EnEf

Energy Efficiency in the Building Sector:

A Sustainable Future

Regional Report

Innovate

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EXECUTIVE SUMMARY

This report presents a profile of the Border, Midland and Western (BMW) region of Ireland. It explores the main characteristics of the region in terms of demographic aspects, infrastructure, industrial and technological infrastructure, social and cultural aspects, education and entrepreneurship. Next, a detailed description of Small to Medium Sized Enterprises (SMEs) in the region is provided. This includes a discussion on the number of SMEs in the region, a general description of the market and some of the challenges that face these organisations. Finally some preliminary findings from our field work are presented.

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1. INTRODUCTION

In recent years major competitive threats to Ireland Inc. have emerged including the rising cost base relative to our trading partners, the continuing migration of traditional manufacturing to low wage economies, as well as increased competition in the high technology sector from other developed economies. Competition is becoming increasingly intense and indigenous industries are finding it difficult to compete. Moreover, research and development by SMEs is limited and economic growth is driven by consumer spending and the property market rather than by internationally traded goods and services.

Creating, maintaining and sustaining enterprise culture in Ireland is a key economic challenge. Ireland's future is dependent on sustained competitive improvements and radical changes in innovation being adopted and implemented by enterprises. This is necessary so that the Irish economy can reposition itself to bring more sophisticated customer focused products and services to a highly competitive global marketplace. Our future economic success lies in the research, commercialisation, production and sale of higher value-added products and services to worldwide markets. According to the Forfás Enterprise Strategy Group report 2004, in order to achieve this it is imperative to develop a "cohesive, strategic and focused approach to market-led applied research and technological development and to leverage increased enterprise investment". Further, their more recent report on Ireland's future skills needs to 2020, emphasises the requirement for a knowledge economy in which skills drive innovation, productivity, and entrepreneurial activity. Irish enterprises must shift from a resource-intensive to a knowledge-intensive, innovative sector that is capable of achieving and maintaining technological leadership in the global marketplace. This is particularly important for our small businesses.

Small and medium Enterprises (SME's) account for a significant proportion of economic activity for any developed economy. SMEs account for 97% of business activity in Ireland, higher than the European counterparts, at 92%. In Ireland 87% of all service firms and 40% of all industrial firms are classified as Micro (Central Statistics Office, 2008). Small businesses are significant because what they lack in size as individual entities is countered by the fact that as a group they are the largest company type in the Irish economy. They also have a large social, cultural and economic impact, and are the largest group of employers in the private sector (Small Business Forum (Macri Report) 2006). In Ireland between January 2004 and June 2007 an average of 2,700 entrepreneurs started new ventures every month, and one in twelve of the adult population were planning to / or had just started a new business (O'Gorman and Fitzsimons 2007) confirming the very positive buy-in from the public to the Government policy of developing an innovation culture. Consequently there can be little doubt that these small businesses are important to the health of the Irish economy.

This report presents a profile of the Border, Midland and Western (BMW) region of Ireland. It explores the main characteristics of the region in terms of demographic aspects, infrastructure, industrial and technological infrastructure, social and cultural aspects, education and entrepreneurship issues. Next, a detailed description of Small to Medium Sized Enterprises (SMEs) in the region is provided. This includes a discussion on the number of SMEs in the region, a general description of the market and some of the challenges that face these organisations. Finally some preliminary findings from our field work are presented.

2. PROFILE OF THE REGION

This report aims to provide a clear and concise understanding of the Border, Midland and Western (BMW) region of Ireland and its potential for growth for Small to Medium Sized Enterprises (SME).

2.1 Demographic aspects

The surface area of the Border Midland and Western Region (BMW) in Ireland makes up 47% of the total surface area of the state but the demography represents only 27% of the population. Urbanisation is relatively low with as little as 32% living in towns with a population of more than 1500 persons. The counties of Mayo, Sligo, Donegal, Leitrim, Monaghan, Louth, Longford, Laois, Cavan, Roscommon, Galway, Offaly and Westmeath make up the BMW Region.

In comparison, on a national level to the Southern and Eastern (S&E) Regions of Ireland and other more affluent European Regions, the Border, Midlands and Western (BMW) region is relatively sparsely populated and rural in nature. Traditionally agriculture has been the main industry within this region. This region has been something of a black spot and has suffered from high levels of immigration mainly due to lack of employment. The average working age is higher in comparison to the national average indicating that a large percentage of the younger population have immigrated in search of employment. In addition, the population growth for the first half of the last decade is almost half that of the national average.

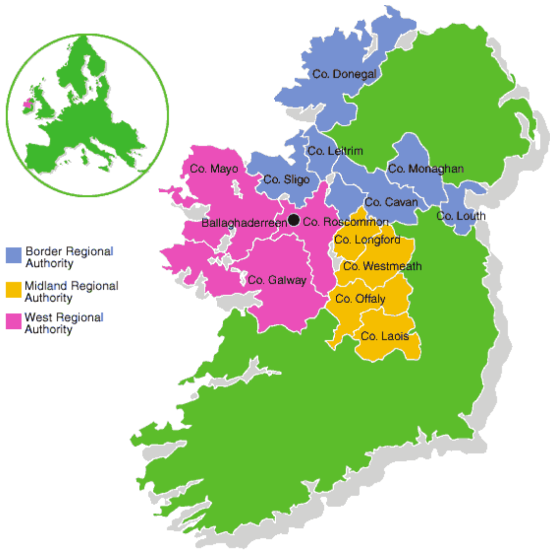

Figure 1-BMW Region of Ireland

2.2 Infrastructure

In comparison to most continental European countries the Irish national infrastructure is poor and undeveloped. The upgrade of all major road, rail, sea and air networks have been of up most importance for the last number of years, especially during the economic prosperity during the late nineteen nineties and the few years of the new millennium. A National Development Plan (NDP) in association with the European Union Structural Funds has been implemented with aim of improving infrastructure nationally. Currently as little as 4% of the population in the BMW Region uses public transportation to get to and from their place of work again this is less that half the national average of 11%.

In terms of accessibility, the Region has two fully international commercial seaports in Galway and Sligo, an international airport centrally located at Knock in Co. Mayo and several other small national airports in Galway, Sligo and Donegal. There are minor rail networks running from Dublin to Galway, Sligo and Castlebar in Co. Mayo however there is a definite need for the opening of a rail network servicing Cork, Limerick, Galway and Sligo servicing the western side of Ireland. The road network within the Region is below European standard. Many of the roads are non-national and minor. There is no major servicing of any of the large urban areas with the Southern or Eastern Regions although there are plans to do so under the national development plan.

2.3 Industrial and technological infrastructure

In economic terms, the primary production in the region is agriculture, fishing, aquaculture and forestry. However, according the department of Agriculture much of the land is classified as "severely handicapped" and the region is dependant on income supports from local and EU government agencies. For the most part all manufacturing and secondary industries are confined to the major urban areas with Galway city and Sligo being the largest. A high percentage of the industry in this sector is in the medical devices and healthcare environments.

The service industry has been steadily increasing and now represents 51% and is the largest single sector within the Region. This is likely to grow especially within the Tourist industry. Almost all of the landscape is natural and unspoilt with some beautiful and breathtaking coastline and mountainous terrain. The entire region only generates 19% of the total national GDP.

The regions labour force represents a quarter of the total national working force. Nevertheless, there are large differences regarding unemployment levels, skilled/qualifications and female participation in comparison to the total labour force. For instance, employment levels rise more slowly than the national average. A smaller percentage of employees have completed second or third level education and the number of unskilled labour is higher than the rest of the country.

Within the region there has been a reduction in employment in SMEs. Many of the problems facing SMEs in the Region today are as follows:

- Many firms are too small and cannot achieve critical mass or economies of scale
- Need to export earlier
- Devote insufficient resources to Marketing / Sales
- Achieve low productivity / added value levels
- Emerge from product ideas rather than market opportunities
- Are financially under capitalised or over borrowed
- Only marginally profitable
- Do little product or market research and lack the capacity to innovate
- Short management expertise and resources
- Lack a strategic perspective.

There is strong involvement both locally and nationally from Government and local authority organisations supporting the development and growth of SMEs across the region. These organisations include:

- IDA Irish Government agency with responsibility for securing new investment from overseas in manufacturing and internationally traded services sectors.
- Enterprise Ireland is the government agency responsible for the development of Irish industry specifically wtihin the area of Technology Innovation, Business Development and Internationalisation.
- Údarás na Gaeltachta is responsible for economic development in the Gaeltacht regions

- FÁS is the national employment and training agency.
- Bord Bía (Irish Food Board) acts as a link between Irish food and drink suppliers and existing and potential customers.
- Forfás is the National Policy and Advisory Board for Enterprise, Trade, Science, Technology & Innovation in Ireland.
- City and County Enterprise Boards (CEBs). These bodies are locally controlled enterprise development companies established in each county and larger urban local authority areas.
- Shannon Free Airport Development Company Ltd was developed under the NDP, concerned with attracting investment to the Shannon region.
- ISME is an independent voice for SMEs throughout the country.
- Bord Fáilte is the Irish Government Agencies, responsible for the development and promotion of tourism in the Republic of Ireland.

In addition to these organisations and especially in recent years there is increased involvement and collaboration between third level institutes and industry. All third level institutes within the region have strong links with local firms and continue to foster and support entrepreneurship and innovation among SMEs. Many serve as incubators, liaison offices and technology transfer institutes for many micro and small enterprises especially those close to the education facilities themselves.

2.4 Social & Cultural

To quote Kottak (2000), "culture is that complex whole which includes knowledge, belief, arts, morals, law, custom, and any other capabilities and habits acquired by man as a member of society". Customs help to tie the Irish together and express their character. Ireland is steeped in traditions, superstitions, customs and tales of old with a rich literary tradition, culture, heritage and history. The culture of Ireland and the Irish people continue to influence all cultures that come into contact with the Irish. Modern Irish culture was formed from a mixture of ancient traditions, religion, and interactions with non-Irish people. The uniquely Irish cultural aspects as listed below:

- Language - Irish (Gaelic) and English are the two official languages of the Republic of Ireland and official documents; street and road signs are all bilingual. In Gaeltacht areas Irish is spoken daily, however English spoken throughout the country.
- Literature- With four Nobel Literature prizewinners in the last century, Ireland's literary pedigree is world-renowned. Past and present Irish writers have inspired audiences through storytelling and the written word.

- Music- The Irish have always loved their music and this close relationship dates over the centuries to the present day. The harp, perhaps the most distinctive of all Irish instruments, is a symbol of this harmony of people and music.
- Sport- The mainstream sporting and recreational activities in Ireland consist of Gaelic Football and Hurling the two national sports. In addition all major sports such as soccer, rugby and athletics are also very popular. Ireland is renowned for breathing scenery with excellent fishing and wonderful golf courses. Sport is an important part of the modern Irish social culture.
- Customs and Traditions- Ireland is very much a western civilised democratic republic with first world values. However, tradition still plays an important part in the everyday Irish life. Family values, catholic religious beliefs and community spirit are still very prevalent throughout the country especially in rural areas.

2.5 Education

The quality of Ireland's education system is exceptionally high. The Independent IMD World Competitiveness Report (2003) rates Ireland as one of the top countries in how it's educational system meets the needs of a competitive economy. In 2003 55, 374 students sat their Leaving Certificate Examination equivalent to the British A level examinations to obtain entry to third level. The current third level student population has increased by almost 37% between 1992 and 2002. Of the 48,000 graduates in 2004 over 57% were in the Engineering, Computer/Software Engineering, Business Studies and general Science fields indicating the current shirt in employment trends towards a knowledge based economy (IDA 2004). Almost 1 million people are in full time education. 60% of school leavers go on to third level education.

In terms of Education the BMW region is successful in producing third level graduates with 11% of the population graduating from a third level institute. This is one percent higher than the national average. However with 28% of the national university students only 13% less than half of all graduates are employed in the BMW Region. Again the lack of employment and lower level of economic and social development are major contributors to the lack of local employment for third level graduates. With respect to Research and Development (R&D) the Region received 12.6% (€80.4M) of funding for its 3rd level institutes between 2000 and 2002 (CIRCA Audit on Innovation in BMW Region, 2004). According to the same report the Region secured only 8.5% of the States national funding for industry related research associations during the same period.

One of the reasons why so many companies choose Ireland is because of the unique workforce - Ireland has the youngest population in Europe with over 40% under the age of 25 years. They are also highly educated and highly motivated. Irelands total investment in knowledge, including investment in public and private spending on higher

education increased by an average annual rate of over 10% over the past decade compared with averages of around 3% by the EU and the OECD (IDA 2003).
Traditionally it has been shown that foreign investors consider the quality and the 'can do' flexible attitude of Irish people to be two of the country's greatest advantages.

2.6 Political Legal issues

In terms of entrepreneurship Ireland scores well in relation to our European competitors. One of the key competitiveness indicators in this area is total entrepreneurial activity. The Global Entrepreneurship Monitor (GEM) attempts to measure entrepreneurial activity by calculating on an international basis the proportion of individuals in the process of starting a new business or who are owner-managers of new businesses. Low costs to register a business and a small level of administration, regulation and legislation all help to attract risk-taking entrepreneurs. The speedy completion of set-up maximises profitability opportunities at this early stage of development. With specific reference to the World Economic Forum (WEF) (2002) studies on business formation within the leading global competitors (US, UK, Germany, Japan etc), assessment of business formation in Ireland reveled the following information:

- The cost of registering a business is low.
- The burden of administration for start-up ventures is low in Ireland.
- It takes a relatively short time to start a business in Ireland.
- An independent study carried out by the International Institute for Management Development (IMD) business school examining the extent to which the creation of firms is hindered/supported by legislation found that Irish legislation is extremely supportive for start-ups, and ranked Ireland 1st out of 16.
- In the innovation and creativity area, the number of patents granted per million population is considered a key indicator. Ireland does not score well here. The number of patents granted per population is well below the EU average number of patents granted.
- In the area of Value-Chain Presence Ireland scored very much on average in comparison to the competition but it must be noted that this is more than likely due to the fact that the there were a large number of multinationals surveyed primarily involved in production. More recent Government backed initiatives have focused specifically on the improvement of Ireland’s value-chain position and the promotion of the knowledge economy. Insurance costs have become a concern among SMEs and need to be addressed.

3. PROFILE OF SMALL TO MEDIUM SIZED ENTERPRISES (SMES)

This section presents a profile of Small to Medium Sized Enterprises (SMEs) in the BMW region. This includes a discussion on the number of SMEs, a general description of the market as well as some of the challenges that face these organisations.

3.1 Number of SMEs in the region

Over 97% of businesses operating in Ireland today are 'small' – they employ fewer than 50 people. There are approximately a quarter of a million small businesses in Ireland. This figure represents more than half of the total private sector, non-agricultural workforce. Small businesses are important for a number of reasons:

- They provide regionally distributed employment around the country, deliver a huge range of local services, and contribute to the economic, social and cultural life of the entire population.
- They pay 50%of VAT on services (over €4 billion), 11% of corporation taxes (around €530 million) and 37% of income taxes (€4 billion).
- They form an essential part of the supply chain for larger firms, and in particular are part of the support infrastructure needed to attract and retain foreign investment.
- The performance of the small business sector is thus an important contributor to the overall quality of life and standard of living in the country.

3.2 Description of the market for small enterprises

The Irish market has grown very substantially. The population – and particularly the number of people in work – has increased. In short, there are more people with more money to spend. In this positive environment, over the ten years since 1995 the small business sector has flourished: the number of small businesses in Ireland has grown by more than 50%, and employment in small businesses has grown by approximately 79%. Economic growth, however, has created a number of difficulties for businesses in Ireland. Small companies are facing greatly increased competition from companies with lower cost bases; High inflation in recent years has contributed to sharp rises in business costs and small businesses have difficulty finding and retaining suitable skilled staff.

Irish companies are facing increased competition from major international players with highly sophisticated business models, coupled with economies of scale in every aspect of their operation. In this environment, only the strongest and fittest companies will survive. A number of trends have recently emerged that are of particular concern, and that present significant challenges for small businesses in the years ahead. These are discussed in more detail in this document.

As the Irish economy becomes increasingly knowledge-based, and as low value-added activities migrate to lower cost economies, a greater proportion of the country's wealth will have to be generated by indigenous companies. Whereas in the past, Irish indigenous companies have tended to start small and remain small, a new generation of indigenous companies is already beginning to emerge – companies with the potential to grow, and in some cases grow rapidly, to conquer international markets. The small business sector is the incubating ground for these companies. Some of them will be technology-based companies, who will exploit the State's substantial investment in R&D and help to assert Ireland's position as a knowledge creator and innovator. A greater proportion will be in services (reflecting the growth internationally of the services sector). These businesses will use highly innovative business models to grow and deliver internationally, services that were previously the preserve of small companies trading locally. The majority, however, will continue to deliver local services and to play their important role in the supply chain of larger companies. Small business owner/managers with the ambition, ability and potential to grow their companies into strong internationally trading entities must be empowered to reach this potential. Those that continue to trade locally largely determine the cost base for both consumers and other businesses, and these must be encouraged to innovate in other ways, in order to maximise their efficiency, quality of product and service, and productivity.
According to the Small Business Forum the business environment in Ireland has been radically transformed in the last 10 years:

- The Irish market has grown very substantially: the population – and particularly the number of people in work – has increased. In short, there are more people with more money to spend.
- The taxation regime has relaxed – for the vast majority of companies, corporation tax has been reduced to 12.5 per cent; the top income tax rate has been reduced to 42 per cent; and the capital gains tax rate has been halved to 20 per cent.
- Short-term interest rates are considerably lower (currently below 4 per cent, compared with 6 or 7 per cent in the mid 1990s).
- In this positive environment, the small business sector has flourished over the last ten years: the number of small businesses in Ireland has grown by more than 50 per cent, and employment in small businesses has grown by approximately 79 per cent.

Economic growth, however, has created a number of difficulties for businesses in Ireland:

- With the liberalisation of international trade and globalisation of markets, small companies are facing greatly increased competition from companies with lower cost bases.

- High inflation in recent years has contributed to sharp rises in business costs.
- The labour market is considerably tighter (unemployment is now around 4 per cent); as a result many businesses have difficulty finding and retaining suitable skilled staff, and wage rates are increasing.

3.3. Challenges facing small businesses

In this changed business environment, there is broad agreement on the challenges facing small businesses today. According to the Small Business Forum, the main issues identified include access to finance; management capability; innovation; ICT audits for small businesses; better regulation; balanced local authority charges; access to information and advice as well as infrastructure. Each of these is briefly discussed in more detail below.

- Access to Finance: While the problem of funding for small business has eased somewhat over the past decade with the improvement in the investment environment and the drop in short term interest rates, small businesses continue to report difficulties in obtaining appropriate levels of finance for start-up and growth. These difficulties appear to be more pronounced for: Businesses in the services sector, with limited capital assets.
- Management Capability: The performance – and even the survival – of a small business depends on the competence and capability of its management. The quality of management affects productivity, profitability and sales growth. Work carried out in Ireland has shown that the level of general management skills in Irish small businesses is relatively poor, particularly in specific functional skills such as human resources, marketing and finance, and in forward planning and strategic management.
- Innovation: Innovation is imperative throughout the enterprise sector as Ireland progresses towards a knowledge-based society. The type of innovation most often referred to is technological innovation, which is rooted in scientific research and development (R&D), but other types of innovation are also important, and more relevant to the majority of small businesses, particularly in the services sector. Very few small businesses have the resources or the expertise to engage in R&D. Those that are unlikely to become R&D performers – and particularly companies in the services sector, should be encouraged to use the best available expertise to help them constantly adapt and be innovative in their businesses. This should help them to bring their operations into line with international best practice, to increase productivity and profitability, and to win new markets.
- ICT audits for Small Businesses: The effective use of ICT by the entire small business sector will be critical to sustained productivity and growth in the years ahead. The Small Business Forum agrees with the assessment of the

Government's eBusiness Strategy that many SMEs need to make better decisions about Information Technology (IT) investment, to manage the IT facilities they already have, and to make more and better use of these facilities. The Small Business Forum believes that the low uptake and limited use of ICT by small businesses is due to a low level of awareness of the benefits presented by the technology.

- Better Regulation: Regulation is necessary and beneficial to society in general, to consumers, to the environment and to businesses themselves. However, regulation carries compliance costs, and much of these are borne by businesses. In recent years, the Government has taken a number of positive initiatives, including the introduction of Regulatory Impact Analyses for new regulations and the establishment of the Business Regulation Forum. However, small businesses are required to bear compliance costs that are disproportionately high, with a resulting loss of competitiveness. The Small Business Forum found that the most burdensome regulations for small businesses are those relating to health and safety, employment, and tax and VAT administration.
- Balanced Local Authority Charges: The rapid growth in the number of households and businesses in recent years has brought about a greatly increased demand for local authority services. Continually increasing local authority charges are a significant issue for all businesses, but particularly for small businesses. Increased charges – commercial rates, service charges (water and waste), planning and development fees and development charges – are impacting negatively on competitiveness, and stifling growth.
- Access to Information and Advice: Despite having access to a very wide range of information sources, far too many entrepreneurs and small business owner/managers in Ireland are without a readily available single point of contact to answer the questions that inevitably arise at each stage of business development. As a result, they are frequently referred from one organisation or individual to another, and may ultimately get advice that is inappropriate or sub-optimal.
- Infrastructure: The very success of the Irish economy over the past ten years has put a huge strain on our physical and social infrastructure. The National Development Plan has played a significant role in closing many infrastructure gaps, but despite these investments, deficiencies remain. Infrastructure developments continue to lag behind demand in many parts of the country, particularly in four key areas:
    - **Broadband:** Broadband take-up in Ireland is significantly slower than in many other OECD countries.

- **Transport:** An efficient transport infrastructure is essential for enterprise development.
- **Energy:** Noting that electricity costs increased by 40% between 2001 and 2004, the Forum is concerned that liberalisation of the energy market is not having the desired effect in reducing prices or improving quality of service. It also notes that very significant investment is needed in order to cater for predicted economic growth.
- **Waste management:** Waste costs are a major issue for Irish business.. Lack of access to suitable recovery and disposal outlets has a negative impact on every enterprise in Ireland.

4. PROFILE OF SMES IN THE CONSTRUCTION SECTOR

Small businesses are described by the EU definition as those that employ 50 or less. However in the construction industry there is a large degree of variability with regard to the average employment levels and size of the operation. For example architect firms employing up to ten people may be considered relatively large for such a firm while a construction firm with ten or less is considered an extremely small firm. Businesses in the construction sector such as architecture, insulation specialists and businesses dealing with specific eco-friendly technology tend to be relatively small. Many of these construction businesses are currently family owned and employ individuals on a contract basis depending on the skill set required for each project.

While no official figures are available as of yet for 2011 it is estimated that employment in the construction industry will fall below 100,000 in 2011 in comparison to employment levels of 257,300 in 2008. In 2007 it accounted for 64% of the GDP. As a result of declining market, banking crisis among other factors, construction output for 2011 could fall to €7bn. This is an 80% decline in activity between 2007 and 2011. According to a government report released however the Irish construction sector is extremely competitive in terms of skills, experience and assets and it is important that we exploit this potential in foreign markets.

Two major trends have hit the construction sector over the past number of years. Firstly is the declining market and level of investment in the construction sector. Secondly there is an emerging market in the area of energy efficient housing. There is both a domestic as well as foreign market available for energy efficient housing both in construction of the housing as well as the development and sales of technology. In the domestic market the production of new housing is almost stopped however the standards and regulation are now driving development to bring new and existing housing up to an energy efficient standard. These changes in the market are also leading to changes in the small business model of construction firms where small firms are becoming increasingly specialised in areas of energy efficiency such as insulation or ventilation.

Many of the firms involved in the manufacturing of energy efficient materials are competing and selling products on the international market. Many companies are modelling their products of the passive house model to enter and compete in this market. One of the companies surveyed stated that over specifying their products so that they become more competitive has helped to open up foreign markets. However keeping abreast of changes to technology is challenging and very costly.

5. PRELIMINARY FINDINGS FROM ENEF FIELD WORK

The two major driving forces in the use of energy efficient housing solutions is legislation stating what must be done as well as customer requests. One of the interviews has stated however that while there are opportunities there to implement these features in new and existing housing, it is vital that to be able to prove the cost savings especially where there is additional cost in the use of energy efficient materials. The design of the house or remodelling of the house for energy efficiency beyond what legislation states, is often requested by the customer and not the architect. Also the survey shows that on average there is no extra financial incentive to use energy efficient materials for the architect. However it was also found the contractor plays a very strong role in influencing the customer and there is also a financial incentive as the implementation of such technologies my increase the cost.

From the interviews we can see that the majority of activity in the Irish construction sector is focused on insulation and heating systems for housing. However more companies are emerging on the market for ventilation systems which according to the interviews done were traditionally misunderstood and were lacking in implementation know how. Furthermore control systems are also being used as part of this design but only where there is good insulation and ventilation system already in place.

Another emerging trend that appears on the Irish market is the emerging of companies that deal specifically with the construction and building of the passive house. The passive house has a certification process with it that is relatively expensive. Hence many of the passive house projects are built to a specification to suite the local surroundings but without certification. Furthermore a number of the building contractors have stated that the passive house model does not entirely work for the Irish climate due to moisture conditions, wind, soil conditions etc.

One of the major challenges facing small contractors is that they are overly specialised. Hence the use of any new construction materials in the area of energy efficiency often requires certification and this certification also implies a diversification in their business model. For very small companies this often poses a significant challenge.

For almost all firms keeping abreast of legislation is vital. As, for the present, many of the uses of these technologies are for the adherence to legislation and standards. Getting on time information is one of the biggest obstacles many companies face. Implementation of these technologies is often regulated and specified in a builders handbook which is issued by the public sector in Ireland. However as the technology and standards are constantly changing the methods of implementation for energy efficient technologies are often incorrect or out of date.

Finally for the sourcing of different technologies available, contractors often find it challenging to know what is available. Currently they find out through conferences, networks or sales representatives but there is little in the way of comparative analysis on performance and cost to help them inform their decision.

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