Northern Ireland Assembly

Research and Information Service Briefing Note

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Public sector renewable generation uptake

1 Introduction

The following paper uses data from Department of Finance and Personnel (DFP) and the Department of Health, Social Services and Public Safety (DHSSPS) to provide an estimate of the number of sites in the public sector currently employing a form of renewable energy generation.

The data from the two Departments is analysed separately in the first two sections, while the final section provides an estimate of total renewable generation uptake by amalgamating the two data sets.

2 The public sector estate

DFP's Properties Division provided data for 3,221[1] sites across the public sector estate. This data includes information on a range of properties, of differing sizes and purposes[2], provides an indication of the proportion of the public sector estate currently

[1] 3,222 individual lines of data have been provided, one of these has be discounted as it refers to "Health and Social Care Total" which is addressed by the DHSSPS data

[2] With regard to the purposes of the sites on which data has been provided, this includes a wide variety of uses such as office, schools, service depots, and public toilets. This paper does not make any assessment of the suitability or viability of installing renewable technology on these sites.

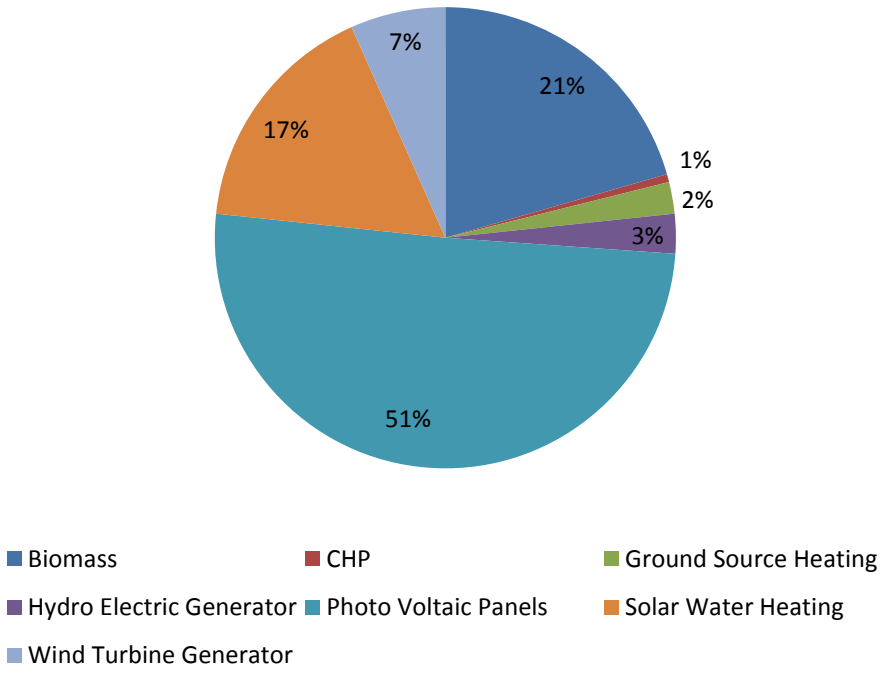
employing some form of renewable generation. The data does not include figures for the DHSSPS sites. Separate data has been provided by that Department and is examined in the section which follows.

With regard to the data provided by DFP, the figures provided quantify all onsite development in use across the sites listed. The original data therefore includes non-renewable generation, i.e. diesel and gas generation, and non-renewable combined heat and power generation (CHP), which have excluded from this analysis. One renewable CHP installation has been included. This installation used is fuelled by biomass.

Of the 3,221 sites for which DFP have provided data 179 have installed some form of renewable generation. Proportionally, 5.6% of the sites listed had a renewable generator installed.

The type of renewable generation utilised at each site is summarised in Figure 1. It is evident from the figure that the most common form of renewable generation to be installed within this section of the public sector estate was solar photovoltaic (PV), representing 51% of total installations (91 installations). This was followed by biomass, representing 20% of total installations (36 installations), and solar heating, representing 17% of total installations (30 installations). Wind generation, ground source heating, hydroelectric and CHP are utilised within the public sector but at lower levels.

Figure 1: Renewable onsite generation in public estate by type of generation



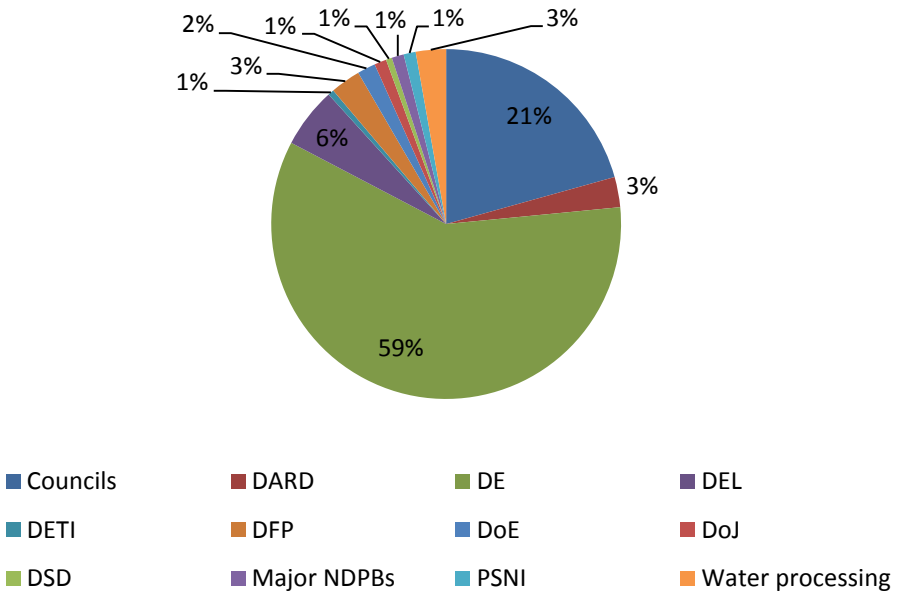
Source: Department of Finance and Personnel

Figure 2 breaks the 178 sites down by government department. It is evident from the figure that the Department of Education (DE) accounts for the majority of sites with renewable generation installed, 59% of all installations are on DE properties (106 installations in total). Council properties make up the next largest proportion of sites, accounting for 21% of the total (37 installations). DETI, the department with lead responsibility for energy, has ownership of only one site with a renewable energy installation.

These figures should be considered contextually, however. DETI properties make up the smallest number of sites within the data. The Department has direct responsibility for five sites, meaning that one out of five of DETI sites have a renewable energy installation, or in other words DETI sites have a 20% renewable penetration rate (i.e. the proportion of sites with renewable installations). By contrast, DE and the Council have responsibility of the largest and second largest number of sites respectively. In this context the renewable penetration rates of these departments appear, in relative terms, low. DE has a renewable penetration rate of 8% (based on 1,387 sites in total) and the Councils have a penetration rate of 4% (based on 1,022).

Figure 3, provides renewable penetration rates for each of the government sectors included in the DFP data[3]. Based on this analysis the largest penetration rate is in Water processing where 63% of all sites have some form of renewable energy installation.

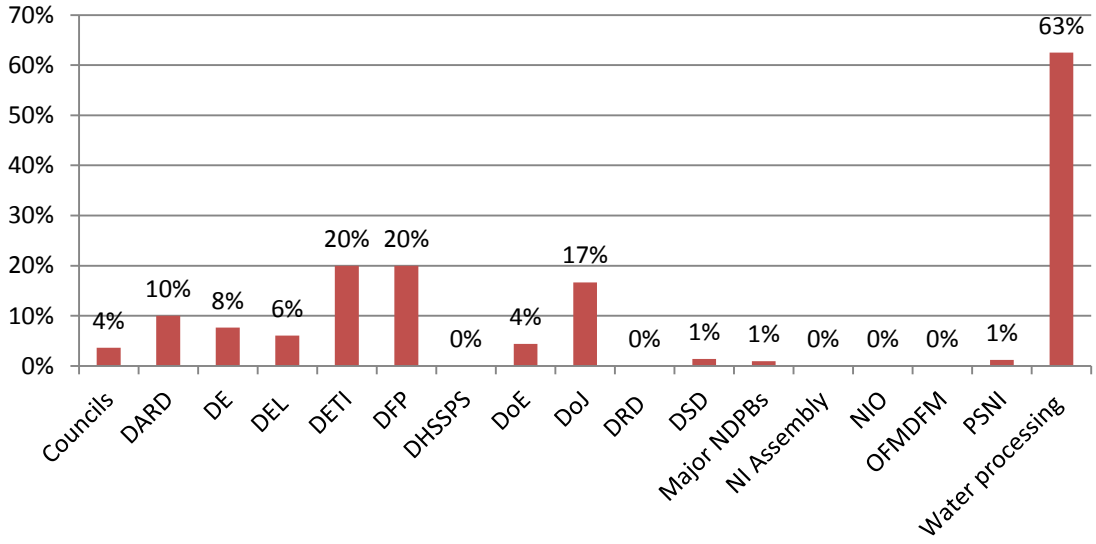
Figure 2: Renewable onsite generation in public estate by government department/sector



Source: Department of Finance and Personnel

[3] Two things should be noted about this data/figure. Firstly, the heading used within the figure corresponding to those used by DFP in its original database. Secondly, DHSSPS is included in the figure to reflect the inclusion of three sites included in the DFP data (all which are based in Castle buildings of which none has a renewable installation). These sites do not reflect the totality of the DHSSPS estate which more fully examined in section 2.

Figure 3: Renewable penetration rates (proportion of sites with renewable installations) by government organisation



Source: Department of Finance and Personnel

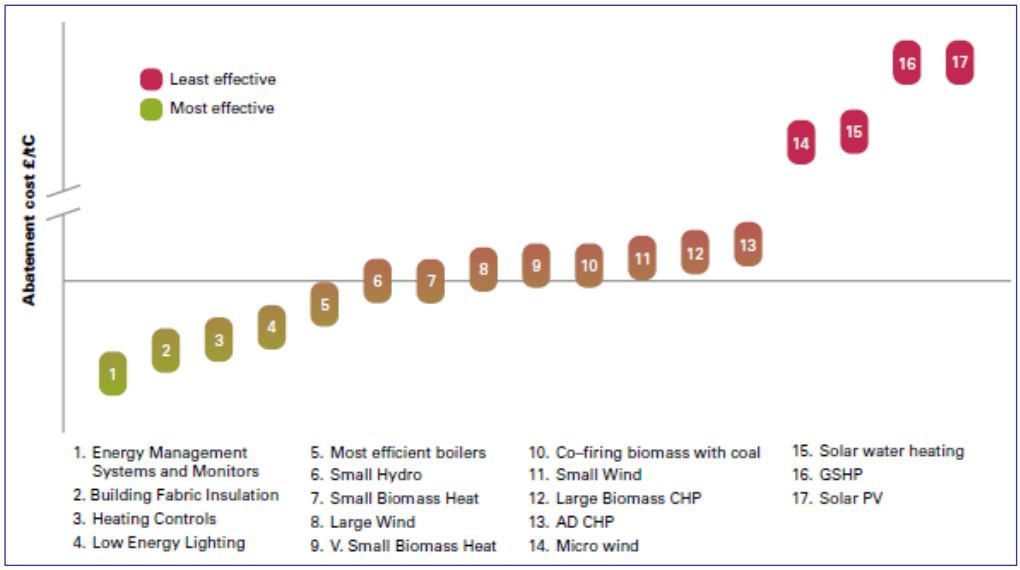
In 2012, DFP published an analysis of renewable energy installations in the NICS Office Estate. The study examined the results of technology trials at eight different sites across the Properties Division (PD) estate. The findings were as follows:

- With regard to solar thermal hot water (STHW) installations the study recommended that no further installations should take place in PD estates and that the trial installations were disconnected. This was due to *'to the excessive payback periods that have been calculated, all of which exceed the expected lifespan of the systems'.* The reports added that *'when consideration is given to the Legionella* [a bacteria variations of which are associated legionaries disease] with *mitigation measures that have been put in place as a result of the STHW installations, it is apparent that the use of these systems within Government office buildings is impractical, from both economic and operational perspectives* '.
- With regard to solar PV, the study found that 'this technology does not offer payback periods which could be considered as realistic'. It added that 'there is no doubt that the installations have generated a worthwhile amount of electricity on site with no associated complications, [but] the capital costs of this technology remain prohibitive. On the basis of this the report recommended that no further installations should be considered '*until there is either a significant reduction in the associated capital cost or a significant increase in the associated displaced grid electricity cost'.*
- With regard to biomass the report concluded that although it was *'clear that this technology offers a low carbon alternative to traditional fossil fuel based heating systems'* due *'to a number of operational issues relating to the integration of biomass boilers within existing heating systems, it has been difficult to draw definitive conclusions on the viability of this technology in the PD Estate'.* The report

questioned the technologies use within office buildings due to the limited operating hours, and recommended further study before any final decision on the technology be made. [i]

Figure 4, which was included in the DFP study although sourced from the Carbon Trust, provides an indication of relative carbon abatement costs for a selection of energy efficiency and renewable energy technologies.

Figure 4 - Relative carbon abatement costs



Source: Department of Finance and Personnel/ Carbon Trust

3 DHSPSS sites

DHSPSS provided data on 1,082 sites within its estate.[ii] Of these sites, 13 had some form of renewable energy currently installed, giving the Department a penetration rate of 1.2%.

Table 1 provides a breakdown of these installations by technology type and by HSC body. It should be noted that whilst 13 sites have renewables generation sites, three of these sites have two installations in operation. The most common technology in use across the sites examined is biomass. The data also indicated that the Belfast Health and Social Care (HSC) Trust has the greatest number of sites with a renewable installation.

The DHSPSS data also indicates that two further sites are to be installed in the South Eastern HSC Trust. These are:

- An air-heat pump to be installed at Downe Hospital; and,
- A ground source heat pump at Thompson House Hospital in Lisburn.

This would increase the Department's renewable penetration rate to 1.4% of sites.

Table 1: DHSSPS sites with renewable installations

HSC Body	No. Sites	Location	Type of technology
Southern HSC Trust	1	Portadown CTCC	Ground source heat pump Biomass
Northern HSC Trust	2	Holywell Hospital Antrim	Biomass
		Antrim Hospital	Wind turbine
South Eastern HSC Trust	2	Cedar Court Dementia Unit	Biomass
		Downshire Hospital	Biomass
Belfast HSC Trust	6	Neurology , Musgrave park Hospital	Solar thermal
		Beech Hall centre	Biomass
		Shankill Centre	Biomass
		Enler centre, Dundonald	Biomass x2
		Knockbracken Healthcare Park	Wind turbine
		Royal Victoria Hospital, Phase 2B	Solar PV
Western HSC Trust	2	South West Acute Hospital Enniskillen	Biomass x2
		Grangewood Mental Health Crisis Unit, Gransha Hospital,	Biomass

4 Total renewable penetration across the public sector

It is evident that 191 public sector sites currently utilise some form of renewable energy, based on the two data sets provided by the Departments. If the two sets are amalgamated, the number of sites on which data is available equals 4,303 (accounting for the exclusion noted in footnote 1). Based on these to figures, the current renewable penetration rate across the public sector can be estimated at 4.4%.

[i] Provided by DFP Properties Division 11 March 2013
[ii] Provided by DHSSPS 09 April 2013