

Building for the Future



5 years / 90 projects
4,000 homes / €22M funding

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CEO'S MESSAGE



The response by innovators and leading players in the construction industry to SEI's House of Tomorrow Programme has been most encouraging. As the examples in the following pages show, the programme is supporting developments in every county in Ireland, with funding support of €22M approved to date for over 4,000 homes, and the demand from new developers increasing monthly. This is living proof that it's practical to build homes of superior energy and environmental quality that are attractive, affordable, comfortable and offer householders more security against future energy price rises.

In addition, the programme is supporting installer training, technology guides, feasibility studies, research into housing performance and postgraduate studentships, to help build awareness and capability among practitioners in the specification and implementation of innovative energy technology features in Irish homes.

The first five years of the House of Tomorrow Programme are only the beginning of a journey to sustainable living that all in Ireland must take. Designing, building and managing our built environment in an energy efficient way is vital to our future. The achievements outlined in this publication give confidence that the market can make the necessary changes to meet the serious economic and environmental challenges facing us in this regard.

The success of the programme so far is testimony to the vision and commitment of a growing community of stakeholders in the field of more sustainable construction practice. Our partners in the programme include developers and builders, design professionals, local authorities and other social housing providers, product suppliers, system installers and energy specialists. They, as real leaders in this field, recognise that there is now a good business case for sustainable building, one that will only strengthen in the future.

To all involved in the House of Tomorrow Programme, I offer my heartiest congratulations.



David Taylor

CEO, SUSTAINABLE ENERGY IRELAND

The subject of sustainable energy is occupying public attention in Ireland like never before. Rising costs, energy insecurity and environmental risks mean that householders are now seeing energy efficiency as an issue they can no longer ignore.

INTERNATIONAL OBLIGATIONS

Arising from the Kyoto Protocol, and the EU burden sharing agreement, Ireland is obliged to limit its carbon dioxide (CO₂) emissions to 13% above its 1990 level by 2012. Today, we are still at about 23% above 1990 levels and have much work to do in this area.

EU ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE

The EU Directive on the Energy Performance of Buildings will soon be implemented, requiring every home for sale or rent in Ireland to be rated as to its energy performance. This directive will mean consumers have an easy way to predict their future energy use and it will also give much greater public exposure to the concept of energy efficient construction.

HOUSING

Ireland's housing sector is in the midst of a construction boom unmatched throughout Europe. This year, more than 80,000 new homes will be built, compared to just 22,000 in 1992. Home owners spend €2.6 billion annually on energy and account for one quarter of energy-related greenhouse gas emissions, the next largest source after transport.

ENERGY SUPPLIES AND COSTS

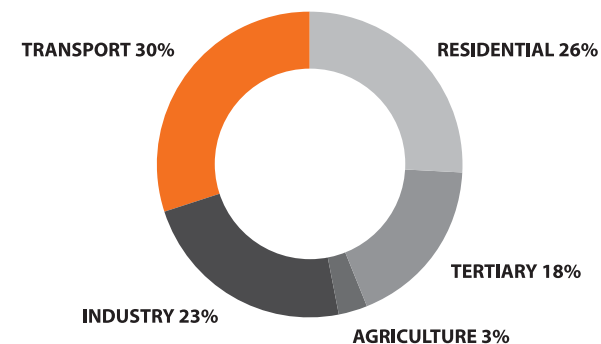
As the demand for oil and gas continues to grow, and the rate of new discovery falls, known reserves of these fuels are diminishing rapidly. Ireland is in a particularly precarious position, being almost entirely dependent on imported fossil fuels for its energy requirements. Energy costs have risen rapidly. Average household expenditure on energy is €1700 per annum and this figure may rise further in the future. While many Irish people show an admirable concern for the wider environment, realistically, economic cost is the key motivator for people to adopt more energy efficient practices.

These factors – international targets and regulations, housing growth, diminishing fossil fuel supplies and rising energy costs – combine to present a unique opportunity for the House of Tomorrow Programme to influence lasting change in Irish life.

A key goal with House of Tomorrow is to generate independent market momentum for energy efficient developments. There are early signs that this is now happening. Its standards represent a saving of over 40% in energy consumption and associated CO₂ emissions relative to what would apply under current building regulations. Builders and estate agents are using these standards as a quality brand mark: queries from builders about the programme are increasing; and a number of local authorities are adopting House of Tomorrow type standards in their local area plans.

From a zero initial base, the programme has thus succeeded in attracting and activating participation by early adopters in the market. Having established this foothold, it is now in an excellent position to extend its reach both in terms of market scale and level of innovation. In becoming an engine for positive change throughout the mainstream of the home building industry, the programme and its participants can make a distinct contribution towards creating a built environment that is fit to serve the needs of both today's and tomorrow's world.

SHARE OF TOTAL ENERGY USE IN IRELAND (2004)



The House of Tomorrow Programme had its origins in the Government’s Green Paper on Sustainable Energy in 1999, which highlighted deficiencies in the energy performance of Irish housing. Among the actions proposed to tackle this was a programme to develop and demonstrate energy efficient design and technology features in the housing sector.

After extensive industry consultation, the House of Tomorrow Programme was launched in September 2001. Within the framework of the National Development Plan 2000-2006, its budget allocation was €21.1M.

The aim of the programme has been to accelerate improvements in the quality of energy performance of Irish homes and to encourage the market uptake of cost-effective innovation. Central to this is the establishment of a nationwide network of living examples of homes incorporating superior energy features new to the mainstream Irish market. These are homes that offer significant benefits to consumers in terms of comfort, economy and convenience and to the country in terms of meeting environmental obligations and reduced dependence on imported fossil fuels.

Specifically, the House of Tomorrow programme aims to:

- support superior energy design and technology practices;
- tackle systemic barriers to sustainable energy within the building industry;
- promote market awareness of best practices; and
- stimulate sustainable energy research, development and demonstration.

The heart of the programme is a demonstration scheme which part funds private and social housing developments that deliver a saving of over 40% in energy consumption and associated CO₂ emissions relative to what would apply under current Building Regulations.

Initial take-up was modest as SEI worked to raise awareness of the programme and overcome traditional attitudes to change within the industry. By the end of 2003, just nine demonstration projects had been approved. But from mid-2004, demand and interest in the programme began to grow dramatically. In all, 35 projects were approved in 2005, and today up to 10 new applications are being received each month.

In total, over 90 housing developments have attracted support of €22M, involving over 4,000 units in every county in Ireland. Co-funding from developers of a further €34M brings joint investment in sustainable energy solutions to around €56M since 2001.

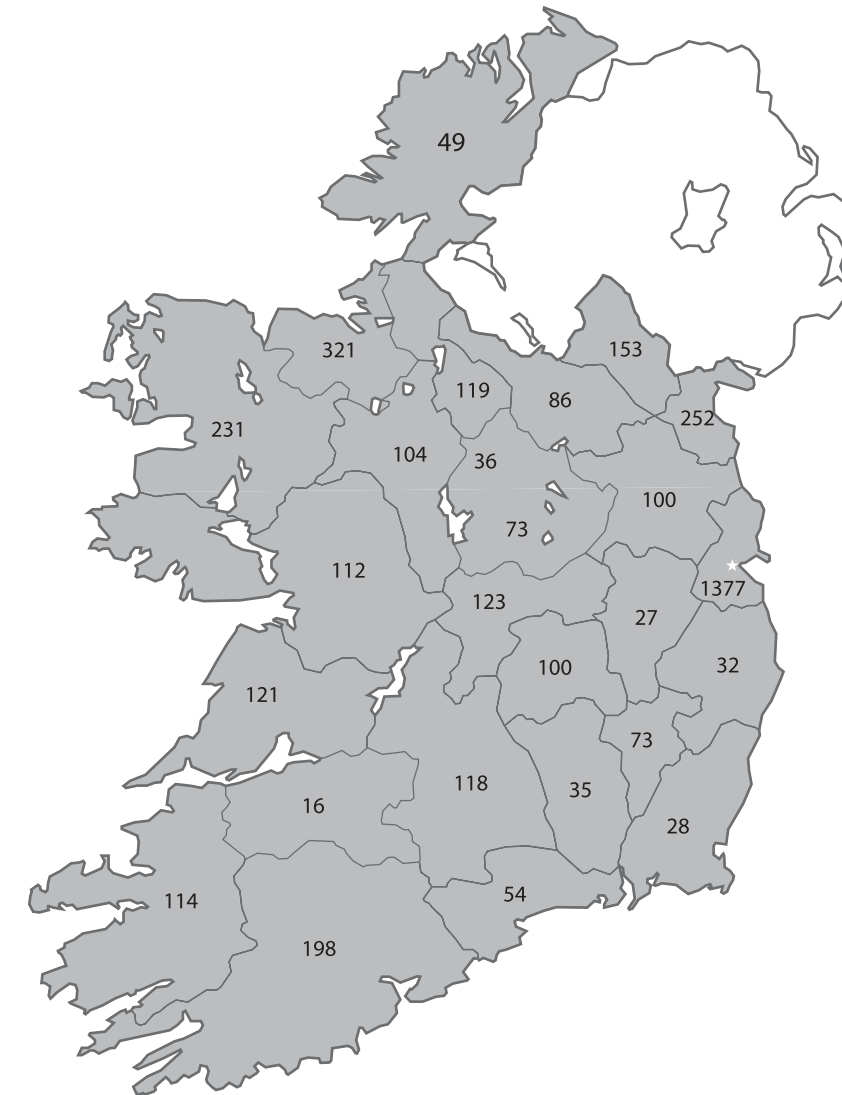
As will be seen from the list of projects in the accompanying table (p12-15), these developments use a strong array of innovative technologies and practices, from insulation materials, advanced windows, and highly efficient boilers, to healthy ventilation control systems, energy efficient lighting and renewable energy systems including solar, heat pumps and biomass heating.

The programme has supported a further 23 projects in the form of installer training, technology guides, feasibility studies, research into housing performance and postgraduate studentships to help build awareness and capability among practitioners in the specification and implementation of innovative energy technology features in Irish homes.

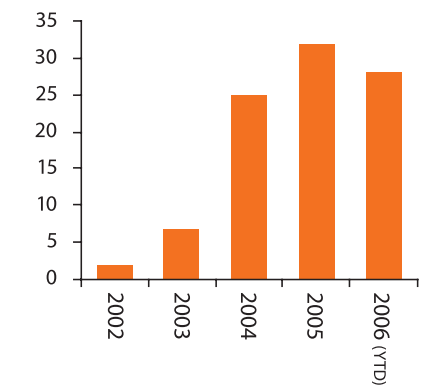
Perhaps most importantly, the momentum of the House of Tomorrow Programme has begun to mobilise awareness in the construction industry and amongst the homeowners of Ireland.

The efforts of the people and organisations active in the scheme to date have given prestige to the House of Tomorrow brand, making it something home buyers see as valuable. At a broader level, the practical solutions being offered through the programme are helping to raise public awareness on the win-win benefits of energy efficiency. The recent examples of local authorities examining their own practices and regulations, and setting targets in relation to energy efficiency, are particularly significant.

APPROVED PROJECTS BY COUNTY 2002-2006



APPROVED APPLICATIONS 2002-2006





01 / ENERGY INNOVATION, SOCIAL INTEGRATION

Rath Oraigh, Rathass, Tralee, Co. Kerry

This innovative Tralee Town Council scheme consists of 64 houses with a community crèche facility. A waste recycling collection area is provided, adjacent to the green space. Features include draught lobbies, high-performance windows, solar water heating, a communal ground source heat pump and gas condensing boilers with an innovative smart card metering system from centralised LPG storage. A playing field serves as the collector area for the ground source heat pump. Over 40% savings on energy costs and related CO₂ emissions are projected.

SEI SUPPORT €320,000

02 / LOCAL COMMUNITY, RENEWABLE ENERGY

Cum an Tobair, Oylegate, Co. Wexford

This Wexford County Council development of 28 single and two-storey homes incorporates careful design detailing, high insulation levels, low-emission glazing, renewable energies and a reed bed wastewater treatment system. Each house has a solar water heating system and an auto-firing wood pellet stove serving radiators, with good heat regulation. The fuel is supplied locally and residents are given guidance on operating the systems. The project aims to cut energy costs by 40%, and energy-related CO₂ emissions by up to 90%.

SEI SUPPORT €140,000

03 / SUSTAINABILITY IN A TIGHT URBAN SETTING

Daintree Building, Pleasant's Place, Dublin 2

The award-winning, mixed-use building for the Daintree (Paper) Company contains seven apartments, commercial and craft space, a retail shop and café, together with ancillary "green" elements. The four-storey building is south facing to maximise solar gain and its combined masonry and timber-frame structure uses wool to create a highly insulated and breathing wall. Six solar panels supply 60% of hot water needs and space heating is by ground source heat pumps from three 200m boreholes.

A high-efficiency gas boiler provides backup to both systems. Daylight reaches all habitable spaces with some internal bathrooms day-lit using solar tubes from roof level. Energy and CO₂ reductions in excess of 50% are expected.

SEI SUPPORT €35,000

04 / MODERN HOMES WITH NATURAL RESOURCES

Auburn Village, Ballymahon, Co. Longford

Located on a mature site, the 36-house Auburn Village private development by Bespoke Construction has good southerly orientation to accommodate solar panels, maximise passive solar gain, and use natural daylight to reduce lighting demand. Marketed as ECO Green Efficient Homes by the builder, key features are highly insulated timber-frame construction, use of external wood pellet boilers for primary heating, and solar panels to provide domestic hot water. Compared with existing norms, savings of more than 45% on energy and 80% on related CO₂ emissions are expected.

SEI SUPPORT €288,000

05 / TOWARDS ENERGY AUTONOMY

Heneghan & Sons (Blacksod) Ltd., Belmullet, Co. Mayo

The Heneghan low-energy private development of 27 mainly semi-detached timber-frame homes is built to a high insulation standard, with special sealing measures to the building fabric and draught lobbies to the front and rear.

A compact, mainly south-facing layout maximises passive solar gain with thermal storage provided by tiled concrete floors. Geothermal borehole heat pumps deliver primary heating and solar panels supply hot water. More than 70% savings on energy usage and related CO₂ emissions are projected.

SEI SUPPORT €135,000

06 / VILLAGE REFURBISHMENT, SENSITIVE TO PAST & FUTURE

Belvedere Orphanage, Tyrellspass, Co. Westmeath

This Westmeath County Council project involved restoring and refurbishing five separate 19th Century buildings into 10 social housing units. A prime objective was to marry the conservation requirements of retaining original building elements such as dressed limestone with successful integration of "sustainable and green" components. A key feature is a mini district heating system fired by an automatic 80kW wood pellet boiler, supplying space heating and hot water on demand. Heat meters located in each house allow tenants to pay on the basis of exact energy use. Maintenance is restricted to monthly ash removal. Each house is insulated internally to cut heat loss by over 50% against its original condition. The project is expected to cut heating use by 50% and related CO₂ emissions by 80% compared with baseline conditions.

SEI SUPPORT €50,000



Credit: Irish Illustration, www.irish-illustrations.com

07 / QUALITY HOMES THROUGH INNOVATION

Carraigweir, Tuam, Co. Galway

Coffey Construction has developed 140 private homes of steel-frame construction with several innovative features. The development combines very high levels of structural insulation with argon-filled, low emission, double-glazed windows. All houses are comprehensively sealed against air leakage, do not employ traditional chimneys, and use balanced mechanical ventilation, with exhaust air heat recovery systems incorporating a heat pump as the primary space and water heating system. Low energy lighting is also used. Householders are expected to save more than 62% on energy use and 72% on related CO₂ emissions compared with existing thermal standards.

SEI SUPPORT €400,000

08 / EXTENDED QUALITY, COMFORT, AFFORDABILITY

St John's Close, Virginia, Co. Cavan

St John's Close is a voluntary sheltered housing complex of 26 two-bedroom units for elderly and disabled people. Developed by Masonic Havens charity to meet full accessibility standards and to promote extended independent living, the project is backed by a community centre and existing nursing home on-site. With high levels of heating required for up to 16 hours per day, low running costs are a priority. The timber-frame homes are highly insulated, of air-tight construction, with fresh air intake through a heat recovery ventilation system, which is coupled to an air solar heating system that meets much of the water and space heating needs. Auxiliary heat is supplied by a condensing gas boiler. Projected energy and related CO₂ savings exceed 55%.

SEI SUPPORT €130,000

09 / FUTURE PROOFING

Killeagh, Co. Cork

J&W Leahy Bros. have developed 200 timber-framed houses designed to achieve a radical reduction in CO₂ emissions by applying the experience of the Century Homes "Formula 1 House" project previously supported under the programme. Features include high insulation and exceptional air tightness, a solar air system for space and hot water heating linked to balanced ventilation with heat recovery, and backup by means of a wood pellet boiler. This automatic system also meets over 50% of hot water needs from the sun. The project aims to deliver savings of well over 40% on energy and 80% on related CO₂ emissions compared with existing standards, helping to 'future proof' these homes against fluctuating fossil fuel prices.

SEI SUPPORT €400,000

10 / A WINNING UPGRADE

Ballymun Regeneration, Ballymun, Dublin 11

Led by Ballymun Regeneration Ltd, this flagship project incorporates a series of advanced energy features in 130 of the first 650 units built under the Ballymun masterplan. It is partnered with seven other demonstration developments across Europe, with EU Commission support. Superior comfort and economical heating are key goals for the residents. The range of energy efficiency features includes: "super-insulated" dwellings, passive ventilation systems to minimise condensation risk, low-emission double glazing, condensing gas boilers, efficient radiant gas fires, solar water heating and ground source heat pumps. Other positive ecological features are also included. An overall target reduction of over 40% in CO₂ emissions is sought across the development.

SEI SUPPORT €104,450

11 / CONVERTING TO AFFORDABLE MODERN COMFORT

Bridgefoot St, Queen Street & Ballybough Apartments, Dublin 7/8

Dublin City Council undertook a major refurbishment of 100 tenant apartments built in the 1960s at three locations. The enhancements carried out included enclosing south-facing balconies and incorporating them into living space, improving fabric insulation to over ten times its previous level and reducing glazing heat losses by 70%. High-efficiency natural gas-fired heating systems were installed to replace solid-fuel open fires and a user-friendly smart card payment system was provided. As well as improving comfort levels these actions are expected to cut fuel use by 52% and result in a reduction of 88% in CO₂ emissions.

SEI SUPPORT €500,000

12 / MODERN LIVING, FUTURE PROOFED

Elmpark, Ballsbridge, Dublin 4

Radora Developments Ltd is incorporating a range of advanced energy features in two residential apartment blocks comprising 336 units and forming part of an exceptional mixed-use development which will include healthcare, hotel and leisure, office, conference and crèche facilities. Notable features include a district heating system served by modular, gas-fired, combined heat and power stations. Supplementary biomass boilers meet winter heat load, condensing gas boilers give further backup, and an automatic heating supervision system provides comprehensive control. As well as high insulation levels, natural stack effect ventilation and cooling strategies are employed. Electricity measures include low-energy appliances and high-efficacy LED lighting. Projected energy and related CO₂ savings exceed 40%. An Energy Services Company (ESCO) is being set up to manage the district heating and other aspects of energy usage.

SEI SUPPORT €1,330,000

THE PROGRAMME IN ACTION



13 / AFFORDABLE NOW, AFFORDABLE FUTURE

Sunnyside, Macroom, Co. Cork

These 12 timber-frame houses by Eco Construction for Radon Ireland Ltd were designed to be affordable in terms of both construction and running costs, suitable for first-time buyers and elderly people on a fixed income. Savings of over 50% on energy and 80% on related CO₂ emissions are projected. Among the features are high fabric insulation, triple glazing, sealed construction plus mechanical ventilation with heat recovery, wood pellet boilers for primary heating and solar water heating.

SEI SUPPORT SEI SUPPORT €60,000

14-15 / MODERN, WITH NATURAL RESOURCES

Croí Na Greíne, Enniscrone, Co. Sligo

Croí Na Greíne is a private development of eight masonry-built homes, with high fabric insulation and low-emission double glazing throughout. The houses have southerly orientation, some with sunrooms, and glazing to the north is kept to a minimum. Wood pellet stoves are used for space and water heating, and additional active solar water heating for the main hot water requirements in summer. Heat output can be regulated to the specific needs of the occupants through heating zone controls and programmable timing. As well as offering up to 65% cost savings to the households, a reduction in CO₂ emissions of 85% is expected.

SEI SUPPORT €40,000



PLANT ROOM IN A NEW IRISH ENERGY EFFICIENT DEVELOPMENT CONTAINING A GROUND SOURCE HEAT PUMP, GREENWATER STORAGE TANK AND BUILDING MANAGEMENT SYSTEM.

DEVELOPER	PROJECT TITLE	COUNTY	NO. OF UNITS	BUILT FORM				CONSTRUCTION			HEATING				VENTILATION			SECTOR		
				APARTMENT	SEMI-D	TERRACED	DETACHED	MASONRY	TIMBER	OTHER	CONDENSING BOILER	SOLAR THERMAL	HEAT PUMP	GROUP HEATING	WOOD/BIO MASS HEATING	MECHANICAL W/HEAT RECOVERY	PASSIVE STACK	NATURAL	SOCIAL NEW BUILD	PRIVATE NEW BUILD
Kilkenny Co Co	Low Energy Affordable Council Housing, Easton Mews, Leixlip	Kildare	27			•		•				•					•			
Kilkenny Co Co	Low Energy Housing, Mooncoin	Kilkenny	23		•	•		•				•					•			
Knocknalyre Ltd	Housing Development, Quignalecka, Ballina	Mayo	50		•		•	•				•	•					•		
Linham Ltd	Housing for the Elderly, Merville Ave	Dublin	10	•						•				•				•		
Lis Na Mere Developments	Housing Development, Lios na Dara, Dundalk	Louth	50		•	•	•		•			•	•					•		
Longford Co Co	Refurbishment of LA Housing, Ballymahon	Longford	48			•			•					•					•	
Masonic Havens	Sheltered Accommodation, Viginia	Cavan	26			•									•			•		
McCaughey Developments	Housing Development, Hoey's Lane South, Dundalk	Louth	39		•				•								•		•	
McCaughey Developments	Housing Development, Hoey's Lane South, Dundalk	Louth	54		•				•								•		•	
McGurran Construction	Housing Development, Swellen Lower, Cavan	Cavan	60		•	•	•		•			•	•			•			•	
McInerney Homes Ltd	Housing Development, Caltragh	Sligo	145		•				•								•		•	
Merrion Contracting	Development, Grove Hall, Blackrock	Dublin	11	•				•									•		•	
Moritz-Elliot JV Ltd (for DCC)	Fatima Mansions Redevelopment Phase One	Dublin	110			•		•									•		•	
Mulvey Development Ltd	Ocean Links, Strandhill	Sligo	12			•									•			•		
Mulvey Development Ltd	Gleann Ailinne, Drumshanbo	Leitrim	9			•	•						•				•		•	
NABCO	Apartment Building, Finglas	Dublin	50	•				•									•		•	
North Tipperary County Council	Energy Upgrading of Social Housing in North Tipperary	Tipperary	40		•			•									•		•	
North West Investments Ltd	Housing Development at Carrick on Shannon	Roscommon	52		•		•	•							•			•		
Oakheights Ltd	Derryveagh Development, Emyvale	Monaghan	28	•	•	•		•									•		•	
Oaklee Housing Trust	Low Energy Housing Ardee	Louth	45	•	•	•	•	•									•		•	
Opus Developments	Housing Development, Newcastle	Dublin	50			•			•								•		•	
Patrick Maughan	Croi na Greine, Enniscrone	Sligo	7				•			•								•		
Peach Glen Construction	Dublin Rd, Oldtown	Meath	30	•				•									•		•	
Pinnacle Developments Ltd	Development at Brooklawns, Sligo	Sligo	107	•	•			•									•		•	
Radon Ireland Group	Eco-Houses, Macroom	Cork	12				•		•						•			•		
Radora Developments	Mixed use development, Elm Park	Dublin	200	•						•				•			•		•	
Rhatigans Ltd	Mixed use development, Chancery Lane	Dublin	77	•				•									•		•	
Rinn Construction	Gort Na Null, Sixmilebridge	Clare	71		•			•									•		•	
Shannon Cove Ltd	Shannon Cove, Dromod	Leitrim	33				•	•										•		
Sherborough Enterprises	Mixed Development at New Street	Dublin	105	•				•						•				•		
SINI Holdings	Residential Development, Longs Place	Dublin	31	•				•									•		•	
Magahy & Co	Sisters of Mercy Residence, Mater Hospital	Dublin	30	•				•									•		•	
Stackallen Construction	Watery Lane, Tullyallen	Louth	14	•	•			•									•		•	
Sustainable Projects	The Village, Cloughjordan	Tipperary	50				•			•				•			•		•	
Thermal Agencies	Bagnelstown, Co Carlow	Carlow	23				•	•							•			•		
Gaeltacht Glas na Mi	Brugh na Mi, An Uaimh	Meath	20				•	•						•			•		•	
Tralee Town Council	LA Housing Development, Rathass, Tralee	Kerry	64			•		•									•		•	
Tullamore Housing Association	Development at Clontarf Rd, Tullamore	Offaly	13	•				•									•		•	
Tullamore Right for Elderly	Development at Clontarf Rd, Tullamore	Offaly	16	•				•									•		•	
Val O'Connor	Castletownroche Housing Development	Cork	83		•				•								•		•	
Wardrop Technical Services	Apartment Development at Thomastown	Kilkenny	12	•				•									•		•	
Waterford City Council	Ballygunner Social Housing Development	Waterford	34				•	•										•		
Waterford County Council	Housing Development at Crobally, Tramore	Waterford	20		•		•	•									•		•	
Westmeath Co Co	Infill Developments at Delvin	Westmeath	8	•				•									•		•	
Westmeath Co Co	Belvedere Orphanage, Tyrellspass	Westmeath	10		•			•					•				•		•	
Westport Town Council	Social & Affordable Development, Tubber Hill, Westport	Mayo	43	•		•		•					•	•		•	•		•	
Wexford County Council	Oilgate Housing Scheme, Enniscorthy	Wexford	28		•			•						•				•		
WP Baldwin and Company	Low Energy Housing Scheme, Knockbridge	Louth	50		•		•		•								•		•	



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