Directive 2010/31/EU on the energy performance of buildings (recast)

Ireland's Equivalence Report 30 June 2011 to 30 June 2014

Article 15(4) – Inspection of Air Conditioning Systems

This report provides the Commission with the Article 15(4) report on equivalence measures taken up to end-March 2012, including an assessment of the achievement of equivalence (or better) of the actions undertaken, relative to what would have applied under Articles 15(1) – 15(3) of Directive 2010/31/EU. This report also includes planned actions for the period up to 30 June 2014 including relevant policy and measures which will progressively reduce the numbers of older or inefficient air conditioning systems.

Background

Article 9 of Directive 2002/91/EC of the European Parliament and of the Council on the energy performance of buildings (known as the EPBD) requires the regular inspection of air conditioning systems of an effective rated output of more than 12kW. This inspection process should include an assessment of the air conditioning efficiency and the sizing compared to the cooling requirements of the building. Appropriate advice shall be provided to the users on possible improvements to, or replacement of, the air conditioning system and on alternative solutions.

Regulation 4 of the European Communities (Inspection and Assessment of Certain Air Conditioning Systems) Regulations 2006 (S.I. No. 346 of 2006) came into effect on 1 January 2008 and required the owners of air conditioning systems with an effective rated output of more than 12kW to ensure that each such system is (a) Inspected by a registered inspector, and (b) Assessed by a registered assessor as and when required by the manual published or approved of by the Minister for Communications, Energy and Natural Resources. Air conditioning systems should also be maintained, serviced or adapted in accordance with the manual or as otherwise specified by a registered inspector or registered assessor in order to ensure efficient energy usage by the systems. The manual, issued in July 2008 by the Minister for Communications, Energy and Natural Resources, was subsequently revised in December 2010.

An interdepartmental working group known as the EPBD Implementation Group, which consists of senior members from the Department of Communications, Energy and Natural Resources, Department of Environment, Community and Local Government and the Sustainable Energy Authority of Ireland (SEAI), oversees the implementation of the EPBD in Ireland. The EPBD Implementation Group has carefully reviewed the provisions of Article 9 of Directive 2002/91/EC in tandem with the potential for energy saving from the existing air conditioning system inspection regime under the requirements set out in S.I. 346 of 2006 and the options provided under Article 15 of Directive 2010/31/EU (known as the recast EPBD).

In this context, Ireland has decided to opt for the alternative approach set out in Article 15(4) of Directive 2010/31/EU. This approach will involve the introduction of equivalence measures concerning the provision of advice to users on the replacement of air conditioning systems or on other modifications to the air conditioning system which may include inspections to assess the efficiency and appropriate size of the air conditioning systems. Adopting this approach against the backdrop of a low installed base of air conditioning and a light existing infrastructure represents a more efficient use of available resources when considered against potential savings which may be realised from a full inspection regime.

An effective communications campaign coupled with other support actions will encourage regular inspection of air conditioning systems with associated maintenance, modification and replacement of inefficient installations. The focus is on establishing a well structured set of initiatives, led by

Government bodies, aligning with business interests of energy efficiency products and service providers, especially key influencers, in the air conditioning systems sector. This approach is likely to achieve greater energy efficiency improvements when compared to an inspection regime.

Baseline study

In 2005, the SEAI commissioned a study to establish the baseline distribution profile of air conditioning systems in Irish buildings, prevailing practice and potential in respect of inspection/servicing/ maintenance, considered options for demonstrating compliance with Article 9 of the EPBD, synergy with other initiatives including "F-Gas" regulations and the potential energy and CO_2 saving impacts under differing scenarios.

The report indicated that over 27,500 out of a total 94,520 air conditioning systems in Ireland have a rated output greater than 12kW accounting for over 70% of the total energy used by air conditioning systems. The following table details the number, size and type of air conditioning systems installed in Ireland in 2004.

	AHU >12kW	DX >12kW	DX < 12kW	Total
Number of air conditioning systems	860	26,710	66,950	94,520
Number as % of total	1%	28%	71%	
Energy used as % of total	19%	53%	28%	

The cost and benefits of an air conditioning system inspection programme was considered as part of the baseline study. The annual energy savings in relation to air conditioning system installation and maintenance are difficult to quantify in many instances, however, the study assumed that the average scope for viable energy savings is 10% across all units and that the cost of identifying the fault (i.e. inspection cost) should be limited to 20% of this potential saving. The inspection process should be cost effective and consider the likelihood of the existence of a fault, the cost / complexity of finding the fault, severity of identified faults, costs of correcting faults and associated energy costs. The electricity consumption, savings and justifiable inspection costs for typical units in each category are presented in the following table.

	AHU >12kW	DX >12kW	DX < 12kW
Typical system size kW	260	40	8
Annual electricity consumption @15c/kWh	€11,700	€`1,440	€240
Annual saving potential kWh	7,800kWhs	960kWhs	160kWhs
Annual saving potential	€1,170	€144	€24
Average justifiable inspection cost (additional to service cost) per unit at one inspection per annum	€234	€29	€5

The study indicated potential notional annual savings of 80GWh in primary energy (32GWh in delivered energy), valued in excess of €4,000,000 before considering the incremental cost of inspection/servicing involved, and translating into 17,800 tonnes of CO_2 abatement. The study noted that there were no regulations covering who can service air conditioning systems, what should be included in the service, and the purchase and use of refrigerant gases. The F-Gas

Regulations are now in force and will restrict the purchase and use of refrigerant gases to certified technicians.

Implementation Progress to date

An aligned set of actions contributing to improving air conditioning system efficiency in the Irish building stock is in place. The points set out below summarises the actions that Ireland intends to take up to the end of 2014. These consist of actions yielding energy savings and CO_2 abatement of a direct nature from capital investment in high efficiency systems, plus actions of an indirect nature that influence such capital upgrading works or influence improvements to operational air conditioning system efficiency.

1. F-Gas Regulation

The European Commission's F-Gas and ODS regulations are pan-European regulations intended to reduce the impact of greenhouse gases, including fluorinated greenhouse gases (F-gases) on climate change and ozone depleting substances (ODS) on the ozone layer, by reducing emissions of F-Gases and ODS respectively. Commission Regulation 303/2008 of 2 April 2008 sets out the requirements for a company certification scheme for companies working with stationary refrigeration, air conditioning and heat pump equipment containing fluorinated greenhouse gases (F gases) in accordance with Article 5.1 of Regulation (EC) No. 842/2006 on certain fluorinated greenhouse gases (known as the F-Gas Regulation).

The Institute of Refrigeration Ireland Ltd and Refrigeration Training Network Ltd are the shareholders of the F-Gas Registration Ltd, www.fgasregistration.ie, a not for profit company working with the Environmental Protection Agency (EPA) in association with the Department of Environment, Community and Local Government, to implement F-Gas Company Certification in Ireland. Companies, including sole traders, undertaking refrigeration and air conditioning work must hold a company certificate if they employ personnel to install and/or maintain and service stationary refrigeration and air conditioning systems containing, or designed to contain, HFCs. At present, 143 businesses have an F-Gas certificate to install, maintain or service stationary refrigeration, stationary fire protection systems and extinguishers, air-conditioning and/or heat pump equipment containing or designed to contain F-Gas refrigerants.

The EPA issued guidance notes for air conditioning system operators in the offices and public buildings sector. The environmental impacts of the F-Gas inspections are expected to include reduced leakage as a result of regular inspection and maintenance, consideration of alternative refrigerants and energy efficiency. The steps necessary for compliance with the F-Gas Regulation provide an opportunity to assess the energy efficiency of air conditioning equipment. If systems have to be replaced or retrofitted, typical issues to consider are: load reduction (e.g. better time and temperature controls), plant operating conditions (e.g. clean condenser and evaporator fins regularly, keep refrigeration doors and lids closed, ensure door seals are not faulty, reduce head pressures); secondary loads (e.g. chilled water pumps), part-load operation (e.g. compressor controls and variable speed drives); and assistance on cutting costs and improving the general environmental performance of Irish organisations is available through the following website www.greenbusiness.ie.

2. National Communication Campaigns Encouraging Regular Servicing or Replacement

In 2012 and subsequent years, Ireland intends to run national communications campaigns in relation to regular servicing of air conditioning systems, using website and trade media. SEAI and key industry stakeholders, including the Institute of Refrigeration Ireland Ltd. and Refrigeration Training Network Ltd., will use F-Gas Registration as an important communications channel. In collaboration with industry stakeholders, the campaign will target specialist media streams including web advertising and promotional literature. The campaign will direct air conditioning

system operators to appropriate resources and networks which will link to the web sites and panels of specialist air conditioning system maintenance service providers maintained by key stakeholders.

3. Triple E Product Register

The on-line Triple E product register of energy efficiency products at www.seai.ie/aca includes motors and drives, refrigeration and cooling systems, and heating, ventilation and air conditioning control systems. This register was developed and is maintained as a procurement support resource for organisations in the non-domestic sector – and is the reference point for eligible products under the tax incentive scheme termed the 'Accelerated Capital Allowance' scheme. The Triple E register is a searchable listing of energy efficient equipment and trained installers.

Triple E sets minimum criteria that products and installers are required to meet in order to be listed. For products, these criteria are regularly updated, and aim to ensure that only the top 10 - 15% most energy efficient products in any technology are listed. Installers must pass up-to-date relevant training and, in some circumstances, approved manufacturer training as well.

4. Business Sector Information and Advice

SEAI provides information and advice services to non-domestic sectors including large industry and SMEs. Included in these programmes are information and advice highlighting high efficiency technologies and operational and maintenance practices to maximise air conditioning system efficiencies.

As part of the energy agreements programme, special working groups focus on specific technologies, initiatives and areas of particular interest. Activities include site assessments, audits, demonstration projects, special investigations, desktop research, design of experiments, methodology development, new tools and solutions development. The special working groups have published reports with international input and details of energy-saving opportunities in the areas of heating, ventilation, air conditioning, refrigeration and large commercial buildings.

Special working groups, focused on specific technologies, initiatives and areas of particular interest, are run each year under the energy agreements programme. Each special working group initiative goes through the phases of piloting, implementation, replication and standardisation.

The refrigeration special working group focused on energy efficiency in industrial refrigeration. The initial study of 15 companies suggests that, on average, energy savings in excess of 20% of a site's total refrigeration electrical energy usage are achievable through refrigeration projects. It should be noted that the participating companies were energy conscious and have already implemented numerous energy saving strategies in the past. Since these companies are at the upper end of energy efficiencies, the potential savings in industry as a whole could be far greater. The refrigeration working group has informed other working groups on issues including energy efficient design, alternative methodologies and sector specific guidance.

5. Better Energy Workplaces

Under the Government's Jobs Initiative, 'Better Energy – The National Upgrade Programme' was launched in May 2011. This programme aims to deliver a major increase in the pace, scale and depth of sustainable energy investments in upgrading existing buildings and facilities. Financial support is available through the Better Energy Workplaces scheme for implementing a wide range of qualifying sustainable energy upgrading projects in the public, commercial, industrial and community sectors.

In 2011, over 100 projects were supported from a total programme fund of €11 million. Projects included a range of energy efficiency and renewable energy technologies. 51 of the 543 measures

supported related to refrigeration and air conditioning systems. A similar support programme is in place for 2012.

6. Public Sector Programme

The Public Sector Programme is an essential pillar in the National Energy Efficiency Action Plan. The Programme helps integrate energy management into the general management of public sector organisations and provides central advice and monitoring services to support all public bodies in their efficiency efforts. Experience, actions and innovations by public sector organisations are also shared via the programme to help others avoid "re-inventing the wheel" and provide a short cut to success.

SEAI has already achieved significant success through its public sector programme, providing a firm foundation to achieve the national 33% savings target for the public sector by 2020. The SEAI is working with public sector organisations throughout the country to help them reduce energy costs and cut carbon emissions.

Ref	Action	Key elements	Estimated Annual • Energy saving • Monetary savings • CO_2 emissions abated	Year
1	**Regulatory** F-Gas Regulation	Certification scheme for companies working with stationary refrigeration, air-conditioning and heat pump equipment containing fluorinated greenhouse gases (F gases)	1.6 GWh final energy €240,000 890 tonnes CO_2	2008
2	**Promotional** Multiannual specialist media campaign	Promoting air conditioning servicing upgrades and replacement	3.2 GWh final energy €480,000 1,780 tonnes CO_2	2012 Planned
3	**Accompanying Resource** Triple E product register	Triple E (high efficiency) product register for business sector	2.2 GWh final energy €330,000 1,223 tonnes CO_2	2009
4	**Accompanying Resource** Business sector information and advice	Highlighting high efficiency air conditioning system technologies and operational and maintenance practices	6 GWh final energy €900,000 3,338 tonnes CO_2	Ongoing
5	**Financial Support** Better Energy Workplaces	Support for Sustainable energy investment in existing buildings Technologies supported include air conditioning system upgrades	8 GWh final energy €1,200,000 4,450 tonnes CO_2	2011
6	**Accompanying Resource** Public Sector Programme	The public sector will improve its energy efficiency by 33% and will be seen to lead by example - showing all sectors what is possible through strong, committed action.	5.6 GWh final energy €840,000 3,115 tonnes CO_2	Ongoing
	Sub-total		**26.6 GWh final energy** **€3,990,000** **14,796 tonnes CO_2**	

Conclusion

As outlined in this report, Ireland has taken a number of promotional, regulatory, incentivising and accompanying initiatives in relation to air conditioning system efficiency which are expected to achieve energy saving and CO_2 abatement levels significantly higher than would have been realistically achievable under the approach set out in Articles 15(1) to 15(3) of Directive 2010/31/EU. Ireland has therefore decided to pursue the alternative approach provided by Article 15(4) of Directive 2010/31/EU having regard to our obligations concerning air conditioning systems.