

# **A Review of the Employment and Skills Needs of the Construction Industry in Ireland**

*A Study by the Skills and Labour Market Research Unit (SLMRU) in FÁS for the  
Expert Group on Future Skills Needs*

**Final Report**

December 2008

# Contents

<b>Preface .....</b>	<b>3</b>
<b>Executive Summary.....</b>	<b>4</b>
<b>Chapter 1: Profile of the Construction Industry 1998-2006 .....</b>	<b>17</b>
<b>Chapter 2: The Impact of ‘Sustainability’ on Activity and Skills .....</b>	<b>26</b>
<b>Chapter 3:The Impact of New Building Methods on Activity and Skills .....</b>	<b>38</b>
<b>Chapter 4:The Future Market for Residential Development 2007-2013 .....</b>	<b>44</b>
<b>Chapter 5:The Market for Physical Infrastructure Development 2007-2013 .....</b>	<b>61</b>
<b>Chapter 6: The Future Market for General Contracting 2007-2013 .....</b>	<b>67</b>
<b>Chapter 7: The Future Supply of Skills to the Industry .....</b>	<b>79</b>
<b>Chapter 8: Forecasting the Skill Needs of the Industry 2007-2013 .....</b>	<b>99</b>
<b>Chapter 9: Conclusions and recommendation.....</b>	<b>107</b>

## Preface

The Expert Group on Future Skill Needs (EGFSN) has asked the Skills and Labour Market Research Unit of FAS to provide a detailed analysis of the employment and skills needs of the construction industry over the period of the National Development Plan 2007-2013.

The construction industry is entering a very challenging period; there was a significant decline in the number of houses and apartments built in 2007 and many commentators are of the view that this adjustment was inevitable and that the level of residential building in recent years was unsustainable in the longer term. In contrast, output is expanding in some other areas of the industry.

The EGFSN is conscious of the fact that the construction industry is undergoing a process of transition and that this process has the potential to create employment opportunities in expanding markets for some of those workers who will be displaced by the contraction in new residential development.

The study adopts a positive approach to developments in the industry and the employment potential to which these developments could give rise. The forecast presented in the study assumes that there will be a considerable increase in activity in some market segments, particularly in infrastructure as a result of the implementation of the National Development Plan (NDP), and the residential repair and improvements market - driven primarily by the sustainable agenda.

Furthermore, it is undoubtedly the case that some projects will emerge over the forecast period, that are not in the NDP and which cannot be foreseen at this time. Such projects will help to offset the adverse impact on employment of any under-achievement of the targets in the NDP.

The study indicates that by 2013 employment in the new residential sector could have declined by over 50%; from around 150,000 at the beginning of 2007 to 65,000 workers by 2013. However, it has identified almost 50,000 employment opportunities in expanding markets within the industry - much of it created by the National Development Plan and increased activity in residential repair and maintenance.

These figures demonstrate the critical role which retraining can perform in facilitating the transition of workers from the new residential sector to other, expanding sectors in the industry.

**Ms Anne Heraty**  
**Chairperson**

## Executive Summary

### ***The construction industry will undergo a process of radical restructuring***

The analysis in the study indicates that the construction industry will undergo a process of significant change in both quantitative and qualitative terms over the period 2007-2013.

The level of activity in new house construction will decline significantly in both absolute and relative terms<sup>1</sup>. In contrast, the level of activity in civil engineering and residential repair and improvements will rise significantly.

The construction industry which will emerge from this process will more closely resemble the structure of the European construction industry where the share of activity accounted for by new house building is significantly lower than in Ireland.

In the short-term (2006-2009) employment in new house building is forecast to decline by over 100,000. However, owing to anticipated growth in other parts of the industry, overall employment in construction is expected to fall by about 80,000 in the short-term. In the longer-term total employment is expected to recover and may reach 231,000 in 2013 (38,000 below the average level in 2006).

These forecasts are contingent on a number of factors. Firstly, they assume that the capital expenditure targets in the National Development Plan are achieved over the forecast period. If there is a significant under-achievement of these targets, the employment forecast in this report for 2013 will be considerably lower.<sup>2</sup> Secondly, they assume that the implementation of the Energy

Performance of Buildings Directive will trigger a considerable volume of activity in the house repair and improvements market between 2009 and 2013.

Thirdly, the forecasts are based on the assumption that those displaced from the new house building sector will take up the employment opportunities that will emerge in other parts of the sector. But this will only be possible if appropriate re-training programmes are put in place.

If one or all of these assumptions prove to be over-optimistic, the employment projections in the report are unlikely to materialise.

The restructuring of the industry will create changes in the skills profile. These changes will be accentuated by legislation and changes in building technology and processes. As a result there will be relatively more professionals in the workforce and relatively less crafts-persons; the building process itself will more closely resemble a manufacturing activity and the industry will have a strong international focus.

### ***House building to decline as investors leave market***

The decline in new house construction over the period 2007-2013 will reflect a contraction in investment activity and a reduction in demand from first-time buyers. However, it is anticipated that affordability will improve considerably through 2009 as interest rates stabilise at current levels or decline.

Furthermore, it is expected that house prices will decline in real terms in 2008 following declines in 2007 and that this trend, combined with the elimination of stamp duty for first-time buyers and increases in interest relief in the 2008 Budget, will bring the first-time buyer back to the market in 2009.

The level of new house construction in recent years has been much higher than the

---

<sup>1</sup> The term 'house' is used to cover all residential dwellings including apartments.

<sup>2</sup> For example, the forecasting model indicates that a 25% annual reduction in NDP activity over the forecast period would result in a further reduction of 20,000 in employment.

level of household formation. Indeed, less than half the new houses built in the intercensal period 2002-2006 were purchased by first-time buyers and many were purchased by investors. Consequently, the level of activity in residential development in the near future will be very much influenced by the behaviour of investors.

Investors were attracted to the new housing market for a number of reasons. First and foremost, the price of houses had been increasing at a far higher rate than the inflation rate since the beginning of the decade and this made house purchase an extremely attractive investment option.

The expectation of high capital appreciation was the single most important factor in attracting investors to the housing market. But two other factors were also significant. Firstly, houses which were purchased as holiday homes qualified for various forms of tax relief and this increased their relative investment value. Secondly, there has been a large influx of immigrants over the last few years and these new-comers provided a rental income to investors while their properties appreciated in value.

These factors no longer apply. The price of houses is declining significantly in real terms, tax relief on holiday homes is being phased out<sup>3</sup> and it is expected that the level of immigration will decline by roughly 50% of recent levels over the next few years.<sup>4</sup>

As a consequence of these developments, it is anticipated that the number of houses purchased by investors will decline dramatically in the short-term. Some investment activity may resume in the medium-term as prices stabilise, but it is

---

<sup>3</sup> A small number of tax relief schemes will continue and the forecasts assume some relatively modest level of investment even in the short-term.

<sup>4</sup> It is assumed that immigration will average 30,000 annually in 2007, 2008 and 2009 or 90,000 in total. Net immigration was over 67,000 in 2007, this means that the immigration estimates for 2008 and 2009 are close to those of the ESRI in their QEC Winter 2007 report of 20,000 and 10,000 respectively.

not anticipated that investment will ever return to the levels which prevailed in the period 2002-2006.

Overall, the study predicts that new house construction will decline quite rapidly from its peak of over 88,000 in 2006, to about 25,000 in 2009, and that numbers will stabilise at an average of between 45,000 and 50,000 in the medium-term. The forecast is for an average of 45,000 new houses and apartments completed each year over the period 2007-2013 inclusive.

This projection is slightly more pessimistic than the recent Government estimate which suggested that there was a sustainable demand for 60,000 house completions annually.<sup>5</sup>

The reason has to do with our estimation of the population growth in the traditional house purchasing age-cohorts of 25-34 years. Together with affordability, this is one of the key determinants of the volume of first-time buyers entering the housing market.

The numbers in this age group are made up of the natural increase in the population and the net immigration flows. The declining birth rate in Ireland during the 1980s means that the numbers entering this age-cohort from the domestic population will decline over the forecast period.

In addition, many immigrants will leave the construction industry as the job-market contracts – a point strikingly illustrated by the analysis of the nationality of the 18,000 workers who left the construction industry between the first and second quarters of 2007.<sup>6</sup>

Our figure of 45,000 house completions on average reflects predictions for lower net

---

<sup>5</sup>The 'Review of the Construction Industry 2006 and Outlook 2007-2009' expects house completions to decline to just 60,000 at the end of 2008 before levelling off or even increasing.

<sup>6</sup> In total, the number of non-Irish working in the construction industry declined by 2,200 from the last quarter in 2006 to the last quarter in 2007

immigration over the forecast period. Specifically, the forecasts assume an average level of net immigration of 30,000 between 2007 and 2009 – much of it occurring in 2007 and 2008.

***Social housing and house repairs and improvements will expand***

There will be a number of positive developments in the residential sector over the next few years. Firstly, it is probable that a record amount of social housing will be built over the lifetime of the National Development Plan. The Government is committed to building or acquiring 27,000 houses by 2009.

In addition, the Government is committed to building 40,000 affordable houses in partnership with the private sector. These initiatives should help to off-set to some extent the anticipated decline in demand for private housing and ensure that a reasonable level of house completions continues over the medium-term.

Secondly, the introduction of mandatory energy rating to the existing housing stock at the point of sale or rent from January 2009 will result in a significant increase in activity, particularly in insulation and the installation of sustainable technology heating systems. It is expected that the sale price of the house will be influenced by its energy rating and this will create a demand from householders, whose houses have a low energy rating, to engage in significant upgrading. The analysis in this study suggests that about 900,000 houses of the current stock have extremely low levels of energy efficiency and require significant upgrading to achieve a good rating.<sup>7</sup>

While this upgrading activity will be a gradual process, and may not manifest itself until 2009 and after, it is predicted that other forms of house improvements, particularly extensions, will expand strongly in the short-term fuelled in part by relatively high levels of disposable

---

<sup>7</sup> The figure of 900,000 is the number of houses built before 1991 when energy regulations did not apply.

income. It is difficult to measure activity in this sector as many of the extensions do not require planning permission. However, it is anticipated that this sector will expand strongly in 2008 and 2009. Subsequently, much of the activity in this area will be strongly influenced by the sustainability agenda.

***Other building activity will also expand significantly***

The other two markets within the construction industry – general contracting and civil engineering – are both expected to perform positively over the period to 2013 in both output and employment terms.<sup>8</sup>

With regard to general contracting, the performance of the commercial sector is perhaps the most difficult to predict. It performed strongly in both 2006 and 2007 but the indications are that it has begun to slow-down and there are a number of reasons for believing that activity in this sector will contract sharply over the next few years before experiencing a modest recovery towards the end of the forecast period.

With regard to the retail market, there is evidence that Ireland may be reaching saturation point in respect of the construction of large retail warehouses. Ireland now has the third largest ratio in Europe of retail space per 1,000 of the population - lower only than Sweden and the Netherlands. Large retail outlets are particularly evident in the counties surrounding Dublin and activity in these centres, as in the rest of the country, has been sustained by the boom in consumer expenditure of the last few years. This has been reflected in very high rental values for these properties.

However, consumer expenditure is expected to be much weaker over the next

---

<sup>8</sup> General contracting is defined as all other building excluding residential development and civil engineering. Civil engineering is defined as including all activity related to the development of the physical infrastructure.

few years, reflecting the slowdown in the economy and the decline in consumer confidence generally. This slowdown in consumption has accelerated in recent months because of a general restriction in credit, reflecting the impact of developments in the US sub-prime market on international financial markets.

The slow-down in economic activity will also reduce the demand in both the office and industry market over the next few years. Indeed, the relatively strong performance of the office and retail sector in recent years means that activity in these markets could be very modest in the latter half of the forecast period.

Following a sharp increase in the construction of agricultural buildings in 2006, the level of output in this area is expected to remain strong. It is expected that the demand for construction services and products will increase over the next few years because of the anticipated increase in prices and incomes in the agricultural sector.

General contracting will be given an added impetus by the injection of large amounts of Government funding under the National Development Plan. The Government has allocated approximately €33 billion to fund the construction of schools, hospitals and other social infrastructure projects. There is a separate €2 billion allocated to the building of public offices under the decentralisation programme.

Activity in the civil engineering sector is also projected to increase sharply over the period 2007-2013 because of the National Development Plan. The Plan envisages total expenditure of approximately €80 billion over the period on non-housing infrastructure, of which approximately €45 billion is allocated to the improvement of the physical infrastructure. This includes €14 billion for the major new roads network and €4 billion for new sewerage works.

These figures represent a substantial increase on the infrastructure spends in the 2000-2006 NDP and will ensure a

significant increase in both output and employment in civil engineering projects over the period 2007-2013.

***But total output and employment will decline***

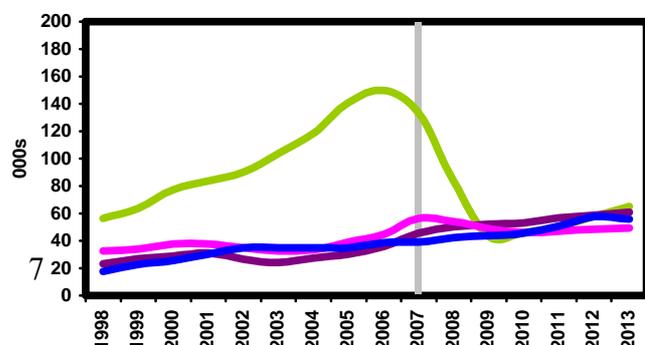
However, from the perspective of the industry as a whole, the projected increase in civil engineering and general contracting - combined with the forecast increase in activity in residential repair and improvements - will not be sufficient to produce positive growth levels, or off-set job losses arising from the projected contraction in new house building. This is because the latter accounts for over half of total output and a somewhat higher proportion of employment.<sup>9</sup>

The projected annual average new house completion rate of 45,000 represents a major reduction on the peak figure of over 88,000 units completed in 2006 and inevitably a contraction of this magnitude will give rise to significant job-losses. Our forecasts assume that in the worst year for new house building, namely 2009, there will be almost 110,000 less persons employed in this sector than in 2006 – a decline of 45%.

While the new housing sector is expected to resume positive growth after 2009, nevertheless the forecasts in this study indicate that this sector will have 85,000 less workers in 2013 than in 2006.

Despite this level of job-shedding in the new residential sector, the study is forecasting that overall employment in the construction industry in 2013 will be 231,000, which is 38,000 below the 2006 average employment levels of 269,000, or 54,000 below the 2006/07 peak employment figure of 285,000.

**Figure:E1  
Construction Sector Employment Forecasts**



shortage is expected to increase, especially in the United Kingdom and Poland.

There will also be some opportunities for employment in other sectors in Ireland for certain types of construction skills, particularly electricians.

The volume of exits from the industry – mainly through retirements - is relatively high for construction craft-workers, and it will also result in a contraction in employment without corresponding rises in unemployment levels.

Furthermore, there are approximately 40,000 non-Irish persons working in the industry. It is reasonable to expect that many of these workers will not have the same degree of attachment to Ireland as Irish-born workers and will seek employment in other European markets as the Irish industry contracts.

Indeed, as already stated, there is evidence that this process has already commenced. The results of the CSO National Quarterly Survey for the second quarter of 2007 shows that of those who exited the industry in the previous three months, non-Irish nationals outnumbered Irish nationals by 3:1.

A significant proportion of non-Irish workers in the industry are Polish nationals. The economy in Poland – including the construction industry – is expanding strongly and the Government in Poland is keen to attract back Polish workers to assist in the further development of their economy.

It is reasonable to assume that the improved performance of the Polish economy will have an impact on the number of Polish workers who enter and stay in the industry in Ireland. There is evidence that the number of Polish workers coming to Ireland is beginning to decline.<sup>10</sup>

---

<sup>10</sup> The number of Polish workers who have obtained PPS numbers has declined significantly in the latter half of 2007.

The reason for this relatively benign

The reason for this relatively benign prediction is that the analysis has estimated that the expanding sectors in the industry have the potential to create employment opportunities for 49,000 workers. These job increases will be in infrastructure (26,000) and residential repair and residential maintenance and improvements (23,000).

Figure E1 shows employment trends in each of the main sub-sectors of the industry over the last decade and for the projection period. The graph illustrates the extent to which new house building has contributed to a very rapid rise in employment, the sharp fall expected from the peak, and the gradual increase expected from 2010 onwards.

A feature of the employment projections, illustrated in Figure E1, is that the highest employment losses occur by 2009. In that year, total employment is projected to be only 188,000, which represents a reduction of 100,000 from the peak employment figure of 288,000 at the beginning of 2007.

***Job-losses will not result in equivalent levels of unemployment***

It is not expected that job losses in the industry will result in equivalent rises in unemployment. There will be many employment opportunities in the construction industry in the United Kingdom, Northern Ireland and the newer EU Member States such as Poland.

Currently, there is a significant shortage of craft-workers in these markets and this

The employment market of the entire European Union, including the relatively large and adjacent German market, will be available as of right to the workers of the former accession countries from 2011. This will give immigrants from these countries significantly more job opportunities than they have at present.

### ***The skills profile of the industry is changing***

Many of the jobs which emerge in expanding areas of the industry can be filled by persons previously employed in the new house building sector. However, there is a limit to the extent to which this transition can occur naturally. This is because the skills which will be most adversely affected by the contraction in new house building – bricklaying, plastering, plumbing, carpentry and painting – are not required to the same degree in civil engineering, general contracting or even in house improvements.

The upgrading of the housing stock will offer employment opportunities for some craft-workers – notably for plumbers and electricians – but the main needs will be for energy rating assessors, energy consultants, and, most significantly, insulation specialists and installers of sustainable technologies. The latter may include many electricians and, in particular, plumbers who have decided to specialise in these new technologies. However, in these cases, some enhancement of their existing skills will be required.

Similarly, while the forecast expansion of activity in both civil engineering and general contracting will create many additional employment opportunities, these will tend to be in areas other than the traditional craft trades. For example, there will be many opportunities in project management, in engineering, in building services and in the operation of specialised plant equipment.

### ***Changes in the skills mix are being driven partly by new technologies***

The changes in the skills mix in the industry are being driven by a combination of new building technologies and legislation. With regard to new technologies, the study shows that new forms of construction – usually involving some aspect of off-site manufacturing – are becoming the norm in respect of large construction projects in general contracting in both the public and private sphere. The advantages of this form of technology are that it produces less waste, it often has superior thermal and energy efficiency properties, it is constructed within a safer working environment, it saves time, and factory-based finishes are generally of a superior quality compared to traditional methods.

The demand for off-site construction technologies varies between different construction markets. Timber frame construction continues to be the predominant form of off-site manufacturing in the residential market and is estimated to have accounted for about 30% of new housing.

But other forms of panellised building methods are entering the residential market and rapidly expanding their market share. Light gauge steel frames, for example, are becoming the technology of choice in the duplex and apartment markets<sup>11</sup> while this technology is also very suitable for high rise residential units – a market which is expected to expand significantly over the next few years.

A concrete-based technology, called insulated concrete forms (ICF), has been applied successfully in the building of a number of residential dwellings and may become a more widely-used method of construction over the next few years.

Innovations in cement board technology and dry brick construction are providing an alternative to block and brick construction as they require less skills and time to erect.

---

<sup>11</sup> Unlike timber, they can incorporate concrete flooring.

Other modular forms of construction are also increasing their share of the Irish market. Both kitchen and bathroom pods are being used in the hotel sector and to some extent in apartment complexes. However, the use of pods, especially imported pods, are relatively expensive and therefore are only viable in respect of large-scale projects.

Nevertheless, despite increasing market share, there have been problems in integrating off-site manufacturing with traditional on-site construction. These problems reflect the fact that custom and practice on sites is very different from the type of culture which supports the design, manufacture, delivery and installation of manufactured modularised components.

In comparison to on-site construction, the latter involves more intensive consultation at the design stage of the project, more strict delivery and payment schedules, and greater care in the installation of the modular components.

Many of these issues could be effectively addressed through appropriate training. Indeed, there is a general consensus in the industry that training holds the key to enabling the industry to fully exploit the economic advantages of off-site development.

#### ***Legislation is also a key driver in the changing skills mix***

One of the key attractions of off-site construction is that the technologies meet the current thermal requirements of Part L of the building regulations. The industry is now required to adhere to more strict regulations in respect of the management of waste, the use of sustainable sources, and the environment.

The current regulatory environment will become stricter over the next few years, particularly in respect of setting minimum standards for energy efficiency in buildings.

The Government is reviewing the scope and structure of the building regulations to

prepare for the next revision of Part L thermal performance requirements. Revised Part L requirements will come into effect in 2010 and will aim to achieve up to a 60% improvement in the thermal performance of houses compared to current standards. Furthermore, it is certain that the review will set higher standards for energy efficiency in relation to such technology as lights, boilers, insulation and air infiltration systems.

The Government is also determined to reduce the level of construction and demolition waste which is being dumped on landfill sites throughout the country. The 1998 Waste Policy Statement set a target of recycling 80% of construction and demolition waste by 2013. While it should be acknowledged that progress has been achieved by the industry in the context of reaching these targets, a great deal more needs to be done.

Thus, as a result of new legislation, there will be an increased demand for managers, professionals and skilled workers with appropriate knowledge and expertise in sustainable construction and environmental-related areas.

#### ***Qualifications are becoming mandatory for an increased number of occupations***

There have been a number of developments over recent years which have resulted in extending the range of occupations for which qualifications are mandatory. These developments include a greater awareness of health and safety issues, which has resulted in the introduction of the Safe Pass requirement for all workers on building sites. For similar reasons, many of the qualifications acquired under the Construction Skills Certification Scheme (e.g. scaffolding, construction plant operation) are mandatory.

It is also likely that in the future appropriate qualifications will be a mandatory requirement to practice in the construction-related professions (e.g. architects).

Many of the activities associated with sustainable construction, such as the assessment of the energy efficiency of buildings and the installation of heating systems, require appropriate qualifications in order to qualify for a range of grants.

***Greater exposure to international markets will accelerate change and provide business and employment opportunities***

Over the last decade, the Irish construction industry has become increasingly involved in international markets. The level of construction activity will increase significantly in many European markets. Notable projects in the UK include the Thames Valley Gateway and the London Olympics. The industry in Northern Ireland and in some countries such as Poland is embarking on a major programme of infrastructural investment.

Significantly, the opportunities in the United Kingdom will include residential development as well as major projects in civil engineering and general contracting. It is to be expected that many Irish contractors who experience a contraction in their residential building activities in Ireland will seek to expand their activities in the United Kingdom.

These companies will have to comply with the energy-efficiency regulations which pertain in these countries, and these regulations are currently stricter than those which apply in Ireland. The Government of the United Kingdom has taken a very proactive role in promoting the use of building technologies which are compatible with its policy on reducing CO<sub>2</sub> emissions from residential development. Its stated objective is that all new houses built after 2016 should be carbon neutral.

The fact that many Irish companies will seek to win contracts in the UK market over the next number of years should accelerate the diffusion of sustainable technologies and techniques as well as skills within the Irish industry.

The job opportunities provided in other countries are likely to attract some of those made redundant in the Irish residential sector.

***Management is becoming more complex***

There are a number of developments within the industry which will make the task of management more complex and indeed more critical than it has been in the past.

Firstly, the transition to off-site methods of construction introduces a complex (increasingly international) supply chain to the production process. It also increases the time-sensitivity of delivery schedules. Supply chain management skills will become much sought after as the industry moves towards quasi-manufacturing methods of construction.

The introduction of fixed-term, fixed-price contracts and changes in EU procurement procedures is creating a demand for persons with specialised knowledge of the costing of large contracts. There has been a shortage of such ‘estimators’ in recent years.

***Professional skills have been difficult to source***

The increasing professionalism of the industry is reflected in the types of skills which the industry has been finding difficulty recruiting in Ireland.

The monthly FÁS/ESRI employment and vacancies survey has consistently showed the industry experiencing difficulties recruiting quantity surveyors and site managers/foremen.

The immigration data for 2007 shows that the industry was continuing to bring in architects, engineers and quantity surveyors from abroad – mainly under the Green Card system. The engineers were predominantly civil and structural engineers, but a number of engineering specialists were also being recruited from abroad.

The severe contraction in commercial activity, expected in 2008 and continuing through 2009 and 2010, may result in a sharp decline in the demand for some professionals, especially architects, project managers, and quantity surveyors.

***In the short-term, there may be a decline in student enrolment in third-level construction courses***

In response to these shortages, the third-level education system has introduced a number of additional professional courses – for example in architecture, civil engineering, construction economics and construction management. The sharp contraction in the construction sector which is forecast in this report may result in some graduates from these courses experiencing difficulties obtaining employment in the short-term.

It may also result in a decline in the number of students enrolling in construction-related courses at third-level. This may be particularly the case in respect of those types of courses which have expanded very rapidly in recent years (e.g. Level 6/7 courses in Institutes of Technology).

In the medium term, however, the demand for certain professionally-qualified construction workers will increase – particularly civil engineers.

***Extensive up-skilling and re-skilling are required to maximise employment***

The combination of a decline in house building and the transition to off-site methods of construction will, in the medium-term, dramatically alter the skills profile of the industry.

There will be both winners and losers in this process. Some occupations will experience a significant decline in the level of demand for their skills while the industry's requirement for other skills will expand.

***There will be a reduction in the demand for some skills***

The study provides forecasts of employment for 34 occupations in respect of the four main sub-sectors in the industry between 2006 and 2013. These forecasts are presented in Tables E3 to E5 (at the end of the Executive Summary).

Currently, the skills profile of the industry is dominated by the skilled craft-workers who account for 43% of direct employment – the equivalent of 116,000 workers. Most of these are employed in the residential sector and they will feel the brunt of the contraction in new house building.

The crafts which are predominantly employed in the residential sector include bricklayers, plasterers, painters, roofers, carpenters, glazers, plumbers and tilers.

The figures in Table E4 show the extent of the decline in the employment of craft-workers as a result of the contraction in new residential construction. For example, the employment of carpenters will decline by over 16,000, bricklayers by almost 8,000, roofers by over 3,000 and plumbers by over 6,000 over the three years between 2006 and 2009 in the new residential sector.

There will be some pick-up in the demand for these crafts from the sectors which are expected to expand – particularly residential repair and maintenance – and this will ameliorate the extent of the decline. The figures in Table E4 show the overall contraction in employment in the trades as a consequence of the forecast change in activity. For example, in the case of carpenters, there will be increased employment in non-residential areas of 6,000 leading to an overall decline of 7,200 over the whole period. Plumbing also shows gains in non-residential employment of 2,900 to set against the loss of 5,100 new residential jobs.

Among the other occupations which show an overall decline in employment from 2006 to 2013 are bricklayers, roofers and related trades, plasterers, building contractors, scaffolders and related trades,

painters and decorators, and building labourers.

Table E5 shows that the employment losses will be greater in the short-term (2006-2009). For example, the overall decline in employment among carpenters between 2006 and 2009 is forecast at 13,000, whereas for the whole period the decline is forecast at 7,200. Similarly, plumbing is forecast to decline by 4,800 in the short-term and 2,200 in the longer-term.

While past trends in employment do not show any significant technological displacement of specific occupations, the more widespread use of modern methods of production over the forecast period may result in changes in the demand for some occupations. Specifically, employment of bricklayers and plasterers could decline because of the increasing use of new methods of construction (e.g. panellised construction and modular components).

***But there will be an expansion in the demand for other skills***

There will be a significant expansion in the demand for a number of skills, particularly those associated with sustainability, off-site construction and civil engineering.

As shown in Table E4, among the occupations which are expected to increase in employment are civil engineers, managers and other professionals, truck drivers and road workers. There are also two crafts, electrical and construction plant fitting, where increased employment is forecast.

With regard to sustainable construction, there will be a growing demand for persons trained in assessing the energy efficiency of buildings and those with the proficiency to advise clients on the relative merits of different sustainable energy technologies.

There will also be a demand for persons qualified in the installation of sustainable technologies. Currently these technologies are being installed by workers who, in

many cases, are not qualified and as a result there have been a considerable number of cases where the technology has not performed to the required standards.

There will be a significant demand for persons who have a thorough knowledge of insulation materials and their installation.

Overall, the analysis in this study estimates that there could be about 3,500 jobs annually in these sustainable-related construction activities. Many of these jobs will be suitable for persons from a plumbing or electrical background (with appropriate up-skilling).

With regard to off-site construction, there will be a growing demand for managers who can source components nationally and internationally, who can manage strict delivery schedules and a highly complex assembly process. The supply chain management expertise which is associated with multi-national companies will become a fundamental requirement for medium to large building contractors.

In addition, there is a requirement for general operatives to be trained in the installation and erection of panellised construction, including timber frame.

The forecast expansion of activity in physical and social infrastructure will result in an increased demand for steel-fixers, construction plant operators and drivers, and fitters.

***There will be a decline in the number of apprentices sponsored by employers***

As stated above, the forecasts predict a major contraction in the employment of craft workers in the short-term. Consequently, it is inevitable that the requirement for apprentices will decline. This has already occurred. It is estimated that there will be a reduction of approximately 60% in the sponsorship of apprentices in the construction trades by the end of 2008 and a number of apprentices will have been made redundant.

An apprenticeship in the construction trades provided a very good career path to over 5,000 young persons annually in recent years. Over half of these young persons had Junior Certificate qualifications and obtaining the National Craft Certificate at the end of their apprenticeship provided them with a Level 6 qualification. In the short-term this career path will not be available to about 2,000 young persons annually and in the long-term the opportunity to undertake a construction apprenticeship will remain below the record numbers of the last few years.

***The Irish construction industry is relatively large in comparison to the industry in other European economies.***

The industry in Ireland provided employment for about 14% of the workforce at its peak in 2006. In contrast, the corresponding figure in comparable European economies is an average of 7%. It is reasonable to assume that over the long-term, the relative size of the Irish industry will move towards the European norm. This is unlikely to occur during the period under review as the forecast activity under the NDP, combined with the relatively low level of the housing stock, should continue to support relatively higher activity levels in Ireland.

***The restructuring of the industry will give rise to a number of key challenges***

There are a number of key challenges that arise as a result of the analysis in this study and these are outlined below.

- To assist those made redundant in house-building to acquire the skills to obtain alternative employment.
- To ensure that the skills and qualifications required by the new and expanding sectors of the industry are delivered in an effective and timely manner.
- To assist redundant apprentices to complete their apprenticeship.
- To ensure that the apprenticeship system is maintained at a level sufficient to meet longer-term industry needs.
- To ensure that the curricula of education and training courses are appropriately adapted to meet the changing requirements of the industry.
- To ensure that there are no difficulties in respect of skills and qualifications that would hinder the capacity of Irish contractors to exploit business opportunities in overseas markets.
- To adapt provision in the higher education system to the anticipated quantitative and qualitative changes in the construction industry.
- To provide alternative career paths for those young persons who would have previously been expected to take-up construction apprenticeships.
- To ensure that where mandatory qualifications are required, suitable training, assessment and certification systems are in place.

**Table E3**

**Occupational forecasts: construction sector (000s)**

Occupation	2006	2007	2008	2009	2010	2011	2012	2013
Building managers	6.0	6.2	5.3	4.4	4.5	4.8	5.2	5.4
Civil/mining engineers	6.0	6.5	5.9	5.3	5.3	5.6	6.1	6.2
Architects	1.1	1.1	0.9	0.8	0.8	0.8	0.9	0.9
Quantity surveyors	3.1	3.2	2.7	2.2	2.2	2.4	2.6	2.7
Bricklayers, masons	15.2	14.9	11.6	8.8	9.0	9.7	10.6	11.2
Roofers, slaters, tilers, sheeters, cladders	7.1	7.2	5.8	4.6	4.7	5.0	5.5	5.7
Plasterers	13.9	13.7	10.7	8.1	8.4	9.0	9.8	10.4
Builders, building contractors	21.5	21.5	17.3	13.5	13.8	14.8	16.1	17.0
Scaffolders, riggers, steepplejacks	2.7	2.7	2.2	1.7	1.8	1.9	2.1	2.2
Floorers, floor coverers, carpet fitters, tilers	1.5	1.5	1.3	1.0	1.0	1.1	1.2	1.3
Painters & decorators	11.5	11.8	10.0	8.3	8.4	9.0	9.8	10.1
Other construction trades n.e.c.	4.2	4.3	3.6	2.9	2.9	3.1	3.4	3.5
Metal working & production & maintenance fitters	3.8	4.0	3.6	3.2	3.2	3.4	3.7	3.8
Electricians, electrical maintenance fitters	21.4	22.4	19.7	16.8	16.9	18.2	19.8	20.2
Plumbers, heating & related trades	16.3	16.7	14.0	11.5	11.6	12.5	13.6	14.1
Steel erectors	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3
Barbenders, steel fixers	0.9	1.0	0.9	0.8	0.8	0.9	0.9	1.0
Welding trades	1.1	1.2	1.1	1.0	1.0	1.1	1.2	1.2
Carpenters & joiners	36.0	36.1	29.1	22.9	23.4	25.2	27.4	28.8
Drivers of road goods vehicles	7.1	7.4	6.4	5.4	5.5	5.9	6.4	6.6
Mechanical plant drivers/operators	6.8	7.0	6.0	5.0	5.1	5.4	5.9	6.1
Crane drivers	1.5	1.5	1.3	1.1	1.1	1.2	1.3	1.3
Pipe layers/pipe jointers	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5
Construction and related workers	5.8	5.9	5.0	4.0	4.1	4.4	4.8	5.0
Mates in Building Trade	1.6	1.6	1.3	1.0	1.1	1.1	1.2	1.3
Road construction & maintenance workers	1.9	2.0	1.8	1.6	1.6	1.7	1.9	1.9
Other building & civil engineering labourers	32.3	32.3	26.0	20.4	20.9	22.5	24.4	25.7
All other labourers & related workers	3.7	3.9	3.4	2.9	2.9	3.1	3.4	3.5
All other managers	5.6	5.9	5.3	4.6	4.6	4.9	5.3	5.5
All other professionals	4.5	4.9	4.5	4.0	4.0	4.3	4.7	4.7
All other associate professionals	3.0	3.2	2.8	2.5	2.5	2.7	2.9	2.9
All clerical	7.9	8.3	7.3	6.2	6.3	6.7	7.3	7.5
All other craft	5.4	5.7	5.0	4.3	4.4	4.7	5.1	5.2
All services	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
All sales	1.8	1.9	1.8	1.6	1.6	1.7	1.9	1.9
All other operatives	3.2	3.4	3.0	2.7	2.7	2.9	3.1	3.2
All other labourers	2.4	2.5	2.2	1.8	1.8	2.0	2.1	2.2
<b>Total</b>	<b>269.0</b>	<b>274.7</b>	<b>230.0</b>	<b>188.0</b>	<b>190.7</b>	<b>205.0</b>	<b>222.8</b>	<b>231.2</b>

**Table E4**  
**Net job gain/loss by sub-sector and occupation, 2006-2013 (000s)**

**Table E5**  
**Net job gain/loss by sub-sector and occupation, 2006-2009 (000s)**

2006-2013 total net job gain/loss						2006-2009 total net job gain/loss					
Occupation	New residential	Residential R&M	General contracting	Infrastruct.	Total	Occupation	New residential	Residential R&M	General contracting	Infrastruct.	Total
Building managers	-1.7	0.5	0.2	0.4	-0.6	Building managers	-2.2	0.3	0.1	0.1	-1.6
Civil/mining engineers	-1.1	0.3	-0.2	1.1	0.2	Civil/mining engineers	-1.3	0.2	0.1	0.4	-0.7
Architects	-0.3	0.1	0.0	0.1	-0.2	Architects	-0.4	0.1	0.0	0.0	-0.3
Quantity surveyors	-0.9	0.3	0.1	0.2	-0.4	Quantity surveyors	-1.2	0.2	0.1	0.1	-0.9
Bricklayers, masons	-6.2	1.8	0.1	0.3	-3.9	Bricklayers, masons	-7.8	1.2	0.1	0.1	-6.4
Roofers, slaters, tilers, sheeters, cladders	-2.5	0.8	0.1	0.3	-1.4	Roofers, slaters, tilers, sheeters, cladders	-3.2	0.5	0.1	0.1	-2.5
Plasterers	-5.6	1.6	0.1	0.3	-3.5	Plasterers	-7.0	1.1	0.1	0.1	-5.7
Builders, building contractors	-8.0	2.4	0.3	0.7	-4.6	Builders, building contractors	-10.1	1.5	0.2	0.2	-8.1
Scaffolders, riggers, sleepjacks	-1.0	0.3	0.0	0.1	-0.6	Scaffolders, riggers, sleepjacks	-1.2	0.2	0.0	0.0	-1.0
Floorers, floor coverers, carpet fitters, tilers	-0.5	0.1	0.0	0.1	-0.2	Floorers, floor coverers, carpet fitters, tilers	-0.6	0.1	0.0	0.0	-0.5
Painters & decorators	-3.5	1.0	0.3	0.7	-1.4	Painters & decorators	-4.3	0.7	0.2	0.2	-3.2
Other construction trades n.e.c.	-1.4	0.4	0.1	0.2	-0.7	Other construction trades n.e.c.	-1.8	0.3	0.1	0.1	-1.4
Metal working production & maintenance fitters	-0.8	0.2	0.2	0.4	0.0	Metal working production & maintenance fitters	-1.0	0.1	0.1	0.1	-0.6
Electricians, electrical maintenance fitters	-5.3	1.6	0.8	1.7	-1.2	Electricians, electrical maintenance fitters	-6.7	1.0	0.6	0.5	-4.6
Plumbers, heating & related trades	-5.1	1.5	0.5	0.9	-2.2	Plumbers, heating & related trades	-6.3	1.0	0.3	0.3	-4.8
Steel erectors	-0.1	0.0	0.0	0.0	0.0	Steel erectors	-0.1	0.0	0.0	0.0	-0.1
Barbenders, steel fixers	-0.2	0.1	-0.1	0.2	0.0	Barbenders, steel fixers	-0.2	0.0	0.0	0.1	-0.1
Welding trades	-0.1	0.0	0.1	0.1	0.1	Welding trades	-0.2	0.0	0.0	0.0	-0.1
Carpenters & joiners	-13.0	3.9	1.3	0.7	-7.2	Carpenters & joiners	-16.3	2.5	0.6	0.2	-13.0
Drivers of road goods vehicles	-1.9	0.6	0.3	0.5	-0.6	Drivers of road goods vehicles	-2.4	0.4	0.2	0.2	-1.7
Mechanical plant drivers/operators	-1.9	0.6	-0.4	1.0	-0.7	Mechanical plant drivers/operators	-2.4	0.4	0.0	0.3	-1.8
Crane drivers	-0.4	0.1	0.0	0.1	-0.2	Crane drivers	-0.5	0.1	0.0	0.0	-0.4
Pipe layers/pipe jointers	0.0	0.0	0.0	0.1	0.1	Pipe layers/pipe jointers	0.0	0.0	0.0	0.0	0.0
Construction and related workers	-1.9	0.6	0.2	0.3	-0.9	Construction and related workers	-2.3	0.4	0.1	0.1	-1.8
Mates in Building Trade	-0.6	0.2	-0.1	0.2	-0.3	Mates in Building Trade	-0.7	0.1	0.0	0.0	-0.6
Road construction & maintenance workers	-0.3	0.1	-0.2	0.5	0.1	Road construction & maintenance workers	-0.4	0.1	0.0	0.1	-0.2
Other building & civil engineering labourers	-11.8	3.5	-0.9	2.6	-6.6	Other building & civil engineering labourers	-14.8	2.2	-0.1	0.8	-11.8
All other labourers & related workers	-0.9	0.3	-0.1	0.5	-0.2	All other labourers & related workers	-1.2	0.2	0.0	0.2	-0.8
All other managers	-1.3	0.4	0.2	0.5	-0.2	All other managers	-1.6	0.2	0.2	0.2	-1.1
All other professionals	-0.7	0.2	0.3	0.5	0.3	All other professionals	-0.9	0.1	0.2	0.2	-0.4
All other associate professionals	-0.7	0.2	0.1	0.3	-0.1	All other associate professionals	-0.9	0.1	0.1	0.1	-0.6
All clerical	-1.9	0.6	0.3	0.6	-0.4	All clerical	-2.4	0.4	0.2	0.2	-1.7
All other craft	-1.3	0.4	0.2	0.5	-0.2	All other craft	-1.6	0.2	0.2	0.1	-1.1
All services	-0.1	0.0	0.0	0.0	0.0	All services	-0.1	0.0	0.0	0.0	-0.1
All sales	-0.3	0.1	0.1	0.2	0.1	All sales	-0.4	0.1	0.1	0.1	-0.2
All other operatives	-0.7	0.2	0.1	0.3	0.0	All other operatives	-0.9	0.1	0.1	0.1	-0.5
All other labourers	-0.7	0.2	0.1	0.2	-0.2	All other labourers	-0.9	0.1	0.1	0.1	-0.6
<b>Total</b>	<b>-84.9</b>	<b>25.1</b>	<b>4.6</b>	<b>17.3</b>	<b>-37.8</b>	<b>Total</b>	<b>-106.5</b>	<b>16.1</b>	<b>4.1</b>	<b>5.4</b>	<b>-80.9</b>

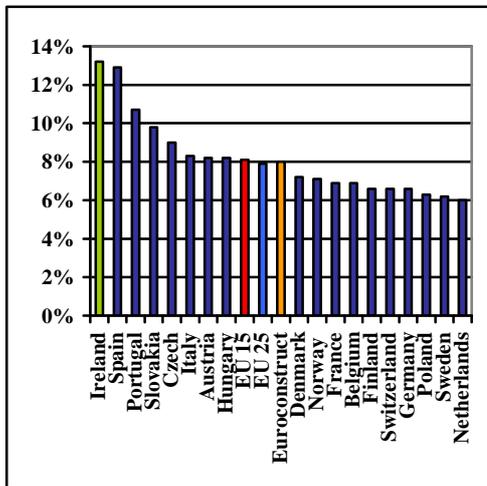
## Chapter 1: Profile of the Construction Industry 1998-2006

### *The construction industry in Ireland accounted for 13% of employment and a substantial proportion of GDP*

The Irish construction industry is producing output valued at €36 billion, and gross value-added at factor cost of over €15 billion. This represents 10% and 24% of GNP depending on the measure used.<sup>12</sup> It provides direct employment for roughly 280,000 persons – equivalent to 13% of total employment.

This is much higher than the corresponding share of output or employment in comparable European economies. In general, construction employment accounted for between 6% and 8% of total employment. Spain is an exception – its share was broadly equivalent to Ireland's.

**Figure 1.1**  
Share of Construction Employment of Total Employment in European Countries, 2006



Source: Eurostat

*The industry is even larger when account is taken of those who are employed exclusively in construction activity but who are classified elsewhere*

Many people who are employed exclusively in the industry are nevertheless classified as working in the business services sector and they are not counted among those employed in construction. These people include most architects, planners, civil and structural engineers and quantity surveyors. If those employed in these professions were included in the figures, they would add roughly another 10,000 to direct employment.

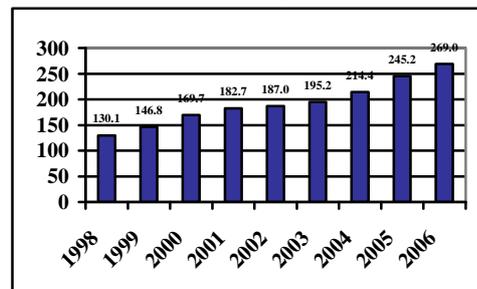
In addition, there are a large number of persons employed in ancillary activities such as building merchants.

The ESRI estimated that indirect employment in the industry accounts for approximately 40% of direct construction employment. This is equivalent to an additional 107,600 jobs. Combining direct and indirect employment, total employment in the industry is 376,600 and accounts for over 18% of total employment in the economy.<sup>13</sup>

### *The last decade has witnessed explosive growth in the industry*

The current scale of the industry is of relatively recent origin. In 1998, the industry generated €20.2 billion in output which, even allowing for construction price inflation over the period, was 66% below current output levels.

**Figure 1.2**  
Numbers Employed in the Construction Sector, 1998-2006  
(Annual Averages – '000s)



Source: CSO, QNHS

<sup>12</sup> The expenditure approach favoured by the DoEHG gives a figure of 24% while the value-added approach gives 10%.

<sup>13</sup> These calculations relate to 2006.

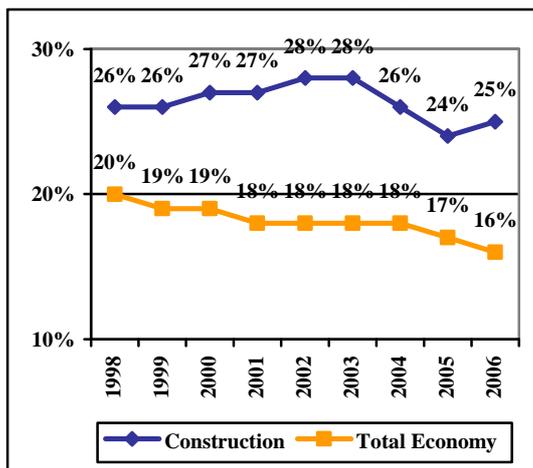
Direct construction employment was only 8.6% of total employment in 1998 – much closer to the European average of 7.7%.

***Significantly more workers classify themselves as self-employed in this industry than in the economy as a whole***

The proportion of self-employed persons in the construction sector is much greater than that registered in the economy as a whole. In 2006, 25% of those employed in construction were self-employed, compared with 16% in the economy as a whole. The corresponding figures in 1998 were 26% and 20% respectively. There has, however, been a decline in the proportion of self-employed persons in construction and across the economy in recent years.

Over four in ten (43%) of qualified construction craftspersons were either self-employed or owned their own business, according to a recent apprenticeship follow-up survey conducted by FÁS on the views and experiences of apprentices who entered the system in 1999.

**Figure 1.3**  
**Percentage of Self-Employed Persons in Construction and Nationally**



Source: CSO, QNHS

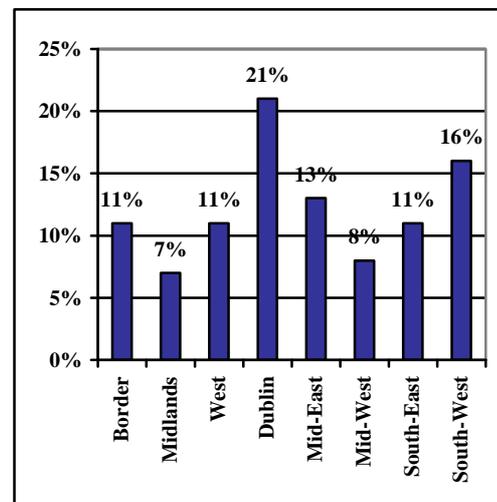
***The Dublin region remains the hub of construction employment***

One-fifth of those employed in the construction sector were located in the

Dublin region in 2006. However, it should be borne in mind that many individuals commute long distances and may live in different regions when compared to their location of employment. The next highest proportion of those employed in the sector were located in the South-West (16%), followed by the Mid-East (13%) and the Border and West regions (11% each respectively).

Over the period 1998 to 2006, all regions recorded significant increases in the numbers employed in the construction sector. In percentage terms, the highest percentage increase was recorded in the Midlands region over this period. This was followed by the South-West region (133%) and the South-East region (130%). At the other end of the spectrum, the smallest percentage increase was recorded in the Dublin region, and in this region the highest absolute numbers were employed.

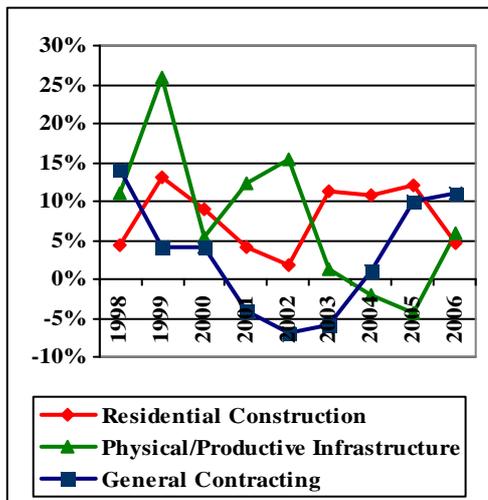
**Figure 1.4**  
**Regional Breakdown of Construction Employment, 2006**



Source: CSO, QNHS

The construction industry includes productive infrastructure/civil engineering, private non-residential construction and social infrastructure. The latter two segments combined form the general contracting sub-sector of the industry.

**Figure 1.11**  
**Construction Output, 1998-2006**  
**(Annual % Volume Changes)**



Source: DKM Economic Consultants

Both general contracting and physical infrastructure experienced some negative growth since 2001 but both market segments have recovered strongly in 2006. Residential construction, however, experienced strong, positive growth throughout the period.

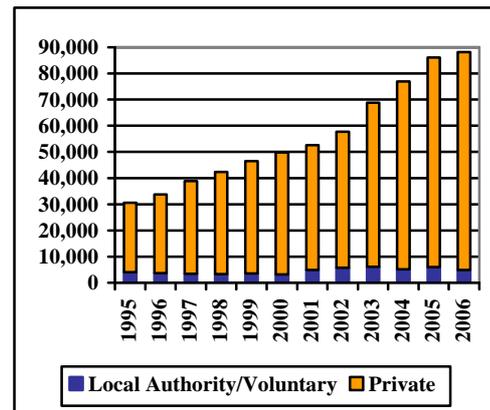
*The driver of this exceptional level of sustained employment growth was new house building*

The gross value of residential construction output reached €24 billion in 2006, compared with €6.2 billion in 1998. This represents an increase of 291% in the value of output or 88% in volume terms, after allowing for construction inflation. The share of this segment of the market in the value of total construction output increased from 52% in 1998 to 68% by the end of 2006.

The number of house completions has grown exponentially in the last decade. There were 88,200<sup>14</sup> units completed in 2006 which compares with 42,349 units in 1998.

<sup>14</sup> The original estimate was 93,419 but this was revised downwards since it included some houses which were built in 2005 but were not connected to the ESB network until 2006.

**Figure 1.5**  
**House Completions**  
**1995-2006 (Number '000s)**

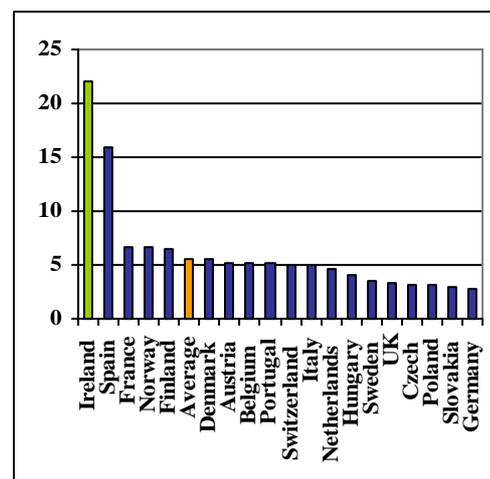


Source: DoEHLG, Housing Statistics Database

*This is a very high level of completions by European standards relative to the size of our population*

This level of activity is very high by European standards. In 2006, the rate of house completions in Ireland – at 22 per 1,000 capita – was almost four times the European average of 5.6 completions per 1,000 capita.

**Figure 1.6**  
**House Completions per 1,000 of the Population in Euroconstruct Countries, 2006**



Source: Euroconstruct

Indeed, it is important to note that Ireland's closest neighbour, the UK, was only producing 3.3 completions per 1,000 capita in 2006.

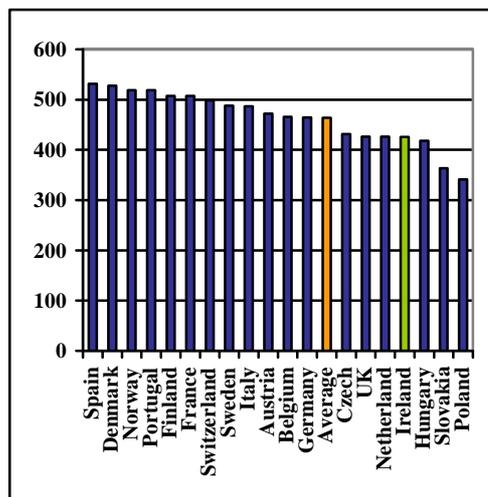
***However, we are emerging from a relatively low housing per capita ratio, but this is no longer the case***

The stock of dwellings in Ireland reached 1,804,000 units in 2006. This figure expressed in units per 1,000 capita is equivalent to 425. This compares to a housing stock of 1,329,000 units in 1998, which was equivalent to 359 units per 1,000 capita at that time.

Thus, there has been a significant increase in the size of the relative housing stock in recent years. Nevertheless, as the graph shows, there is still a considerable distance to travel before the relative housing stock reaches the European norm of 464 units per 1,000 capita.

Interestingly, the ratio in the UK is similar to Ireland's. Spain achieved the highest ratio, with 532 units per 1,000 capita. This was followed by Denmark and Norway, with 530 and 519 units per 1,000 capita respectively. In contrast, Poland had the lowest ratio, with 341 units per 1,000 capita.

**Figure 1.7**  
**Housing Stock per 1,000 of the Population, 2006**



Source: Euroconstruct

***Playing 'catch-up' was not the only factor driving housing demand***

The relatively low housing stock did not produce a similar house purchasing spree

in the UK. The difference is that Ireland had low interest rates, rising levels of disposable income, an expanding young population due to immigration, the confidence generated by a booming economy and, more recently, relatively high returns from investing in housing.

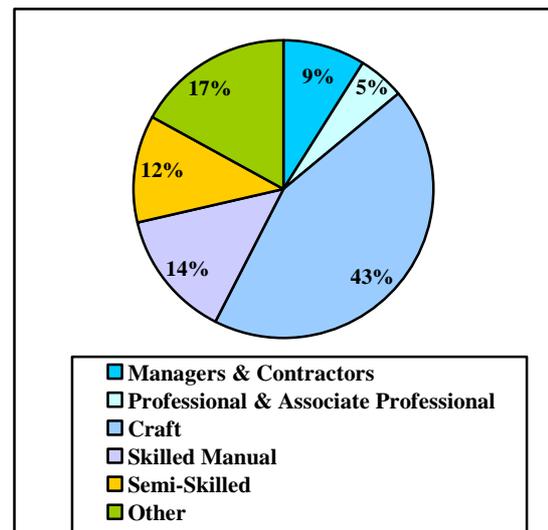
***The surge in house building has created many employment opportunities for workers qualified in the skilled trades***

The high level of new house building is reflected in the composition of the workforce. Thus, the majority (43%) were employed in skilled craft occupations in 2006.

This was followed by those employed in skilled manual and semi-skilled manual occupations – a total of 14% and 12% respectively.

Professional and associate professional occupations accounted for the lowest share of total construction employment (5%) for reasons stated earlier.

**Figure 1.8**  
**Employment in the Construction Sector by Broad Occupational Group, 2006**



Source: CSO, QNHS

There are a considerable number of people employed in the industry who are not working on-site as such. These include, for example, software engineers, financial and

marketing managers, sales assistants, accountants and clerical staff and account in total for 17% of the workforce of the industry.

***The number of apprentices has more than doubled over the decade***

The rapid expansion in new house building has had a dramatic impact on the numbers entering the construction trades. The 24,164 apprentices, registered across the eight construction trades in 2006 represented a remarkable increase of 14,043 or almost two and a half times the total number of apprenticeship registrations recorded in 1998.

The three largest trades – electrician, plumber and carpenter/joiner, collectively accounted for over 80% of the total number registered in construction apprenticeships in 2006 and for over 80% of the net increase in total registrations between 1998 and 2006.

**Table 1.1  
Construction Apprenticeship Registrations  
by Trade, 1998 and 2006**

Trade	1998	2006
Bricklayer	823	1,976
Carpenter/Joiner	2,730	7,280
Construction Plant Fitter	264	344
Electrician	3,996	7,968
Floor/Wall Tiler	35	124
Painter/Decorator	328	496
Plasterer	403	987
Plumber	1,542	4,989
<b>Total</b>	<b>10,121</b>	<b>24,164</b>

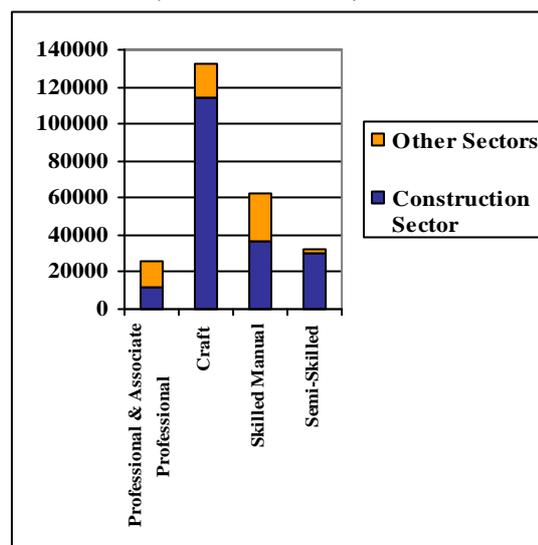
Source: FÁS, *Apprenticeship Registration Statistics Database*

***Almost all those working in craft occupations are employed in the construction sector***

In view of the fact that a very high proportion of all craft workers – almost 90% or 114,600 persons in 2006 – work in the construction industry, any slowdown in the sector will have an adverse impact on those working in craft occupations.

The construction sector was also the predominant sector of employment for those working in semi-skilled occupations in 2006, with over 90% employed in the sector.

**Figure 1.9  
Employment in Construction Occupations  
in the Construction Sector and Other  
Sectors of the Economy by Broad  
Occupational Group, 2006  
(Numbers – ‘000s)**



Source: CSO, *QNHS*

In the case of those working in professional and associate occupations, a higher proportion was employed in non-construction sectors in 2006, with a total of 54%.

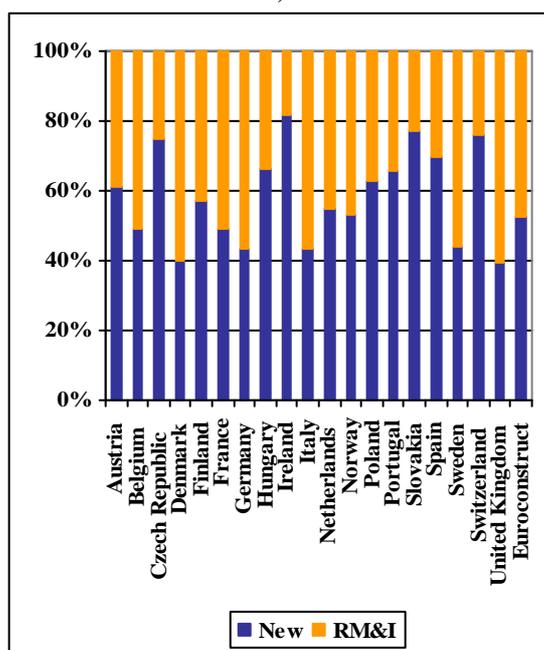
***The level of residential repair, maintenance and improvements has been relatively low by European standards***

Output from the residential repair, maintenance and improvements (RM&I) sub-sector has increased by 125% from €2 billion in 1998 to €4.5 billion in 2006.

In 2006, this component of the sub-sector accounted for 19% of total residential output which is relatively low by European standards. The share of output from new construction and repairs and improvements on existing buildings in the residential sub-sector was roughly evenly split across European countries in 2006. In most

comparable economies, the proportion of output from the residential sector which is attributable to improvements or repairs on existing buildings is almost as high as the total output from new housing.

**Figure 1.10**  
Share of Residential RM&I and New Residential Construction of Total Residential Construction in European Countries, 2006



Source: Euroconstruct, 63<sup>rd</sup> Euroconstruct Conference Summary Report, June 2007

The non-residential market continued to perform strongly boosted by a significant capital investment provision for public sector non-residential buildings (hospitals, educational and Government buildings) as well as a strong pipeline of planning permissions for private commercial, industrial and agricultural buildings.

The value of non-residential construction output increased to €11.4 billion in 2006, compared with €5.7 billion in 1998. This represents an increase of 102% in the value of output or 33% in volume terms, after allowing for construction inflation.

Strong growth in the general contracting sector was recorded over the period 1998-2006. The value of output in general contracting reached €6.2 billion in 2006, compared with €3.8 billion in 1998. This

represents an annual average increase of 3.7% in volume terms over the period.

The sub-sector accounted for 32% of the total value of construction output in 2006, which is two percentage points below the 1998 share.

***The level of activity in market segments other than housing expanded strongly in recent years***

Excluding housing, the construction industry also includes private commercial development, and public investment in social and physical infrastructure.

Private commercial development includes agriculture and tourism, but it is dominated by three market segments in particular, office, retail and industrial property. These segments accounted for 73% of the total value of output in the private non-residential sector in 2006, compared with 65% in 1998.

These market segments are highly sensitive to the performance of the economy. Consequently, as shown in Figure 1.14 when the economy slowed from 2002 to 2004, activity in these markets contracted quite significantly.

**Figure 1.14**  
Commercial Building Volumes, 1998-2006  
(Constant 2005 prices – €million)



Source: DKM

There has, however, been a strong recovery in this sector in recent years and

the losses experienced during the economic slowdown have been recuperated, although the extent of the recovery has varied between the different market segments.

The value of output from the office market fell to €0.6 billion in 2004, representing a 55% decline below its 2001 peak output value of €1.3 billion in volume terms. Since 2004, the sector's output began to increase, reaching €1 billion by 2006. The sector accounted for 25% of all commercial construction in 2006, compared with its 36% peak during 2001.

The retail sector did pick up some of the slack experienced in the office market during the period 2002-2003. The stock of retail shopping space has increased substantially in Ireland over the past number of years. This trend is reflected in the significant increase in the volume of construction output from retail building activity. The value of output from this sector increased from €0.56 billion in 2002 to €1.1 billion in 2006, representing an increase of 85% in volume terms.

The retail sector accounted for 26% of the total value of commercial output in 2006 compared with 19% in 2002.

The key factors driving retail development have been a very buoyant economy, rising disposable incomes which in turn have fuelled consumer spending growth, and the demand from Irish retailers looking to expand and from the UK and Europe.

The remaining segment of the commercial market is the industrial sector. The volume of new construction in this market increased by 5% in 2006 while investment in construction by the semi-state agencies, declined following two exceptional years of growth. Employment growth is a key factor driving the demand for space, especially from indigenous small and medium sized enterprises.

***Social infrastructure spending is the smallest sub-component of the construction industry, accounting for just over 5% of the total value of construction output in 2006***

Social infrastructure is the smallest market segment of the construction industry, accounting for 5.4% of the total value of construction output in 2006. The corresponding figure in 1998 were 7%..

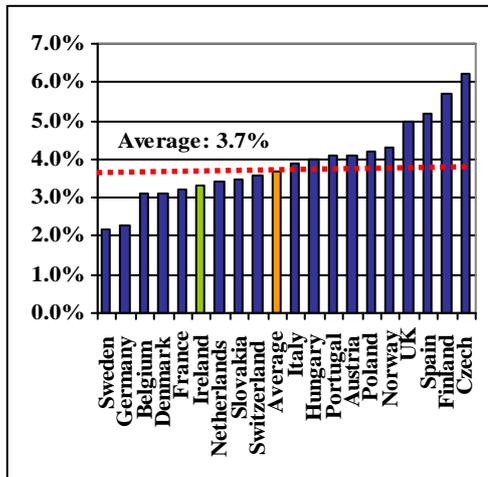
The value of output in this sub-sector was €1.9 billion in 2006, compared with €0.8 billion in 1998, representing an increase of 131%, or an increase of 53% in volume terms. The value of output in this sub-sector peaked in 2002 at €1.8 billion, largely due to an exceptional increase in the level of investment in education.

Activity in social infrastructure is also determined by the PCP, and includes capital investment in areas such as education, hospitals, public buildings, local authority services and public sporting facilities. The current NDP 2007-2013, envisages capital investment of some €33 billion in construction related social infrastructure projects over the seven year period. This significant level of capital spend should underpin strong construction output growth in this sub-sector in the coming years.

***Ireland's share of non-residential construction output in real GDP exceeds the EU average***

Ireland's share of non-residential construction output accounted for 3.3% of real GDP over the period 2003-2006. This compares relatively favourably across other European countries which recorded an average of 3.7%.

**Figure 1.12**  
**Total Non-Residential Construction as a %**  
**of Real GDP (2003-2006)**



Source: Euroconstruct

***But civil engineering was also strong, driven by investment under the National Development Plan***

Investment in productive infrastructure captures total output from all civil engineering projects, both in the public and private sectors. This includes public investment spending on roads, airports, seaports and harbours, water services, as well as investment by the respective Semi-State organisations responsible for transport, energy and telecommunications. Output in this sub-sector also includes capital investment by private sector companies involved in the energy and telecommunications sectors and in public private partnerships (PPP's) in physical infrastructure projects.

The value of output in this sub-sector amounted to €5.3 billion in 2006, representing an increase from €1.9 billion in 1998. This represents an increase of 183% or 74% in volume terms, after allowing for construction inflation.

Productive infrastructure accounted for 15% of the value of total construction output in 2006, compared with 21.5% in 2002 and 16% in 1998.

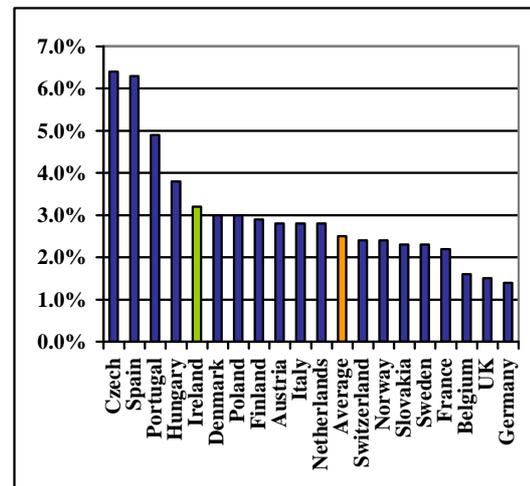
The level of productive infrastructure activity is driven by the value of capital

investment provisions both in the Public Capital Programme (PCP) and the NDP. The sector is set to benefit from the unprecedented multi-annual commitment to investment in productive infrastructure under the current NDP 2007-2013. A total of €45 billion has been allocated to capital investment projects for the improvement of Ireland's physical infrastructure over the next seven years. The sector will also benefit from the substantial allocation for public transport projects within this commitment – nearly €33 billion – over the seven year period.

***The share of Irish civil engineering output in GDP was higher than the European average.***

Ireland's share of civil engineering output in GDP over the period 2003-2006 was 3.2%, which exceeds the EU average of 2.5%. This places Ireland in fifth position in the relative ranking, indicating that Ireland compares quite favourably in terms of spending in this sector in a European context.

**Figure 1.13**  
**Civil Engineering Output as a Percentage of**  
**Real GDP by European Country, 2003-2006**



Source: Euroconstruct

In contrast, the share of this segment of the construction industry in GDP was below the EU average in some of the largest European economies – France, the UK and Germany.

*A number of key points emerge from the analysis*

The new residential was responsible for most of the output and employment growth experienced over the period 1998-2006.

The volume of housing was relatively low by European standards at the beginning of the period but by 2006 it was approaching the European average.

The level of house building was exceptional by European standards but there was not a notable difference between the levels of activity in Ireland and Europe in the other markets in the industry.

Thus, it is the house-building sector which is largely responsible for the relatively high share of national output and employment accounted for by the industry in Ireland and in the long-term, it is inevitable that the share of both output and employment will move closer to the European average.

## Chapter 2: The Impact of ‘Sustainability’ on Activity and Skills

### *Ireland is committed to the concept of sustainable development in construction*

Sustainable development is one of the Government’s key top priorities. The national strategy entitled ‘Sustainable Development – A Strategy for Ireland’ states that “we should not tolerate development that is inefficient, that is excessive in its consumption of natural resources or that unduly pressurises the environment”.

### *The State is legally committed to limiting the growth in its green house gas emissions to 13% above 1990 levels by 2012*

Under the Kyoto Protocol, Ireland has committed to limit its growth in annual greenhouse gas emissions to 13% above its 1990 levels over the five year period 2008-2012. For Ireland, this translates into an annual emissions target of approximately 63 million tonnes of CO<sub>2</sub> per annum.

The 2008-2012 emissions target can be achieved through an emissions reduction programme, and/or emissions allowances that can be purchased from countries that have successfully lowered emissions.

The most recent data show that Ireland’s greenhouse gas emissions were 26% above 1990 levels<sup>15</sup> (the base-year level) in 2005, or 12 percentage points above the 13% target which must be reached over the 2008-2012 period.<sup>16</sup> The 2005 figure represents a decline when compared with peak levels in 2001. In 2001, emissions reached a peak of 28% above 1990 levels. In absolute terms, emissions in 2005 were 70 Mt in excess of Ireland’s Kyoto Protocol target of 63 Mt per annum.

<sup>15</sup> The year 1990 is the reference year on which Kyoto Protocol commitments are based.

<sup>16</sup> National Inventory Report 2007, Greenhouse Gas Emissions 1990-2005, Environmental Protection Agency.

### *Buildings in Ireland account for over 40% of energy-related CO<sub>2</sub> emissions*

Energy consumption for heating, cooling, lighting and other services in buildings accounted for over 40% of Ireland’s energy-related CO<sub>2</sub> emissions in 2005. This represents nearly one-third of total greenhouse gas emissions associated with global warming. CO<sub>2</sub> arises mainly from the combustion of fossil fuels for space and water heating in buildings.

The residential sector alone, accounted for 27% of energy related CO<sub>2</sub> emissions in 2005 – this sector accounted for the largest share of total energy-related CO<sub>2</sub> emissions after transport – which was responsible for 32% of emissions. Final energy use in the sector increased by 27% over the period 1990 to 2005, mainly due to a 35% increase in the number of private households in permanent housing in the State from approximately 1.01 million in 1990 to 1.5 million in 2005.

Although residential energy consumption increased by about 17% from 1990 to 2005, CO<sub>2</sub> emissions in this sub-sector decreased by 3% due to the decline in the use of carbon-intensive fuels such as peat and coal, and greater use of oil and natural gas.

### *European Union has identified improved energy efficiency of buildings as a top priority*

The European Commission’s Action Plan for Energy Efficiency: Realising the Potential (2006) states that it is “technically and economically feasible to save 20% of total primary energy by 2020 on top of what could be achieved by price effects and structural changes in the economy, natural replacement of technology and measures already in place”.

The Plan highlights that the largest cost-effective savings potential lies in the residential (households) and commercial buildings (tertiary sector), where the full potential is now estimated to be around 27% and 30% of energy use, respectively.

***There are a number of ways in which the industry can contribute to the development of sustainability***

Sustainability in building and construction can be enhanced in a number of ways;

- Optimising energy efficiency and reducing CO<sub>2</sub> emissions (for example, location to maximise use of natural light and heat, good thermal insulation, and energy-efficient space and water heating);
- Using renewable materials, reducing use of non-renewable materials, and avoiding use of synthetic materials which affect indoor air quality or comfort;
- Reducing undue consumption through the use of efficient components and fittings such as low water consuming flush toilets, and water recycling systems in industrial premises;
- Using low-embodied energy materials;
- Waste prevention;
- Reuse of existing buildings, and of demolition spoil;
- Minimising water consumption;
- Reducing transportation requirements and pollution prevention

***The State has implemented a series of legislative measures to encourage the industry to become more involved in these activities***

Part L of the Building Regulations relates to the conservation of fuel and energy in buildings in Ireland.

The first energy conservation requirements in national Building Regulations came into force in 1992 and these were improved and updated in 1998, 2003 and again in

2006 to improve energy efficiency through introducing improved thermal performance requirements into the Building Regulations.

The current standards are expected to achieve an annual emissions saving of 360,000 tonnes in the period 2008 to 2012.

***The Government is currently holding a public consultation on recently published revised draft amendments to Part L of the current building regulations***

The Department of the Environment, Heritage and Local Government published revised draft Regulations under Part L of the building code in September 2007. The proposed amendments to Part L of the Building Regulations are currently undergoing a period of consultation – providing a window of opportunity for relevant bodies to make submissions of their views on the draft regulations to the Department of the Environment, Heritage and Local Government.

The new draft regulations are the most ambitious to date and provide for a dramatic improvement in energy performance standards in new Irish homes. These Regulations are aimed at ensuring that new housing stock in Ireland is built to the highest international standards, where they will be cheaper to run and will have a much lower impact on the environment.

The draft regulations provide for inter alia:

- A 40% improvement in energy efficiency for new homes in 2008;
- A 40% reduction in CO<sub>2</sub> emissions for new homes;
- A mandatory minimum renewable energy requirement in all new homes, such as solar heating systems or biomass systems (for example, wood pellet);
- Mandatory levels of energy efficient fixed light fittings;
- Minimum standards of heating systems to ensure they are highly energy efficient;

- Minimum requirements for heating system controls to minimise energy waste through excessive heating;
- Air tightness testing, to ensure the homes are not leaking heat excessively;
- Guidance on ensuring a minimum quality of workmanship and construction;
- Consumer information on the efficient operation of the homeowner's dwelling as a minimum requirement;
- Commitment in the guidelines to review and improve regulations to 60% in 2010 with the ultimate aim of achieving a zero carbon standard for new houses in the medium to long term; and
- New buildings should also be future-proofed to be easily upgraded to higher energy and CO<sub>2</sub> standards in the future.

***Timeframe for revised Part L standards to come into force***

The draft Regulations have been sent to the European Commission for consideration, as required under Competition law. The Minister of the Environment, Heritage and Local Government may choose to amend parts of the Regulations and Guidance following public consultation.

The Minister intends to sign the Regulations in December 2007. There will be a phasing-in period for the Regulations in order to provide time for the industry to adjust. The intention is that the new rules will apply to all new housing planning applications after 1 July 2008. From 1 July 2009 they will apply to all new homes that have not been substantially completed at that stage, regardless of when planning permission was sought.

***The draft regulations are the first step in the process of achieving carbon zero housing***

Irish building controls legislation follows closely developments in the United Kingdom where the focus now is on achieving zero carbon housing from 2016.

The new draft Regulations are the first dramatic step in the process of achieving carbon zero housing. These higher standards are expected to achieve additional emissions savings of up to 120,000 tonnes per annum in the period 2008-2012.

***These changes in building energy standards could significantly address the high levels of CO<sub>2</sub> emissions from the typical Irish new home***

The typical Irish new home produces, in some cases, up to 200% more CO<sub>2</sub> emissions than its UK equivalent, according to recent research. This finding was concluded after a leading energy expert compared the current Part L of the Irish Building Regulations, which sets standards for energy efficiency in homes, to the UK equivalent. The recently published proposed changes in building energy standards could greatly help to address this imbalance.

***A review of the regulations is 'on the cards' for 2010, with a further tightening of standards so as to achieve zero carbon housing in the future***

The Government intends to review the regulations in 2010 and achieve a 60% energy efficiency target above current levels in future years. The objective is to achieve zero carbon emissions associated with the operation and use of buildings, at the earliest date practicable.

The guidelines also advise that new homes should be future energy-proofed. It recommends that the design and construction of new dwellings should be carried out with due regard to the likely need to upgrade the building fabric and fixed services in the future so as to reduce further carbon emissions associated with the operation and use of these dwellings.

***The UK is committed to ensuring that all new homes produce zero carbon emissions by 2016***

In the UK's Energy White Paper, the Government has signalled its intention to

significantly reduce energy use in buildings as an important element in its climate change strategy.

Energy use in buildings in the UK accounted for nearly half of total CO<sub>2</sub> emissions (152.5 million tonnes) in 2004. Emissions from domestic housing represent around 27% of total CO<sub>2</sub> emissions for 2004.

In a drive to reduce CO<sub>2</sub> emissions from energy use in buildings, the UK Government is committed to ensuring that all new homes produce zero carbon emissions by 2016 – a home with ‘zero net emissions of CO<sub>2</sub> from all energy use in the home’.<sup>17</sup>

***Improvement in the energy/carbon performance standards set in the UK’s building regulations is one of the mechanisms that the UK government is adopting in order to achieve zero carbon homes by 2016***

The minimum energy/carbon performance requirements set in Part L of the UK’s Building Regulations are one of the mechanisms through which reductions in CO<sub>2</sub> emissions are to be achieved<sup>18</sup> – moving towards zero carbon homes in 2016. The UK Government is aiming to achieve a 25% improvement in the carbon/energy performance standard set in the 2006 Building Regulations in 2010; a 44% improvement by 2013; and, to zero carbon housing in 2016.

***The UK Government is focusing in particular on the new homes market due to a significant shortage of housing***

The UK Government is focusing on the new homes market as there will be a

---

<sup>17</sup> This includes energy use from cooking, washing and electronic entertainment appliances as well as space heating, cooling, ventilation, lighting and hot water.

<sup>18</sup> This will be supported by the Code for Sustainable Homes, the Planning Policy Statement on Climate Change and stamp duty relief for new zero carbon homes from 1 October 2007.

significant number of new homes built in the coming years to meet housing demand. The Government has set a target of building three million houses by 2020, two million of them by 2016. These new targets are assumed to meet the estimated need of 240,000 additional households per annum.

***Energy Performance of Buildings Directive (EPBD) – the most powerful instrument developed to date for improving the energy efficiency of the buildings sector***

Given that buildings account for a significant share of Europe’s energy use and CO<sub>2</sub> emissions, the EU Commission’s Action Plan to Improve Energy Efficiency (2000) indicated the need for the introduction of specific measures to improve energy efficiency in buildings. In response, the Commission published the proposed Energy Performance of Buildings Directive in May 2001. It was adopted by the European Parliament and Council on 16 December 2002, and upon its publication in the EU Official Journal on 4 January 2003, the Directive became European Law.

***The scope and requirements of the Directive***

The Directive applies to virtually all buildings, residential and non-residential to listed buildings of architectural or historical importance, religious buildings and buildings of low occupancy or size.

The main elements of the Directive are:

- A method for calculating the energy performance of buildings;
- Application of minimum standards for the energy performance for new buildings and for large existing buildings that are subject to major renovation;
- Certification schemes for energy performance in new and existing buildings and the public display of these certificates; and

- Regular inspection of boilers, heating and cooling systems.

The Directive requires that when a building is constructed (both residential and non-residential), sold or rented out, the owner is required to have a building energy rating (BER) carried out by an accredited assessor<sup>19</sup> and must provide the BER Certificate to the prospective buyer/tenant. The rating gives an objective scale of comparison for energy demand and performance of a building and is similar to the energy rating scale for household appliances. Ratings range from “A1 (most energy efficient) to “G” (least energy efficient).

The BER Certificate will be valid for ten years and be accompanied by an advisory report setting out options on how the energy performance of a particular building could be improved in the future. However, there will be no legal obligation on vendors or prospective purchasers to carry out the recommended improvements.

#### ***Ireland is implementing the core aspects of this Directive in phases***

The EPBD was transposed into national legislation on the 4 January 2006 in Ireland, in compliance with the EU Directive; however, provision is made to allow for a longer time period – up to 4 January 2009 – for full implementation of more the complex requirements relating to energy certificates, promoting improved energy efficiency of boilers and inspection of air conditioning systems.

---

<sup>19</sup> All assessors are required to use the Dwellings Energy Assessment Procedure (DEAP) for assessing the energy performance of new buildings, for the purpose of demonstrating compliance with Part L (Conservation of Fuel and Energy) of the national Building Regulations. This procedure is also recognised by Technical Guidance Document L (May 2006) published by the Department of the Environment, Heritage and Local Government.

#### ***BER certification for new domestic dwellings was rolled out from January 2007 and this will be extended to existing dwellings from 2009***

The new system of BER, commenced with new dwellings for which planning permission was applied for on or after 1 January 2007.<sup>20</sup> Energy ratings will be introduced for new non-domestic buildings for which planning permission is applied for on or after 1 July 2008<sup>21</sup> and finally for all existing buildings (dwellings and other buildings), when being let or sold from 1 January 2009.

#### ***The requirement for a feasibility assessment of alternative energy systems for large new buildings over 1,000m<sup>2</sup> before construction starts came into force on 1 January 2007***

Another aspect of the Directive became effective from 1 January 2007 – the requirement that anyone commissioning the construction of a large new building (total useful floor area over 1,000m<sup>2</sup>) must consider the technical, environmental and economic feasibility of installing alternative energy systems<sup>22</sup> before construction starts (i.e. at the design stage).

#### ***Regular inspection and assessment of certain air-conditioning systems will become mandatory from 1 January 2008***

In line with the requirements of article 9 of the EPBD, from January 1 2008, the owner of an air conditioning system with an effective rated output of more than 12

---

<sup>20</sup> Transitional BER exemptions will apply to new dwellings for which planning permission is applied for on or before 31 December 2006, where the new dwellings involved are substantially completed on or before 30 June 2006.

<sup>21</sup> Transitional BER exemptions will apply to new non-domestic buildings for which planning permission is applied for on or before 30 June 2008 provided the new non-domestic buildings involved are substantially completed by 30 June 2010.

<sup>22</sup> For example, CHP, district or block heating, heat, heat pumps).

kW (this will be almost exclusively relevant to non-residential buildings only) will be required to have the system inspected by a trained inspector in order to ensure energy efficient usage by the system. Accompanying advice on possible improvements or alternatives will also be mandatory. This mandatory requirement will be almost exclusively relevant to non-residential buildings only).

It has been estimated that this action will affect an estimated 30,000 air conditioning systems on 14,000 different sites in Ireland that consume nearly 20,000 MWh of electricity per annum.

#### ***Energy efficiency scheme for boiler/heating systems***

In compliance with article 8 of the EPBD – improvement of energy efficiency of larger boiler systems with effective rated output of more than 20kW – SEI will launch an awareness campaign in 2008 to encourage householders and other building owners to maximise the energy efficiency of their boilers through regular servicing and where necessary replacement.

#### ***Energy rating certificates will allow individuals to compare and benchmark the energy efficiency of buildings, and estimated annual running costs***

The energy auditing aspect of the Directive means that for the first time it will allow prospective buyers or tenants to factor energy performance and costs into their comparison of different properties and into their ultimate property decision. Furthermore, it is destined to convert a building's energy performance into a factor that significantly affects its value.

With buyers and prospective tenants better informed on the running costs of a building, builders and landlords will have a greater incentive to incorporate energy-efficient technologies and designs into their buildings. The energy rating should encourage builders and developers to build more energy efficient new dwellings in order to merit an “A” or “B” rating, which

will improve the marketability of new dwellings offered for sale or letting.

#### ***A number of factors will drive house owners to upgrade the energy and thermal performance of their homes***

There is no mandatory requirement for owners of houses built to pre-1991 building energy conservation regulations to comply with the current mandatory regulations. Nevertheless, it is reasonable to anticipate that most of those who own houses that were built prior to the 1991 building regulations will seek to significantly improve the energy conservation and thermal performance of their houses over the next few years. Factors driving this expected trend are:

- Building energy rating certification – a high grade of energy rating will result in lower bills for householders;
- Reducing their dependence on imported fossil fuels, which are expected to continually rise in prices; and
- Good citizens may wish to reduce their own ‘carbon footprint’.

#### ***By far, the most significant driver will be building energy rating certification***

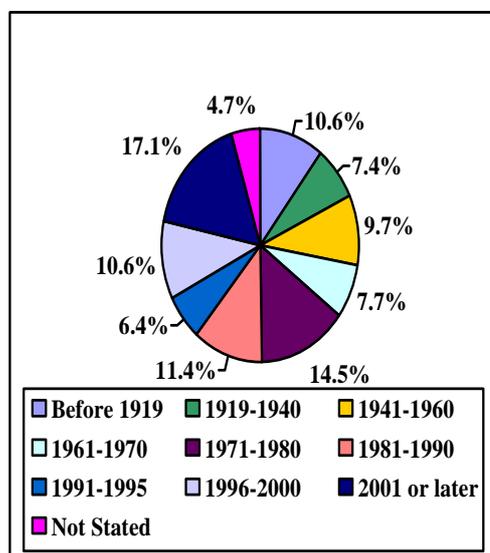
Building energy rating certification is expected to be by far the most significant driver of improvements in the pre-1991 building regulations housing stock. It is anticipated that owners of buildings built before that year are likely to upgrade the energy efficiency and thermal performance of their properties to a high rating (i.e. an “A” or “B” rating) as the market price or rental of a property is likely to be reflected by the energy rating grade that the owner has secured for the property.

#### ***Around 60% of the occupied housing stock in 2006 remains of the pre-1991 building regulations era***

Despite the fact that Ireland has one of the youngest housing stocks in Europe, a significant proportion of the current stock was built prior to the introduction of

mandatory building energy efficient regulations in 1991 (effective from 1992).<sup>23</sup>

**Figure 3.1**  
**Occupied Housing Stock by Period of Construction, 2006 (%)**



Source: CSO, *Census 2006 – Principal Demographic Results*

There were 1,469,521 occupied private households in the State at the time of the 2006 Census, according to the CSO. Of these, it is estimated that approximately 60% or 900,800 houses were built prior to the introduction of 1991 building standards – these houses are lacking the most basic energy efficiency measures.

***Research has shown many of these houses require extensive upgrading to secure a good level of certification***

Recent research conducted by the DIT RiSE (Research in Sustainable Environments) highlighted a significant energy efficiency gap between building regulations houses and pre-regulation houses.

The findings revealed that energy rating results for a typical three bed semi-detached house built to a range of pre-

<sup>23</sup> Building regulations were first introduced in 1979 but they were not mandatory and applied to social housing only.

regulation and upgrade specifications<sup>24</sup> fell outside the formal BER scale (i.e. below “G”, the lowest grade represented on the scale). For example, an un-insulated single-glazed house specification heated by open fires at 32% efficiency equated to a borderline K-L rating, while if the house was centrally heated with an external oil fired boiler of 65% efficiency (typical of pre-regulations) then its rating would have risen to “H”, which is still off the formal scale.

The energy rating of these house types are well below those of the 2002/2005 building regulations, which would generally, subject to a range of parameters, rate at the B3/C1 threshold (if they have a reasonable fuel and boiler efficiency).

***This legislation could result in up-to 900,000 houses eventually undergoing significant upgrading***

In general, most pre-regulations houses have had some form of energy improvement undertaken over the intervening years, according to the ESRI’s Irish National Survey of Housing Quality. For example, attic insulation and replacing single glazing with double glazed systems. The RiSE study also highlights that simple energy improvement measures can significantly improve the energy rating assigned to a house. For example, in the case of the oil heated pre-building regulations case example, its energy rating could be brought up to the ‘G’ band of the scale by adding attic insulation; replacing single glazing with double glazing; installing a central heating system and adding a lagging jacket to an existing cylinder.

<sup>24</sup> The house was typically un-insulated and single glazed, was varied over heating system fuel and boiler efficiency variations (for example, three-four fire places plus back boiler, solid fuel central heating system, oil-fired central heating, and a house with typical improvements – attic insulation, double glazing, lagging jacket etc.).

The installation of energy-saving measures by homeowners will significantly influence the energy rating assigned to a house; a factor that will become an important feature for the sale or letting of the property. It is anticipated that the BER element of the EPBD, could eventually result in up-to 900,000 pre-1991 building regulation houses undergoing significant energy refurbishment improvements.

***There are also grants available to encourage greater use of sustainable technologies in buildings across all sectors of the economy – from industry to consumers***

There are a myriad of grants available to encourage the use of sustainable technologies in both the domestic and non-domestic sectors (industrial, commercial etc.) to ensure a truly sustainable energy future for Ireland.

***Grants to encourage the use of renewable energy technologies in the domestic sector***

Under a number of schemes administered by Sustainable Energy Ireland (SEI) – the Greener Homes Scheme, House of Tomorrow Programme and the Low Income Housing Programme – grant assistance is available to encourage and increase the uptake of sustainable technologies by Irish homeowners. SEI intends to offer financial incentives to owners of ‘older’ houses (i.e. those that are part of the ‘older housing stock’) from 2008 to upgrade the energy performance of their homes.

***Greener homes grant scheme – over 16,000 householders have availed of grant aid to convert or install renewable heating systems in their homes***

The Greener Homes Scheme will provide €47 million of grant assistance to homeowners who intend to purchase a new renewable energy heating system<sup>25</sup> for

---

<sup>25</sup> Grants are available for the installation of either a new wood chip/pellet, solar or a heat pump based heating system.

either new or existing homes over the next five years. The scheme aims to develop a sustainable market for domestic renewable energy technologies by increasing their uptake in this market, thereby reducing emissions in the domestic sector, encouraging energy efficiency, contributing to security of supply objectives and facilitating greater consumer choice in the heating sector.

The scheme has surpassed its original targets and 16,000 grants were approved under Phase I of the scheme which ran from April 2006 to August 2007, with a consequent saving of 40,000 tonnes of CO<sub>2</sub> per annum. Since the scheme was launched, the number of registered renewable heat products on the market increased ten-fold and there has been a significant increase in the number of registered renewable energy installers.

Building on the success of the first phase, a second phase was launched on 1 October 2007. The second phase will focus on product quality standards and training, and grant levels will be reduced in cases where the market is relatively mature for a particular technology.

***House of tomorrow programme – has funded the development of over 5,000 energy efficient homes – and it paves the way for further improvements in the energy efficiency benchmark, relative to that set in the current building regulations***

The House of Tomorrow Programme aims to accelerate improvements in the quality and energy features in Irish housing. Its focus is to stimulate the widespread uptake of superior sustainable energy planning, design, specification and construction practices in both the new home building and home improvement market.

Until recently, developers of groups of housing could avail of grant aid if they built units which were 40% more energy efficient than the requirements set in the current building regulations. The Programme is now being revised and will require builders to achieve an energy

efficient standard of at least 60% above the current building regulations.

The Programme has been very successful since its launch in 2001, with funding granted to over 5,000 homes to date, many of which include renewable energy technologies.

***Warmer homes scheme has retrofitted over 12,000 fuel poverty homes with energy efficient measures – insulation and draught-proofing***

The issue of fuel poverty<sup>26</sup> is being addressed through the warmer homes scheme – by improving the energy efficiency and comfort conditions of homes occupied by low-income households. The scheme has to date retrofitted some 12,000 homes with energy efficient features such as insulation, where fuel poverty posed a difficulty for occupants. A pilot initiative has commenced that extends beyond the normal package of insulation and draft-proofing measures to include complete installation of an efficient central heating system.

***Financial incentives to householders to upgrade the energy efficiency of the older housing stock***

Following on from the Programme for Government to introduce a €100 million grant package for retro-fitting homes with insulation in a move towards greater energy efficiency, an incentive programme is being developed by SEI to encourage householders to upgrade the energy efficiency of older housing stock. SEI intends that financial assistance will be available from 2008 for the installation of

key energy efficiency technologies, possibly including condensing boilers and wall and attic insulation.

***Suite of grants for the uptake of sustainable technologies in non-domestic buildings***

Under a number of schemes administered by Sustainable Energy Ireland (SEI) – Combined Heat and Power Deployment Programme, Renewable Heat Deployment Programme, and the Public and Commercial Programme – grant support is available to encourage the development and deployment of renewable sources of energy (alternative heating systems).

***Combined heat and power deployment programme provides grant support for the deployment of small-scale fossil fired and biomass CHP systems***

The €11 million Combined Heat and Power (CHP) Deployment Programme provides grant support to assist the deployment of small-scale (greater than 50kWe and less than 1MWe) fossil-fired and biomass CHP systems in industrial, commercial, service and public sectors. Typical applications for units in this range include hotels, leisure centres, small hospitals, offices and many commercial and public buildings.

The programme is running over the period 2006 to 2010. The Government's ambition for CHP is underpinned by a target to achieve an installed capacity of 400 Mw by 2010 and 800 Mw by 2020. According to the Government's Climate Change Strategy, the achievement of the 2010 target will reduce greenhouse gas emissions by 162,000 tonnes on average over the period 2008 to 2012.

***Renewable Heat Deployment Programme (ReHeat) grant aid for the deployment of new renewable heating systems***

Launched in 2007, the €26 million Renewable Heat (ReHeat) Deployment Programme provides grant assistance for the deployment of new renewable heating systems in the commercial, industrial,

---

<sup>26</sup> Around 60,000 Irish households are estimated to live in persistent fuel poverty and a further 160,000 or so experience intermittent fuel poverty. Fuel poverty is the inability to heat ones home to an adequate (i.e. safe and comfortable) level owing to low household income and poor, energy inefficient housing and also the need to spend greater than 10% of household income on fuel to achieve an acceptable level of comfort and amenity.

services and public sectors in Ireland. The programme is administered by SEI and is an expansion of the previous Bioheat Boiler Deployment Programme which supported woodchip or pellet boilers only. The programme also focuses on solar thermal systems and heat pumps.

***Public and commercial programme aims to stimulate the installation of renewable heating systems***

This programme offers financial support on a restricted basis to public sector and commercial organisations to promote energy efficient design, technologies and services in new and retrofit public sector projects. The programme is aimed at establishing public sector buildings as an exemplar in energy efficiency best practice and as a demand leader for the services and technologies involved.

Under the programme, funding has been made available for Government Departments, Local Authorities, the health sector, Agencies and non-commercial state bodies.

Funding of up to 50% of eligible costs is available through the programme's three main elements: generic design studies, model new and retrofit building projects, energy management bureau services.

***The management of waste is an important component of the sustainability strategy***

Construction and demolition waste is defined as waste which arises from construction, renovation and demolition activities, together with all waste categories mentioned in chapter 17 of the European Waste Catalogue (EWC). Also included within the definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities.

Construction and demolition waste is broken down into the following categories at the level two headings in the EWC.

- Concrete, bricks, tiles and ceramics;
- Wood, glass and plastic;
- Soil (including excavated soil from contaminated sites), stones and dredging spoil;
- Insulation materials and asbestos containing construction materials;
- Gypsum-based construction material;
- Bituminous mixtures, coal tar and tarred products;
- Metals (including their alloys);
- Other construction and demolition wastes including mixed wastes.

Construction and demolition waste is a very significant component of the overall waste stream. Much of the increase is attributed to the high levels of building, construction, renovation and demolition activities. The most recent EPA National Waste Database report (2005) revealed that 85.3 million tonnes of waste was generated in Ireland in 2004. Just over 11.2 million tonnes (13%), of this was attributed to the construction industry.

***Landfill has been the traditional disposal mechanism for construction and demolition waste***

Due to a lack of a national solid waste infrastructure, very large quantities of waste is being landfilled, despite its potential resource value – most of it is better suited to recycling and reuse as an alternative to the use of virgin materials.

While Ireland's rate of recovery of construction and demolition waste is quite high – at 87% in 2005 – this is mainly accounted for by soil and stones (which are the easiest to recover), while that for core construction and demolition waste materials is relatively low.

Construction and demolition waste management in Ireland is coming under increasing pressure as landfill void space is decreasing and waste management costs are rising steeply. Government targets are keenly focused on reducing waste

production and eliminating illegal disposal in unauthorised sites around the country.

The government policy document “Changing Our Ways” (1998) set a recycling target of 85% for construction and demolition waste by 2013. To achieve this target, the National Construction and Demolition Waste Council (NCDWC) was established in June 2002 by the Forum for the Construction Industry on the recommendation of Task Force B4 as approved by the Minister for the Environment, Heritage and Local Government. The Council was set up as a voluntary initiative. The role of the Council is to provide a framework to achieve compliance with the policy and targets as set out in Changing Our Ways. This will be achieved through each participant in the country industry committing to a series of actions, which will promote waste prevention, reduction, reuse of materials and recycling.

A key recommendation of the Forum for the Construction Industry – Taskforce B4 “Recycling of Construction and Demolition Waste” is that for every development requiring planning permission, a waste management plan should be drawn up prior to the commencement of construction activity. The Plan should respect the waste management hierarchy – waste reduction must be the first priority, followed by re-use and recycling initiatives as appropriate with disposal only being considered as a last resort.

In particular, project construction and demolition waste management plans should be prepared for projects in excess of any of the following thresholds:

1. New residential development of 10 houses or more;
2. New developments other than (1) above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250m<sup>2</sup>;
3. Demolition/renovation/refurbishment projects generating in excess of 100m<sup>3</sup> in volume, of

construction and demolition waste;

4. Civil engineering projects producing in excess of 500m<sup>3</sup> of waste, excluding waste materials used for development works on site.

This assist in compilation of waste management plans, “Best Practice Guidelines on the Preparation of Waste Management Plans for construction and demolition waste projects were published by the Department of the Environment, Heritage and Local Government in 2006. The Guidelines promote an integrated approach to the management of this waste stream. They are designed to promote sustainable development, environmental protection and the optimum use of resources.

***Guidelines have been recently issued to assist the industry in the effective management of waste***

FÁS and the CIF have developed a handbook specifically for contractors and site managers in construction and demolition waste.<sup>27</sup>

The National Construction and Demolition Waste Council (NCDWC) are currently in the process of developing guidelines/handbook for the prevention, minimisation and recycling of construction and demolition waste management.

The Department of the Environment, Heritage and Local Government has prepared best practice guidelines on the preparation of waste management plans for construction and demolition projects. These provide guidance on the preparation of construction and demolition waste management plans and provide local authorities, engineers and developers with an agreed basis for the content of Construction and Demolition Waste Management Plans.

---

<sup>27</sup> Construction and Demolition Waste Management – A Handbook for Contractors and Site Managers.

***The transition towards sustainability has significant implications for skills both for assessors and the skilled trades***

Sale and rental transactions in the Irish residential market currently number approximately 170,000 per year. The BER must be carried out by a registered assessor and it has been estimated that up to 1,000 trained and certified assessors will be required to service the BER requirements for the residential market alone.

Sustainable Energy Ireland is currently in the process of estimating the assessor requirements for the non-residential sector.

***The implementation of Part L regulations should give rise to increased levels of activity for skilled trades***

Taking the pre-1991 building regulations as the threshold, it is estimated that the upgrading requirements of the housing stock could require up to 3,500 skilled trades-workers.

This may be an over-estimate as some of this work may be done by owner-occupiers on a DIY basis. However, there is no doubt that the upgrading of the housing stock will provide substantial opportunities to craft workers who have expertise in the insulation of residential properties and for this reason training programmes in this area are urgently required.

***Changes in the skills mix is being driven partly by new technologies***

To implement the requirement under the new draft Part L building regulations dealing with energy efficiency in new homes, the Government needs to ensure that installers with the necessary and accredited skill-set are available to install the renewable energy technologies into all new Irish homes.

For example, plumbers will need some training in the installation of sustainable heating systems.

FÁS in conjunction with Construction Industry Federation (CIF) have delivered

two pilot programmes – Sustainability in Construction and Sustainable Building Technologies – which are designed to enhance the industry’s knowledge and expertise in sustainable technologies.

SEI in conjunction with Action Renewables have set up a Renewable Energy Installers Academy (REIA). The objective of this academy is to provide training, accreditation, quality inspection and registration for installers of renewable technologies – solar water heating, heat pumps, biomass, wind, PV and hydro.

FÁS is currently developing a training programme in building energy rating.

FÁS in conjunction with Sustainable Energy Ireland is also examining the training needs of those required for the inspection of certain types of air-conditioning systems in compliance with Article 9 of the EPBD. It seems likely that the content of the FÁS revised refrigeration and air-conditioning apprenticeship curriculum will more than adequately equip those who have completed the National Craft Certificate in Refrigeration and Air-Conditioning to meet the requirements set down for inspectors in Energy Efficiency Inspection Manual for Air-Conditioning Systems in compliance with the requirements of the Air-Conditioning Regulations 2006.

**Key conclusions from the analysis**

The opportunities for new businesses and for employment from activities related to sustainable construction are immense. These opportunities are being driven by a combination of legislation and a much greater awareness and indeed acceptance by society of our responsibilities to the environment

But these opportunities can only be grasped by those who have the knowledge and skills to effectively utilise these technologies for the benefit of others. This in turn requires that the appropriate training programmes are made available to the industry.

## Chapter 3: The Impact of New Building Methods on Activity and Skills

### *Modern methods of construction embrace a wide range of technologies and building methods*

Modern methods of construction (MCC) embrace a range of technologies and processes involving various forms of pre-fabrication and off-site manufacture (OSM). Whereas all on-site manufacture may be regarded as falling within a generic MMC heading, not all MMC may be regarded as OSM.

Off-site manufacture refers to that part of the production process that is carried out remotely from the building site in factory conditions. There are two basic forms of OSM – volumetric and panellised construction. There are also hybrid systems (also known as ‘semi-volumetric’) which combine both panellised and volumetric methods of construction. In addition, there are site-based systems that utilise concrete cast in situ. While it is not strictly off-site manufacture, this approach is more akin to factory production rather than the normal site-based forms of construction. It might be best categorised as ‘site-based factory production’.

*Volumetric Systems (Modular Systems):* involve producing three-dimensional modules in controlled factory conditions which are then transported to the site. The modules can be used in isolation or in multiples to form the structure of the building.

Pre-fabricated modules (also referred to as ‘pods’) are factory finished internally, complete with mechanical and electrical services. Pod framing are available in light steel frame or rolled hollow section steel, timber frame, pre-cast concrete. Pods are mainly used in more specialised areas that can be standardised and repeated, such as kitchens and bathrooms and bedrooms.

Applications for pods include commercial offices, public buildings, hotels, airports, sport stadiums, hospitals, universities and schools.

*Panellised Systems:* panellised units are produced in a factory and assembled on-site to produce a three dimensional structural frame. There are two main types of panel systems – open and closed panel. Open panel systems consist of a skeletal structure only (also known as a ‘stick frame’), while more advanced closed panel systems may include lining, insulation, windows, doors, internal and external finishes. Such systems have been around for many years, particularly for timber frame dwellings.

Structural insulated panels (SIPs) are a form of panellised construction comprising a rigid insulation (usually a closed-cell foam such as polyurethane) sandwiched between two skins of sheet material to form a structural panel. The panels do not need studs within to give load bearing capacity. The external skins can be made from a range of materials such as wood, gypsum-based boards, steel, or cement-based materials.

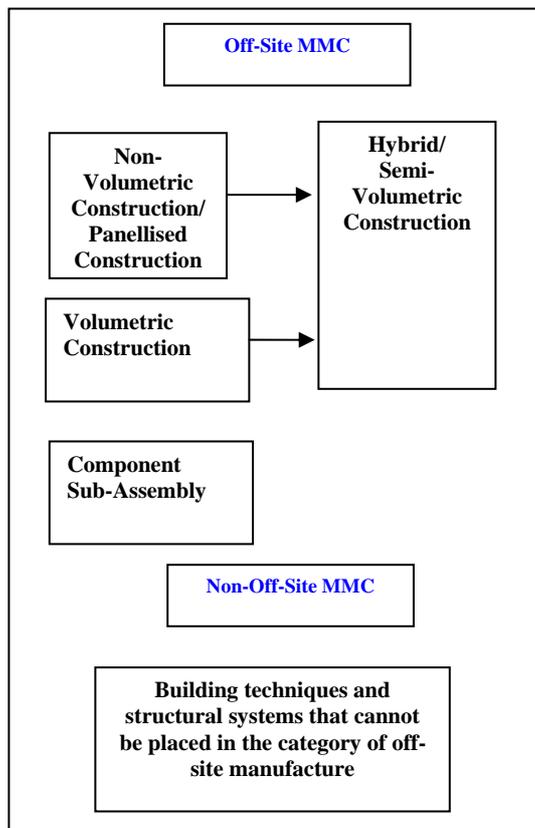
*Hybrid Systems (Semi-Volumetric):* are a combination of volumetric and panellised systems where the high value area (kitchen and bathroom) are typically formed from volumetric units (pods) and the rest of the structure from some form of framing system.

*Sub-Assemblies:* major building elements that are manufactured off-site but do not form the primary structure of the building. Pre-concrete foundation assemblies, floor or roof cassettes are typical examples.

*Components:* Non-structural elements that are assembled off-site. Although currently less common than structural elements, components such as mechanical and electrical services infrastructures are being

developed with significant assembly work being carried out off-site.

**Figure 3.1**



**The Main Types of MMC**

***Non off-site manufacturing/MMC – characterised by innovative Site-based methods***

Non off-site manufacture encompasses building techniques and structural systems that fall outside the category of OSM. The main characteristic of these methods is that of innovation. This could be through an innovative non OSM building technique or through the use of a method of construction that has been used in other industries, but not in house building. Examples of non OSM include ‘Tunnel Form’ and ‘Thin-Joint Masonry’.

During the tunnel form construction process, a structural tunnel is created by pouring concrete into steel mould known as a formwork to form the floor and walls. Every 24 hours, the formwork is moved so that another tunnel can be created. Once a storey has been completed, the process is completed on the next floor. Tunnel form

is evolving into one of the most frequently used methods of cellular construction as its cost effectiveness, productivity and quality benefits are being realised on a variety of developments. Tunnel form is particularly suitable for repetitive cellular projects such as hotels, apartment blocks and student accommodation. Structures of up to 40 or more storeys in height can be built using this technique.

Thin joint masonry allows the depth of the mortar to be reduced from 10mm to just 3mm or less, resulting in faster laying and improved productivity, particularly on long runs of walling. Construction speed can be further increased by around 13% using large-format concrete blocks, which have a face size equivalent to two traditional concrete blocks. The mortar cures rapidly, achieving full bond strength within one to two hours, eliminating the problem of ‘floating’ and enabling more courses to be laid per day.

***New forms of construction – usually involving some aspect of off-site manufacturing – are becoming the norm in large construction projects***

Elements of off-site construction are becoming an integral part in large construction projects in Ireland – for example, pre-fabricated panels, bathroom and kitchen pods and pre-cast concrete floors and walls.

The potential of modular construction is being realised by an increasing number of developers, architects and contractors particularly in the areas of timber frame housing and for the supply of fully fitted kitchen and bathroom units for social housing, apartments, hotels and student accommodation.

***Timber frame – probably the most well-known form of off-site construction***

Timber framing is one of the most popular forms of off-site construction in Ireland.

This form of panellised building<sup>28</sup> continues to be predominantly employed in the construction of houses. Apart from housing, timber frame can be used effectively in apartments, nursing homes, crèches and other commercial buildings. According to the Irish Timber Manufacturers' Association (ITMA), the timber frame sector's share of the new housing market has increased from 1% in 1990 to 30% in 2005.

Despite a downturn predicted for the housing market, timber frame manufacturers are confident that the market share of timber frame will further increase, reaching 50% by 2010. This expected share; however, is still behind that of other countries such as the US, Canada and Scotland where timber frame accounts for up to 90% of new housing.

***The timber frame market will be largely driven by the introduction of energy rating certification***

Continued growth in the popularity of timber frame houses is expected to be driven by the Government's phased introduction of energy ratings for most buildings under the EU Energy Performance of Buildings Directive (EPBD).

Wood is particularly characterised by its CO<sub>2</sub> neutrality, and their representative association claims that quality built modern timber frame houses can have real savings in CO<sub>2</sub> emissions of some 43% over a typically built traditional concrete block house.<sup>29</sup>

---

<sup>28</sup> Panellised units are produced in factory and assembled on-site to produce a three dimensional structural structure. There are two main types of panel systems – open and closed panel. Open panel systems consist of a skeletal structure only, with services, insulation, external cladding and internal finishing occurring on-site (also known as a 'stick frame'), while more advanced closed panel may include lining, insulation, windows, doors, internal and external finishes.

<sup>29</sup> The Irish Timber Frame Association...

Other benefits of using timber frame systems are the speed and accuracy of construction, virtually no waste and improved safety on-site. The completion time for a timber frame house is typically far less than that of any other material as timber frame structures can be erected on-site with roofing and tiling completed in days – the average timber frame home is weather proof in five day or less: this means that tradesmen such as plumbers and electricians can get to work on the inside of a house from virtually the outset and the homeowner can take possession of the home within six to eight weeks.

However, the traditional concrete built house is also capable of achieving the highest grade 'A' rating in respect of energy efficiency. Therefore while the market for timber frame houses may increase over the next few years, it is not expected to replace the traditional concrete build, which also has certain advantages, for example in terms of thermal mass.

***Light gauge steel frames are popular in the construction of commercial, institutional and industrial buildings***

Steel framing (cold-formed) is relatively new in Ireland and is used in the construction of houses and apartments, commercial, institutional and industrial buildings. Given the expectation of a trend towards high rise buildings, the deployment of this type of off-site construction is expected to increase.

The use of steel in construction is continuing to develop apace in other ways – it has already experienced strong growth in the internal partition market and can be expected to benefit from the increased use of volumetric modular designs where steel has a significant edge over timber because it is stronger and lighter.

The following are some of the benefits of using steel:

- Energy performance of steel-frame houses exceeds the latest

requirements of new Part L regulations;

- Modern insulation materials used in steel construction produce low U-values and high standards of air tightness, which promote a warm, draught-free internal environment;
- Steel is a 100% recyclable – in effect producing no waste.

***Lack of a common software package and lack of training could hamper the growth of the steel frame sector***

The “newness” of steel has meant that there is much to learn about designing and building steel framed houses in a cost-competitive way. There is a need for the development of more efficient tools, and better design information. According to some steel frame suppliers in the Irish market, the only thing that could possibly hold back an increase in capacity in the steel frame sector is a lack of design resources. The lack of a common software package that could be shared with the clients’ architects and engineers has somewhat hampered the design process. Also, there is no qualification that is focused on modern methods of construction, except for steel erection which is provided by FÁS.

***Now in regular use are volumetric elements – ‘Pods’***

The use of prefabricated units (also referred to as ‘pods’) – such as fully fitted bathroom and bedroom modules – has become very popular in student accommodation, social housing, hotels and apartments in Ireland. These units are fully factory finished internally complete with building services, and are mainly used in more specialised areas that can be standardised and repeated. Pods are made from a wide range of materials – fibre plastic and steel studs with plasterboard cladding and concrete – concrete of several classes – and combinations of these materials.

The traditional bathroom pod market has rapidly grown in Ireland and industry experts estimate that as many as 50% of new hotels rely on pod construction, with between 40 and 50% of apartment schemes are benefiting from this modular method of construction.

Some of the factors underpinning the strong demand for pods include:

- Shorter production periods – up to a 20%;
- Reduction in the risk of accidents on the building site by relocating labour to the factory;
- Speed of construction;
- More easily transported relative to other pre-fabricated materials – ten pods can be delivered on site at a time;
- In-house assembly of all components together with rigorous quality control regimes means the finished product is of the highest standard;
- Allows developers to complete a building project faster and more efficiently;
- Existing standard modules in common sizes also make the production of single units an economical option;
- Disposal of packages and waste on site is minimal.

The demand for pod construction is set to increase in the years ahead driven mainly by an anticipated expansion in student accommodation<sup>30</sup> arising from the Irish education system expanding (the availability of tax relief for rented residential accommodation in this area will facilitate in the provision of additional student accommodation)<sup>31</sup> and an expected shift away from the traditional

---

<sup>30</sup> Tax relief here

<sup>31</sup> Section 50 of the Finance Act, 1999 provides for a scheme of tax relief for rented residential accommodation for third level students. The purpose of which is the provision of additional rented accommodation to relieve current supply pressures in the private rented sector.

one-off house to mid to high-rise developments (high density developments) becoming the norm.

Currently, 85% of the UK pod market is sourced in Europe, particularly Italy, Germany, Denmark and Poland. There is a obvious potential for Irish pod manufacturers to enter this market.

### ***The Irish pre-cast market has grown rapidly***

The pre-cast concrete market accounts for 20% of overall construction methods.

There are a number of companies in Ireland which are regarded as being very technically advanced in the manufacture of a range of pre-cast concrete building components for the construction industry. These include for example, finished pre-cast floors, walls, stairs and landings, external panels, and chimney systems which incorporate the flue liner and preformed insulation.

Products are fabricated using state of the art machinery and high quality moulds, all within an enclosed factory environment. Factory finished products are then loaded onto a flatbed truck, delivered to the site, and lifted into place.

Pre-cast concrete products and systems are used extensively across all sub-sectors of the Irish construction sector – residential (hollowcore units and pre-cast stairs), civil engineering (bridges – reinforced concrete beams), commercial.

### ***Use of sophisticated cladding systems has now become prevalent***

Novabrik is an innovative external mortarless overlapping brick cladding system. It comprises brick-sized slips which lock together to form a weather-proof outer skin for timber-framed, steel-framed or concrete panel structures. The system is equally suited to use with conventional block-work walls or insulated concrete formwork (ICF) systems.

As the system does not need mortar, it can be installed by workers without masonry skills, therefore the installed cost of the mortarless brick system is less than that of conventional brick walls. It can be installed in inclement weather conditions and as a result, can be installed up to 40% faster than conventional masonry construction with significant savings in labour costs as a consequence.

This innovative external cladding system is suitable for new commercial, industrial and domestic building and it has found particular favour for multi-dwelling apartment-style applications in Ireland.

### ***The skills profile associated with new forms of construction is radically different from the traditional build.***

There is not doubt that the skills profile associated with many new forms of construction is quite different from the skills associated with traditional methods of construction. This difference is particularly evident in the building fabric. There is relatively little use of block or brick work or plastering or painting in many ‘panellised’ methods of construction. Glazing skills, on the other hand, are often extensively deployed.

The new methods of construction also create a larger national and international market in terms of the sourcing and purchasing of components. The building process becomes more closely aligned to the manufacturing process and skills in logistics and the management of the supply chain will become as important to the large or medium-sized contractor as they are to the multi-national manufacturing company.

Design and scheduling will become more important features of the building process and in general, the new methods of construction will have

relatively more professional staff and relatively less staff employed in the 'wet trades'.

education and training programmes in these and other areas.

Unfortunately, as the adoption of new methods of construction is of relatively recent origin in Ireland, it is not possible to quantify with any degree of accuracy the extent of the change in the skills-mix associated with the different construction methods.

However such a project should be undertaken in the future when these methods of construction become more widespread throughout the industry.

### ***Key points to emerge from the analysis***

There has been a significant adoption of new methods of construction in Ireland in recent years and this trend is expected to continue over the next few years.

These methods of construction are particularly efficient in respect of large projects where there is considerable repetition and where economies of scale are available to the contractor.

These new methods of construction, when they become more extensively deployed in Ireland, will result in a significant change in the skills profile.

Broadly speaking, they will result in a relative decline in the demand for craft workers in the 'wet trades'; an increase in demand for glaziers and those involved in erection of panels (including timber frame) and in an increase in demand for a range of professionals including logistics managers and designers.

The education and training system should prepare for this transition in the skills profile by offering appropriate

## Chapter 4: The Future Market for Residential Development 2007-2013

***Residential demand: Demand for housing is a function of a number of different factors***

The demand for housing is a function of demographics, the general prosperity of the population, which is linked to the macroeconomic environment, and especially in recent years, its attractiveness as an investment opportunity.

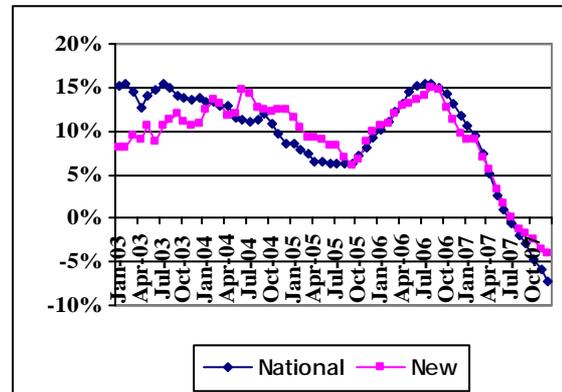
***Current situation: The demand for houses is declining significantly***

The demand for new houses has declined significantly in recent months. The growth in mortgages has contracted by 20% and this fall-off is reflected in a reduction in nominal national house prices. Prices declined by 1.5% for the tenth consecutive month in December 2007 – and by 7.3% since the beginning of the year.<sup>32</sup>

This decline is in sharp contrast to a peak increase in annual house prices nationally of 15.4% in July/August 2006, and to an increase of around 11% on average over the five year period December 2001 to December 2006.

New house prices declined by 0.2% in December of last year, and by 4.1% since the beginning of 2007. This annual decline compares with an increase of 9.6% in 2006 and 9.9% in 2005. The annual rate of house price inflation for this segment of the market was running at 4.7% over the last six years.

**Figure 4.1**  
**House Prices**  
(Percentage Change, Year-on-Year)



Source: Permanent tsb/ESRI House Price Index

***Much of the demand for houses was investor-driven***

This increase was significantly above the prevailing inflation rate and resulted in houses becoming a very attractive option for those with money to invest. The attractiveness of houses as investments was also enhanced by the introduction of a number of schemes which allowed investors to qualify for tax relief on the purchase of properties in certain locations. These schemes resulted in a significant number of houses being built in the designated areas.

Also, the growth in the population of young people – which was driven mainly by immigrants – provided a supply of people who were seeking properties to rent. The investor could thus earn an income on the property while also gaining significant capital appreciation.

However, the extent to which the level of rental income was a key factor in the decision to invest in new houses is debatable. The fact that 265,000 houses were vacant on the night of the 2006 Census, including 50,000 holiday homes and 30,000 dwellings which were vacant temporarily, suggests that for many purchasers the level of capital appreciation was the primary motivation for investing in new houses.

<sup>32</sup> These figures are based on the average price paid for a house nationally in the Permanent tsb/ESRI House Price Index publications. The index is based on a survey of properties for which mortgages are borrowed from Permanent tsb: it measures rises and falls in house prices, but takes into account the mix of properties sold in the period.

***Purchases of new houses have far exceeded household formation rates***

The results of the 2006 Census show that between the period 2002-2006, the number of additional households formed (households living in permanent accommodation) increased by around 182,700, while an additional 303,000 new housing units were added to the housing stock – indicating that the volume of new house building has been far in excess of the rate of household formation.

**Table 4.1  
Household Formation versus New House Building**

Period	Number of Households (Net Increase)	Annual Average	Number of Houses Built Total	Annual Average
1991-'96	85,890	17,178	123,376	24,376
1996-'02	164,643	41,161	268,604	67,151
2002-'06	182,679	45,670	302,700	75,675

Source: CSO

There has been a marked increase in the difference between the level of house purchase and the rate of household formation since the beginning of the nineteen nineties. In the period 1991-1996, household formation amounted to just over 70% of houses purchased, but by 2006 household formation per annum amounted to only 60% of houses built over the period 2002-2006.

The level of completions is usually somewhat above the level of household formation due to some obsolescence of the existing housing stock – the proportion of the housing stock which requires replacement annually.

The internationally accepted norm for an annual replacement rate (obsolescence rate) is around 6 units per 1,000 units of housing stock. At current stock levels, applying this rate of 6% translates to a replacement requirement of 10,800 units annually.

However, the housing stock in Ireland is relatively young compared to the rest of Europe, indicating a somewhat lower replacement rate for Ireland. As a result of a lower replacement requirement annually, a

figure of 7,000 is suggested as more realistic, not least due to the fact that approximately one third of the current housing stock in Ireland has been built in the past 10 years.

In addition, it is natural to assume that some houses will still be purchased for investment or alternatively as holiday homes.

There are some indications that the stock of housing has almost caught-up with the international comparable standards. Thus there are estimated to be about 1.8 million units of housing stock in 2006<sup>33</sup>, including both vacant and occupied dwellings. This represents about 420 units for every 1,000 persons, which compares favourably with the EU average of approximately 450 per 1,000 persons.

In 2006 some 80% of new house mortgages were for the purchase of a principal residence, 19% were declared to be for investment purposes, and only 1% for holiday homes (the breakdown for second hand homes mirrors this distribution).

Therefore, it would seem that a high proportion of the houses constructed in recent years were purchased for investment and indeed speculative reasons, primarily to realise capital appreciation gains.

***First-time buyers' share of the market has been relatively low: less than half of new residential units are purchased by first time buyers***

Data on mortgage lending supports the aforementioned assertion. According to the DoEHLG's data for new loans payments, 47% of the 55,737 new home purchase loans granted in 2006 were to first-time buyers. Based on this data source, less than 50% of the total volume of new mortgage lending activity was to this category of house purchaser since 2004.

<sup>33</sup> This estimate is based on the number of dwellings surveyed for the Census of Population 2006.

**Table 4.2**  
**Status of Borrowers – FTB's Share**

Year	New Houses (%)	All Houses (%)
2001	63.0	43.1
2002	54.5	40.3
2003	52.1	36.8
2004	43.6	33.8
2005	45.3	37.4
2006	46.9	37.6

Source: DoEHLG

The Irish Banking Federation's (IBF) data on new residential mortgage lending shows that 33.5% of the 110,495 new mortgages issued (excluding re-mortgages and top-ups) in 2006 were to first-time buyers (FTB). The corresponding proportion accounted for by the other types of borrowers – investors and mover purchasers – was 25% and 41% respectively – the latter accounting for the largest share in volume terms of the total mortgage market.

The FTBs segment increased their share of new lending to 36% in 2007. The mover-purchasers share decreased to 39%, while residential investment letting maintained its share at 25%.

While some studies have shown that up to 5% of first time buyers do not require a mortgage for the purchase of their home, this would not significantly alter the conclusion that most new homes are purchased by those who have or at least had a property, and that the demand for new homes will be significantly affected if investors leave the market.

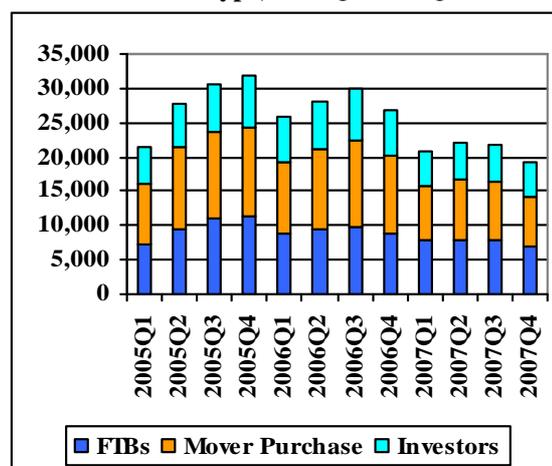
### ***Houses are no longer considered an attractive investment opportunity***

There is some evidence to indicate that this situation has arrived. The most recent figures published by the IBF on new mortgage lending confirm the apparent withdrawal of investors from the market.

There were 4,925 new home loans issued to investors in Q4 2007, bringing the total number to 20,861 last year. The number of new loans issued in Q4 2007 was 35% below its peak level of 7,530 in Q3 2006 and for the year as whole was 26% below its 2006 level.

At the same time, there was also a significant decline in the number of new loans issued to mover purchasers – a total of 7,489 new loans were issued in Q4 2007, bringing the total number for that year to 32,864. The number issued in Q4 2007 was 33% below its level in the same quarter the previous year, and 42% below its peak level of 12,941 in Q4 2005. Last year, the total number of loans issued was 28% below its 2006 level.

**Figure 4.2**  
**Number of New Loans Issued by House Purchaser Type, 2005Q1-2007Q4**



Source: IBF/PwC Mortgage Market Profile – New Lending Quarterly Report, Q4 2007

While the share of loans issued to first-time buyers has increased on the previous year – rising to 36% in 2007 – this apparent increase needs to be interpreted in light of the overall decline in the number of new loans issued over the same period – the number declined by 25% to 84,194 in 2007.<sup>34</sup>

Indeed, the decline is evident across all categories of house purchasers – loans to FTBs were down by 18% and to mover purchasers and investors by a discernable 28% and 26% respectively.

Consequently, if the investor leaves the market, it will result in both a significant degree of contraction in new housing output and an overall decline in construction output and employment.

<sup>34</sup> These figures exclude (re-mortgages and top-ups).

The factors which made it so attractive to invest in new houses no longer exist. As already stated, prices of houses nationally have declined by 3.3% in the first seven months of 2007, with this downward trend accelerating as evidenced by a 7.3% decline by the end of 2007. The average price paid for a house nationally in December 2007 was €287,887, compared to €310,632 in December 2006, and €277,852 in December 2005.<sup>35</sup>

In addition, most of the schemes through which purchasers of new properties qualified for tax relief are being phased out. The level of immigration is also forecast to decline significantly and this will ease pressure on the value of rents – private sector rents rose strongly last year – the annual increase was 7.5% in March 2007, compared with an annual increase of 12.3% in December of that year.<sup>36</sup> One of the contributing factors to this pronounced increase appears to have been the reluctance of some investors to buy properties for the reasons already aforementioned.

***Immigrants made a significant contribution to household formation rates***

The figures in Table 4.1 show that the average annual number of households created in Ireland trebled between 1991 and 2006.

Some of this increase is due to the decline in the average household size in Ireland over the period – it fell to 2.81 in 2006 from 2.95 in 2002. But undoubtedly, the most significant factor is the transition from net emigration to significant net immigration which occurred over this period. The migration flows changed from negative to positive during the 1990s. Over the period 1991-1996, net migration is estimated to have reached only 6,400 in total (positive figures were only recorded for 1992 and 1996) whereas the corresponding figure for the period of 2002-2006 was 180,800.

These immigrants contributed to housing demand in two ways. Firstly, surveys show

<sup>35</sup> Permanent TSB price index, December 2007

<sup>36</sup> CSO Rental Index 2007

that the immigrant population now accounts for about 20% of purchases of new houses. Approximately 50% or one-half of these immigrants are Irish people returning from abroad while the remainder are non-Irish nationals and/or new-Irish.

Secondly, the sheer scale of the immigrant population means that they provide a strong rental market for investors. It is estimated that immigrants rent houses at roughly three per dwelling.

**Table 4.3  
Net Immigration, 1991-2006**

Period	Net Immigration '000s	Annual Average '000s
1991-1996	6.4	1.06
1997-2001	112.7	22.54
2002-2006	180,800	45.2

Source: CSO

On this basis, immigrants would have accounted for about one-third of the household formations which occurred during the period 2002-2006.

Immigration; however, is forecast to decline to 30,000 per annum by 2010 and to remain at this level until the year 2016.<sup>37</sup>

Based on the assumptions outlined above, such a scenario would result in a reduction in the immigrant's contribution to household formation, to about 10,000 per annum

***The anticipated contraction in immigration will not be offset by a natural increase in the population***

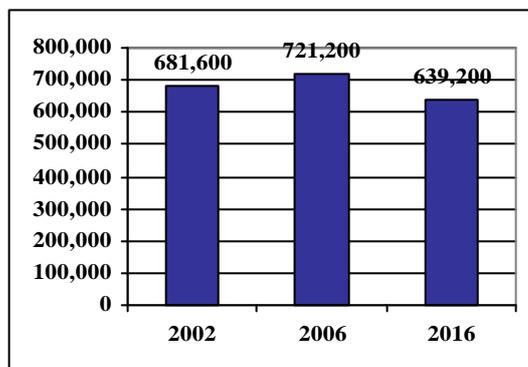
The above anticipated reduction in immigration and subsequent drop in housing demand is unlikely to be off-set by an increase in the population in the traditional house purchasing age cohort of 25 to 34 years. The average age of a FTB in 2006 was 30 years, with 60% under this age.<sup>38</sup>

<sup>37</sup> CSO, *Population and Labour Force Projections 2006-2036*; Migration scenario labelled M1 is adopted here since the lower version – M2 has already been surpassed considerably for the year 2006 and for the entire 2002-2006 period, with net migration amounting to 45,000 per annum, 50% above the original estimate.

<sup>38</sup> DoEHLG, *Annual Housing Statistics Bulletin 2006*.

Thus, the natural increase in the population – that is births over deaths – of those in the traditional house purchasing cohort – is actually projected to fall (Figure 4.3).

**Figure 4.3**  
**Demography and Residential Demand – “25-34” Age Cohort, Actual and Projected, 2002-2016**



Source: CSO

***Young people will continue to purchase their own homes***

However, while it is anticipated that investment activity will contract significantly, it is expected that headship rates – that is the proportion of those in each age cohort who purchase a house/form independent households – will continue to increase.

***Indications that housing affordability began to improve during 2007***

Affordability for first-time buyers improved steadily during 2007. Despite an increase in the cost of borrowing – mortgage interest rate increases in both March and June of last year due to increases of 0.25 basis points in the ECB official interest rates in both of these months, following six increases of an equivalent rate which commenced in December 2005 – a number of factors have helped to balance out the affordability equation during the year.

These factors included falling house prices;<sup>39</sup> fiscal measures introduced in Budget 2007 – the doubling of mortgage

<sup>39</sup> Much of this decline has been attributed to the spate of mortgage rate increases between December 2005 and June of last year.

interest relief for first-time buyers; increases in tax credits and the widening of tax bands – factors resulting in higher disposable incomes; the abolition of stamp duty for first-time buyers; wage growth averaging 5.6% economy-wide, boosted by pay increases; and the ECB keeping its base interest rates on hold at 4% since June of last year.

In point of fact, affordability was in a better position at the end of the last year than at the end of 2006, according to the EBS/DKM Affordability Index<sup>40</sup> published in January 2008. By the end of December 2007, the average first-time buyer couple nationally was estimated to have spent 22.6% of their net income on a 90% mortgage, compared with 24.5% in June of that year and 26.4% in December 2006.

***Stamp duty reform, increases in mortgage interest relief, declining house prices, and a likely cut in the ECB interest rate point to a further improvement in affordability***

Looking to 2008, housing affordability for all types of house purchasers is expected to continue improving for a number of reasons.

First, a further decline in new house prices during 2008 is expected to be the key factor underpinning the further improvement in affordability. It is anticipated that real house prices will fall by 15% on the 2006 level during 2008 and this will mean that more young people will be able to afford the initial capital payment.

Second, the general consensus is that the key ECB interest rate – the refi rate – has peaked at 4%. Furthermore, although the ECB has indicated that further policy tightening may prove necessary; weakening market conditions in the world economy may force

<sup>40</sup> The average first-time buyer couple are assumed to be on average earnings and buying the “average” new house. The Index is then an indication of mortgage-paying commitments in the early years; it takes into account changes in mortgage rates, changes in the level of mortgage interest relief and increases in average earnings. It assumes that loans did not exceed 90% of the value of the house and it does not deal with other financial commitments people might have.

the ECB to ease policy later this year. Some commentators are expecting that the ECB will cut official interest rates by 0.25% around mid-year followed by at least one further similar cut later in the year.<sup>41</sup>

If this expectation materialises and banks pass on the expected interest cuts to mortgage holders through lowering mortgage interest rates, the cost of serving a mortgage will be lower. This should also lead to pick-up in buyer activity this year.

Third, Budget 2008 provided welcome support for a depressed housing market.

The ceiling on mortgage interest relief was increased from €16,000 to €20,000 for a first-time buyer married couple and from €8,000 to €10,000 for a single person (at the standard rate of 20%). This increased the maximum monthly relief available by about €66 and €33 respectively, bringing the total monthly increase to €333 for a married couple and €166 for a single person.

The increase in interest relief for both married couples and single persons are quite significant and will provide a significant boost to the disposable income of some households. Hence, this will ease affordability pressures on this sector of the housing market.<sup>42</sup>

***Reform of the stamp duty regime is likely to assist housing market affordability and increase the number of transactions***

The Minister for Finance introduced a simplified system of stamp duty on residential transactions for owner-occupiers and investors in Budget 2008. In this new system, stamp duty will not be charged on the first €125,000 of the house price, with

two progressive rates instead of the six-rate bands that previously existed.<sup>43</sup>

This new system will lead to significant cost savings (an effective price cut for buyers) and thereby should increase the level of transactions in the housing market. For example, an investor purchasing a house for €850,000 will pay stamp duty of €50,000, just over €27,750 less than under the old regime, a 34% saving.

The stamp duty exemptions that were available to first-time buyers and purchasers of new homes under the old regime are being retained in the new regime.

There had been considerable uncertainty surrounding stamp duty since the final quarter of 2006, which combined with the spate of mortgage rate increases substantially weakened confidence in the housing market over the past twelve months.

Finally, there is still a strong tradition of home ownership in Ireland – over 75% of all lived-in dwellings are owner occupied. A cultural preference for home ownership appears to have persisted and is rather high by international standards. This should ensure a strong demand from first time buyers for house purchase in the medium to long term.

***Projected volumes of new house building set to align more closely with household formation rates***

In the forecasting analyses undertaken for this report, it is projected that on average 57,500 houses per annum will be built during the period 2007-2013<sup>44</sup>, which would amount to a closer alignment with household formation rates. Indeed, in relative terms, this household formation to house building ratio would resemble the situation that prevailed during the period 1991-1996.

<sup>41</sup> AIB Global Treasury – and Bank of Ireland Global Markets – The Bulletin, January 2008.

<sup>42</sup> AIB Global Treasury, expect that this measure will boost the disposable income of a couple by up to €800 and by up to €400 for a single person.

<sup>43</sup> Stamp duty will be levied at 7% above €125,000 up to €1,000,000, and the rate increases to 9% for the proportion above that threshold. In addition, residential properties with a value in excess of €125,000 but not exceeding €127,000 will be exempt from stamp duty.

<sup>44</sup> For more detailed forecasting, see Chapter 8.

***But planned State investment in social housing will possibly increase household formation rates***

The Government has earmarked a total of €21.2 billion in the National Development Plan to social housing,<sup>45</sup> comprising assistance through social, affordable and voluntary housing schemes to over 140,000 households over the Plan period, including 100,000 new social and affordable units and delivering support under the rent supplement scheme to other households<sup>46</sup>.

The figure above would translate into approximately 11,400 new social housing units being delivered per annum<sup>47</sup>, which would in turn compares extremely favourably to the actual figure of 5,208 achieved in 2006, and would thus amount to a significant departure on previous year's and the 2000-2006 planning period. Government commitment to meeting these targets notwithstanding, however, the most recent figures suggest that the volume of housing units completed appears to be in line with previous years – with 2,411 social housing units being completed by the end of June 2007<sup>48</sup>.

***The volume of activity in the repair, maintenance and improvements sub-sector will expand significantly as home owners 'keep-up appearances'***

The results of a survey undertaken by the Financial Regulator in 2004 indicated that 13% of recipients of Special Saving Incentive Accounts (SSIAs) intended to spend their money on house improvements.

---

<sup>45</sup> Social Housing Schemes include social rented accommodation provided by local authorities and voluntary and co-operative housing bodies, Rental Accommodation Scheme and other social housing options.

<sup>46</sup> National Development Plan 2007-2013: 17; <http://www.ppp.gov.ie>; it is assumed that this would incorporate units envisaged within/under Part V of the Planning and Development Act, 2000.

<sup>47</sup> The ratio of 4:1 is assumed to hold for the period, as per 2006 breakdown between new units and acquired units; i.e. out of 6,361 social housing units in 2006 (which includes voluntary & co-operative housing), 5,208 were new build, while the remaining 1,153 were second hand acquired units.

<sup>48</sup> DoEHLG, *Housing Statistics Database*.

This segment has apparently increased in the fourth quarter of 2005, with 22.6% of SSIA account holders intending to use their maturing SSIA funds for this purpose<sup>49</sup>.

This proportion; however, after controlling for whether the SSIA holders had firm plans to undertake home improvements, fell back to approximately 17.5%. Assuming that this proportion of 1.2 million of SSIA holders keeps up with their declared intentions, this would translate into about a €2.8 billion "fund" consigned for home improvements<sup>50</sup>, a substantial portion of which would ultimately be channelled into the construction industry.

***Residential repair, maintenance and improvements is set to expand to over €9 million by 2009***

The Construction Industry Federation (CIF) estimates that repair, maintenance and improvement work to existing homes and apartments was worth €4.5 billion in 2006 (the total for the construction industry was €7 billion<sup>51</sup>) and now accounts for 12.8% of all construction activity. The CIF forecasts that this construction activity will be worth over €5 billion by the end of 2007, and will grow in value by 4.4% annually between 2006 and 2009.

***Government commitment to social housing remedial and refurbishment initiatives should bolster activity in repair, maintenance and improvements***

Consistent with this, the Government is committed and continues to fund major re-development and re-generation programmes associated with social housing units. In 2006, some 600 units benefited from some form of refurbishment, and new units (over 200) were constructed as part of regeneration schemes.

---

<sup>49</sup> CSO 2006, *QNHS: Special Saving Incentive Accounts, Quarter 4 2005*.

<sup>45</sup> Based on the total of €16 billion and assuming an average SSIA value of 13,333 for all intending to undertake home improvements.

<sup>51</sup> This figure includes the RM&I work to on private non-residential premises such as offices, factories; social infrastructure such as schools and hospitals and civil engineering work.

In addition, some 5,500 households were assisted in 2006 through a new programme, introduced in 2004, aimed at providing central heating to local authority tenants. Grants totalling €70 million has been paid to local authorities to the end of 2006 allowing more than 15,000 houses to be provided with central heating under the programme. It is estimated that 20,000 units of local authorities are without central heating and it is intended to complete the programme of installation over the next few years.

Finally, some repair and maintenance is arising out of specific government policies (for example, Special Housing Aid for the Elderly) for the carrying out of essential repairs to houses occupied by elderly persons living on their own. The total allocated to the scheme by October of last year amounted to €19,132 million, with up to 3,700 households assisted in the first six months of the year.<sup>52</sup>

***Indications are that this expansion is already underway***

The slowdown in new housing output has facilitated the availability of an increasing number of builders and tradesmen to carry out home improvements – labour was patently lacking to carry out such work over the last decade. Consequently, there are indications that the level of activity in this sub-sector is expanding significantly. The number of planning applications for extensions and conversions in the year 2006 appears quite high (Table 4.4).

**Table 4.4  
Planning Applications Received by Planning Authorities, 2004-2006**

Year	Class of Application/ Development	
	Dwellings	Extensions, Alterations etc.
2004	51,762	18,213
2005	44,480	19,229
2006	46,880	21,204

Source: DoEHLG, *Planning Statistics*

<sup>52</sup> Since the introduction of this scheme in 1982 to June 2007, over 76,000 households have had repairs carried out on their homes. Over €137 million has been provided for the scheme during the last ten years. Funding is provided to the Health Service Executive (HSE) by the Task Force on Special Housing Aid for the Elderly, under the aegis of the DoEHLG.

Furthermore, there is a reason to believe that these figures understate the level of activity in this area. Extensions and improvements which are under 40 square metres do not require planning permission and reports from the industry suggest that there is a substantial level of activity in this particular area at present. With house extensions exempted from the need for planning permission in certain circumstances, extensions represent for many families an ideal and cost effective way of adding an extra bedroom or bathroom to a house due to changing family circumstances and indeed changing fashions or tastes.

***Growing awareness of new regulations – the EPBD – should also bolster repair, maintenance and improvement activity***

While the impact of the SSIA's will fade in 2009, the implementation of the Energy Performance of Buildings Directive (EPBD),<sup>53</sup> should ensure that repair and improvements in residential sub-sector will continue to perform very strongly over the forecast period.

The analysis in this study suggests that up to 900,000 houses of the current stock have extremely low levels of energy efficiency and would require significant upgrading in order to qualify for a good energy rating following the introduction of Building Energy Rating (BER) of the EPBD for all houses that are being sold from 2009. This should ensure a significant increase in the take-up of energy efficiency related activities, particularly for improving wall, roof and floor insulation; installing airtight windows and sustainable technology heating systems, as the value of a house will be linked to its energy rating. Furthermore, Government grant aid to assist householders with the retro-fitting of insulation to the existing housing stock in Budget 2008 should promote heightened awareness and the usage of energy efficiency measures.<sup>54</sup>

<sup>53</sup> This Directive is discussed in-depth in Chapter 2 – *The Impact of 'Sustainability' on Activity and Skills*.

<sup>54</sup> In Budget 2008, the Government has allocated €13 million to energy conservation and a further

Overall, there will be a substantial increase in the level of repair, maintenance and improvements in the residential sector in 2007 and 2008.

***But it will not be enough to off-set the decline in new private house building***

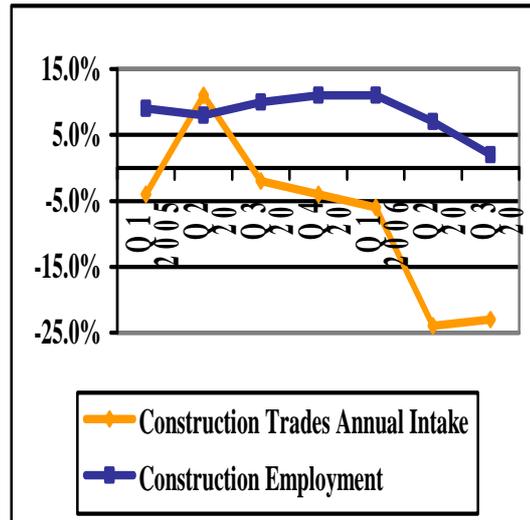
However, the on-going and anticipated expansion of activity in house repair and improvements will not be sufficient to off-set the expected contraction in new private house building.

New private house building accounted for 51.2% of the total real value of construction output in 2006 – equivalent to €17.1 billion. In contrast, the house building repair, maintenance and improvements sub-sector (private and public combined) accounted for 12.9% of the total real value of construction output in that year – equivalent to €4.3 billion. While this figure is not insignificant, it is not sufficient to make-up for the expected shortfall in new house building output.

***The building industry has begun to reduce activity***

Employers have responded to the decline in activity levels in the residential sector by retaining existing tradesworkers rather than sponsoring new construction workers into these trades (Figure 4.4).

**Figure 4.4**  
**Annual Intake of Construction Trades and Construction Employment**  
**(Year-on-Year % Changes)**



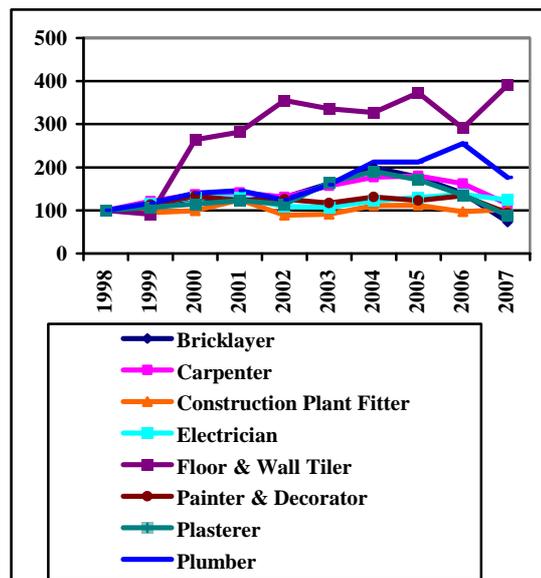
Source: CSO, FÁS

***The sponsorship rates of apprentices have dropped noticeably***

The sponsorship rate of new apprentices by employers declined in 2007. This decline is confined exclusively to the construction trades – the overall level of apprentice intake in these trades declined by 23.5%.

The most pronounced decline in annual intake was recorded for the so-called “wet trades” – bricklayers and plasterers – intake was 48% and 35% below the 2006 figures for these trades respectively (Figure 4.5).

**Figure 4.5**  
**Apprenticeship Intake – annual % change**  
**1998 – 2007 (Base Year – 1998=100)**



Source: FÁS

€13.2 million to renewable energy research, particularly from oceans.

Even taking into account some seasonal effects (third quarter apprenticeship intake figures have been relatively lower in both 2005 and 2006), the decline seems to be more pronounced in 2007. This is particularly true for bricklayers and plasterers – the intake of bricklayers in the fourth quarter of 2007 is 69% below the figure in the first quarter of 2005, while the corresponding decline for plasterers is 52%.

At the same time, the official statistics on registrations and commencements indicate that the building industry has responded to the contraction in demand at current prices by adopting measures to curtail the supply of houses coming onto the market.

### ***The downturn in housing activity gathers pace***

The statistics available for lead indicators of housing activity – planning permissions, registrations and commencements – all declined sharply (with the exception of planning permissions) in 2007 and indicate that house building output will decline again in 2008.

### ***Planning permissions data – the only positive lead indicator of house building activity – suggesting an upturn in activity levels in the long-term***

There has been a reversal in the trend of planning permissions granted for the number of new residential units<sup>55</sup> – an upward trend emerged in the second quarter of 2007, from a year earlier, with a spectacular increase of 25.6% – bringing the total number of units granted planning permission to 23,988, a level not recorded since the third quarter of 2005.

Total residential planning permissions granted in the third quarter declined by 4.8% on the previous quarter. However, the number of units granted planning permission increased by 6% in the same quarter on the previous year.

---

<sup>55</sup> This includes all types of houses (i.e. multi-development houses and one-off houses) and apartments.

On a four-month cumulative basis, a total of 82,915 units were granted planning permission in the four cumulative quarters to the third quarter of 2007, which is just over 21,000 units below the peak level of over 104,000 units in the second quarter of 2005.

This long-term indicator of future activity points to an upturn in house building at some point in the future – this study anticipates that this will not occur prior to 2010.

Given that there is a time-lag between planning permission being granted and commencement of house building – planning permissions have a life-span of five-years – it is informative to consider commencement figures as these are more relevant for capturing the level of activity in construction.

### ***The number of new residential commencements has declined at an alarming rate***

The latest housing commencement data shows that the total number of new residential commencements has declined considerably. In the first 11 months to the end of November 2007, the number of new commencements declined by 34% from 71,383 in the same period in the previous year. The decline in this indicator has accelerated – new commencements declined by 8% in the first three months of 2007, from a year earlier.

The 12-month cumulative total for commencements has been on a downward trend since July 2006, after peaking at 78,721 in June 2006. The 12-month cumulative total of just over 51,000 in November 2007 is 27,664 below its peak level.

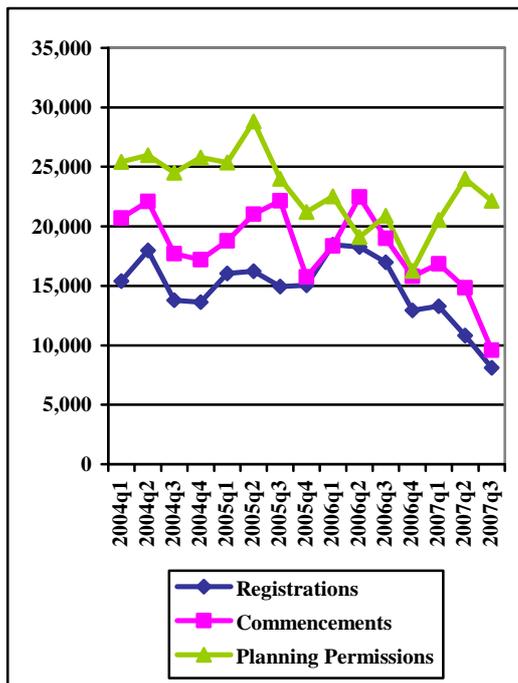
### ***The pace of decline in new residential registrations has accelerated***

New house registrations for the first 11 months of 2007 reached 36,710, representing a decline of 42% on the same period in 2006.

After peaking at 18,439 in the first quarter of 2006, registrations have continued to decline on a quarter-on-quarter basis up to the third quarter of 2007 (with the exception of the

period between the fourth quarter of 2006 and the first quarter of 2007). In this period, registrations fell by 55% or just over 10,300 – the most pronounced decline occurred during the three months to September 2007 – a decline of 52% on the same period a year ago – their lowest level of just over 8,100 on a quarterly-basis since the beginning of 2004.

**Figure 4.6**  
Leading Indicators of Housing Activity  
2004Q1-2007Q3



Source: CSO

This indicator began to slow in the second quarter of 2006, and assuming a nine-month lag between registrations and completions, suggests that completions should reflect this slowdown in the first half of 2008.

The 12-month cumulative figure was 39,807 in November 2007, which is 26% below the 54,043 registrations in June 2007 and 40% below the peak level of 68,759 in September 2006.

***This analysis suggests total completions of 50,000 in 2009, rising to 55,000 by 2013***

Based on all of the short-term and long-term indicators analysed above, it is estimated that house completions will decline from over 88,000 in 2006 to 50,000 in 2009.

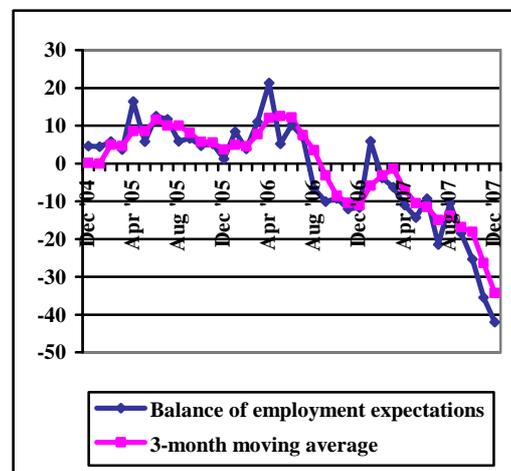
While some recovery is anticipated from 2010 onwards, the analysis in this report suggests that the medium-term level of demand (i.e. 2010-2013) will be for 55,000 houses.

This forecast, together with the forecasts for the economy and each of the other main sub-sectors, are elaborated in detail in chapter 7 of the report.

***The FÁS/ESRI employment and vacancies survey – construction sector employers’ expect employment to be ‘hit hard’ over the coming months***

Construction sector employers’ have been pessimistic about employment prospects for quite some time. Employment expectations continued to deteriorate in December of last year – maintaining the downward trend that commenced in February 2007 – according to the FÁS/ESRI Employment and Vacancies Survey for December 2007.

**Figure 4.7**  
Construction Sector Employment  
Expectations  
December 2004 – December 2007



Source: FÁS/ESRI Monthly Employment and Vacancies Survey

The Net Employment Expectations indicator for the sector fell by 7 percentage points from -35% in November 2007 to -42% in December 2007 – indicating that the percentage of employers anticipating a decline in employment levels in their firms over the next three to four months was 42 percentage points higher than for those

expecting a rise – its lowest level since the survey began in May 2002.

The corresponding indicator for the sector in December 2006 was -12% – which is significantly below the December 2007 figure (Figure 4.7).

The results of the January 2008 survey indicate that there was significant improvement in the net employment expectations indicator, although employers continue to be negative about future employment levels in the sector. The figure for this indicator increased by 10 percentage points from the December figure to -32% in January 2008 – indicating that 37% of employers expect a rise in employment levels over the coming months while 5% expect that they may increase their workforce.

### ***Construction activity and employment has already declined***

There is some evidence to indicate that total output and employment has already begun to decline in the industry.

### ***The supply of new housing units is being rapidly cut back***

New house completions are now reflecting some of the decline in house building that has been evident for some time in leading indicators of activity, and confirm the rapid response of the construction industry to more challenging conditions in the residential construction market.

Figures from the DoEHLG indicate that new annual house completions declined to around 78,000 units in 2007 from the record level of around 88,400<sup>56</sup> in 2006 – a decline of 11.8% or 10,400 – this was the first decline in completions since 1998.

<sup>56</sup>This house completions figure for 2006 differs from that published by the DoEHLG. This figure has been adjusted downwards by 5,000 units that were connected to the ESB in 2006, but were actually built in 2005.

The latest data for the first 11 months of 2007, shows that total completions at 71,598, were 10.5% below their level in the same period in the previous year.

A continued decline in completions is expected over the remainder of the fourth quarter of 2007, which has tended to be the record quarter each year historically.

### ***The CSO's construction employment index shows continuous year-on-year declines in employment since April of last year***

The CSO's Monthly Index of Employment in Construction – a measure of employment in private sector firms (with 5 or more persons engaged) – highlights that the year-on-year-change in employment entered into negative territory in April 2007 – a decline of 0.1%, compared to the same month a year earlier. This trend continued into the remainder of 2007, with a year-on-year decline of 4.7% recorded in October 2007, before recording its sharpest decline of 6.4% in December,<sup>57</sup> bringing the annual average rate of decline to 1.9%. This is in contrast to an annual increase of 2.4% recorded in the previous year.

**Table 4.5**  
**Monthly Index of Employment in**  
**Construction, January 2006-December 2007**  
**(Base Year 2000=100)**

<b>Month</b>	<b>2006 Index</b>	<b>Annual Change</b>	<b>2007 Index</b>	<b>Annual Change</b>
January	108.1	+0.6%	110.0	+1.8%
February	109.8	+2.0%	110.7	+0.8%
March	110.1	+2.3%	110.1	0.0%
April	109.2	+2.7%	109.1	-0.1%
May	109.0	+2.5%	108.7	-0.3%
June	111.1	+2.8%	109.8	-1.2%
July	113.5	+2.6%	111.2	-2.0%
August	112.8	+2.5%	110.1	-2.4%
September	113.8	+2.5%	110.1	-3.3%
October	107.1	+3.0%	102.1	-4.7%
November	105.4	+2.5%	99.8	-5.3%
December	105.0	+2.3%	98.3	-6.4%
<b>Year (avg)</b>	<b>109.6</b>	<b>+2.4%</b>	<b>107.5</b>	<b>-1.9%</b>

Source: CSO, *Monthly Index of Employment in Construction*

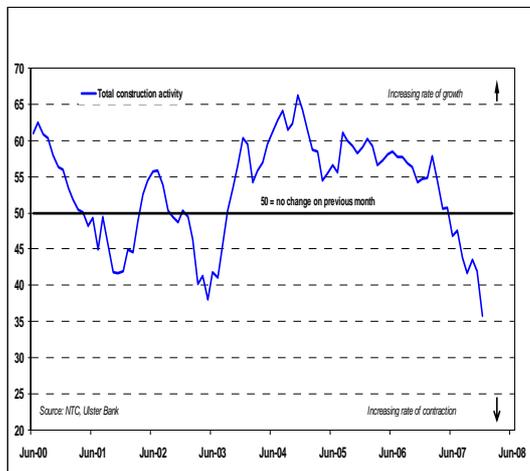
<sup>57</sup> The data for both the year-on-year change in employment in December 2007 and the annual average change for 2007 are provisional.

***Ulster Bank's monthly barometer of the construction industry shows that activity in December was at a seven year low***

Consistent with this downward trend in construction employment, Ulster Bank's Monthly Construction Purchasing Managers' Index<sup>58</sup> showed that the sector contracted sharply in December 2007, with record falls in activity, new orders and employment.

Activity in the construction sector fell in December 2007 to 35.7, the lowest since the series began in 2000, from 42 in November 2007.

**Figure 4.8  
Construction Industry Activity,  
June 2000-June 2008**



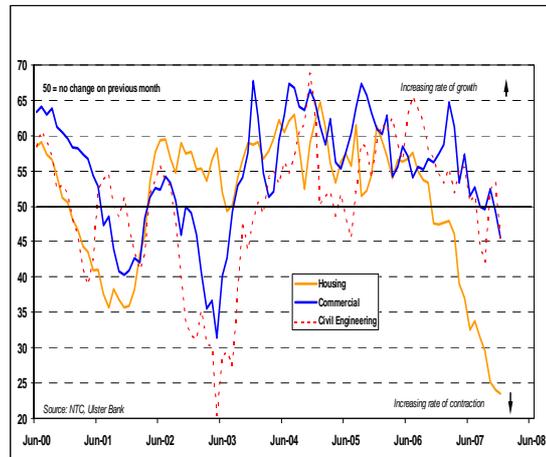
Source: Ulster Bank, *Construction Purchasing Managers' Index (PMI)*

***This contraction in activity is mainly due to rapid decline in house completions***

This contraction in activity is mainly due to the record fall in house completions. As housing accounts for two-thirds of construction, this dragged overall construction activity into negative territory since mid-2007. Housing activity continued to fall – to 23.5 in December, according to the survey.

<sup>58</sup> Purchasing Managers' Indexes (PMIs) are monthly surveys of selected companies which provide an advance indication of what is happening in the private sector economy by tracking variables such as output, new orders, employment and prices. The value of 50 signifies no change in activity on the previous period, while values below 50 signify a decline in activity.

**Figure 4.9  
Construction Industry Activity by Sub-Sector,  
June 2000-June 2008**



Source: Ulster Bank, *Construction Purchasing Managers' Index (PMI)*

The decline in new orders was the largest in the survey's history, with more than one-third of firms noting a fall, which resulted in staff numbers also falling at a record rate for the survey. Staff levels have contracted as a number of firms laid off staff at the completion of projects and the lack of new work to replace them.

***FÁS/ESRI's monthly employment and vacancies survey also reports that construction firms experienced a decline in their employment levels***

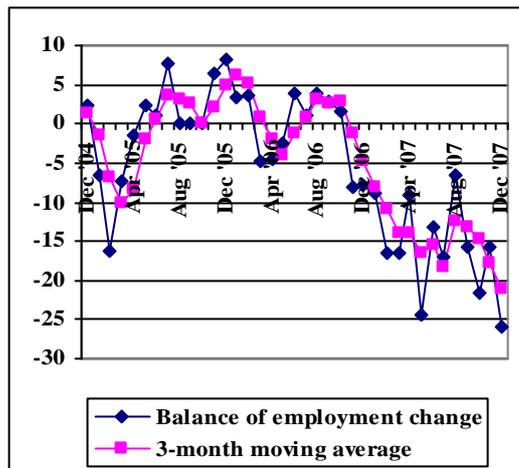
The above is consistent the FÁS/ESRI survey – with the net employment change indicator the construction sector falling by 10 percentage points to -26% in December 2007 from the previous month. This means that the percentage of firms that reported a decline in their employment levels in December 2007 was 26 percentage points<sup>59</sup> higher than for those that reported a rise in employment levels from the previous month. The December's figure for this indicator was at its lowest since the survey began in May

<sup>59</sup> This balance of employment change is the balance of positive over negative responses. The survey is carried out using a sample of firms which are statistically representative of the construction industry. These same firms are surveyed each month and responses are weighted by firm size and employment.

2002. The corresponding indicator figure for December 2006 was -7.8%.

Early indications suggest that there has been an improvement in this indicator – the results of the January 2008 survey – show that, on balance, 21% of the firms surveyed in this month reported a decline in their employment levels from the previous month.

**Figure 4.9**  
**Construction Sector Employment Change,**  
**December 2004 – December 2007**



Source: FÁS/ESRI Monthly Employment and Vacancies Survey

***Jobless rise – a reflection of housing fall-off***

The implosion of the housing boom led to a further increase in the number of people claiming unemployment benefit in January of this year, pushing the standardised unemployment rate up to 4.9%. This compares with 4.4%, the latest seasonally adjusted unemployment rate from the CSO’s QNHS.

According to the CSO, an additional 7,800 people signed on in January of this year, bringing the seasonally adjusted Live Register total to 179,400. This follows from an increase of 2,100 claimants in December of last year.

The rise in the jobless total in January 2008 (seasonally adjusted) was heavily skewed toward male workers – with 6,400 new male claimants, compared with 1,900 in December 2007 – suggesting that construction firms in the stagnating housing

market laid-off workers as the Christmas break approached and failed to re-employ workers at the beginning of the New Year.

***The relatively large supply of vacant houses will also suppress demand***

As already stated, there is a relatively large volume of empty dwellings throughout the country. The extent to which owners sell these properties over the next few years is difficult to determine.

Surveys have shown that the long-term investment nature and the current volatility in equity markets may encourage many to do so. On the other hand, their intentions might be tempered somewhat as they see the real value of their properties decline over the next few years.

In any case, some off-loading of property in inevitable and this is set to further depress residential property prices.

***New guidelines for apartment sizes in Dublin City will not have significant implications for employment***

In an effort to combat urban sprawl and to develop sustainable communities, Dublin City Council (DCC) published, in May 2007, a document entitled ‘Achieving Liveable, Sustainable New Apartment Homes for Dublin City: Draft Guidelines’. The aim is to promote apartment living through the provision of spacious, attractive, family-sized apartments in new developments. Guidelines for planning authorities throughout the country have also been published by the Department of the Environment, Heritage and Local Government (DoEHLG) in September 2007. This section deals with those outlined by Dublin City Council.

The number of new apartments in Ireland has been increasing since 2000 and, in the first nine months of 2007, accounted for just over 13,700 or 24% of all new house completions (see Table 4.6). However, in Dublin, the proportion of apartments is much higher and they have accounted for, on

average, 79% of all new house completions since 2000.

**Table 4.6**  
**New Apartment Completions in Ireland and Dublin City, 2000-2007\***

Year	Total new apartments (Nationwide)	% total new completions (Nationwide)	Total new apartments (Dublin city)	% total new completions (Dublin city)
2000	8,886	18%	2,123	90%
2001	10,626	20%	2,904	94%
2002	11,638	20%	3,108	75%
2003	14,839	22%	2,487	74%
2004	16,106	21%	3,072	68%
2005	18,035	22%	5,309	76%
2006	19,946	21%	6,122	79%
2007	13,704	24%	3,615	79%

Source: DoEHLG; Housing Statistics

\*Figures for 2007 are for the first nine months only

The new guidelines represents a 41.67% increase in the total floor area<sup>60</sup> required per scheme of 100 units, where the average floor area across a scheme would go from 60m<sup>2</sup> to 85m<sup>2</sup>.

On average, over the period 2000-2007, more than three quarters of all new house completions in Dublin city were for apartments. Therefore, in theory, the new Guidelines could have serious implications for most of the future housing activity in Dublin. However, evidence from the CSO planning permissions data indicate that the effect of these Guidelines will be tempered by the fact that many apartments already appear to meet the standard, at least in terms of target average floor area.<sup>61</sup>

### ***Economists are forecasting a significant decline to house completions by end of 2008***

It is very difficult to calculate the precise magnitude of the decline in residential development. Nonetheless, it is possible to give a board indication of the probable outcome.

<sup>60</sup> In addition, according to the DCC Guidelines, balcony sizes will also be increased from 4m<sup>2</sup> (for units of all sizes) to 6m<sup>2</sup> for one bed, 8m<sup>2</sup> for two bed and 10m<sup>2</sup> for three bed or equivalent units. The minimum floor to ceiling height is to be 2.7m, up from the current minimum of 2.4m.

<sup>61</sup> See Appendix C for the calculation of the impact of the guidelines on apartments sizes.

There is little doubt that there will be a steep decline in new private house building in 2008 and 2009. Indeed, there is an emerging consensus amongst the Irish economists on this, with the figure of 50,000-55,000 residential completions being put forward for the year 2008. There are fewer predictions for the year 2009 and beyond.

The forecast in this report is for a sharp decline in the output of completed housing units from 88,000 in 2006 to a low of 50,000 in 2009. This will represent a contraction of over 40% on the 2006 level. A recovery in housing volumes is anticipated to occur beyond 2009, to 55,000 units, which in turn means that the projection is for an average annual completion rate of 57,500 houses over the forecast period.

In turn, this decline is set to impact on employment opportunities of those working in residential development, with a particularly strong effect on certain trades.

### ***The UK Housing Market***

The UK residential market is increasingly considered as an opportunity for Irish-based construction firms and workers alike. Indeed, there appears to be a considerable potential for the UK residential market to expand.

To begin with, the UK construction industry's output is considerably different to the Irish one in terms of its composition: it is estimated that in 2006, residential output (public and private housing combined) amounted to only 18% of the total output. In addition, repair and maintenance work amounted to 44% of the total output<sup>62</sup>.

At the same time, it seems that the UK housing market has not responded sufficiently to meet the needs of the country's growing population, leading to a considerable gap between housing supply and demand. This is illustrated by the fact that over the last 30 years of the 20th century, house building rates halved while the number of households increased by 30%.

<sup>62</sup> Construction Skills Network 2007-2011: Blueprint for UK Construction Skills 2007-2011.

Thus in 2001, around 175,000 houses were built in the UK – the lowest level since the Second World War. In 2004, 150,000 new homes were built, while household growth for the same year was at 189,000<sup>63</sup>. In 2005-2006, around 185,000 new homes were delivered. This was a significant increase from the low of 131,000 over the 2001-2002 period, but is still below the required level - the latest projections show that the number of households will grow by 223,000 per year up to 2026.

At the same time, there is an apparent undersupply of social housing – it fell from around 42,700 per year in 1994-95 to around 21,000 in 2002-03. Gross social housing investment actually declined in real terms for the period 1980-2002 by almost a half<sup>64</sup>. Although expenditure on social housing increased in 2003-04, the rate of new supply has continued to decline, due both to the strong rise in land prices and increased spending on improving the existing stock.

There is a considerable amount of evidence that the UK Government has responded positively to the issue of undersupply. It set a new housing target of 240,000 additional homes a year to meet the growing demand<sup>65</sup>. The Barker report<sup>66</sup> recommended that between 70,000 and 120,000 additional private sector homes would be required each year on top of the current level of building (140,000 starts and 125,000 completions) to meet current levels of demand and reduce the level of house price inflation. It also concluded that in excess of 17,000 social housing units would be required per annum.

In addition, some major projects such as the Thames Gateway will deliver a substantial number of new homes to meet the high demand in the South East of England, with plans in place to build 160,000 units between

2001 and 2016.<sup>66</sup> The aims of the project are to improve social housing, increase the provision of new affordable housing for key public sector workers and to regenerate urban areas. Furthermore, the 2012 Olympic Games will be held in the Thames Gateway. By 2012, 34,000 homes are planned within the area surrounding the Olympic Park (more than 9,000 houses will be built in East London to accommodate athletes and these will subsequently be turned into affordable homes).

### ***UK looks set to provide employment opportunities***

In conclusion, there exists an undersupply of residential housing in the UK and this gap between supply and demand has been recognised and begun to be addressed by a policy response. In addition to this demand “pull”, the composition of the construction sector seems favourable towards absorbing a considerable number of craft-workers. Indeed, it has been suggested that a shortage of skilled labour in the building industry could become an acute constraint on achieving greater output and various targets.<sup>67</sup>

It seems reasonable, then, to expect that the UK residential sector will provide employment opportunities for some Irish workers. The UK construction industry looks set to expand to 2.8 million by 2011, which is an increase from the 2.41 million individuals it employed in 2005. It is worth noting that the construction sector in Northern Ireland is set to expand strongly, exceeding the UK average growth rate. Crucially, there is a considerable projected increase in employment in occupations and trade skills that are set to be hardest hit here, particularly bricklayers (Figure 4.11).

Finally, the timing of some large construction projects, such as the construction of the Olympic Park is favourable, coinciding with the anticipated decline domestically. Enterprise Ireland has already set out its own target of trying to

---

<sup>63</sup> Barker, K. 2004. Review of Housing Supply *Delivering stability: securing our future housing needs*.

<sup>64</sup> Wilcox, S. 2004. *UK Housing review 2002/2003*. Joseph Rowntree Foundation.

<sup>65</sup> Department for Communities and Local Government, 2007. *Homes for the future: more affordable, more sustainable* (Green Paper). London: The Stationery Office.

---

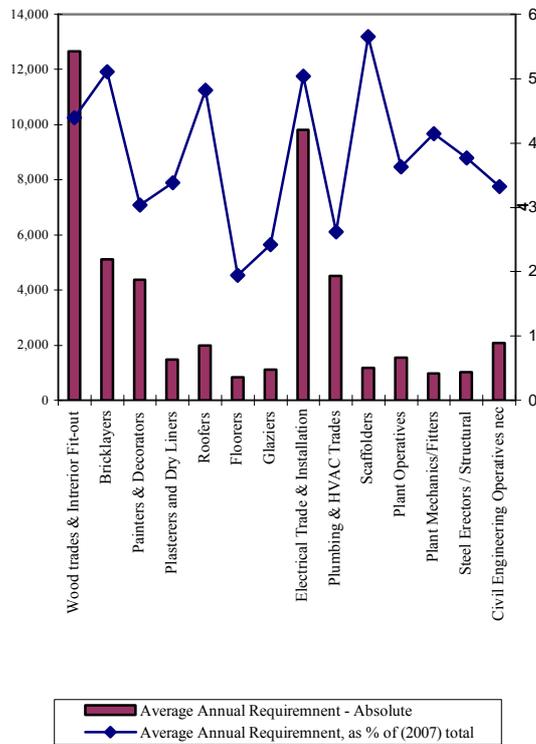
<sup>66</sup> UK Department for Communities & Local Government.

<sup>67</sup> Source: Chartered Institute of Housing, UK.

secure half a billion sterling worth of business contracts for Irish firms, a large share of which would be related to construction work<sup>68</sup>.

this sub-sector is expected to be greatly augmented by the implementation of the Energy Performance of Building Directive for the existing housing stock.

**Figure 4.11**  
**UK Craft Employment Projections: Average Annual Requirement by Occupation (2007-2011)**



Consequently, many employment opportunities will emerge in sustainable related construction for those who lose their jobs in the residential sub-sector. However, some up-skilling will be required for these workers to be in a position to avail of these opportunities.

The analysis in this chapter also identifies many employment opportunities for both Irish contractors and construction workers in the United Kingdom residential market over the forecast period.

Source: Construction Skills Network 2007-2011: Blueprint for UK Construction Skills 2007-2011.

**Key conclusions to emerging from the analysis**

There will be a dramatic contraction in homebuilding in both 2008 and 2009. The estimate in this chapter is for 50,000 house completions in 2009. Some modest recovery beyond 2010 but the analysis suggests that the medium-term level of housing demand is about 55,000.

The level of activity in repair and maintenance will be very positive in 2008 and 2009. Activity in this area will be initially driven by the increasing towards upgrading existing homes. However, from 2009 onwards, activity in

<sup>68</sup> DETE.

## Chapter 5: The Market for Physical Infrastructure Development 2007-2013

### *Activity on the physical infrastructure will be driven primarily by the NDP*

The level of physical infrastructure activity is largely determined by the amount of investment expenditure allocated by the Government for roads, water services, airports, seaports and harbours, energy and telecommunications and public transport. The National Development Plan (NDP) is the framework that the Government uses to put in place the amount of investment expenditure for each of these categories.

### *Capital spending to exceed 5% of GNP – twice the level invested in the previous NDP*

The current NDP represents a significant increase on the €51.5 billion allocated to the previous NDP (2000-2006). In particular, the proposed spending of €54.7 billion for economic infrastructure represents a large increase in capital expenditure since the previous development plan.

Exchequer Capital spending under the Plan will average 5.4% of GNP annually over the duration of the Plan.

### *Output growth rates in productive infrastructure will peak in 2009*

The productive infrastructure sub-sector is expected, under the low growth scenario detailed in Chapter 8, to increase in 2008 and 2009 and level off after this period. This is primarily due to the significant activity in the areas of transport and airport development in the early part of this period. A drop in the level of activity in these areas in 2013 is expected to result in an overall decline in output. A breakdown of output growth rates by infrastructure programme is provided in Table 5.1.

**Table 5.1 Output Forecasts for Productive Infrastructure, 2006-2013**

	2006	2007	2008	2009	2010	2011	2012	2013
<b>Roads</b>	7.5%	0.8%	4.7%	10.4%	2.4%	0.8%	19.5%	-
<b>Water &amp; Sanitary Services</b>	12.9%	-0.7%	3.0%	4.8%	0.6%	2.2%	3.2%	3.3%
<b>Airport Development</b>	12.4%	11.1%	88.7%	32.9%	0.1%	-	0.2%	-9.2%
<b>Ports and Harbours</b>	3.8%	21.0%	4.3%	4.3%	3.0%	3.3%	3.3%	3.5%
<b>Energy including new power stations</b>	2.8%	-6.5%	8.9%	13.2%	0.4%	9.1%	13.5%	0.4%
<b>Transport including LUAS</b>	-	64.0%	24.2%	66.3%	2.4%	0.6%	20.5%	-
<b>Telecommunications</b>	15.2%	15.8%	3.0%	2.7%	3.0%	3.3%	3.3%	3.5%
<b>Total</b>	<b>6.0%</b>	<b>2.0%</b>	<b>9.9%</b>	<b>17.4%</b>	<b>1.6%</b>	<b>2.5%</b>	<b>14.1%</b>	<b>13.8%</b>

Source: DKM

These output growth rates are very much dependent on the investment from the National Development Plan. In the latest NDP (for the period 2007-2013), the Government has allocated a total of €54.7 billion for infrastructure projects. This is detailed in Table 5.2 below.

**Table 5.2 NDP Economic Infrastructure Funds 2007-2013**

<b>Programme</b>	<b>Total (€million)</b>
Transport	32,914
Energy	8,526
Environmental Services	5,772
Communications and Broadband	435
Govt. Infrastructure	1,413
Local Authority Development	
Contributions	2,100
Unallocated Capital Reserve	3,500
<b>Economic Infrastructure Total</b>	<b>54,660</b>

### *Transport is the biggest beneficiary of NDP funding over the period*

Almost €33 billion of the €54.7 billion allocated for economic infrastructure has been earmarked for transport.

Many projects mentioned under the transport priority have previously been announced under Transport 21 – the Government's initiative for capital investment in Ireland's transport system.

***Some €17.6 billion has been allocated to improving the national roads network.***

A total of €13.3 billion has been allocated for investment in national roads (as compared to €6 billion set out in the previous NDP), while the remaining €4.3 billion will be invested in the non-national road network.

The principal objectives of the Roads Sub-Programme will be the following:

- Completion by 2010 of the major inter-urban routes linking Dublin with Belfast, Cork, Galway, Limerick and Waterford;
- The upgrade of the M50 by 2010 which will convert to barrier free tolling in 2008;
- Improvement of road links between the main NSS Gateways;
- Ongoing development of the Atlantic Road Corridor from Letterkenny through Sligo, Galway, Limerick, Cork and Waterford;
- Continued upgrading of road links to Northern Ireland;
- Targeted improvements of a number of key national secondary routes;
- Improvement and maintenance of the non-national roads network; and
- Investment in strategic non-national roads which will complement the national roads investment.

According to the National Roads Authority<sup>69</sup>, road construction activity hit a record high in 2006 with a total of 27 major road events and this level of activity is set to continue to increase with the NDP investment over the period 2007-2013.

The investment in roads accounts for almost a third of the total investment in productive infrastructure and, as such, the annual output growth rate in this sector will be largely dependent on road projects. Output growth rates for roads are expected to be strong with rates peaking at 22.7% in 2012 before dropping off in 2013, as per Table 5.2.

---

<sup>69</sup> Construction & Property News, April 2007. National Roads Authority.

***A Total of €13 billion will be invested under the Public Transport Sub-Programme during the lifespan of the NDP.***

Under the Public Transport Sub-Programme of the Plan, a total of €13 billion is set to be invested in public transport. All modes of transport will be improved or initiated during the next seven years. The bulk of the public investment will be in the Greater Dublin Area (GDA). This region accounts for some 40% of Ireland's population and it has experienced the most rapid population growth rates in recent years.

As a result of investment in the 2000-2006 NDP (the first time to have a concentrated investment programme in public transport), significant developments occurred within the public transport sub-sector, including the new LUAS light rail system in Dublin and enhanced capacity on DART and commuter rail services.

A key objective of the Government's investment programme, Transport 21, is to promote a switch from car usage to public transport. The following projects are planned within the timetable in Transport 21:

- Completion of the Metro North line from the city centre to Swords via Dublin Airport;
- Phased development of the Metro West line;
- Enhancement and extension of the LUAS network;
- Expansion of the capacity of the suburban rail network through city centre re-signalling, quadrupling of track on the Kildare line and re-opening of the Dublin to Navan rail link;
- Commencement of the Heuston Docklands Interconnector and the electrification section of the Dublin suburban rail network;
- Significant expansion of the bus fleet and bus priority;
- The introduction in the Plan of a fully integrated, customer-friendly, smart card ticketing system in the GDA, facilitating

the use of different transport modes (bus, LUAS, DART, Irish Rail etc.) in single journeys;

- Construction of additional park and ride facilities;
- The mainstreaming of accessibility across all modes of public transport, in line with the Department of Transport's Sectoral Plan under the Disability Act, 2006;
- Development of enhanced cycling and walking facilities.

The rest of the country also has a substantial need for an upgrading of public infrastructure. The Plan, therefore, also encompasses:

- Provision of enhanced rail services, including either hourly/two hourly services on the principal intercity routes serviced by modern rolling stock;
- The phased re-opening of the Western Rail Corridor from Ennis to Claremorris;
- An allocation of €90 million for the Rural Transport Initiative;
- New commuter rail services in Cork and Galway;
- Upgrading public transport services in provincial cities and in the regions, including additional buses, new bus priority measures and new park and ride sites.

With the extension of the LUAS line and development of Metro line in progress, a significant surge in NDP investment in public transport will occur in the early stages of the NDP. As such, output growth rates are expected to be high in the period 2007-2009, with rates levelling off after this period.

#### ***State airports set for significant capital investment – €1.8 billion***

Under the Air Transport Programme (€1.9 billion), significant capital spend worth €1.8 billion has been allocated for improving the infrastructure of the State Airports of Dublin, Cork and Shannon. This amount of expenditure aims to put in place sufficient infrastructure capacity to meet the growing air traffic demand.

These airports collectively account for 96% of all air traffic in Ireland.

In Dublin airport, work on the new terminal is scheduled to be completed by the end of 2009, while the provision of a second runway is expected to progress during the period of the NDP.

As passenger numbers continue to grow planning for extra capacity will be essential in the later part of the NDP period.

#### ***Regional airports allocated €96.5 million for capital investment***

A further €96.5 million of capital funding has been allocated in the Plan for investment in the six regional airports in the State – South East Regional Airport Waterford, Farranfore Airport Kerry, Ireland West Airport Knock, Sligo, Galway and Donegal – and to the development of the City of Derry Airport. The Government has committed €7.5 million to capital development of the City of Derry Airport.

The State's six regional airports are all in private ownership; however, they are eligible to apply for State assistance. There will be Exchequer support for capital investment in developmental projects at these airports to 2010, where sustainable demand for additional air services can be demonstrated and where an economic case can be made to justify the increased investment.

Output rates are forecast to be high in this sub-sector until 2009, with a levelling off expected from 2010 after the completion of the new terminal in Dublin airport.

#### ***Some €481 million has been allocated for construction related investment in seaports and regional harbours***

Given that Ireland is a small open economy, trading in the global marketplace, good quality seaports are necessary for the efficient transfer of goods in and out of the country. Ireland's commercial seaports are essential pieces of

public infrastructure, carrying 99% by volume of the island's external trade. A total of €481 million capital expenditure is allocated under the NDP to support the ongoing development in the ports sub-programme, with €450 million to be invested by the state-owned commercial companies. A further €31 million will be funded by the Exchequer and PPP resources for the development of regional harbours.

After an initial increase in output growth rates during the NDP period, it is expected that output growth rates will follow in line with GNP rates from 2010 onwards.

***Investment provision of €4.8 billion has been allocated under the NDP 2007-2013 for investment in upgrading and expanding water and waste-water treatment infrastructure.***

Building on the progress made under the NDP 2000-2006, capital investment of €4.8 billion under the Water Services Sub-Programme of the new NDP has been allocated for upgrading and expanding water and waste water treatment capacity. This Programme is the largest component of the Environmental Services Programme under the NDP for the next seven years. The objective of this programme is to ensure that adequate infrastructure is in place to meet demands from continuing growth and development in the economy and from a rapidly expanding population. Improvements in the quality of drinking water so as to meet both national and EU drinking water standards is also a key component of the programme.

The main focus of the investment during the period 2007-2013 will be on:

- Infrastructural improvements required to ensure that good quality drinking water is available to all consumers of public and group water supplies in compliance with national and EU drinking water standards;
- Continuing substantial investment in the Rural Water Programme to improve the standard of waste-water infrastructure in smaller towns and villages;

- Increasing the availability of serviced sites to support residential development under the Serviced Land Initiative (i.e. the provision of waste supply and waste-water treatment);
- Ensuring the remaining infrastructure needed to provide secondary waste-water treatment in compliance with the requirements of the EU Urban Waste-Water Treatment Directive and the Government's commitment to provide secondary waste-water treatment to agglomerations over 1,000;
- Ensuring the provision of adequate water and sewerage service in the Gateways and Hubs under the National Spatial Strategy together with other locations where services need to be enhanced;
- Promoting water conservation through the rehabilitation of existing water and sewerage networks.

As a result of the investment from the NDP, output in the water and waste-water treatment infrastructure sub-sector is expected to increase over the period 2007-2013. The growth rates are forecast to fluctuate throughout the period, peaking at 6.4% in 2009.

***A provision of €8.5 billion has been allocated for capital investment in energy infrastructure.***

Security of energy supply is of paramount importance to ensuring the continued economic development of the country. A total of €1.2 billion has been allocated under the Strategic Energy Infrastructure Programme under the Energy Programme of the NDP for investment in a number of large-scale public good energy infrastructure projects, with the objective of bringing energy infrastructure up-to-date.

An additional €7 billion has been allocated under the State Energy Companies Sub-Programme for capital investment by State Energy Companies (Bord Gáis Éireann, the Electricity Supply Board (ESB), EirGrid and Bord na Móna) to ensure the adequate supply of gas and electricity and

the development of wind farms in Mayo and the Midlands over the period of Plan.

Of the total amount of capital expenditure allocated to State Energy Companies, €1.2 billion has been allocated to Bord Gáis Éireann for upgrading and renewing existing gas transmission and distribution networks; developing and expanding the gas transmission and distribution networks; and construction of a 400MW gas-fired electricity generating station at Whitegate in Cork. In addition, €4.0 billion has been allocated to the ESB for enhancement and extension of electricity transmission and distribution networks to meet the continuing growth in demand for electricity and to generally improve the quality of the service. The remainder, a total of €770 million and €270 million, has been allocated to EirGrid and Bord na Móna respectively for the improvement of the transmission network for electricity and the development of wind farms in Mayo and the Midlands by these respective State energy companies and for the development of a waste facility.

From 2008, significant increases in output growth are expected in this sub-sector. Output rates are forecast to reach 15% in both 2009 and 2012. These forecasts are based on DKM estimates of both private and public investment.

***A total provision of €435 million has been allocated for the Communications and Broadband Programme under the NDP 2007-2013.***

With a provision of €435 million, the key strategic objectives of the Communications and Broadband Programme under the NDP 2007-2013 are:

- To promote the availability of competitive broadband services on a nationwide basis by the end of the Plan period;
- To position Ireland with a telecommunications infrastructure that will meet future requirements in terms of technical capacity;

- The delivery of new innovative competitive based telecommunications services.

This provision will fund spending on broadband telecommunications infrastructure – the completion of all the Metropolitan Area Networks in Gateways and Hubs, implementation of a scheme to deliver broadband to areas of the country that would not be reached by the MANs Programme or by the Group Broadband Scheme, a digital terrestrial television (DTT) pilot network which is due to finish in 2008 to inform Irish broadcasters, transmission companies and the Irish viewer about the potential benefits of DTT rollout.

Output growth rates in this sub-sector are expected to be in line with GNP growth.

***Employment growth in the infrastructure sector in the UK market is forecast to be strong.***

The infrastructure sub-sector is forecast to be one of the key areas of employment growth to 2011 in the UK<sup>70</sup> as work begins on some significant expansion and refurbishment projects. Annual average growth rates for infrastructure are expected to be particularly strong in Scotland, East of England and Greater London, with rates of 6.2%, 7.7% and 11% respectively.

One of the key areas of infrastructure development will be in relation to the Olympic games due to be held in London in 2012. Projects including the Thames Gateway and a large transport programme in Scotland will further boost employment growth.

***Increases in employment in occupations relating to infrastructure are expected.***

For occupations relating to infrastructure, the employment outlook in the UK is very encouraging. Employment in occupations such as scaffolders and civil engineering operatives n.e.c. is expected to increase by

---

<sup>70</sup> Construction Skills Network, 2007-2011.

as much as 12.8% and 10.1%, respectively.

<i>Occupations</i>	<i>% Change 2007-2011</i>
Scaffolders	12.8%
Plant Operatives	9.6%
Plant Mechanics	6.5%
Steel Erectors/Structural	7.4%
Civil Engineering Operative nec	10.1%

Source: Construction Skills Network Model, 2006

***The creation of 20,000 net jobs is expected in Ireland in the period 2007-2012.***

Growth in employment in the infrastructure sub-sector in Ireland is also expected, as detailed in Chapter 8, with the

creation of over 20,000 net jobs over the period 2007-2012. In terms of occupations, the infrastructure sub-sector has a higher share of civil engineers, mechanical plant drivers/operators and other building/civil engineering labourers than in the residential sub-sector. Over the period 2007-2013, employment in these occupations is expected to contract in the residential sub-sector, but increase in the infrastructure sub-sector.

Skills in project management will become increasingly important in civil engineering due to changes in the government's selection, appraisal and cost benefiting of schemes. Value for money and ensuring that projects are completed on time are key objectives for the successful tendering of projects.

## Chapter 6: The Future Market for General Contracting 2007-2013

### ***Two broad segments of the construction industry make up the general contracting market***

The general contracting market is comprised of private non-residential construction and social infrastructure.

*Private non-residential construction:* covers private sector building investment (new and repair, maintenance and improvements) in the following areas:

- Industrial;
- Semi-State Industry;
- Commercial;
- Agriculture;
- Tourism (including hotels, restaurants and conference centres);
- Cultural buildings such as museums, art galleries, racecourses and marinas).

*Social infrastructure:* covers public and private sector building investment (new and repair, maintenance and improvements) in the following areas:

- Education;
- Health;
- Public Buildings;
- Local Authority (LA) Services; and
- Public sporting facilities.

### ***Factors influencing activity levels in the general contracting market***

Activity in the private non-residential sector is strongly influenced by prevailing economic conditions, particularly strong growth in employment and consumer expenditure. This is particularly the case in respect of retail and office buildings.

The level of construction activity in social infrastructure will continue to be predominantly driven by capital investment provisions in the Public Capital Programme (PCP). The new NDP

envisages significant capital investment of some €33 billion for construction related social infrastructure projects over the next seven years. The proposed distribution of this expenditure is outlined in detail below.

### ***Education is set for significant infrastructural investment – to the tune of €6.5 billion – under the current NDP***

Significant capital expenditure – a total of €6.5 billion– has been allocated for investment in the nation's educational infrastructure (first and second level schools and higher education institutions) under the NDP over the next seven years. Of this provision, a total of €4.5 billion relates to schools infrastructure while €2 billion relates to higher education infrastructure.

This expenditure will be used to improve accommodation and the physical fabric of existing facilities in primary schools and for the construction of new schools, extensions and associated new machinery and equipment in secondary schools. The allocation for higher level institutions is to fund capital works in the institutes of technology and universities. The types of buildings funded at third level comprise sports buildings, engineering/informatics buildings, student accommodation and research buildings.

The real value of new construction output in this sector is expected to increase by 35% from €0.6 billion in 2006 to €0.8 billion in 2013.

### ***Capital expenditure of €4.5 billion to be injected into the health sector under the current NDP***

Construction activity in healthcare will benefit from capital investment in the sector. Under the Health Infrastructure Programme of the NDP 2007-2013, a total of €2.4 billion will be invested in acute hospital infrastructure, while an additional

€2.1 billion will be invested in primary, community and continuing care infrastructure.

Most of this capital investment spending allocation will be provided by the Exchequer (94%), while the remainder will be through public private partnerships (PPPs).

This capital expenditure provision will be used to fund the building of new modern hospitals and the refurbishment of existing hospitals, development and expansion of facilities and related services, and the maintenance of equipment and equipment replacement.

It is important to note that the NDP only sets out capital investment allocations for public healthcare projects. Under the Hospital Co-Location Initiative, a number of private hospitals are expected to be built on the same site of the public hospitals; these will be funded by private providers.

Overall, the real value of new construction output in this sector is expected to increase by around 30% or by around 4% on average annually over the period 2007-2013, bringing the real value of the sector to €0.8 billion in 2013.

#### ***Investment in public buildings is set to increase***

This component of public investment includes expenditure by the Office of Public Works (OPW) on the provision and refurbishment of accommodation for government departments and offices, and for the decentralisation programme.

The allocation also includes construction related investment by the Department of Justice, Equality and Law Reform in the refurbishment of prisons and courthouses, along with commencement of work on new projects by the Department of Health and Children under the childcare investment programme.

#### ***Capital investment provision of €1.4 billion has been earmarked for Government infrastructure under the new NDP***

The NDP 2007-2013 provides for expenditure of €1.4 billion on Government infrastructure, consisting of office and specialist accommodation for Government Departments under the Government Sites and Buildings Sub-Programme.

#### ***Envisaged capital expenditure of €2.3 billion is to be invested in infrastructure under the Justice Programme of the NDP***

Total expenditure of €2.3 billion under the Justice Programme of the NDP 2007-2013 will be expended on a number of major capital projects and the refurbishment of existing facilities.

The projects include inter alia the building of a number of Garda stations and two new major prison complexes.

#### ***Driven by capital investment provision under the NDP, real output from public building investment is expected to expand***

Given the substantial amount of capital allocated for investment in public buildings under the NDP 2007-2013, it is expected that the value of real output from new and RM&I activity will increase by 11% or 1.5% on average annually between 2006 and 2013, bringing the real value of the sector to €0.63 billion in 2013.

#### ***Other social infrastructure investment***

This category covers investment in local authority services, the Gaeltacht and in public sports facilities funded by the Department of Arts, Sport and Tourism.

Investment in local authority (LA) services covers work carried out by local authorities and includes construction work associated with local authority offices, public libraries, the fire services and special amenity projects. Grants for waste management, waste disposal infrastructure and urban renewal works are also included.

***Local authority's capital investment in infrastructure is expected to expand strongly***

Mostly due to a significant increase in the level of investment by local authorities in their own office accommodation, and in the allocation for waste recycling and disposal facilities, overall investment in LA services is expected to reach €318 million by 2013 – representing an overall volume increase of 124% or annual average growth of 12% between 2006 and 2013.

***Construction investment in sporting facilities will be driven by the €991 million investment provision under the NDP and private sector investment***

The largest Government investment programme to-date for the development of Irish sport is provided for in the NDP under the Sports Sub-Programme. Some €991 million is envisaged to be invested in sporting infrastructure over the period 2007-2013. This will be based on creating an attractive, well-equipped and easily accessible sporting infrastructure so that as many persons as possible can tap into the benefits of sport.

Overall strong growth is expected in the volume of new public construction related investment in sporting facilities between 2006 and 2013, with an increase of 86% from €128 million in 2006. This is equivalent to annual average growth of around 9% over the period.

***Capital funding under the NDP will give impetus to upgrading and addressing critical infrastructural deficiencies in the Gaeltacht***

A total of €457 million has been allocated under the NDP for investment towards the development of the Gaeltacht and off-shore islands over the next seven years.

Construction related investment in the Gaeltacht covers the improvement of strategic Gaeltacht roads, access roads, village renewal and marine works as well as the provision and refurbishment of

community and recreational facilities in Gaeltacht areas.

***A total of €1.1 billion is earmarked for investment in Ireland's cultural and infrastructure and Irish language***

A total provision of €1.1 billion will be invested in Ireland's cultural infrastructure and the Irish language over the period of the NDP 2007-2013.

***The NDP has allocated funding for investment in capital heritage projects, tourism, and the protection of important buildings, facilities and sites.***

Under the NDP 2007-2013, funding will be provided for capital projects, carried out by the Office of Public Works (OPW), on heritage sites of national and international importance in State ownership. Investment will focus, not only on the conservation and presentation of heritage properties, but also on the capacity to attract visitors. The Heritage Council will continue to co-fund major renovation works on heritage properties in private ownership, where it is important to ensure their conservation and where the owners are not in a position to meet the cost in full.

A total of €373million will be invested in a range of measures to conserve and protect Ireland's architectural and archaeological heritage.

Some €75 million will be invested over the period of the NDP 2007-2013 for the restoration and development of the waterways under the Waterways Sub-Programme. Work to pursue the possibility of restoring the Ulster Canal to provide a major inland waterway for the border region is already in hand.

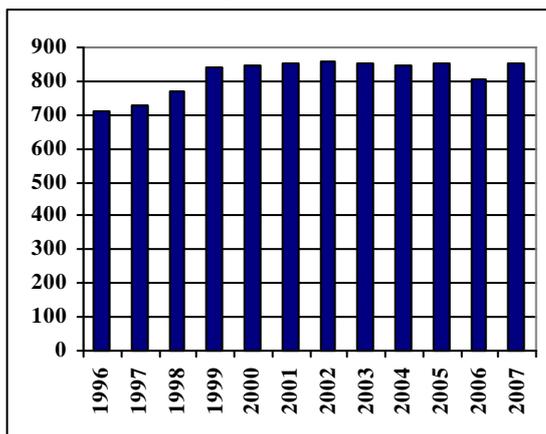
Tourism construction output covers expenditure on the construction and development of hotels, holiday accommodation, resorts and other amenities and tourism infrastructure. Under the Product Development and Infrastructure Sub-Programme of the NDP covering the period 2007 to 2013, a total

of €317 million will be invested in enhancing Ireland's tourism product and infrastructure.

Given the significant level of investment in the provision of accommodation over the past fifteen years in particular, Ireland has a very modern stock of tourist accommodation and capacity is currently regarded to be at an optimum level. Consequently, investment provision will be targeted on tourism infrastructure, major new events and other innovative products that will attract additional visitors rather than on the provision of standard accommodation.

Most of private sector investment in tourism is accounted for by hotels. According to Fáilte Ireland's hotel registration figures, there were a total of 850 hotel registrations, with a total of 51,774 rooms at the start of 2007 nationally.<sup>71</sup> This compares with a total of 713 hotel registrations, with a total of 26,350 rooms at the start of 1996. There was a 20% increase in the number of hotel registrations, while there was a 97% increase in room capacity.

**Figure 6.1**  
Number of New Registered Hotels in Ireland, 1996-2007



Source: Fáilte Ireland

***The real value of new construction output from the tourism sector is expected to increase by 31% over the period 2007-2013***

<sup>71</sup> The figures cited for hotel registrations and bedrooms related to the 1 January of each year.

The real value new construction output from this sector is expected to grow at an annual average rate of 8.5% over the period 2006-2013, bringing the real value of the sector to €0.9 billion in 2013.

Much of the growth in this sector in the past reflects a high level of hotel construction, and modernisation of the existing stock, which have been supported by the availability of favourable tax incentives. Property based tax incentives and relief are also available for investment in holiday camps and cottages.

With the market already at capacity and capital allowances for new development virtually phased out,<sup>72</sup> it is likely that the rate of new build will start to decline.

Construction of an essential element of national tourism infrastructure, the National Conference Centre (NCC), at Spencer Dock in Dublin, commenced construction this year and is expected to be operational in 2010. At almost half a million square feet (44,000 square metres), it is the largest single use building constructed in Dublin in decades.<sup>73</sup>

***Strong growth in planned floor area for agricultural buildings***

The total floor area planned for the new construction of agricultural buildings from the CSO's planning permissions statistics provides an indication of the supply of completed buildings in the pipeline.

The figures indicate that there was an exceptional increase in the floor area planned for new construction of agricultural buildings in 2006. The total floor area planned reached 1.9 million square metres, an increase of 226% on the 2005 level of 596 square metres – the strongest increase in this lead indicator among all non-residential buildings in that year.

<sup>72</sup> Tax relief will be phased out by the end of July of this year.

<sup>73</sup> It will have a 2,000 seat ranked auditorium and a large range of purpose built meeting, banqueting and exhibition spaces over five levels.

Growth was also strong in the floor area planned in the four quarters or twelve months to Q3 2007, with an increase of 257%, compared to the same period in the previous year – the 12 month annual total to Q3 2007 reached 4.8 square metres.

The high level of planned floor area suggests that prospects for agricultural volumes could be favourable in the short-term.

There are a number of possible factors driving the exceptional level of planned investment in farm buildings in 2007. These include conforming to legislative requirements under the Nitrates Directive<sup>74</sup>, compliance with the Single Farm Payment, increased participation in the Rural Environment Protection Scheme (REPS) and most importantly the closure of the Farm Waste Management Scheme<sup>75</sup> at the end of December 2006.

***The performance of the retail market has been strong***

This segment of the commercial market has been described as the “jewel in the crown” of that sector in recent years, as it has been a consistently good performer.<sup>76</sup>

Due to the severe undersupply in shopping centre space during the early 1990s, there has been rapid growth in the volume of shopping centre stock in Ireland in recent years. This is reflected in the strong growth in the volume of construction output from retail building activity – the overall volume of retail buildings put in

<sup>74</sup> The nitrates directive came into effect in February 2006, and it requires by law that farmers have adequate storage facilities on their farms to cater to the waste that is produced by their animals. The objective of this Directive is to reduce water pollution caused or induced by nitrates from agricultural sources and to prevent further pollution.

<sup>75</sup> This scheme makes a vital contribution to Ireland’s programme for meeting the requirements of the EU Nitrates Directive. It encourages, through capital grant assistance, the development of facilities for the storage of farm wastes during periods when weather and soil conditions make water sources particularly vulnerable to leaching of nitrates spread on land. It contributes to the objectives of reducing water pollution caused by nitrates from agricultural sources, preventing further such pollution, improvement of water quality and safety and preventing eutrophication of rivers and lakes.

<sup>76</sup> DKM Review of the Construction Industry 2005 and Outlook 2006-2008.

place increased by over 80% in the four years to 2006.<sup>77</sup>

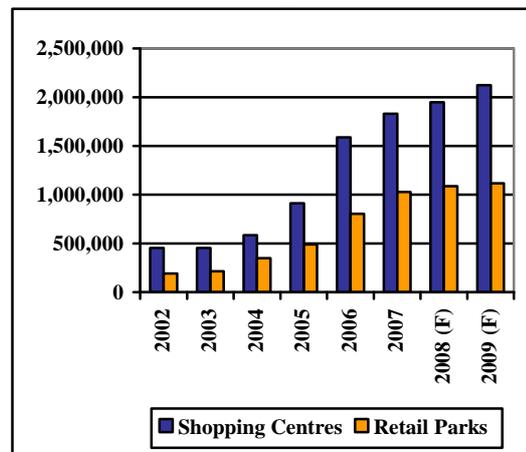
***Ireland has the third-highest level of shopping centre space per capita in Europe***

Given the rapid growth in the volume of shopping centre stock during the last decade, Ireland currently has the third-highest level of shopping centre space per capita in Europe with a figure of almost 368m<sup>2</sup> gross letting area for every 1,000 inhabitants – only exceeded by the Netherlands and Sweden.

The strong performance of the Irish retail sector continued into 2007. In that year alone, a total of ten shopping centres opened throughout Ireland, an unprecedented number in a single year. Notable shopping centre openings in 2007 include the Bridgewater Centre in Arklow, MacDonagh Junction in Kilkenny, the Charlestown Centre in Dublin and Athlone Shopping Centre.

According to Jones Lang Lasalle, there was strong growth in the volume of shopping centre stock in Ireland in 2007 – a total of around 240,000 m<sup>2</sup> of new space was completed in that year, bringing the total stock to almost 2 million m<sup>2</sup>.

**Figure 6.2**  
**Growth in Retail Floorspace in Ireland**  
**2002-2009 (F) – Square Metres**



Source: CB Richard Ellis Research.

<sup>77</sup> DKM Review of the Construction Industry 2005 and Outlook 2006-2008.

The growth of shopping centre in Ireland is forecast to continue. In 2008, there are 290,000 square metres under construction around the country. When completed, this will result in a 20% increase in the existing stock.

**Table 6.2**  
**Sample of Shopping Centre Schemes**  
**Currently Under Construction**

Location	Development Name	Total Size (M <sup>2</sup> )	Opening Year
Waterford	Ferrybank Shopping Centre	37,718	2008
Portlaoise	The Maltings, Portlaoise	30,158	2008
Limerick	Parkway Valley Shopping Centre, Limerick	23,225	2009
Limerick	Coonagh Cross, Shopping Centre, Naas Shopping Centre,	21,000	2008
Kildare	Kildare Millennium Mall, O'Connell Street,	22,799	2009
Dublin	Dublin 1	39,948	2009

Source: CB Richard Ellis

***Plus, there will be re-development of many older shopping centres***

Given that so much space has been put in place in the past decade and that there is so much existing space from the decade before, we are likely to be entering a different phase of activity – i.e. a lot of refurbishments and extensions to some of the older centres.

Going forward, it is likely that the focus will on redeveloping older retail facilities as opposed to large-scale new development. A notable trend which has emerged in recent times is the disposal of petrol filling stations, which are seen as offering major redevelopment potential.

***Strong growth in retail park accommodation over the last decade – exceeded 1 million m<sup>2</sup> last year***

There has been significant growth in retail parks since they were first developed in 1990. Retail parks provide an outlet for bulky goods retailers such DIY outlets and home furnishings.

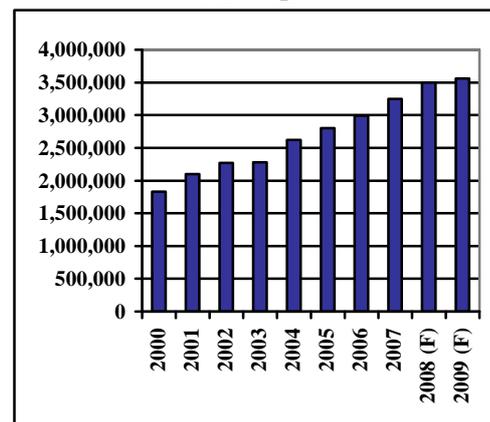
There was over 800,000 square metres of retail warehousing stock in Ireland at the beginning of 2008. There is also a considerable future supply pipeline and there is almost 190,000 square metres of retail park stock under construction which will be completed in the latter half of 2008 and the first half of 2009.<sup>78</sup>

However, it is generally believed that activity in the retail market will begin to abate from 2009 onwards owing to a combination of two factors; the current very high level of retail space and the anticipated contraction in consumption. The forecast in this report assume very modest levels of activity in the retail market from 2010 onwards.

***The Dublin office market performed strongly in 2007***

During 2007, the Dublin office market increased in size by 8% to 3,015,688 square metres.<sup>79</sup> This additional volume of space resulted in an almost doubling of the completed Dublin office market in ten years.

**Figure 6.3**  
**Growth in Office Floorspace in Dublin**  
**2000-2009 (F) – Squared Metres**



Source: CB Richard Ellis Research.

<sup>78</sup> Jones Lang Lasalle; Ireland Retail report, January 2008.

<sup>79</sup> Jones Lang Lasalle; Dublin office market report 2007 summary.

The total level of new office completions in Dublin increased by 71% to 245,595 m<sup>2</sup> in 2007 from 143,919 m<sup>2</sup> in 2006;

The office market is set to continue in 2008 with 235,349 square metres of stock currently under construction and due to be completed in 2009.

Alternative forecasts by CB Richard Ellis also indicate that there will be a significant level of activity in this market in 2008 and 2009.

However, it is generally believed that the relatively high level of office construction in recent years, combined with the sudden deterioration in the performance of the economy and, in particular, much lower employment projections, will result in relatively modest activity in this market beyond 2009.

***The momentum behind the Dublin Dockland's construction programme remains strong – the area can look forward to a stream of iconic development projects***

Over €5 billion has been invested by the Docklands Authority, other public bodies and the private sector in infrastructural and social regeneration projects in the Dublin Docklands since the Docklands Authority was established in 1997. A further €5 billion is expected to be invested in such projects up to 2012.

The momentum behind the Docklands construction programme continues with a steady stream of major infrastructural projects due for completion within the next few years such as:

- Construction of the Luas extension from Connolly to The Point (Line C1) – this has commenced and is due for completion by 2009;
- Full scale construction work has commenced on the €800 million Point Village development. This development will cover a 12 acre site surrounding the Point Theatre and includes a 30,000 square metre shopping centre, 13,000 square metres

of office space, a 250 bed hotel, a 12 screen multiplex cinema and a five-storey underground car park.. The development's signature building will be the 120 metre Watchtower – the tower, which was granted planning permission – will include 500 square metres of office space and luxury apartments and a roof top restaurant and bar along with a viewing deck;

- As part of the Point Village development, the Point Theatre is expected to be expanded to a seating capacity of 15,000;
- Planning permission was granted for the construction of the U2 Tower at Sir John Rogerson's Quay in the Grand Canal area of the Docklands. The Tower will soar 120 metres above the Docklands and includes a public viewing platform at 100 metres, a public amenity area at the base and hotel, retail, and residential accommodation, including 34 social and affordable housing units. At the top, the new U2 recording studio will be located in a suspended egg-shaped pod. Construction is expected to start next year, with a completion date of 2011;
- The Britain Quay Development, adjacent to the U2 Tower, has also been granted planning permission. It will be approximately 11,500 square metres and will contain a mix of uses including leisure, residential, commercial, arts and culture uses;
- Construction of the €100 million Studio Libeskind designed Grand Canal Theatre, located on the Grand Canal Square, is expected to be completed in 2008;
- Construction of the Mael Aires Mateus designed five-star hotel, located in the Grand Canal Square, began this year and is expected to be completed in 2009;
- Construction of Ireland's new €400 million National Convention Centre (NCC), at Spencer Dock, is expected to be completed in 2011;
- The George's Dock beside the IFSC will be the new home for the new National Theatre, The Abbey. An

international design competition is being held to select a design for the new theatre. It will be over 24,000 square metres and will include have three theatres, several rehearsal spaces, shops, bars, restaurants, cafes, facilities for performers and staff, gallery and exhibition facilities and a cinema/lecture facility.

- Construction of the new Luas Bridge across the Royal Canal at Docklands North Lotts is expected to commence in autumn of this year. This bridge is an important element in the extension of the Luas connecting the IFSC to The Point.

***A scarcity of good quality industrial space to buy has led to substantial new development***

There is currently a scarcity of good quality industrial space to buy, and this has led to substantial new development. Lisney research has identified 684,320 square metres of industrial property under development within the Dublin area.<sup>80</sup> This represents a 42% increase on the 483,320 square metres under development one year ago. It is not precisely known when this plant will be built; however, the identified projects are expected to be completed by 2010.

The industrial market is being adversely affected by global credit squeeze, reflecting the impact of developments in the US sub-prime market on international financial markets.

In addition, it is anticipated that the Irish economy will expand at a much slower rate over the period of the NDP. For these reasons, the forecasts in this report assume only modest levels of activity from 2010 onwards.

***General contracting output forecasts indicate that the real value of the sector will increase to €8.4 billion by 2013***

The real value of output from the general contracting sector (2005 constant prices) is

<sup>80</sup> This figure only refers to larger industrial units of 600 square metres or more.

expected to increase from €5.9 billion in 2006 to €8.4 billion in 2013. This represents a 41% increase on the 2006 figure and is equivalent to an annual average growth rate of 5% over the period.

The share of output accounted for by this sector in the total real value of construction output is expected to increase from 17.7% in 2006 to 25.6% in 2013.

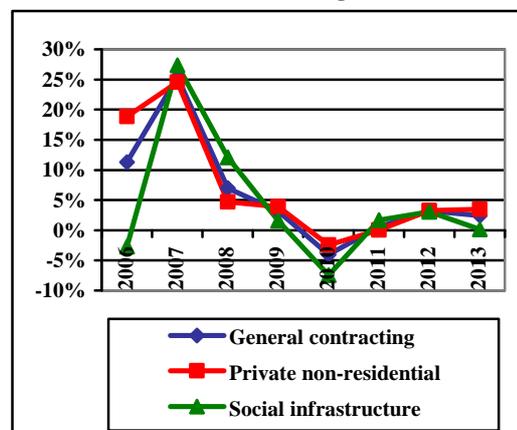
***But the commercial will weaken significantly beyond 2009***

The private non-residential construction sector is by far the largest segment of the general contracting sector. This sector grew strongly in 2005 and this trend is expected to continue up to the year 2009.

The real value of output from the sector was worth €4.1 billion in 2006 and it is expected to increase to €5.6 billion in 2009 and to moderately increase to €5.8 billion by 2013. This represents an increase of 41.3% over the entire forecast period or growth of 5% on average annually.

Commercial building activity is the largest sub-sector of private non-residential construction and it looks set to remain very buoyant in the short-term followed by a weakness in 2010 and 2011, before rising in line with GNP in 2012 and 2013.

**Figure 6.4**  
**General contracting output forecasts,**  
**2006-2013**  
**(% Volume Changes)**



The other key segment that forms the general contracting sector – social

infrastructure – the real value of output from this sector is expected to also increase over the forecast period – increasing from €1.8 billion in 2006 to €2.6 in 2013. This represents an increase of 41% in the real value of output or annual average growth of 5% over the period.

***Strong projected employment growth in the general contracting sector – an estimated 18,000 net new jobs by 2013 – bringing employment to 62,700***

The overall real growth in output in the general contracting sector over the period 2006-2013 translates to an overall net gain of approximately 18,000 jobs. Employment is expected to continually increase up to 2009, with a net gain of 15,300 jobs, before contracting in both 2010 and 2011 and then increasing to reach approximately to 62,700.

***Employment of skilled trades is expected to increase***

Similar to the residential sector, there is relatively a higher share of persons employed in skilled trades – most notably bricklayers, plasterers, electricians and plumbers – in the general contracting sector when compared to the infrastructure sector. There is also relatively a higher representation of those employed as civil engineers in general contracting.

The numbers employed in each of these occupations is expected to increase over the period 2006-2013. The number employed as civil engineers is expected to increase by an estimated 600 – most of the new jobs (estimated at 500) is expected to be created in the short-term – during the period 2006-2009.

Of those employed in the skilled trades, the numbers employed as electricians and plumbers are expected to experience the most pronounced absolute increase. An estimated additional 2,300 and 1,200 persons are expected to be employed as electricians and plumbers respectively by 2013. Most of the job creation for both of these occupations is expected over the

period 2006-2009, as the commercial sector is expected to slowdown significant after 2009.

The anticipated growth in employment in skilled trade occupations in general contracting is likely to compensate to some extent for the anticipated net job losses in these occupations in the residential sector in the short-term.

***Strong employment growth in general contracting is anticipated in the UK***

Although the infrastructure sub-sector is expected to be the ‘shinning star’ of the UK construction industry from 2007 to 2011, the commercial and public non-residential sub-sectors of the industry are forecast to experience strong growth in output over this period. The delivery of many new projects in these sectors will present significant employment opportunities for Irish construction workers in the next years.

Commercial and public non-residential construction output is forecast to grow at an annual average rate of 3.7% and 3.2% respectively between 2007 and 2011, while industrial output is expected to grow at a much more moderate rate of 1.6%.

***Employment opportunities from commercial activities will arise from healthcare, education, mixed-use and office developments***

Strong forecast output growth from the commercial sector will be fuelled by significant investment in health and education facilities through PFI/PPPs, and investment in large office developments.

Commercial construction is expected to be particularly strong in the Greater London Region, the East Midlands region and Northern Ireland.

In the East Midlands Region, commercial activity will be driven by the £900 million of mixed-use schemes in Corby, Wellingborough and Kettering, the redevelopment of Sliverstone race track,

and a £711 million PFI hospital project in Leicester.

In Greater London activity will be driven by developments such as the Heron Tower, the ‘Shard of Glass’, major PFI hospital projects, and work on Olympic venues, while in Northern Ireland, activity will be driven by mixed-use Titanic Quarter Development in Belfast.

***Activity in the UK public non-residential sector will be fuelled by publicly financed projects***

Activity in the public non-residential sector will be primarily fuelled by significant government spending provision for education under the Building Schools for the Future Programme – this area is forecast to be the single largest investment in UK construction in the next five years<sup>81</sup> – and is expected to provide the single largest boost to construction employment outside London. Furthermore, the national picture shows that this eclipses even the resource demands of the 2012 Olympic Build Programme in the next five years.

Public non-residential construction activity is expected to be particularly strong in the South West, North East and East Midlands – output is expected to grow at an annual average rate of 4.4%, 4.3% and 3.4% respectively between 2007 and 2011.

***Modest growth expected in industrial related building in the UK***

Over the last five years, the level of warehouse construction has grown rapidly to equal that of factory building. However, that cycle has now peaked. The Construction Skills Network forecast modest growth in manufacturing output in the next five years, indicating that output from the industrial sector will be modest.

<sup>81</sup> An expected £4.7 billion is set to be released for construction and information and communications technology (ICT) improvements in schools between 2007 and 2011.

***A significant number of new recruits will be required to meet demand in these sectors***

Growth in new build and repair and maintenance activities in the commercial, public non-residential and industrial sectors combined will translate into significant jobs gains between 2007 and 2011.

The Construction Skills Network does not provide estimates of the number of new recruits for these specific sectors; however, it estimates that approximately 87,600 recruits will be needed each year over the period 2007-2011 in order to meet demand and to take account of those leaving the *entire* industry.

**Table 6.4  
Annual Average Requirement by Occupation, 2007-2011  
(% Change)**

<b>Occupation</b>	<b>% Change 2007-2011</b>
Construction Managers	+9%
Bricklayers	+14%
Plasterers & Dry Liners	+8%
Painters & Decorators	+13%
Electrical Trades & Installation	+9%
Plumbing & HVAC Trades	+10%
Roofers	+10%

Source: Construction Skills Network, *Blueprint for UK Construction Skills 2007-2011*

The employment outlook is very promising for those occupations in which there are a relatively high proportion of persons employed in the general contracting sector – these are predominantly skilled craft occupations. Employment of bricklayers, plasterers and dry liners is expected to experience the most pronounced increase in the five-year period – approximately 14% and 13% respectively.

Employment of professionals such as construction managers is expected to increase by 9% over the same period.

***Bright employment prospects for Irish workers in construction activity directly related to the London 2012 Olympics***

Construction activity directly related to the games will create a significant number of new jobs in general contracting. New building activity will include the building of the complex mix of stadia (Olympic stadium, indoor handball arenas, the cycling precinct, aquatics centre, hockey complex, and an athlete's village) and other building activity prompted by the games such as new hotels and visitor facilities.

The Construction Skills Network, predicts that 33,500<sup>82</sup> additional jobs will be required to build Olympic venues, infrastructure and residential developments – all construction work directly attributed to the games – over the seven year period 2005-2012.

A wide range of workers will be in high demand. Of the 33,500 additional jobs required over this seven-year period, 6,500 (20%) relate to managerial or administrative roles, while 2,800 (8%) and 24,000 jobs (72%) relate to professionals (such as architects and surveyors) and trade or craft roles.

While the Network has not produced any forecasts for the breakdown of the number of additional workers required by sub-sector, it can be assumed that a significant number of additional workers will be required in the general contracting sector – particularly skilled trade workers.

***Shortages of certain skills in the UK construction industry – will result in migration 'plugging' the gap***

There is currently a skills shortage of certain construction occupations in the UK construction industry. For example, skilled trades: bricklayers, carpenters and joiners, painters and decorators; and professionals: architects and construction managers.

---

<sup>82</sup> This forecast was based on construction spend of around £2.5 billion (2005 prices). The Construction Skills Network is waiting for the Olympic Delivery Authority (ODA) to release revised spend figures from which the employment forecasts can be adjusted.

Some of the demand will be taken up by workers from elsewhere in the UK, but it is likely that the shortfall will have to be made up by migrant workers elsewhere in the EU in order to 'stage' the games.

Given the expectation of downturn in the Irish housing market over the next few years, this presents a welcome opportunity for some workers that are predominantly employed in the residential sector and to a lesser extent in the general contracting market to gain employment in the UK.

***Significant new build for the London 2012 Olympics – will provide a window of opportunity for Irish contractors to tender for projects***

The 2012 London Olympics Games building-related projects in general contracting (mainly stadia) will provide an opportunity not only for UK-based contractors to tender for projects but also for international contractors (including Irish).

Enterprise Ireland, London have launched a programme to assist Irish companies bidding for Olympic contracts. It is expected that Irish companies will secure half a billion in contracts from the Olympics.<sup>83</sup>

***Non-residential construction in Europe was worth €430 billion in 2006***

The European non-residential construction market covers all building related activity, with the exception of house building and civil engineering infrastructure. It covers construction related investment in education, health, industry, storage, office, commercial, agriculture and other miscellaneous non-residential building.

The market for non-residential construction in Europe was worth €429 billion in 2006, compared with €416 billion in 2003. This represents an increase of 3% over the period.

---

<sup>83</sup> Irish Examiner, "Olympics may Generate €700 billion", 25 October 2007

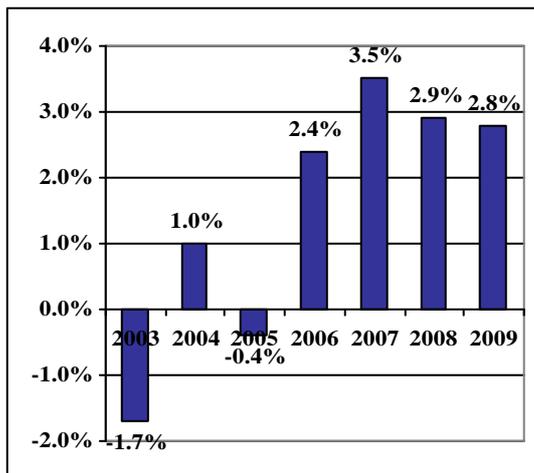
This market is smaller than that for housing (€671 billion in 2006), but larger than that for civil engineering (€284 billion in 2006).

***Strong growth is expected up to 2009, with the market reaching €470 billion***

It is expected that the market will record strong growth over the next three-years – to reach €470 billion in 2009 – according to short-term forecasts produced by member institutes of the Euroconstruct network.

In 2006, the market grew by 2.4% and it is expected to grow strongly this year – at 3.5% – and to just below 3% in both 2008 and 2009.

**Figure 6.5**  
**Non-Residential Construction Output**  
**(% Change)**



Source: Euroconstruct, *Summary Report*, June 2007

This favourable growth anticipated for building in this sector over the next few years will be influenced by two main factors, according to member institutes of the Euroconstruct Network.

First, favourable forecasted European economic growth – this will have large stimulating effects, which should translate into increasing corporate profits for industry and commerce.

Second, the revival of retail investment – investment in properties is winning share

from other types of investment – there is an abundance of capital world-wide in search of investment opportunities, and the quite strong increase in property transactions in 2006 is likely to continue into the future in the short-term.

Another related factor is strong expected growth in private consumption – the European Consumer Confidence Index has been rising since late 2005, and the rise has been quite rapid in early 2007.

***Key points emerging from the analysis***

There are a number of key points to emerge from the analysis. Firstly, there will be a major increase in activity in areas such as health and education arising primarily but not exclusively from funding under the National Development Plan.

Secondly, the level of commercial activity was exceptional in 2006 and very strong in 2007 also. However, there is a distinct possibility that new activity in this area – including the retail, office and industry markets – will decline sharply. There is a considerable level of activity in the pipeline which should be completed in 2008 and 2009. However, activity is expected to be very modest after 2009 as a result of sharp reductions in the number of new projects starting in 2008 and 2009.

Commercial activity will begin to recover towards the end of the forecast period.

However, activity in general contracting in Europe, and especially in Northern Ireland and the United Kingdom should be very positive and these countries have the potential to provide many business and employment opportunities to Irish contractors and workers.

## Chapter 7: The Future Supply of Skills to the Industry

### *Post leaving certificate courses*

On completion of second level education, students who wish to pursue further studies have a number of options open to them. They may enter the workforce, pursue further education and training or apply for direct entry to higher education and training. Table 7.1 shows that in 2006, almost 550 students were enrolled in one of three construction related post leaving certificate courses in 2006. Overall, the numbers have been declining in recent years, down from 589 in 2003.

**Table 7.1**  
**Construction Related PLC Course Enrolments,**  
**2003-2006**

Subject	2003	2004	2005	2006
Computer Aided Design	218	231	223	173
Construction Technology	280	221	264	266
Engineering Technology	91	119	101	109
<b>Total</b>	<b>589</b>	<b>571</b>	<b>588</b>	<b>548</b>

Source: DES

Table 7.2 presents the number of major awards made to those completing construction related courses in 2006. (A breakdown for previous years by type of award is unavailable).

**Table 7.2**  
**FETAC Construction Related Major Awards**  
**(Level 5), 2005-2006**

	2006
Computer Aided Design	65
Construction Technology	114
Engineering Technology	37
<b>Total Construction Related</b>	<b>216</b>

Source: FETAC

On completion of a FETAC accredited PLC course, students may be eligible to progress to further study at higher education institutions through the Higher Education Links Scheme.

Under the Higher Education Links Scheme, specific FETAC Awards are linked to a reserved quota of places on a

variety of higher education programmes. For construction related studies, these programmes are almost exclusively provided at IoTs although universities participate in the scheme for other disciplines.

### *Training provision at FÁS*

This section looks at FÁS supported/provided training programmes in construction-related occupations for those already in employment. There are a number of programmes: Construction Skills Certification Scheme; Construction Training; Environmental Training; Gas Installation training; Safe Pass Programmes currently in development are also examined. This section excludes craft-occupations and apprenticeships.

Table 7.3 presents the number of FETAC awards made in 2006 to employees participating on FÁS construction related courses.<sup>84</sup> Overall, more than 20,500 awards were made in 2006, most of which were Special Purpose awards. There were more than 17,200 awards made for CSCS training, 2,634 for other construction training and 640 awards for environmental training. Gas installation, which is a supplemental award, totaled 196.

<sup>84</sup> The number of candidates is not available by course level for Special Purpose awards. However, the total number of Special Purpose awards made across all disciplines in 2006 was 28,028 while the total number of candidates was 24,777, indicating that the majority of candidates received one award.

**Table 7.3**  
**FETAC awards for FÁS courses, 2006**

<b>Award</b>	<b>Number of Awards (FETAC 5 or 6)</b>
<b>CSCS Awards of which</b>	<b>17,238</b>
Construction operative	11,096
Plant	5721
Roofing	38
Scaffolding	383
<b>Environmental Training Awards, of which:</b>	<b>640</b>
Construction and demolition waste management	131
Environment operative	187
Radon gas remediation and prevention	3
Site suitability assessment	38
Waste facility operations	8
Waste facility operative	83
Waste management	105
Waste management - on site	13
Wastewater plant operation	32
Wastewater treatment plant operations	6
Water treatment plant operation	30
Water treatment plant operations	4
<b>Other Construction Training Awards – of which:</b>	<b>2,438</b>
Building construction	1,212
Computer aided design	2
Confined spaces operations	37
Health and safety at roadworks	328
Mounting of abrasive wheels	41
Risk supervision in confined spaces	16
Road construction and maintenance	626
Supervision of outdoor services	115
Supervision of timber frame building erection	1
Surface dressing	29
Winter maintenance	31
<b>Gas Installation (Supplemental Award)</b>	<b>196</b>
<b>Grand Total</b>	<b>20,512</b>

Source: FETAC

***The construction skills certification scheme (CSCS)***

The CSCS provides for the training, assessment, certification and registration

of specific non-craft occupations associated with the construction industry. The aims of the CSCS are to promote the use of skilled operatives within the construction industry; to provide employees with the skills for specific job requirements; to maintain a record of operatives in specific construction occupations who have attained a recognised level of competence. Training courses are 1-10 days in duration and lead to a FEATC level 5 or 6 Special Purpose Award.

The occupations covered by the CSCS are, for the most part prescribed under the Safety, Health and Welfare at Work (Construction) Regulations 2006. The CSCS covers approximately 20 specific non-craft occupations and are detailed below:

**Table 7.4**  
**Occupations Eligible under the CSCS**

<b>Plant Operative</b>
Construction – contractors plant operation
180 Degree excavator
360 Degree excavator
Mini digger
Tower crane
Self-erect tower crane
Mobile crane
Crawler crane
Telescopic handler
Tractor dozer
Site dumper
Articulated dumper
Slinger signaller
<b>Scaffolding</b>
Scaffolding –basic
Scaffolding – advanced
<b>Roofing</b>
Roof and wall sheeting/cladding
Built-up roof felting - single ply
Built-up roof felting - bituminous
<b>Construction Operative</b>
Mobile access tower scaffold
Mobile aluminium access towers
Signing, lighting and guarding on roads
Locating underground services
Shotfiring

In addition, the CSCS scheme also provides for training in a smaller number of occupations that are not prescribed in the Regulations and include:

- Building construction
- Concreting
- Paving/kerb laying
- Site Drainage

**Other construction training**

Other construction training by FÁS is for occupations which are, in the main, not governed by legislation. These include:

- Confined space programme
- Health and safety
- Mounting of abrasive wheels
- Road construction and maintenance
- Supervision of timber frame erection
- Supervision of outdoor services
- Surface dressing
- Winter maintenance
- Leakage detection
- Mainslaying/service laying
- Diploma/Grad Dip in Highway Technology (distance learning)

**Environmental training programmes**

Environmental programmes are supported by the Environmental Training Unit at FÁS and include courses on waste management, construction and demolition waste, etc. Most programmes are 3-7 days in duration and on completion participants receive a level 5 or 6 FETAC Special Purpose award. Only one course, the water protection and nutrient management planning course, leads to a FETAC major award. A summary of FÁS environmental training programmes is outlined below in Table 7.5.

**Table 7.5**  
**FÁS' Environmental Programmes**

Waste and Demolition
Waste management
Waste facility operative
Construction and demolition waste
Landfill gas monitoring and control
Environmental Issues
Site suitability assessment
Radon gas remediation and prevention
Leachate management and control
Water protection and nutrient management planning
Environmental management systems
Environmental inspection skills
Water and waste water plant operation
Inspection, installation and maintenance of on site waste water treatment systems

**Gas installation**

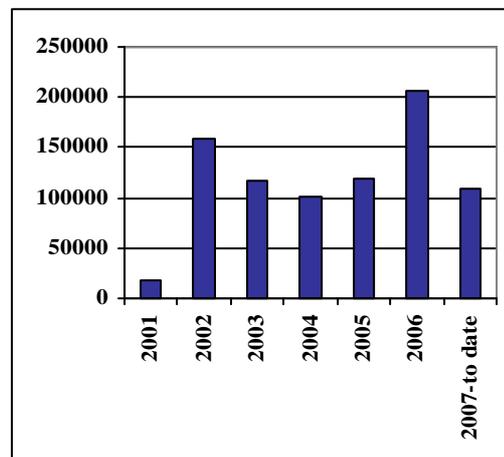
FÁS also provide training in gas installation. Programmes are usually seven days in duration and participants receive a level 6 FETAC Supplemental Award.

**Safe pass**

The Safe Pass course is aimed at construction site and local authority workers (including new entrants, apprentices and trainees). The objective is to increase health and safety awareness among construction personnel so that they may work on-site without being a risk to themselves or others. On completion of the course, participants are registered with FÁS and obtain a FÁS Safe Pass Registration card; cards must be renewed every four years. Employers are legally required to ensure that employees on construction sites in Ireland carry Safe Pass cards.

Figure 7.1 below presents the number of Safe Pass Registration Card applications received by FÁS between 2002 and 2006. With a total of 206,575, 2006 saw the highest number of applications since the programme began, on a pilot basis, in 2001. The figure for 2006 includes those who re-took a Safe Pass course in order to renew cards which were first issued in 2002 (i.e. four years previously).

**Figure 7.1**  
**Safe Pass applications, 2002-2006**  
(Number – '000s)



### ***Current developments***

Because FÁS develops its training in line with industry requirements, some courses are either still in development, or are undergoing re-development or revision. These courses include the following:

#### *CSCS courses*

- 360 degree telescopic handler
- Mini crawler cranes
- Mobile access tower scaffold
- Mobile aluminium access towers
- Mobile elevated work platforms
- Road roller
- Shotfiring
- Steelfixing
- Training programme for CSCS Trainers (scheduled for release by the end of 2007)
- Training for experienced plant operators (scheduled for release by the end of 2007)

#### *Environmental & construction training programmes*

- Leachate and landfill gas management and control (under re-development)
- Building regulations and building control (this course has been in existence for sometime but has recently been upgraded)
- Building defects
- Energy rating

Currently, development of a wide range of plant, scaffolding and roofing programmes is underway aimed at new entrants and these programmes are scheduled for release in 2007.

### ***Higher Education Outflows***

#### ***Introduction***

This section examines the supply of skills to the construction industry that derive from the Irish higher education system. In the Republic of Ireland, higher education for construction related studies is provided by the university sector and the institute of technology (IoT) sector. Entrants to higher education construction

programmes are predominantly school leavers applying on the basis of Leaving Certificate results. However, a number of places are reserved for FETAC (Further Education and Training Awards Council) award recipients and mature students.

Traditionally, participation in construction related education has been predominantly male and the current data shows that there have been no significant changes in the gender distribution in programme participation for this discipline. In 2005, out of almost 3,000 higher education graduates in construction related studies, 90% were male. Architecture and town planning, however, are the only individual disciplines where females are strongly represented.

The section breaks down into four sub-sections. First, the progression route to higher education qualifications in construction related fields is presented. Then, in order to gain an insight into inflow trends to construction related programmes in higher education, CAO acceptance data is examined. This is followed by an in-depth look at eight occupations where the potential labour supply participating in and emerging from the higher education system between 2002/03 and 2004/05 is examined. As a significant number of Irish-domiciled students take up studies at UK higher education institutions, the fourth section of this document focuses on Irish-domiciled students enrolled in and graduating from construction related programmes in the UK for the academic year 2005/06.

### ***National Framework of Qualifications***

The National Framework of Qualifications (NFQ) was introduced in 2003. In higher education, the NFQ describes and links all higher education and training qualifications including those that are awarded by universities, IoTs (under delegated authority from HETAC) and DIT. For the most part, qualifications obtained as a result of studies undertaken at higher education institutions span levels 6 to 10 on the NFQ. The most common major awards corresponding to each

qualification level are detailed below in Table 7.6.

**Table 7.6**  
**NFQ levels and awards in Irish higher education**

NFQ level	Award
Level 6	Higher Certificate
Level 7	Ordinary Bachelor Degree
Level 8	Honours Bachelor Degree/Higher Diploma
Level 9	Masters Degree/Postgraduate Diploma
Level 10	Doctoral Degree (PhD)

Source: National Qualifications Authority of Ireland

While programmes at levels 7/6 are available predominantly at IoTs throughout the country, programmes at levels 8, 9 and 10 are provided at both universities and IoTs.

### Ladder system of progression

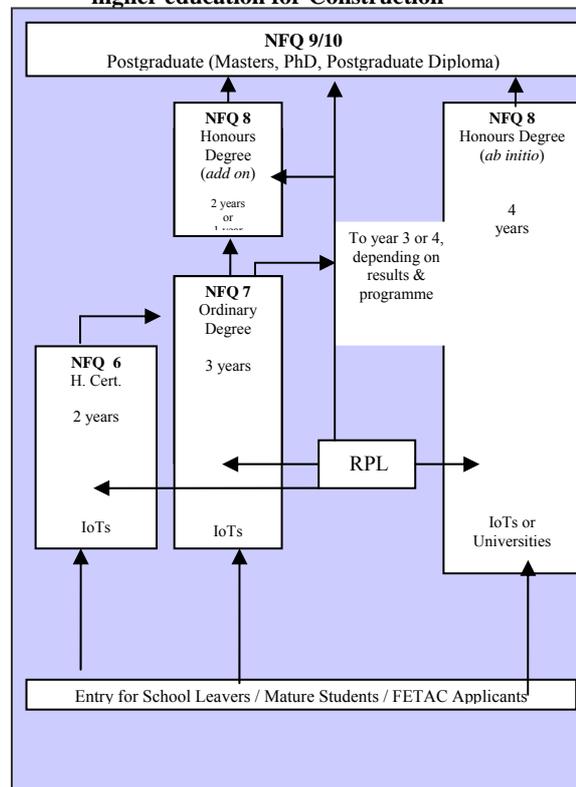
The IoTs in Ireland operate a ladder system of progression within higher education. This route to qualification allows learners to begin their studies on a two year certificate programme, move on to a one year ordinary bachelor degree, and then spend a further year (or two years, depending on the programme) to obtain an add-on honours bachelor's degree. The standard of this honours qualification is precisely the same as *ab initio* honours bachelor's degree qualifications.

The ladder system offers several important advantages. It allows a student to begin higher education knowing that there is the possibility of entering the workforce with a recognised qualification after a comparatively short period of time (i.e. two years) while leaving open the possibility for an individual to continue studying and enhance his/her qualifications by enrolling on an add-on degree programme. In addition, the structure facilitates students who may wish to transfer to different compatible programmes in other higher education institutions, including universities (in Ireland or abroad), to complete degrees or pursue post-graduate studies.

The procedures for access, transfer and progression associated with the National Framework of Qualifications also provide for transfer between programmes even where qualifications have not been awarded with due credit being given through a rigorous process for the recognition of prior learning (RPL).

Figure 7.2 outlines the progression routes within Irish higher education that lead to qualifications in construction related disciplines. (The progression routes for architecture, however, are slightly different where 5 years of undergraduate study are required).

**Figure 7.2**  
**Progression routes to qualifications within Irish higher education for Construction**



Source: Adapted by the SLMRU from the DES document entitled 'A brief Description of the Irish Education System 2004'

### Leaving Certificate Mathematics

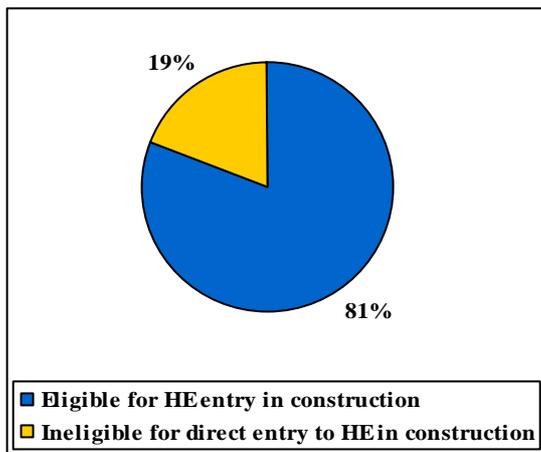
*In 2006, 81% of Leaving Certificate students met the required standard in mathematics for direct entry to most construction programmes.*

Out of approximately 49,200 candidates who sat the Leaving Certificate

mathematics examination in 2006, 39,700 (81%) met the minimum standard necessary for direct entry to most construction related programmes in higher education; most construction related programmes in higher education require a minimum grade D in mathematics at either higher or ordinary level (Figure 7.3).<sup>85</sup> However, of these, only 7,416 (15% of total sits) qualified for civil engineering programmes which require a 'C' grade or better in higher level mathematics in the Leaving Certificate (all programmes at the Irish universities as well as some programmes at DIT, Cork IT and IT Sligo).

Finally, 9,464 (19% of total sits in mathematics) are not qualified for direct entry to construction programmes in higher education either because they sat foundation level mathematics for because they obtained less than a grade D on the ordinary or higher level papers.

**Figure 7.3**  
**LC students' eligibility for HE based on**  
**mathematics achievement, 2006**



Source: State Examinations Commission

### **Data collection**

Unless otherwise stated, all supply data for Irish higher education cited in this document was provided by the National Skills Database at the Skills and Labour

<sup>85</sup> The numbers here do not include those who sat the Leaving Certificate Applied Programme as the LCAP is a separate stand alone programme and is not recognised for **direct** entry to higher education in Ireland.

Market Research Unit (SLMRU) and based in FÁS. The National Skills Database holds details on a variety of supply and demand indicators and includes the enrolment and graduation data from programmes in Irish higher education (university, IoT and colleges of education), supplied to the SLMRU as follows:

- The Higher Education Authority (HEA) supplies enrolment and graduation data for universities and colleges of education
- The Department of Education and Science (DES) supplies enrolment data for IoTs. The enrolment data represents the number of students participating in each year of a programme (i.e. for a level 7 programme, the figure includes the total number of students enrolled in first, second and third year).
- HETAC and individual IoTs supply IoT graduation data
- The DES supplies enrolment data for Post Leaving Certificate (PLC) courses
- FETAC supplies graduation data for PLC courses
- The Central Applications Office provided on level 7/6 and level 8 acceptance data.

The latest available data is used throughout the document. CAO acceptances data includes figures between 2000 and 2007; for enrolments, this includes figures up to and including 2004/05; for graduation data, figures up to and including 2005 are used. Information regarding new courses and professional recognition of courses was supplied through individual contact with the appropriate departments and institutions.

Enrolment and graduation data for Irish students studying at higher education institutions in the UK was supplied by the Higher Education Statistics Agency (HESA) in the UK.

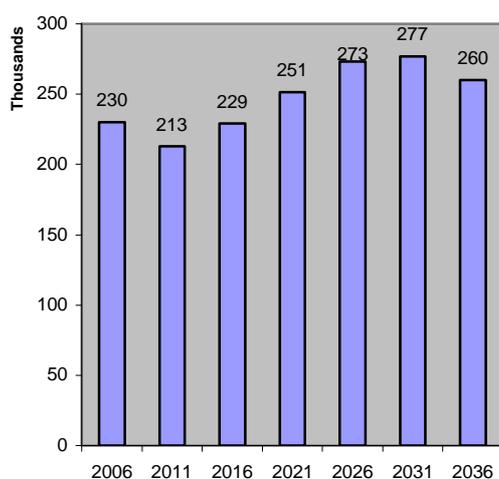
Finally, Leaving Certificate student data was supplied by the State Examinations Commission.

## CAO Acceptances

Most entrants to higher education in Ireland apply for their desired programmes through the Central Applications Office (CAO). An applicant may receive an offer of a level 7/6 and a level 8 programme; however, only one programme may be accepted. CAO programme acceptances are not the same as student enrolments. Some acceptors do not enrol and some seek deferment. Nonetheless, they are a good indication of the inflows to programmes at these levels.

The typical age of school-leavers in Ireland is 16-19 years. In 2005, 88% of those who accepted a level 8 course through the CAO and 85% of those who accepted a level 7/6 course were aged 16-19 years. However, CSO population projections, presented in Figure 7.4 forecast a significant decline in this age cohort in the coming years with the population forecast to fall by approximately 70,000 by 2011. As this cohort represents the majority of new entrants to third level education, demand for places at university and particularly at IoTs is likely to experience a corresponding decline.

**Figure 7.4 CSO Population Projections for 16-19 year-olds, 2006-2036 (000s)**



Source: CSO Population Projections (M2F1), 2006-2036

Table 7.7 shows the numbers of CAO applicants who accepted a place on construction related programmes over the period 2000-2007.<sup>86</sup> The percentage in brackets indicates the proportion of all CAO applicants at each level who accepted a place in construction.

Overall, the proportion of CAO acceptors opting to pursue construction related studies has increased since 2000. The trend is most pronounced at level 7/6 where CAO acceptances for construction increased from 12.7% of all level 7/6 acceptances to 17.1% over the period 2000-2007.<sup>87</sup> In absolute terms, however, the number of acceptors declined. This decrease is a reflection, in part, of the decline in the relevant demographic cohort: the number of leaving certificate sits decreased by approximately 5,000 between 2002 and 2007.

Increases in CAO acceptances were also observed for level 8 construction programmes, albeit on a more modest scale: in 2000, construction programmes made up 2.9% of all level 8 acceptances; in 2007 that percentage rose to 3.8%.

**Table 7.7  
Changes in Acceptances for Construction  
Related Programmes, 2000-2007**

	2000	2004	2005	2006	2007
<b>Level 7/6</b>	2,128 (12.7%)	1,995 (15.3%)	2,136 (16.2%)	2,051 (16.4%)	2,061 (17.1%)
<b>Level 8</b>	609 (2.9%)	1,031 (3.5%)	1,116 (4.5%)	1,042 (3.9%)	1,056 (3.8%)

Source: CAO

## Occupational profiles

The focus of this section is on individual occupation profiles. For each of the professions outlined below, we provide

<sup>86</sup> Construction related courses include: Civil Engineering, Construction studies, Architecture, Estate Agency, Valuation, Planning.

<sup>87</sup> It should be noted that not all level 7/6 graduates enter the workforce on completion of programmes at this level. Many opt to remain in higher education to obtain further qualifications.

enrolment and graduation data for the relevant higher education programmes at universities and Institutes of Technology (IoTs):

1. Architects
2. Architectural technologists
3. Town planners
4. Civil, structural and environmental engineers
5. Quantity Surveyors
6. Other engineers and surveyors
7. Civil, building, and other construction related technologists
8. Project Managers

### *Architects*

*There were over 500 student enrolments in 2004/05, an increase of 7% since 2002/03.*

*On average, 79 students graduated per annum between 2003 and 2005.*

*Three new architectural degree programmes have been introduced in Limerick, Waterford and Cork.*

The Royal Institute of Architects in Ireland (RIAI) is the representative body for architects in the Republic of Ireland. Currently, architecture is not a regulated profession. However, when the Building Control Act 2007 comes into force (expected 2008), the title ‘architect’, along with other specified professions, will become a protected title and only those who have fulfilled the educational and professional requirements and been admitted to the Register will be legally able call themselves “Architect”.

A qualification in architecture requires five years of full-time study. Currently, in the Republic of Ireland, there are only two schools of architecture which run courses that are fully accredited by the RIAI and recognized under the Qualifications Directive (DIT and UCD). In 2005, two new architectural degree programmes were established at the University of Limerick (UL) and Waterford Institute of Technology (WIT), while a third architectural degree programme was set up jointly by UCC and Cork Institute of

Technology (CIT) in 2006. UCD also offer a master’s degree in architecture.

Table 7.8 presents the number of students who were enrolled on level 8 architectural degree programmes between 2002/03 and 2004/05.<sup>88</sup> As the intake of students on all of the newer courses is outside the time period for the data presented in this document, only data from UCD and DIT is included. However, in 2006, a combined total of approximately 55 additional students were enrolled on the architectural programmes in UL and WIT.

Architectural enrolments have been increasing in recent years: numbers enrolled rose by over 7% between 2002/03 and 2004/05 going from 482 to 518 over the three-year period. Student enrolments are expected to increase further in the coming years due to the increase in course provision at WIT, UL and UCC/CIT.

**Table 7.8**  
**Architecture Enrolments (Level 8),**  
**2002/03-2004/05**

	2002/03	2003/04	2004/05
DIT & UCD	482	491	518

Source: DES; HEA

With a total of 80 and 86 graduates respectively, graduations in 2003 and 2005 were broadly similar (Table 7.9). However, due to the increase in education provision for architects since 2005 and the consequent rise in intake, this number is expected to begin to increase between 2009 and 2011 as the first cohorts of students in the new architectural programmes complete their studies.

<sup>88</sup> While a small number of graduates opt to pursue further studies at level 9 and are consequently not available to enter the workforce, the numbers are very small with an average of 11 enrolments and three graduations per year.

**Table 7.9**  
**Architecture Graduations (Level 8),**  
**2003-2005**

	2003	2004	2005
DIT & UCD	80	66	86

Source: DIT; HEA

### *Architectural technologists*

*Enrolments on architectural technology programmes totalled 665 in 2004/05, an increase of 16% since 2002/03.*

*Graduate output in 2003 and 2005 was unchanged at almost 190.*

*Two new level 7 programmes were introduced in 2006.*

Architectural technology is not a regulated occupation and there are no minimum qualifications necessary to work as an architectural technician. In order to become an Architectural Technician Member of the RIAI, however, one must have followed an RIAI recognised course in higher education and completed two years of approved practical experience. The Building Control Bill is not expected to affect the use of the title architectural technologist.

Architectural technology course provision in Irish higher education consists of a three-year course leading to level 7 qualification.<sup>89</sup> Currently, five institutes of technology provide courses in architectural technology in: Carlow, Cork, Dublin, Galway-Mayo and Waterford. However, only the BSc in Architectural Technology courses offered at Waterford IoT and DIT are recognised by the RIAI for the purposes of technician membership. While the level 7 courses at Carlow IoT and Galway-Mayo IoT are not recognised

<sup>89</sup> While a three-year ordinary bachelor's degree of an accredited course is sufficient to meet the qualifications requirements for technician membership of the RIAI, several of the IoTs have introduced or are planning to introduce a fourth, add-on year of study for which students are awarded a level 8 qualification in architectural technology. However, for the academic year 2004/2005, the latest year for which data is available, only WIT offered the honours degree programme.

by the RIAI, holders of such qualifications may nonetheless find employment as architectural technicians. Alternatively, these qualifications may earn the holder exemptions on recognised courses, both in Ireland and the UK, should the student wish to pursue further studies and an RIAI recognised qualification.

Enrolment data for level 7/6 and level 8 courses in architectural technology is presented below in Table 7.10. Galway-Mayo IoT data is not included as the course began in 2006. Overall enrolments on architectural technology courses have increased by more than 16% since 2002/03, going from 573 enrolments to 665 in that period.

**Table 7.10**  
**Architectural Technology Course Enrolments**  
**(all levels), 2002/03-2004/05**

	2002/03	2003/04	2004/05
RIAI Recognised (WIT, DIT)	362	369	379
Others (CIT & Carlow IoT)	211	215	286
<b>Total</b>	<b>573</b>	<b>584</b>	<b>665</b>

Source: DES

Graduations, presented in Table 7.11, did not change significantly between 2003 and 2005 reaching over 180 in 2005.

Future increases in both enrolments and graduations for architectural technology courses may occur due to the introduction, in 2006, of two new level 7 programmes at Galway-Mayo IT: the Galway and Castlebar campuses each offer one programme with 36 and 24 student places respectively.

**Table 7.11**  
**Architectural Technology Course Graduations**  
**(all levels), 2003-2005**

	2003	2004	2005
RIAI Recognised (WIT, DIT)	113	99	128
Others (CIT & Carlow IoT)	73	28	60
<b>Total</b>	<b>186</b>	<b>127</b>	<b>188</b>

Source: IoTs

## Town planners

*Course provision for town planners has expanded since 2006 at both undergraduate and postgraduate level.*

*100 individuals graduated in 2005, up from 84 in 2003.*

Town planning is not a restricted profession and entry requirements to the profession differ, depending on whether employment is within the private or public sector. In practice however, entry to the profession is competitive and individuals who wish to pursue a career in planning usually hold a third level qualification in planning. For employment in the public sector, the only requirement is a planning degree recognised by the Public Appointments Service. Membership of the Irish Planning Institute (IPI) is not a prerequisite to employment as a town planner, but employers, particularly those in the private sector, tend to encourage membership.

Currently, five programmes (two undergraduate and three postgraduate) in planning are provided in Irish higher education although only three – listed below - are currently producing graduates:

- a BSc (level 8) in spatial planning at DIT – IPI accredited
- a Master (level 9) of Regional and Urban Planning (MRUP) at UCD – IPI accredited
- a Master Degree (level 9) at DIT (Part-time) – IPI accredited

In addition, the MSc in Urban Design is a programme aimed at individuals who hold a town planning degree or are already working in the field of town planning. It is *not* a planning qualification but is frequently undertaken by planners to enhance their qualifications and is therefore considered in Tables 7.11 and 7.12 below.

New Courses in 2006 include:

- a BSc (level 8) in Geography, Planning and Environmental Policy at UCD. The first intake of students was in 2005 and the course is three years in

duration. The first graduates are expected in autumn 2008. In order to become fully qualified planners, graduates must do a one-year Masters degree which UCD will be offering from 2008/09 onwards.

- a two-year full-time master's programme in planning (MPlan) at UCC which had the first intake of approximately 30 students in September 2006. Graduates are expected in 2008. Accreditation has been sought for this course from the IPI

A two-year master degree in planning at Limerick Institute of Technology (LIT) is currently in development and LIT expects to have its first cohort of 20 students in September 2008.

Enrolment and graduation data for planning courses in Irish higher education is presented in Table 7.12 and Table 7.13 respectively. Although enrolments declined slightly between 2002/03 and 2004/05, it is possible that this trend may be reversed due to the increased education provision for planners at both graduate and undergraduate level.

Graduations have increased between 2003 and 2005, going from 84 to 101.

**Table 7.12**  
**Enrolments for planning Courses,**  
**2002/03 – 2004/5**

	2002/03	2003/04	2004/05
UCD	123	111	104*
DIT	145	158	150
<b>Total</b>	<b>268</b>	<b>269</b>	<b>254</b>

Source: DES; HEA

**Table 7.13**  
**Graduations from Planning Courses, 2003-2005**

	2003	2004	2005
UCD	58	56	54*
DIT	26	30	47
<b>Total</b>	<b>84</b>	<b>86</b>	<b>101</b>

\*Estimate

Source: DIT; HEA

While there has been an increase in the provision of third-level courses in Town-

Planning at both graduate and post-graduate levels, an over-supply of planning graduates is not anticipated, despite the slowdown in construction activity.

On the contrary, recent legislation has radically increased the responsibilities of the planning officer and the complexity of the planning function. This trend will continue as successive Governments place more emphasis on creating an environmentally friendly and sustainable physical infrastructure.

Thus the employment intensity of the planning function should increase significantly and the slowdown in general construction activity is not expected to be reflected in a concomitant decline in the demand for the services of planners.

#### *Civil, structural and environmental engineers*

*In 2004/05, there were over 1,325 level 8 enrolments representing an increase of 12% over the period 2002/03-2004/05.*

*Over the period 2003-2005, level 8 graduations increased by almost 10%, reaching just over 400 in 2005.*

*Post-graduate enrolments remain largely unchanged at approximately 300 in 2002/03 and 2004/05*

The focus of this section is on the education participation and outflows relevant to occupations in the field of civil, structural and environmental engineering. We also include two courses related to this particular sub-discipline: the BSc in Geomatics at DIT and the BSc in Structural Engineering with Architecture at UCD.<sup>90</sup> For the sake of brevity we will use the term ‘civil engineering’ to denote each of these courses of study. The majority of courses considered in this

<sup>90</sup> BSc (Geomatics) students acquire skills that are similar to some of those of a qualified civil engineer. The programme is accredited by the Society of Chartered Surveyors, the Irish Institution of Surveyors and the Institution of Civil Engineering Surveyors.

section lead to a level 8 award.<sup>91</sup> Postgraduate data is also examined, albeit in less detail: it is not always possible to disaggregate civil engineering postgraduate awards from other engineering discipline awards.

#### *(a) Undergraduate Courses*

Undergraduate qualifications in civil engineering are available through both universities and IoTs throughout the country. Currently there are eight higher education institutions in Ireland providing level 8 programmes in civil engineering – Cork IoT, Sligo IoT, Athlone IoT (2 year add-on), Dublin Institute of Technology, NUI Galway, Trinity College Dublin, University College Cork, and University College Dublin

Table 7.14 shows the enrolment figures for civil engineering courses in higher education between 2002/03 and 2004/05. The numbers of students enrolled on level 8 courses in civil engineering stood at 1,485 in 2004/05 representing an increase of more than 150, or 12% since 2003/04.<sup>92</sup>

<sup>91</sup> The Institution of Engineers in Ireland is the professional body representing engineers in Ireland and operates under the name Engineers Ireland. For the most part, courses in this section are accredited by the Engineers Ireland and recognised as meeting the educational requirements for ordinary membership. The exceptions are the BSc in Structural Engineering with Architecture at UCD – a new course for which the first cohort of graduates is expected in the latter half of 2007; the two-year add-on degree in civil engineering at Athlone IoT; BSc in Geomatics at DIT.

<sup>92</sup> We estimate that for each academic year the enrolment data in Table 3.8 under-represents civil engineering enrolments by between 250 to 300 students as it does not include the numbers of students enrolled in common entry courses at NUIG, UCD, TCD and DIT. Students enrolled on common entry courses opt to specialise in any one of a number of engineering disciplines, including civil engineering and related courses. For students at TCD, this choice is made at the end of second year, while students at NUIG, UCD and DIT make this choice at the end of first year.

**Table 7.14**  
**Civil engineering enrolments, 2002/03–2004/05**

	2002/03	2003/04	2004/05
University*	902	935	1,015
IoTs	427	434	470
<b>Total</b>	<b>1,329</b>	<b>1,369</b>	<b>1,485</b>

\*TCD data is an estimate

Source: DES; HEA

Table 7.15 shows that over 400 students graduated from the engineering courses discussed here in 2005 which was an overall increase of almost 10% on the 2003 total.

**Table 7.15**  
**Civil engineering graduations, 2003-2005**

	2003	2004	2005
University*	258	246	284
IoT	109	118	119
<b>Total</b>	<b>367</b>	<b>364</b>	<b>403</b>

\*TCD data is an estimate

Source: IoTs; HEA

Education provision for level 8 civil engineering has expanded recently with the development of a two-year add on course at Athlone IoT. The course was introduced in 2005 and the first graduates are expected in 2007. In addition, the University of Limerick is planning to introduce a level 8 course in civil engineering with a capacity of approximately 30 students beginning September 2008.

### *(b) Postgraduate Courses*

Post-graduate courses (i.e. levels 9/10) are offered in civil, structural and/or environmental engineering at five higher education institutions: NUIG, UCC, UCD TCD and Cork IoT. Graduation data for civil engineers at post-graduate level is not sufficiently detailed to allow a distinction between civil engineering graduates and graduates in other engineering disciplines and are therefore not included in this section. Available enrolment data is presented below in Table 7.16 and shows that, overall enrolments in 2004/05 stood at just over 300 students. This is only slightly less than the 2002/03 figure of 318. Approximately 16 enrolments every year were for PhD programmes in civil engineering.

**Table 7.16**  
**Postgraduate Enrolments for Civil Engineering, 2002/03–2004/05**

	2002/03	2003/04	2004/05
<b>Total</b>	<b>318</b>	<b>274</b>	<b>303</b>

Source: DES; HEA

\*Note: In addition, TCD provides a post-graduate diploma in civil engineering project management. The data for this course is not included in Table 3.10 but in the later section covering construction and project managers, Section 3.2.8.

### **The Bologna Process and Engineering Qualifications**

The Bologna Declaration, signed by the Education Ministers of 29 European countries in 1999, aims to create a European Higher Education Area by 2010. To this end, a series of reforms has been introduced across Europe in order to make higher education more comparable and to increase student and employee mobility internationally; the reform process has come to be known as the Bologna Process.

Within the context of this report the most notable implication of the Bologna Process is that the educational standard for the title of Chartered Engineer is to be raised from Level 8 B.Eng (currently 4 years) to level 9 M. Eng (5 years combined under- and post-graduate study), with effect from courses completed in 2013. Therefore, from September 2008, all new entrants to engineering education at third level will require a level 9 qualification in order to be eligible to apply for the title of Chartered Engineer. This effectively lengthens the time required to qualify as an engineer.

### *Quantity surveyors*

*Add-on level 8 courses have recently been introduced at three IoTs (Cork, Carlow and Sligo)*

*Enrolments in 2004/05 were down on those in 2002/03*

*Graduate output in 2003 and 2005 was largely unchanged at 162 and 152 respectively*

The focus of this section is on courses that lead to a level 8 award in quantity surveying. There exist other courses in quantity surveying at levels 7/6 but these are considered to be ‘technician level’ qualifications and are discussed separately in Section 3.2.7.

Until recently, only two level 8 courses in the specific area of quantity surveying were available in higher education: a BSc (Surveying) in Construction Economics and Management at DIT and a BSc in Construction Economics (Quantity Surveying) at LIT, both of which allow graduates full exemptions from the examinations of the Society of Chartered Surveyors in Ireland.

The IoTs at Cork, Carlow and Sligo have recently expanded their existing level 7/6 courses to develop an add-on programme leading to a level 8 honours bachelor degree. The first intake of students for each of these new add-on courses was in September 2006 and the first cohort of graduates is expected towards the end of the academic year in 2007. The participation data for these newer courses is not, therefore, included in this section.

Table 7.17 presents the total student enrolments for level 8 quantity surveying courses between 2002/03 and 2004/05. There were 467 students participating in level 8 quantity surveying courses at DIT and LIT in 2004/05. This represents an overall decrease in enrolments of almost 9% since 2002/03.

Graduations, presented in Table 7.18, also declined during that time, going from 162 in 2003 to 152 in 2005.

**Table 7.17**  
**Quantity Surveying Enrolments (Level 8),**  
**2002/03-2004/05**

	2002/03	2003/04	2004/05
<b>DIT &amp; LIT</b>	<b>513</b>	<b>491</b>	<b>467</b>

Source: DES

**Table 7.18**  
**Quantity Surveying Graduations (Level 8),**  
**2003-2005**

	2003	2004	2005
<b>DIT &amp; LIT</b>	<b>162</b>	<b>130</b>	<b>151</b>

Source: IoTs

Two factors, however, suggest that the declining trend observed for level 8 quantity surveying enrolments and graduations will not continue and may even be reversed in the coming years. First, the development of add-on level 8 programmes at several IoTs means that course provision at this level in quantity surveying has increased; secondly, as we will see in Section 3.2.8, enrolments and graduations on quantity surveying courses at level 7/6 have been increasing, providing a greater pool of students who may opt to remain in education in order to pursue an honours degree in quantity surveying.

#### *Other engineers and surveyors*

*At 220, enrolments in 2004/05 were almost double the figure in 2002/03.*

*Graduations in 2003 and 2005 were approximately 45 per annum.*

In this section, we examine the outflows from other level 8 courses in the construction-related field that cannot be accurately captured in either of the preceding sections, namely building services engineering and building surveying.

Building services engineering courses are available at several IoTs (e.g. CIT, Letterkenny IT and Dundalk IT), but only one institution – DIT – provides a level 8 degree in building services engineering. Level 7/6 student data for building services engineering is included in Section 3.2.7. The level 8 course in Building Surveying at Dundalk IoT is the only course available in the Republic of Ireland that is specifically dedicated to building surveying.

Enrolment and graduation data from these courses since 2002/03 is detailed in Tables 7.19 and 7.20 respectively. There has been a significant increase in enrolments since 2002/03 which almost doubled to reach 220 in 2004/05.

At 47, the number of graduations in 2005 was only marginally higher than in 2003. Graduate output in the coming years, however, may increase due to current increases in enrolments for these courses.

**Table 7.19**  
**Other Engineers and Surveyors Enrolments (Level 8), 2002/03-2004/05**

	2002/03	2003/04	2004/05
Building Surveying	53	78	137
Building Services Engineering	64	69	83
<b>Total</b>	<b>117</b>	<b>147</b>	<b>220</b>

Source: DES

**Table 7.20**  
**Other Engineers and Surveyors Graduations (Level 8), 2003-2005**

	2003	2004	2005
Building Surveying	20	12	21
Building Services Engineering	25	16	26
<b>Total</b>	<b>45</b>	<b>28</b>	<b>47</b>

Source: IoTs

### *Building & civil engineering and other construction technologists*

*Over the period 2002/03-2004/05 technician level enrolments grew by 8% and reached 3,699 in 2004/05.*

*Graduations in 2005 totalled almost 1,900, the highest proportion of which was for civil engineering course (911)*

Higher education programmes that lead to qualifications necessary for construction technologist occupations span levels 6 and 7 of the NFQ. Level 7/6 (higher certificate/ ordinary bachelor degree) courses in civil engineering, quantity surveying, building surveying, building services engineering, and other construction-related studies are available in 11 Institutes of Technology throughout

the country.<sup>93</sup> However, output from level 7/6 courses has not, as a general rule, represented a viable source of labour supply to specific occupations in the construction industry for two reasons: first destination data from the HEA shows that a significant proportion (over 60% in 2004; 48% in 2005) of students who complete level 7/6 courses remain in higher education and study for an honours bachelor degree, either in Ireland or abroad (usually the UK). Secondly, level 7/6 programmes in construction related disciplines tend to be general in nature and graduates may be eligible to enter one of a variety of related courses (at level 8) and/or careers.

While enrolment and graduation data from level 7/6 courses should not be exaggerated in terms of labour supply for specific 'technologist' occupations, neither should the data be underestimated as an indicator of potential future supply of skills to the industry: many of those participating in the courses covered in this section will later either pursue careers or further study in this discipline.

Table 7.21 presents the total enrolments (2002/03 to 2004/05) for level 7/6 courses in (a) civil engineering (b) quantity surveying and (c) other construction studies.

**Table 7.21**  
**Construction Technician Enrolments (Levels 7/6), 2002/03-2004/05**

Sub-discipline*	2002/03	2003/04	2004/05
Civil Engineering	1,694	1,720	1,813
Quantity Surveying	157	185	218
Other Construction Studies	1,574	1,659	1,668
<b>Total</b>	<b>3,425</b>	<b>3,564</b>	<b>3,699</b>

Source: IoTs; DES

Overall, enrolments on construction technician courses increased by 8% over the period 2002/03-2004/05 and reached almost 3,700 in 2004/05. In terms of

<sup>93</sup> Data from architectural technology courses is not included in this section as it was discussed separately in an earlier section of this chapter (see architectural technologist).

numbers, enrolments increased most for civil engineering, with 120 additional students in 2004/05 compared to 2002/03. Enrolments for quantity surveying courses recorded the highest relative increase, with 2004/05 numbers 39% greater than in 2002/03.

Graduation output for level 7/6 courses in (a) civil engineering (b) quantity surveying and (c) other construction studies is shown in Table 7.22. There were almost 1,900 graduates from construction related courses in 2005. While there were almost 50 fewer graduations in 2005 compared to 2004, the number is broadly similar to the 2003 figure of 1,864. In 2005, almost one half (47%) of all graduations in this discipline were for civil engineering courses, followed by other construction studies at almost 43%.

**Table 7.22**  
**Construction Technician Graduations**  
**(Levels 7/6), 2003-2005**

Sub-discipline*	2003	2004	2005
Civil Engineering	796	906	911
Quantity Surveying	100	107	156
Other Construction Studies	968	930	830
<b>Total</b>	<b>1,864</b>	<b>1,943</b>	<b>1,897</b>

Source: IoTs

\*Civil engineering includes civil and water engineering, highway technology and site management as well as specific civil engineering courses.

\*Quantity surveying is made up of construction economics courses and quantity surveying courses.

\*Building surveying, building services engineering and construction studies are included in 'other construction studies'.

### **Construction and project managers**

*Level 8 enrolments increased from 483 to 635 between 2002/03 and 2004/05.*

*At 96 and 136 respectively, graduations from level 8 programmes in 2003 and 2005 were broadly similar*

*In 2006, approximately 250 individuals completed courses at post-graduate or professional level in construction or project level.*

The examination of the skills supply for construction managers differs from those discussed thus far in that it is impossible to identify a primary source of supply for this occupation. The difficulty in isolating the skills supply for construction managers stems from three related issues:

- Construction managers come from a variety of educational backgrounds ranging from lower secondary to third level. The National Skills Bulletin 2006 shows that 25% of building managers had reached lower secondary education or less while 32% had reached upper secondary education.

For those construction managers that do hold higher education qualifications, it is possible that the qualifications are in a variety of disciplines which may range from specific project management qualifications to qualifications in related fields such as engineering, quantity surveying, architecture etc.

Managers in the construction sector, as in any other sector, must by definition have acquired a certain amount of experience in the field before assuming any management role. For instance, before receiving accreditation of any level by the Irish Institute of Project Management, candidates must be a minimum of 23 years. Direct entry to construction management on completion of full-time education is uncommon.

This section thus examines the education provision and participation data in two broad areas: higher education and, where available, professional organisations such as the Construction Industry Federation and the Irish Institute of Project Management. First, we will look at the higher education undergraduate courses and post-graduate courses in construction management. We will then look at a selected number of professionally provided project management courses and focus in particular on those delivering education to construction professionals.

### (a) Undergraduate Courses

The data in this section is confined to courses that lead to a level 8 award: all level 7/6 courses in construction were included in the earlier section on construction technologists. Currently, construction management courses are provided at the University of Limerick and seven IoTs throughout Ireland. Education provision in construction management at level 8 has increased over the last number of years with both the expansion of existing level 7 programmes and the development of entirely new four year programmes at five institutes and universities. As data for these **new courses** is not available for the time period covered in this document (2002/03 to 2004/05) the following is a short description with, where possible, an indication of potential course capacity:

- One-year add-on programmes were introduced to existing level 7 degrees at CIT (2005) and DIT (2006).
- In addition to its level 8 construction management course, LIT introduced in September 2006 a BSc in Civil Engineering Management with students in years 1, 2 and 3 of the four year programme. The first graduates of this course can therefore be expected in 2008. Course capacity is expected to be 25 for years 1 and 2, and 40-50 for years 3 and 4, with the increase in number to facilitate students transferring from other level 7 courses.

Table 7.23 presents enrolment data for ab-initio and add-on courses between 2002/03 and 2004/05. In 2004/05, there were over 630 student enrolments on the construction management courses at undergraduate level. This is an increase of 150, or more than 30% on enrolments for 2002/03.

Graduations for construction management level 8 courses stood at 136 in 2005, up from 96 in 2003 (Table 7.24).<sup>94</sup>

<sup>94</sup> Graduation data for construction management (level 8) courses is presented in Table 3.18. While there were fewer graduates in 2005 when compared to 2003, at a total of 103, graduations remain slightly higher than in 2004.

**Table 7.23**  
**Construction Management Enrolments (Level 8),**  
**2002/03-2004/05**

	2002/03	2003/04	2004/05
	0	44	61
Ab-initio Courses	142	169	165
	148	146	190
	161	173	183
Add-on Courses	32	37	36
<b>Total</b>	<b>483</b>	<b>569</b>	<b>635</b>

Source: DES

**Table 7.24**  
**Construction Management Graduations**  
**(Level 8), 2003-2005**

	2003	2004	2005
	0	0	0
Add-on courses	26	45	33
	29	29	48
	32	39	42
Ab-initio courses	9	19	13
<b>Total</b>	<b>96</b>	<b>132</b>	<b>136</b>

Source: IoTs

### (b) Other project/construction management courses

In this section we look at project management courses that are aimed either at post-graduate students and/or at individuals who have already acquired experience working in the field. These project management courses are offered by higher education and/or professional institutions. Professional institutes are bodies that represent the concerns and interests of those working in a given occupation. Some professional courses are accredited by higher education institutions while the University of Limerick has a dedicated Centre for Project Management which delivers not only post-graduate education but also short (1-4 day workshops) to business. This section focuses on the courses that generally of one academic year in duration.

Project management courses can be general in nature, of relevance to a wide variety of sectors, construction, health, marketing, etc. Other project management

courses are specifically designed to meet the needs of the construction industry.

Generic project management courses are offered at:

- The University of Limerick (Centre for Project Management) offers a university diploma course (1 year) and a master degree course in project management. Approximately 17% of masters students and 31% of diploma students in 2006 came from the engineering/construction sector.
- Dublin Institute of Technology provides an MBA in Project Management.
- The Institute of Project Management in conjunction with UCC run a 1 year diploma course. Approximately 25% of award recipients in 2006 were construction industry workers.
- The Institute of Public Administration

Project management courses specific to the construction sector are available as follows:

- The Construction Industry Federation run two courses, a certificate (1 year) and diploma (2 years) in conjunction with the UK based body the chartered Institute of Building.
- Waterford IoT introduced a new level 9 (masters) course in Construction management in 2005 with a total of 8 enrolments. These students are expected to graduate in autumn 2007 and therefore their numbers are not included in Table 11 below. The level 9 programme (one-year) in International Construction Management is under review and currently not offered at WIT. It may run again in 2008/09.
- Trinity College Dublin runs a level 9 (post-graduate diploma) in civil engineering project management.
- DIT a one year Building Technology and Construction Management Programme. On

completion of the courses, successful students receive a DIT Continuing Professional Development Certificate. The course also acts as a preparatory programme for those wishing to sit the Chartered Institute of Builders (CIOB) professional examination - and the majority of students go on to sit the professional examinations.

Table 7.25 lists a number of course providers and the title of the courses on offer relevant to the construction management profession. All of the courses are run either on a distance learning or part-time learning basis and are aimed to accommodate those working in the construction industry. In 2006 approximately 250 individuals received a construction / project management qualification on completion of one of the courses detailed in Table 3.19. Of these, 156 were on completion of dedicated construction management courses while the remainder were construction sector candidates following generic programmes.

**Table 7.25**  
**Postgraduate & Professional Project Management Awards, 2006**

Course Provider	Course Title	Duration
Institute of Project Management (& UCC)	*Diploma in Applied Project Management (Generic)	6 – 9 months
Trinity College Construction Industry Federation	Grad-Diploma in Civil Engineering Project Management	1 year Add-on yr to Cert course
Construction Industry Federation	Diploma in Site Management	1 year
DIT (CIOB examination preparation)	Certificate in Site Management Building Technology and Construction Management Programme	1 year
University of Limerick	*Masters in project management	2 years
University of Limerick	*Diploma in project management	1 year
<b>IPA (NUI)</b>	<b>*Certificate/Diploma</b>	

Source: Individual contact with relevant institutions

*\*Number of awards refers to construction sector candidates only. Total enrolments were higher but candidates were from other backgrounds, e.g. Health. Estimate only.*

Finally, FÁS have begun the process of introducing project management training specifically for the construction sector. Initial plans are in place to run the course beginning September 2007. In addition, FÁS provide funding support for students on the project management diploma course at UL under the Competency Development Programme (CDP) which has had a positive effect on the courses' take up rate.

### *Irish domiciled students in the UK*

*In 2006, over 500 Irish graduated with construction related qualifications from UK universities; the largest proportion was in civil engineering*

Every year thousands of Irish domiciled students enrol in a wide range of first degree courses in the UK, including construction related courses. The Higher Education Statistics Agency (HESA) in the UK holds data on student enrolments and graduations at each publicly funded higher education institution in the United Kingdom. The student population data includes details on students' domicile (permanent/home address prior to the start of their studies) as well as their chosen subject area of study. The data is not available at course level and we cannot therefore draw conclusions concerning the supply stock for specific occupations. For example, we are unable to distinguish graduates in architecture from graduates in architectural technology. The information nonetheless provides a useful indicator of the construction-related skills that are acquired by Irish domiciled students in the UK.

Table 7.26 provides a breakdown by subject area of the Irish domiciled students enrolled in and graduating from construction-related studies at UK higher education institutions.

**Table 7.26**  
**Irish Domiciled First Degree Students in UK**  
**Higher Education, 2005-2006**

	Enrolments	Graduations
Architecture	360	110
Building	330	170
Civil engineering	560	230
Planning (urban, rural & regional)	60	25
<b>Total</b>	<b>1,310</b>	<b>535</b>

Source: HESA (UK)

Overall, there were over 1,300 Irish-domiciled students enrolled on undergraduate degree courses in construction the UK. Civil engineering has the highest number of enrolments at 560, followed by architecture and building at 350 and 330, respectively.

In terms of graduations, a total of 535 students graduated from courses related to the construction industry in 2006. Again, the highest number of graduates was in the field of civil engineering at 230, with an additional 170 in building and 110 graduates in architecture.

### *Summary*

*Almost 8,000 students were enrolled in construction related higher education programmes in 2004/05, up from 7,200 in 2002/03.*

*In 2005, graduate output from higher education construction courses was almost 3,000, up from approximately 2,900 in 2003.*

*The 16-19 year old cohort is set to decline by 70,000 in the coming years and is likely to result in a decrease in demand for third level education.*

Tables 7.27 and 7.28 show that increases were observed in construction related enrolments and graduations from Irish higher education in recent years. In 2002/03, the total enrolment figure for this broad discipline stood at just over 7,200 but increased by almost 800 to reach almost 8,000 in 2004/05. Graduations have increased, by more than 8%, going

from just over 2,750 in 2003 to almost 3,000 in 2005.

**Table 7.27**  
**Higher Education Construction Enrolments,\***  
**2002/03-2004/05**

Occupational Skills	2002/03	2003/04	2004/05
Architects	482	491	518
Architect Technologists	573	584	665
Town Planners	268	269	264
Civil Engineers	1,329	1,369	1,485
Quantity Surveyors	513	491	467
Other Engineers/surveyors	117	147	220
Construction Technologists	3,425	3,564	3,699
Construction Managers	483	569	635
<b>Grand Total</b>	<b>7,190</b>	<b>7,484</b>	<b>7,953</b>

\*Excludes level 9 civil engineering and architects

**Table 7.28**  
**Higher Education Construction Graduations,**  
**2003-2005**

Occupational Skills	2003	2004	2005
Architects	80	66	86
Architectural Technologists	186	127	188
Town Planners	84	86	101
Civil Engineers	367	364	403
Quantity Surveyors	162	230	151
Other engineers and Surveyors	45	28	47
Construction Technologists	1,864	1,943	1,897
Construction Project Managers	96	132	136
<b>Grand Total</b>	<b>2,884</b>	<b>2,976</b>	<b>3,009</b>

Source: IoTs; HEA

Course provision for construction related studies has increased significantly in recent years. IoTs and universities have expanded and/or planning to expand their existing programmes to include add-on degrees or master degrees to compliment current courses. They have also introduced entirely new programmes, at both undergraduate and postgraduate level. In all, since 2005, a total of 21 new programmes have been introduced in almost every occupational skill discussed in this document. A list of these new programmes is provided in Table A.1 of the Appendix.

In 2006, there were approximately 1,300 Irish students enrolled on construction

related degree programmes in the UK. Also in 2006, more than 500 Irish domiciled students obtained a first degree in construction related courses in the UK. Most of these students were in civil engineering.

The slowdown in the construction industry could have a significant impact on the destination of male school-leavers. In recent years, a relatively high proportion of these school-leavers have been either entering apprenticeships in the construction trades or they have been attending construction related courses in the Institutes of Technology.

According to the figures in Table 7.29, some 5,086 individuals – almost all of whom were male school-leavers – registered for apprenticeships in the construction trades in 2007 (apprenticeship data is examined in greater detail in Chapter 1). The same year, in the higher education sector, over 17% of CAO applicants who accepted a place on a level 7/6 course (Table 7.30) did so for construction related courses.

The analysis in this report shows that employer sponsorship of apprentices will decline by at least 25% and this figure is conservative. While it is not possible to predict what the impact of the construction slowdown will be on students' preferences, it is reasonable to assume that there will be some decline in the take-up of places on these courses over the next few years. In this context, it is worth noting that there has been a major expansion in provision in these courses in recent years and that this expansion in provision has coincided with the boom in construction activity. As recently as the year 2000, only 12.7% of CAO level 7/6 acceptors were for construction related courses in Irish higher education, mostly at the Institutes of Technology.

Thus it is conceivable that as many as 5,000 male school-leavers who would have either entered apprenticeships or attended courses in the Institutes of Technology, would be seeking alternative careers as a consequences of the slow-

down in the construction sector. This possibility represents a major challenge to the education and vocational training system.

Although it is anticipated that there will be a significant reduction in the number of young people entering apprenticeships, there will also be a decline in the number of 16-19 year olds entering third level education (due to a decline in the relevant demographic cohort), leading, in turn, to surplus capacity at third level, particularly in the IoT sector. This appears, therefore, to offer an opportunity to utilise this capacity to provide appropriate education and training for those who would traditionally have entered the apprenticeship programme.

**Table 7.29**  
**Apprenticeship Registrations, 2000 & 2007**

<b>Trade</b>	<b>2000</b>	<b>2007</b>
Brick & stonelaying	441	247
Carpentry & joinery	1,618	1,353
Construction plant fitting	91	94
Electrical	2,151	2,054
Floor & wall tiling	29	43
Painting & decorating	159	113
Plastering	188	143
Plumbing	826	1,039
<b>Total</b>	<b>5,503</b>	<b>5,086</b>

Source: FÁS

**Table 7.30**  
**Changes in Acceptances for Construction**  
**Courses at Level 7/6, 2000-2007**

	<b>2000</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Number of Acceptors	2,128	1,995	2,136	2,051	2,061
% of Total Level 7/6 Acceptances	12.7	15.3	16.2	16.4	17.1

Source: CAO

## Chapter 8: Forecasting the Skill Needs of the Industry 2007-2013

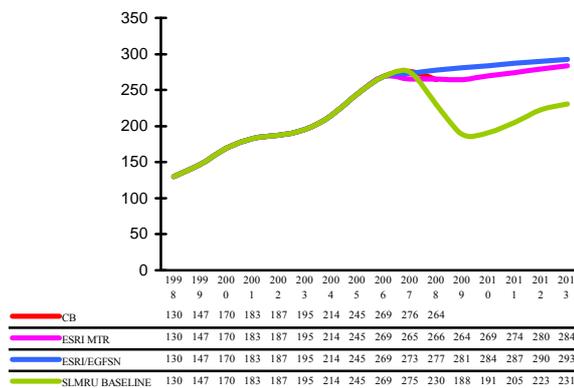
In this chapter we provide the employment forecasts for the construction sector for the period 2006-2013. Forecasts are generated at sector, sub-sector and occupation level.

### *Total sector employment forecasts*

The starting point in producing employment forecasts was to estimate how the total employment in the construction sector will evolve in the coming years. For this purpose we generated a set of forecasts from different sources. These forecasts are presented in Figure 8.1.

Medium Term Review are applied to the most recent historical data for construction employment, the forecasts for 2008 are in line with those of the Central Bank. By contrast the ESRI, in their report to the EGFSN in 2006, produced a revised employment growth forecasts for the construction sector, whereby employment was set to grow by 1.5% annually over the period 2006-2010 and by 1% thereafter. This translates into a continuous employment growth over the forecast period with employment reaching over 290,000 by 2013.

**Figure 8.1**  
**Construction Sector Employment Forecasts**  
(Number –'000s)



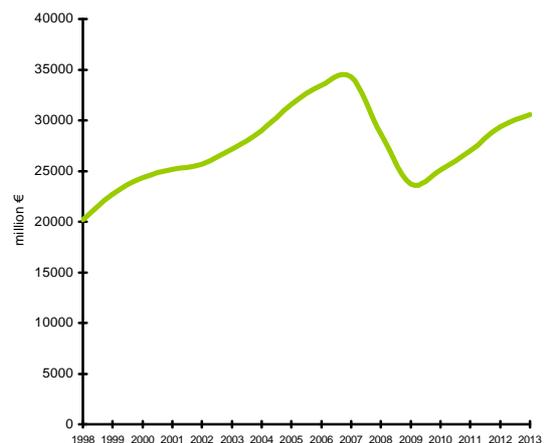
Source: Central Bank, SLMRU calculations

The Central Bank produced construction sector employment forecasts for 2007 and 2008 in their third quarterly bulletin for 2007. Employment in the construction sector was forecast to decline by more than 10,000 between 2007 and 2008 to just below 265,000.

We also produced forecasts based on the ESRI Medium Term Review of the economy published in 2005. When the annual employment growth rates implied in the low growth scenario in the ESRI

The SLMRU produced an additional set of forecasts based on the probable levels of activity in each of the four main sub-sectors of the industry; new residential development, residential repair and improvements; infrastructure and commercial.

**Figure 8.2**  
**Construction Output Forecasts**  
(constant 2005 prices)



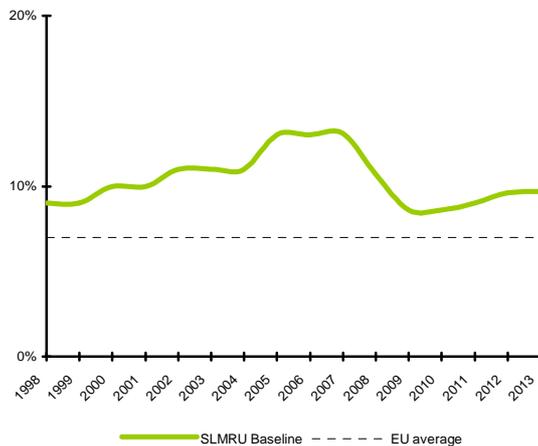
While the forecast of the Central Bank and the ESRI may have been reasonable when they were published, we consider them to be much too optimistic in the context of the continuing contraction in activity.

Furthermore, we consider that the anticipated level of contraction in the industry in both new residential development and in the commercial sector is such as to represent in statistical terms a discontinuity which is so sharp and dramatic that any attempt to discern a correlation between output and employment sufficiently robust to form the basis for forecasts, is futile.

Consequently, the forecasts presented in this chapter are based on an in-depth investigation of planned levels of activity in each sub-sector over the forecast period.

Our analysis suggests an expected sharp decline in the total construction employment between 2007 and 2009 of approximately 90,000. While the recovery is expected beyond 2010, the expected employment in 2013 (approximately 231,000) will fail to reach levels recorded at the peak of the cycle in 2006-2007.

**Figure 8.3**  
Share of Construction Employment in National Employment



Source: CSO, SLMRU calculations

Finally, based on our predictions in relation to future household formation numbers and the associated demographic developments as described in Chapter 4, we believe that only 45,000 houses will be built in 2013 although this level of output may expand to 50,000 annually in

subsequent years as the industry moves to a longer-term equilibrium level.

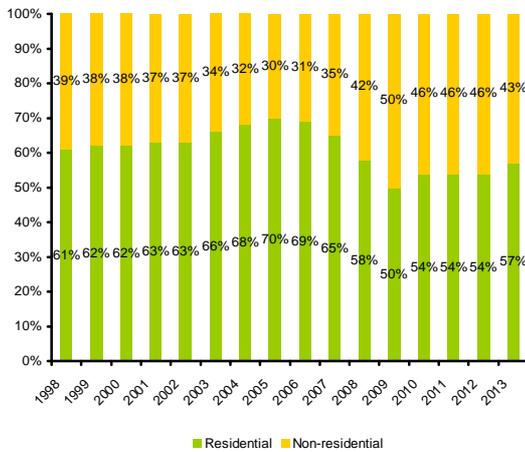
### *Employment forecasts by sub-sector*

Sub-sectoral employment projections were based on the employment forecast for the overall construction sector. The first step was to estimate the division of the sector employment between residential and non-residential.

The CSO has recently included an additional question in the QNHS to gain an insight into the share of employment in the construction sector engaged in the residential sub-sector. The data from the amended survey is available for the first two quarters in 2007. Using this data we estimated the share of employment in the residential and non-residential sectors and applied them to the total employment in the construction sector in 2006 (the most recent annual employment data available). We assumed that the ratio between the residential and non-residential sub-sectors in quarter 1 2007 would not significantly differ from the ratio in 2006, particularly since quarter 1 covers Dec 2006 – Feb 2007.

Our results suggest that in 2006 approximately 69% of employment in the construction sector was in the residential sub-sector. In the same year, the share of residential sub-sector output in the overall sector output was 67%, suggesting that the residential sub-sector is somewhat more labour intensive than the non-residential one. Assuming that the labour intensity of the residential sub-sector remains constant over the projection period, we derived sub-sector employment shares using the DKM sub-sector output forecasts. This ensured that both the expected future evolution of the sub-sector outputs and the higher labour intensity of the residential sub-sector are accounted for in the projected sub-sectoral employment shares. Figure 6 presents the estimated employment shares for residential and non-residential sub-sectors.

**Figure 8.4**  
**Residential and Non-Residential**  
**Employment Shares**



Source: CSO, SLMRU calculations

The share of employment in the residential sub-sector has declined in 2007 and is projected to continue to decline until 2010 when the share is expected to increase and level off thereafter. This closely follows the expected evolution of the residential sub-sector output in the coming years, which is expected to account for just over 50% of the overall construction sector output by the end of the projection period.

Residential sub-sector employment forecasts were further disaggregated into new residential construction and residential repair and maintenance (R&M); non-residential into general contracting (private non-residential and social infrastructure combined) and infrastructure. In the absence of any historical data for the employment division within the residential and non-residential sub-sectors, we used corresponding output distributions based on the DKM forecasts to further divide sub-sectoral employment. For instance, the share of the new residential output within the total residential output was used to estimate the new residential employment within the total residential employment. There is an implicit assumption here that all areas within the residential sub-sector have the same degree of labour intensity. The same

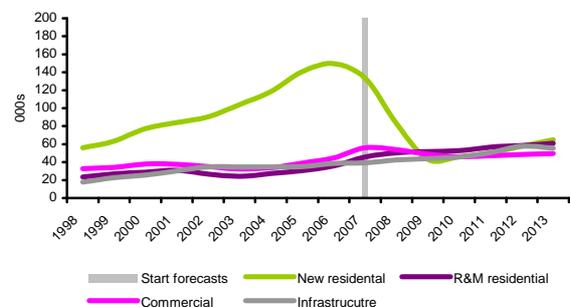
is assumed for the non-residential sub-sector and its components.

In 2006, 81% of the residential sub-sector output was for new residential construction and the remainder residential R&M. The share of new residential output is forecast to decline to 62% by the end of the forecasting period. The share of new residential employment is forecast to mirror the output share.

The share of infrastructure within the non-residential sub-sector output is expected to continually increase over the period 2007-2012 and to level off thereafter. However, the general contracting output will continue to account for over 50% of the non-residential output over the projection period. Employment of the non-residential sub-sector was divided between the general contracting and infrastructure in line with these output projections.

Figure 8.5 shows the employment forecasts for all construction areas<sup>95</sup>. Over the period 2006-2013, employment in the construction sector is expected to contract with the overall net loss of approximately 38,000 jobs. Employment is expected to decline sharply in the short term, with an expected loss of approximately 80,000 jobs by 2009. Recovery is expected beyond 2009 however, employment is not expected to reach levels recorded in 2006: by 2013 the total number of persons employed in the construction sector is expected to be 231,000.

**Figure 8.5**  
**Employment Forecasts by Sub-Sector**



Source: CSO, SLMRU calculations

<sup>95</sup> All employment figures are ILO

The decline in employment will not be equally distributed across the construction sub-sectors. The actual net job loss in the new residential sector over the period 2006-2013 is expected to be approximately 85,000 and even greater in the short run with an estimated 107,000 net job losses by 2009. An estimated 65,000 persons are expected to be employed in the new residential sub-sector by 2013.

On the other hand, over the period 2006-2013, employment in the residential R&M, and infrastructure sub-sectors is expected to increase with a net job creation of 25,000, and 17,000 posts respectively. Even in the short term 2006-2009, these sectors are expected to grow with the net job gain of over 20, 000 posts. However, the total job creation in these sectors will not compensate for the net job losses in new residential construction, leading to the decline in employment at the overall sector level.

#### ***Employment forecasts by occupation***

Employment forecasts for each construction sub-sector were further broken down into occupational employment projections. This was done using all available data on the occupational composition of the sub-sectoral employment.

The occupational distribution of employment in the total residential sector was available for the first two quarters of the 2007 QHNS. The distribution for quarter 1 is presented in Table 8.1.

First, it was assumed that the occupational distribution will not significantly change over the projection period. To justify this assumption, we conducted an analysis of the historical occupational mix for the overall construction sector – the only historical data available. Over the period 1998-2006, no significant trends were identified in any of the occupations, suggesting that holding occupational mix constant over the projection period is unlikely to significantly distort the final result. This was further confirmed when

no significant difference was found in comparing the occupational mix associated with the overall construction sector forecasts at the end of the projection period and the historical occupational shares extrapolated using semi-log trend (Appendix, Table A2).

Second, in the absence of data on the occupational distributions of different areas within the residential sub-sector, it was assumed that new residential construction and residential R&M do not differ significantly in their occupational distributions. Therefore, occupational shares from the second column of Table 8.1 were applied to employment forecasts for the new residential and the residential R&M sector presented in the preceding section. This produced occupational employment forecasts for the new residential sector and the residential R&M respectively.

The SLMRU obtained data on the skills mix for a road construction project from one of the major general contracting companies in Ireland. Using their labour utilisation data in terms of the total hours worked per occupation, we adjusted the occupational distribution for the non-residential sub-sector (q 1 QNHS 2007) to account for a difference in the skills mix between infrastructure development and other non-residential construction. For instance, the share of road construction workers and mechanical plant operatives in the infrastructure sector employment is greater than the corresponding shares in the residential and the general contracting sub-sectors.

Adjusted shares for the infrastructure sub-sector are presented in the third column of Table 8.1. They were projected onto employment forecasts for the infrastructure sub-sector presented in the preceding section to generate occupational employment forecasts. There are two implicit assumptions here: first, the occupational mix of various infrastructural projects does not differ significantly; second, road construction, which accounts for one third of all infrastructural output,

adequately represents the overall occupational mix of this sub-sector.

**Table 8.1  
Construction Sub-Sectors: Occupational  
Distribution**

Occupation	New residential and R&M	Infrastructure	General contracting
Building managers	2.0%	2.3%	3.6%
Civil/mining engineers	1.3%	6.5%	3.6%
Architects	0.4%	0.3%	0.5%
Quantity surveyors	1.1%	1.0%	1.7%
Bricklayers, masons	7.3%	1.6%	2.6%
Roofers, slaters, tilers, sheeters, cladders	3.0%	1.6%	2.5%
Plasterers	6.6%	1.7%	2.8%
Builders, building contractors	9.4%	4.1%	6.6%
Scaffolders, riggers, steeplejacks	1.2%	0.6%	0.9%
Floorers, floor covers, carpet fitters, tillers	0.6%	0.4%	0.7%
Painters & decorators	4.1%	4.1%	6.5%
Other construction trades n.e.c.	1.7%	1.2%	1.9%
Metal working production & maintenance fitters	0.9%	2.1%	3.4%
Electricians, electrical maintenance fitters	6.3%	9.9%	15.9%
Plumbers, heating & related trades	6.0%	5.3%	8.5%
Steel erectors	0.1%	0.1%	0.2%
Barbenders, steel fixers	0.2%	1.4%	0.2%
Welding trades	0.2%	0.8%	1.3%
Carpenters & joiners	15.3%	3.8%	15.6%
Drivers of road goods vehicles	2.2%	3.0%	4.9%
Mechanical plant drivers/operatives	2.3%	6.0%	1.2%
Crane drivers	0.5%	0.5%	0.9%
Pipe layers/pipe jointers	0.0%	0.4%	0.6%
Construction and related workers	2.2%	1.8%	2.9%
Mates in Building Trade	0.7%	0.9%	0.1%
Road construction & maintenance workers	0.4%	2.7%	0.5%
Other building & civil engineering labourers	13.9%	15.0%	3.4%
All other labourers & related workers	1.1%	3.0%	1.6%
All other managers	1.5%	2.9%	4.6%
All other professionals	0.9%	3.0%	4.8%
All other associate professionals	0.8%	1.5%	2.5%
All clerical	2.3%	3.7%	5.9%
All other craft	1.5%	2.6%	4.2%
All services	0.1%	0.2%	0.4%
All sales	0.3%	1.2%	1.9%
All other operatives	0.8%	1.7%	2.8%
All other labourers	0.8%	0.9%	1.5%
Total	100.0%	100.0%	100.0%

Source: CSO, SLMRU calculations

Occupational forecasts for general contracting were derived as a difference between the non-residential employment and infrastructure. Therefore, the

occupational mix is implicit in this calculation (fifth column Table 2).

Estimated shares reflect the difference between the occupational distribution of employment in the residential and non-residential sub-sectors. Most notably, the share of bricklayers, plasterers and carpenters in the residential sector exceeds significantly the corresponding shares in the non-residential sub-sectors. By contrast, the share of civil engineers in the infrastructure sub-sector exceeds their share in residential (and general contracting).

Table 8.2 presents occupational forecasts for the overall construction sector, which were derived as a sum of the sub-sectoral occupational forecasts. Tables 8.3 and 8.4 summarise the net effect of the projected employment evolution by sub-sector and occupation: Table 8.3 covers the entire projection period, while Table 8.4 focuses on the period 2006-2009, which is expected to be the trough in the employment growth path.

The decline in employment will not be equally distributed across occupations. Occupations employed predominantly in the residential sub-sector will be disproportionately affected by the decline in the new residential construction. Employment in these occupations will decline despite the expected employment growth in other construction sub-sectors. These include bricklayers, carpenters, plumbers, roofers, plasterers and construction labourers.

The number of bricklayers is expected to decline by an estimated 3,900 over the forecasting period. In the short run, the employment in this occupation is expected to be particularly negatively affected by the decline in the new residential construction with the net loss of jobs by 2009 expected at 6,400. It should be noted that these forecasts would underestimate the actual net job loss for bricklayers if the use of the new building techniques discussed in Chapter 3 became widespread.

By contrast, over the projection period, the number of civil engineers is expected to increase by an estimated 200. Employment of civil engineers is expected to be primarily driven by the growth in infrastructure construction.

However, employment in most occupations is expected to contract over the period 2006-2013. The exceptions are occupations closely associated with the 'sustainability' agenda and occupations where the introduction of mandatory qualifications (e.g. shot blasting) creates an increase in the demand for appropriately qualified workers.

The anticipated emergence of market niches associated with an expanding demand for certain specific skills highlight the fact that targeted and appropriate training interventions can play a critical role in reducing the extent of job losses in this industry over the forecast period.

**Table 8.2**  
**Occupational Forecasts: Construction Sector (Number – '000s)**

Occupation	2006	2007	2008	2009	2010	2011	2012	2013
Building managers	6.0	6.2	5.3	4.4	4.5	4.8	5.2	5.4
Civil/mining engineers	6.0	6.5	5.9	5.3	5.3	5.6	6.1	6.2
Architects	1.1	1.1	0.9	0.8	0.8	0.8	0.9	0.9
Quantity surveyors	3.1	3.2	2.7	2.2	2.2	2.4	2.6	2.7
Bricklayers, masons	15.2	14.9	11.6	8.8	9.0	9.7	10.6	11.2
Roofers, slaters, tilers, sheeters, cladders	7.1	7.2	5.8	4.6	4.7	5.0	5.5	5.7
Plasterers	13.9	13.7	10.7	8.1	8.4	9.0	9.8	10.4
Builders, building contractors	21.5	21.5	17.3	13.5	13.8	14.8	16.1	17.0
Scaffolders, riggers, steplejacks	2.7	2.7	2.2	1.7	1.8	1.9	2.1	2.2
Floors, floor coverers, carpet fitters, tillers	1.5	1.5	1.3	1.0	1.0	1.1	1.2	1.3
Painters & decorators	11.5	11.8	10.0	8.3	8.4	9.0	9.8	10.1
Other construction trades n.e.c.	4.2	4.3	3.6	2.9	2.9	3.1	3.4	3.5
Metal working production & maintenance fitters	3.8	4.0	3.6	3.2	3.2	3.4	3.7	3.8
Electricians, electrical maintenance fitters	21.4	22.4	19.7	16.8	16.9	18.2	19.8	20.2
Plumbers, heating & related trades	16.3	16.7	14.0	11.5	11.6	12.5	13.6	14.1
Steel erectors	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3
Barbenders, steel fixers	0.9	1.0	0.9	0.8	0.8	0.9	0.9	1.0
Welding trades	1.1	1.2	1.1	1.0	1.0	1.1	1.2	1.2
Carpenters & joiners	36.0	36.1	29.1	22.9	23.4	25.2	27.4	28.8
Drivers of road goods vehicles	7.1	7.4	6.4	5.4	5.5	5.9	6.4	6.6
Mechanical plant drivers/operators	6.8	7.0	6.0	5.0	5.1	5.4	5.9	6.1
Crane drivers	1.5	1.5	1.3	1.1	1.1	1.2	1.3	1.3
Pipe layers/pipe jointers	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5
Construction and related workers	5.8	5.9	5.0	4.0	4.1	4.4	4.8	5.0
Mates in Building Trade	1.6	1.6	1.3	1.0	1.1	1.1	1.2	1.3
Road construction & maintenance workers	1.9	2.0	1.8	1.6	1.6	1.7	1.9	1.9
Other building & civil engineering labourers	32.3	32.3	26.0	20.4	20.9	22.5	24.4	25.7
All other labourers & related workers	3.7	3.9	3.4	2.9	2.9	3.1	3.4	3.5
All other managers	5.6	5.9	5.3	4.6	4.6	4.9	5.3	5.5
All other professionals	4.5	4.9	4.5	4.0	4.0	4.3	4.7	4.7
All other associate professionals	3.0	3.2	2.8	2.5	2.5	2.7	2.9	2.9
All clerical	7.9	8.3	7.3	6.2	6.3	6.7	7.3	7.5
All other craft	5.4	5.7	5.0	4.3	4.4	4.7	5.1	5.2
All services	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
All sales	1.8	1.9	1.8	1.6	1.6	1.7	1.9	1.9
All other operatives	3.2	3.4	3.0	2.7	2.7	2.9	3.1	3.2
All other labourers	2.4	2.5	2.2	1.8	1.8	2.0	2.1	2.2
<b>Total</b>	<b>269.0</b>	<b>274.7</b>	<b>230.0</b>	<b>188.0</b>	<b>190.7</b>	<b>205.0</b>	<b>222.8</b>	<b>231.2</b>

**Table 8.3**  
**Net Job Gain/Loss by Sub-Sector and Occupation, 2006-2013 (Number –000s)**

Occupation	2006-2013 total net job gain/loss				
	New residential	Residential R&M	General contracting	Infrastr.	Total
Building managers	-1.7	0.5	0.2	0.4	-0.6
Civil/mining engineers	-1.1	0.3	-0.2	1.1	0.2
Architects	-0.3	0.1	0.0	0.1	-0.2
Quantity surveyors	-0.9	0.3	0.1	0.2	-0.4
Bricklayers, masons	-6.2	1.8	0.1	0.3	-3.9
Roofers, slaters, tilers, sheeters, cladders	-2.5	0.8	0.1	0.3	-1.4
Plasterers	-5.6	1.6	0.1	0.3	-3.5
Builders, building contractors	-8.0	2.4	0.3	0.7	-4.6
Scaffolders, riggers, steplejacks	-1.0	0.3	0.0	0.1	-0.6
Floors, floor coverers, carpet fitters, tillers	-0.5	0.1	0.0	0.1	-0.2
Painters & decorators	-3.5	1.0	0.3	0.7	-1.4
Other construction trades n.e.c.	-1.4	0.4	0.1	0.2	-0.7
Metal working production & maintenance fitters	-0.8	0.2	0.2	0.4	0.0
Electricians, electrical maintenance fitters	-5.3	1.6	0.8	1.7	-1.2
Plumbers, heating & related trades	-5.1	1.5	0.5	0.9	-2.2
Steel erectors	-0.1	0.0	0.0	0.0	0.0
Barbenders, steel fixers	-0.2	0.1	-0.1	0.2	0.0
Welding trades	-0.1	0.0	0.1	0.1	0.1
Carpenters & joiners	-13.0	3.9	1.3	0.7	-7.2
Drivers of road goods vehicles	-1.9	0.6	0.3	0.5	-0.6
Mechanical plant drivers/operators	-1.9	0.6	-0.4	1.0	-0.7
Crane drivers	-0.4	0.1	0.0	0.1	-0.2
Pipe layers/pipe jointers	0.0	0.0	0.0	0.1	0.1
Construction and related workers	-1.9	0.6	0.2	0.3	-0.9
Mates in Building Trade	-0.6	0.2	-0.1	0.2	-0.3
Road construction & maintenance workers	-0.3	0.1	-0.2	0.5	0.1
Other building & civil engineering labourers	-11.8	3.5	-0.9	2.6	-6.6
All other labourers & related workers	-0.9	0.3	-0.1	0.5	-0.2
All other managers	-1.3	0.4	0.2	0.5	-0.2
All other professionals	-0.7	0.2	0.3	0.5	0.3
All other associate professionals	-0.7	0.2	0.1	0.3	-0.1
All clerical	-1.9	0.6	0.3	0.6	-0.4
All other craft	-1.3	0.4	0.2	0.5	-0.2
All services	-0.1	0.0	0.0	0.0	0.0
All sales	-0.3	0.1	0.1	0.2	0.1
All other operatives	-0.7	0.2	0.1	0.3	0.0
All other labourers	-0.7	0.2	0.1	0.2	-0.2
<b>Total</b>	<b>-84.9</b>	<b>25.1</b>	<b>4.6</b>	<b>17.3</b>	<b>-37.8</b>

**Table 8.4: Net Job Gain/Loss by Sub-Sector and Occupation, 2006-2009 (Number – '000s)**

Occupation	2006-2009 total net job gain/loss				Total
	New residential	Residential R&M	General contracting	Infrastr.	
Building managers	-2.2	0.3	0.1	0.1	-1.6
Civil/mining engineers	-1.3	0.2	0.1	0.4	-0.7
Architects	-0.4	0.1	0.0	0.0	-0.3
Quantity surveyors	-1.2	0.2	0.1	0.1	-0.9
Bricklayers, masons	-7.8	1.2	0.1	0.1	-6.4
Roofers, slaters, tilers, sheeters, cladders	-3.2	0.5	0.1	0.1	-2.5
Plasterers	-7.0	1.1	0.1	0.1	-5.7
Builders, building contractors	-10.1	1.5	0.2	0.2	-8.1
Scaffolders, riggers, steeplejacks	-1.2	0.2	0.0	0.0	-1.0
Floorers, floor coverers, carpet fitters, tilers	-0.6	0.1	0.0	0.0	-0.5
Painters & decorators	-4.3	0.7	0.2	0.2	-3.2
Other construction trades n.e.c.	-1.8	0.3	0.1	0.1	-1.4
Metal working & production & maintenance fitters	-1.0	0.1	0.1	0.1	-0.6
Electricians, electrical maintenance fitters	-6.7	1.0	0.6	0.5	-4.6
Plumbers, heating & related trades	-6.3	1.0	0.3	0.3	-4.8
Steel erectors	-0.1	0.0	0.0	0.0	-0.1
Barbenders, steel fixers	-0.2	0.0	0.0	0.1	-0.1
Welding trades	-0.2	0.0	0.0	0.0	-0.1
Carpenters & joiners	-16.3	2.5	0.6	0.2	-13.0
Drivers of road goods vehicles	-2.4	0.4	0.2	0.2	-1.7
Mechanical plant drivers/operatives	-2.4	0.4	0.0	0.3	-1.8
Crane drivers	-0.5	0.1	0.0	0.0	-0.4
Pipe layers/pipe jointers	0.0	0.0	0.0	0.0	0.0
Construction and related workers	-2.3	0.4	0.1	0.1	-1.8
Mates in Building Trade	-0.7	0.1	0.0	0.0	-0.6
Road construction & maintenance workers	-0.4	0.1	0.0	0.1	-0.2
Other building & civil engineering labourers	-14.8	2.2	-0.1	0.8	-11.8
All other labourers & related workers	-1.2	0.2	0.0	0.2	-0.8
All other managers	-1.6	0.2	0.2	0.2	-1.1
All other professionals	-0.9	0.1	0.2	0.2	-0.4
All other associate professionals	-0.9	0.1	0.1	0.1	-0.6
All clerical	-2.4	0.4	0.2	0.2	-1.7
All other craft	-1.6	0.2	0.2	0.1	-1.1
All services	-0.1	0.0	0.0	0.0	-0.1
All sales	-0.4	0.1	0.1	0.1	-0.2
All other operatives	-0.9	0.1	0.1	0.1	-0.5
All other labourers	-0.9	0.1	0.1	0.1	-0.6
<b>Total</b>	<b>-106.5</b>	<b>16.1</b>	<b>4.1</b>	<b>5.4</b>	<b>-80.9</b>

### Conclusions:

#### ***The industry is undergoing a significant process of restructuring***

The analysis and forecasts contained in this report indicates that the construction industry is undergoing a process of restructuring which will continue for the next few years. The main features of this process include a declining level of activity in house building; an emerging and potentially vibrant market in sustainable construction and house improvements generally, the increasing use of new building techniques and materials; and an expansion of output in physical and social infrastructure under the National Development Plan.

The analysis in the report demonstrates that the restructuring of the industry will not occur in an even manner. The decline in house-building will occur over the period 2007-2009. The emerging market in sustainable construction and the increase in the number of projects in physical and social infrastructure will be a gradual process which will extend throughout the forecast period.

#### ***The contraction in house-building will give rise to unemployment***

The levels of employment and unemployment in the industry will follow this pattern. Thus, there will be a major loss of jobs in the house-building sector in 2008 and 2009. There will be some positive activity in the other sectors of the industry during this period. But as the analysis shows, this activity will not be sufficient to

prevent a significant decline in employment in the industry by 2009.

The analysis in the report also suggests that this reduction in employment will not be reflected in a similar rise in unemployment. The report points out that there are a significant number of non-Irish nationals working in the industry and there is an expectation that some of these workers will seek employment overseas.

Nevertheless, the numbers seeking employment in Ireland is expected to be significant. These job seekers will consist mainly of craft-workers and some general operatives from the housing sector. However, it is expected that these job-seekers will also include a significant number of apprentices who will have been made redundant before the completion of their programme.

#### ***There will be job opportunities in other parts of the industry***

The analysis in this report shows that there will be considerable job opportunities in those parts of the industry which are involved in sustainable development, in residential repair and maintenance, and in projects which are associated with the National Development Plan.

It makes sense for the education and vocational system to assist construction workers, who have become displaced from the housing sector, to secure employment in these expanding areas of the industry.

In some cases, the level of assistance required for these unemployed construction workers to find jobs may

only involve the provision of some specific additional skills, in addition to the skills they already possess.

For example, plumbers and electricians, with some additional training in the installation of sustainable heating systems, would be ideally placed to exploit some of the employment opportunities in sustainable construction outlined in chapter 2 of this report.

Similarly, many craft-workers will have the opportunity to provide services to the small residential repair and maintenance market. As the report points out, this market has been ignored by many craft workers during the boom in the industry with the result that typically householders have had to wait a considerable time and pay relatively high fees to have small repairs done to their homes.

The contraction in house building provides an opportunity for craft workers to set up in business and to provide a reliable and timely service to this market. Vocational training organisations should facilitate this development by providing a business and mentoring service for any construction worker who wishes to set-up in business.

There will also be a demand in this industry for workers with specialist manual skills, for example in electro-fusion welding. The demand for such skills will increase over the next few years reflecting the increase in large infrastructure projects under the National Development Plan.

***The job opportunities which will emerge in other parts of the construction industry will not be sufficient to absorb many of those who***

***will lose their jobs in the residential sector.***

However, even if all of the new employment opportunities which are expected to arise in the non-residential sector of the industry over the forecast period are filled by unemployed construction workers, it would only provide employment for a proportion of those who are forecast to lose their jobs. This is particularly the case in 2008 and 2009 when job losses are forecast to be at their highest levels and when total new employment opportunities emerging in the industry will absorb, at best, less than half of the predicted job losses.

Those workers who do not find employment within the industry will have to focus on opportunities in other sectors of the economy. Despite the anticipated significant slowdown in economic activity, there are, and there will continue to be such opportunities. Reports show that skill shortages persist in a number of key areas, for example in transport; at technician level in engineering, and in distribution.

In most cases, unemployed construction workers will need to upgrade their skills and qualifications to be eligible to apply for these positions. Consequently, they will have to attend the appropriate courses at a FAS vocational training centre, an institute of vocational education, an institute of technology or a university and it is important that they are made fully aware of the range of assistance which is currently available to them.

It is inevitable that in 2008 and 2009, as many construction workers lose their jobs, FAS, the VEC's and the third level education sector will receive a considerable volume of inquiries from these unemployed workers regarding

the range of training and education programmes on offer.

It would be appropriate in these circumstances for these institutions to review their systems to ensure that comprehensive information on their portfolio of training and education programmes and the eligibility criteria applying to them are readily available to these applicants.

It might also be helpful if these institutions developed certain protocols in respect of how their front-line staff might most effectively interact with these former construction workers to ensure that they are provided with the most appropriate assistance relevant to their needs.

Many of them will be experiencing unemployment for the first time and their work experience will be limited to the construction industry. It is important that they acquire an appreciation of the full range of career choices which are available to them.

While the provision of such information has obvious benefits from the perspective of the individual, it may also give rise to benefits at a broader economic level.

In recent years, there has been a significant decline in the number of students entering science and technology courses, particularly at levels 6 and 7 of the National Qualifications Framework. This development is a major source of concern for many manufacturing companies and internationally traded services that rely on well educated science and technology graduates.

Many construction workers have an aptitude for technology-related disciplines and they could provide a

valuable source of skilled technicians for industry in the future if they were encouraged to consider engaging in further study in a science and technology related discipline.

***The focus should be on utilising existing education and training resources in an effective and efficient manner***

The forecasts in this report assume that the economy will grow by an average of 3.2% over the period 2007-2013. There will be a considerable variation, however, in the growth rates from year to year, and the anticipated volatility in the construction industry will contribute significantly to this variation.

Specifically, the level of growth in 2008 and 2009 is expected to be very modest indeed. The challenge, therefore, is to utilise the existing levels of provision in a more effective and efficient manner. This can be achieved through developing a shared consensus among the relevant stakeholders on the human resource requirements of the industry and through targeting agreed priority areas.

The wide range of education and training courses which are available for this industry (see chapter 7) and the diverse number of institutions and organisations involved in delivering these programmes, suggests that there may be some scope for achieving greater efficiencies through developing a more co-ordinated approach to education and training provision.

***Many of the apprentices who are expected to be made redundant over the next few years will wish to secure alternative sources of on-the-job training to complete their apprenticeship***

As the report points out, it is expected that a significant number of apprentices will be made redundant in 2008 and in 2009. This poses a particular problem for FAS which has statutory responsibility for the apprenticeship system. An apprentice must complete four on-the-job modules in a satisfactory manner to qualify for the National Craft Award and the provision of appropriate on-the-job facilitates could become problematic in a situation where many apprentices are being made redundant and, as the report shows, many building firms are no longer recruiting apprentices.

It would not be appropriate to prescribe in detail the actions which FAS should pursue to assist redundant apprentices to complete their on-the-job modules. Suffice to say that the apprenticeship system represents a relatively large investment both on the part of the State and the individual apprentice. Consequently, assuming that a redundant apprentice wishes to complete his/her apprenticeship, every effort should be made by FAS to enable them to do so.

**In the recent review of progress under the national plan 'Towards 2016' covering the period 2008-2009, there is a very strong endorsement by Government and the Social Partners of the need to ensure that apprentices are provided with the means necessary to complete their apprenticeship and that measures are put in place to ensure that there are sufficient apprentice opportunities available to meet market demand over the next few years.**

A number of apprentices were also made redundant when the construction industry last experienced a significant

contraction in activity. The fact that a significant number of redundancies is forecast to occur again during this current slowdown suggests that the structure of the system makes apprentices vulnerable to unemployment during periods of recession in the industry.

This volatility may be the inevitable consequence of a system which relies exclusively on employers' needs for the recruitment of apprentices. Recruitment trends in such a system are likely to be very sensitive to changes in market demand.

Nevertheless, there is considerable merit in a market-driven approach to the determination of recruitment needs. Consequently, the best outcome might be achieved by exploring ways whereby redundant apprentices could be further supported in their attempts to complete their training while retaining this aspect of the system.

In this context, the type of issues which might be explored by the relevant stakeholders includes a more flexible delivery of off-the-job modules and treating each module as a stand-alone phase of the training programme with its own accreditation.

If apprentices were to receive appropriate credits for each phase they completed, and if there was a high degree of flexibility in the delivery of the different phases, the apprentice might be in a better position to 'ride-out' the impact of a temporary loss of their on-the-job training facilities during periods of redundancy.

Similarly if modules on entrepreneurship were introduced into the apprenticeship system, it should enhance the capacity of apprentices to set-up in business when they complete

their programme. This would provide them with more employment opportunities – particularly in periods of recession.

One of the main reasons, however, why redundant apprentices are particularly vulnerable to unemployment is because they have relatively poor formal education qualifications. This is particularly true of those who work in the so-called ‘wet trades’, most of whom have only a level 3 qualification (i.e. Junior Certificate). As shown in the forecasts, these are the workers who will be most adversely affected by the contraction in activity in the residential sector.

A core objective of the Government’s current human resource strategy ‘Tomorrow’s Skills; Towards a National Skills Strategy’ is to significantly increase the proportion of school-leavers who attain level 4/5 qualifications (i.e. Leaving Certificate). The progressive implementation of this policy should result over time in an increase in the qualifications of apprentices and, to this extent, enhance their overall employability.

***The restructuring of the industry represents an opportunity for those who are involved in the provision of education and training to adjust their education and training portfolios to reflect the changing skills and qualification priorities outlined in this report.***

The analysis in this report shows that the construction industry in 2013 will be quite different in many respects to the traditional industry we have become accustomed to. The new house building sector will represent a much smaller part of the industry. The conservation of energy and a sensitive management of the environment will be

a prerequisite in all building projects. The transition from on-site construction to an off-site manufacturing process will create an international market for the export and import of building materials and techniques, and the industry will be more regularised in terms of safety and quality.

These fundamental changes in both the structure of the industry and in the building process will be reflected in a concomitant change in the skills hierarchy. Virtually everyone working on a building project will be required to have the formal qualifications appropriate to their work.

Some of the craft workers, most notably those associated with traditional on-site building methods, such as block-layers and plasterers, will decline in terms of their relative importance to the sector.

Other trades, however, will assume greater importance; - for example, glazing, insulation, and the installation of heating and ventilation systems and security systems.

The new building materials and techniques which are being developed are transforming the way the external building fabric is being erected. In many cases, this can now be built by appropriately qualified skilled manual workers rather than traditional craft workers.

While this particular development could be viewed as a de-skilling process, the overall skills profile of the industry will become more professional than it currently is. There are a wide range of issues which will impact on the industry, many of which will require a more professional and technical workforce.

These include the need to introduce energy conservation and thermal efficiency into the building fabric; the need to take account of environmental issues such as waste management and the preservation of valuable flora and fauna; and the emergence of a global trading environment in building materials, which will attract logistics, purchasing and marketing managers to the sector in greater numbers.

The increasing diffusion of ICT technologies will radically enhance the living environment; houses will become more secure and there will be an increasing trend towards houses which are equipped with the technology to manage themselves and do their own maintenance - often by instruction from remote locations.

These changes are occurring quite quickly and they require a response from the education and training system in terms of the regular monitoring and up-dating of curricula and an emphasis on flexibility in the delivery of programmes as an increasing proportion of the recipients of education and training inputs in the future will be already employed in the industry.

Consequently, this may be an opportune time for those who are involved in the delivery of training and education programmes to this industry to review the appropriateness of their current portfolio of education and training programmes. The issue of the flexibility of these programmes, particularly in the context of attracting those who are employed, also warrants consideration in view of the changing skill priorities of the existing construction work-force.

**There is a need for a formal, systematic career structure for**

**construction workers which would facilitate flexibility and progression.**

One of the objectives of developing the National Qualifications Framework is to create a system which would facilitate and support horizontal and vertical integration between different qualification levels.

To date, however, there is no officially-recognised progressive career path for a person with a National Craft Qualification.

The absence of an officially-recognised career path reflects the fact that an appropriate matching system has not yet been completed which would enable craft-workers to pursue further education and to obtain 'credits' for the qualifications they have.<sup>96</sup>

Despite the lack of an official progression route, both FAS and the Institutes of Technology have developed, on an ad-hoc basis, third-level education programmes which are designed to attract craft-workers.

The experience of craft workers attending third-level education programmes has been positive and many have achieved excellent results (e.g. Higher Certificate in Civil Engineering in Cork Institute of Technology). These programmes are often delivered at night-time or at the week-ends to facilitate craft workers who are in employment.

There are many reasons for favouring a more systematic and extensive implementation of these initiatives throughout the Institutes of Technology. As shown in Chapter 7, the Institutes of Technology have experienced a significant reduction in

---

<sup>96</sup> There is work currently underway in the Institutes of Technology on the development of such a system

student enrolments in many of the technology-related disciplines in recent years.

This reduction in student numbers will be accentuated by the forecast decline in the recruitment of apprentices which will impact on the numbers attending phases 4 and 6 of the apprenticeship system; phases which are delivered exclusively by the Institutes.

One of the objectives of the national skills strategy is to increase the number of graduates in science and technology disciplines. The development of a career structure for craft workers can make an important contribution to the achievement of this objective.

Consequently, the development of technician level programmes in the technology area and the targeting of these programmes to unemployed craft-workers would represent a positive development for the Institutes and for the economy as a whole.

An additional benefit is that a more widespread provision of courses at technician level for craft-workers should result in an increase in the level of apprentice recruitment above what it would otherwise be. As craft workers qualify for positions in facilities management, civil engineering or other professional and technical jobs, they will create vacancies, thus encouraging employers to recruit more apprentices.

Finally, the development of a formal and progressive career path for craft workers in the industry should encourage more women to consider entering the trades. As noted in Chapter 1 of this report, the number of female apprentices is negligible, and while the reasons for this may be varied and complex, a more attractive career profile would present a positive image of the industry to young women.

### **A more active role for industry is required in the education and training of construction workers at all levels.**

The analysis in the report shows how the relative levels of demand for different skills will change. It highlights, in particular, the changing role of management and the increasing importance of non-technical skills to the manager's role; it also refers to the need for professionals to have practical experience of working in a multi-disciplinary environment.

Highlighting such requirements inevitably raises issues concerning the appropriateness of the traditional approach to the acquisition of qualifications and competences. In particular, it raises concerns about the efficacy of delivering education programmes in an exclusively classroom environment and of focussing on a single, traditionally-defined discipline.

It may be significant in this respect that some of the skills which are classified as being in short supply in this report, notably project management and estimation, have not been part of the traditional education syllabus. The demarcation lines between different professional and technical, and indeed, craft disciplines are increasingly being blurred. New occupations are emerging which merge competences which were formerly associated with distinct disciplines and the education and training systems have to respond to these developments.

A greater involvement by employers in the design of curricula would improve the relevance of professional qualifications to the changing skill needs of the industry.

## Recommendations

### Recommendation 1

There is an urgent need for FAS the Institutes of Technology, and the Higher Education Authority (HEA) to design an ‘action plan’ based on the findings of this report to assist unemployed construction workers to access appropriate vocational training and third-level education programmes; to find relevant work placements and assistance in securing employment.

As stated in this report, the number of new employment opportunities which are forecast to emerge in the construction sector will not provide employment for most of the workers who are expected to lose their jobs. Consequently, a concerted effort must be made by the relevant stakeholders to ensure that the appropriate education and training programmes are made available to enable these workers to acquire the skills and qualifications to exploit employment opportunities in other sectors of the economy.

In particular, FAS, the Institutes of Technology and the HEA should co-operate in the design of such an ‘action plan’ in order to reduce the possibility of duplication – for example in the provision of new programmes - and to generate efficiencies through developing synergies.

While it is not appropriate to prescribe in detail the types of specific assistance which should be provided under such an ‘action plan’, the analysis of employment opportunities in this report suggests that the ‘action’ plan should, *inter alia*, include the following features;

- A pro-active campaign to ensure that, firstly, unemployed

construction workers are made aware of the many employment opportunities in the wider economy which have been identified by numerous research reports and, secondly, that they are provided with assistance in terms of both direct placement assistance, and education and training programmes to secure employment in these areas.

- A portfolio of courses in the installation of sustainable heating systems and in residential insulation
- A targeted business and mentoring programme to assist those who wish to set-up in business.
- A promotional campaign - perhaps in conjunction with the Construction Industry Federation – which would ensure that unemployed construction workers are aware of the range of assistance which is available to them in their search for jobs elsewhere in the construction industry.

### Recommendation 2

There is an urgent need to effectively manage the apprenticeship system in view of the dramatic reduction in the recruitment of apprentices and the anticipated significant increase in redundancy among apprentices.

In this regard, the following actions are recommended.

- FAS should make strenuous efforts to secure alternative and appropriate facilities to enable apprentices - who have been made redundant as a result of

the contraction in house building - to complete the on-the-job modules of their programme.

- FAS, the HEA and the Institutes of Technology should (having regard to the need to manage the capacity of the training and education system to respond to changing skills needs), cooperatively explore how best to provide for the apprenticeship system being better aligned, so as to more effectively respond to changing economic circumstances and the effects that such have on the training and employment opportunities available to apprentices. That could also include assessment of the introduction into the apprenticeship syllabus of modules on entrepreneurship, an increased emphasis on instruction in maths and ICT skills, an examination of the potential for greater flexibility in undertaking apprenticeships and in assessing related qualifications; (and consideration of mechanisms to better align training provision with fluctuating demand.)

**APPENDIX**

**Table A1. Output forecasts by sub-sector**

Sub sector	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Residential Construction	4168	4037	4112	4468	4049	5038	5772	6591	7718	8411	9472	10700	11153	11990	14009	15564	17654	18103	15824	9865	5138	6576	7193	8220	9248
New private housing	4090	3954	3987	4338	3799	4649	5332	6181	7336	7991	9040	10106	10279	10930	12970	14599	16614	17114	14830	8841	4048	5499	6100	7093	8084
New public housing	78	83	124	129	250	389	440	409	382	420	432	594	874	1059	1039	965	1040	989	994	1024	1090	1078	1093	1128	1164
R&M Residential	1592	2111	2166	2368	2144	2627	2873	3784	3692	3494	4001	3989	4126	3548	3263	3578	3803	4329	5541	6095	6278	6403	6845	7084	7366
New Private Non Residential	1429	2265	2262	1817	1442	1362	1690	2289	2903	3439	3496	3561	3215	2491	2210	2236	2656	3183	4090	3640	2912	2475	2549	2633	2712
New Productive Infrastructure	1103	1235	1252	1300	1503	1418	1505	1655	2009	2262	2979	3215	3664	4354	4296	4128	3879	3983	4087	4414	4634	4820	5468	6370	6051
New Social Infrastructure	358	404	367	458	424	500	554	657	705	729	886	1014	1192	1528	1450	1420	1480	1416	1881	2163	2176	2198	2226	2292	2277
R&M Private Non Residential	406	426	414	401	444	493	527	579	634	701	737	761	639	641	743	768	800	924	1026	903	930	949	977	1009	1045
R&M Productive Infrastructure	593	592	593	585	616	617	672	624	636	674	715	685	714	700	829	890	925	1110	1107	1195	1171	1206	1246	1287	1332
R&MSocial Infrastructure	252	304	288	302	362	400	460	368	411	457	409	409	442	428	371	409	389	402	436	431	444	458	473	488	505
Total construction	9900	11374	11455	11699	10985	12454	14053	16546	18709	20167	22696	24334	25145	25680	27171	28992	31586	33452	34279	28706	23683	25085	26977	29384	30535

**Table A2. Occupational Shares in the Construction Sector**

	Historical data										Semmi-log trend extrapolation					
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Building managers	3%	3%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Civil/mining engineers	2%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Architects	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quantity surveyors	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Bricklayers, masons	6%	6%	6%	6%	5%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Roofers, slaters, etc.	2%	2%	2%	2%	2%	3%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Plasterers	5%	5%	5%	5%	5%	5%	5%	5%	6%	5%	5%	5%	5%	5%	5%	5%
Builders, building contractors	7%	6%	6%	7%	6%	7%	7%	8%	7%	7%	7%	7%	7%	7%	7%	7%
Scaffolders, riggers, steeplejacks	0%	1%	1%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Floorets.s etc.	1%	1%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Painters and decorators	4%	5%	5%	5%	5%	5%	4%	4%	4%	5%	5%	5%	5%	4%	4%	4%
Other construction trades n.e.c.	1%	1%	1%	1%	1%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Metal working production and maintenance fitters	2%	2%	2%	1%	1%	1%	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%
Electricians, electrical maintenance fitters	8%	7%	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Plumbers, heating and related trades	6%	5%	5%	5%	5%	6%	5%	5%	6%	5%	5%	5%	5%	5%	5%	5%
Steel erectors	0%	0%	0%	1%	1%	1%	1%	0%	1%	0%	0%	1%	1%	1%	0%	0%
Barbenders, steel fixers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Welding trades	0%	1%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Carpenters and joiners	13%	14%	13%	13%	14%	14%	15%	13%	13%	14%	14%	14%	14%	14%	14%	14%
Drivers of road goods vehicles	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Mechanical plant drivers/operators	3%	4%	3%	3%	3%	3%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Crane drivers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pipe layers/pipe jointers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Construction and related workers	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Mates in Building Trade	1%	1%	1%	1%	1%	1%	1%	1%	0%	1%	1%	1%	1%	1%	1%	1%
Road construction and maintenance workers	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Other building and civil engineering labourers	15%	15%	14%	14%	13%	12%	9%	10%	11%	13%	12%	12%	12%	11%	11%	11%
All other labourers and related workers	0%	0%	0%	0%	1%	0%	3%	2%	2%	1%	1%	1%	1%	1%	1%	2%
All other managers	3%	2%	2%	3%	4%	3%	5%	3%	2%	3%	3%	3%	3%	3%	3%	3%
All other professionals	1%	1%	1%	2%	2%	1%	2%	2%	2%	1%	1%	1%	2%	2%	2%	2%
All other associate professionals	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
All clerical	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
All other craft	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
All other service occupations	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
All sales	1%	1%	0%	1%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
All other operatives	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
All other labourers	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%



## Appendix A: New Construction Courses in Higher Education

**Table A.1 Summary of new construction courses in higher education since 2005**

Course type	Level	Institution	Date of first intake
<b>Architecture</b>	8	Waterford IoT	2005
	8	University of Limerick	2005
	8	University College Cork /Cork IoT	2006
<b>Architectural Technology</b>	7	Galway-Mayo IoT (Castlebar)	2006
	7	Galway-Mayo IoT (Galway)	2006
<b>Town Planning</b>	9	University College Cork	2006
	8	University College Dublin	2005
	9	Limerick IoT	2008*
	9	University College Dublin	2008*
<b>Quantity Surveying</b>	8	Cork IoT	2006
	8	Carlow IoT	2006
	8	Sligo IoT	2006
<b>Engineering</b>	9	University College Dublin	2007*
	8	University of Limerick	2008*
	8	Athlone IoT	2006
<b>Project Management</b>	8	Dublin IoT	2006
	8	Limerick IoT	2006
	8	University of Limerick	2005
	8	Cork IoT	2005
	8	NUI Galway	2007*
	9	Waterford IoT	2005

\*No student enrolments yet

## Appendix B: Continuing Professional Development

Continuing Professional Development (CPD) courses for the construction industry are provided by a variety of private education and higher education providers.

Courses are typically of short duration, often ranging from one-to-three days. Programmes of a longer duration such as undergraduate and graduate degrees and diplomas are also promoted as part of CPD and these were examined in Chapter 7 dealing with educational output.

CPD courses cover a range of topics, some of which are specific to individuals working in the construction industry and others which are more generic in nature.

While it is impossible to provide comprehensive listings of all courses available, this section outlines some of those on offer or that are promoted by the main representative bodies for construction professionals such as Engineers Ireland. Short courses offered by a selection of IoTs and private providers are also listed. Finally, an overview of the learning and training provided to those in employment under two relatively new initiatives – the Skillnets Programme and Accel Programme – is discussed. Relevant courses offered by FÁS were discussed separately in the educational output chapter.

### ***Sustainable Energy Ireland (SEI)***

SEI is currently not running training programmes, but SEI approved Building Energy Rating (BER) Assessor Training is available from numerous providers throughout the country. Courses may require from three to six days training, depending on prior experience. Sustainable Energy Ireland approved courses include those offered at:

- Galway-Mayo IoT; DIT (National Maintenance Centre);

- University of Limerick (Department of Physics);
- Chris Mee Safety Engineering (CMSE);
- Chevron Training Ltd.

Some providers (for example, Chevron Training Limited) offer on-line courses and/or FETAC level 6 accreditation (for example, CMSE and Chevron Training Limited).

### ***The Institution of Engineers of Ireland (Engineers Ireland)***

Engineers Ireland – the operating name of the Institution of Engineers of Ireland – offer short duration courses (usually of one to two days), seminars and lectures on a range of topics relevant to engineers. Some of these courses are specific to those working in the construction industry, and include training and seminars in:

- Public works contracts;
- Construction contract awareness;
- Financial control in construction works;
- Method of measurement at roadworks, etc.; and
- Roads – Maintenance.

Other courses that are provided are suitable for engineers in general, not just for construction professionals, and these include:

- Writing effective technical reports;
- Organisational skills for engineers;
- Project management; and
- Charing meetings.

Engineers Ireland also offer a SafePass course for engineers working in the construction industry, which is run at various locations throughout the country.

### ***The National Maintenance Centre (DIT)***

The National Maintenance Centre is part of the Dublin Institute of Technology, and it provides on-line courses for

construction/engineering professionals in the area of energy efficiency of buildings:

- *Simulation Building Design*: this course aims to provide participants with the knowledge and skills required to use computer simulation as an integral part of the design process, and thereby significantly improve the energy performance of buildings, in compliance with the Energy Performance of Buildings Directive (EPBD). It is a ten-week (part-time) course and is DIT accredited.
- *Energy Performance of Buildings Directive*: this course aims to provide participants with a full understanding of the background of the EPBD and its implementation. It is a ten-week (part-time) course and is DIT accredited.
- *EPBD BER Assessor Training*: this course aims to provide participants with the knowledge to undertake and provide a BER and accompanying Advisory Report for a new dwelling to a owner or builder, and to a prospective buyer or tenant, when the dwelling is constructed sold or rented. This course comprises of three on-line assignments, two workshop components and a final practical exam – all of which must be completed within sixteen weeks. This course is SEI approved.

#### ***Royal Institute of Architects of Ireland (RIAI)***

CPD courses offered by the RIAI are primarily aimed at architects, planners and architectural technologists. Courses provided in 2007 included, among others:

- *Project Management in the Built Environment*: a three-day course;
- BER assessor training: delivered in consultation with the RIAI, UCD Energy Research Group, and Rickaby Thomsson;
- *The Business of Architecture*: this course is run in conjunction with DCU Business School over eight days;

- *Designing for Safety*: a half-day safety course for Architects.

#### ***Construction Industry Federation (CIF)***

CIF courses cover both industry-specific and non-specific courses but which are relevant to the industry and are often one-to-two days in duration. Their main aim is to cover areas that are not otherwise covered in higher education or apprenticeship. These include:

- The Management and Inspection of Scaffolding: a course for site managers, foremen, project supervisors, etc.;
- Sustainability in Construction (half-day course);
- Sustainability in Building Technologies (one-day);
- Certificate in Construction Administration;
- New Public Sector Contracts;
- Certificate and Diploma in Site Management;
- First Aid;
- Safety;
- Language Training;
- IT Training.

#### ***SQT Training Ltd (Limerick)***

Courses are not specifically aimed at construction industry professionals and are appropriate to a variety of sectors. Courses that are possibly most suited to the construction sector include:

- Construction Safety Management (one-day course);
- Energy Management (in buildings);
- Waste Management/Minimisation;
- Environment Hazard Identification and Risk Assessment;
- Energy Assessment.

#### ***Institute of Technology, Tralee (ITT)***

ITT provide occasional short courses for members of the construction industry – for example, the Site Management Education and Training Scheme for the Construction Industry Federation (CIF).

### *The Society of Chartered Surveyors*

The Society of Chartered Surveyors regularly runs seminars and lectures of interest to its members as part of its CPD programme.

### *School of Real Estate and Construction Economics (DIT)*

*Safety Management in the Construction Industry:* this course is delivered over five weeks, one evening (three hours) per week.

### *Dept. of Building Services Engineering (DIT)*

*High Tech Assistive Technology Training:* this is a two-week course with an additional 20 hours of self-study.

### *Skillnets and Accel Programmes*

Skillnets is a support agency whose aim is to facilitate the enterprise-led promotion of learning and training in the workplace. Learning networks are composed of a number of enterprises that decide to work together as a group to identify and define their own training needs and to source training to meet these requirements.

Learning networks tend to be sector-based, and between 2004 and 2006, approximately 3% of companies in Skillnets were construction sector companies.<sup>97</sup>

Training and learning has, in the past, been promoted through 'Training Networks' but 2006 saw the implementation of the *Accel Programme*, run by Skillnets, on behalf of the Department of Enterprise Trade and Employment. One of the chief differences between these two types of learning programmes lies in the source of funding (funding comes, in part, from the European Social Fund).

*The Construction Skillnet:* this sector based network is primarily focused on growing the skills base of the participating companies and increasing the skill and competence levels of all workers. The companies involved are in the Border, Midland and Western Region (BMW) and are engaged in contracting and specialist activities in construction.

A number of new Skillnet projects in construction or that are construction related have been approved for 2008-2009. These projects are listed in Table B1.

**Table B1**  
**New Skillnet Approved**  
**Construction/Construction-Related Projects,**  
**2008-2009**

<b>Network Name</b>	<b>Sector</b>	<b>Region</b>
Construction Skillnet	Construction	National
Irish Hardware Skillnet	Hardware	National
	Renewable	National
Renewable Energy Skills Skillnet	Energy	
Enviro Skillnet	Services	National
Engineers Skillnet	Engineering	National
The Timber Frame Skillnet	Timber	National
CITA Skillnet	Construction	National

Source: Skillnets, New Networks under the Training Network Programme 2008/2009

Over the period 2006-2007, there were seven construction sector Accel Projects, and these are listed in Table B2.

**Table B2**  
**Accel Projects, 2006-2007**

<b>Project Name</b>	<b>Region</b>
CIF/BICC – Building In-Company Capacity (for Development)	National
ENGNET	South East
GT Skills: Geothermal Skills Accel Project	Dublin
Managing Diversity in Construction	National
Renewable Energy Installers Training Programme	Midland
Renewable Energy Skills	Midwest
Virtual Micro-Business Development Centre – Pilot project	South East

Source: The Training Networks Programme 2007-2009

### *CIF/BICC – Building In-Company Capacity (for Development)*

The aim of the CIF/BICC – Building In-Company Capacity (for Development) project is to build capacity within SMEs to carry out training and development. Companies involved in this project include

<sup>97</sup> The Training Networks Programme 2007-2009.

RIJD Contractors, Phoenix Electrical Ltd.  
and Highway Markings Ltd.

### ***ENGNET***

The primary focus of this project is to develop an in-company training programme aimed at supporting the training needs of engineering companies in the South East Region. It is a collaborate project between Waterford Institute of Technology (WIT) and Wexford County Enterprise Board.

### ***GT Skills: Geothermal Skills Accel Project***

The aim of the Geothermal Skills Accel Project is to promote effectiveness and sustainability in the development of geothermal energy technology. It also aims to increase the numbers of qualified professionals in this sector.

### ***Managing Diversity in Construction Project***

The aim of this project is to support the construction sector by enhancing workforce efficiency and improving career opportunities for non-Irish nationals. Companies involved in this project include John Sisk & Sons Ltd., Coffey Construction Ltd. and P.J. Walls Ltd.

### ***Renewable Energy Installers Training Programme***

Those participating in this project are electrical, plumbing and engineering contracting companies which are based in Sligo, Cavan, Leitrim and Roscommon. The main focus is the development and delivery of courses in renewable technologies – for example, wind turbines, solar water heating panels, heat pumps etc.

### ***Renewable Energy Skills***

This project involves companies in the renewable energy installation sector and includes: heating and plumbing contractors, electricians, consultant engineers, architects and renewable energy suppliers.

### ***Virtual Micro-Business Development Centre – Pilot Project***

This project is a collaboration of WIT and Wexford County Enterprise Board companies. The aim is to develop and pilot virtual training systems in order to address the needs of SMEs.

## Appendix C: Calculation of Impact of Apartment Guidelines on Volume of Building Activity

The Guidelines issued by DCC cover three broad areas: the apartment itself, the apartment scheme and the neighbourhood and discusses issues relevant to apartment living, such as size, light, noise, communal areas.

In terms of the apartment itself, the **target average floor area across an apartment scheme will be 85m<sup>2</sup>** with the recommended minimum for different apartment types as follows:<sup>98</sup>

- 1 bed apartment 55m<sup>2</sup> (currently 45m<sup>2</sup>)
- 2 bed apartment 80m<sup>2</sup> to 90m<sup>2</sup> (currently 65m<sup>2</sup>)
- 3 bed apartment 100m<sup>2</sup> (currently 80m<sup>2</sup>)

The Guidelines also set out minimum specifications in relation to the mix of different types of apartment.

**Table 1**  
**DCC Guidelines for the mix of different units in apartment schemes**

Unit type	Unit mix	Current mix
1 bed	Max. 20%	Max 45%
2 bed (80m <sup>2</sup> +) 3 bed (100m <sup>2</sup> +)	Min. 80%, (of which 15% must be 3 bed, i.e. 100m)	Min. 25% @ 80m <sup>2</sup> +

The maximum proportion of 1 bed apartments will be 20%, less than half the current proportion of 45%. A minimum ratio of 15% is set out for 3 bed or equivalent apartments. The aim is to achieve **80% of apartments with over 80m<sup>2</sup>** (up from the current minimum of 25%).

<sup>98</sup> The floor areas indicated in brackets are the minimum standards that were set in *the Dublin City Development Plan 2005-2011*.

**Table 2**  
**Pre-2007 Regulations \***

Number of units	Floor area (M <sup>2</sup> )	Apartment Type	Total floor area (M <sup>2</sup> )
45	45	One bed	2,025
55	30	Two bed	1,950
	25	Three-bed	2,000
<b>100</b>			<b>5,975</b>

\*Figures are for illustrative purposes only

**Table 3**  
**2007 DCC Guidelines\***

Number of units	Floor area (M <sup>2</sup> )	Apartment Type	Total floor area (M <sup>2</sup> )
20	55	One bed	1,100
80	65	Two bed	5,850
	15	Three-bed	1,500
<b>100</b>			<b>8,450</b>

\*Figures are for illustrative purposes only

In order to illustrate the effect of the new Guidelines in terms of the amount of additional floor space required to build a hypothetical scheme of 100 units, we compared the floor area required to build 100 units under the pre-2007 regulations with the floor area required for 100 units under the 2007 guidelines. These are set out in Tables 4.8 and 4.9.

Table 4.8 outlines the floor areas required, in theory, according to the minimum standards set out in the Dublin City Development Plan 2005-2011. Table 4.9 outlines the floor areas required according to the minimum standards set out in the Dublin City Council Guidelines. Overall, the floor space required for 100 units is:

as per 2007 Guidelines 8,450m<sup>2</sup>  
as per previous (2005) standards 5,975m<sup>2</sup>

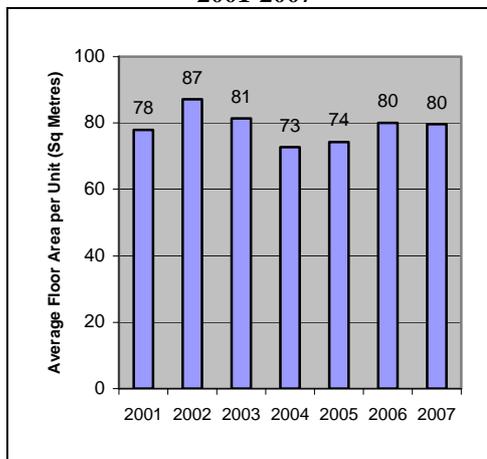
Therefore, the minimum standards as per the 2007 guidelines would result in an average floor area of 85 m<sup>2</sup>; but just an average floor area of 60 m<sup>2</sup> under the 2005 standards.

Figure 4.8 shows the average floor area per unit (sq metres) for planning permissions for apartments granted by

<sup>99</sup> While the minimum standards are set at a range of between 80m<sup>2</sup> and 90m<sup>2</sup>, we have taken 90m<sup>2</sup> so that the overall average floor area is 85m<sup>2</sup>.

Dublin City Council between 2001 and 2007. While the average floor area per unit does not yet meet the 85m<sup>2</sup> set out in the Guidelines, it easily exceeds the previous minimum standards set out in the 2005-2011 Development Plan of almost 60m<sup>2</sup>. This suggests that the increase in building activity that will be required to meet the new standards is comparatively small.

**Figure 4.10**  
**Planning permissions granted by Dublin City Council - private flats and apartments, 2001-2007\***



Source: CSO

\*Figures of 2007 represent the average for q1 and q2 only.