

Appendix 1

Solid Fuel Burning

Introduction

Solid fuel (mostly coal) used to be the most popular form of heating for homes in the UK, but from the 1960s natural gas central heating grew in popularity and is now used by almost all commercial and domestic users. Exceptions are off gas-grid, remote farms in the South Downs NP and house boats. However, since the 1990s solid fuels especially wood logs and pellets are increased in popularity as supplementary heating and as a feature in the living room.

Burning solid fuels contribute to airborne particles and many cities used to suffer heavy, sooty smogs. In response to these problems the Government passed the first Clean Air Act in 1956, which regulated the use of household solid fuels. Many urban local authorities established Smoke Control Areas under the Clean Air Act 1968: these are areas where special provisions apply if people wish to burn solid fuels. However, the legislation became almost redundant due to the switch to gas fired central heating. Statutory nuisance legislation under the Environment Protection 1990 became the first consideration for local authorities in England when responding to smoke complaints.

The simplest way to burn solid fuels is in an open fireplace. However, open fires are inefficient - most of the heat is lost up the chimney and this method can potentially be the most polluting for carbon monoxide, fly ash and particles due to the lower temperatures involved. Stoves need to be fed fuel to keep combustion temperatures hot and emissions low. Slow smouldering of logs and ash can release smoke. This may be detected by monitors for some hours during the day or night.

Health Impacts

Air pollution is the biggest environmental risk to public health. Airborne pollution (mix of gases and particles) is a strong contributor to the 170 early deaths that occur each year in Brighton & Hove.¹ 1 in 20 deaths in those aged 30 or over in Brighton & Hove are estimated to be attributed to particulate air pollution.² However, it is difficult to distinguish the impacts of smoke from wood burning from other causes of particulate emissions.

Using a stove or open fire at home can be contributor to smoke and pollutant called fine particulate matter (known as PM₁₀). These tiny particles can damage the lungs and other organs and can be harmful to human health.³

Eco-stoves for burning solid fuel can emit smoke and fine particulate matter (PM₁₀ and PM_{2.5}). A report⁴ commissioned by DEFRA reveals that even an Ecodesign stove emits six

¹ Brighton and Hove City Council Air Quality Action Plan 2022 to 2027 October 2022

² JSNA <https://infogram.com/1pqm9wklw969nrhq7x3g70ee39c0gr2e9mw?live>

³ <https://uk-air.defra.gov.uk/library/burnbetter/>

⁴ <https://uk->

[air.defra.gov.uk/assets/documents/reports/cat11/1708081027_170807_AQEG_Biomass_report.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1708081027_170807_AQEG_Biomass_report.pdf)

times as much PM_{2.5} as a Euro-VI HGV, per hour. The lorry has diesel particulate traps on the exhaust. The air quality impact relates to where the emission happens, for example:

- In an urban street at the bottom of a valley or near an open hilltop
- The hours of operation throughout the year, and in almost all cases natural gas boilers are used for longer durations than solid fuel stoves.

In an article about wood smoke pollution on the Medical Journal of Australia's website, respiratory physician Dr James Markos notes there is no safe level of wood smoke exposure. "It is identical to the risk of lung cancer from passive smoking."⁵

Air pollution has adverse effects on the cardiovascular and respiratory systems. When air pollutants enter the body they can affect the eyes, nose, throat, lungs, heart. The smallest particles enter the blood vessels. Over a long time, exposure to air pollution can cause chronic health conditions such as cardiovascular and respiratory diseases, as well as lung cancer, leading to reduced life expectancy.

Air pollution affects everyone's wellbeing at some stage of life, some people are more vulnerable to the health effects – older people, pregnant women, children, and those with cardiovascular or respiratory disease.

Environmental Impact

Pollution problems with solid fuels usually stem from operators using poor quality appliances and/or inappropriate fuels and stop-start operations. Nuisance issues can arise when unseasoned wood or mixed waste materials are burnt in appliances unsuited to these fuels. 'Invisible' pollution also occurs when poor quality appliances are used and, more worryingly, when waste wood treated with toxic preservatives such as old paint is burnt.

There is often a misconception that solid fuel burning is carbon neutral. Living trees absorb CO₂ from the air and store the carbon within, but when wood is burned, the CO₂ that was absorbed over the years that the tree was alive is released back into the atmosphere all at once, along with short-lived pollutants such as black carbon. Trees can be replanted, but it takes decades for those new trees to reabsorb the carbon that was emitted when their predecessors were burned. Fossil fuel burning, including natural gas releases CO₂ to atmosphere from a past geological era and this is most impactful in terms of today's atmospheric carbon budget. Gas boilers have NO₂ contributions which is the most plentiful pollutant locally.

If Brighton & Hove householders choose to burn solid fuels to keep warm this winter, essential considerations are:

- Wood is seasoned or dry
- Is clean without treatments such as paints or varnish

⁵ <https://www.dsawsp.org/secondhand-smoke/the-other-secondhand-smoke>

- Is not Elm, because stored logs are habitat for the beetle that spreads Elm's disease and this is a risk to Brighton & Hove's mature Elm specimens (centuries old heritage in many cases)
- Manufactured Solid Fuels approved by DEFRA
- Phase out or cease Bituminous Coal burning (no longer available to buy)

Monitoring

Local monitoring suggests particulate levels across the city are achieving the government's 2040 national target ($10 \mu\text{g}/\text{m}^3$) as an annual average for $\text{PM}_{2.5}$ (airborne particles less than 2.5 microns). There is excellent medical and scientific evidence showing health benefits at lower levels of pollution. A reduction in long term concentrations of particles $<10 \mu\text{g}/\text{m}^3$ will have benefits for individual health and at a population level. Monitoring to date suggests particulate levels are higher in built-up areas and portside compared to the South Downs National Park, but not more concentrated next to local roads. Nitrogen Dioxide is more concentrated next to roads. Longer term construction sites contribute to dust and particles. Events with diesel generators contribute to smoke, such as the Fair on The Level, Lady Boys at Victoria Gardens and the Food Festival at Hove Lawns. Wood burners associated with Saunas emit smoke close to Marine Parade as does the Brighton Speed Trial Event. A variety of local and distant emission sources contribute to breathable particles (including smoke).⁶

Fire Safety

East Sussex Fire and Rescue Service [ESFRS] provide guidance on the use of solid fuel burners and open fires to enable their safe use.⁷ These include advice to regularly have chimneys swept, once a year for most fuel types, but up to four times a year for wood burning fires depending on the amount of use. Checkatrade suggests that the average cost of a chimney sweep in the UK (outside London) is £65, which may be seen as expensive to those using solid fuel or open fires in a bid to reduce heating costs.⁸

The cost of installing solid fuel burners varies greatly depending on the type and size but can range between £500 and £5,000. According to Which? this is leading to some people considering installing solid fuel burners themselves, with 7% of people in a recent Which? survey doing so.⁹

⁶ BHCC 2024 Annual Status Report for Air Quality
https://www.brighton-hove.gov.uk/sites/default/files/2024-07/ASR_Brighton%20%26%20Hove_2024%20V2.asd_.pdf

⁷ <https://www.esfrs.org/chimneys>

⁸ <https://www.checkatrade.com/Search/Chimney-Sweep/in/Brighton>

⁹ <https://www.which.co.uk/news/article/why-you-shouldnt-install-a-wood-burning-stove-yourself-arN9O6b79Cxp#:~:text=Installing%20a%20wood%20burner%20or,home%20and%20create%20more%20pollution.>

Self-installation of solid fuel burners carries significant risk of carbon monoxide poisoning or fire. These are mainly from using incorrect materials and or incorrectly installing flues.

Even with correctly installed solid fuel burners there are also further risks from the positioning of furniture, items adjacent for drying, which may be positioned too close to solid fuel burners or open fires to feel the heat more. Other risks include storage of fuel, failure to properly extinguish fires when going to bed or leaving the house, not using fire guards, spitting embers, overloaded ash trays, and using too much or not enough fuel at once.

ESFRS also recommend that carbon monoxide alarms are fitting in any room with a solid fuel burner or open fire.

The burning of incorrect and different sized fuel also poses a danger to the user in terms of fire safety and additional environmental impacts. People may be tempted to burn things other than DEFRA approved fuel, such as wood they have collected or old furniture, particularly if they are using solid fuel burners and open fires for cost reasons. This wood may contain too much moisture resulting in excess smoke or may have been treated with chemicals or have pieces of plastic.

Smoke Control Areas

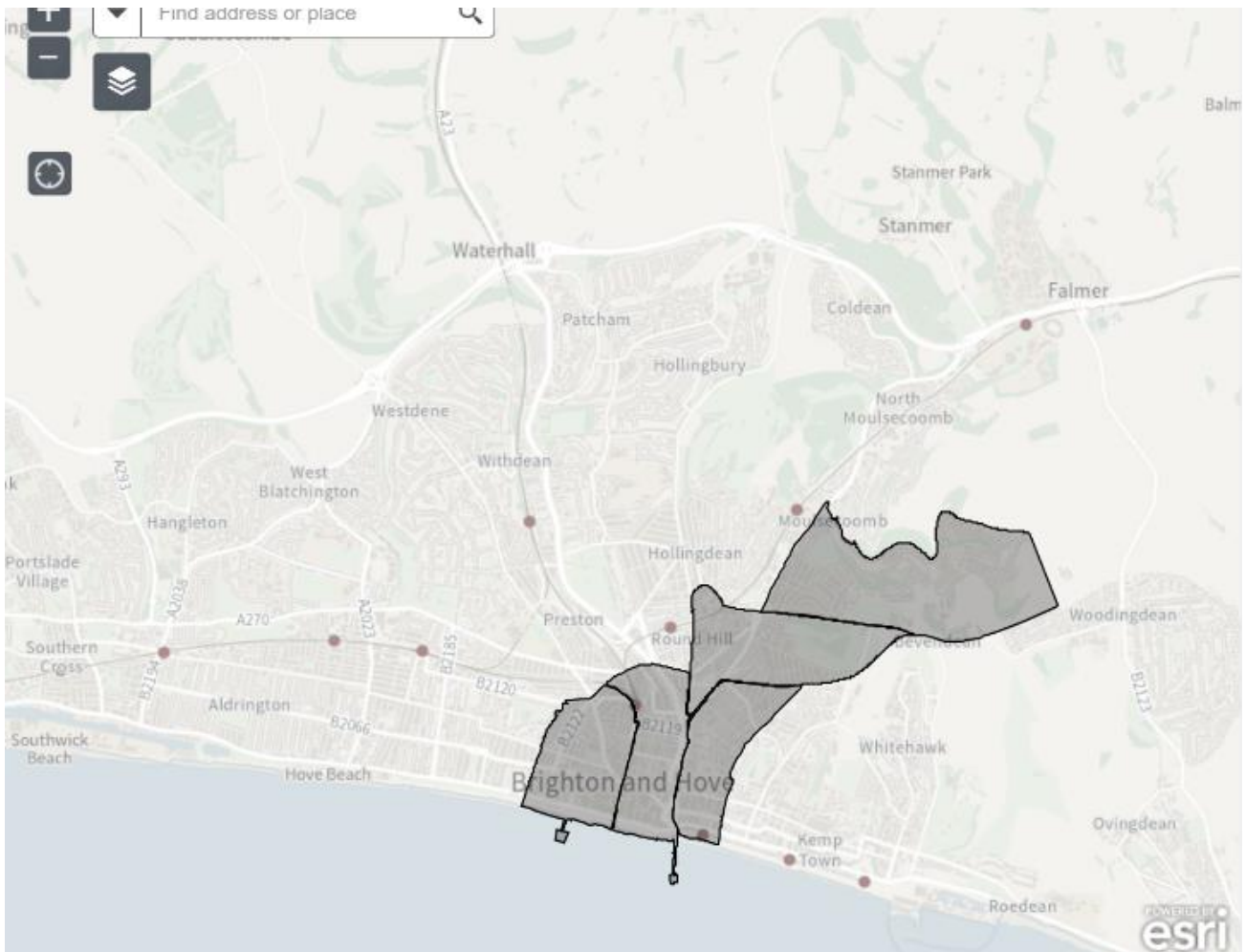
There are 5 Smoke Control Areas [SCAs] in Brighton & Hove.¹⁰ They were all declared under The Clean Air Acts, 1956 and 1968. The declarations were made between 1974 and 1981 by Brighton Borough Council.

The following describes the 5 areas (1 through to 5) in order as they were declared:

- The Brighton No. 1 (Lower Bevendean) Smoke Control Order 1974 approved by the Brighton Borough Council on the 9 May 1974, and confirmed by the Secretary of State for the Environment on the 5 August 1974 and operative from 1 October 1975.
- The Brighton No. 2 Smoke Control Order 1974 approved by the Brighton Borough Council on 8 October 1975. Confirmed by the Secretary of State for the Environment, with modification on the 5 February 1976. Operative from 1 October 1976.
- The Brighton No. 3 Smoke Control Order 1974 approved by the Brighton Borough Council on 18 May 1978. Confirmed by the Secretary of State for the Environment, with modification, on the 1 September 1978. Operative from 1 May 1979.

¹⁰ <https://www.brighton-hove.gov.uk/environment/noise-pollution-and-air-quality/using-solid-fuels-safely-and-legally>

- The Brighton No. 4 Smoke Control Order 1974 approved by the Brighton Borough Council on 2 February 1979. Confirmed by the Secretary of State for the Environment, with modification on the 23 April 1979. Operative from 1 November 1979
- The Brighton No. 5 Smoke Control Order 1979 approved by the Brighton Borough Council on 13 December 1979. Confirmed by the Secretary of State for the Environment, with modification, on the 6 February 1981. Operative from 1 October 1981.



A report¹¹ titled 'Air Quality Action Plan 2022 Consultation Results' was presented to the Environment, Transport and Sustainability Committee in November 2022 seeking approval to prioritise the delivery of a city-wide SCA. However, the recommendation was amended as follows:

2.4 That the committee requests officers **research further how** to prioritise the development and delivery of a citywide Smoke Control Area **to could** help tackle the harmful effects of particulate matter **in the areas where there is currently no Smoke Control Area, and that officers ensure that advice is provided to residents on the council website on how best to manage solid fuel heating where they do have it to supplement heating, including referring people to the East Sussex Fire and Rescue Service for a free home visit if they have concerns.**

Local authorities across the country have reported that enforcement of smoke control areas is difficult due to a lack of capacity and resources. In early 2023 when former DEFRA Secretary Therese Coffey suggest tougher enforcement measures the response from councils was that this would not be possible without additional funding. Councillor David Renard, of the Local Government Association, said: "Councils are happy to take on these responsibilities, but we need funding to resource them properly..."¹²

Burning outside SCAs or not from building chimneys

Brighton & Hove City Council receives more complaints for bonfires and static diesel generators (compared to smoke from a building chimney), but this is citywide and does not necessarily relate just to Smoke Control Areas. In the past five years 501 complaints for bonfires and twelve complaints for smoke from a domestic chimney. The council's website provides advice for households on bonfires, including how to reduce pollution from them.

<https://www.brighton-hove.gov.uk/environment/noise-pollution-and-air-quality/how-reduce-pollution-bonfires>

<https://www.brighton-hove.gov.uk/environment/noise-pollution-and-air-quality/bonfires-advice-households>

Barbecues are not allowed in some public areas of the city. There are bylaws for the seafront related to this which are primarily based around the health and safety of people using those areas and the associated fire risk.

¹¹ <https://democracy.brighton-hove.gov.uk/documents/s183869/Air%20Quality%20Action%20Plan%202022.pdf>

¹² <https://www.theguardian.com/environment/2023/feb/03/councils-say-they-lack-funds-to-enforce-stricter-limits-on-wood-burners>

<https://www.brighton-hove.gov.uk/libraries-leisure-and-arts/parks-and-green-spaces/single-use-disposable-barbecues>

<https://www.brighton-hove.gov.uk/libraries-leisure-and-arts/seafront/seafront-bylaws-and-accessibility/barbecues-beach>

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