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Solid Fuel and Air Quality

An Update for Local Authorities



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Introduction and Summary

This note is an update to the Environmental Protection UK publication “Biomass and Air Quality Guidance for Local Authorities”. This guidance was released in 2008¹, with a version for Scottish local authorities following in 2010.

Since the release of the EPUK guidance there have been improvements in our understanding of how solid fuels, such as wood, are used and their impacts on air quality. Some of the principal findings have been:

- Wood burning is making a significant contribution towards wintertime PM₁₀ concentrations in many towns and cities
- PM₁₀ attributable to wood burning tends to peak during wintertime evenings and weekends. This suggests that wood is used principally as a secondary or ‘lifestyle’ fuel, rather than a primary source of heating. It also suggests that the majority of current air quality impacts are linked to simpler appliances such as open fires and stoves, rather than more complex appliances such as biomass boilers and Combined Heat and Power systems
- The public are far less aware of safety issues with solid fuel than they are with gas fired appliances. As such there is less appreciation of the need for regular maintenance and good operating practice
- Local authorities have experienced a number of gross pollution and nuisance cases linked to solid fuel appliances, and the frequency of these cases may be increasing. In many cases these problems occur when appliances are poorly installed, misused and/or inappropriate fuels are used

The Government is aiming to increase the use of biomass heat – and other renewable heat technologies – through the Renewable Heat Incentive (RHI) scheme. The scheme provides ongoing payments linked to the amount of heat that a renewable heating system provides. The scheme will support more complex biomass appliances such as boilers that provide heating for an entire property, but will not support stoves and open fires. The RHI is already in operation for non-domestic installations, and should start supporting domestic installations in autumn 2013.

Renewable heat installations supported by the RHI must meet certain quality standards for both the appliance itself and its installation. Air quality standards will also apply to biomass appliances installed under the domestic RHI. However, emissions from RHI supported biomass boilers will still be significantly higher than equivalent gas boilers, and adverse air quality impacts could occur if, for example, a number of biomass boilers are installed in close proximity.

Local authorities cannot ban the use of solid fuel appliances if they have concerns about air quality impacts, providing appliances meet the conditions of regimes such as the Clean Air Act. However, local authorities can take strategic decisions regarding what renewable heat technologies are suitable for certain area, and steer residents towards this approach through channels such as advice and information, planning and implementation of their Clean Air Act responsibilities.

Several local authorities are also integrating an approach to biofuels and other renewable heat technologies into their planning policies. This allows local authorities to set out where and where not biomass appliances are suitable when they are included as part of a planning application.

¹ See www.iaqm.co.uk/guidance.html

1. Trends in Solid Fuel Use and Air Quality Impacts

1.1 Solid fuel use and drivers

Solid fuel use is currently very low in areas of the country where mains gas is available, however over recent years some indications suggest that a significant increase is occurring from this low base. Drivers for increasing solid fuel use are:

- The rising cost of conventional heating fuels such as mains gas, electricity and heating oil
- A fashionable “Grand Designs” style image
- The green agenda – wood fuel is considered to be low carbon

There are additional drivers for larger biomass (wood and other renewable fuel) installations, those that provide heating and hot water for an entire house or larger development. These are:

- Financial incentives, such as the Renewable Heat Incentive (see section 3).
- Planning policies that set renewable energy targets for new developments.

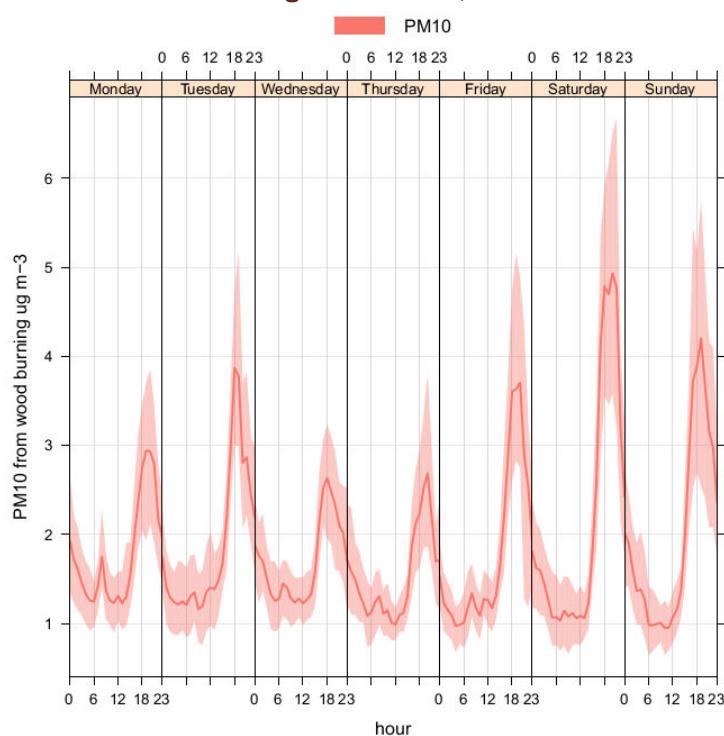
Note that in areas where mains gas is not available a significant proportion of homes are likely to use solid fuel as their main or secondary heating fuel. As these areas are generally sparsely populated rural regions poor air quality is not normally an issue, however solid fuel burning can still be the source of some isolated air quality problems.

1.2 Current contribution of wood burning to particulate matter (PM₁₀) concentrations

Analysis of measurements from the Defra black carbon network (Fuller et al 2013) between 2009 and 2011 suggest that wood burning in the UK is already contributing to ambient air pollution in many urban areas.

Monthly mean PM₁₀ from wood burning shows clear seasonality and ranges from around 1 to 3 ug/m³ in winter to less than 0.5 ug/m³ in summer. As shown in Figure 1 on the following page, the winter time airborne particulate from wood burning is greatest during the evenings, suggesting that wood is being burnt domestically.

Figure 1 – Mean winter time diurnal and day of week concentrations of PM₁₀ from wood burning in Norwich, 2009 – 2011²



The evening concentrations at weekends are greater than those during the week; this is especially the case in southern England suggesting that a substantial amount of wood burning is discretionary and not required as a sole or main method for home heating.

Analysis of the chemical composition of ambient air pollution in London suggests that a combination of soft and hard woods are being burnt, typical of combustion in old stoves and fireplaces rather than the soft woods that are used in modern pellet burners.

1.3 Current patterns of solid fuel use

Data availability on where and how solid fuel appliances are used is currently poor, and information on trends largely comes from qualitative intelligence from industry bodies and support groups. Some conclusions can be drawn from the evidence available, however please note that local trends may differ from this picture.

Stoves and open fires are by far the most commonly used solid fuel appliances. Whilst these appliances are small in size, emissions can be relatively high (on a grams per kilowatt basis) when compared to both gas boilers and larger solid fuel appliances. It is also easier to misuse (either intentionally or unintentionally) smaller appliances than larger automatic boilers, for example they can be poorly maintained, operated incorrectly, or be used with fuels of inappropriate quality or size. Such misuse can sometimes be the source of gross pollution problems.

² “New Directions: Time to tackle urban wood burning?” (Fuller, et al) Atmospheric Environment 68, 295–296

Larger domestic solid fuel appliances, for example solid fuel boilers that provide heating and/or hot water for an entire property, are currently far less common. At the present time the largest driver for installations of these types of boilers (usually fuelled by wood or other biomass) are planning conditions stating minimum targets for renewable energy provision in a new development. Retrofit of solid fuel boilers into existing properties is currently rare, however this may change in the future with the introduction of the domestic Renewable Heat Incentive.

1.4 Solid fuel air quality and safety risk factors

There is a risk that increased wood burning may offset the air pollution benefits achieved by decreasing emissions from industry and traffic. Although the apparent carbon neutrality of wood burning may make it appear environmentally friendly (see section 2), there is growing evidence of adverse health effects from wood smoke.

Domestic wood burning takes place where people live, at times when they are at home. Coupled with poor pollution dispersion during winter nights, even modest wood burning in densely populated residential areas may lead to PM_{2.5} exposures comparable to those from traffic sources³.

In addition to direct air quality impacts, research in Brighton and Hove flagged up a number of potential air quality and safety risk factors related to solid fuel (wood and coal) use:

- *Smoke Control Area (SCA) compliance* – the majority of solid fuel users appear to have a basic idea of what a SCA is, however compliance rates seem to be much lower. This may be because people do not know how to comply, or are just not willing to comply. With wood fuel there is considerable confusion around its environmental impacts, with many people believing that, as wood is promoted as a low carbon fuel, burning wood has only beneficial environmental impacts
- *Safety awareness* - there is poor understanding amongst the public of solid fuel safety. Most people are aware of the safety risks surrounding gas appliances and the need for regular maintenance by appropriately qualified personnel. This is not the case for solid fuel appliances, which can lead to poor quality installations and basic maintenance being skipped
- *Internet stoves and DIY fitting* – There is a healthy market for new and 2nd hand stoves sold over the internet. These are often DIY installed or fitted by a general builder without the required building regulation approval, and can be poor quality and/or unsafe installations
- *Fuel quality* – Stoves and boilers need specific fuels in order to operate efficiently and cleanly, however this is not appreciated by all users. A minority of solid fuel users also use their stove or fireplace to burn general waste. Many solid fuel users collect waste wood, for example fallen branches from woodlands or wood waste from skips. Waste wood can create problems if it is not seasoned (dried) or has been treated with chemical preservatives

³ Source, “New Directions: Time to tackle urban wood burning?” (Fuller, et al) Atmospheric Environment 68, 295–296

1.5 Obtaining local information on solid fuel trends

Numerical data on solid fuel use is currently scarce. Local data on solid fuel use may be available in local authorities with a housing function through activities such as Housing Condition Surveys and Home Energy Conservation Act reporting⁴. Housing departments may be able to help access this data.

The 2011 census included a question on heating fuel, “*What type of central heating does this accommodation have?*”, with solid fuel being one of the possible answers. Data from the census is being released in phases over the course of 2012-13. However, as this question relates to central heating systems it is unlikely to pick up open fires and stoves. It may be useful for showing the relative prevalence of solid fuel use between local authorities, and also different areas within a particular local authority. This question was not included in the 2001 census, so it will not be possible to assess trends in solid fuel use between census periods.

Intelligence on solid fuel trends may be gathered from individuals and organisations who work within the sector. Some public sector bodies employ individuals to support the use of wood fuels (and other low carbon fuels), who will have a good knowledge of the local market. Contacting your local Forestry Commission office is a good way to start⁵. County and district councils may also employ individuals who can help, for example staff promoting sustainability and the use of renewable fuels.

Perhaps the best way of obtaining detailed intelligence on your local solid fuel market is to talk to solid fuel appliance installers and fuel suppliers. You can find these companies via:

- Installers – the HETAS guide (directory of installers registered with the HETAS scheme) www.hetas.co.uk/find-installer/
- Fuel suppliers – the National Biofuels Supply database www.woodfueldirectory.org/, the HETAS guide www.hetas.co.uk/find-fuels/ and the Solid Fuel Association www.solidfuel.co.uk

Other online business directories may also be useful, such as www.yell.com and www.checkatrade.com.

1.6 Identifying areas where air quality may be affected by solid fuel use

It may be useful to identify areas of your local authority where there is potential for solid fuel use to increase, in order to make a quick assessment of the potential risk to air quality. The following factors may help to identify such areas:

- *Smoke Control Areas*. Most SCAs were declared during the 60s and 70s in areas where there were either smoke pollution problems or a risk of such problems. As such they may provide a guide to where modern day solid fuel use could present a risk to air quality. Note, however, that many urban areas have expanded or redeveloped since SCAs were declared, and also that SCA declarations (or the lack of SCA declarations) were sometimes influenced by the local authority politics of the day
- *Housing age*. Properties constructed since the 1970s are unlikely to have a fireplace and chimney. This makes it much more difficult (but not impossible) to use basic solid fuel appliances such as open fires and stoves

⁴ Note that the Home Energy Conservation Act has not been repealed (as stated in the EPUK Biomass and Air Quality Guidance document), and new guidance has been issued to local authorities for their duties under the Act

⁵ See www.forestry.gov.uk/forestry/HCOU-4U4HZV

- *Dwelling size.* More sophisticated solid fuel appliances (such as boilers) have larger space requirements than a natural gas boiler: the appliances themselves are larger and storage space is needed for fuel. As such they are unlikely to be installed in smaller properties such as terraced houses
- *Complaint trends.* An increase in the use of solid fuels may be accompanied by an increase in smoke nuisance complaints to a local authority. Logging and/or mapping such complaints may reveal trends in solid fuel use

2. Climate Impacts of Wood Burning

Biomass is often assumed to be a carbon neutral fuel, i.e. the carbon released when the fuel is burnt is that which was absorbed from the atmosphere when the wood was growing. However, whilst there is a “closed loop” for *direct* carbon emissions, there are *indirect* carbon emissions associated with growing, harvesting and transporting biomass fuels. The indirect impacts can vary significantly, even within the same fuel type, depending on the origin of the fuel, its production and any processing. There may also be other indirect impacts, such as land use changes. Where the information is available, these indirect impacts can be taken into account by users when selecting their fuel supply.

Greenhouse gas emission factors have been produced by the Government for wood fuels; these are shown in Table 1 below alongside figures for popular heating fuels⁶.

Table 1 – CO₂ emissions from heating fuels (direct and indirect)

Fuel	kg CO ₂ (equivalent) per kWh of fuel
Grid electricity (2010 grid mix)	0.49390
Natural gas	0.20435
Heating oil	0.31885
Wood pellets	0.03895
Wood logs (seasoned)	0.01895
Wood chips	0.01579
Grasses/straw	0.01020
Biogas	0.00000

Some of the local air pollutants emitted by biomass burning also have an impact on the climate. Some particles (e.g. black carbon) have a warming impact on climate, whilst others (e.g. organic carbon) have a cooling impact. These pollutants are known as “short lived climate pollutants”, as they are removed from the atmosphere far more quickly than long lived climate pollutants such as CO₂ and methane.

Current scientific understanding of short lived climate pollutants is not good enough to be able to directly compare their impacts to those of CO₂. However, one of the most recent authoritative papers on the subject suggested that emissions of short lived climate pollutants from biomass combustion had an overall warming impact, “*For a few of these sources, such as diesel engines and possibly residential biofuels, warming is strong enough that eliminating all emissions from these sources would reduce net climate forcing (i.e., produce cooling)*”.⁷

⁶ Source: <http://www.defra.gov.uk/publications/files/pb13773-ghg-conversion-factors-2012.pdf>

⁷ Source: “Bounding the role of black carbon in the climate system: A scientific assessment” (2013) , <http://onlinelibrary.wiley.com/doi/10.1002/jgrd.50171/abstract>

3. The Renewable Heat Incentive: An Update

3.1 Introduction to the RHI

The Renewable Heat Incentive (RHI) is a Government scheme that provides financial incentives for people to use renewable heat technologies. It incentivises the use of biomass boilers (but not stoves and fireplaces), as well as other renewable heat technologies such as solar hot water and heat pumps

The scheme provides ongoing payments linked to the amount of renewable heat provided by a heating system, rather than a one off grant to subsidise the cost of installing it. The aim of the RHI is to significantly increase the amount of renewable heat used in the UK, helping the Government meet the UK's target of providing 15% of all energy needs from renewable sources by 2015⁸.

The RHI has been available to certain non-domestic applicants (the *non-domestic* RHI) since November 2011, and should be extended to domestic applicants (the *domestic* RHI) in autumn 2013. Note that the rules for the *non-domestic* RHI differ in some ways to the planned rules for the *domestic* RHI. The scheme is similar (but not identical) to the Feed in Tariffs scheme currently available to people installing renewable electricity technologies such as solar photovoltaic panels.

To meet the UK's renewable energy target the use of renewable heat will need to rise from 2% of heat demand now to 12% in 2020. The RHI is the main mechanism the Government is using to achieve this target. Deployment of renewable heat technologies will need to significantly increase to meet these targets, and many of these technologies have air quality impacts (positive and negative).

Please note that at the time of writing the full design of the *domestic* RHI was yet to be finalised. This note therefore covers the draft proposals for the scheme, as provided in a consultation by the Department of Energy and Climate Change in July 2012 and confirmed in the Government response to the consultation in February 2013⁹.

3.2 What technologies does the RHI support?

The RHI will support a range of renewable heat technologies. The *domestic* and *non-domestic* RHI will support the same technologies, but the size of installations will be limited under the *domestic* RHI. The supported technologies are shown in Table 2 on the following page, along with an indication of their environmental impacts.

⁸ Source:

http://www.decc.gov.uk/assets/decc/what%20we%20do/uk%20energy%20supply/energy%20mix/renewable%20energy/renewable%20energy%20strategy/1_20090717120647_e_@@_theukrenewableenergystrategy2009.pdf

⁹ www.gov.uk/government/consultations/renewable-heat-incentive-providing-certainty-and-improving-performance

Table 2 – Technologies supported by the Renewable Heat Incentive

Technology	Description	CO ₂ impacts	Air quality impacts	Noise impacts
Biomass boilers	Heating and hot water boilers burning wood logs, chips or pellets	Positive – wood is a low carbon fuel (see section 2)	Negative if replacing gas or electric heat sources	n/a
Solar hot water	Water heating solar panels, normally used to provide hot water	Positive – solar is a zero carbon technology	Positive if replacing hot water from a combustion boiler	n/a
Ground source heat pump	Transfers heat from the ground to a building via pipes buried beneath the ground	Positive if replacing heat from a combustion boiler	Positive if replacing heat from a combustion boiler	n/a
Air source heat pump	Transfers heat from the air to a building, rather like a “reverse” air conditioning unit	Positive if replacing heat from a combustion boiler	Positive if replacing heat from a combustion boiler	May produce significant additional noise

3.3 How does the RHI work?

The RHI provides a payment per unit (kilowatt hour/kWh) of heat produced. The size of the payment (the “tariff”) depends on the type of technology installed: the RHI aims to make all of the supported technologies affordable, therefore the more expensive technologies such as solar thermal receive a higher payment per kWh than more cost efficient technologies such as biomass boilers. The tariff levels for the *domestic* RHI were not finalised at the time of writing¹⁰. The tariff levels will be regularly reviewed and reduced, as it is likely that the cost of renewable heat technologies will fall over forthcoming years.

For smaller installations it is not practical to measure the actual heat supplied, so the payments will be based upon the technology used and the anticipated heat load (e.g. the heat needed by a house), a process known as “deemed payments”. If payments are deemed the applicant will not be able to keep a fossil fuel back up boiler, for example if a homeowner plans to receive deemed payment for a biomass boiler they will need to remove their gas boiler or any other heating system.

Payments under the *domestic* RHI will be made for 7 years, however the tariff levels are designed to provide 20 year’s worth of support, i.e. the payments are frontloaded in order to make the scheme more attractive. In addition to funding new installations the *domestic* RHI will also support eligible technologies installed since 15th July 2009, providing they meet the required standard. Funding for the scheme will be provided directly by the Government.

Home owners will be able to apply for the *domestic* RHI, and social and private landlords may also be included. Second homes will not be eligible. In order to claim the *domestic* RHI homes will need to undergo a Green Deal (energy efficiency) assessment and the home owner will need to install any reasonable energy efficiency measures this suggests are necessary.

¹⁰ Draft tariff levels are available in this document
<http://www.decc.gov.uk/assets/decc/11/consultation/RHI/6453-rhi-consultation-domestic.pdf>

3.4 Technology standards

In order to receive *domestic* RHI payments a renewable heat system will need to be approved by the Microgeneration Certification Scheme (MCS), and installed by an MCS approved installer. This is an independent, industry-led certification scheme accredited by the United Kingdom Accreditation Service (UKAS). MCS approval provides assurances for the quality, durability and energy generation performance of microgeneration products. Mandating MCS approval reduces the risk of a poor quality installation for both the customer and the funder (the Government).

Biomass boilers over 45 kW (thermal) do not have to be MCS approved, however support for these larger boilers is only available through the *non-domestic* RHI.

3.5 Biomass technology supported

The *domestic* RHI will support biomass fuelled boilers providing heating and hot water, and wood pellet stoves with a back boiler. The system will need to be able to supply 99% of the peak space heating load of the property. It will not support other biomass appliances such as stoves and open fires.

MCS approved biomass boilers may burn wood logs, chips or pellets, or other biomass fuels. A full list is available on the MCS website¹¹. RHI supported biomass systems will tend to be boilers providing heating and hot water to an entire house, and larger systems that, for example, provide heating for a small block of flats or other development.

The maximum size for *domestic* RHI supported installations is 45 kW (thermal). The *non-domestic* RHI can support larger installations: currently biomass boilers of up to 200 kW (thermal) are supported, and there are plans to extend support to even larger boilers during phase 2 of the scheme (starting in 2013).

3.6 Air quality standards for RHI supported biomass appliances

Due to concerns around the air quality impacts of biomass burning, *domestic* RHI funded biomass boilers will need to meet minimum air quality standards in order to receive payments. The proposed standards are 30 g/GJ (thermal input) for particulate matter (PM₁₀) and 150 g/GJ for oxides of nitrogen (NO_x)¹². These standards are also expected to apply to biomass boilers supported under phase 2 of the *non-domestic* RHI, starting in 2013.

In order to claim the RHI the operator of a biomass boiler will need to provide a certificate demonstrating that the appliance complies with these emissions limits. There will be no separate UK testing and certification regime for the RHI emissions criteria. Instead the results of Defra approved tests will be accepted, for example from overseas test houses.

Smaller mass produced biomass boilers are tested for air pollutant emissions as part of their process of design and manufacture, therefore certificates will be provided when the appliances is purchased and installed. A list of these “off the shelf” RHI eligible boilers that meet the emissions standards will be compiled and published by HETAS (the solid fuels domestic heating appliance approvals body). For larger bespoke boilers with individual

¹¹ See

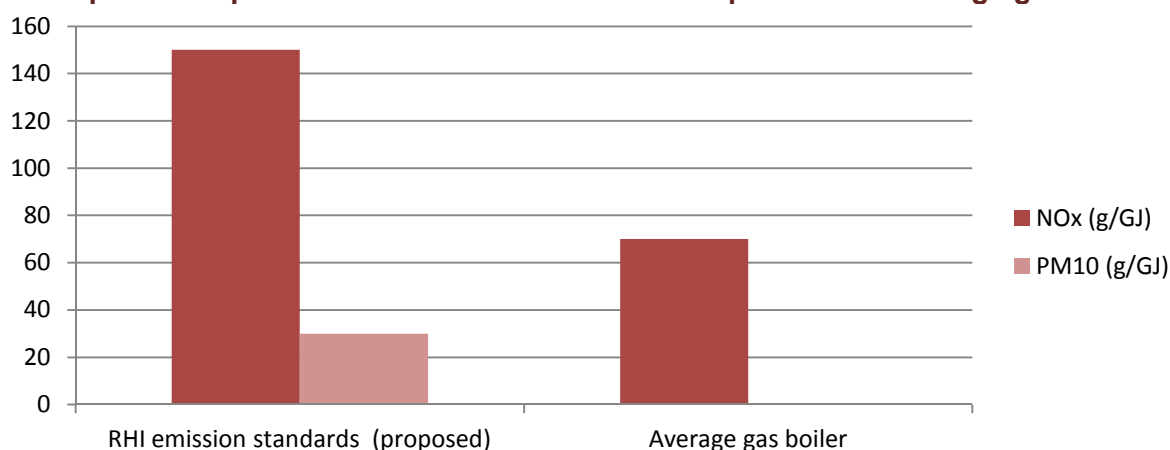
http://www.microgenerationcertification.org/index.php?option=com_content&view=article&id=21&Itemid=155

¹² See www.gov.uk/government/consultations/renewable-heat-incentive-providing-certainty-and-improving-performance

design characteristics emissions testing will need to take place on site and the commissioning stage.

It is important to note the limitations of the RHI emissions limits. Whilst they guard against the installation of grossly polluting boilers, emissions from approved boilers will still be much higher than natural gas boilers. This is shown in Graph 1 below: NO_x emissions from a biomass boiler which just complies with the RHI standards will be significantly higher than a gas boiler, whilst PM emissions are an order of magnitude higher.

Graph 1 – Proposed RHI emission standards compared to an average gas boiler



3.7 Planning, Building Regulations and Smoke Control Areas

A biomass boiler does not need planning permission. However if the boiler or any of its infrastructure (for example, a fuel store) needs additional building work then planning permission may be required, depending on local permitted development policies. New biomass boilers will require buildings regulations approval, unless the installer is registered with a “competent persons scheme” such as HETAS.

The relationship between RHI supported biomass boilers and Smoke Control Areas is, at present, undefined. In order to be installed in a Smoke Control Area solid fuel boilers must be tested and registered as an “exempt appliance”, however at the time of writing very few MCS accredited biomass boilers appear on the official list of exempt appliances. Boilers that meet the RHI emission criteria do not automatically become exempt appliances, as the testing and certification regimes are different.

The Government is planning to review the Clean Air Act during 2013¹³, which may tidy up this situation by, for example, aligning testing and approval systems for the RHI and exempt appliances. It is worth noting that the RHI emission standards provide a better guide to performance regarding pollutants of modern concern (i.e. NO_x and PM₁₀) than the exempt appliance standards, as the latter process only tests for total particulate matter, i.e. all particles regardless of size¹⁴. Local authorities can (at their discretion) permit non-exempt appliances to be installed in a Smoke Control Area.

¹³ See www.defra.gov.uk/industrial-emissions/other-regulation/clean-air-act/

¹⁴ See http://smokecontrol.defra.gov.uk/Application_Pack_Issue_3_FINAL.pdf

4. Managing the Air Quality Impacts of Solid Fuels

4.1 Assessment of biomass fuel emissions

The 2008 EPUK guidance “Biomass and Air Quality Guidance for Local Authorities” noted that neither HMIP Technical Guidance Note (Dispersion) (D1) nor the third edition of the 1956 Clean Air Act Memorandum were suitable for calculating stack heights for biomass boilers. If an initial screening assessment indicates that air quality impacts may be significant then detailed dispersion modelling should be used to assess impacts and calculate a stack height sufficient to disperse emissions from the boiler.

At the time of writing a guidance note on air quality screening and stack height calculation methods was being prepared for Defra. Once approved this will be available on the Defra Local Air Quality Management website (<http://lagm.defra.gov.uk/>)

4.2 Strategic approaches to managing biomass deployment

A case-by-case approach to assessment of biomass boilers may not be sufficient to guard against negative impacts on air quality. The cumulative impacts of a large number of biomass boilers installed in close proximity may be significant, even if the impacts of the individual boilers are negligible.

With solid fuel use likely to increase over forthcoming years local authorities may wish to take a policy position on solid fuels that can be used to inform their air quality strategy, climate change strategy and the advice and guidance they provide to their residents. The following principles are a possible starting point for a proposed solid fuel policy:

- i. Solid fuels technologies may not be appropriate in areas of poor air quality, such as in Air Quality Management Areas. All types of solid fuel appliances have higher PM and NO_x emissions than equivalent natural gas appliances. Where solid fuel substitutes for natural gas or electric heating air quality will be adversely affected to some degree
- ii. Growth in the use of small solid fuel appliances in areas of poor air quality should be discouraged. Smaller solid fuel appliances such as open fireplaces and stoves have relatively high pollutant emissions when compared to both natural gas heating and larger solid fuel boilers
- iii. Larger solid fuel boilers (as with any combustion appliance) may become the source of localised air quality problems. Air quality assessment of solid fuel appliances included in planning applications may therefore be necessary
- iv. Outside of areas of poor air quality (for example Air Quality Management Areas) the carbon emission benefits of biomass fuelled appliances may outweigh any impact on air quality. Where mains gas is not available biomass appliances may have lower NO_x and/or PM emissions than realistic alternatives such as coal or oil fired appliances

These principles suggest a zoned approach to solid fuel, discouraging its use where air quality is poor and encouraging the use of renewable solid fuels (biomass) where air quality is good and/or mains gas is not available. However, local authorities cannot simply ban the use of solid fuels in a particular area; instead the planning system, the Clean Air Act and advice and guidance for residents need to be used to implement a policy approach to solid fuels.

4.3 Using the Planning System

Larger solid fuel appliances will normally be subject to a planning application, either because they are installed in a new development or due to the need for building alterations to accommodate the boiler and/or fuel store. Note that the latter situation may be affected by proposed changes to Permitted Development rights.

Guidance on the air quality assessment of solid fuel boilers is provided in the EPUK document "Biomass and Air Quality Guidance for Local Authorities". However, feedback from local authorities suggests that a case-by-case assessment approach to solid fuel is unlikely to achieve a policy aim of restricting deployment in areas of poor air quality, as the impacts of *individual* solid fuel boilers is often insignificant.

A more effective approach is for a local authority to integrate a policy on solid fuels and/or biofuels into their planning policies. Two examples are shown below. Note that these examples are for local authorities where their entire area has been declared as an AQMA. Where air quality is only poor in a particular part(s) of a local authority this area should be specified in the policy statement.

- City of London draft Local Plan, Jan 2013 - *"3.15.8 The City is an air quality management area for NO_x and fine particulates and it is important that renewable energy technologies such as biomass and biofuel use do not exacerbate this problem. Where combustion-based renewable technologies are proposed developers will need to provide evidence that their use will not result in the deterioration of air quality."*
- [London Borough of] Camden Development Policies 2010-2015 - *"32.6 Core Strategy policy CS13 promotes the use of renewable energy technologies to reduce carbon emissions and tackle climate change. The burning of biomass in a boiler is identified as a renewable energy resource in the Mayor's Energy Strategy. Boilers can burn solid biomass or liquid biofuels and are popular on high density sites with small footprints as their use can be the only way for development to reduce their carbon emissions by 20%. However, in central London there are air quality implications for the use of biomass as higher levels of nitrogen oxides (NO_x) and particulates are released than conventional gas boilers or gas-fired community heating facilities. Given the existing poor air quality in Camden, the use of biomass as a renewable energy source will be the Council's least preferred option for the provision of renewable energy. We will expect developments to focus on energy efficiency and an efficient energy supply. Details on potential low carbon and renewable energy technologies can be found in the Camden Planning Guidance and also within policy DP22 –Promoting sustainable design and construction."*

4.4 Using the Clean Air Act

The Clean Air Act allows local authorities to set up Smoke Control Areas (SCAs) where approved smokeless fuels, or smokeless "exempt appliances", have to be used. These conditions mainly apply to small solid fuel appliances such as open fires and stoves, although solid fuel boilers smaller than 20 MW (thermal) should also meet SCA criteria. Whilst the designation of SCAs do not stop residents using solid fuels they allow a local authority to set out guidance for the use of solid fuels and help promote good practice.

With solid fuel use declining between the 1960s and 1990s most local authorities have scaled back their activities around designating, monitoring and enforcing SCAs. In the current financial climate it is unlikely that a local authority will dedicate significant resources to establishing and enforcing SCAs, but some activities may prove to be beneficial. Some suggestions here are:

- Review existing SCA declarations, some local authorities have reviewed their SCAs to “tidy up”, for example by checking for inconsistencies in the declarations and merging multiple SCAs into a single declaration.
- Distribute simple guidance on complying with SCAs and smoke control policy¹⁵.
- Provide online advice and guidance on smoke control policy and legislation, and (importantly) maps of SCAs¹⁶.
- Brief solid fuel appliance installers, fuel suppliers and chimney sweeps to ensure they are aware of SCA declarations and the local authority’s approach to smoke control. This information can then be passed onto their customers.

4.5 Using local authority policies on energy, climate and air quality

Most local authorities are (or will be) encouraging their residents to take up support schemes for energy efficiency and renewable energy. These schemes aim to reduce carbon emissions and provide financial savings for their users. The three main schemes available are:

- The Green Deal (available now) – a financing scheme for domestic energy efficiency measures and certain renewable energy technologies.
- The Renewable Heat Incentive (*domestic* RHI starts autumn 2013) – subsidies for renewable heat technologies such as solar thermal panels (hot water), heat pumps and biomass boilers.
- Clean Energy Cashbacks (available now) – subsidies for renewable electricity technologies such as solar photovoltaic panels and small wind turbines.

Most of the technologies supported by these schemes have neutral or beneficial impacts on air quality, with only biomass having a negative impact (if substituting for natural gas heat). Technologies with beneficial air quality impacts should be strongly encouraged in areas of poor air quality (providing they do not have other undesirable local environmental impacts), whilst those with negative air quality impacts should be discouraged.

A local authority’s policy on solid fuel should be allowed to feed into their plans to promote these schemes, and communicated through the partnerships they may make to promote these. Organisations that should be aware of a local authority’s approach to solid fuels (and the reasons behind it) should include:

- Delivery partners, for example local environmental organisations and private sector bodies promoting energy efficiency and renewable energy.
- Advice providers, for example energy suppliers, environmental bodies and Energy Saving Trust funded advice providers.
- Housing associations and other providers of residential accommodation (for example universities and colleges).
- Business support groups, for example Business Link.
- Installers of energy efficiency and renewable energy measures, and their support groups.

¹⁵ Brighton and Hove Council’s new smoke control leaflet is available at [http://www.brighton-hove.gov.uk/downloads/bhcc/airquality/Using_Solid_Fuels_Safely_and_Legally_\(pdf_0.2_mb\).pdf](http://www.brighton-hove.gov.uk/downloads/bhcc/airquality/Using_Solid_Fuels_Safely_and_Legally_(pdf_0.2_mb).pdf)

¹⁶ See Brighton and Hove example here <http://www.brighton-hove.gov.uk/index.cfm?request=c1260494>

4.6 Public advice and guidance on solid fuels

Provision of good quality information to people using, or considering using, solid fuel is essential for purposes of both pollution control and safety. Research in Brighton and Hove suggested that public information on using solid fuels is fragmented, and there is no obvious first port of call for people considering using solid fuels. Industry bodies such as HETAS do provide some good information, however awareness of these bodies amongst the public is low. In a survey, however, most people indicated that they would go to the Council website as a first port of call regarding Smoke Control Areas and the Clean Air Act.

One of the findings of the research was that open fires were still popular in Brighton and Hove (as opposed to stoves and more sophisticated appliances) and that awareness of some of the safety and pollution aspects of solid fuel use was relatively low. This suggested that provision of advice and information needed to start from a low base, i.e. rather than just providing advice on choosing and using solid fuel appliances (such as stoves) guidance should be provided on basic safety and the environmental impacts of solid fuels. Guidance should also encourage people towards safer choices, such as professionally fitted, Clean Air Act compliant stoves.

Information and guidance may be useful in 4 key areas:

- basic information for people thinking of using solid fuels, with a focus on both stoves and open fireplaces, this information should “nudge” people towards using stoves rather than open fireplaces for reasons of both fuel efficiency and pollution control
- guidance on using solid fuel appliances safely, efficiently and legally with a focus on safety, this approach is more likely to interest people than a heavy focus on the legal issues
- guidance on collecting and using waste wood, including “dos and don’ts”
- guidance on the seasoning and dry storage of wood

There are several good sources of online information on solid fuel use that can be supplied directly to the public or used to inform local authority web pages and leaflets. The main ones are listed below.

Local Authorities

Most local authorities with Smoke Control Areas include a page on their website explaining what they are and how to comply. Material developed for use in Brighton and Hove includes:

- “Using solid fuel safely and legally” leaflet - http://www.brighton-hove.gov.uk/downloads/bhcc/airquality/Using_Solid_Fuels_Safely_and_Legally_%28pdf_0.2_mb%29.pdf
- Solid fuel web page - www.brighton-hove.gov.uk/smokecontrolareas

Defra (<http://smokecontrol.defra.gov.uk>)

Defra is the Government department tasked with implementation of the Clean Air Act. They certify (through a contractor) approved fuels and exempt appliances for use in Smoke Control Areas. This information is presented on their website along with general information about the Clean Air Act and smoke control.

HETAS (www.hetas.co.uk/consumer/consumer-advice-sheets)

HETAS (Heating Equipment Training and Approvals Scheme) is a national body providing installer training and the registration of competent installers and servicing businesses. They produce a number of information leaflets on solid fuel appliance and their use. Their online information resource is perhaps the most comprehensive available for the small scale appliance sector.

Forestry Commission (www.biomassenergycentre.org.uk)

The Commission is a public body, with Defra as the parent Government department. The Biomass Energy Centre is a technical advisory service within the Forestry Commission, which advises on biomass system installation, fuel production, handling and supply chains. This is a comprehensive source of information about wood fuel and appliances, with a focus on larger scale plant. There is some information about the Clean Air Act on the site.

Solid Fuel Association (www.solidfuel.co.uk)

The SFA is the trade association for the manufacturers and suppliers of solid fuel, mainly the larger suppliers of coal based fuels. Their website provides guides on using solid fuel efficiently, with a small amount of information on the Clean Air Act.

Stove Manufactures Sites

The quality of information available on stove manufactures sites varies significantly. Some explain the Clean Air Act and list their stoves that are approved as exempt appliances, others do not. Examples of manufactures that do provide information include:

- <http://www.broseleyfires.com/DEFRA.html>
- http://www.acrheatproducts.co.uk/page/read/environment/smoke_control_zones