects of the four themes of the *Smarter World, Smarter Work* campaign are interchangeable Ibec has carried out various other pieces of work which fit under the four themes. These include our recent Maternity Leave and Parenting Toolkit to address some of the wider policy issues around flexible working and balancing the needs of employers and employees."

Proactive planning

Underpinning the campaign is the accelerated pace of new technologies and how this will affect career paths and industry requirements. In the case of engineering, such technologies include the use of more artificial intelligence, robotics and computer aided design.

"It will be necessary to factor in some redundancy, but we want to challenge organisations to think about exactly what skills they will need in the next five years and how to plan for that in terms of job specifications and recruitment. It's important not to just focus on the technology they need to invest in, but also what fundamental operational changes they need to make, looking at areas such as the optimal number of employees and planning for certain qualifications no longer being required," says McElwee.

"We are linking in with universities to make sure the appropriate skills evolve and the graduates that emerge reflect this. Added to this is the need to recognise that the so-called 'gig economy' has become part of our social fabric. It's important to consider the implications of an even greater number of people working independently, looking at things like social welfare, sick leave and how to encourage and facilitate people in and out of education."

Skillnets supporting engineering nationally

The Irish Medtech Skillnet and First Polymer Skillnet bring businesses together to collaborate, share best practice and respond to skills needs with industry-led training that support business growth.

The Irish Medtech Skillnet has grown in recent years with €6.3 million in expenditure and 8,900 trainees underscoring the group's proven track record delivering training that meets business needs.

First Polymer Training (FPT) Skillnet was one of the very first funded Skillnet Ireland networks established in 1999, formed by Ibec's Polymer Technology Ireland. The group has trained in excess of 7,000 people, delivered in a one-of-a-kind dedicated polymer training facility in Athlone with state of the art polymer processing facilities.

Members of the Ibec Engineering Network can benefit from reduced rates of the government funded training provided by Skillnets with the array of programmes from leadership and lean manufacturing to polymer processing and design as well as customised onsite company training.

Finding the right balance

Employers have faced challenges in recent years because of legislation which restricts opportunities for them to be more flexible, according to McElwee.

A much more positive narrative around flexibility is needed, according to McElwee. "This is a really important part of the dynamic labour market aspect of the Smarter World, Smarter Work campaign. The narrative to date has tended to be around flexible working not offering security and being precarious. This is not always the case. Employers, in accommodating flexibility and statutory entitlements, must protect the security of employment of the person availing of leave," she explains. Viewed positively, such contracts often offer significant opportunities to try out new roles or to step-up and gain experience that can enhance career prospects."

"We need to drive greater participation rates in our labour market, particularly female participation so it is important to find a good legislative balance that doesn't close down opportunities for employers to be flexible."

How engineering is supporting sustainability

Climate change is dramatically changing the world with serious consequences. Engineering is tackling this challenge with innovation in technologies to support renewable energies, from new strides in wind energy to better ways to charge electric cars. Ibec's ambition is for Ireland to become a low carbon economy, while businesses want the Government to make climate change a priority.

Worldclass infrastructure needed for worldclass engineering industry

Ibec is leading a major campaign to make Ireland a better place to live and work. While Ireland is already a location of choice to start and grow a manufacturing business, more needs to be done to ensure sustainable growth and maintain the competitiveness of the engineering industry.

The basis of what determines the economic success of a region or country has radically changed in recent years. When at one time a company decided to set up a factory or service business in a certain location, the talent would simply come. Now, it is the location of the talent that is the determinant of economic success.

This significant shift is the key driver behind Ibec's *Better Lives, Better Business* campaign, which was launched in 2018 with the aim of making Ireland a better place to live and work so that Irish businesses can more effectively attract and retain talent.

"When we engage with businesses about the really big things they see as challenges and opportunities, the uniform issue that comes up most is the ability to attract and retain talented staff," says Fergal O'Brien, Director of Policy and Public Affairs at Ibec.

"Connected to that issue is the type of environment and quality of life available for mobile talent. One in five workers in Ireland is non-national and a lot of Irish people choose to work abroad. The shortage of engineers is a global phenomenon and Ireland has to be best in class to attract them."

SO

> " Given the quality of engineering and manufacturing we have in Ireland, for those sectors to really flourish we need to be able to develop worldclass infrastructure in a timely fashion that is equally sophisticated."

The *Better Lives, Better Business* campaign is championing new policies across four key pillars – housing, infrastructure, planning and sustainability.

"In the past year, the area we have been most engaged in is the housing challenge as this is the main obstacle in terms of bringing workers into any particular city, not just Dublin. There are housing shortages right across the country now," notes O'Brien.

In collaboration with Property Industry Ireland, Ibec produced a detailed piece of policy work called 'Better Housing – actions to increase affordable supply'. Its recommendations are aimed at addressing blockages to supply as well as ensuring a stable and smoothly functioning property market.

"We have seen some progress, such as innovations in the planning system and an increase in housing completions," says O'Brien. "The real challenge is around affordability and the need for the Government to provide more certainty in this area. The 'Help to Buy' scheme is good, but more needs to be done.

"Supply is not running as quickly as we would like. It is simply not possible for some developers to bring new units to market because it can't bear the cost prices involved. The high cost of land is also a very significant problem."

Infrastructure

Earlier this year, Ibec published 'Better Planning: reforms for sustainable development' as part of the *Better Lives, Better Business* campaign. In light of the appointment of the Planning Regulator in December 2018, it makes various recommendations around local authorities, legal reforms and the streamlining of procedures.

"Now we have gotten to the stage where we have a new National Development Plan and there is a lot more money available to support infrastructure development, it is clear to us that the planning system is not fit for purpose," says O'Brien.

"Far too often, public infrastructure projects and company investments are delayed and hindered by complexities in the system. This is particularly significant in terms of traffic congestion challenges. The timelines involved in delivering proper road infrastructure and improving public transport are incredibly long. From initial project approval to commencement of construction typically takes half a decade."

The time lost when it comes to appeals on strategic infrastructure development applications to An Bord Pleanála is adding to the problem, O'Brien continues. "There are much

Fergal O'Brien, Director of Policy and Public Affairs, Ibec

Better delivery of infrastructure to enable better business

Investment in public infrastructure is fundamental to creating the economic conditions necessary for long-term national prosperity according to Ibec Senior Public Sector and Regulatory Executive Aidan Sweeney. He cautions that "Underinvestment over recent years has run down the region's stock of critical infrastructure". "The lack of investment in the economy has been a major constraint to progress. We have lost ground in international 'liveability' stakes," he adds. It is now time for corrective action according to Sweeney.

The National Development Plan (NDP) launched as part of Project Ireland 2040 has earmarked a €116 billion investment on priority projects over the period to 2027 and will see annual capital spending exceed 4% of economic output.

There are 271 projects and programmes currently included in the Government's Capital Projects/Programmes Tracker. If delivered, the NDP will go a long way to remedying the chronic and pronounced infrastructural deficits that need to be addressed.

"Ibec believes that more needs to be done and that the NDP does not address all the key infrastructural deficits. It is important that the right infrastructure can be delivered" Sweeney notes. This is the core objective of the infrastructure strand under Ibec's Better Lives, Better Business campaign.

Ibec aims to influence public debate and decision makers to ensure that the country's infrastructure improves people's quality of life. This will underpin sustainable economic growth.

Sweeney calls for action saying "We must be able to deliver projects in a timely, certain and consistent manner. Timelines concerning planning and procurement must be streamlined. Additional projects enabling economic growth across the country should be advanced. Availing of funding from external sources the European Investment Bank should be stepped up."

He concludes, "we should be using the newly announced competitive funding streams such as the Urban Regeneration and Development Fund, the Climate Action Fund and the Disruptive Technologies Fund more strategically to unlock further investment locally."

Aidan Sweeney,
Senior Public Sector and
Regulatory Executive, Ibec

longer delays on appeals compared to other countries. We need proper resourcing in terms of specialist judges and greater clarity around the grounds for appeal. This is a significant frustration for businesses and citizens generally.

"Given the quality of engineering and manufacturing we have in Ireland, for those sectors to really flourish we need to be able to develop worldclass infrastructure in a timely fashion that is equally sophisticated."

Sustainability

The sustainability pillar of the Better Lives, Better Business campaign is relevant to all key sectors in the economy, including housing, transport and energy. "We are trying to achieve synergy across the four pillars of the campaign. Ibec's flagship piece of work was our leadership view published in May on how to build a low carbon economy. It represents the first time the entire business sector across all trade associations has come together to really support a strong initiative in this area," explains O'Brien. "It is very ambitious from a business perspective and we are also making some brave calls, including the support of an increase in carbon tax as we acknowledge this will be one of the tools to change behaviour."

Businesses are really engaging with the Ibec report, which is entitled 'Building a competitive low carbon economy – An Irish business roadmap to 2050', according to O'Brien. "They are looking at things like their supply chain to see what changes they can make to support their own transition to a lower carbon process. In addition, businesses also see a significant employee engagement factor in being a low carbon operator," he says.

Winds of change

Since arriving in the Irish market over 20 years ago, ENERCON has responded to changing customer needs with innovative technologies and fast service. There is a huge opportunity now in wind energy if the Government put in place the right policies to embrace this important technology.

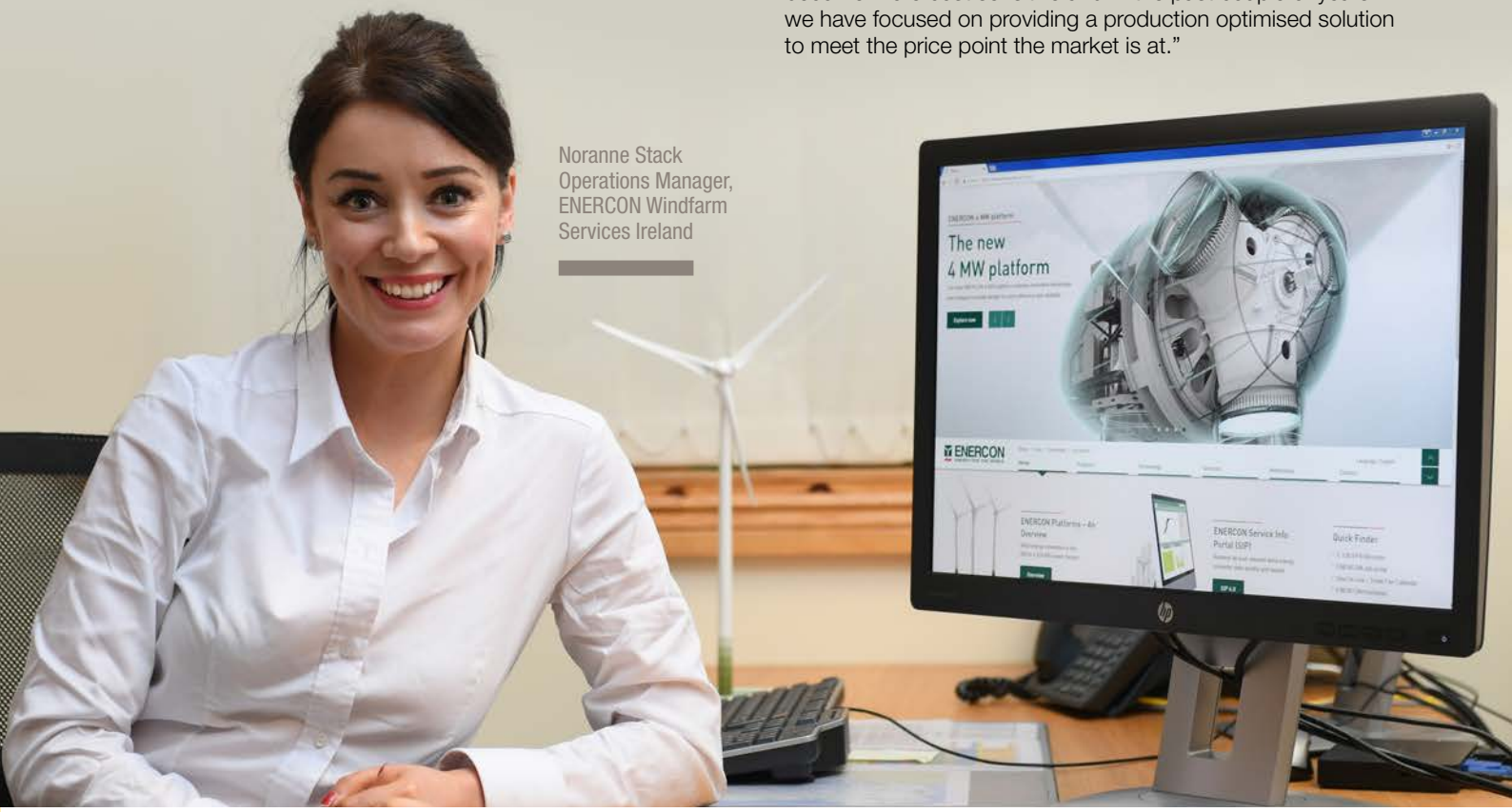
Established in Germany in 1984, ENERCON GmbH designed and developed the world's first direct drive solution for wind turbines. This groundbreaking gearless technology involves fewer moving parts, which means less stress on the machine and less likelihood of mechanical faults over time.

To date, over 650 of ENERCON's 's turbines have been installed in Ireland and its Irish subsidiary Enercon Windfarm Services Ireland is responsible for maintaining all of these, as well as having carried out the vast majority of installations.

Having entered the market in 2005 with a small physical presence, ENERCON Windfarm Services Ireland set up its headquarters in Tralee, Co Kerry in 2010 and has grown with 12 other bases around the country and over 180 employees now.

"ENERCON has always stood out relative to competitors in terms of the technologies it uses. Turbines continue to be its bread and butter, but the company has diversified into other areas including e-chargers for electric vehicles and battery storage," says Noranne Stack, Operations Manager, ENERCON Windfarm Services Ireland.

"In recent times, the challenge within the wind industry across Europe has been to optimise production while at the same time reducing costs as the tariff supports are no longer there to the extent they were previously. Customers have become more cost sensitive and in the past couple of years we have focused on providing a production optimised solution to meet the price point the market is at."



Noranne Stack
Operations Manager,
ENERCON Windfarm
Services Ireland

ENERCON released a new platform focused on streamlining costs, which involved a change in the design of wind turbine nacelle. Shaped like a rugby ball, the nacelle is located at the top of the turbine in between the blades and houses all of its generating components.

In addition to optimising production, ENERCON has made sure to respond to customers' needs and expectations in relation to service. "From a practical point of view, if a customer has detected a fault, we have to be ready to react rapidly so that the turbines are back spinning as quickly as possible. This means our people have to have the knowledge to do first-time fixes and be familiar with our database of solutions and retrofits. They need to have a deep understanding of the technology," says Stack.

The introduction of the Integrated Single Electricity Market (I-SEM) last October is impacting how Enercon's customers do business, making fast and efficient service even more important for ENERCON Windfarm Services Ireland. "A lot of our customers are selling electricity via auction systems through the grid. They need to be able to forecast production on a given day, when maintenance is going to happen and predict if they are going to have faults. We have to focus on minimising downtime for these customers by supporting them with all of this," explains Stack.

Varied customer base

In Ireland, ENERCON has over 100 different customers across its 650 turbines, varying from farmers developing individual turbines on their land to larger companies from different industries which are striving to generate a proportion of their electricity from renewable sources.

"Installation projects are always happening and there are quite a few new builds, including a number on the west coast of Ireland during 2019.," says Stack.

"We have two installation teams and one grid connection team. As our turbine numbers grow, headcount grows too. Employee numbers have increased from 100 in 2013 to 180 now."

Enercon Windfarm Services' employees range from electrical and mechanical field service support technicians, to rotorblade technicians, to grid operations technicians and a variety ofoffice-based support positions. .

"There is a lot of variety in our industry covering all sides of engineering. It is a very dynamic area with constantly changing technology. Our people have the opportunity to travel and see a variety of different sites, for example, in we have recently had teams in Scotland where weather conditions can be challenging," notes Stack.

"One of the advantages for us in Ireland is that we have been able to corner the market for engineering graduates who want to return home to work in the rural localities we have grown in."

Globally, ENERCON GmbH employs close to 20,000 people in 45 countries around the world. It has moved into a lot of new markets recently, including in Asia, Africa and South America.

Looking ahead, Stack would like to see a bigger emphasis on renewables generally as part of Irish Government policy. "In recent years, there has been a noted decrease in regulatory support for the wind industry from the Government. However, recent announcements relating to the climate action plan indicate that this may be changing for the better. We believe wind energy has the potential to develop fast over the next couple of years. Some companies, such as in the pharmaceutical sector, are at the forefront of pushing renewable energy generation on their sites and are leading by example. This is the real drive behind growth at the moment."

" We believe wind energy has the potential to develop fast over the next couple of years. Some companies are at the forefront of pushing renewable energy generation on their sites and are leading by example. This is the real drive behind growth at the moment."

Powering ahead

Continuously adapting to the evolving needs of the energy industry, Renley has placed an increased emphasis on innovation in recent years by tapping in to industry-led research and assembling more in-house innovative teams. As it continues to grow its strategy is to stand-out from competitors by offering superior products, designed to each utility's specification, at costs that are competitive with off the shelf products. Renley provides support and often design accessories and alternative configurations throughout the lifecycle of our framework contracts to meet the evolving needs of our clients.

Two years ago, Renley moved from its base in Walkinstown in Dublin to Dunboyne, Co Meath to facilitate expansion. Managing Director, Declan McGrath expects turnover to grow from €6.5 million this year to €10 million a year in six years' time as the firm increasingly wins framework contracts with utility companies in Ireland and the UK, African and Australian markets.

We won a lot of business with ESB Networks and Northern Ireland Electricity in 1997 and went on to supply products to Scottish Power. We need to push for medium to long term framework contracts and are now securing them with ESB Networks and NIE for five to seven years. The UK currently accounts for about 2% of the business but we aim to grow that aggressively to 10% over the next six years.

Established in 1972, Renley designs and manufactures customised solutions for low and medium voltage energy networks. Its offering covers four key areas of the electrical distribution industry: protection, isolation, control and management. The product range includes MV distribution cabinets, mini pillars, Fixed Connection Units, and LV distribution cabinets and other MV and LV distribution cabinets.

A director at Renley since 1992, McGrath bought out the company in 2008, appointing two non-executive directors to the Renley Board. He then hired three more people to complete the management team. With a current workforce of

22 people, the Managing Director's recruitment focus at the moment is on building up the innovation team as well as the electrical engineering expertise within the company. With a current workforce of 22 people, McGrath's recruitment focus at the moment is on building up the innovation team as well as the electrical engineering expertise within the company.

We use 3D modelling and simulation software for a lot of our work and need highly qualified competent designers with experience. 3D modelling and simulation ensures our designs comply with the tender requirements while also giving us the opportunity to innovate and collaborate with our customers. Good engineers who know what they're doing are essential as the products we design become more innovative and competitive in nature. We have recently appointed an electrical engineering person to lead and develop the engineering design team.

The Technology Gateway Network has allowed Renley to leverage the expertise of over 300 industry-focused researchers and access specialist testing equipment and facilities. This programme runs in partnership with Enterprise Ireland and the Institutes of Technology in Ireland, has enabled the company to interact with research in areas such as energy management and design.

Combining this cutting-edge research with the knowledge and experience of our electrical distribution network teams has allowed us to extend product innovation to meet the expectations of the industry.

Renley has forged a special link with Dundalk Institute of Technology, which involved the company providing funding to send a number of students to carry out research into the utilities industry in the African continent.

Increasingly, Renley's target customers are saying they are looking for Irish companies which take on competitors by supplying products which are better. In practice, this means Renley is now focused on generating its own intellectual property while at the same time striving to bring costs down by, for example, introducing Lean principles into its processes.

Through collaboration with clients we can respond rapidly to key challenges and trends in the industry, such as the demand for greener renewable energy. For example, we have supplied a lot of products for wind farms to CG Power and we hope to soon expand into supplying products for wind farms to other utilities in the UK market. The solutions provided by Renley have been used by CG Power in wind farms in the UK . Northern Ireland and the Irish market.

The huge emphasis on the decarbonisation of energy generation has stimulated investment in interconnection and high voltage transmission systems. The electrical engineering industry is going through significant change in Ireland, UK and European markets as countries try to acheive the complete elimination of carbon by 2050. The next challenge will be at low voltage distribution level as more vehicles become electric and consumers play a more active role in energy conservation and generation. At present there are not even enough charging stations, the infrastructure to support them is even farther behind.

Making high standards a priority for better competitiveness

Technology and business are changing fast with convergence across sectors making standards interoperability a priority. Businesses that make standards a priority can get a competitive edge. Benchmarking against international standards is a priority for businesses, that why Ibec Engineering Network members can come together to share best practice with the Occupational Environmental Health and Safety Forum.

Standards for success

The pace of standards development and technological change in engineering has accelerated in recent years, with new opportunities in the areas of digital transformation and the low-carbon circular economy. But Brexit could pose a challenge if companies are not mindful of standards implications.

The National Standards Authority of Ireland (NSAI) is focused on putting all Irish businesses, especially in high-tech sectors like engineering, at the heart of international standards. This will allow them to benefit from cutting-edge technologies and enable them to grow both domestically and in new markets, according to Chief Executive Officer Geraldine Larkin.

"This is a really exciting time to be in the NSAI as our standards work is codifying new innovations and technologies, as well as those likely to come down the track in a couple of years' time. The two big areas affecting engineering at the moment – digital transformation and the low-carbon circular economy – have very different requirements, but huge implications in terms of standards."

Digital developments

In relation to digital transformation, this is all about businesses and engineers exploiting the capabilities of technologies to create more robust digital models.

"Everything is becoming more interoperable. Standards that might have been developed in fintech for blockchain are suddenly applicable in areas where the traceability and authenticity of transactions are important. This could be anything from real estate through to food traceability," Larkin explains.

"Now, moreso than ever, technologies can speak to one another and a lot of our standards work is around ensuring that level of interoperability is covered."

There is huge potential for engineers to retrofit sensors to all types of machines so that suddenly they are connected to the cloud and the internet. This means engineering products and innovations are also becoming data hubs. "Standards have a big role to play in how that data can be manipulated and the trustworthiness of it – for example, what safeguards are needed in relation to how an autonomous vehicle responds in a crash situation?," notes Larkin.

Dramatic changes in traditional manufacturing also have implications in terms of standards. "We are used to the idea of robots doing different types of automation, but now we have cobots that work alongside humans and develop far higher-level and more efficient services," explains Larkin. "The challenge is how we then lift human intervention to a new level to create competitive advantage in those spaces. 3D printing is revolutionising mass production as we know it. If engineering firms can create just-in-time 3D products and put those on their clients' sites, this changes the whole concept of manufacturing."

The Government's Future Jobs framework has highlighted the role of standards in terms of bridging the gap between new technologies, current jobs and what the future workforce will look like. "There is a lot happening in this area. Standards will help with efficiencies and productivity as we are going to see new products and operations we haven't even thought about as yet," notes Larkin.

Geraldine Larkin
Chief Executive Officer, NSAI

> “ Once a company has a standard it is demonstrating that it is operating to the best international practice, which means it stands head and shoulders above competitors anywhere in the world.”

The circular economy

The NSAI has done a lot of work to match standards activity with the Sustainable Development Goals set out by the United Nations in 2015. It has looked at low carbon power sources with minimal outputs, standards relating to the recycling of materials and what the end-stage for various components in new product development will be. “The suite of standards developed around Building Information Modelling [BIM] overlaps with this area. BIM allows technology to speak to the green economy through various measures, such as the tracking of products and components,” says Larkin.

The core standards relevant to any business are ISO 9001 (quality management) and ISO 14001 (environmental management), ISO 45001 (health and safety) and more recently ISO 50001 (energy management). NSAI introduced ISO 27001 to allow Irish businesses to provide some level of assurance that the systems they have in place are in compliance with GDPR requirements. The next stage of this will be cyber security certification, which is currently being discussed at the European Commission.

“There has been an increase in the take-up of standards, both in terms of the general suite and also specific standards relating to niche areas of activity. Businesses are seeing the competitive and market advantage in achieving standards. Once a company has a standard it is demonstrating that it is operating to the best international practice, which means it stands head and shoulders above competitors anywhere in the world,” says Larkin.

Brexit – standards implications

In the past two years the NSAI has been encouraging all businesses to consider the implications of Brexit, particularly in relation to having products properly certified and recognised in the post-Brexit environment.

“There may well be opportunities for more Irish firms to get involved in standards development as it will be important their voice is heard once the UK leaves the EU. It is unclear at the moment whether there will be any divergences in certifications and standards, although the UK is pointing to a legislative framework that will recognise European standards and norms,” says Larkin.

“Irish companies need to be very much aware of what could happen, not just with regard to using UK bodies for certification. There will be much larger implications up and down the supply chain. For example, if a component is being sold through the UK or by a body under UK authorisation, questions need to be asked about what will happen in those circumstances. A simple but core component sourced through the UK by an Irish engineering firm might not be as readily available as before.”

Getting ahead of EHS regulation by sharing best practice

Occupational and Environmental Health and Safety (EHS) standards and procedures impact the operations of every company and any changes in EHS legislation can have far-reaching effects Jennifer McCormack warns. “Key synergies in health and safety practices exist across the engineering and manufacturing industries. We’re leveraging this shared expertise to develop best practice models and new ideas,” McCormack says. Whatever the industry, having a strong safety and assessment programme in place, coupled with a positive safety culture, is vital.

Recognising this, the Ibec Medtech & Engineering EHS Forum was established, McCormack advises that the group exists “To support the sharing of up to date information on key EHS trends by bringing together health and safety professionals from both industries to discuss shared challenges, best practice insights and build industry relationships.”

The forum agenda is developed “By industry for industry with members encouraged to share case studies and success stories with each other to promote peer learning and improved EHS practices” she adds.

Key areas of interest for the group include:

- Behaviour-based safety
- Manufacturing ergonomics
- Personal injuries in the workplace
- Best practice in the management of EHS activities
- Promoting a positive safety culture while tackling complacency

The EHS Forum provides and anonymous query facility, which consists of 170+ EHS professionals from engineering, medtech and polymer companies. This is an invaluable resource for members enabling them to gain fresh insights on current issues, EHS challenges and strengthening current EHS structures and systems.

Recent feedback from members has helped to highlight top environmental programmes currently underway in Irish sites including:

- Identify and implement resource reduction projects (including energy, water and waste)
- Develop and support re-usable / recyclable packaging and reduce pallet packaging
- The installation of electrical vehicle charging points for employees
- Develop a culture of sustainable thinking in companies by increasing environmental awareness and responsibility

The Ibec Medtech & Engineering EHS Forum meets twice yearly and is open to all occupational, health and safety professionals in the Ibec Engineering Network.

Jennifer McCormack
Connected Health Skillnet
Network Manager,
Irish Medtech Association

A sign of things to come

Finbarr Clarkson
Managing Director,
Gaelite Signs

Having started out installing neon signs in Dublin in the 1930s, Gaelite Signs is now supporting cutting edge improvements for enhanced in-store customer experiences. Moving beyond traditional process, it has embraced new technologies in recent years like computer assisted design and 3D printing to deliver more sophisticated products.

> “I believe the skillset and fundamental knowledge of people who started as apprentices is so much higher than people who fell into the industry in an unstructured way.”

One evening six years ago Managing Director of Gaelite Signs Finbarr Clarkson was watching the BBC News when Chief Executive of Tesco UK & Ireland Philip Clarke came on to speak about a new concept in retail. “He was presenting Tesco’s new store in Watford where people could have a cocktail and a duck stir fry in a concession inside,” he recalls. This vibrant new eat-in section attracted customers attention and challenged them to think of Tesco as more than a grocery store with the eye-catching signs manufactured by Gaelite, in Dublin, clearly visible in the background.

“If someone had told me ten or 12 years ago we would be involved in hundreds of projects for Tesco in the UK I wouldn’t have thought it was possible. Tesco was so far ahead of everyone else in the development of next generation stores focused on creating an experience for customers. We can apply our expertise gained with Tesco to Irish and UK scenarios.”

Gaelite provides the permanent branding fixtures internally and externally for these next generation stores. “We help to create almost a 3D environment where illuminated lettering directs and informs customers walking around and gives a sense of what the store is going to offer them. It is a whole different means of communicating. Gaelite has become a solutions provider in this area rather than just an implementer.”

An example of Gaelite’s work on next generation stores in Ireland is the Spar at Abbey Street Luas stop in Dublin’s City Centre. “The aisles are wide and the signage is hung from the ceiling rather than just on the walls. It is a high-tech environment, designed to be stimulating and to highlight all that is available for immediate consumption,” Clarkson explains.

Spar has been a client of Gaelite for 30 years in Ireland. Other important relationships have been built up with Maxol, Bank of Ireland and Kia Motors Ireland. “We have worked with most of the motor industry in Ireland, in a lot of instances providing localisation services to large European sign manufacturers,” says Clarkson. “A really substantial project for us recently was Volkswagen’s new dealership in Finglas which involved logos coming from a factory in Germany.”

Early days to evolution

Gaelite was set up in 1933 in Abbey Street in Dublin to manufacture and install neon. This was Ireland’s first venture into this display medium and was quickly put to use decorating Dublin’s early cinema fronts and interiors. It wasn’t long before advertisers and other businesses spotted the potential for neon. This was the basis for what Gaelite does today.

Currently employing 45 people spread across production, design and project management, Gaelite has two factories – one in Sandyford Industrial Estate specialised in bespoke signage and digital printing and a second in Clondalkin, which is more focused on light engineering and the traditional skills of the signage industry. The company has tripled its turnover in the past ten years.

“The traditional process involves cutting, folding and painting sheets of aluminium and turning them into a finished product,” says Clarkson. “We have owned our own 3D printer for a few years. Now, we design a profile using computer aided design [CAD], 3D print it to check all of the functionality is correct, commission a dye and produce the profiles with a factory finish that is guaranteed for ten years outside. The design content of what we do has gone up exponentially.”

“When we are tendering for a job we don’t have any real sense of the standards competitors are operating to. We are constantly looking to benchmark ourselves against the proper standards, including ISO 9001, CE structural steel standards and CE standards for lighting and wiring,” notes Clarkson. With this in mind, Gaelite has made benchmarking against international standards over the past ten years a priority.”

Routes to work

Gaelite’s experience in the UK combined with research across Europe led to the company almost entirely upgrading its manufacturing techniques. “A lot of the equipment we use is similar to what you might see in a window manufacturing company. We focus on materials that are quick to assemble. All elements must have longevity,” explains Clarkson.

A firm believer in apprenticeships, Clarkson trained in all aspects of the sign trade at Gaelite, having first joined the company in 1988. He left in the late 1990s to run his own businesses and was head-hunted back in 2006 as Managing Director, with a remit to revitalise the business.

“We recently restarted our apprenticeship programmes and have two young people under the sheet metalwork apprenticeship. It is so important to encourage young people to consider this route, which has been the cornerstone of German industry,” he says. “Our Technical Manager Alan Brauner was Apprentice of the Year 15 years ago. I believe the skillset and fundamental knowledge of people who started as apprentices is so much higher than people who fell into the industry in an unstructured way.”

Representing engineering industries with international advocacy and engagement

A changing Europe presents both opportunities and challenges for Ireland. Our international reputation as one of the most competitive and productive countries in the world means we're well placed to support further innovation as a high-tech economy. As one of the leading lobby groups in Europe, Ibec is representing member businesses both in Ireland and internationally, while Orgalim is connecting engineering firms across Europe.

Dynamic international engagement

Ibec is making sure that the voice of Irish business continues to be heard at both the macro and sectoral levels in the EU and there is significant opportunity for Ireland to be at the forefront of how Europe responds to technological changes and climate change.

Ireland's position within the EU is critical to the future development of the economy and Ibec will be very engaged in the framing of the EU's new work programme for the next five years, which is currently being developed, according to Pat Ivory, Director of EU and International Affairs, Ibec.

"With a new Council, Commission and Parliament, the EU has a dynamic future ahead of it. There is likely to be an increased focus on innovation and a new industrial strategy for Europe, which will be important from an Irish context," he says. "Ireland has a high-end, technology-based style of manufacturing and strong innovation capabilities compared to other member states which are more traditional. With the convergence of technologies across different sectors and industrial areas, there is a significant contribution we can make to the future growth of the EU economy."

Pat Ivory
Director of EU and International Affairs, Ibec

> “We can be at the forefront of changes in the digital space, in pharma, medtech, high-tech manufacturing and food and drink – all sectors which are reliant on a strong engineering base.”

With an office in Brussels since the 1970s, Ibec is the only Irish business representative group with a permanent presence on the ground there. “Working with European business partners we have extremely close engagement with the European institutions. However, Ibec not only represents the voice of Irish business at macro level but also at sectoral level through our numerous sector associations, which are also linked into their European counterparts ,” says Ivory.

In addition to Ibec’s membership of BusinessEurope and the European Services Forum, it is also involved with these organisations’ individual sector groups, including Orgalim in the engineering space and Digital Europe. “We are very well networked in Brussels and in a good position to influence the regulations and legislation that comes out of European institutions,” notes Ivory.

“Ibec has been at the forefront in promoting the idea of innovation at European level and of ensuring that the industrial strategy reflects the role of services as well as manufacturing. A lot of what happens in the manufacturing context is now also impacted by the provision of services and integrated nature of global supply chains.”

Two of the main areas of opportunity Ivory sees for Ireland in relation to the EU are international business and responses to climate change. “It is vital that the new Commission and Parliament ensure that the EU continues to take a leadership role in openness to trade and investment. On climate change, Ibec has introduced a roadmap towards a low carbon economy by 2030. There is broad agreement that this is something we can commit to as a business organisation. We have an opportunity to make Ireland a model of sustainable industry,” he says.

“Because of the dynamic and modern style of doing business, one of the strengths of the Irish economy is that we’re fleet of foot in terms of responding to change. We can be at the forefront of changes in the digital space, in pharma, medtech, high-tech manufacturing and food and drink – all sectors which are reliant on a strong engineering base. The skills our people have and our role in the global supply chain mean that engineers and engineering companies can contribute to these changes.”

The biggest challenge facing Irish business is Brexit, particularly if the UK leaves without a deal. “Ibec continues to support the withdrawal agreement as the best option for an orderly exit by the UK. The other big challenge at the moment is the changed global trading environment, with the emergence of more aggressive trade policy with rising tariffs,” says Ivory.

In Ivory’s experience, Ireland is viewed as having an open, dynamic approach to business and Ibec campaigns, for example on Brexit and the Future EU, have been used as templates by business groups in several member states.

Member companies interested in finding out more and getting engaged in this important work can get involved in the Ibec EU Affairs and Trade Policy Committee.

Positive action in Europe

Over the next decade, rapid technological innovation can unlock a greener, healthier and more prosperous future for the EU and its citizens. And Europe's technology industries are leading the way in delivering solutions to make this happen, according to representative body Orgalim.

Last February Orgalim launched '*2030: an industry vision for a renewed Europe*'. It envisages a Europe in 2030 where innovation drives global competitiveness, a strong industry spreads prosperity throughout the economy, and technology responds to citizens' needs – improving quality of life while enabling the transition to a low-carbon, more sustainable society.

The technology industries represented by Orgalim cover three main branches: mechanical engineering, electrical engineering and electronics, and metal technology. These industries make up about one third of the European manufacturing industry in terms of jobs and exports. In the past five years, employment in these industries has grown year-on-year by 600,000 additional jobs to reach a total of over 11 million.

"Our industries are growing ahead of the economy, with a 3% increase in turnover in 2018 to around €2,000 billion and 2% growth projected for 2019, which is still healthy," says Malte Lohan, Director General, Orgalim.

"We believe that this sector will play an even more important role for the future prosperity of the region than other sectors will. None of the fundamental challenges facing our society will be solved without technology. There is no way we can tackle climate change and be resource efficient, no way we will rethink mobility and cities, without technology at the heart of it."

At a crossroads

Lohan explains the rationale behind Orgalim's vision: "Europe is at a crossroads because of a fundamental realignment of the political environment at home and abroad at a scale not seen since World War II. The superpower rivalry between the US and China is becoming a defining theme. All of this has huge implications for our technology industries."

Lohan is passionate about continuing to foster a culture of collaboration in Europe, as he maintains that the industries Orgalim represents will not succeed in the long run if countries act alone.

"Our ability to collaborate is one of the unique strengths of Europe in a tougher global competitive environment – whether it is across countries, companies and also between the industrial and academic communities. It is a different model than in China or the US," says Lohan.

"The vision we are putting forward recognises that the landscape is tougher, but it is fundamentally an optimistic one. If we make the right choices and don't try to compete on Chinese or US terms we have a unique opportunity to succeed in terms of technological supremacy. We need to build on the historical strengths we have, such as ecosystems, collaboration and industrial leadership in a number of areas including smart manufacturing, clean green technologies and future mobility technologies. Europe has plenty of global leaders in these fields today."

"If we are first movers and create the right policy, investment and innovation conditions for European companies to be the leaders in developing solutions, we will be able to capture markets in Europe and abroad."

Focus on strengths

Orgalim is keen to maintain funding for research and development (R&D) at European level as this is a major driver of the competitiveness of the industries it represents. Horizon 2020 is the world's largest single public R&D programme.

"In the current budget plan, there is significant growth in this public funding to €100 billion. This is an important step, but we would like to see more," says Lohan. "If Member States take a more nationalistic turn and start questioning the benefits of pooling resources, R&D could be one of the areas that could suffer. It is so important that this does not happen, as it would make it harder to mobilise private funding. That multiplier effect is very important."

Orgalim's relationship with Ibec represents a strong link to the voice of Irish business, which Lohan says is essential when framing the right vision for the future. "The Irish business perspective is strongly aligned with our own and we want to help to make a real example of Irish companies, to build on that and reinforce it."

"We can see a healthy vigorous debate of ideas ahead. All voices at national levels need to be heard so that we don't have a negative backward-looking narrative in the next cycle of policy making."

Malte Lohan
Director General,
Orgalim

> "There is no way we can tackle climate change and be resource efficient, no way we will rethink mobility and cities, without technology at the heart of it."

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About Ibec

Ibec is Ireland's largest lobby group representing Irish business both domestically and internationally. Its membership is home grown, multinational, big and small, spanning every sector of the economy. Together they employ over 70% of the private sector workforce in Ireland. Ibec and its trade associations lobby government, policy makers and other key stakeholders nationally and internationally to shape business conditions and drive economic growth. It has over 230 professional services staff in seven locations including Brussels and has 38 different trade associations in the group.

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