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1. Introduction

Article 10 of Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market requires Member States to report to the commission on a variety of aspects of cogeneration.

2. Reporting Under Article 6(1)

> *Member States shall establish an analysis of the national potential for the application of high-efficiency cogeneration, including high-efficiency micro-generation.*

2.1 Overview of Cogeneration in Ireland

The potential for the uptake of cogeneration, including high efficiency cogeneration, has been assessed in Ireland since the early 1990s, including assessments of market penetration, barriers to its uptake and potential areas of growth. However, to date the uptake of cogeneration has been slow, with a total installed capacity at the end of 2008 in the order of 300 MW. This compared with an installed capacity in the early 1990s in the order of 55 MW. In the intervening period, the underlying annual growth rate has been approximately 5 MW. However, a single 160 MW cogeneration plant constructed in 2006 accounted for over 50% of the national capacity at end of 2008. While uptake of cogeneration technology has been strong in more recent years, the overall growth in capacity has remained low compared to other Member States (Ireland 7.2%[1], Netherlands 29%[2], Denmark 47%[2]).

2.2 Structural Aspects of CHP in Ireland

There are several key structural reasons why Ireland has had a low take up of cogeneration to date compared to other Member States

1. Ireland's industry is, in the main, based on high value, low energy intensity sectors including pharmaceuticals, ICT and the services industries.

2. The single large energy-intense industrial site (an alumina refinery) has 160 MW of cogeneration plant, which represented over 50% of national installed capacity at the end of 2008.

3. Several of Ireland's medium sized and energy intensive industries have closed over the last ten years, including two sugar plants (14.8 MW and 11.2 MW) and an organic chemical manufacturer (5 MW).

4. There are no Waste-to-Energy plants in Ireland, converting municipal waste to electricity and heat, as is common practice in other Member States.

5. There is no tradition of district heating in Ireland, due to the distribution of the population, mild climate, and low-density and low-rise housing with few multi-family dwellings.

Thus the structure of Ireland's industrial base and its housing pattern are not conducive to significant penetration of cogeneration, even in the absence of all other barriers.

[1] Sustainable Energy Ireland Provisional Energy Balance, 2008.
[2] International Energy Agency, Country Scorecard (2006).

2.3 National Potential

In 2007, the Government published the Energy White Paper *Delivering a Sustainable Energy Future for Ireland*. This paper identified the areas of growth to be targeted in the period to 2020, including growth in the uptake of cogeneration. The White Paper states:

> *Growth in Combined Heat and Power deployment is an important objective to 2020. The national economic benefit from CHP grows with scale of deployment. It is also the case that CHP investment yields a relatively low return at high risk. So barriers need to be addressed and supports maintained in order to realise the deployment potential, not just in community and buildings, but also in large scale plants.*

Thus, while the White Paper acknowledges the potential benefits of cogeneration, it also recognises that there are substantial barriers, although specific targets for installed cogeneration capacity were set at 400 MW by 2010 and 800 MW by 2020. The White Paper also set out three specific actions in relation to cogeneration:

1. Continued support under the CHP Deployment Programme and R&D supports with particular emphasis on biomass fuelled CHP

2. Within two years (from 2007) a further target for CHP will be considered for 2020 in light of further feasibility studies into CHP applications.

3. A review by CER of potential administrative and regulatory barriers and decisions on appropriate price support mechanisms for electricity generated from new high-efficiency, large-scale CHP.

The budget for the most recent CHP Deployment Programme was €11 million, allocated between fossil fuel fired cogeneration and biomass/anaerobic digestion (AD) fired cogeneration. The indicative budget for the biomass/anaerobic digestion element of the programme was between €5 and €8 million (out of the €11 million). As of the end of 2008, approximately 50% of the funding available had been allocated and the total installed and approved cogeneration capacity under this grant scheme was approximately 13 MW, at a cost of support of approximately €400 per kW. The size range of the fossil fuelled projects supported ranged from 55 kW to 999 kW. A 3 MWe Biomass CHP has been approved and commissioned since late 2008, while a number of anaerobic digestion plants were also under consideration in 2009

2.3.1 Fuel Types

The majority of cogeneration plants in Ireland, including the largest cogeneration plant (160 MW) are fired on natural gas (94% in capacity terms). Biomass fuels account for only 4% of the installed capacity, with oil and solid fuels providing the balance in 2008.

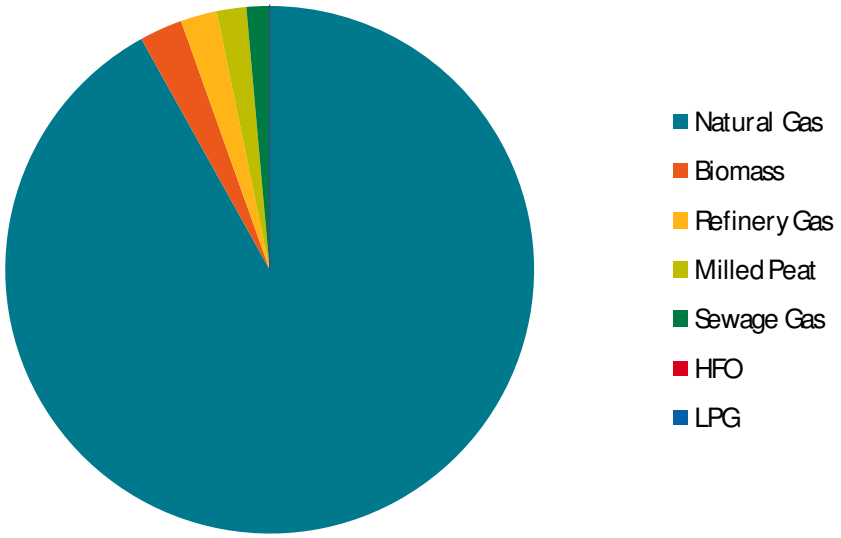
In the most recent assessment of Ireland's potential for the uptake of cogeneration, it was found that the majority of large scale energy users investigating the feasibility of cogeneration at their sites were only considering the use of natural gas as the fuel source. Only two sites (in the wood sector) were considering biomass fired cogeneration.

Therefore, it is likely that the majority of future cogeneration plants will be fuelled on natural gas, although the promotion of biomass fuelled cogeneration is likely to increase the capacity, but the proportion of biomass fuelled cogeneration is expected to remain relatively low in the short to medium term. Alternative fuel sources, including sewage gas and landfill gas, are expected to gain market share in cogeneration technologies. However, the

prospects for landfill gas are limited by the lack of suitable heat demands in the vicinity of the landfill sites and therefore may not qualify as high efficiency cogeneration.

Figure 1 shows the breakdown of fuels used in cogeneration plants at the end of 2008.

Figure 1: Fuels Used in Cogeneration



2.3.2 Cogeneration Technologies

A wide range of cogeneration technologies are used throughout the 241 active cogeneration plants in Ireland. Table 1 summarises the use of the technologies set out in Annex I to the cogeneration Directive in Ireland and the prospects for future use through further uptake of cogeneration.

Table 1: Cogeneration Technology in Ireland

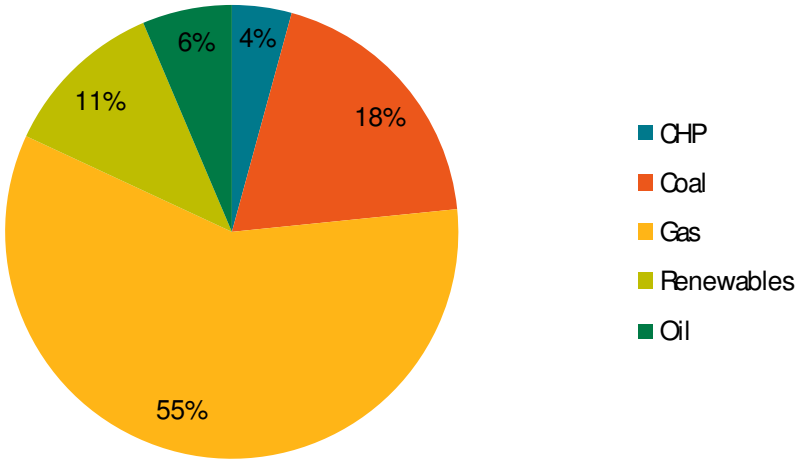
Technology Description	Potential for Use in 2020
Gas fired CCGT with heat recovery (> 100 MW)	Possible in very large scale plants
Steam back pressure turbines (c. 3 MW)	Wood processing Peat Briquetting
Steam condensing extraction turbines (c. 3 MW)	Wood processing Peat Briquetting
Combined pass out and condensing steam turbine (c. 3 MW)	Wood processing Waste Incineration
Gas turbines with heat recovery (up to 75 MW)	Alumina Dairy ICT Pharmaceutical
Internal combustion engines (0.25 to 17 MW)	Multiple sectors in industrial and services sectors

Technology Description	Potential for Use in 2020
Microturbines (100 kW)	Residential Commercial (small scale)
Fuel cells (1 kW)	Potential dependent on wider development of the technology
Sterling Engines (domestic scale)	Potential in residential sector
Micro CHP gas engines	Yes
Organic Rankine Cycles (100 - 500 kW)	Possible in conjunction with geothermal pilot plants
Steam engines	None identified
Biomass gasification with internal combustion	Potential in large scale plants

2.3.3 Fuel Mix in Traditional Electricity Generation

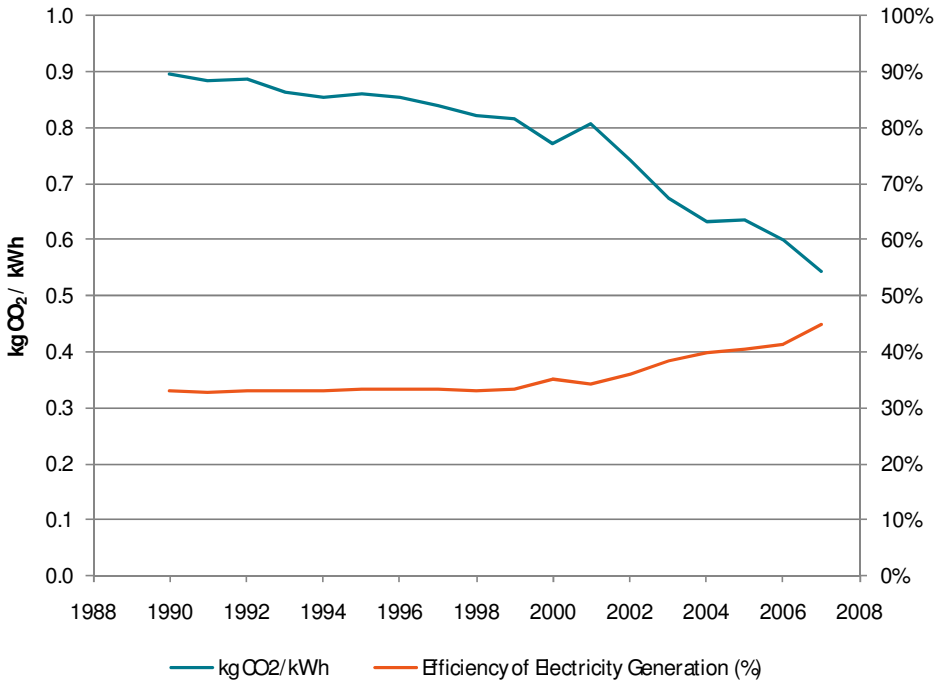
In recent years, the fuel mix for electricity generation in Ireland has changed considerably and continues to do so as the percentage of electricity generated from wind energy increases and solid fuels (coal and peat) decreases. By 2010, the National target is to generate 13 to 15% of Ireland's electricity from renewable energy sources, rising to 40% by 2020. The share of electricity generation by fuel in 2007 is shown in Figure 2.

Figure 2: Electricity Generation by Fuel (2007)



In 2007, the average CO_2 emission factor from electricity generation in Ireland was 543 kg CO_2 per MWh, and this is expected to decrease progressively. The historical trend of the average CO_2 emission factor, together with the efficiency of electricity generation, is shown in Figure 3.

Figure 3: CO_2 Emission Factors and Electricity Generation Efficiency



As Ireland moves towards its renewable electricity generation targets, the energy sources that are expected to dominate the fuel mix are natural gas, wind and biomass, with reducing

quantities of oil, peat and, to a lesser extent, coal. New cogeneration capacity is expected to mirror this change in fuel mix.

2.3.4 Modernisation and New Build

At the end of 2008 there were approximately 255 cogeneration units in Ireland (241 active units), the majority of which were small (71%) or micro (9%) scale units. The majority of new cogeneration capacity in recent years (in number of units rather than capacity terms) have been installed in the services sector[3] (83% of the total number of units). The units installed in this sector have typically been in the order of 100 kW to 200 kW, with the largest unit being a 2.9 MW gas fired unit.

There were only fifty cogeneration units with an electrical capacity greater than 1 MW, located primarily in industrial sites. These included a 160 MW generating station at an alumina refinery, a 6.9 MW unit at Ireland's only oil refinery, and 14.4 MW at a single brewery. These three sites accounted for over 60% of the installed capacity in December 2008. All were commissioned within the last ten years and all were installed on existing industrial sites with a demand for both heat and power.

The recent assessment of Ireland's national potential concluded that the majority of new cogeneration capacity would arise from new build projects, with a small proportion (depending upon the growth scenario, refer to Section 0) of retrofitting of cogeneration plants at existing sites. However, due to the relatively recent uptake of cogeneration technology and the closure of older sites with cogeneration (where there may have been scope for replacement of existing cogeneration capacity), there is unlikely to be significant scope for the modernisation of existing cogeneration stations.

2.4 Cost Effectiveness

The penetration of cogeneration into Ireland's energy mix is expected to improve the overall efficiency of electricity and heat generation. As shown in Figure 3, the efficiency with which electricity has been generated in recent years has been improving, and this is expected to continue due to a combination of the commissioning of newer, gas-fired generating stations and, to a lesser extent (due to the current installed capacity) the further uptake of cogeneration technology.

The cost effectiveness of installing cogeneration plant depends upon the alternative option of purchasing electricity from the grid combined with the generation of steam or hot water from natural gas fired boilers, and varies depending upon the specific sector.

In the case of industry, the current investment climate is not conducive to the installation of cogeneration technology, with many large sites (with potentially large cogeneration demands) requiring short payback periods on capital investments. At present, cogeneration technology cannot meet these criteria, due in part to the current spark gap.

A similar scenario arises in the services and residential sectors, where the spark gap has been declining in recent years, thereby reducing the economic benefit of cogeneration (the higher the spark gap, the greater the incentive for cogeneration). The economics of cogeneration uptake are discussed under the barriers in the following section.

[3] Hospitals, hotels, public sector buildings, airports, educational buildings, offices and leisure facilities.

2.5 Barriers to Cogeneration

In the following sub-sections, an overview of the barriers to the uptake of cogeneration identified as part of a recent study undertaken for Sustainable Energy Ireland are presented. Due to the nature of the infrastructural context in which cogeneration must operate in Ireland, some of these barriers may not materialise in reality or there may be a link between a number of barriers and the removal of one will have a positive knock-on effect to the uptake of cogeneration (an example of this is the current economic climate).

2.5.1 Socio-Economic Structure of Ireland

Ireland has not attracted large numbers of heavy industry with continuous steady heat loads, which are normally a prerequisite for large scale industrial cogeneration. In addition, the heavy industry that has been present in Ireland has been in decline in recent years, with the loss of actual and potential cogeneration capacity, while some of the largest scale heavy industry in Ireland (world scale cement kilns) is not suited to the uptake of cogeneration.

The services/commercial sector in Ireland is a significant consumer of electricity and fossil fuels, although much of this is accounted for by offices and retail. Thus, while the electrical and heat demands may appear to be suitable for the application of cogeneration, the occupancy pattern of offices and commercial property presents a barrier. A typical five day working week, with primarily a daytime energy use pattern, reduces the running time for the operation of cogeneration installations to approximately 3,000 hours per annum out of a potential of 8,760 hours. This generally results in longer payback times than for similarly sized cogeneration units in buildings with a more constant demand, such as hotels, hospitals and nursing homes.

The global economic downturn is likely to mean lower rate of new build offices for the foreseeable future with limited demand for new cogeneration capacity. While existing offices offer an outlet for the retrofitting of cogeneration, the nature of the occupancy and potentially unfavourable payback periods presents a barrier.

In the residential sector, the preference of home owners in Ireland has, until recently, been primarily for individual detached or semi-detached houses with front and back gardens, even in urban areas. In rural areas, bungalows and detached and semi-detached housing has been the norm which has led to very low housing densities. Even in substantially urban areas, Ireland's population density is low compared to other Member States, where apartment living is far more common. In addition to Ireland's aversion to the use of Waste-to-Energy projects, this low population density has been and remains a barrier to the use of district heating schemes connected to cogeneration plants.

2.5.2 Economic Criteria

The economic viability of a specific cogeneration unit is dependent upon fuel and technology costs, together with site specific factors, in particular the spark gap. The low uptake of cogeneration, despite a number of initiatives in recent years, indicates that the economics of cogeneration are still poor in Ireland compared to other Member States.

The payback period for a cogeneration project can be anywhere from one year or less to greater than ten years, while different organisations that are considering cogeneration have different investment criteria. This range of corporate investment criteria, generally expressed in terms of the payback period, was borne out in the recent assessment of the

barriers to cogeneration in Ireland. The typical payback period that was identified for sites considering cogeneration and where it is *technically* viable was 5 years. However, many corporate investors only consider capital projects with payback periods in the order of three to four years, with some organisations requiring even shorter payback periods. While the difference may be marginal, it was found that this is a significant barrier to the future uptake of cogeneration.

In terms of providing an incentive to sites interested in cogeneration, grant assistance clearly presents a large stimulus. As an example, a 30% grant (such as is currently available for fossil fuel fired units of less than 1 MW and for biomass fired units of any size) could reduce the payback period from 4 – 7 years to 3 – 5 years.

The current grant scheme operated by Sustainable Energy Ireland for fossil fuel fired cogeneration is capped at units with an electrical output of 999 kW, although there is no capacity cap for biomass fired units. Given the lack of penetration of biomass units to date and the likelihood that fossil fuels (natural gas) will remain the dominant fuel in the short to medium term, if Ireland is to meet its ambitious cogeneration targets then cogeneration units larger than the 999 kW threshold will be required.

As part of the recent assessment of barriers to cogeneration, one of the stakeholders noted that the grant threshold of 999 kW for fossil fuel fired units was a particularly significant barrier for larger projects. It was also noted that some sites supported under the CHP Deployment Programme have installed 999 kW units. This approach may suit the particular site in terms of the size of unit required, or it may have been adopted to make maximum use of the grant scheme. In the case of the latter, this approach may impact on the optimum plant configuration and the overall economics of the project. The extent of such impacts would be site specific.

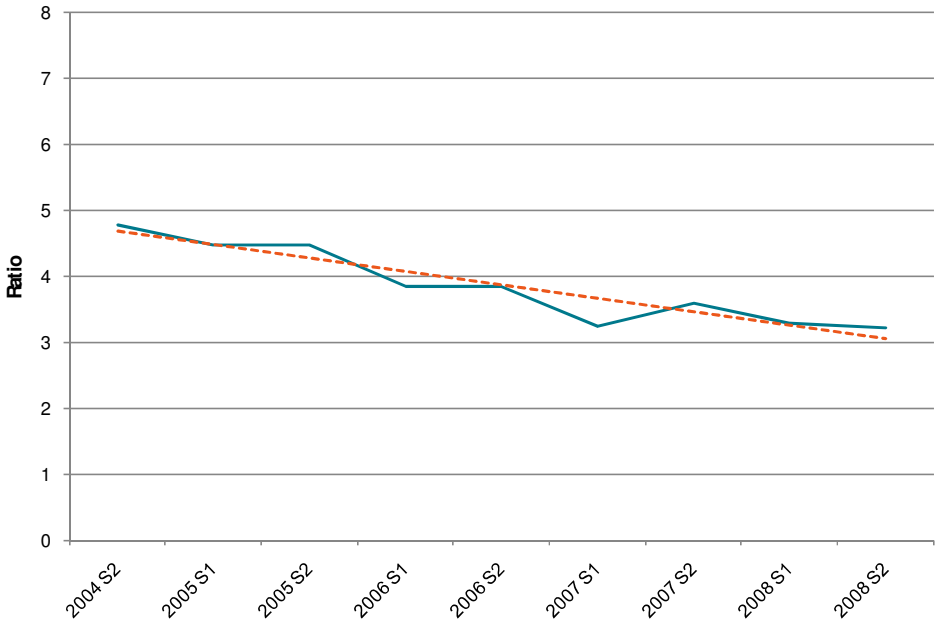
2.5.3 Fuel Prices & Spark Gap

The economics of cogeneration are highly dependent on the price of fuels for the combustion process, the system efficiency and the savings made on electricity purchased. In general, the greater the ratio between the price at which the electricity is valued by the end user and the price at which the fuel for the cogeneration plant can be purchased (the spark gap) the better the economic case for cogeneration. However, the spark gap can be considerably different for similar technologies (e.g. natural gas fired cogeneration) depending on the installed capacity and even in different sectors, as the market prices for both electricity and thermal input fuels vary, depending upon the scale of usage.

In the industrial sector, large scale energy users have greater opportunity to negotiate on the unit rate of their energy supply than smaller consumers and therefore the standard tariffs for electricity and natural gas are generally not applicable. The spark gap in the industrial sector in Ireland has typically been decreasing over the last four to five years, as shown in

Figure 4. This trend has adversely affected the economic benefit of cogeneration

Figure 4: Spark Gap in the Industrial Sector

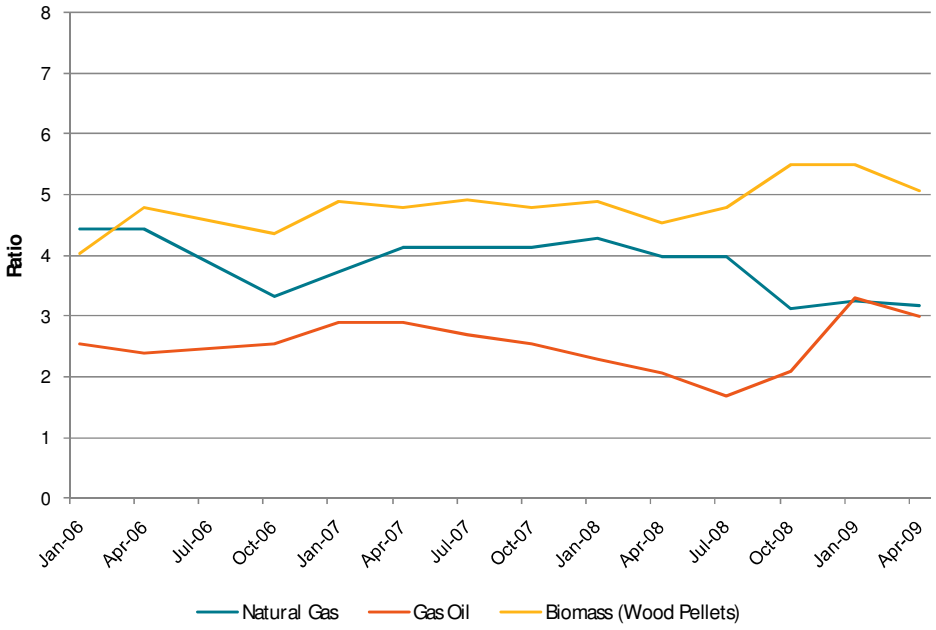


The spark gap plays a similarly significant role in the commercial sector. Notwithstanding this improving trend in the spark gap for gas oil and biomass through 2008, there were no gas oil or biomass cogeneration plants approved under the CHP Deployment Scheme up to December 2008.

Figure 5 shows the trend in the ratio of the price of electricity to the price of three different fuels in the commercial sector: natural gas, gas oil and biomass over the last three. It can be seen from this figure that the natural gas spark gap has been decreasing since mid-2008 and therefore the barrier caused by an unfavourable spark gap has been increasing. As the majority of current installed CHP capacity is fired on natural gas, and future uptake of cogeneration is likely to be dominated by natural gas in this sector, the potential for growth appears to be limited on economic grounds. However, the spark gap for both gas oil and biomass has increased, indicating that the spark gap barrier for these fuels is decreasing (i.e. it is becoming more economic than in previous years, solely from a fuel cost perspective, to operate cogeneration plants on these fuels).

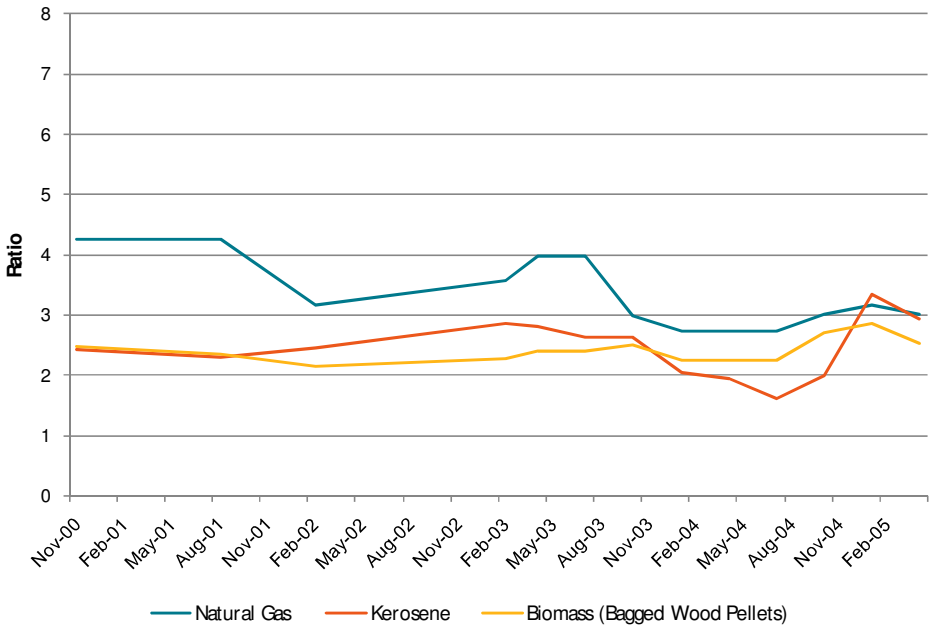
Notwithstanding this improving trend in the spark gap for gas oil and biomass through 2008, there were no gas oil or biomass cogeneration plants approved under the CHP Deployment Scheme up to December 2008.

Figure 5: Spark Gap in the Commercial Sector



In the domestic sector, the spark gap for each of these three fuels has followed a similar trend to that in the commercial sector, except for kerosene for which the spark gap has increased (improved) more significantly than natural gas and biomass since mid-2008. This is shown in Figure 6.

Figure 6: Spark Gap in the Domestic Sector



From this trend, it can be seen that the cost ratio of electricity to natural gas price has been decreasing in Ireland since June 2000. In the first quarter of 2009, the Commission for Energy Regulation announced that both electricity and natural gas prices would be reduced by approximately 10% from July 2009. If both energy forms reduce by a similar percentage

then the electricity to gas price ratio which existed as of July 2009 may not alter significantly in the short term.

This analysis indicates that, based on fuel price alone, the economic viability for domestic scale gas-fired cogeneration has not been improving over the last three years, although the economics of oil-fired cogeneration may have been improving at the end of 2008.

In light of Ireland's move towards a higher proportion of electricity generated from natural gas, the relative prices of electricity and gas for industrial (and commercial / domestic) consumers are not expected to alter significantly in the short term, in other words, gas and electricity prices are likely to move in approximately the same way in the medium term with no significant improvement expected in the spark gap.

2.5.4 Availability of Heat Loads

Ireland's industrial population is limited in terms of the heat loads available for the uptake of cogeneration technology. While some of the largest industries in Ireland (cement and periclase manufacture and mining) consume a significant proportion of industrial fossil fuel and electricity, they are not suited to cogeneration due to the mismatch between the heat output from cogeneration plants and the thermal demand from the industry. In addition, other large scale industries, such as the dairy sector, operate on a seasonal basis and thus, while the substantial heat load may be met by a cogeneration plant, its seasonal nature means that the economics can become unfavourable compared to plants with a year round 24/7 operating regime. Many of the major dairies have already invested in cogeneration plants limiting the prospects for major new capacity in the sector, although there remains some potential for smaller cogeneration units.

2.5.5 Technological

While cogeneration technology has been available for many years, and has been utilised extensively in other Member States, the scale of the technology has tended towards larger units, while the fuel dominating the market place, from a demand perspective, has been natural gas. As a result, the technology for small scale and micro scale cogeneration has lagged and it is only in recent years that micro-scale units suitable for small multiple occupancy or single dwellings has become available.

These micro-scale units, with a single phase electrical supply for use in single dwellings, are not currently available in the Irish market. Somewhat larger gas engine units with a three phase electrical supply are available in Ireland and these have dominated the recent SEI Micro Demonstration Project. However, while the pace of development of micro-cogeneration technology at a scale suitable for installation in individual houses has been slow up to recently, a number of manufacturers are, and have been, developing these units which are expected to become more widely available on the Irish and UK markets between 2009 and 2010.

In relation to biomass fired cogeneration technology, there is a stated preference in the large wood processing industries for the use of more advanced biomass technology, such as biomass gasification, rather than the more traditional systems currently used in Ireland. Gasification units are seen as having the potential to allow the operation of the unit on a variety of biomass inputs and therefore remove some of the barriers associated with the need to supply a constant grade and quantity of biomass. However, while gasification technology has been available for a number of years and there are several examples of megawatt scale biomass gasification-based cogeneration plants in Europe, the use of this technology at the scale of interest to major Irish industries is relatively recent.

The potential for oil-fired cogeneration to penetrate the Irish market is limited due to the lack of suitably sized units in the micro-scale range and the higher costs associated with the maintenance of these units. Thus, while approximately 46% of houses with central heating in Ireland use oil (gas oil and kerosene) as the fuel, it is unlikely that traditional oil-fired central heating systems will be displaced, or replaced, by micro-cogeneration units within the short to medium term.

2.5.6 Availability of Fuel

In general, oil fuels are readily available throughout the country and, as they are stored at the point of use, the availability of oil fuels is not considered to present a barrier to the uptake of cogeneration.

Natural gas is available in 146 population centres within nineteen counties in Ireland. While this is a significant distribution area for natural gas, there remain large areas of the country without access to the gas grid and in some cases the prospects for the grid extending to particular areas of low population density may be remote within the short to medium term. Therefore, where there is potentially a market for gas fired cogeneration, for example from large industry in more rural parts of the country or, as has been the case in recent years, the development of apartments or higher density housing in rural population centres, the lack of a connection to the gas grid presents a significant barrier in these areas.

However, it should be noted that where particular sites are not connected to the grid but are close to it, it may be *technically* feasible to obtain an individual connection to the grid at the discretion of Bord Gáis. In this case, the cost of installing the connection may have to be borne by the end user rather than Bord Gáis. This can add another layer to this particular barrier.

Biomass is considered to offer significant potential for renewable energy generation and in the context of cogeneration the Energy White Paper placed particular emphasis on the development and uptake of biomass fuelled cogeneration capacity. However, it is the view of industry that biomass availability is currently quite tight and that it may not be straightforward to obtain the necessary supplies on which to base large cogeneration plants of the scale they might otherwise consider.

The other barriers associated with the supply of biomass in Ireland are considered by industry to be:

- The lack of brokerage services in Ireland for (large scale) biomass.
- The (perceived) requirement to maintain a consistent quality of biomass.

2.5.7 Electricity Market

The barriers associated with the electricity market are discussed in more detail under the reporting under Article 9 of the Directive. Those aspects of the electricity market not reported on under the Directive are set out below.

Connection to the electricity grid for export purposes is a significant barrier to the uptake of cogeneration where export is required to ensure the economic viability of the project. In order to supply electricity to final customers, a cogeneration operator must apply for a CHP Supply Licence.

Applications for connections greater than 500 kW are processed in a gate system whereby all applications deemed complete by a given date are processed in one batch. Based on their

level of electrical interaction with each other and their geographic location, the applications within each gate are divided into specific groups by the Transmission and Distribution System Operators for processing purposes. Due to the nature of this application system, a developer who submits an application today may face a multi-year wait before the project is connected to the network. The extent of the delay is dependent on the location of the project with respect to electrical load and other generators, its scale and the technology proposed.

However, there is a special provision for bypassing the lengthy Group Processing Approach for applicants seeking connections of less than 500 kW. Such applications are treated *on a case-by-case basis as deemed appropriate by the System Operators (ESB Networks) and approved by the Commission (CER)*. The applicant must demonstrate that processing the application in an accelerated timeframe would be in the public interest as distinct from a benefit to that individual generator. Furthermore, the application must not interact (electrically) with any other applications. The allocation of a connection is at the discretion of the Distribution System Operator and the Commission for Energy Regulation.

Therefore, under the current arrangements, the requirements for obtaining a connection to the grid for large scale cogeneration is a significant barrier, while the connection of small and micro-cogeneration is less hampered. However, the Commission recently undertook a public consultation process on the *Treatment of Small, Renewable and Low Carbon Generators outside the Group Processing Approach*[4] and the findings from this process may alleviate this barrier in certain cases.

The **Public Service Obligation** (PSO) Levy is an additional charge on electricity bills relating to the costs to ESB Public Electricity Supply (PES) of purchasing peat generated electricity and the output of renewable, sustainable or alternative forms of energy purchased under various Government schemes. The ESB is obliged by government to make these purchases in the interests of security of supply and environmental protection.

The PSO levy is charged to all electricity customers and is designed to recoup any additional costs incurred by ESB PES in meeting this obligation. There is no PSO levy currently imposed on electricity bills and therefore the PSO levy is not considered to be a current barrier. However, the mechanisms are in place for a non-zero PSO levy to be applied as the need arises, and it could therefore become a barrier if, for example, the support of particular higher cost technologies such as wave power were to lead to higher electricity prices.

In this case, the imposition of the levy on cogeneration operators would be considered a barrier as the application of the levy is based solely on the maximum import capacity (MIC) of the site. In general, most cogeneration sites which are set up to export to the grid will also need to maintain an import connection to the grid appropriate to their needs in order to provide sufficient back up. In normal operation of the cogeneration plant, the site may import little or no electricity from the grid but, as it has the *capacity* to import electricity up to its MIC, the PSO levy may be imposed even at times when the site is not making (direct) use of the network.

Furthermore, the PSO levy is intended to support renewable, sustainable or alternative forms of energy. As the environmental and security of supply benefits of high efficiency cogeneration are recognised by the CER as being in the public interest[5] and the development of cogeneration is supported by the Government through the Energy White Paper and the CHP Deployment Programme, the current method of application of the PSO levy on sites with cogeneration is considered unhelpful, both by existing cogeneration operators and by potential operators interested in developing such capacity.

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[4] Consultation Paper CER/09/044, closed on 30th April 2009.

[5] Treatment of Small, Renewable and Low Carbon Generators outside the Group Processing Approach

Transmission Use of System (TUoS) Charges and **Distribution Use of System (DUoS) Charges** are levied on generators that are connected to the transmission and distribution systems respectively. In general, Use of System Charges increase the cost of electricity and therefore may increase the spark gap, potentially improving the economic viability of cogeneration projects. However, these charges also impact on cogeneration installations, with the impact being different depending upon the specific operating mode of the site (MEC to MIC ratio, auto-producer status). While the current use of system charges facilitate sites that both import from and export to the grid, the use of system charges are still considered by some industries to present a (potential) barrier to the uptake of cogeneration.

There is currently only a limited support price for the sale of electricity to the grid from cogeneration installations. These support prices relate to biomass fired cogeneration plants, which are eligible under the Renewable Energy Feed in Tariff (REFIT) at a rate of €0.12 per kWh, and micro-cogeneration which is eligible for a feed in tariff of €0.19 per kWh within the domestic sector. Larger scale fossil fuel fired cogeneration operators are not provided with any support prices for the sale of electricity to the grid, which is considered by some stakeholders to present a barrier to the uptake of this technology. However, as in other areas of exporting to the grid, this will only affect a small number of sites, albeit with potentially greater capacity.

Private Wire Networks, whereby a generator sells electricity to a third party without using the distribution (or transmission) system, are strictly controlled by legislation in Ireland[6]. This has been suggested as posing a significant barrier to particular cogeneration applications where a developer/landlord considers installing this technology with the intention of supplying electricity and heat to tenants or other adjacent premises. Under the current regulations for the supply of electricity, a cogeneration operator must make use of the electricity distribution (or transmission) system.

2.5.8 Competition with Other Technologies

In addition to setting out the objectives for the uptake of cogeneration, the Energy White Paper also sets out the objectives for other energy saving technologies and schemes, including the use and development of renewable energy.

Sustainable Energy Ireland supports a range of other technologies in addition to cogeneration, some of which directly compete for the same market. In the residential and services sector the other programmes include grants for high efficiency oil- and gas-fired boilers, for ground source heat pumps, geothermal energy and biomass. While competition in the market place is advantageous in reducing the costs associated with the technologies in the longer term, it has the potential to result in inefficient prioritisation of supports for these technologies in the absence of a detailed comparison of the benefits and drawbacks associated with them.

Domestic scale cogeneration units will face significant competition from modern high efficiency condensing boilers, many of which can achieve seasonal efficiencies of over 90%. The balancing of domestic electricity and thermal demands may also prove difficult to control, and without the appropriate balance, cogeneration units in individual houses may be used for electricity generation with the heat being wasted when not needed. In this case, natural gas boilers combined with electricity purchased from the grid may prove to be more viable for the end user.

Geothermal energy (direct and indirect use), solar thermal energy and biomass (including anaerobic digestion technologies) are also targeted at the same market as small and micro

[6] Section 37 of the Electricity Regulation Act, 1999, provides scope for direct line (private wire) systems to be installed at the discretion of the CER.

scale cogeneration (and to a certain extent, the large cogeneration market). Biomass boilers are a proven technology and are widely used at all scales in the Irish market, while anaerobic digestion units are proven in Europe and are present in a small number of municipal waste water treatment plants in Ireland. In addition, biomass boiler technology is relatively simple compared to cogeneration as it does not require electrical interconnection or smart metering.

Similarly, while geothermal energy applications are not as widely utilised in the Irish market, they also have the potential to compete for the heating element of the cogeneration market, while solar energy units have increased their market share in recent years in providing hot water for both the commercial and domestic sectors.

However, while these technologies compete with cogeneration and can therefore be considered as a barrier, they are a positive factor in terms of Ireland's overall energy policy and efficiency targets.

2.5.9 Competition with Energy Saving Programmes

Recent years have seen a large focus on energy efficiency across the industrial, commercial and residential sectors, driven by increasing energy costs, regulation (the 2008 Building Regulations, the Energy Performance of Buildings Directive, the IPPC Directive and the EU Emissions Trading Scheme). These energy saving programmes are clearly beneficial to Ireland, but may prove to be a barrier to the uptake of cogeneration. In short, the reduction in energy demand will reduce the demand for electricity and heat and thereby the potential savings from existing or potential cogeneration units, while in some cases energy savings may eliminate the potential for cogeneration entirely.

2.5.10 Management & Operation

In general, cogeneration is not a core activity within industry and therefore the installation of a cogeneration plant would require external expertise to develop the plant and to train the site operators in its operation. The alternative to owning and operating the plant by a site operator is to enter into agreement with an Energy Supply Company (ESCo) to manage and operate the unit. While the lack of expertise in the operation of a cogeneration plant is a barrier, the majority of industrial sites would be expected to have the resources to expand their in-house expertise in this area, while the commercial sector can make use of ESCos to manage this process.

2.5.11 Interaction with Regulatory and Promotional Agencies

The interaction between the stakeholders and State Agencies is considered to present somewhat of a barrier, although this is mainly the case where sites intend to export electricity to the grid and therefore require the appropriate licences and permits from the CER and Eirgrid.

2.5.12 Availability of Information

A related to the interaction with Regulatory and Promotional Agencies is the lack of a centralised source of information encompassing all aspects of cogeneration. While the individual Regulatory and Promotional Agencies provide useful information to prospective cogeneration plant operators, the absence of a central agency is considered by some stakeholders to increase the administrative barrier.

2.5.13 Definition of Cogeneration

The term *economically justifiable demand* defined in the Cogeneration Directive may present a barrier to the uptake of cogeneration if this uptake is to be promoted through financial support mechanisms. The question arises as to whether the use of a specific technology only when supported by a (partial) grant meets an *economically justifiable demand*. It may be argued that the economic justification is to be viewed from a national perspective and therefore grant aid to encourage the uptake of energy efficient technology is justifiable, particularly as the Directive is intended to encourage such uptake.

2.5.14 Risk Aversion

One of the new barriers identified during the recent assessment of Ireland's cogeneration potential was the reluctance of a cogeneration plant operator to supply heat to specific third parties (e.g. hospital campuses) due to corporate concerns (liability) relating to the reliability of the heat supply. The generating site's concern related to the potential adverse impact on the third party if the heat supply were to be interrupted. While this may be perceived as a barrier by potential heat suppliers, it is not considered to present a significant barrier as sufficient technical (standby) and contractual safe guards could be provided to protect both parties.

2.6 Potentials

In the most recent assessment of Ireland's potential for the uptake of cogeneration, three uptake scenarios were considered, taking into account the barriers discussed in the previous sub-section and the supports for cogeneration in place in Ireland. These three scenarios were a low, medium and high uptake rate. The bases for the three scenarios are set out below.

Table 2: Description of Low, Medium and High Cogeneration Uptake Scenarios

Low Scenario	Based upon the current rate of cogeneration capacity growth (excluding the contribution of the 160 MW plant) and the current supports in place from Ireland's national energy agency (Sustainable Energy Ireland) and industry bodies. It acknowledges that some existing sites may close down within both the 2010 and 2020 horizons and assumes that there is little or no replacement of lost cogeneration on a like-for-like basis. This scenario also takes a more pessimistic view in terms of a short-term economic recovery, the confidence of industry to invest in large capital projects with uncertain economic prospects and the uncertainties surrounding fuel prices, in particular the recent volatile oil markets. However, it is recognised that even in the current climate, advances are being made in small and micro cogeneration units and that the uptake of cogeneration in recent years has been dominated (in the number of units rather than in installed capacity) by the commercial and leisure sectors. Therefore, the Low Uptake scenario includes an allowance for a modest breakthrough in residential micro-generation, aided by the recently announced Feed-in-Tariff support, albeit in a much reduced new-build housing market compared to the recent building boom years. There may be opportunities for some retrofitting of such micro cogeneration units but this is unlikely to contribute significantly to the uptake in this scenario.

	Similarly, there may be some retrofit projects in commercial and public sector sites (hotels and hospitals). It is assumed that no expansion takes place at the 160 MW cogeneration plant. In the longer term (post 2016), this scenario assumes that the proposed waste-to-energy and district heating plans for Dublin are rolled out, with an initial uptake of up to 20 MW as cogeneration, although its qualification as high efficiency cogeneration would need to be demonstrated.
Medium Scenario	The Medium Uptake scenario is based upon more favourable market conditions for cogeneration. However, while the rate of uptake is greater than in the Low Uptake scenario, the majority of growth is expected to occur in the latter half of the 2010 to 2020 period, and beyond. Sites that have completed or are in the process of completing feasibility studies are expected to install the plants, where practicable and economic, between 2015 and 2020. Other, as yet unidentified, sites will carry out feasibility studies from 2012 onwards and, where feasible, the plants may be constructed before 2020. It is assumed that the 160 MW cogeneration plant, which has already investigated the potential of constructing a further 75 MW of capacity, invests in the project towards the end of the 2010 to 2020 period. The Medium Uptake scenario also assumes that the construction industry recovers towards the middle of the 2010 to 2020 period but at a rate significantly lower than the peak of the previous years. New developments are more favourable to cogeneration, although the growth is from a relatively low (capacity) level of new build activity. There is also a recovery in the residential building sector, although new build housing is not expected to be greater than 30,000 houses per annum. Technological advances in micro-cogeneration allow for the retrofitting of such units into existing houses from 2015/2016 onwards. The proposed waste-to-energy and district heating plans for Dublin are rolled out by 2016 and the waste-to-energy plant in Cork is partially subscribed to (as with the Dublin development, this station would need to demonstrate that it qualifies as high efficiency cogeneration).
High Scenario	The High Uptake scenario is the most optimistic is terms of economic recovery, improvements in the market for cogeneration (both in terms of existing and new sites) and the support structures (both informative and financial) from the Government and financial institutions. This scenario is based upon economic recovery within three to four years, with economic growth returning to the pre 2008/2009 levels, although it does not reach the peak rates experienced during the early part of the 21st century. The majority of sites identified as having the technical and economic potential for cogeneration install it, or commence installing it, by 2016. New sites begin feasibility studies and invest progressively over the 2010 to 2020 period. The 160 MW plant expands by 75 MW sometime after 2015.

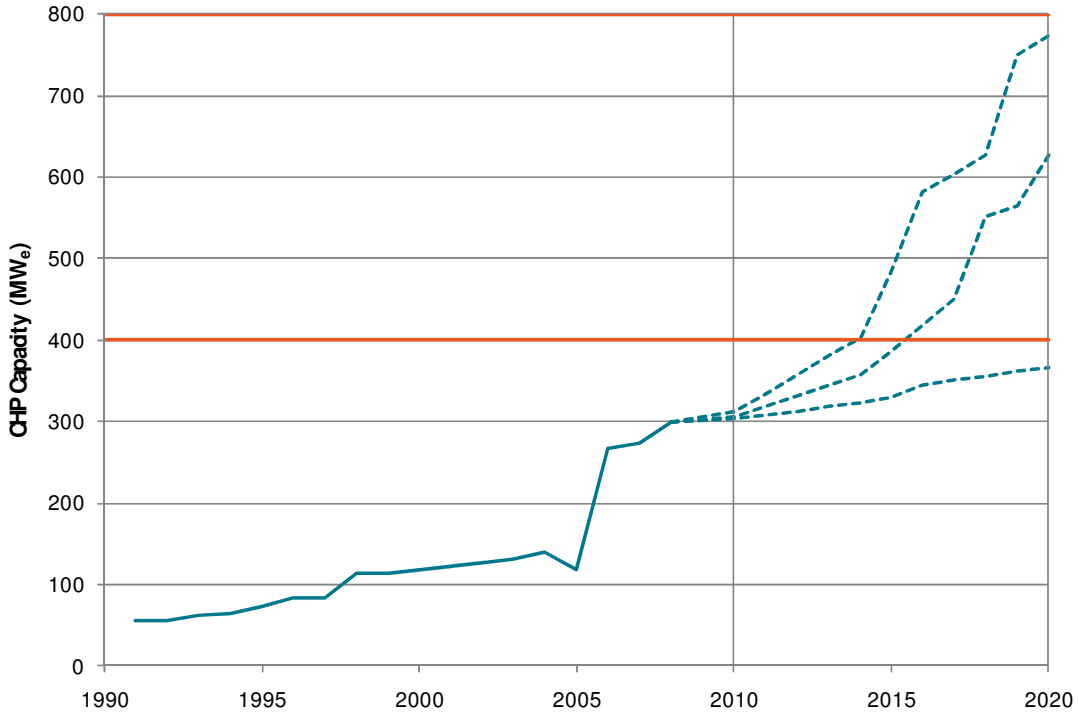
	The advancements in micro-cogeneration allow for a higher rate of installation in a more buoyant housing market (approximately 60,000 houses per annum) and the retrofitting of these units in the existing housing stock.

Under these three scenarios, the potential installed capacity was estimated in 2010 and 2020, with estimates for the intervening periods taking into account large, one-off projects. Table 3 and Figure 7 summarise these projections.

Table 3: Summary of National Potential for Cogeneration Capacity (MW)

	2006	2008	2010	2020
Low Uptake	310	299	303	366
Distance to Target	-	-	97	434
Medium Uptake	310	299	306	627
Distance to Target	-	-	94	173
High Uptake	310	299	312	773
Distance to Target	-	-	88	27

Figure 7: Potential for Cogeneration Capacity under Three Scenarios



It is assumed that the majority of new cogeneration capacity installed within the 2020 time frame meets the requirements of high efficiency cogeneration. However, given the diverse range of industries in which it is likely to be installed, and the underlying difficulty in accounting for landfill gas and, to a lesser extent, sewage gas / anaerobic digestion technology, it is likely that some electricity generating plant will not qualify as high efficiency cogeneration and in some cases may not qualify as cogeneration at all. In developing the estimated National potential, it is assumed that there is no heat demand associated with the generation of electricity from landfill gas, and this is likely to remain the case unless and until district heating schemes are installed adjacent to existing landfill sites.

2.7 Summary

At the end of 2008, Ireland had achieved an installed (active) cogeneration capacity of 299 MW, a decrease of 10 MW from a peak of 309 MW in 2006. Over 50% of the current installed capacity is located at a single site.

There are a wide range of barriers to the uptake of cogeneration, some of which have been identified in previous studies, many of which remain significant barriers to future growth. However, while there is a diverse range of barriers (and perceived barriers) in place, the overriding barrier is one of economic viability. Some of the other barriers identified, and previously highlighted, are only relevant to certain scales of cogeneration installation, the principal barrier in this case being access to the electricity grid for installations intending to export.

While recent years have seen an overall decline in installed capacity, the current SEI Deployment Grant Scheme has seen a large number of cogeneration units installed, adding 13 MW to the national capacity by the end of 2008. However, these are mainly small units, with an average capacity of 170 kW, although some larger units (up to 999 kW) were in the approval process.

The three growth scenario projections indicate that it is highly unlikely that Ireland will meet its 2010 target of 400 MW, with an estimated shortfall in the order of 88 MW to 97 MW, while even the High Uptake Scenario predicts a shortfall of 27 MW against the 2020 target of 800 MW (in the Low Uptake Scenario the shortfall could be in the order of 434 MW). However, although the projections from this study indicate that Ireland is unlikely to meet either the 2010 or 2020 targets, there are a number of significant industrial scale projects in the pipeline which, if all were come to fruition, could contribute up to 151 MW between them.

It is also positive to note that Irish industry is showing a strong interest in cogeneration despite the current unfavourable economic climate and it appears that it is *technically* viable at large scale across a number of sites in different sectors. However, the economic viability of cogeneration is the key to achieving the national targets. At present, the payback times for cogeneration investments exceed those required to meet corporate investment criteria in many sectors.

The commercial sector has shown the highest growth rate in recent years and the projections indicate that this sector will continue to contribute an increasing proportion of cogeneration capacity out to 2020. The residential sector has not shown the same level of growth over the same period but it is expected that strong growth will take place in light of technological advances in micro scale cogeneration and in the uptake of heat from Waste-to-Energy projects. The High Uptake scenario projects that the residential sector will see very strong growth out to 2020, contributing a similar cogeneration capacity to that from the commercial sector (approximately 100 MW).

3. Reporting Under Article 9(1)

> *Member Sates or the competent bodies appointed by the Member States shall evaluate the existing legislative and regulatory framework with regard to authorisation procedures or the other procedures laid down in Article 6 of Directive 2003/54/EC, which are applicable to high-efficiency cogeneration units.*

3.1 Authorisation Procedures

3.1.1 Background

In Ireland, the Electricity Regulation Act, 1999, giving effect to Directive 96/92/EC concerning Common Rules for the internal market in electricity, subsequently repealed by Directive 2003/54/EC, governs the authorisation procedures for the construction or reconstruction of generating stations. The responsibility for overseeing this process rests with the Commission for Energy Regulation (CER), which was established under this Act.

Initially, all generating stations were required to apply to the CER for an Authorisation to Construct, irrespective of the plant's size. In 2007, the CER published its proposed decision paper regarding the revised process for the authorisation and licensing of electricity generating stations. The decision paper arising from the proposed decision paper (consultation) included two Draft Orders setting out the process for authorisation and licensing. In 2008, the CER published a further decision paper clarifying a number of items set out in the 2007 paper, namely:

- the terms and conditions applicable to generators with a capacity not exceeding 1 MW;
- the necessity of such generators to notify the Commission; and
- the requirements for submission of a power purchase agreement (PPA) for those generators with a capacity between 1 MW and 10 MW as well as for those with a capacity exceeding 10 MW.

The 2007 Draft Orders were also formally adopted as Orders to the Electricity Regulation Act 1999.

3.1.2 Generation Capacity ≤ 1 MW

Under the 2008 CER decision, and the two Electricity Regulation Act Orders, which came into effect on 25th September 2008, generators with a capacity not exceeding 1 MW are no longer required to apply to the Commission to stand *duly authorised*. Instead, such generators are considered to *automatically stand duly authorised*, provided that they meet the requirements set out in the Schedule to the Electricity Regulation Act 1999 (Section 16(3A)) Order 2008 (hereinafter referred to as the Authorisation Order), which sets out general conditions relating to planning requirements, interaction with the Commission (CER) including the provision of information upon request, and the transfer and revocation of an authorisation.

In addition to automatically standing duly authorised under this decision, generators with a capacity not exceeding 1 MW are also considered to *automatically stand duly licensed to generate electricity* (whether for own use only or exporting to the grid) and therefore are not required to apply to the Commission for such a licence. As in the case of authorisations, generators must meet certain criteria in order to be considered *duly licensed*, as set out in the Schedule to the Electricity Regulation Act 1999 (Section 14(1A)) Order 2008 (hereinafter referred to as the Licensing Order). These requirements include compliance with the relevant codes for connection to the grid, design of the system to relevant standards, and the arrangements for connection to and use of the licensee's system by third parties.

3.1.3 Generation Capacity > 1 MW and < 10 MW

Under the Commission's 2008 decision and the two Electricity Regulation Act Orders, generators with a capacity greater than 1 MW and not exceeding 10 MW are required to apply to the Commission for both an authorisation to construct and a licence to generate electricity. The information required to accompany an application for an authorisation is irrespective of the type of generating station proposed. Guidance on the application for an authorisation is provided by the Commission.

3.1.4 Generation Capacity ≥ 10 MW

Generators with a capacity in excess of 10 MW are outside the scope of the 2008 Electricity Regulation Act Orders and are therefore required to apply to the Commission for authorisation. The same information as that for generators with a capacity between 1 MW and 10 MW is required.

3.1.5 Authorisation for Cogeneration

The Electricity Regulation Act 1999, or any Orders made under this Act, does not make specific reference to generator types and therefore applications for authorisations for cogeneration are treated in the same way as all generation technologies as set out in Sections 3.1.2 to 3.1.4.

3.1.6 Assessment of Applications for Authorisation

Where an application is made for an authorisation, the Commission is required to assess it in the context of SI 309 of 1999, Electricity Regulation Act 1999 (Criteria for Determination of Authorisations) Order, 1999. This Order sets out the nine broad criteria that must be met for an authorisation to be granted.

(a) *that the Commission is satisfied that, if it grants the authorisation, no activity carried out under it will adversely affect the safety and security of the electricity system;*

(b) *that the Commission is satisfied that, if it grants the authorisation, energy will be used efficiently in the course of any activities carried out under the authorisation;*

(c) *that the Commission is satisfied that the applicant will comply with any grid code or distribution code in so far as it is applicable to the applicant and, at the relevant times, will have the capability of doing so;*

(d) that the Commission is satisfied that the applicant has commenced or will at the appropriate time commence, to apply for all applicable statutory consents related to the matters referred to in section 18(2) of the Electricity Regulation Act, 1999 , necessary for the construction of the plant to which the application relates;

(e) that the Commission is satisfied that the generating station to which the application relates will be constructed and commissioned within a period which the Commission shall specify in relation to each application;

(f) that the Commission is satisfied that the generating station to which the application relates will be capable of providing an appropriate level of ancillary services being the services necessary to ensure the stable and secure operation of the electricity system, including the provision of spinning reserve, reactive power, frequency control or black start capability, as specified by the Commission in the authorisation;

(g) that the Commission is satisfied that the generating station to which the application relates will be capable of generating electricity for any minimum continuous period which is specified by the Commission in the authorisation using a primary fuel source of a nature other than that proposed to be used predominantly;

(h) that the Commission is satisfied that the applicant is a fit and proper person to be granted an authorisation and has the financial capacity and technical skills to carry out the activities to which the application relates and to comply with the authorisation, if granted;

(i) that the Commission is satisfied that the applicant will be capable of complying with any order made by the Minister under section 39 of the Electricity Regulation Act, 1999 .

These criteria are applied irrespective of the type of generating station proposed. However, the interpretation of these criteria may be seen to benefit certain types of generating station, for example criterion (b) may be seen as beneficial in the assessment of a high efficiency cogeneration station, where energy is used efficiently in generating electricity. This is discussed in more detail in Section 3.2.1.

3.1.7 Grant of Authorisation

When an applicant is granted authorisation, a Grant of Authorisation is issued, which sets out the terms of the authorisation. In 2001, the Commission published its response[7] to the comments received on the draft Authorisation and Application for an Authorisation to Construct or Reconstruct a Generating Station. In the context of authorisations for cogeneration stations, the following comments and responses from the CER are noteworthy.

Comments	CER Response

[7] Report on the Consultation on the Draft Authorisation and Application for an Authorisation to Construct or Reconstruct a Generating Station (CER/00/01)

Comments	CER Response
Comments were made that wind farms cannot, and CHP units may not be in a position, to provide ancillary services. It was therefore suggested that this condition be amended to allow the Commission discretion as to whether a generator should provide ancillary services.	The Commission has been advised that the technology is available for wind farms and CHP units to provide certain ancillary services. It is therefore at the Commission's discretion whether to amend this condition for defined generators which do not have the capacity to provide ancillary services. The Commission shall decide on a case by case basis the appropriate level of ancillary services in accordance with Article 2(a) of the Order.
Some concern was expressed that the wording of Clause 6.1 may cause an unnecessary impediment to the development of renewable energy sources or discriminate against those existing generators which do not have the capacity to use an alternative fuel source.	The Commission has discretion under the Order to consider on a case by case basis whether this condition should be applied. It is not the intention of the Commission to apply this Condition to generating stations using renewable, sustainable or alternative forms of energy.
It was generally accepted that plant capability to provide, utilise and store alternative fuel sources was necessary where plant availability would be critical. It was commented that this would lead to increased technological complexity and cost, and would not be required where commercial agreements could be made by he generator to ensure a committed uninterrupted supply of the primary fuel.	It is not the intention of the Commission to apply this criterion to stations whose primary energy source, e.g. coal, oil or peat etc. is carried as stock on site in the normal course of events. However, the Commission is of the opinion that for CCGT stations, it is necessary to guard against disruptions to supply of gas by holding stocks of oils on site. The Commission considers it reasonable for such a plant to hold oil stocks on site to cover five days operation of the station. If disruptions continue for a longer period, the oil stocks can be replenished as necessary. As has already been stated, it is not the intention of the Commission to apply this Condition to generating stations using renewable, sustainable or alternative forms of energy or for small scale CHP plants.

The general form of a Grant of Authorisation to Construct or Reconstruct a Generating Station includes provision for ancillary services (reactive power, operating reserve, frequency control and blackstart control) and alternative fuel source. However, in the context of cogeneration units, the comments from the Commission set out above permit a pragmatic approach to be taken in their application to such stations and therefore such units are not placed at a disadvantage. This is discussed in more detail in Section 3.2.2.

3.2 Evaluation of Legislative & Regulatory Framework

Prior to the Commission's decision and commencement of the two Electricity Regulation Act Orders in 2008, all generators were required to apply to the Commission for an authorisation to construct or reconstruct a generating station, irrespective of the capacity of the station or its fuel source. Consequently, prior to 2008 a 100 kW micro generation CHP unit would have been required to apply for the same authorisation and licence to generate as a 500 MW combined cycle gas turbine. This is no longer the case.

3.2.1 Encouragement of Cogeneration

The process for applying for an authorisation is common across all types of generating station and only differs in relation to the capacity of the station. Therefore, from a high level perspective, cogeneration does not receive any particular encouragement in terms of the authorisation process and must be treated in the same manner as all other types of generating station. For cogeneration stations with a capacity not exceeding 1 MW, the administrative barrier of applying for an authorisation has been removed, but this is also the case for all other types of generating station within this size range.

However, where a cogeneration station is required to apply for an authorisation by nature of its capacity (i.e. > 1 MW), some of the criteria under which the application is assessed may be considered to favour cogeneration above other types of station.

Criterion (b) (referred to in Section 3.1.6) refers to the efficient use of energy in the course of any activities carried out under the authorisation. As cogeneration, and high efficiency cogeneration in particular, is intended to make the most efficient use of the energy input for generating electricity (or mechanical energy) and heat, the assessment of this type of generation would be seen as favourable under criterion (b).

However, it is important to recognise that the authorisation process only relates to the generation of electricity and therefore, while cogeneration may be an efficient form of generating electricity (or mechanical energy) and heat simultaneously, the efficiency with which the electricity is generated will be influenced by the overall cycle, the prime mover efficiency and the percentage of heat that can be utilised for economic use. The latter is dependent upon the specific energy balance demand on the station. Thus, criterion (b) does not automatically favour all cogeneration stations, but does promote the efficient generation of electricity.

3.2.2 Reducing Barriers to Cogeneration

As set out above, the authorisation procedure in Ireland does not distinguish between different types of generating station and therefore the removal of the administrative barrier of applying for an authorisation for generating stations with a capacity not exceeding 1 MW has been beneficial for all types of station. It is likely to have as great a benefit on high efficiency cogeneration as any other form of generation, but other barriers to the uptake of cogeneration remain (refer to the reporting under Article 6(1)).

Other barriers to the uptake of cogeneration not related to the authorisation procedure for the construction or reconstruction of a generating station, including non-regulatory barriers, have been identified in a series of studies carried out into the uptake potential of cogeneration in Ireland. The most recent study was carried out in the first half of 2009 and identified five categories of barriers, including those identified by industry:

- Barriers that have been removed;
- Barriers that remain;
- Partial barriers (dependent upon the particular cogeneration station);
- New barriers (which had not been identified in previous studies); or
- Perceived barriers (which do not present a significant practical obstacle to cogeneration).

The barriers that were identified are discussed in more detail in the reporting under Article 6(1) of the Directive.

3.2.3 Streamlining Administrative Procedures

For cogeneration stations with a capacity not exceeding 1 MW, there are no external administrative procedures, as such stations automatically stand duly authorised and there is no requirement to notify the Commission. The only administrative task that a cogeneration station of this size should carry out is to satisfy itself that it meets the requirements set out in the Schedule to the Authorisation Order. There is no difference between the administrative procedures for this scale of cogeneration station and other types of generating station.

For generating stations that are required to apply for an authorisation, the administrative process requires completion of a single application form and is assessed by a single authority (the Commission for Energy Regulation). This has been the procedure since the formation of the Commission under the Electricity Regulation Act 1999, which implemented Directive 96/92/EC concerning common rules for the internal market in electricity.

3.2.4 Objective, Transparent & Non-Discriminatory Rules

The procedure for applying for an authorisation to construct or reconstruct a generating station, or for automatically standing duly authorised for generating stations with capacities not exceeding 1MW, are published by the Commission and updated as required in light of Commission decisions and consultations. Comments received on any consultation process are included in the Commission's report on the process. These documents are available on the Commission's website. In addition, the criteria under which generating stations are assessed for authorisation are contained within Irish legislation and are therefore available to all potential applicants.

The procedure for applying for an authorisation does not distinguish between different types of generating station and therefore does not discriminate against cogeneration station (or any other type of station). The only distinction that is made in this regard is in relation to the capacity of the generating station, with such stations with capacities not exceeding 1 MW automatically standing duly authorised without the need to apply to the Commission. Again, this exemption from the application process does not distinguish and therefore does not discriminate in favour of or against any particular type of generating station[8].

A general authorisation procedure has the potential to discriminate against certain types of generating stations in its application, particularly where there is no discretion permitted in assessing the criteria for granting an authorisation. As written, the criteria for assessing applications for authorisations and the Terms of Authorisation may be interpreted as discriminating against certain types of generating station, particularly in relation to the provision of ancillary services and alternative fuel sources. These items were highlighted during the initial consultation process undertaken by the Commission prior to the introduction of the authorisation procedure (refer to Section 3.1.7). However, the Commission confirmed that it was not its intention to apply the condition relating to alternative fuel sources to generating stations using renewable, sustainable or alternative forms of energy and small scale CHP plants, while also noting that it has discretion to apply this condition on a case by case basis.

In relation to the provision of ancillary services (reactive power, operating reserve, frequency control and blackstart control) in relation to cogeneration stations (and wind farms) the Commission stated that the application of this condition was at its discretion, although it noted that the technology was available for cogeneration to provide certain

[8] Section 18 of the Electricity Regulation Act 1999 prohibits the use of nuclear fission for the generation of electricity.

ancillary services. Therefore, the application of the Terms of Authorisation is not considered to be discriminatory towards cogeneration[9].

[9] The process is neither favourable or unfavourable towards cogeneration

3.3 Summary

The procedure for granting authorisations to construct or reconstruct a generating station in Ireland is simple and straight forward, requiring a single application to be made to the Commission for Energy Regulation. From the inception of the procedure, certain criteria required of more traditional generating stations (coal fired, CCGT) have not been applied to, or have been applied on a case-by-case basis, generating stations using renewable, sustainable or alternative forms of energy or for small scale cogeneration plants. This is done in recognition of the benefits and operational aspects of these types of station. Consequently, the authorisation procedure does not discriminate against cogeneration and, while the assessment of large scale cogeneration stations takes into account energy efficiency, the procedure could not be considered to promote cogeneration as a particular method of electricity generation above other types of generation.

The criteria for assessing applications for authorisations are contained within Irish legislation and decisions from the Commission (the regulatory authority) are published on its website. The results of consultation processes undertaken by the Commission are also made available to the public (and to potential cogeneration station applicants).

Other barriers remain to the uptake of cogeneration stations, described in more detail under reporting under Article 6(1), although these relate to criteria outside the scope of Article 6 of Directive 2003/54/EC.

4. Reporting Under Article 9(2)

Member States shall - where this is appropriate in the context of national legislation - provide an indication of the stage reached specifically in:

(a) coordination between the different administrative bodies as regards deadlines, reception and treatment of applications for authorisations;
(b) the drawing up of possible guidelines for the activities referred to in paragraph 1, and the feasibility of a fast-track planning procedure for cogeneration producers

4.1 Administrative Bodies

The Commission for Energy Regulation is the single body responsible for administering the procedure for authorisations to construct or reconstruct generating stations, irrespective of the generating technology. Therefore, it is the body responsible for administering authorisations to construct cogeneration plants.

Depending upon the nature of a particular application, the Commission may consult with either the Transmission System Operator (Eirgrid) or the Distribution System Operator (ESB Networks). However, the decision on whether the grant an authorisation remains with the Commission, albeit informed by the TSO or DSO, as required.

4.2 Application Process

Applications for authorisations are submitted to the Commission and are assessed in accordance with the criteria set out in the Electricity Regulation Act 1999 (Criteria for Determination of Authorisations) Order, 1999.

The time required to process an application depends upon the complexity of the cogeneration plant under consideration and the availability of information required to assess the application, but is generally greater than two to three months. During the process the applicant is informed of progress and, where necessary, the Commission may request additional information from the applicant in order to progress the application.

The application process is set out on the Commission for Energy Regulation's website.

4.3 Guidelines for Cogeneration

The Commission for Energy Regulation has produced guidelines for prospective cogeneration plant applicants setting out the process for applying for an authorisation (and licence to generate electricity). The guidelines include:

- General eligibility criteria for applicants,
- The Terms and Conditions of an authorisation,
- Instructions on the required form for completing an application,
- The timeframe for applying for an authorisation,
- The information required to be submitted with the application,
- The fees associated with submitting the application,
- The confidentiality of information submitted in the application, and

- Contact information for applicants requiring further advice.

While there are no specific guidelines for assisting prospective cogeneration plant operators through the process from feasibility study to grant of authorisation and generation licence, the Commission for Energy Regulation and Sustainable Energy Ireland provide support throughout the process, where required, and a number of industry representative bodies also provide support and guidance on the process.

4.4 Fast Track Planning Procedure for Cogeneration

There is no fast track procedure for the grant of authorisations to construct generating stations in Ireland, with all applications processed under the criteria set out in Electricity Regulation Act 1999 (Criteria for Determination of Authorisations) Order, 1999.

However, associated with the requirement for an authorisation to construct a generating station is the requirement to secure planning permission, where required, from the Local Authority. Under the Planning and Development Regulations, 2008, certain cogeneration plants are considered exempt development and therefore do not require planning permission. These developments are set out below, albeit with certain conditions and limitations applied to the development:

(a) The construction, erection or placing within the curtilage of an industrial building of a structure for the purposes of housing a (fully enclosed) Combined Heat and Power system.
(b) The construction, erection, or placing within the curtilage of a business premises, or a light industrial building, of a structure for the purposes of housing a (fully enclosed) Combined Heat and Power system.

In addition, the Planning and Development (Strategic Infrastructure) Act, 2006, recognises that certain types of development are in the National interest. Planning permission for these types of development can be sought directly from An Bord Pleanála (the authority to which planning decisions from Local Authorities are appealed), eliminating the requirement for an application to the Local Authority. While this process does not fast track applications in terms of the rigour in which they are assessed, it can reduce the duration of the application process which may otherwise have been assessed by the Local Authority in the first instance and then appealed to An Bord Pleanála (by either the applicant or potential objectors). However, given the nature of the types of development catered for in this Act, it is likely that, if permission were to be sought from the Local Authority, it would ultimately be appealed to An Bord Pleanála, and therefore the Act does facilitate fast tracking from the perspective of the timeframe in which the application is assessed.

The following developments may be processed under this Act:

- A thermal power station or other combustion installation with a total energy output of 300 megawatts or more.
- An industrial installation for the production of electricity, steam or hot water with a heat output of 300 megawatts or more.
- An industrial installation for carrying gas, steam or hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables, where the voltage would be 220 kilovolts or more.

While these types of development have the potential to assist the planning process for cogeneration stations in Ireland, it is unlikely that such stations would be constructed at this scale. However, other developments that may incorporate cogeneration into the process are also included within the Act. Such industrial developments that have the potential to attract cogeneration technology in Ireland include:

- Airports
- Waste disposal installations for incineration of hazardous wastes (or non hazardous wastes with a capacity greater than 100,000 tonnes)
- Waste disposal installations for the chemical treatment of hazardous wastes
- Waste water treatment plants (with a capacity greater than a population equivalent of 10,000)

4.5 Summary

As summarised under the reporting requirements of Article 9(1), the administrative procedures associated with authorisations to construct cogeneration stations in Ireland is relatively straight forward, with a clear system for all generating station technologies. There is a single body responsible for administering the application process in accordance with a publicised set of assessment criteria. While there are no guidelines assisting prospective cogeneration plant operators in the process of progress a feasibility study to final commissioning of the plant, the Commission for Energy Regulation has published guidelines on the application process for an authorisation (and licence to generate), while both the Commission and Sustainable Energy Ireland provide support to industry (and domestic) applicants on the process.

Finally, in recent years, Ireland has introduced a number of items of legislation in relation to the planning and permitting of certain technologies and developments of national importance, including cogeneration technologies.

Reporting Under Article 10(3)

Member States shall submit to the Commission, for the first time before the end of December 2004 covering data for the year 2003, and thereafter on an annual basis, statistics on national electricity and heat production from cogeneration, in accordance with the methodology shown in Annex II. They shall also submit annual statistics on cogeneration capacities and fuels used for cogeneration. Member States may also submit statistics on primary energy savings achieved by application of cogeneration, in accordance with the methodology shown in Annex III.

Table 4: Summary of CHP Statistics 2003-2007

	2003	2004	2005	2006	2007
Electricity Produced GWh/yr	634	668	614	1,563	1,790
Heat Produced GWh/yr	1,308	1,219	1,236	2,801	3,243
Operational Installed capacity MWe	130	139	118	268	273
Operational Installed capacity MWt	554	580	422	517	523

Fuel Inputs (TJ)	2003	2004	2005	2006	2007
Coal	251	246	440	0	
Peat	1,056	750	782	876	793
Refinery Gas	546	562	562	494	559
LPG	9	9	9	9	17
Natural Gas	6,894	7,287	6,605	16,923	20,376
Biomass	0	146	146	146	134
Total Fuel Inputs	***8,756***	***9,001***	***8,545***	***18,448***	***21,879***

Notes
Only operational units included