

Fife Council Air Quality Strategy 2021-25: "Domestic Fuel Use Survey in Fife - March 2022"



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Introduction

"Burning at home is a major contributor to a type of pollutant called fine particulate matter, which is present in smoke. These tiny particles can damage your lungs and other organs, and harm the health of you and your family."

Defra UK Air 2022

"Domestic combustion is a major source of PM emissions in 2020, accounting for 15 per cent and 25 per cent of PM10 and PM2.5, respectively"

Defra National Statistics February 2022

"Dirty air will damage our health if we respond to rising oil and gas prices by burning more solid fuels."

Irish Times 23rd September 2022







Air Quality Strategy 2021-2025

- Developed from Scottish Government CAFS 2 guidance (2021)
- Nine key areas of approach:
- (1) Health e.g. work more closely with NHS Fife
- (2) Integrated Policy-e.g. integrate within Council plans/strategies
- (3) Placemaking e.g. ensure development assessed for air quality impacts
- (4) Data e.g. publish high quality data
- (5) Public Engagement & Behaviour Change- e.g. raise public awareness of local air quality issues
- (6) **Industrial-** e.g. collaborate with SEPA on industrial emissions monitoring
- (7) Non- Transport –e.g. raise awareness of air quality issues associated with domestic (household) combustion
- (8) **Transport-** e.g. ensure Air Quality issues are considered in all future transport planning decisions
- (9) **Governance -**e.g. regular meetings of Core Air Quality Steering Group

Air Quality Strategy for Fife 2021 - 2025
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Background



Protective Services

<u>Key Legislation</u>

- Part IV of Environment Act 1995
- Air Quality (Scotland) Regulations 2000 (as amended)
- <u>Review and assessment process</u>
- Prescribed air quality objectives
- Short & long term objectives
- Human health effects
- Annual air quality progress reports
- **Detailed assessments** where required
- Air Quality Management Areas (AQMAs)
- Air Quality Action Plans (AQAPs)



Air Quality Management Areas



- AQMAs are essentially air pollution zones
- One or more of **objectives exceeded**
- 15 authorities in Scotland have AQMAs
- Over 40 AQMAs in Scotland
- Most are for NO₂ and PM₁₀
- Majority as result of road traffic pollution
- Fife has two AQMAs
- (1) Bonnygate, Cupar
- (2) Appin Crescent, Dunfermline







- Fife is Scotland's third largest local authority area by **population at 367, 000**
- Population of Cupar is 9,000 (rural) & Dunfermline is 50,000 (urban)

Bonnygate & Appin Crescent AQMAs



- Bonnygate, Cupar & Appin Crescent, Dunfermline
- (1) Busy (> 10, 000 AADT) roads;
- (2) Narrow & congested roads and;
- (3) Street Canyons trap pollutants
- Extensive monitoring and modelling –
 NO₂ & PM₁₀ exceedances
- Bonnygate AQMA declared 2008 –
 administrative based area
- Appin Crescent AQMA declared 2011pollutant based area
- Air quality action plan in 12-18 months
- Set of measures to tackle the problem





Air Quality Action Plans



Protective Services

- Bonnygate Cupar Air Quality Action Plan 2010
- Appin Crescent Dunfermline Air Quality Action Plan 2013
- Action Plans updated in 2015 & 2021
- Comprehensive & prioritised set of measures
- These include:

(1) Traffic management measures;

- (2) Fleet measures (includes Fife ECO Stars scheme)
- (3) Behavioural measures
- (4) Strategic measures and;



(5) Non Transport Measures – includes domestic (household) combustion

Recent Trends







Solid Fuel Burning

 But what about background sources such as domestic household combustion?





Source Apportionment





 Background PM₁₀ sources account for 77.6% and 81.7% in Appin Crescent and Bonnygate Cupar respectively – therefore merits further consideration under the action planning process.



EP UK Solid Fuel and Air Quality 2013

- 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

April 2013
Solid Fuel and Air Quality An Update for Local Authorities
environmental protection uk



EP UK Solid Fuel and Air Quality 2

- From surveys undertaken 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





EP UK Solid Fuel and Air Quality 3

- 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

Clean Air Act 1993 (1)



Protective Services

 Current legislation for controlling domestic combustion emissions derives from the Clean Air Act 1993 and associated regulations. This is based around the establishment of Smoke Control Areas (SCAs). Fife has 14 SCAs in its area.



Clean Air Act 1993 (2)



- Only appliances which have passed tests to demonstrate that they emit a minimal level of smoke are permitted for use in SCAs. Similar tests apply for fuels; only exempted fuels can be used in non permitted appliances.
- However the Clean Air Act provisions are becoming increasingly outdated and have little relevance to modern air quality legislation. This results in the anomaly that appliances and fuels may pass the SCA tests without necessarily being compliant with LAQM air quality objectives.
- In addition, the provisions are difficult for local authorities to enforce and are poorly understood by members of the public. They also do nothing to address the impact of domestic combustion emissions outwith SCAs, nor the recent trend to install woodburning stoves in urban areas as a secondary or amenity heating source. The SCA approach is therefore, to a large extent, ineffective in ensuring that air pollution from domestic combustion is properly controlled.



Action Plan Measures

Appin Crescent

Measure Number	Measure Description
17	Update Air Quality Strategy for Fife
18	Promote the continued expansion of the Council's Electric Vehicle Fleet
19	Promote the continued development of the Electric Vehicle Infrastructure
20	Promote sustainable travel initiatives
21	Promote domestic combustion best practice guidance
22	Develop alternative travel Infrastructure
23	Promote and organise Clean Air Day Events
24 <	Identify source apportionment to background PM
25 🤇	Utilise Sensor technology to gain a better understanding of PM concentrations within the AQMA
26	Identify most polluting vehicles within AQMA

Bonnygate

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- Action plan measures created to tackle issues of domestic (household)fuel emissions
- Survey undertaken to further understand these at two AQMAs



Background

- This survey was undertaken in March 2022 to help Fife Council develop a better understanding of local sources of emissions within both their Bonnygate, Cupar and Appin Crescent, Dunfermline Air Quality Management Areas (AQMA) and to inform future air quality modelling and action planning activities.
- This fuel use survey looked specifically at identifying the extent of solid fuel burning in and around the AQMAs, in particular whether open fireplaces, solid-fuel stoves and biomass boilers are used as a source of heat by householders and businesses.







Methodology

- A short questionnaire was prepared and sent out to ask householders and businesses to specify the fuel they use to heat their home or business and what type of appliance they use.
- The questionnaire consisted of 16 concise questions designed to extract as much information with regards domestic solid fuel burning without being too intrusive and cumbersome to the extent that people would not participate. In general questions covered the following issues:
- What type of heating system is used?
- What type of appliance is used?
- What type of solid fuel is used?
- How frequently is it used?
- Additional information was requested regarding the provision of best practice guidance.

	mpleting the questionnaire for?	
Detached house	Semi-detached house	
Terrace house	Flat or apartment	
Commercial – please specify		
2. How old is the property?		
Less than 5 years	5 to 15 years	
15 to 40 years	More than 40 years	
. Which fuels/energy sources do y	ou use to heat your property? (Tick all that apply)	
Mains gas	LPG	
	Solid fuel (wood, coal, other solid fuels)	
Other – please specify		
Yes – please continue with No – please return survey a No – please return survey a Open fire Other – please specify	this survey is is do you have? Stove Boiler	
	ick all that apply)	
Which solid fuels do you use? (T		
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Methodology 2

- The surveys did not include any personal questions that could link the survey back to the respondent.
- All responses were anonymous.
- A short introductory letter explaining why the survey was being undertaken and encouraging householders and businesses to respond was also included along with the survey.
- Fife Council letter headed paper was used with the Council's permission and it was outlined in the letter that Ricardo Energy & Environment were carrying out the survey on behalf of Fife Council.





Methodology 3

- The letter and survey was then sent out to properties within and around the Bonnygate and Appin Crescent AQMAs along with freepost envelopes to encourage participation. It was also decided that the questionnaire was provided using paper copies and the post rather than electronically to again encourage participation and also to gain a quick response.
- Responses were then collated and the results included within the relevant report.

 What 	type of property are you	completing	g the questionni	sire for?	
Det	ached house			Semi-de	tached house
Ten	race house			Flat or a	partment
_ Cor	nmercial – please spec	ify			
9 Married	dd in the property?				
	a than 5 years			5 to 15 v	
15.1	o 40 years			More tha	in 40 years
					-h -Walked
	rueisenergy sources (o near your pro	party / (II	
	ns gas		ctricity		
E on	er – please specify	L_ 50	na mei (wood, c	oai, omer	solid fuels)
4. Do yo	u use solid fuel indoors	(wood, eoa	I, smokeless fu	al, etc)?	
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	40 - please return surv	ey as is	eay .		
	town of a plied front second		h		
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	viner – piease specify				
-	a subled decades also comercians	a crists all de	and another		
	r sond raens do you use		tac approy		
- 83	touse coal	- H	Smokeless fu	nin l	L Wood panets
	Other - please specify		and a second sec		
_					
7. Whiel	is the main solid fuel y	ou use?			

8.	Please describe your appliance including make and model where possible?	1
9.	Now long have you had your appliance?	ן ר
10	How many appliances do you have and / or use? One	1
11	Is this a main or supplementary source of heat?	
12	Only in winter All year	
13	How frequently do you use your appliance? Daty Evening Cocasionally Special occasions	
14	How do you making source your feel? Dry in body Dry in body Converse yourself Converse yourself Converse specify Converse specify]
15	Were you given any best practice procedures when purchasing your appliance? Yes No	
16	Would grant to be barrented to transmose on the test practice in terms of neuroing and maintaining grantmer? Yes How would you the the information? No Track you for comparing the neuropy to be address process.) J Your
	Please return in the prepaid envelope to the address provided.	





Methodology 4

 In total, there were 2,020 surveys sent out, 1,440 to the Bonnygate area and 580 to Appin Crescent. The substantial difference in number of questionnaires issued to each location was a result of the varying size of the relevant AQMAs and the number of residences located in and around them.







Response Rate

- Of the **2,020 surveys** sent out a total of **556 responses** were received, **339** from the Bonnygate area and **217** from the Appin Crescent area.
- This was an overall response rate of **28%**.
- Considering each location individually **Bonnygate had a 24%** response rate compared to 37% at Appin Crescent.
- Out of the 339 responses from Bonnygate, 12% (42) responded yes to using solid fuel burning as a heating source. In Appin Crescent 17% (36) out of the 217 responded yes to using solid fuel burning as a heating source.





Key Findings

• Which Fuels/Energy Sources do you use to heat your property?



- The majority of respondents from Bonnygate and Appin Crescent heat their properties using mains gas (55% and 61% respectively), followed by electricity (37% and 31%).
- Solid fuel is next (7% and 8%), followed by LPG and other (less than 1% for both)



Key Findings 2

What type of solid fuel appliance do you have?
 Bonnygate Appin Crescent



 In the Bonnygate area a stove is the most common solid fuel appliance with 71% of the responses, followed by 22% for open fires. In Appin Crescent, open fires and stoves were more equally split with 42.5% and 52.5% respectively



Key Findings 3

Which solid fuels do you use? Bonnygate



Appin Crescent

Wood

Wood

briquettes



coal at 8%, while 16 people selected multiple. In the Appin Crescent area wood is the most common at 54%, followed by

smokeless fuel at 19%, house coal at 15%, wood briquettes at 9% and 2% for wood pellets.



Key Findings 4

9%

Which is the main solid fuel you use?

Bonnygate





A significant number, **79% of people in the Bonnygate area use wood or a form of wood**, 63% selected wood in general, 14% kiln dried wood or logs and 2% wood briquettes. This is followed by smokeless fuels at 12% and coal /anthracite at 9%. **In Appin Crescent a total of 89% use some form of wood with 85% selecting wood in general**, 2% wood briquettes and 2% kiln dried woods. 6% use smokeless fuel and 4% use coal.



Key Findings 5

When do you use your appliance?

Bonnygate





In both Bonnygate and Appin Crescent most people use their solid fuel burning appliance **in the winter only**, with 93% and 91% respectively



Key Findings 6

 Were you given any best practice procedures in terms of running and maintaining your appliance?

Bonnygate Appin Crescent



A significant percentage of users in Bonnygate (36%) and Appin Crescent (42%) were not provided with best practice procedures or guidance for running and/or maintaining their appliance. This might suggest that a significant proportion of solid fuel burners are not using them properly.



Key Findings 7

 Would you be interested to learn more on the best practice in terms of running and maintaining your appliance?

Bonnygate

Appin Crescent



 Interestingly most people did not want to learn more on the best practice in terms of running and maintaining their appliance, with 70% responding no in the Bonnygate area and 67% in the Appin Crescent area. In the Bonnygate and Appin Crescent areas only 30% and 33% respectively responded yes they would be interested to learn more.



Discussion 1

- **556 responses were received out of the 2,020 sent out**, 339 (24%) from Bonnygate and 217 (37%) from Appin Crescent.
- Of these responses 12% of the Bonnygate and 17% of the Appin Crescent areas use solid fuel in their homes as a source of heat.
- Solid fuel burning appliances are **either open fires or stoves**; there are **no biomass boilers in the areas surveyed**.
- The responses indicate that there are a wide variety of makes and models of open fires and stoves used in both areas.
- Wood or a form of wood was the most common fuel type used in both Bonnygate and Appin Crescent with 79% and 89% respectively. This suggests that people might be burning unspecified wood.
- There have been 24 solid fuel burning appliances installed in the Bonnygate area since the AQMA was declared in 2008, that is 56% of solid fuel burning appliances in the area.



Discussion 2

- While in Appin Crescent there have been 19 solid fuel burning appliances installed since the AQMA was declared in 2012, that is 54% of appliances in the area.
- The majority of solid fuel burners had one appliance, **76% in Bonnygate** and **83% in Appin Crescent**.
- Solid fuel burning is most common as a supplementary source of heat in both **Bonnygate (92%) and in Appin Crescent (91%).**
- The majority of people in Bonnygate (93%) and Appin Crescent (92%) **only use their solid fuel burning appliance in the winter**.
- A significant number of solid fuel burners in Bonnygate (26%) and Appin Crescent (24%) areas use solid fuel that they have sourced themselves, suggesting that they may not be preparing the wood properly before burning.
- A significant number of users in Bonnygate (36%) and Appin Crescent (42%) responded that they were not provided with best practice procedures/guidance when using their solid fuel burners.

Next Steps



- Respond to survey respondents directly who asked for more information and guidance on solid fuel burning and provided their contact details. This has been undertaken already and proven to be a positive exercise.
- Produce and make freely and easily available to the constituents of Fife Council, **best practice guidance** on solid fuel burning. This will be produced in calendar year 2023.
- In our best practice guidance refer to relevant air quality legislation and guidance including the Defra Open Fires and wood- burning stoves – A practical guide (2022)





Next Steps 2

- Utilise the Councils air quality monitoring sensor resources to ascertain data on urban background concentrations in the Bonnygate area so as to better understand the contribution of local solid fuel burning sources to overall particulate matter concentrations. Due to the currently low concentrations of particulate matter in Appin Crescent there is not an immediate need to carry out this type of study at this location.
- **Repeat this survey in 5 or 10 years' time** to identify whether solid fuel use has increased or decreased.





- Fife Council believe that one of the best and efficient ways of tackling this issue is to focus on raising any grapher beth in terms
 - tackling this issue is to focus on raising awareness both in terms of operation of appliances and the choice of fuel.
 - At UK Level Burnright is an educational campaign which provides a range of materials and resources for stove users.
 HETAS also support cleaner and safer choices for the use of biomass and other solid fuels, appliances and associated technologies
 - Within Scotland, **Home Energy Scotland** provides advice and support to households considering low carbon heating for their homes.
 - Fife intends to focus promoting the **EU led Ecodesign programme** which looks to lower emissions and improve efficiency in wood burners. Fife Council intends to refer to these initiatives in the production of its best practice guidance for solid fuel burning.











Land & Air Quality Team



Protective Services

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Fife Direct Web Page

www.fife.gov.uk/airquality

- Thank you for listening!
- Any Questions?