Consultation Paper on proposed planning exemptions for certain Renewable Energy Technologies

AN ROINN COMHSHAOIL, OIDHREACHTA AGUS RIALTAIS ÁITIÚIL
DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT

October 2007

Minister's Foreword

The use of renewable energy technologies provides a perfect example of how economic well-being and a strong commitment to our environment can complement one another provided we are committed to the Green Energy Revolution outlined in the Agreed Programme for Government.

According to the International Energy Agency, policies to encourage the most efficient production and use of energy can contribute almost 80% of avoided CO_2 emissions by 2030. What is immediately obvious from this statistic is the crucial role that a sustainable energy future has for Ireland, and for the planet, in terms of our overall efforts to tackle climate change, which is by some margin the most grave environmental issue we are faced with.

However, less immediately apparent, but highly significant nevertheless, is the unique opportunity that renewable energy presents us, given our abundance of renewable energy sources in Ireland. In the coming years, this will enable us to combine our shared objectives for reduced emissions and a cleaner environment on the one hand, and a strong and growing economy on the other, by reducing our dependence on imported fossil fuels and enhancing our security of energy supply.

This is not something that can be achieved by Government action alone. Tackling environmental pressures while building upon the economic and social opportunities afforded by our recent growth requires a broad based, cross-sectoral approach. It also requires individuals, organizations, and sectors to recognize that we must all be willing to assume

responsibility for our individual and collective actions and for the impact those actions have on our environment.

The success of programmes designed to increase uptake of renewable energy, such as the range of funding and educational schemes operated by Sustainable Energy Ireland, and changes made to the planning code and draft Building Regulations earlier this year show that individuals and businesses want to play a role in shaping Ireland's environmental future while reducing their fossil fuel bills at the same time. We would be failing in our task as a Government if we did not adequately recognise this commitment by doing our utmost to facilitate the widest possible penetration of renewable energy uptake across all sectors. This of course requires that perceived barriers to renewable energy usage need to be addressed, and where possible, removed.

I am committed to ensuring that the planning system supports widespread use of renewables. With this in mind, my Department has carried out research into the specific planning issues that arise in relation to renewable energy technologies for use in the industrial, commercial, agricultural and public sectors, and with a view to providing exemptions from planning permission requirements where possible.

This public consultation document sets out the results of that research.

In summary, I am considering the introduction of planning exemptions in respect of five classes of renewable technology. These are:

- *Combined Heat and Power Systems (CHP)*
- *Wind turbines;*
- *Solar panels;*
- *Heat pumps, and*
- *Biomass*

Certain conditions will apply in each case to ensure that the right balance is struck between maximising the impact of the exemptions on uptake of renewable energy on the one hand, and on adequately addressing the potential impacts on visual amenity, noise, and safety considerations on the other.

Climate change and security and pricing of energy supply are issues which impact upon all of us – I therefore urge as many people as possible to involve themselves in this consultation process. I look forward to receiving a full and wide-ranging variety of views.

John Gormley, T.D.,
Minister for the Environment, Heritage
& Local Government

Contents *Page*

6. Exemptions Proposed for Heat Pumps

7. Exemptions Proposed for Biomass Boilers

Appendix

1.0 Introduction

The provision of a secure, sustainable, and competitively priced energy supply is a key political priority throughout the world. Here in Ireland, in a very real sense the alteration of our energy mix to reduce consumption of fossil fuels and increase supply from renewable sources is an increasing economic as well as environmental concern, and has been highlighted on a number of occasions as a key factor in maintaining Ireland's competitiveness[1]. While over 90% of Ireland's total energy demand is met from imported fossil fuels, with oil accounting for around 56% of our total primary energy supply[2] (TPES), economic as well as environmental considerations have begun to effect a discernible shift in the composition our energy mix.

For example, increasing demand for dwindling fossil fuel reserves, particularly oil, combined with political instability in oil rich regions of the world has directed many business and industries towards other more sustainable energy sources which might previously have been relatively unattractive in economic terms. At the same time, increasing awareness of and interest in the environmental benefits of renewable energy, helped along by a range of policy supports and instruments introduced in recent years at national and international levels has begun to impact upon the way in which people, businesses, and industries think about meeting their energy needs.

As it will continue to be for Governments into the future, combating climate change, maximising the uptake of renewable energy technologies, and increasing the amount of energy from renewable sources as a proportion of our total consumption is a key concern for this Government. To achieve this, the Government is committed to introducing a range of supporting measures which will, on the one hand, remove any unnecessary regulatory barriers to uptake of renewables in all sectors, and on the other, help to make renewable energy use an increasingly economically attractive option, relative to traditional fossil fuel sources.

[1] IDA Annual Report 2006, P 11, SEI, *National Development Plan 2007 - 2013*
[2] *Energy Policies of IEA Countries – Ireland 2007 Review,* International Energy Agency, 2007, figure refers to 2005 levels of consumption.

1.1 Climate Change & Energy in Ireland

It is generally acknowledged in Ireland and throughout the world that climate change is the single greatest challenge faced by humankind. In order to reflect that priority the Government is committed to taking decisive action to reduce our emissions of carbon dioxide.

A wide range of actions are required to meet Ireland's emissions target under the Kyoto Protocol and the further emissions reduction targets that are anticipated. Many of these actions are detailed in the National Climate Change Strategy 2007-2012 and in the Agreed Programme for Government. The Strategy recognises that the issue of climate change requires a whole-of-Government effort across all sectors, from agriculture and forestry to energy, transport and waste management.

The importance of adopting new approaches to the supply and use of energy is a key theme of the Strategy. In particular, the Strategy expressly recognises that taking action to reduce emissions also means:

- making Ireland's energy use more sustainable
- creating new levels of energy efficiency in our buildings
- harnessing the business sector's capacity for innovation
- diversifying agriculture towards producing energy crops and expanding afforestation
- improving waste management systems even further and using waste as an energy source, and
- funding research and public awareness programmes.

These objectives serve to underline the fact that in recent years the economic and financial discourse on climate change has shifted radically. Where once this discourse seemed to be underpinned by an assumption that economic growth must always come at a cost to environmental standards, and vice versa, more recently a strong evidence has been produced to show that gradual the economic costs of inaction on climate change greatly outweigh the costs of taking action now. In other words, economic development and a strong commitment to the environment can and must complement one another.

In other words, the challenges presented by climate change also present great opportunities where there is willingness to take decisive action. Reducing our emissions, maximising renewable energy uptake, and ensuring security of energy supply are not simple tasks by any means. But these challenges also present great opportunities for all sectors of the economy. If, for example, we maximise the enormous potential of renewable energy sources we will be directly combating climate change. And if we ensure security and sustainability of energy supply we will be fostering and promoting sustainable economic growth and employment in Ireland.

The Energy White Paper sets out specific targets for renewable energy use which will facilitate our efforts to meet the challenges posed by climate change.

Traditionally Ireland's geographical isolation has significantly shaped our energy policies. Our position at the edge of Europe combined with a shortage of our own fossil fuel reserves have meant that much of our demand for energy must be met from imported sources. This reliance on imported energy (largely derived from fossil fuels, particularly oil and gas) obviously leaves Ireland exposed to fluctuations in the international energy markets (again, particularly oil and gas), prompting significant increases in energy costs in recent years[3]. However, the impacts of our heavy reliance on imported fossil fuels can also be seen in increased greenhouse gas emissions (driven primarily by a rise in CO_2 emissions, in turn largely as a result of increasing consumption of oil in the transport sector), presenting obvious challenges for Ireland in terms of our commitments under the Kyoto Protocol.

1.2 Renewable Energy and the Energy White Paper

In order to set an Energy Policy Framework capable of delivering a sustainable energy future for Ireland, the Government launched the Energy White Paper in March 2007. This paper frames Irish energy policy generally and sets out the key energy challenges faced by Ireland in the coming decades, including challenges relating to security of energy supply, sustainability of supply and use, and an integrated, long term strategy to achieve an optimal mix of renewable resources. The White Paper also outlines a range of policy options tailored to meet those challenges, including through making much greater use of Ireland's abundance of renewable energy sources.

[3] *Energy Policies of IEA Countries – Ireland 2007 Review,* International Energy Agency, 2007

One of the key themes of the White Paper is the extent to which, over recent decades, Ireland has largely followed energy usage trends prevalent across the developed world by, on the one hand, continuing to derive an increasing proportion of its energy from fossil fuels, particularly oil and gas, while at the same time increasing our levels of investment in renewable energy technologies. The challenge for the future will be to increase the share of energy supply derived from renewable sources as a proportion of overall energy demand / use.

The White Paper posits that renewable energy, as an integral part of our climate change, economic and sustainability objectives, will be a critical and growing component of Irish energy supply to 2020 and beyond.

To that end, the Paper sets the following ambitious targets for the uptake of renewable energy for the years leading up to and beyond 2020:

- By 2010, 15% of all electricity consumed on a national basis will come from renewable sources, delivering an emissions saving of some 1.47Mt annually, rising to 33% by 2020
- At least 400MW will be derived from Combined Heat and Power (CHP) by 2010, with a further aim of 800MW by 2020, and consideration to be given to further CHP targets at a later date
- An initial ambition of at least 500MW of installed ocean energy by 2020
- Minimum 5% market penetration of renewables in the heat market by 2010, rising to 12% penetration by 2020
- 5.75% biofuels market penetration by 2010 (in line with EU targets).

These targets obviously present challenges across all sectors, including transport, industry, agriculture, and the residential and commercial sectors. In order to help maximise renewable energy uptake and to help meet the targets set out in the White Paper and further signposted in the recent Consultation Paper on National Energy Efficiency Action Plan for Ireland 2007-1010. It is essential that all unnecessary barriers to the widest possible penetration of renewable energy uptake are removed.

1.3 The Role of the Planning System

The Minister for Environment, Heritage and Local Government, Mr. John Gormley, is seeking to ensure that the planning system supports the maximum uptake of renewable energy across all sectors. In this context, and following on from the introduction of exemptions from planning permission requirements for certain micro-renewable energy technologies in the domestic sector in February 2007, the Department reviewed existing provisions with a view to facilitating increased usage of renewable energy in the industrial, agricultural, and commercial sectors, and in public buildings, including schools and hospitals.

Over the course of the last 3 months the Department has carried out preliminary research into the types of planning issues arising in relation to proposed developments comprising renewable energy technologies to ascertain whether it would be feasible to exempt renewables on a scale that would provide a meaningful contribution towards patterns of energy use in medium to large scale industrial, commercial or agricultural activities.

This paper presents the outcome of that background research.

The Department is of the view that it is possible to provide exemptions for renewable energy technology developments on a sufficient scale to make very meaningful and significant contributions to patterns of energy usage in Ireland, enabling us, simultaneously to address issues of energy supply, competitiveness, sustainability, and, above all, climate change.

The paper sets out a number of legislative proposals designed to ensure that the planning system plays its part in contributing towards the targets set out in the Energy White Paper by encouraging increased uptake of renewable energy technologies. A range of exemptions from planning permission requirements are proposed for specific technologies across the various sectors. In arriving at the specific proposed exemptions, it has been the intention of the Department to strike the optimal balance between, on the one hand, maximising renewable energy usage, and on the other, minimising the potential for adverse impacts on neighbouring properties and wider communities arising from that wider uptake.

1.4 Who is the paper aimed at?

Our patterns of energy usage are becoming increasing pivotal aspects of daily living. Each of us is faced with daily choices in terms of the impact of our lives on the future of our planet. Every member of society, and interests across every sector therefore has a significant interest in the issues set out in this paper.

Like the consultation document on the then Energy Green Paper, the issues that this paper explores can be boiled down to one essential question: *What impacts do we want our fuel use mix to have upon Ireland's economy and environment?* Every individual with an interest in shaping our collective response to that question is being invited to participate in this exercise.

The purpose of this paper is to set out the various issues involved in adapting the planning code to support widespread uptake of renewable energy sources. The paper is also designed to elicit the widest possible response from the various sectors potentially affected by the exemptions themselves, and from individual members of the public who may be more indirectly affected, to ensure that a balanced approach can be taken to the scale and nature of the proposed exemptions.

Accordingly, you are invited to make submissions on the draft paper by 18th January 2008. Submissions should be returned in electronic format to the Department at: planning@environ.ie. In addition the specific questions posed in relation to each of the proposed exemptions, participants in the process are invited to suggest any alternative approaches to ensuring that the planning system supports renewable energy uptake, or to propose other renewable technologies for inclusion.

1.5 Structure of the Paper

The paper is divided into 7 Chapters.

Chapter 2 provides an overview of the technologies covered by the proposed exemptions. Exemptions are proposed in respect of Combined Heat and Power (CHP), solar panels, wind turbines, heat pumps and biomass. All of the suggested exemptions are subject to conditions relating to, for example, physical size, noise emissions, distance

from neighbouring boundaries, etc. In addition, all of the proposed exemptions are to be made to the Planning and Development Regulations 2001.

Chapter 3 contains specific proposals for exemptions for Combined Heat and Power Installations (including biomass CHP systems).

Chapter 4 sets out proposed exemptions for wind turbines and for temporary met masts.

Chapter 5 sets out proposed exemptions for solar energy.

Chapter 6 sets out proposed exemptions for ground source, and air source, heat pumps.

Chapter 7 contains proposed exemptions for biomass heating systems.

Finally, a summary of all of the exemptions proposed is provided in the Appendix.

1.6 Closing Date for Submissions

The closing date for receipt of submissions on the proposals contained in the paper is **18 January, 2008**.

Submissions should be made, in electronic format, to: Planning Section, Department of the Environment, Heritage and Local Government, Custom House, Dublin 1, tel: 01-888 2895/2821, email: planning@environ.ie.

CHAPTER 2 – RENEWABLE ENERGY TECHNOLOGIES

2.0 Overview

This chapter provides an overview of the technologies for which exemptions are proposed in respect of the various sectors. In summary, these are:

- Combined Heat and Power installations (CHP), including biomass and non-biomass CHP
- Wind energy (wind turbines)
- Solar Energy
- Heat pumps
- Biomass (for heating purposes only).

The exemptions in respect of each of the technologies and for each of the individual sectors are set out in later chapters. It should be noted that planning exemptions for all of the above technologies other than CHP were introduced for domestic users in February 2007.

Application of the Exemptions

However for the purposes of clarity, the proposed exemptions maintain the separation between general exemptions. which would be applicable for industrial , commercial and public buildings and rural ones which would be applicable to agricultural structures.

It is important to note that the proposed exemptions would be introduced by way of amendment to the Planning and Development Regulations 2001. Article 6 of the 2001 Regulations provides that certain classes of development may be classed as exempted development for the purposes of the Planning Acts. Parts 1 and 3 of schedule 2 of the Regulations set out a detailed list of general and rural developments which are exempt from planning permission requirements.

However, certain limitations apply to exempted development generally, by way of the provisions of article 9 of the 2001 Regulations. The article requires that where the carrying out of development that is otherwise exempt could have one or other of a number of listed effects, including impacts on sites or objects of archaeological, geological or historical interest, it shall not be exempted development. *The current proposals will not in any way affect the continued application of article 9.*

This means, for example, that in circumstances where a prospective user intends to erect solar panels on the roof of a commercial, public, or industrial building which is also a

protected structure (under section 57 of the Planning and Development Act 2000), the exemptions will not apply and planning permission will be required.

Other Technologies Considered for Exemption

During the research phase, the Department considered the application of an appropriate exemption for anaerobic digesters but decided that this technology should remain subject to the provisions of the planning system.

Anaerobic Digestion (AD) is a technology that extracts energy in the form of biogas from organic waste, and has the potential to assist in meeting the the requirements of the Nitrates Regulations through processing of slurry in treatment plants comprising of AD technology.

The research revealed that there would be little or no advantage to providing an exemption unless it was at a scale that would have a potentially significant impact on the area. For example, anaerobic digesters require a shed to hold a combined heat and power (CHP) unit and tanks for effluent. These would need to be quite large to provide an economic return.

In addition, cattle generate by far the largest proportion of farm waste, but the very high water content in the manure would require the input of other organic waste streams to make it viable, thereby increasing the potential traffic flows to the site. The process also needs other technologies to give environmental improvements to the resulting waste, i.e., to separate the constituent elements of the waste.

In the circumstances, it is considered that the current requirements of these systems would have potentially significant impacts on an area which would need to be assessed through the planning process.

2.1 Combined Heat and Power

Combined Heat and Power (CHP) technology can be used to provide spatial and thermal heating, power and most significantly electricity. It is defined under the Electricity Act 1999 as "the simultaneous production of utilisable heat and electricity from an integrated thermo-dynamic process where the overall process operating efficiency, based on gross calorific value of the fuel used and defined as the ratio of energy output usefully employed to the energy output, is greater than 70 per cent"[4]. CHP basically utilises the heat produced in electricity generation rather than releasing it wastefully into the atmosphere, thereby recycling heat emissions to generate power for other uses.

There are a number of CHP technologies available on the Irish market including; gas turbines, reciprocating engines, stirling engines and fuel cells (development is still at an early stage in Ireland). CHP can operate on a number of resources. Biomass CHP units are available whereby the unit can run on woodchip and pellet. This unit is probably the most environmentally efficient, although the majority of CHP plants in Ireland are fired by gas or natural gas.

CHP units consist of several components. The main components can include turbines, engines, boilers and flues. Depending on its size a CHP unit can provide enough electricity and heat to power a major industrial or manufacturing facility entirely independent of the national grid (however, a grid connection would be maintained in case, for example, of CHP maintenance). Most significantly, CHP can achieve over 80% efficiency, and as high as 90% in some cases, thereby reducing overall fuel usage.

The use of CHP in particular has the potential to make a major contribution to efforts to reduce CO_2 emissions: it is estimated that 1MW provided by CHP results in savings of 0.6Kt of CO_2 where CHP replaces an electricity based alternative[5].

As with all renewable technologies, the physical scale of a CHP installation depends on the energy requirements of the user.

Large Scale CHP

CHP technology may consist of a gas turbine or spark ignition gas engine. These technologies consist of a generator, which produces electricity whereby the emitted gases pass through a recovery unit, which provides heat in the form required by the site (steam, hot water, etc). Large scale CHP may be appropriate for industrial or commercial sites. The largest CHP facilities in Ireland can produce up to 150MW of power.

[4] Section 2(1) of the Electricity Act 1999 (as amended)

[5] Consultation on *National Energy Efficiency Action Plan* October 2007, Department of Communications, Marine and Natural Resources.

Medium Scale CHP

Small scale CHP generally operates with a reciprocating engine or micro-turbine, mounted on an acoustic enclosure. Heat exchanges recover heat from the exhausted engine gases to produce hot water, which can be integrated into the site services. The exhausted heat is charged into modular gas boilers to provide hot water. Small scale CHPs generally produce less than 1 MW of power.

Micro CHP

Micro CHP technologies vary in size up to 100 KW and use a number of different technologies including internal combustion engines, external combustion engines, micro turbines and fuel cells.

There are several planning related issues regarding Combined Heat and Power that must be taken into account before installation.

Emissions

Emissions from CHP include steam, a small amount of carbon dioxide, and N_{OX} & S_{OX} in small quantities. However, emissions are still much lower than that of standard oil and gas boilers.

Any CHP plant with a generating capacity above 50 MW requires an IPPC licence issued by the Environmental Protection Agency. Many industrial plants though already operate under IPPC licences, in most cases of CHP retro-fit, industrial licencees would apply for a revised license to join the CHP facility to their existing operating license.

Auto-production

To operate a CHP plant that provides electricity independent of the national grid, a user must apply to the Commission for Energy Regulation (CER) for a grid connection agreement. If a grid connection is achieved then an auto-producer can produce and use electricity independent from the grid and export excess electricity to the grid if necessary. On the other hand most commercial, agricultural and industrial premises will have backup access to the grid in case of CHP malfunction, a process that rarely occurs.

Visual Impact

As with small-scale biomass units, CHP facilities require flues. The height of flue required depends on the scale of the CHP in output terms. Flues of approximately 20 metres in height are generally sufficient for some large scale CHP's (of the order, for example, of 5MW output). Flues are also available in different colours and material types.

A CHP system itself can have varying visual impacts. Enclosed CHP units are generally less visually intrusive than non-enclosed units where the various constituent elements are visible and can appear more visually disordered. The physical dimensions of an enclosed CHP unit itself will also vary according to energy requirements and output. In general, medium scale CHP's and CHP's at the lower end of the large scale will have a physical footprint of 200 – 500 square metres, with height varying between 5 – 8 metres.

Visual impacts will also tend to vary according to the nature of neighbouring development, and the surrounding landscape. For instance, a large CHP attached to an industrial building located in an industrial estate will obviously be far less visually intrusive than a large CHP on a farm in an area of outstanding natural beauty.

Noise

CHP facilities emit noise during normal operation and indeed, some very large-scale CHP plants can create noise levels exceeding 85 db(A). However, measures can be taken to ensure that noise emissions from units do not cause disturbance to neighbouring properties or within a surrounding area. At present a number of large scale CHPs are operating to noise requirements similar to those attached to exemptions for small-scale wind turbines and heat pumps (i.e. not exceeding 45db(A) during normal operation at site boundary).

2.2 Wind Energy

Wind has been the world's fastest growing renewable energy source for the last seven years and industry commentators predict that that growth will continue into the future as a result of falling costs of wind energy, in both relative and absolute terms, and of efforts to tackle climate change[6].

Wind energy has been utilised for electricity generation in Ireland for many years in domestic, industrial and farming applications. Ireland's total electricity generating capacity from wind energy is 866.15KW, produced by a total of 88 wind farms across 19 counties[7], with a further generating capacity of almost 450KW due to come on stream over the coming 12 month period.

However, given that Ireland has one of the best wind resources in the world, in terms both of onshore and offshore wind energy, wind energy remains a relatively under-exploited resource, particularly as a means of auto-production.

As of February 2007 the erection of small scale wind turbines within the curtilage of a house and for the purposes of electricity generation has been exempt from planning permission requirements (subject to certain conditions). It is now proposed that similar exemptions can be provided for the erection of wind turbines at industrial or agricultural sites. It is also proposed that these exemptions would be subject to certain conditions.

The aim of the current project is to ensure that the appropriate balance between maximising energy production and minimising unwelcome planning impacts, and in relation to wind energy, a number of planning considerations arise.

These are set below in general terms.

While these apply across all sectors, their significance can vary. The specific visual impacts in respect of each sector are discussed in detail in the relevant chapters below.

Visual Impact

Wind turbines consist of several components; a tower, a gearbox, electrical generator, rotor and blades. The visual impact of a particular wind system therefore depends on a broad range of factors related to the appearance of the turbine itself, including rotor size and axis, overall tower height, rotor speed, but factors such as proximal topographical

[6] *Irish Wind Energy Association*
[7] Ibid, (includes Northern Ireland).

features, tree coverage, proximity to neighbouring properties and roads, etc., are also important.

A wind turbine can affect the owner's view or views from nearby or neighbouring properties. However, depending on the conditions attached to any proposed exemption, the Department is satisfied that the visual impacts can be minimised.

Noise Impact

Most of the sound that comes from a wind turbine is aerodynamic noise caused by the blades passing through the air. At high wind speeds the rotor is likely to produce more sound because of the rapid turning effect. However, high wind speeds increase output from turbines (up to a point). At the same time, increasing wind speeds means that noise from itself increases, which has the effect of masking the increasing noise emissions from the turbine.

Turbulence created by gusting winds or impediments to airflow is an issue that can affect both the performance and noise produced from a wind turbine system.

Shadow Flicker

Shadow flicker is the term used to describe the short-lived effect of shadows cast by rotating blades of wind turbines when the sun passes behind them, which occurs under certain combinations of geographical positions and time of day[8]. The possibility of the shadow from the wind turbine causing a flicker should be considered at the site selection stage, as it is normally possible to avoid or minimise this problem. Reflections from the rotor blades are unlikely, especially as coatings used on modern turbines have been refined to minimise reflection. Due to the likely location of wind turbines and seasonal variation in sunshine, shadow flicker is unlikely to be a major planning consideration in the vast majority of instances.

[8] *Wind Energy Development Guidelines,* Department of the Environment, Heritage and Local Government, June 206.

2.3 Solar Panels

While solar energy is the most commonly used renewable energy source in Ireland, particularly for domestic applications, it remains the case that the true potential of solar energy in Ireland is also under-utilised. A number of recent initiatives have incentivised prospective domestic users to avail of the benefits of solar energy, through planning exemptions and grant funding for solar panel installation made available by Sustainable Energy Ireland.

Solar panels can be categorised according to the type of energy produced. Traditional flat plate or evacuated tube solar collectors are used for the purposes of space and, more commonly, water heating.

Water Heating

A solar water heating system for generally comprises three main components: solar panels, hot water cylinder and a plumbing system. In general, a flat-plate collector (which looks like a thin, flat, rectangular box with a transparent cover) is mounted on the roof, facing the sun. The water is pumped through the solar panels and heated by the energy retained from the sun's rays through the absorber plate. This heated water then flows through a heat exchanger, warming the stored water in the hot cylinder. In effect this serves to pre-heat the water so that less energy is required from traditional sources such as the boiler to raise the temperature to a required level. To move the heated fluid between the collector and the storage cylinder, a system uses a pump or gravity, as water has a tendency to circulate naturally as it is heated. The collectors, which are the key component in a solar hot water system, are silent and generate no emissions. The solar water system needs to be backed up with a conventional heat source such as an electric immersion in the storage cylinder, to provide the remainder of the water needs.

Photo-Voltaic (PV) Systems

PV systems convert solar radiation into electricity. The PV cell consists of one or two layers of a semi-conducting material, usually silicon. When light shines on the cell, it creates an electric field across the layers, causing electricity to flow. The greater the intensity of the light, the greater the flow of electricity. The ideal orientation for PV panels is south facing, although they still produce around 80% of the optimum output when facing east or west.

PV solar panels may vary in appearance and size, but for the most part they bear strong resemblance to conventional solar panels. They can be installed on an existing roof, be an integral part of the roof covering as panels or tiles installed within roof glazing

systems or installed on a nearby structure. The cells are usually grouped together to form a PV array to meet the required output of electricity.

The operation of any type of solar panel is dependent upon seasonal constraints. Solar panels function best at peak sunlight. Both energy and carbon emissions savings can be made with solar technologies. In the Irish climate, typical solar contributions to water heating systems can range between 30% and 60%. One square metre of solar panelling can provide up to 70 litres of hot water per day.

Visual impact

Solar panels have no moving parts, generate no noise or emissions, and can be integrated into all types of buildings – residential, industrial, commercial and public buildings creating a low visual impact making them particularly suitable urban areas. However, solar panels can impact on the appearance of buildings, depending on their design, surrounding development, and landscape.

2.4 Heat Pumps

A heat pump extracts heat from outside a building and releases that heat at a higher temperature inside the building. Heat flows naturally from a higher to a lower temperature but heat pumps are able to reverse the natural flow of heat and force the heat flow in the other direction, using a relatively small amount of drive energy.

The 3 main types of heat pumps are:

- Ground-source heat pumps which draw heat from ground below the frost line;
- Water-source heat pumps extract heat from water (usually well water,) and
- Air-source heat pumps get heat from the outdoor air.

Even at temperatures considered to be cold, the air, ground and water contain useful heat that is continuously replenished by the sun. By applying a little more energy, a heat pump can raise the temperature of this heat energy to the level required. By reversing the process,the heat pump it can also be used for cooling.

Most heat pumps have two main parts; an outdoor unit and an indoor unit. The outdoor unit includes the outdoor heat exchanger, the compressor and a fan. This is where the heat from the air outside is picked up during the heating season, and where the heat from inside the house is rejected during the cooling season. The indoor unit contains the indoor heat exchanger and the fan that distributes heated or cooled air to the distribution system of the house.

Operational issues relating to ownership of water sources, and the risk of contamination arising from leakages, or undesirable, synthetic temperature variations in the aquifer effectively rule out any planning exemptions for water source heat pumps. Therefore, only exemptions from planning permission requirements for ground and air source heat pumps are considered in this consultation document.

Ground Source Heat Pumps (GSHP)

GSHP, also known as geothermal heat pumps, collect heat from solar energy stored in the ground and are ideal for the Irish climate. In this country, the ground maintains a constant temperature between 11ºC and 13ºC several metres below the surface. GSHPs are a means of tapping into and utilising this resource. GSHP were invented more than 50 years ago and continuous development has greatly improved their efficiency and reliability. It is now a proven, safe and environmentally friendly alternative to fossil fuels, that is also cost-effective for certain commercial and domestic applications. GSHP are most likely to be an option where the prospective user has no access to natural gas and so the alternative may be oil or direct electric heating (storage heaters). GSHP ground

loops (lengths of pipe) can be laid in the ground either vertically or horizontally and are then covered over. The exemptions set out in the following sections in respect of GSHP apply to closed loop systems.

While exemptions are being recommended for GSHP systems (horizontal and vertical), it should be borne in mind that the user must ensure that they have adequate information about any services that may be located in the possible site for the ground loop (e.g., electricity cables, gas/water pipes) before construction begins. It is also recommended by SEI that ground source heat pumps should not be installed under tarmacadem due to operational constraints.

Noise

A heat pump contains electric motors, which emit noise. However most units are fitted with extensive sound insulation to minimise emissions and as ground source heating pumps have no outside condensing units, ambient noise levels are significantly reduced. When running, its sound is similar to that of a freezer or a washing machine. Noise levels on the exterior of heat pumps should generally not exceed 43 db (A).

Archaeology

As the installation of ground source heat pumps will require the excavation of trenches (for horizontal loop systems) or boreholes (vertical loop) it is important to consider in advance whether archaeological remains exist on the development site and what implications the development might bring. Consent from the Minister for the Environment, Heritage and Local Government to carry out the works may be required in certain instances, or planning permission may be required if the area is a protected archaeological site.

Air Source Heat Pumps

Air source heat pumps extract the heat in air by using a fan to draw air over coils that extract energy. This energy is then transferred to a building and used as part of a heating supply. Air source heat pumps can be used for a wide variety of applications such as heating or cooling for light industrial / manufacturing purposes, restaurant kitchens and hotel plant rooms where the hot water can easily be used for other applications. They can provide hot water by utilising waste heat in the air. By using waste heat, they can also remove heat from areas where it is not needed. The only visible component of an ASHP is the outdoor collector, generally located on the roof or wall of a building. Visual impact and noise are therefore the main planning issues to be considered in relation to the installation and use of air source heat pumps.

Visual Impact

The outdoor unit should be placed where it is protected from prevailing winter winds, which can intensify frost build-up on the coil that transfers heat. An ideal location is on the south side of a premise, shaded by deciduous trees in the summer. During the winter, sunlight passing through the bare branches helps to warm the unit.

Noise

The outdoor units of some air-source heat pumps can create noise. To avoid noise becoming an issue, the outdoor unit should be located away from windows and adjacent buildings, and a heat pump with the lowest outdoor sound rating should be selected. All heat pumps have sound ratings in units of db (A); the lower the rating, the quieter the unit. Mounting the unit on a noise-absorbing base can also reduce noise.

2.5 Biomass

Biomass refers to all organic material, an example being plant matter. All biomass is therefore either the:

- Direct product of photosynthesis (for example, plant matter – leaves, stems, etc.) or the;
- Indirect product of photosynthesis (for example, animal mass resulting from the consumption of plant matter).

Energy from biomass is a renewable indigenous source of fuel for heat and/or power generation through CHP. In this section, biomass is taken to refer only to biomass for the purposes of heating, as biomass for the purposes of CHP has been discussed previously.

Conversion of biomass into energy by currently proven technologies is based on combustion. Applications can include stand-alone heat plants and individual heating boilers in buildings. As a renewable energy source biomass is still a relatively new technology to the Irish market. Biomass boilers serve the same two functions as solar panels, i.e., spatial and thermal heating. A biomass heating system generally comprises a boiler, connector tubes and a flue.

The heat output of biomass heating systems can be significant. For example a small biomass unit of five cubic metres can potentially provide up to 16,200 kWh of heat output per month or 540 kWh per day. Two of the most common biomass units are woodchip and wood pellet fuelled boilers. Woodchip biomass heaters can now be purchased as a fully automatic system whereby woodchip is transferred to the boiler automatically from a storage compound or hopper (while wood fuel is carbon neutral, it should be noted that small amounts of N_{OX} and S_{OX} can also be emitted by biomass systems).

There are several potential planning implications of biomass systems, which are discussed below.

Visual Impact

A biomass system itself can have varying visual impacts. A retrofitted biomass unit will have little negative impacts upon the visual amenity on a specific area where it is replacing an existing heating system (i.e., the biomass system would be housed in an existing boiler house). Where this is not possible, it may be necessary to construct a modest size new boiler house to accommodate the boiler, as well as a storage area for the particular biomass fuel used.

In addition, flues are required for the dispersal of emissions from the combustion process. These will vary in height according to the output of the biomass heater, but for non-CHP biomass, flues would generally be no more than 8 – 10 metres in height.

Noise

Biomass heating systems produce generally low-level noise. However, as with CHP installations, measures can be taken to ensure that noise emissions from units do not cause disturbance to neighbouring properties or within a surrounding area.

CHAPTER 3 – EXEMPTIONS PROPOSED FOR COMBINED HEAT & POWER

3.0 Overview

Planning exemptions for Combined Heat and Power Systems are proposed for industrial, commercial, and public buildings and for agricultural uses. Because the planning considerations, particularly in terms of visual amenity, vary across these different sectoral building types, two different sets of conditions for CHP exemptions are proposed.

The first, and most generous exemption applies to industrial sites. The second applies to commercial (including hotels and leisure centres), public buildings (including hospitals and educational facilities), and CHP systems within farmyard complexes. Each exemption applies only to CHP systems that are fully enclosed within covering structure for the purposes of minimising visual impact.

The draft amendments to the Planning and Development Regulations 2001 to give effect to the proposed exemptions outlined below are set out at section 3.3.

3.1 Industrial Buildings

Dimensions

The proposed exemption for CHP systems within the curtilage of an industrial building exempts a structure measuring up to 500 square metres surface area, 10 metres in height and 50 metres in length. A maximum of 2 flues can be attached to the roof of the structure. These flues can measure up to 20 metres in height, measured from ground level. The flues are also subject to a maximum diameter of 2 metres. A maximum of one such structure per industrial site is exempted from planning permission requirements.

The physical dimensions of the structure have been chosen on the basis that a structure of this size could house a CHP system with an output of up to 5MW. This level would be sufficient to comfortably meet the total power needs of a large-scale industrial operation. It is considered that the proposed siting conditions attached to the proposed exemption will sufficiently mitigate against any potential negative visual impacts of such a structure.

Siting

It is proposed that structures housing CHP systems would not be located less than 200 metres from the nearest inhabited dwelling (as measured from the structure itself and not the site boundary of the industrial establishment). Similarly, the exemption would require that such structures would not be located within 50 metres of the nearest public road. Both of these conditions are proposed for the purposes of minimising visual impacts.

Noise

A condition relating to noise levels arising from the operation of the CHP has been included in order to protect the amenity of neighbouring properties. This condition requires that noise levels from the CHP system may not exceed 43dBA during normal operation, or 5dBA above background noise, as measured at the site boundary nearest to the structure. In conjunction with the requirement that no such structure shall be located within 200 metres of an inhabited dwelling, this noise condition will ensure that the amenity of any neighbouring party is well protected.

3.2 Commercial and Public Buildings, and Agricultural Structures

Dimensions

On the basis that the potential negative visual impacts of enclosed CHP systems would generally be greater in the case of public and commercial buildings, and agricultural structures (each of which, more often than industrial developments, can be located in areas of mixed uses, and are often closer to residential areas), it is proposed that the conditions relating to the physical dimensions of such a structure should be adapted accordingly. The proposed total floor area allowed is the same as that currently exempted for agricultural barns, stores, sheds or glass houses (Schedule 2, Part 3, Class 8, Planning and Development Regulations 2001).

Therefore, the proposed exemption for CHP systems within the curtilage of public or commercial buildings, or as part of a farmyard complex, allows a structure measuring up to 300 square metres of surface area, 8 metres in height and 40 metres in length. Again, a maximum of 2 flues can be attached to the roof of the structure, however, these flues shall not exceed 15 metres in height, measured from ground level. The flues are also subject to a maximum diameter of 2 metres. As in the case of industrial sites, A maximum of one such structure would be exempt from planning permission requirements.

Siting & Noise

The same conditions attached to industrial CHP in relation to siting of the enclosing structure and noise emissions are proposed for CHP systems at commercial or public buildings or as part of farmyard complexes.

3.3 Draft Amendments to the Planning and Development Regulations 2001 providing exemptions for CHP Systems

Column 1 Description of Development	Column 2 Conditions and Limitations
The erection, within the curtilage of an industrial building, of a structure for the purposes of housing a [fully enclosed] Combined Heat and Power system.	1. The gross floor space of the structure shall not exceed 500 square metres. 2. No such structure shall exceed 10 metres in height, or 50 metres in length. 3. No such structure shall be within 200 metres of the nearest inhabited dwelling. 4. No such structure shall be located within 50 metres of any public road 5. No such structure shall have more than 2 flues, neither of which shall exceed 20 metres in height from ground level. 6. The diameter of any flue shall not exceed 2 metres. 7. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db(A) above the background noise, whichever is greater, as measured at the site boundary. 8. No more than one such structure shall be erected within the curtilage of an industrial, or commercial building.
The erection, within the curtilage of a public or commercial building, of a structure for the purposes of housing a [fully enclosed] Combined Heat and Power system.	1. The gross floor space of the structure shall not exceed 300 square metres. 2. No such structure shall exceed 8 metres in height, or 40 metres in length. 3. No such structure shall be within 200 metres of the nearest inhabited dwelling. 4. No such structure shall be located within 50 metres of any public road 5. No such structure shall have more than 2 flues,

	neither of which shall exceed 15 metres in height from ground level. 6. The diameter of any flue shall not exceed 2 metres. 7. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db(A) above the background noise, whichever is greater, as measured at the site boundary. 8. No more than one such structure shall be erected within the curtilage of an industrial, or commercial building.
Agricultural Structures The erection of a structure for the purposes of housing a [fully enclosed] Combined Heat and Power system.	1. The gross floor space of the structure shall not exceed 300 square metres. 2. No such structure shall exceed 8 metres in height, or 40 metres in length. 3. No such structure shall be within 200 metres of the nearest inhabited dwelling. 4. No such structure shall be located within 50 metres of any public road 5. No such structure shall have more than 2 flues, neither of which shall exceed 15 metres in height from ground level. 6. The diameter of any flue shall not exceed 2 metres. 7. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db(A) above the background noise, whichever is greater, as measured at the site boundary. 8. No more than one such structure shall be erected within a farmyard complex.

1. DO YOU AGREE WITH THE PROPOSED EXEMPTIONS FOR CHP SYSTEMS?

2. DO YOU HAVE ANY SUGGESTED IMPROVEMENTS TO THE PROPOSED EXEMPTIONS?

3. IF YOU DISAGREE WITH THE PROPOSED INTRODUCTION OF EXEMPTIONS, PLEASE OUTLINE REASONS

CHAPTER 4 – EXEMPTIONS PROPOSED FOR WIND TURBINES

4.0 Overview

Planning exemptions for wind turbines are proposed for industrial, commercial, and public buildings and for agricultural uses subject to certain conditions. However, by their very nature, wind turbines raise a number of significant planning considerations which militate against significant exemptions. For example, exemptions for wind turbines for domestic use were introduced earlier this year, allowing the erection of a 13 metre high (total height) turbines without planning permission (provided that certain other conditions were met). This height condition meant that the 2.5kW range of turbines was brought within the exemptions, potentially enabling households to derive a more significant overall proportion of their energy needs from the turbine. However, given their much larger energy requirements, exemptions for wind turbines of the order of 30m+ in height would be necessary in order to enable prospective industrial, commercial or agricultural end users derive significant proportions of their total requirements from wind energy. From the point of view of visual impact, it is not considered feasible to provide for such exemptions.

Nevertheless, allowances are being proposed for potential users who wish to possibly power certain aspects of their operations, which do not necessarily have large electricity requirements, from on-site wind generation. It is proposed that the same exemptions and conditions apply to industrial, commercial, agricultural and public buildings. In addition, an amendment to the Regulations which would have the effect of exempting temporary met masts (for wind mapping in advance of the erection of turbines) from planning permission requirements is being proposed, subject to certain conditions. This is set out section 4.2 below.

The draft amendments to the Planning and Development Regulations 2001 to give effect to the proposed exemptions outlined below are set out at section 4.3.

4.1 Exemptions and Conditions

Free Standing Turbines Only

It is not proposed to provide exemptions for building mounted turbines on the basis that the absence of an applicable building standards for such turbines means that the planning code is the only process by which safety considerations relating to these turbines can currently be addressed.

As with any other proposed development involving renewable energy technology which falls outside the scope of the proposed exemptions, this does not mean that such turbines are not permitted under any circumstances – it merely means that planning permission is required before these turbines can be erected.

Dimensions

In light of the points outlined above in relation to the likely height requirements of wind turbines with sufficient output to power industrial or agricultural operations, it is proposed that a maximum turbine height of 20 metres (total height including the high point of the rotor blade in the vertical position) be allowed as exempted development. The maximum exempted height for domestic turbines, at 13 metres, would be wholly unsuitable for industrial, commercial, or public buildings, which would in general be higher than the average house, and would thereby be liable to create levels of turbulence that would severely impede the safe and effective performance of the turbines at that height.

Given the proposed total height, there is scope for a wide range of blade diameters up to 8 metres to be used to gain maximum benefit from the turbine for its location. However, a minimum clearance of 3 metres from the ground should be maintained for the purposes of public safety.

Siting

On safety and cumulative visual impact grounds, it is proposed that the turbine should be located:

- No nearer than its total height plus 1 metre from the nearest party boundary,
- No nearer than 100 metres from the nearest inhabited dwelling (measured from the turbine itself and not the site boundary of the industrial establishment),
- No nearer than 50 metres from the nearest public road, and;
- No nearer than two times the rotor diameter from any existing overhead cables .

The first three of these conditions are proposed primarily for the purposes of minimising visual impacts, and to a lesser degree, on safety grounds. The final condition is proposed purely on safety grounds.

It is acknowledged that these conditions may limit the potential growth of the technology in urban commercial areas, but it aims at reaching an appropriate compromise between the requirements of a prospective user for a renewable energy supply and the safety of the general public.

Noise

The nature of the area in which industrial and commercial development takes place would tend to have higher ambient noise levels. However, it is considered that WHO guidelines would be appropriate in all instances.

Numbers of Turbines

Only 1 turbine is allowed on each site.

Other visual impacts

Non-reflective finishes and no logos are aimed at limiting any unnecessary visual impacts.

4.2 Met Masts

Before large wind turbines are erected, in order to ensure that a proposed wind energy development is viable in terms of the generating potential of a site, prospective developers will often erect a temporary structure known as a met mast. Met masts are, as the name suggests, masts which enable meteorological conditions above the ground (specifically, wind speed, direction and turbulence) to be recorded and analysed over a period of time. While met masts will often correspond in height to the hub height of a proposed turbine, this is not always the case. It is possible to employ met masts at heights lower than final turbine height and to extrapolate the data upwards for an approximation of the conditions at the proposed turbine height.

Met masts can also have the added advantage of providing planners and neighbouring properties with a short term approximation of the appearance of a wind turbine.

Planning considerations

Currently, all met masts require planning permission, regardless of height or the length of time for which they are to remain in place. However, in terms of their appearance, met masts are less visually intrusive than wind turbines for a number of reasons. Firstly, the masts itself tends to be considerably narrower than a turbine tower. Secondly, while the anemometre rotates as moving air passes between its blades, the diameter of the anemometre (or anemometres at different levels) would generally be less than a metre.

Similarly, the potential noise emissions are relatively very low.

For these reasons, it is now proposed that an exemption be introduced allowing for the erection of a met mast of up to 50 metres for a period of 9 months in any 18 month period without planning permission. This limitation is intended to prevent a series of masts being installed over consecutive years.

4.3 Draft Amendments to the Planning and Development Regulations 2001 providing exemptions for Wind Turbines

Column 1 Description of Development	Column 2 Conditions and Limitations
The construction, erection or placing within the curtilage of an industrial, public, or commercial building of a wind turbine.	1. The turbine shall not be erected on or attached to the building or other structure within its curtilage. 2. The total height of the turbine shall not exceed 20 metres. 3. The rotor diameter shall not exceed 8 metres. 4. The minimum clearance between the lower tip of the rotor and ground level shall not be less than 3 metres. 5. The supporting tower shall be a distance of not less than the total structure height (including the blade of the turbine at the highest point of its arc) plus one metre from any party boundary. 6. The turbine shall not be located within; a. 50 metres of any public road, b. 100 metres of the nearest inhabited dwelling c. 2 rotor diameters of any overhead cables. 7. Noise levels must not exceed 43db (A) during normal operation, or in excess of 5db (A) above the background noise, whichever is greater, as measured from the nearest neighbouring inhabited dwelling. 8. No more than one turbine shall be erected within the curtilage of the building. 9. All turbine components shall have a matt, non-reflective finish and the blade shall be made of material that does not deflect telecommunication signals. 10. No sign, advertisement or object, not required for the functioning or safety of the turbine shall be

	attached to or exhibited on the wind turbine.
Agricultural Structures The construction or erection of a wind turbine.	1. The turbine shall not be erected on or attached to the building or other structure. 2. The total height of the turbine shall not exceed 20 metres. 3. The rotor diameter shall not exceed 8 metres. 4. The minimum clearance between the lower tip of the rotor and ground level shall not be less than 3 metres. 5. The supporting tower shall be a distance of not less than the total structure height (including the blade of the turbine at the highest point of its arc) plus one metre from any party boundary. 6. The turbine shall not be located within; a. 50 metres of any public road, b. 100 metres of the nearest inhabited dwelling c. 2 rotor diameters of any overhead cables. 7. Noise levels must not exceed 43db (A) during normal operation, or in excess of 5db (A) above the background noise, whichever is greater, as measured from the nearest neighbouring inhabited dwelling. 8. No more than one turbine shall be erected within the curtilage of an industrial building. 9. All turbine components shall have a matt, non-reflective finish and the blade shall be made of material that does not deflect telecommunication signals. 10. No sign, advertisement or object, not required for the functioning or safety of the turbine shall be attached to or exhibited on the wind turbine.

4.4 Draft Amendments to the Planning and Development Regulations 2001 providing exemptions for temporary met masts

Column 1 Description of Development	Column 2 Conditions and Limitations
Temporary structures and uses The erection, in advance of future development for the purposes of harnessing wind power for energy production, of a mast [/ structure] for mapping meteorological conditions.	1. No such masts shall be erected for a period exceeding 9 months in any 18 month period. 2. The total mast height shall not exceed 50 metres. 3. The mast shall be a distance of not less than the total structure height plus one metre from any party boundary. 4. Not more than one such mast shall be erected 5. No sign, advertisement or object, not required for the functioning or safety of the mast shall be attached to or exhibited on the mast.

1. DO YOU AGREE WITH THE PROPOSED EXEMPTIONS FOR WIND TURBINES?

2. DO YOU HAVE ANY SUGGESTED IMPROVEMENTS TO THE PROPOSED EXEMPTIONS?

3. IF YOU DISAGREE WITH THE PROPOSED INTRODUCTION OF EXEMPTIONS FOR WIND TURBINES, PLEASE OUTLINE REASONS

CHAPTER 5 – EXEMPTIONS PROPOSED FOR SOLAR ENERGY

5.0 Overview

Planning exemptions with varying conditions are proposed for the installation of solar panels (both roof and wall mounted, as well as free standing solar arrays) within the curtilage of industrial, commercial, public, and agricultural buildings. As indicated in Chapter 2, visual impact is the primary planning consideration with regard to the installation of solar panels.

As in the case of proposed exemptions for CHP systems, the scale of the proposed exemptions differs across the sectoral building types, on the basis that the potential visual impacts also vary according to the typical siting and respective natures of these building types. The most generous exemption again applies to industrial buildings on the basis that for the most part industrial premises tend to be clustered, tend not to be located in areas of high visual amenity, and tend not to be overlooked by residential buildings. The same exemptions and conditions are then proposed for commercial (including hotels and leisure centres), public buildings (including hospitals and educational facilities), and agricultural buildings together, on the grounds that these types of buildings tend to be located, in the case of public and commercial buildings, in mixed use areas where residential properties are also common, and in the case of agricultural buildings, in areas of high visual amenity and natural beauty.

The draft amendments to the Planning and Development Regulations 2001 to give effect to the proposed exemptions outlined below are set out at section 3.

5.1 Industrial Buildings

Dimensions

The proposed exemptions allow for the placing of solar panels on the roof or wall of an industrial building, or as part of a free-standing solar array within the curtilage of an industrial building. Both PV and conventional heating panels are included under the proposed exemption.

No limit on the total surface area of solar panels placed on the roof is proposed, while a limit of 50 square metres is proposed for wall mounted panels or free standing solar arrays (on the basis that the visual impact of wall mounted panels and solar arrays at ground level would be much greater than that of a large area of panels on the roof of a building which is unlikely to be overlooked from domestic buildings).

To facilitate optimal yield, panels may be tilted from the plane of the roof or wall on which they are mounted, provided the distance of the plane of the panel does not exceed 1 metre from the plane of the wall or pitched roof, or 2 metres from the plane of a flat roof. It is considered that these conditions strike a balance between allowing the prospective end user to maximise the benefits of a solar array, while also minimising any negative visual impacts.

On the basis of visual considerations the maximum proposed height of a free-standing array is 2 metres.

Siting

The proposed exemption provides that solar panels can be installed on auxiliary buildings within the curtilage of an industrial building so that the total available surface area for solar collectors can be maximised.

In high winds there is a possibility that a solar collector panel may be lifted away from the roof if the wind weakens the tiles at the edge of the roof. Therefore, a condition is attached to the proposed exemption requiring that solar panels be located a minimum of 50cm from the edge of wall or roof on which they are mounted.

5.2 Commercial, Public and Agricultural Buildings

These proposed exemptions also allow for the placing of solar panels on the roof or wall of commercial, public and agricultural buildings, or as part of a free-standing solar array within the curtilage of these buildings. Once again, the exemption would apply to all types of solar panel.

The total surface area of solar panels placed on the roof is limited to 50 square metres or 50% of the total roof area, whichever is the lesser. A limit of 25 square metres is proposed for wall mounted panels or free standing solar arrays (again on the basis that the visual impact of wall mounted panels and solar arrays at ground level would be much greater than that of a large area of panels on the roof of a building which is unlikely to be overlooked from domestic buildings). These conditions are proposed on the grounds of visual impact considerations.

The same 2 metres maximum height of a free-standing array will apply to commercial, public and agricultural buildings as applies to industrial buildings. This is the case also with conditions relating to the degree of panel tilt allowed for maximising return.

Siting

As with industrial buildings, solar panels can be installed on auxiliary buildings within the curtilage of a commercial, public and agricultural buildings, but must be a minimum distance of 50cms from the edge of the roof or wall on which they are mounted.

5.3 Draft Amendments to the Planning and Development Regulations 2001 providing exemptions for solar panels

Column 1 Description of Development	Column 2 Conditions and Limitations
The installation or erection of a solar panel on, or within the curtilage of an industrial building, or any ancillary buildings within the curtilage of an industrial building.	1. The distance between the plane of the wall or a pitched roof and the panel shall not exceed 1 metre. 2. The distance between the plane of a flat roof and the panel shall not exceed 2 metres. 3. The solar panel shall be a minimum of 50cm from the edge of the wall or roof on which it is mounted. 4. The total aperture area of any wall-mounted panel or free-standing solar array shall not exceed 50 square metres. 5. The height of a free-standing solar array shall not exceed 2 metres, at its highest point, above ground level.
The installation or erection of a solar panel on, or within the curtilage of a commercial or public building, or any ancillary buildings within the curtilage of a commercial or public building.	1. The total aperture area of any such panel on, or within, the curtilage of a commercial or public building, or taken together with any other such panel, any buildings of a previously placed on or within the said curtilage, shall not exceed 50 square metres or 50% of the total roof area, whichever is the lesser. 2. The distance between the plane of the wall or a pitched roof and the panel shall not exceed 1 metre. 3. The distance between the plane of a flat roof and the panel shall not exceed 2 metres. 4. The solar panel shall be a minimum of 50cm from the edge of the wall or roof on which it is

	mounted. 5. The total aperture area of any wall-mounted panel or free-standing solar array shall not exceed 25 square metres. 6. The height of a free-standing solar array shall not exceed 2 metres, at its highest point, above ground level.
Agricultural Structures The installation or erection of a solar panel on, or within the curtilage of aan agricultural structure, or public building, or any ancillary buildings within the curtilage of an industrial building	1. The total aperture area of any such panel, on, or within the curtilage of an agricultural structure building, or taken together with any other such panel previously placed on or within the said cartilage shall not exceed 50 square metres or 50% of the total roof area, whichever is the lesser 2. The distance between the plane of the wall or a pitched roof and the panel shall not exceed I metre. 3. The distance between the plane of a flat roof and the panel shall not exceed 2 metres. 4. The solar panel shall be a minimum of 50cm from the edge of the wall or roof on which it is mounted. 5. The total aperture area of any wall-mounted panel or free-standing solar array shall not exceed 25 square metres. 6. The height of a free-standing solar array shall not exceed 2 metres, at its highest point, above ground level.

1. DO YOU AGREE WITH THE PROPOSED EXEMPTIONS FOR SOLAR PANELS?

2. DO YOU HAVE ANY SUGGESTED IMPROVEMENTS TO THE PROPOSED EXEMPTIONS?

3. IF YOU DISAGREE WITH THE PROPOSED INTRODUCTION OF EXEMPTIONS FOR SOLAR PANELS, PLEASE OUTLINE REASONS

CHAPTER 6 – EXEMPTIONS PROPOSED FOR GROUND SOURCE HEAT PUMPS (GSHP) AND AIR SOURCE HEAT PUMPS (ASHP)

6.0 Overview

Planning exemptions with varying conditions are proposed for the installation of Ground Source Heat Pumps (GSHP) and Air Source Heat Pumps (ASHP) within the curtilage of industrial, commercial, public, and agricultural buildings.

As in the case of proposed exemptions for CHP and solar systems, the scale of the proposed exemptions differs across the sectoral building types, on the basis that the potential visual impacts also vary according to the typical siting and respective natures of these building types. The most generous exemption again applies to industrial buildings on the basis that for the most part industrial premises tend to be clustered, tend not to be located in areas of high visual amenity, and tend not to be overlooked by residential buildings. The same exemptions and conditions are then proposed for commercial (including hotels and leisure centres), public buildings (including hospitals and educational facilities), and agricultural buildings together, on the grounds that these types of buildings often tend to be located, in the case of public and commercial buildings, in mixed use areas where residential properties are also common, and in the case of agricultural buildings, in areas of high visual amenity and natural beauty.

As the installation of GSHPs will require the excavation of trenches or deep boreholes it is important to consider in advance whether items of archaeological significance exist on the development site and what implications the development might bring. Consent from the Minister for the Environment, Heritage and Local Government to carry out the works **may** be required in certain instances, or planning permission may be required if the area is a protected archaeological site.

As stated in Chapter 2, prospective users of GSHPs must ensure that they have adequate information about any services that may be located in the possible site for the ground loop (e.g., electricity cables, gas/water pipes) before construction of a ground source heat pump begins. It is also recommended by SEI that ground source heat pumps should not be installed under tarmacadam due to operational constraints.

The draft amendments to the Planning and Development Regulations 2001 to give effect to the proposed exemptions outlined below are set out at section 6.3.

6.1 Industrial Buildings

Ground Alteration - GSHP

This exemption provides that the level of the ground shall not be altered by more than 1 metre above or below the level of the adjoining ground. This corresponds to an existing requirement in relation to landscaping works in the 2001 Planning and Development Regulations.

The building plot will need sufficient land available for installation of the ground works (approximately ½ an acre is recommended for a GSHP). Where there is no room for the installation of horizontal bore GSHP's, vertical boreholes can be used. The dimensions of trenches or boreholes will vary between manufacturers.

Dimensions - ASHP

The proposed exemption for ground source and air source heat pump systems within the curtilage of an industrial building exempts air source heat pumps with a combined total collector area of up to 15 square metres.

Siting - ASHP

It is proposed that air source heat pump systems would not be located less than 50cm from the edge of the wall or roof on which it is mounted. This condition is proposed for the purposes of avoiding any negative visual impacts of such structures, and also for purposes of safety, as there may be potential for ASHP collectors to be de-stabilised in high winds.

The outdoor unit should be placed where it is protected from prevailing winter winds, which can intensify frost build-up on the coil that transfers heat. An ideal location is on the south side of a premise, shaded by deciduous trees in the summer. During the winter, sunlight passing through the bare branches helps warm the unit.

Noise – ASHP and GSHP

A condition relating to noise levels arising from the operation of the heat pump has been included in order to protect the amenity of neighbouring properties. This condition

requires that noise levels from the heat pump system may not exceed 43dB during normal operation, or 5dB above background noise, as measured at the site boundary nearest to the structure.

To avoid noise becoming an issue, the outdoor unit should be located away from windows and adjacent buildings, and a heat pump with the lowest outdoor sound rating should be selected. All heat pumps have sound ratings in units of db (A); the lower the rating, the quieter the unit. Mounting the unit on a noise-absorbing base can also reduce noise. This noise condition will ensure that the amenity of any neighbouring party is well protected.

6.2 Commercial, Public and Agricultural Buildings

These proposed exemptions also allow for the placing of ground source and air source heat pumps on or within the curtilage of commercial, public and agricultural buildings.

Apart from a slightly smaller size and an additional condition relating to the siting of ASHP units on commercial, public and agricultural buildings, the same exemptions apply to these sectors as outlined in relation to the industrial sector.

Siting - ASHP

The proposed exemption provides that no ASHP collector shall be erected on, or forward of, the front wall of the building. It is considered that this proposed conditions attached to the proposed exemption will sufficiently mitigate against any potential negative visual impacts of such a structure.

6.3 Draft Amendments to the Planning and Development Regulations 2001 providing exemptions for Ground Source and Air Source Heat Pump Systems

Column 1 **Description of Development**	**Column 2** **Conditions and Limitations**
The installation, on or within the curtilage of an industrial building or any ancillary buildings within the curtilage of an industrial building, of a ground source heat pump system (horizontal or vertical) or air source heat pumps.	1. The level of the ground shall not be altered by more than 1 metre above or below the level of the adjoining ground. 2. The total area of such heat pumps shall not exceed 15 square metres. 3. The heat pump shall be a minimum of 50cm from the edge of the wall or roof on which it is mounted. 4. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db (A) above the background noise, whichever is greater, as measured from the nearest neighbouring inhabited dwelling.
The installation, on or within the curtilage of a commercial or public building or any ancillary buildings within the curtilage of a commercial or public building, of a ground source heat pump system (horizontal or vertical) or air source heat pumps.	1. The level of the ground shall not be altered by more than 1 metre above or below the level of the adjoining ground. 2. The total area of such heat pumps shall not exceed 10 square metres. 3. The heat pump shall be a minimum of 50cm from the edge of the wall or roof on which it is mounted. 4. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db (A) above the background noise, whichever is greater, as measured from the nearest neighbouring inhabited dwelling.

Agricultural Structures The installation of a ground source heat pump system (horizontal and vertical) or air source heat pumps.	1. The level of the ground shall not be altered by more than 1 metre above or below the level of the adjoining ground. 2. The total area of such heat pumps shall not exceed 10 square metres. 3. No such structure shall be constructed, erected or placed forward of the front wall of the building. 4. The heat pump shall be a minimum of 50cm from the edge of the wall or roof on which it is mounted. 5. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db (A) above the background noise, whichever is greater, as measured from the nearest neighbouring inhabited dwelling.

6.1. DO YOU AGREE WITH THE PROPOSED EXEMPTIONS FOR HEAT PUMPS?

6.2. DO YOU HAVE ANY SUGGESTED IMPROVEMENTS TO THE PROPOSED EXEMPTIONS?

6.3. IF YOU DISAGREE WITH THE PROPOSED INTRODUCTION OF EXEMPTIONS FOR HEAT PUMPS, PLEASE OUTLINE REASONS

CHAPTER 7– EXEMPTIONS PROPOSED FOR BIOMASS BOILERS

7.0 Overview

Exemptions are proposed for biomass boilers across all of the sectors covered by this paper.

It is proposed that the same exemptions and conditions will apply to the installation of biomass heating systems to industrial, commercial and public buildings, and agricultural structures (taken here to include the boiler house, fuel storage tank and flues attached to the boiler house).

The draft amendments to the Planning and Development Regulations 2001 to give effect to the proposed exemptions outlined below are set out at section 7.2.

7.1 Industrial, Commercial, Public and Agricultural Buildings

Dimensions & Siting

While it is likely that many prospective users of biomass heating systems will look to install such systems as replacements for existing conventional fossil fuel heating systems (in which case no planning issues arise), it is proposed that exemptions should be introduced where works are required for installation. This is in recognition of the fact that a biomass energy producing installation may often require new structures of a sufficient size for effective operation and energy output**.**

The proposed exemption therefore allows for the installation of a boiler house with a surface area of up to 20 square metres, and up to 3 metres in height. This exemption is sufficiently generous to include biomass heaters with generating output of up to 5MW.

It is also proposed that the installation of an over-ground fuel storage tank for the biomass system would also be exempted. For these tanks it is proposed that the maximum allowable capacity be set at 50,000 litres. This lower storage capacity is proposed on the basis that the visual impact of a storage tank above ground is likely to be more significant than in the case of a tank that is wholly submerged.

Conditions relating to flues erected on biomass boiler houses are the same as those attached to flues for CHP systems. This means that a maximum of 2 flues are allowed, subject to a maximum height of 15 metres from ground level, and to a maximum diameter of 2 metres.

Noise

A condition relating to noise levels arising from the operation of the boiler unit has been included in order to protect the amenity of neighbouring properties. This condition requires that noise levels from the boiler system may not exceed 43dB during normal operation, or 5dB above background noise, as measured at the site boundary nearest to the structure.

7.2 Biomass – Industrial, Commercial, Public Buildings & Agricultural Structures

Column 1 Description of Development	Column 2 Conditions and Limitations
The provision of a biomass boiler, including a boiler house, flues mounted on the boiler house, and over-ground fuel storage tank as part of a heating system for an industrial, commercial or public building.	1. The gross floor space of the boiler house shall not exceed 20 square metres. 2. The capacity of the fuel storage tank shall not exceed 50,000 litres. 3. The height of a boiler house or fuel storage tank installed above ground level shall not exceed 3 metres. 4. The height of a flue mounted on a biomass unit shall not exceed 15 metres, measured from ground level. 5. No more than 2 flues shall be erected. 6. The diameter of any flue shall not exceed 2 metres. 7. The boiler house shall not be located within; a. 50 metres of any public road, b. 100 metres of the nearest inhabited dwelling. 8. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db(A) above the background noise, whichever is greater, as measured from the site boundary.

Agricultural Structures The provision of a biomass boiler, including a boiler house, flues mounted on the boiler house, and over-ground fuel storage tank as part of a heating system for an agricultural building.	1. The gross floor space of the boiler house shall not exceed 20 square metres. 2. The capacity of the fuel storage tank shall not exceed 50,000. 3. The height of a boiler house or fuel storage tank installed above ground level shall not exceed 3 metres. 4. The height of a flue mounted on a biomass unit shall not exceed 20 metres, measured from ground level. 5. No more than 2 flues shall be erected. 6. The diameter of any flue shall not exceed 2 metres. 7. The boiler house shall not be located within; a. 50 metres of any public road, b. 100 metres of the nearest inhabited dwelling. 8. Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db(A) above the background noise, whichever is greater, as measured from the site boundary.

7.1. DO YOU AGREE WITH THE PROPOSED EXEMPTIONS FOR BIOMASS BOILERS?

7.2. DO YOU HAVE ANY SUGGESTED IMPROVEMENTS TO THE PROPOSED EXEMPTIONS?

7.3. IF YOU DISAGREE WITH THE PROPOSED INTRODUCTION OF EXEMPTIONS FOR BIOMASS, PLEASE OUTLINE REASONS

7.4. DO YOU THINK AN EXEMPTION SHOULD ALSO BE INCLUDED FOR UNDERGROUND STORAGE TANKS?

7.5. IF SO, WHAT CONDITIONS SHOULD BE ATTACHED TO SUCH AN EXEMPTION?

Appendix 1
Summary of Proposed Exemptions:

CHP Systems

Industrial buildings:

- Gross floor space < 500 m^2
- Max height = 10m and max length = 50m
- 200m from nearest inhabited dwelling
- 50m from nearest public road
- Up to 2 flues, max height 20m and max diameter 2m
- Noise levels < 43db(A) or <5 db(A) above background noise at site boundary
- Only 1 per site.

Public and commercial buildings, and agricultural structures:

- As above, except
- Gross floor space < 300 m^2
- Max height = 8m and max length = 40m
- Flue height 15m

Wind turbines

Industrial, public and commercial buildings, and agricultural structures:

- No exemption for building-mounted turbines
- Max height < 20m
- Rotor diameter < 8m
- Ground clearance > 3m
- Turbine height plus 1 m from nearest party boundary
- 100m from nearest inhabited dwelling
- 50m from nearest public road
- 2 rotor diameters from overhead cables
- Noise levels < 43db(A) or <5 db(A) above background noise at site boundary
- Only 1 per site
- No logos, and non-reflective finish

Met masts

- Max length of time in position < 9 months out of an 18 month period
- Max height < 50m
- Turbine height plus 1 m from nearest party boundary
- Only 1 per site
- No logos, and non-reflective finish

Solar panels

Industrial buildings:

- < 1m from plane of a pitched roof to panel
- < 2m from plane of a flat roof to panel
- 50cm from edge of wall or roof
- Aperture area of wall mounted or free-standing arrays < 50m^2

- Height of free-standing arrays < 2m

Public and commercial buildings, and agricultural structures:
- As above, except:
- Total aperture area < 50m^2 or 50% of total roof area, whichever is lesser
- Aperture area of wall mounted or free-standing arrays < 25m^2

Ground source and air source heat pumps

Industrial buildings:
- Ground level alteration < 1m above or below adjoining ground
- Total area of heat pumps < 15m^2
- 50cm from edge of wall or roof
- Noise levels < 43db(A) or <5 db(A) above background noise at site boundary

Public and commercial buildings, and agricultural structures:
- As above, except:
- Total area of heat pumps < 10m^2

Biomass

Industrial, public and commercial buildings, and agricultural structures:
- Gross floor space < 20 m^2
- Capacity of fuel storage tank above ground < 50,000 litres
- Max height of boiler house or fuel tank < 3m
- Up to 2 flues, max height 15m and max diameter 2m
- 100m from nearest inhabited dwelling
- 50m from nearest public road
- Noise levels < 43db(A) or <5 db(A) above background noise at site boundary