Forestry Commission Scotland
Coimisean na Coillteareachd Alba

Woodfuel

Demand and Usage in Scotland Report:

1st Jan 2015 – 31st Dec 2015

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Contents

Report prepared for Forestry Commission Scotland by RDI Associates Ltd in association with Acres.

Executive summary

1. This report on existing and potential woodfuel use covers 2015 and assesses the possible additional use of woodfuel for the next few years.

2. At the end of 2015, there were an estimated 5,985 boilers using woodfuel in Scotland. 99.5% of these installations were heat only, with a thermal capacity of less than 1,000 kilowatts (kW).

3. Total woodfuel used in Scotland in 2015 was 1,248k oven dry tonnes (odt). In 2014, the total woodfuel used was estimated to be 1,098k odt. There was, therefore, a 14% increase in woodfuel usage in Scotland over this period. This is in contrast to the 2013-14 increase of 41%.

4. In 2015, the number of large boilers with a capacity of 1,000 kilowatt thermal (kWth) or more represented 0.45% of all boilers using woodfuel in Scotland. From 2014 to 2015, the amount of woodfuel used by boilers in this category dropped as a percentage of total woodfuel used from 84% to 81%.

5. The highest number of woodfuel boiler installations was found in rural Local Authority areas, with Aberdeenshire, Borders, Dumfries and Galloway and Highland accounting for almost 50% of all installations.

6. The majority of woodfuel used in Scotland continued to be virgin fibre, sawmill co-products and process residues (52%). However, there was a 1% decrease in its use as compared with the 2014 figure of 53%. Recycled wood remained an important source of fuel for very large boilers but its use decreased to 39% compared with 42% in 2014. Pellet use increased slightly to 5% in 2015, up from 4% in 2014.

7. There will be at least two large new woodfuel boilers commissioned in 2016 with a further 3 large boilers in the process of design, planning or development. The predicted increase in woodfuel demand for 2016 is 72.5k odt and in 2017 a further 12k odt. As noted in the previous report, continued 'degression' of tariff rates offered through the government's Renewable Heat Incentive schemes and the reduction in the price of oil, has slowed the rate of new small heat installations (less than 200 kWth). In previous years, this category has seen the highest increase in the number of boilers.

8. No new wood pellet plants have been opened since 2012 so the total in Scotland remains at 5. The quantity of wood used for the manufacture of pellets in 2015 was approximately 296k odt, compared with 304k in 2014.

9. In 2015, woodfuel boilers in Scotland contributed 3,276k megawatt hours (MWh) to the Scottish Government's renewable heat targets.

10. Wood-fuelled boilers in Scotland are estimated to have saved 1,467k tonnes of CO_2e in 2015. This is slightly more than in 2014 (1,309k tonnes), mainly due to an increase in woodfuel use but also due to changes in the methodology used.

1. The brief

To update the Woodfuel Demand and Usage in Scotland Report and to provide data for the period from 1st January 2015 to 31st December 2015. The use of woodfuel is presented using three heat capacity bands.

2. Methodology

2.1 Data collection

Data for this report was collected by email correspondence and telephone calls with woodfuel users, installers and other stakeholders, as has been done for previous reports. Figures provided by woodfuel users were used on strict conditions of confidentiality and are therefore only reported on an aggregated basis. In addition, information was used from past Woodfuel Usage reports and in particular the report covering the years 2013 and 2014.

This report has also been able to make extensive use of the data collected and published by the Department for Business, Energy and Industrial Strategy (BEIS – formerly DECC) on Renewable Heat Incentive (RHI) accredited boilers in the domestic and non-domestic schemes plus earlier Scottish Biomass Heat Scheme (SBHS) survey data.

Non-domestic boilers

- The RHI scheme for non-domestic buildings was introduced in November 2011, although it is assumed in this study that no new boilers were commissioned until January 2012.
- Biomass boilers installed after July 2009 were eligible to be subsequently accredited onto the RHI scheme ('RHI backdating').
- FC survey data covers non-domestic boilers installed between 2005 and 2012. However, the 2012 survey data is only included in the calculations of the average woodfuel use per installation. The aggregate number of boilers for that year has been replaced with the number of boilers obtained from the non-domestic RHI data.
- Boilers included in the FC's survey data, which were installed by the end of 2011, are referred to as **'antedated boilers'** for the purpose of this report. BEIS refers to boilers installed between July 2009 and November 2011 and subsequently accredited onto the RHI scheme as 'legacy' boilers.
- Allowing backdating within the RHI scheme meant that FC and RHI datasets overlapped and introduced a potential issue of **double-counting** for a number of non-domestic boilers installed prior to 2012. Due to the confidentiality of the RHI data, individual legacy boilers could not be identified. The problem was however minimised

using information on grant repayment levels for boilers originally funded by the Scottish Biomass Heat Scheme (SBHS). Owners who wished to enter the RHI scheme with a legacy boiler had to pay back the SBHS grant to avoid double funding. Based on this information, it has been estimated that approximately 30% of antedated boilers (installed before 2012) were subsequently accredited onto the non-domestic RHI scheme after its inception. This figure was then applied to the overall number of boilers included in the FC survey data for 2009-2011 and 42 boilers, using an estimated 4,600 odt/year, were removed from that dataset.

- Based on the FC survey data (2005-2012) on boilers using less than 1,000 odt per year the average boiler size was 164.52kW and the average woodfuel consumption per boiler was 98.334 odt/year or the equivalent of **0.5977 odt per year, per 1kW of boiler heat capacity**. In the absence of this information in the RHI data, this conversion number has been applied to past report estimates.

Domestic boilers

- The RHI scheme for biomass boilers installed in domestic buildings was launched on 9th April 2014 but boilers installed after 15th July 2009 were eligible to be subsequently accredited to the scheme.
- No information is available on wood-fuelled boilers installed in domestic buildings prior to 15th July 2009.
- According to UK Housing Energy Fact file (BEIS, 2013)[1], **the average woodfuel consumption per domestic installation has been estimated to be approximately 4 odt of woodfuel per annum[2].**
- This research excludes firewood used in open fires or wood burning stoves in domestic homes.

Data for domestic and non-domestic boilers

- The data available on the amount of heat generated by boilers accredited into the domestic and non-domestic RHI schemes differs. The payments received by owners of boilers in non-domestic buildings are related to the actual amounts of heat generated, which is metered on site, so this information is collected and recorded by BEIS. The owners of boilers in the domestic RHI scheme are not required to record the actual amounts of heat generated. Their payments are based on an estimate related to the energy consumption of a property at time of installation and these payments are made annually irrespective of the amount of heat generated.

[1] UK Housing Energy Fact File (BEIS, 2013)
[2] This assumes an average sized home using average amounts of energy for heating and hot water purposes as set out in the UK Housing Fact File. In all likelihood, homes with biomass boilers are likely to be larger and will therefore use more energy, possibly as high as 6 odt per year. For the purposes of consistency with past reports, the figure of 4 odt has been applied.

- This study assumes that since the inception of the RHI schemes, all newly installed biomass boilers will be registered to receive the RHI, or, where they are electricity or combined heat and power (CHP) plants, they will be participating in the government's Renewables Obligation (RO) incentive scheme and data available from BEIS will therefore include them.
- Boilers installed for generating heat in the larger wood processing plants will normally be fuelled with as much on-site process residue as possible such as bark, offcuts and sander dust. Where necessary companies can supplement their on-site supplies by diverting some of their existing roundwood or sawmill co-product purchases to make up quantities rather than separately buying-in virgin material such as logs, wood chips or recycled timber to fuel their biomass boilers. It has not been possible to obtain data that will allow separation of the quantities of these different fuel types that have been used. They have therefore all been classified together as 'virgin fibre, sawmill co-products and process residues' for the purposes of this report.

Data Assumptions

The following assumptions and assumption-based formula have been applied throughout:

- 1 oven dry tonne (odt) of wood has a realizable energy value of 5,000 kWh[3].

- The green to oven dry timber ratio can be calculated using the following formula:
  Where
  R = the ratio to apply
  mc = moisture content

  R = (100 – oven dried mc%) / (100 - green mc%)

  e.g.
  R = (100 - 0) / (100 - 50)
  R = 2

  So for every odt (0% mc) wood produced, 2 tonnes at 50% mc will need to be harvested.

[3] This is the figure that has been used in past reports and has been used in this report for consistency. Typical figures quoted for oven dry calorific values of wood (net CV) are closer to 19 MJ/kg or 5,200 kWh per tonne (rounded down).

2.2 Scope and structure of report

The results are presented in this report in the same way as they were in the last report (titled 2015:

- The estimated quantity of woodfuel used by boilers installed for domestic use under the RHI scheme has been included.
- The results are presented using the following three heat banding categories, which correspond to the three tariff bands used by BEIS in the non-domestic RHI scheme:
    - Plants with an installed capacity of 1,000kWth and above
    - Plants with an installed capacity of 200kWth and above, but less than 1000kWth
    - Plants with an installed capacity of less than 200kWth

Information on the types and quantities of woodfuel used in boilers with a heat generating capacity of 1,000kWth and above was collected as part of this research. For non-domestic boilers with a capacity of less than 1,000kWth, the estimate of the type of wood fuel and consumption is based on previously collected data and for domestic boilers on analysis by the Wood Heat Association (WHA).

3. Results

3.1 Woodfuel used by operational boilers

The total number of boilers using woodfuel at the end of 2014 is estimated to have been 3,906. In 2015, it is estimated that another 2,079 boilers were commissioned and accredited into RHI schemes, bringing the total to **5,985**. The main increase in the number of boilers was seen in the domestic category with an increase in 2015 of 1,453 over 2014. A further 625 boilers were installed in the non-domestic category.

3.1.1 Woodfuel used by boilers providing ≥1,000kWth

At the end of 2015, there were 27 boilers (an increase of one from 2014) operating in this heat category, of which 6 were CHP plants. **During 2015 these 27 boilers used a total of 1,013,489 odt of woodfuel. The 6 CHP plants used a total of 787,438 odt and the remaining heat only boilers over 1,000kWth used 226,051 odt of woodfuel.**

3.1.2 Woodfuel used by boilers providing ≥200kWth but <1,000 kWth

At the end of 2014, there were 164 boilers operating in this heat category. Based on survey data and BEIS non-domestic RHI data, it is calculated that a further 117 boilers were commissioned in this size category in 2015, giving a total number of 281.

Using the estimated average woodfuel consumption of 218.16 odt /year per installation, as used for 2014, (0.5977 odt per 1kW of boiler capacity[4]), **the amount of woodfuel used in 2015 by the 281 installations is calculated to be 61,303 odt.**

3.1.3 Woodfuel used by boilers providing <200kWth in the Non-domestic scheme

The number of antedated and RHI accredited boilers into the non-domestic RHI scheme was calculated to be 1,895 boilers at the end of 2014. BEIS RHI data shows that a further 508 boilers in this heat category were accredited into the non-domestic RHI scheme in 2015, giving a total of 2,403.

For the last 3 years (2013 to 2015), the weighted average capacity for non-domestic RHI boilers in this heat band is 111.67kW per installation. Using the previously calculated relationship of 0.5977 odt of woodfuel per year, per 1kW of boiler heat, gives an average woodfuel consumption per installation of 66.7431 odt per year. **As there were 2,403 antedated and RHI accredited boilers in the non-domestic scheme in 2015, their total estimated wood fuel consumption was 160,384 odt.**

3.1.4 Woodfuel used by boilers in the Domestic scheme

BEIS data made available in October 2016, shows that the median capacity of boilers accredited in the domestic scheme was 25kW. According to UK Housing Energy Fact file (BEIS, 2013), average woodfuel consumption per domestic installation is approximately 4 odt of woodfuel per year. **As there were 3,274 boilers accredited to the domestic RHI scheme in this category, their total woodfuel consumption was estimated to be 13,096 odt in 2015.**

In total, there were 5,985 antedated and RHI accredited boilers commissioned by the end of 2015 and the total wood fuel used is calculated to have been 1,248,272 odt.

3.1.5 Total woodfuel use

Over the 2015 calendar year, the total aggregated amount of woodfuel used by boilers in the three heat categories was 1,248k odt (Table 1). This is an increase of 150k odt (14%) compared with the previous calendar year.

An estimated 81% of the total woodfuel used was consumed by boilers with a capacity of 1,000kWth or more, with the next highest consuming category being boilers with capacity of less than 200kWth. Compared to previous years, the biggest increase in woodfuel consumption occurred in the boilers with a capacity of over 1,000kWth category, where there was an increase of 92k odt used in 2015 over 2014.

[4] Woodfuel use in Scotland 2015 Hudson and John Clegg Consulting Ltd

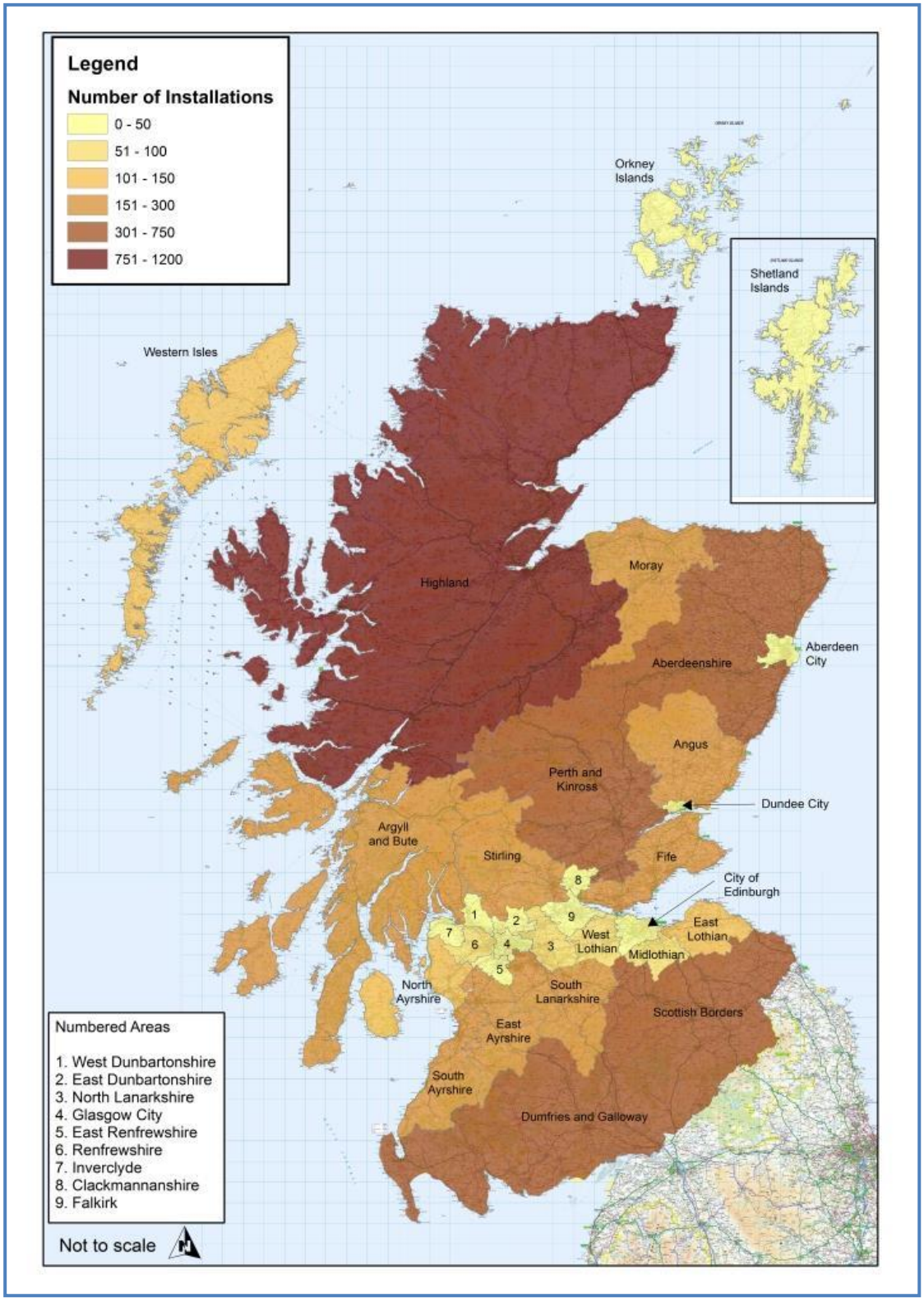
Table 1: Total woodfuel used by heat capacity of boilers in 2015

Boiler heat category	**Number of boilers**		**As %** (rounded)	**odt**		**As %** (rounded)
≥1,000kWth	27		0	1,013,489		81
200kWth – 999kWth	281		5	61,303		5
less than 200kWth	Domestic 3,274	Non-domestic 2,403	95	Domestic 13,096	Non-domestic 160,384	14
	Total 5,677			Total 173,480		
Total	**5,985**		**100**	**1,248,272**		**100**

The aggregate number of antedated and accredited boilers to the Renewables Obligation, Non-domestic and Domestic RHI schemes is shown by Local Authority area in Map 1.

The local authority with the greatest number of installations is Highland at 1,128 followed by Dumfries and Galloway at 713 and Aberdeenshire at 547. The local authorities with the least installations are Dundee City and West Dunbartonshire at 8 each.

Map 1: Geographical distribution of antedated, RHI and RO accredited woodfuel boilers commissioned by the end of 2015 by Local Authority area



3.2 Woodfuel use by fuel category

Confidential information on the types and quantities of woodfuel used in boilers with a heat capacity of 1,000kWth or more has been collected as part of the research for this report.

To estimate the quantities of different types of fuel used for the other two heat categories, a similar set of assumptions has been made to those made in the previous report, namely, that the woodfuel used by boilers with a heat capacity of less than 1,000kWth in commercial situations or accredited to the non-domestic RHI scheme comprised 73% wood chips and sawmill co-products, 25% pellets and 2% other material.

As set out in the previous report, for the period up to September 2015, WHA analysis of GB non-domestic RHI data on biomass fuel and capacity indicated that 50% of woodfuel used was pellets, 33% wood chips and the rest logs. The percentage of pellets used in Scotland is therefore lower, but the conclusion in the previous report was that there is a more readily available supply of coniferous wood chips in Scotland than most other parts of GB. The WHA analysis also covered fuel type in domestic installations and this showed a split of 90% pellets and 10% logs. In the absence of any other data, this report has assumed the same split for Scotland.

Based on survey information and the above assumptions, the total woodfuel used in 2015 by woodfuel category is given in Figure 1 below. Compared with 2014 (figure 2 below), there has been a decrease in the percentage spilt of virgin fibre and process residues used of 1% and a decrease in the percentage split of recycled wood used by 3%. 'Other sources', which includes sludge and other woody biomass (such as energy crops and arboricultural arisings) has increased from 1% in 2014 to 4% in 2015, primarily down to a handful of the ≥1000kWth boilers using more material from this category than in 2014. Figure 3 below shows total woodfuel use since 2004/2005 by major fuel category.

Figure 1: Woodfuel usage by fuel category in 2015

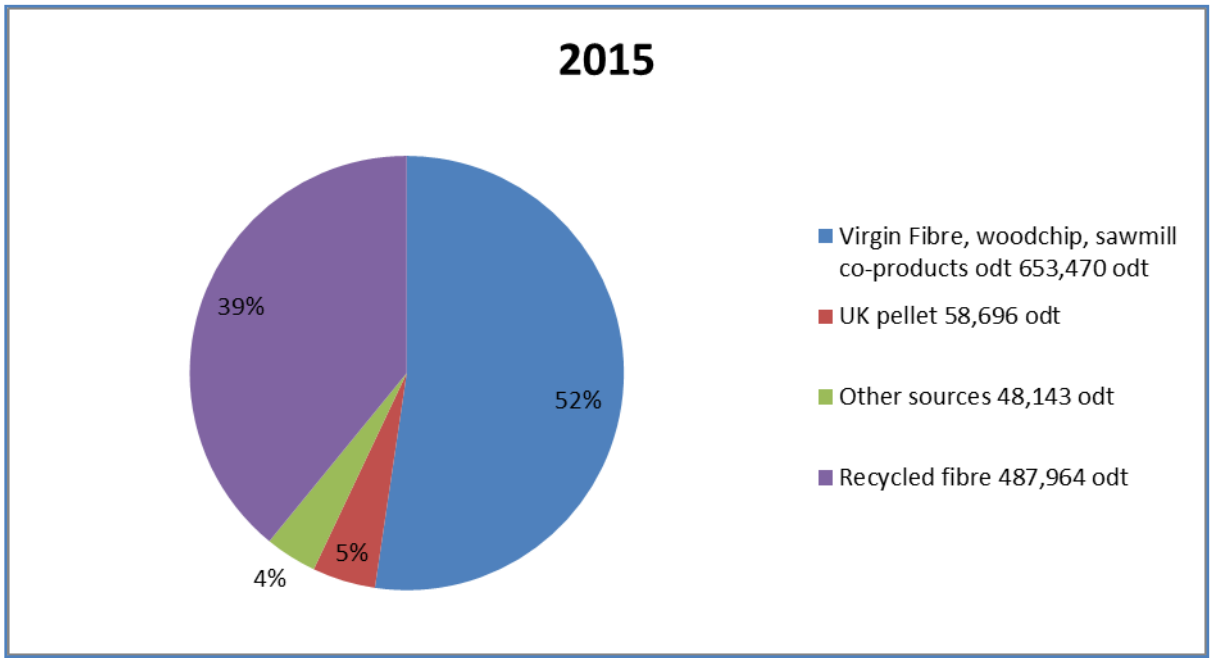


Figure 2: Woodfuel usage by fuel category in 2014

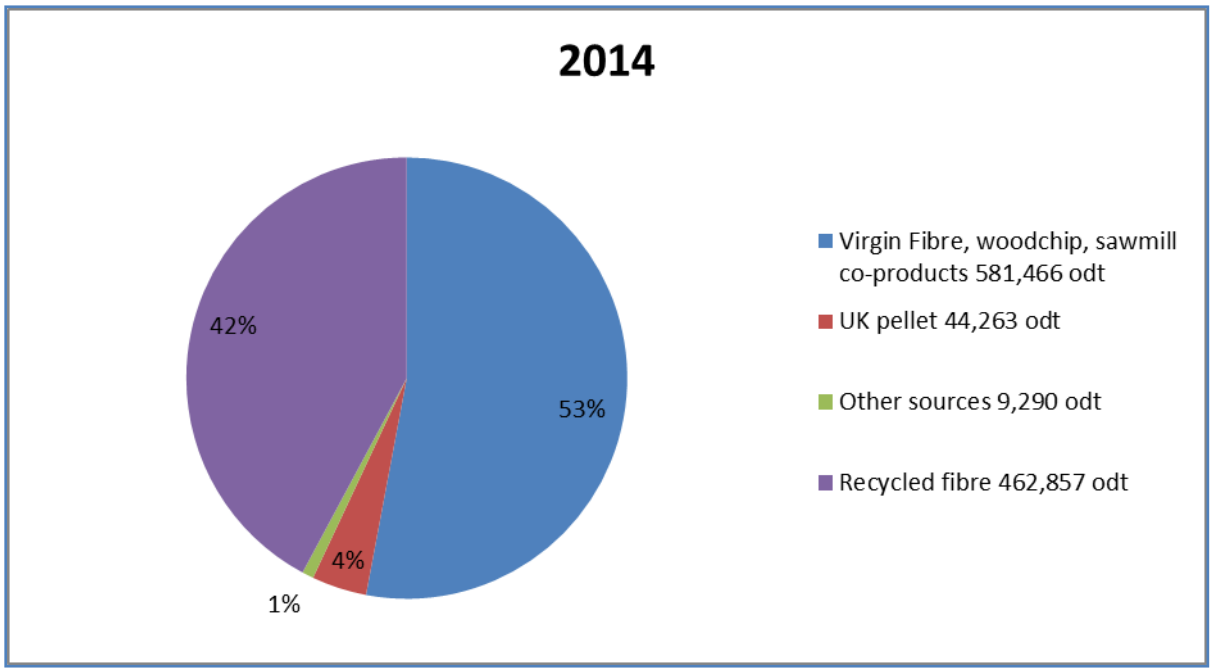
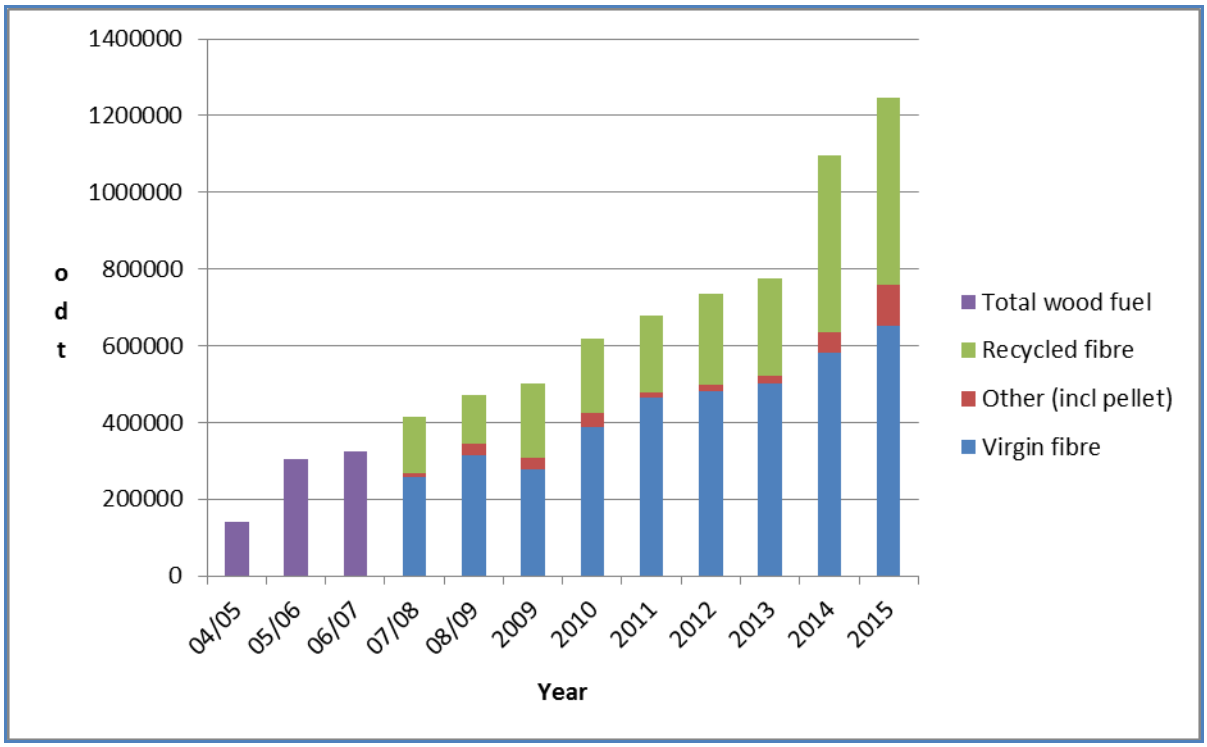


Figure 3: Total woodfuel use between 2004/05 and 2015 split by major fuel category.



3.3 Pellet plants operating in Scotland

In 2015, no new pellet plants started operating in Scotland so the total remained at 5. Their total intake of logs and sawmill co-products was very slightly lower than the 304odt in 2014, at 296,111 odt.

3.4 Contributions towards the Scottish Government's renewable heat targets

Operational data on the contribution that wood-fuelled boilers made to the Scottish Government's renewable heat targets in 2015 is not available for all heat categories of boiler but it is for boilers with a capacity of ≥1,000kWth.

As was the situation in 2014, the total heat output obtained operationally from boilers with a heat capacity of <1,000kWth was not available. However, the numbers of boilers in each heat category and estimates of the average thermal capacity of the boilers was obtained, as described in previous sections. As the number of operational hours was not known, these have again been estimated by assuming that the boilers were only used for 6 months of the year (180 days) and they were then only operating 10 hours a day. Using these estimates, annual operating hours therefore totalled 1,800. This represents

an assumed load capacity of 20.5%, which is almost identical to the BEIS load factor of 20%.

Using the data and assumptions described above, the contribution that woodfuel made towards the Scottish Government's renewable heat targets in 2015 has been estimated as 3,276,195MWh (see table 2 below). This is an increase of 532.149MWh (19%) over the 2014 estimate of 2,744,046MWh, The increase in heat output from 2013 to 2014 was 707,000 MWh or 35%.

Table 2: Estimated contribution of woodfuel to Scottish Government renewable heat target in 2015

Boiler heat category	No of Boilers	Annual Operational hrs	Av Boiler capacity kWth	Heat output MWh
≥1,000kWth	27	Survey data	Survey data	2,459,802[5]
200kWth - 999kWth	281	1,800	365	184,617
<200kWth non-domestic	2,403	1,800	112	484,445
<200kWth domestic	3,274	1,800	25	147,330
Total	5,985			3,276,195

3.5 Carbon savings

As in the last report, recorded data on the actual annual production of heat and electricity for wood-fuelled boilers that have been accredited into the Renewables Obligation scheme has been used to calculate carbon savings.

[5] Total obtained from survey reduced to account for heat generation for pellet production

The carbon savings achieved as a result of using woodfuel rather than other energy sources can be calculated using conversion factors for different fuel types published annually by BEIS[6]. The conversion factors for 2015 are given in Table 3 below.

For boilers with a capacity of 1,000kWth or more, it was feasible for most of the plants to record the substituted fuel to which the appropriate conversion factor was applied. It was not possible to identify what type of fuel was being replaced in the majority of boilers with a thermal capacity of less than 1,000kWth and it has therefore been assumed that it was oil (Burning oil – kerosene). The carbon savings have been calculated using a calorific value of wood of 5,000 kWh per tonne and are shown in Table 4.

Table 3: Conversion factors for greenhouse gas emissions for 2015

Substituted fuel (1kWth)	**Conversion factor: Net CV kg CO_2e**
Electricity	0.46219
Compressed natural gas	0.20494
Burning oil (kerosene)	0.25954
Coal (industrial)	0.3458
LPG	0.23052

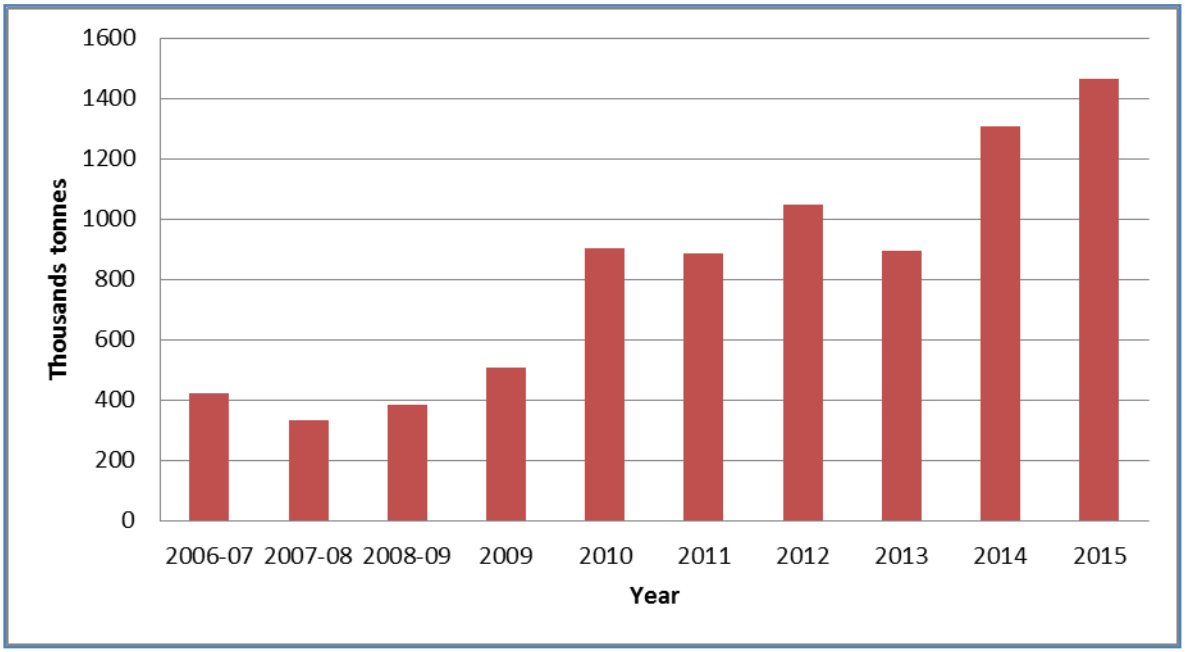
Table 4: Carbon savings from woodfuel projects in Scotland in 2015 – Net CV

Boiler heat category	**Woodfuel use (odt / annum)**	**Annual CO_2e Savings (tonnes/ annum)**
≥1,000kWth	1,013,489	1,162,466
200kWth – 999kWth	61,303	79,553
less than 200kWth	173,480	225,125
Total	**1,248,272**	**1,467,144**

[6] DEFRA, 2015: Government GHG Conversion Factors for Company Reporting

Woodfuel boilers operating across Scotland are estimated to have saved 1,467,144 tonnes of CO_2 over the course of 2015. This is an increase of 157,685 tonnes compared with 2014. Figure 4 (below) shows annual CO_2e savings from 2006/07 to the current reporting year.

Figure 4: Annual CO_2e Savings (thousand tonnes/annum)



4. Projects in progress

BEIS adopted a mechanism for budget management of RHI payments which involved "degression" of tariff rates for technologies that absorbed more funding from the RHI budget than BEIS had envisaged. For boilers in the small category of less than 200kWth, continual degressions in the non-domestic and domestic schemes were imposed throughout 2015. This resulted in a marginal slowdown in the number of small boilers installed compared to 2014. The increase in installations between 2013 and 2014 was 2,093, whereas the increase in 2015 compared to 2014 was 1,961. Additional RHI budgetary policy includes an annual cap on spend whereby BEIS can 'close' the scheme when annual budgets are likely to be met/exceeded although at the time of writing this has not yet been imposed. During 2016 a consultation on RHI policy reform was held and further changes to the scheme and budget will be introduced in 2017. On top of the uncertainty around the RHI in 2016, the price of oil continued to drop in the first half of 2016. This has also been compounded by the adjustment to the value of pound sterling compared to the Euro which has made importing European manufactured biomass boilers more expensive. It is currently hard to predict exactly what impact these factors will have, but a reduction in the rate of commissioning of domestic and small non-

domestic boilers in the heat category of less than 200 kWth has already happened and may well continue. This was the fastest growing category in the past.

The UK government recently announced details of the next Contracts for Difference auction. Some £290m has been set aside for the construction of new renewable power generation capacity. This round of funding is for less established technologies and includes dedicated biomass with CHP, which would start generating from 2021/22 or 2022/23. The round is due to open in April 2017 and may well stimulate further large-scale woodfuel CHP projects in Scotland.

There are estimated to be 6 large scale projects (>1MW) that could become operational in 2016 and into 2017. Growth in the demand for woodfuel in 2016 is likely to be in the region of 70,000 to 75,000 odt, with a further 15,000 to 20,000 tonnes in 2017. This does not take into account any increase in the number of RHI accredited large boilers which may, or may not be favoured by the RHI reforms.

5. Discussion

5.1 Methodological reflections

The methodology used in this report differs from earlier ones in a number of respects:

1. The guidance from BEIS on the methodology and conversion factors to use in calculating carbon savings has been changing and the latest advice has been applied in this report. However, the changes compared with the 2014 conversion factors are minimal.
2. As in last year's report, the actual outputs of electricity and heat from boilers in the Renewables Obligations scheme have been collected and used to calculate carbon savings, rather than basing them on boiler capacity as has been done in the past; the results should therefore be more accurate.
3. Although there is now much better information about the number of small wood-fuelled boilers than previously, available capacity and woodfuel use data for commissioned boilers accepted into the domestic RHI scheme is not considered very reliable. Operational information in this report for small boilers has been derived from past survey data and BEIS data and therefore it is thought to be reasonably reliable, but changes could be taking place that have not been picked up. However, any errors are thought to be small and be masked by the impact of the amount of woodfuel used in the larger boilers.
4. As set out previously, we have applied consistent conversion factors throughout this report in line with previous reports and most notably the figure of 5,000 kWh per odt.

5.2 Key findings

The total amount of woodfuel used in Scotland in 2015 rose by 150 odt to 1,248k odt, a 14% increase on the amount used in 2014 (1,098k odt). It is notable that the increase from 2013 to 2104 was much greater at 321k odt, a 41% increase.

The total number of boilers that use woodfuel in Scotland in 2015 was 5,985, an increase of 2,079 boilers from 2014. The majority of this increase was in the sub 200kWth category and in particular domestic boilers.

The category using the most woodfuel was large scale boilers with a capacity of ≥1000kWth. In 2015, they used 1,013k odt or 81% of all woodfuel. This means 10% more woodfuel was consumed by this category of boiler in 2015 than in 2014, when 921k odt was used. However, there was a 3% decrease in the percentage share of total woodfuel useage for this category compared with 2014.

The number of boilers in the 200kWth-999kWth category grew to 281 in 2015, an increase of 117 over 2014. This category continues to use the smallest amount of woodfuel at 61k odt. However, there was a 71% increase over 2014 in the amount of fuel used, making this the largest growth category as a percentage.

The sub 200kWth category showed a growth of 508 boilers to 2,403 in 2015 and a corresponding increase of 26k odt in the amount of fuel used, with a total useage of 160k odt, a 20% increase over 2014.

The domestic category saw an increase in boilers from 1,821 in 2014 to 3,274 in 2015, by far the biggest growth area in terms of numbers of boilers. Correspondingly, fuel use increased from 7k odt in 2014 to 13k odt in 2015, a 79.8% increase.

The most widely used type of woodfuel in Scotland in 2015 was virgin wood fibre at 653k odt or 52% of the total fuel used. Recycled fibre still makes up a significant proportion at 488k odt or 39%. Pellet increased its share from 4% in 2014 to 5% in 2015 and 'other sources' increased from 1% to 4%. Recycled wood is a very important source of fuel for the largest boilers, whilst pellets remain an important fuel type for small boilers.

The rural Local Authority areas in Scotland account for the majority of all woodfuel installations.

The number of pellet plants operating in Scotland in 2015 remains the same as 2014 at 5. The amount of woodfuel used for pellet production was recorded at 296k odt.

As the number of boilers and quantity of woodfuel used increased in 2015, correspondingly, the contribution of woodfuel boilers to the Scottish Government's

renewable heat targets grew; in 2015 the contribution was 3,276,195 MWH, up by just over 532k MWh on the 2014 contribution of 2,744,046.

Carbon savings also increased from 1,309k tonnes in 2014 to 1,463k tonnes in 2015.

The predicted rate of growth of woodfuel usage in the market place is now more difficult to predict than previously due to the policy and economic factors highlighted in section 4 of this report. It is likely that growth in 2016 and 2017 will slow and be less sizeable than that experienced in 2013 to 2014 (41%) and 2014 to 2015 (14%).