

## **Heating Position Paper for warmth, safety and efficiency (Part One – Domestic Gas Boiler Programme)**

### **Executive Summary**

1. While acknowledging the Council's commitment to carbon neutrality and the phasing out of gas boilers this Position Paper recognises that there needs to be a balance between provision of heating to our tenants and the medium-term challenges of non-gas alternatives. These include cost, availability, and deliverability at scale.
2. The life of many of the boilers in our homes are coming to an end. The Council had a large installation programme between 2007-2009. This Paper outlines the current condition of the existing boilers concluding that a planned gas boiler replacement programme is required.
3. A six-year programme between 2024/25 to 2029/30 is proposed. The programme has been "smoothed" for an even spread of installations across the period. This will only be achievable if the condition of the boilers do not deteriorate substantially over the period. The programme may need to be brought forward if the volume of boiler failures is high.
4. At the end of the proposed programme the Council will have a period of time to develop a strategy for replacing the boilers with non-gas alternatives.
5. Between now and 2030 the Council will continue taking a "Fabric first" approach when investing in our homes to meet the carbon neutrality objective.

### **Introduction**

6. Waverley Borough Council's journey towards Net Zero will ultimately mean gradually, but completely, moving away from burning fossil fuels for heating. Waverley's Net Zero future is likely to see a mix of low-carbon technologies used for heating: electrification of heat for buildings using hydronic (air-to-water or ground-to-water) heat pumps, heat networks and potentially the introduction of low carbon hydrogen replacing natural gas in the national grid.
7. The UK Government has committed to carbon neutrality in the UK by 2050. Presented in the Heat and Buildings Strategy is the ambition of phasing out the installation of new natural gas boilers from 2035. To meet this ambition

Government and Industry are currently focused on developing UK supply chains and the technology options needed to save carbon throughout the decade to maintain a cost-effective pathway to Net Zero.

8. Waverley's transition to high-efficiency low-carbon buildings is in tandem with national objective. To manage the transition, Waverley is required to consider its statutory obligations as a Social Landlord, as defined within the Decent Homes Standard in addition to individual, local and regional circumstances surrounding decarbonisation. We recognise that during this period, throughout the next decade natural gas burning appliances will be required to replace existing aged assets.
9. We believe this necessitates the implementation of a Domestic Heating Strategy regarding Gas Fired Appliances, to maintain the trajectory to decarbonisation and meet our obligations as a Social Landlord.

### **Housing Asset Management Strategy 2022-2030**

10. The Housing Asset Management Strategy recognises that there are considerations and impacts of changing Waverley's approach to the installation of gas boilers and the need to develop a specific gas boiler replacement strategy to help inform our approach.
11. The council is committed to phasing out gas boilers as soon as possible but recognises that there needs to be a balance between provision of heating equipment to our residents and the short to medium term challenges of non-gas alternatives. These include cost, availability, and deliverability at scale. Noting that the objective will be the replacement of gas heating/hot water systems from >95% of the housing stock, with electrical/other low carbon fuels/systems.
12. The volume at which natural gas is consumed for heat generation is proportionate to the environment being heated. Waverley's intention to adopt a 'Fabric First' approach to improve building thermal efficiency within the housing stock to move to obtaining a carbon neutral position, is pragmatic, sustainable, and cost efficient. An energy efficient environment is conducive to ambient heat retention and will reduce the rate at which gas is consumed for heat generation.
13. It should be noted that the heating industry were early adopters of energy efficiency over two decades ago. All Waverley Borough Council's housing stock (with the exception of five dwellings) have gas fired boilers with an appliance SEDBUK (Seasonal Efficiency of Domestic Boiler in UK) energy efficiency rating of 89.2% or greater and an ERP (Energy Related Product Directive) A-rating for heat.

## **Renewables Position as of December 2022**

14. For Local Authorities and Social Landlords with large volumes of existing housing stock the renewable's retrofit era is still in its infancy. The predominant catalyst to change is within the new build sector, where gas boilers will not be permitted to be installed within properties-built post 2025. This means by default that all properties built after this date will have a renewable energy source as the primary means of heating/ hot water generation.

## **Heat Pumps**

15. The legislation presented in the Government Heat and Buildings Strategy has the stated intention to develop a domestic heat pump supply chain through the introduction of the regulation to create market-based conditions that make domestic heat pump technologies affordable. The Government target is to ensure that heat pumps are no more expensive to buy and run than gas boilers by 2030 and that these conditions will allow for the phasing out of the installation of new gas boilers beyond 2035.

## **Hydrogen**

16. The Government's Heat and Buildings Strategy presents that a strategic decision will be made in 2026 regarding the role of hydrogen in heating buildings. A wider research, testing and development plan is currently underway from which the information needed to make the decision will be obtained.

17. ENA (Energy Networks Association) is the industry governing body who represent the companies involved in gas and electricity transmission through the national infrastructure. They are currently leading on the research in conjunction with the Health and Safety Executive (HSE).

18. The areas of focus during 2020 to 2025 are centred on ascertaining whether a safe distribution of hydrogen gas through the national grid is possible and whether the existing infrastructure needs to be repurposed or a new grid installed. Subject to their findings and the outcome of the Government's heat policy decision concerning hydrogen in 2026, a target to full transition has been set to occur between 2040 to 2050.

19. Notwithstanding this, boiler manufacturers have already altered their gas fired products entering the market to be fully hydrogen compatible, though this is

widely perceived to have been done as part of the national narrative to focus on the need to change from fossil fuels.

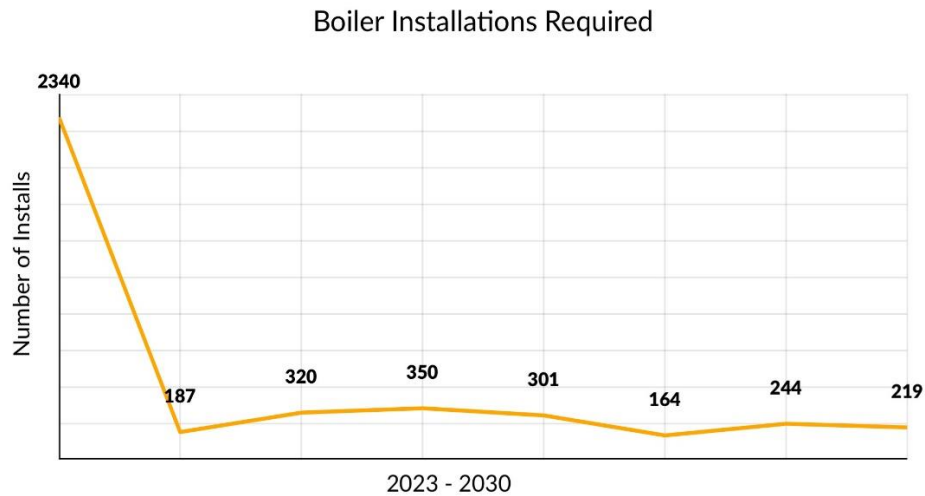
## **Opportunities**

20. Waverley remains tuned in to the development and application of renewable technologies at a local and national level, through connections within industry, housing providers and local authorities. Members have the opportunity to visit renewables projects in the Borough of Southwark in London where they have used latent heat from the aquifer with the application of ground source heat pumps to fuel district heating networks and have partnered with SELCHP for heat and power distribution from a waste incineration plant.
21. Additionally, Waverley has been offered the opportunity to visit the Hydrogen Homes initiative by Northern Gas Networks which showcases 100% hydrogen appliances fitted in domestic dwellings.

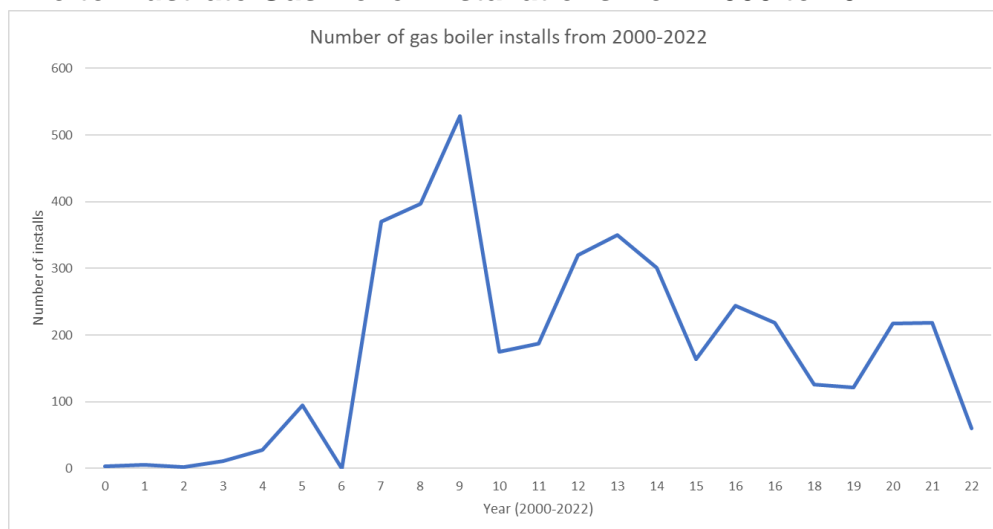
## **Waverley's Domestic Gas Arena Analysis – Gas Boiler Installation Forecast**

22. The efficiency and longevity of a property heating system is as effective as the sum of its design, component parts and usage. These are metrics that are measurable. The CIBSE (Chartered Institute of Building Service Engineers) indicative economic life expectancy table is the industry standard within asset management and presents the life expectancy of a domestic gas fired boiler as between 10 to 15 years, which is reflective of the type of boiler, the system it is seated within and the maintenance and subsequent condition.
23. All of Waverley's aged stock are Baxi Solo 2 boilers. These are first generation condensing boilers with an indicative economic life expectancy of 15 years. On this basis this presents Waverley's domestic gas boiler installation forecast as presented below.

## Chart One to Illustrate Gas Boiler Installation Forecast 2023 to 2030



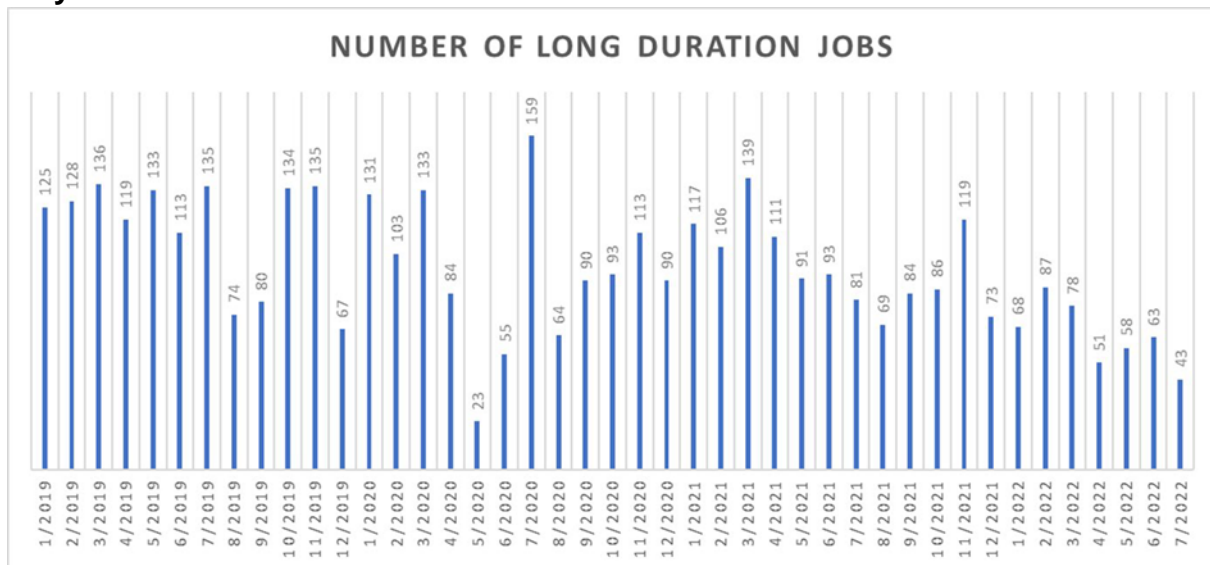
## Chart Two to Illustrate Gas Boiler Installations from 2000 to 2022



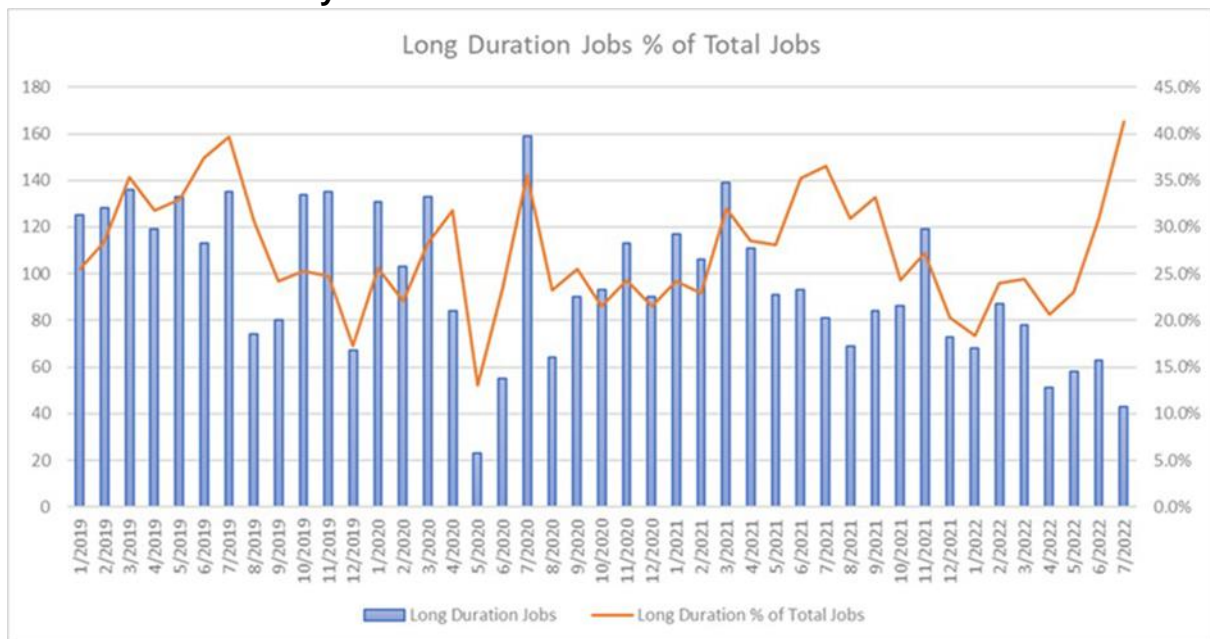
## Gas Boiler Asset Condition

24. Waverley can make informed decisions on the functionality of the assets within the domestic gas arena based on the age of the appliance, which can be accurately measured from the appliance serial number, which denotes within it the year of manufacture and by reviewing and charting the breakdown history of the system(s) specifically long duration jobs.
25. A long duration job is a job that has a scheduled time of 120 minutes and/or 180 minutes. These jobs would have required an engineer to attend on an initial visit in order to determine the time required to affect a repair. These jobs were charted between Jan 2019 and July 2022.

**Chart Three to Illustrate Number of Long Duration Jobs Between Jan 2019 to July 2022**



**Chart Four to Illustrate Number of Long Duration Jobs as a Percentage of Total Jobs Jan 2019 to July 2022**



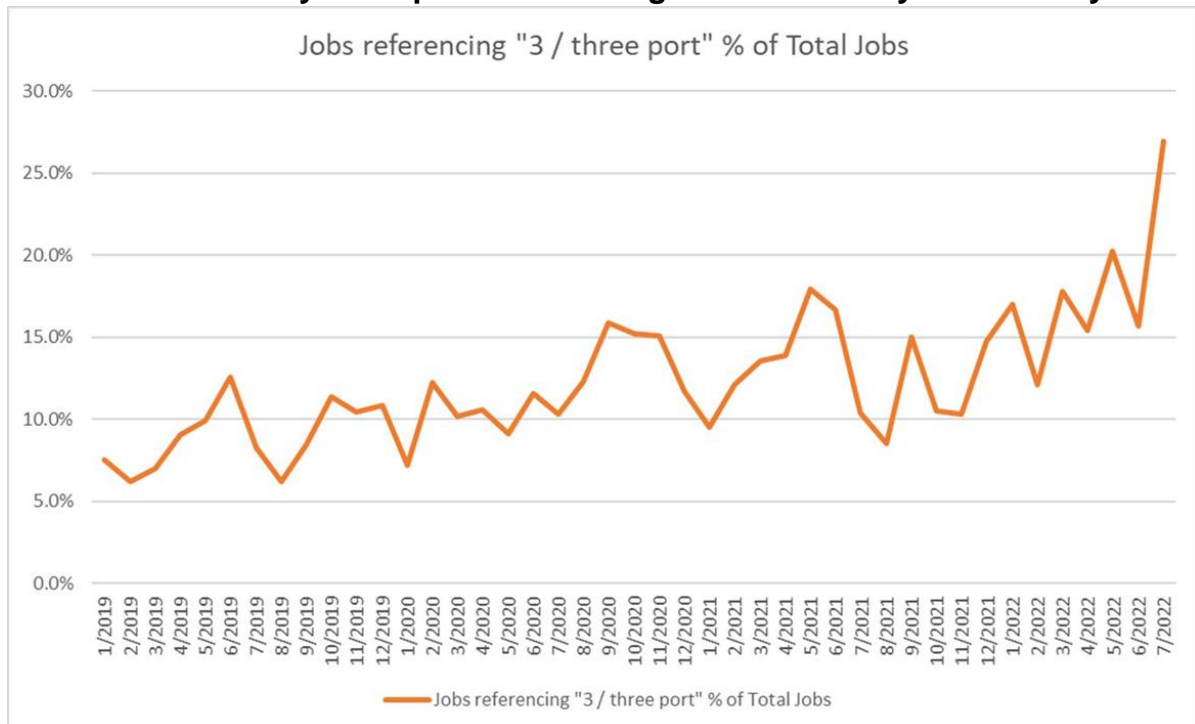
26. The highest percentage of these jobs occurs in the months of June and July.

27. Jobs associated with this time requirement are pump changes and motorised (3-port) valve changes. The symptom for the latter being that when the system control is set to deliver hot water only, the heating comes on as well in part or in full.

28. Iron oxide volumes in the system water are the root cause, which is a by-product of ageing central heating systems.

29. This provides an indicator as to the current condition of the assets within the gas arena.
30. The chemical reaction that causes iron oxide to occur is as a result of the dissimilar metals iron and steel being exposed to oxygen and water within the central heating system.
31. Iron oxide builds up on the inside of boiler heat exchangers, radiators, pumps, and controls. It acts as an insulator to reduce heat transfer and system efficiency, whilst preventing the movement of electromechanical parts within the boiler and heating system, it furthermore causes seals within the boiler and system components to become porous.
32. Inhibitor is added to systems at point of installation. This prevents the chemical reaction from occurring. Many variables effect how long inhibitor will remain active within the system, but 10 years is the benchmark, set by the manufactures.

**Chart five to identify three port valve changes from January 2019 to July 2022.**



33. The 19.3% increase is representative of increasing volumes of iron oxide prevailing in heating systems. As the potency of the system inhibitor decreases the volume of iron oxide increases.
34. What the findings present is the likelihood of boiler critical failure due to system condition is increasing throughout the Waverley domestic gas arena

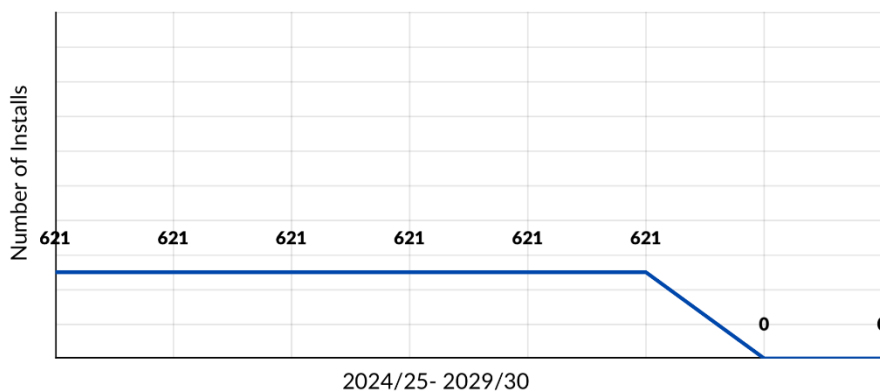
compounded by the gas fired appliances reaching the end of their economic lifecycle. Presenting the need for a capital investment in the gas fired boiler stock.

## Proposed Programme

35. The recently procured domestic gas maintenance contract due to commence on 31 Jan 2023 was done as an interim measure for a term of 18 months.
36. During this time, a procurement package for the servicing, maintenance and capital works covering the full spectrum of Waverley's Heating Arena's (domestic and commercial) will be undertaken. The natural place for a future capital programme for gas boiler replacement would be placed within that procurement from the perspective of commercial viability and potential savings associated efficiency gains. This presents the proposed programme commencing in July 2024.
37. This would also allow time for Waverley to complete the planned stock condition survey initiative, providing valuable information to identify where renewable technologies may be applied.
38. The capital programme is planned to start in 2024/25 and run through to fiscal year 2029/30 with a review at the end of 2026/27 to explore if there are any options for installing non-carbon alternatives at scale. In the interim period to mitigate the risks associated with the aged stock, responsive installation will be undertaken when appliances reach a point of critical failure. It is estimate that 395 responsive installations will be undertaken in the 79 weeks between January 2023 and the planned start of the capital programme in July 2024.

## Chart six – Planned installation forecast

Planned Installation Forecast 2024/25 to 2029/30





## **Finance**

39. The estimated total number of gas boiler installations to be included in the capital replacement programme 2024/25 to 2029/30 is 3730.
40. This is representative of £5,744,200 at an average cost per installation of £1540 (2002 price).

## **Conclusion**

41. Waverley will continue to pursue actively its carbon neutrality goal, further developing our thinking and technical approach to devising a longer-term strategy with the aim to become Carbon Neutral by 2030. As presented within the Housing Asset Management Strategy 2022 to 2030, 'Critical to meeting this target is to understand our current position and to develop a clear baseline which we can work against'.
42. This report aims to present the baseline within Waverley's domestic gas arena providing accurate quantitative data from which to understand Waverley's position on gas fired heating appliances during the transition period. And additionally, to bring an awareness that renewable technologies will not be a cost-efficient alternative till post 2030 presenting 2030 to 2035 as the period in which Waverley can begin to phase out the installation of gas fired heating appliances.