

Summary Report

Name of sponsoring supplier	Innovator / manufacturer	Name of demonstration action / product
E.On	Chimella	Chimella

Description of measure

Chimella is chimney draught excluder that when not using your fireplace, it fits inside the chimney conveniently with the push of a button and prevents cold draughts. It's designed to allow a very limited airflow to improve householder thermal comfort whilst preventing any water which may come down the chimney from causing damp, allowing water to dry quickly, preventing internal damage to the chimney itself.

Sample size and composition

After excluding dropouts, cancellations and unsuitable properties, the sample size was 88 dwellings in total that actively participated in the monitoring. Further dwellings were filtered out from the data analysis due to data issues, resulting in a data analysis sample of 82 dwellings.

A summary of the primary measured parameters for calculating the cost savings of the measure, performed across the sample, are detailed below.

Measurement Type	Dwellings Measured	Data Issues	Included in data analysis
Airtightness	74	20	54
SmartHTC	87	18	69
Total Measured*	88		82

* Some dwellings only had one measurement type performed so there isn't a complete overlap

Parameters monitored

The Heat Transfer Coefficient (HTC) was monitored for a minimum 3-week period both prior to having the Chimella installed (referred to as the pre-period) and afterwards (referred to as the post-period) to accurately determine the effect that the device has on whole house heat loss, due to a predicted decrease in infiltration losses as a result of blocking up any chimneys. Of the 87 dwellings where SmartHTC was installed, it was not possible to determine the change in HTC in 15 of them due to data collection issues preventing either the pre-, post-period or both from being calculated. Additionally, 3 further dwellings were excluded from the data analysis due to having an insufficient internal-external temperature difference or being an extreme outlier.

The airtightness of each dwelling was also measured using either a traditional blower door fan or a low-pressure Pulse device, with results presented at 50 Pa. Of the 74 dwellings where airtightness testing was attempted, there were 17 houses affected by an issue with the testing equipment and 3 in which the chimneys were unstable with lots of loose debris and hence impractical for testing.

Other parameters monitored included a household diary log and householder feedback surveys.

Monitoring duration

SmartHTC requires a minimum of 3-weeks (21 days) of data to generate a result but as a precautionary measure, the methodology for this project set an objective to measure over a 3 month duration with the product installed and the same 3 months with the product fitted.

This was carried out over two heating seasons (December 2020 until April 2021, and December 2021 until March 2022). Best efforts were made to achieve this however the length of each pre- and post-period varied based on location and availability of assessors:

Period	Minimum Days	Mean Days	Maximum Days
	26	74	131
	23	48	98

Average annual cost saving

Across the sample of 69 buildings, where SmartHTC measurements were successfully completed, the mean HLP was 2.2% ($\pm 100\%$) lower (i.e. less heat loss) with the Chimella in place.

Basis for percentage: annual space heating costs

Main heating source¹: gas

Main house type: SAP model is for a 92m², mid-terraced house with an HTC of 239W/K

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Basis for percentage: annual space heating costs

Main heating source²: Direct electric heating

Main house type: SAP model is for a 92m², mid-terraced house with an HTC of 239W/K

Expected lifetime cost savings

For gas central heating, the estimated fuel bill saving is £11.66/year ($\pm 100\%$), based on SAP10 unit gas price of 3.64p/kWh or £23.60/year, based on an average per-unit gas price of 7.37p/kWh (Ofgem Price Cap - April 2022) for our modelled property.

Basis for LBS: Annual space heating costs
Main heating source: gas
Main house type: SAP model is for a 92m², mid-terraced house with an HTC of 239W/K
Expected lifetime: 25 years

Alternatively, for peak rate direct electric heating (CoP 1.0), the estimated fuel bill saving is higher still at £36.71/year ($\pm 100\%$) based on the SAP 10 standard tariff of 16.49p/kWh, or £63.10/year ($\pm 100\%$) based on an average per-unit electricity price of 28.34p/kWh (Ofgem Price Cap – April 2022).

Basis for LBS: Annual space heating costs
Main heating source: Direct electric heating
Main house type: SAP model is for a 92m², mid-terraced house with an HTC of 239W/K
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Summary of Discussion and Conclusion

¹ SAP 2018 fuel tariffs are normally used for ECO3.

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There was a statistically significant mean average reduction (improvement) in the air permeability of 13% across the sample of 54 buildings where measurements were successfully carried out with and without the Chimella installed.

Across the sample of 69 buildings, where SmartHTC measurements were successfully completed, the mean HLP was 2.2% ($\pm 100\%$) lower (i.e. less heat loss) with the Chimella in place. A large variation was observed across the sample in terms of HTC measurement, because the sample included a wide variety of different houses as it sought a sample of properties that was representative of the English Housing Stock as far as reasonably practicable.

Partially due to the inhomogeneity of the sample, the reduction in HLP was not statistically significant and had a 95% confidence interval of $\pm 100\%$, our analytical team estimated a sample size of 74 would have been required to achieve statistical significance at a 95% confidence level (given the same mean difference in HLP and standard deviation in the sample).

This observed change was then modelled in SAP to estimate the fuel bill savings a typical home (a 92m², mid-terraced house in the Midlands) could expect to realise with the installation of a Chimella. If the property was heated using gas central heating the estimated fuel bill savings were £11.66/year (based on a SAP10 unit gas price of 3.64p/kWh) or £23.60/year (based average gas price of 7.37p/kWh – Ofgem price cap – April 2022).

For peak rate direct electric heating (CoP 1.0), the estimated fuel bill saving is higher still at £36.71/year ($\pm 100\%$) based on the SAP10 standard tariff of 16.49p/kWh, When modelled using the current Ofgem price cap, the estimated fuel bill savings would be £63.10/year ($\pm 100\%$) based on an average per-unit electricity price of 28.34p/kWh (Ofgem Price Cap – April 2022).

As part of the trial a household diary (recording use of the fireplace) was requested from participants. Whilst less than 10% of the participants regularly used their fireplace during the study the findings suggest that removal and replacement of the Chimella does not impact its performance.

We also received feedback from 65 households across the trial. To support our conclusions regarding energy bill savings, participants were asked to comment on the warmth and heat retention of the rooms with the Chimella installed, before and after installation. The majority of participants noticed a benefit with 90% stating that they would recommend the Chimella to a friend.

As noted throughout this study, there are many factors which can affect the overall energy efficiency of a home further studies should seek a larger and more homogenous sample to confirm the direct impact of blocking a chimney with a chimney draught excluder.

Summary of actual costs incurred

Total Cost		£192,892					
Recruitment	Product/ installation	Performance monitoring	Analysis/ reporting	Technical monitoring	Supplier administration	Project Management	Aftercare
£47,280	£20,939.06	£69,066.72	£29,000	£384.00	£6,750	£11,280	£8191.85