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# An overview on high heat retention storage heaters

Green Heat Installer
Engagement Programme

24 July 2024

Net Zero Scotland
Scottish Government

LET'S DO NET ZERO

# Presenters

| | | |
|---|---|---|
| Rachel Comrie | Assistant Programme Manager, **Energy Saving Trust** | Presenter, Q&A Panel |
| Shaun Hurworth | Marketing Director, **Dimplex** | Presenter, Q&A Panel |
| David Patrick | Head of Specification Marketing, **Dimplex** | Presenter, Q&A Panel |

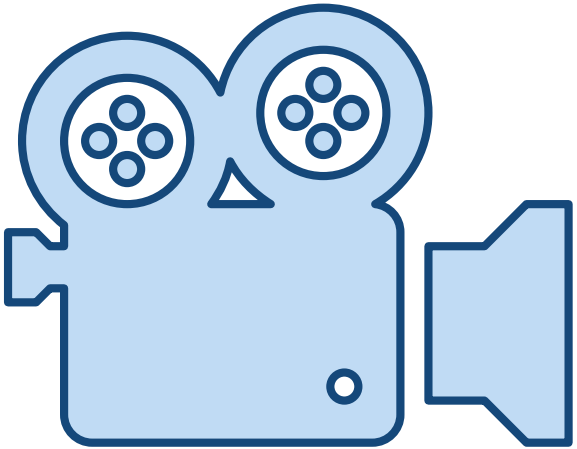
# Questions

Type questions into the Questions pane of the control panel.

**You can send in your questions at any time during the presentation.**

These will be collected and addressed during the Q&A session at the end of the presentations.

# Recording



This presentation is being recorded but your name and attendance are hidden from the recording.

The recording will be uploaded and will be made available to watch again.

Details of how to do this will be shared with you via email after the webinar has ended.

# Have Your Say



There will be a brief anonymous poll at the end of our presentation and a short feedback survey after the webinar has finished.

Please complete this if you can so we can continue to improve the webinars we offer.

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# The Scottish Green Heat transition

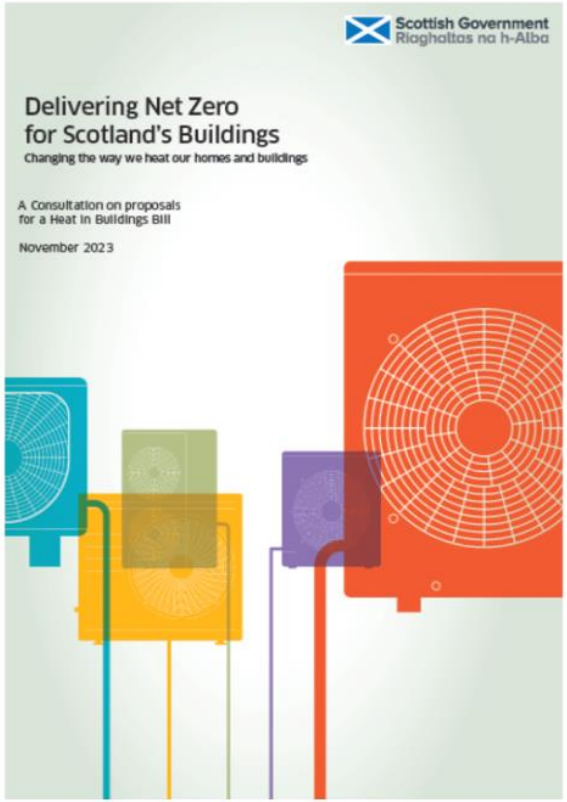
Rachel Comrie

24/07/2024

# Heat in Buildings Bill Proposals

Proposals under the Heat in Buildings Bill consultation include establishing a Heat in Buildings Standard, comprising two main parts:

- **Polluting heating systems will be prohibited by the end of 2045**
  - Polluting heating systems like gas, oil and LPG boilers will need to be replaced with a clean heating solution
  - Clean heating includes air or ground source heat pump, electric storage heaters or boilers, or through a connection to a heat network.
- **Making sure that homes meet a reasonable minimum energy efficiency standard.**




New Build Heat Standard in effect 2024

# Scottish Government Funding

- Home Energy Scotland Grant and Loan scheme

'If installing high heat retention storage heaters, you must provide evidence that a heat pump is not suitable for your property; this can be a Home Energy Renewable Report from a Home Energy Scotland specialist advisor.'

- Private Rented Sector Landlord Loan
- SME Loan Scheme
- Warmer Homes Scotland
- Heat and Energy Efficiency Scotland: area-based scheme

# The Green Heat Installer Engagement Programme

## Resources hub

Support hub for small businesses working on energy efficiency, heating systems and micro generation. Find research, case studies and online tools to...

## Skills, funding and certification

Discover the certification requirements as an installer or assessor looking to carry out work under various schemes.

## Green heat installer events

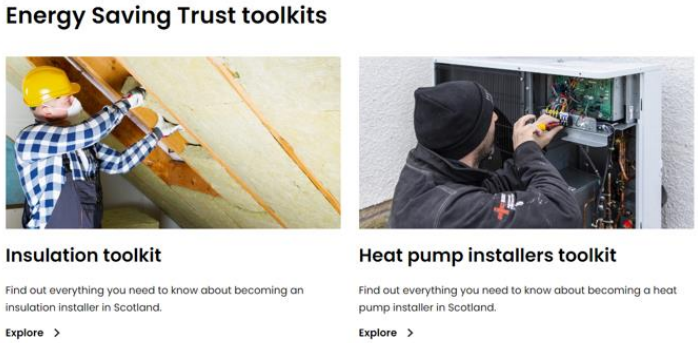
We organise networking events, webinars, workshops and information sessions. All free of charge. Find out more about our upcoming sessions.

## Funding for your customers

Energy Saving Trust helps consumers access funding to make energy efficiency improvements and renewable energy additions to their property.

# Green Heat Installer Engagement Programme resources

- How to become a heat pump installer in Scotland
- Domestic heat pump best practice guide
- Procurement guide
- Case studies to encourage the industry to upskill
- Recorded and upcoming webinars
- Mobile Heat Pump Training centre
- Heat pump and insulation installer toolkits




# Green Heat Installer Engagement Programme – useful links

Email: **GreenInstallerScotland@est.org.uk**

LinkedIn Group: **www.linkedin.com/groups/5139242**

Email updates and quarterly newsletter subscription: **bit.ly/2PSatkL**

Website: **energysavingtrust.org.uk/business/energy-efficiency/green-installer**

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# Thank you

A Dimplex presentation

# The value of thermal storage

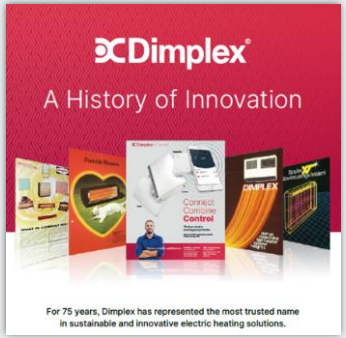
*in the decarbonisation of heat in buildings*

# Aims of this webinar

- Introduction
- Carbon, generation and grid flexibility
- Electrification options
- Thermal storage and HHR
- Specification and installation of Quantum
- Smart tariffs
- Benefits for all

# We are Dimplex.

## A history of innovation


Dimplex is proud of its role as a formative brand of the Glen Dimplex Group and has been bringing comfort to people's lives since the 1940s through the power of electricity.

During the 1950s and 1960s the growth of the brand was meteoric and in the 1970s, amidst great economic uncertainty, acquisition by Glen to form Glen Dimplex marked the brand's re-birth.

The evolution of Dimplex gathered real pace in the early 1990s as the Group entered a new phase of growth through acquisition. Since then, Dimplex has grown exponentially to become a global leader in electric comfort solutions.

# Our Products and Solutions

**Dimplex specialises in the design, development and manufacture of innovative electric heating & ventilation solutions**

- Heat Pumps (inc. Hot Water Heat Pumps)
- Smart Electric & Thermal Storage Heating
- Ventilation & Heat Recovery
- IoT & Smart Controls

Residential and light commercial buildings

New build and retrofit

Whole system approach

# Electrification of the UK

**Electricity is clean enough that it is the preferred option over gas in new buildings, and now existing buildings must start to make the switch to this low carbon and increasingly renewable fuel.**

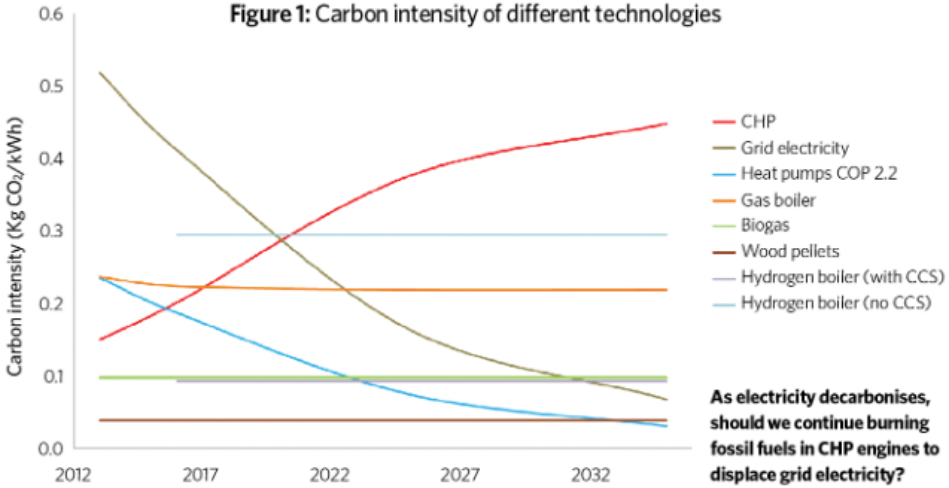
## Ban gas boilers in new homes by 2025, says Committee on Climate Change

**Government advisers suggest homes are heated using low-carbon energy instead**

▲ The committee warned that UK homes are not fit for the future. Photograph: Alamy

Gas hobs or boilers should be banned from being installed in new homes within the next six years, government advisers have recommended.

**Figure 1:** Carbon intensity of different technologies




**As electricity decarbonises, should we continue burning fossil fuels in CHP engines to displace grid electricity?**

# The missed opportunity in modern generation

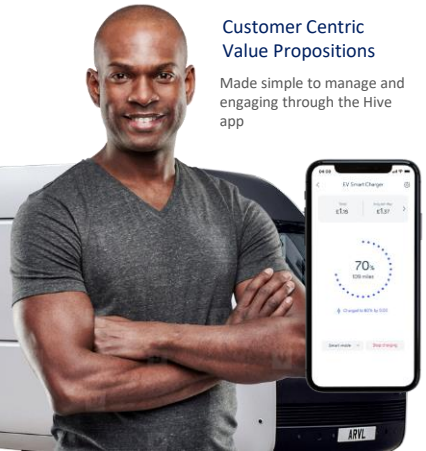
As we move to a decarbonised grid, mis-timing of generation creates additional cost and carbon.

This curtailment cost adds over half a billion pounds to annual energy bills in the UK.

We cannot adjust our generation to meet energy demands at any given time, due to the variability of its increasingly renewable nature such as wind and solar.

We cannot manage the system from the generation side, so we must look to the demand side for the answer, with £500m of diverted revenue stream available to the technologies which help solve it.

# Residential DSR will bring together in-home devices, energy supply and access to energy markets through VPPs



Customer Centric Value Propositions

Made simple to manage and engaging through the Hive app

Heating Propositions

Connected Home

Home Hub

Smart Meter

IoT Pool Enabled Hive Control

Smart Tariffs

Sharing optimisation revenues to drive customer value.

Virtual Power Plant

Solar PV and Battery

Connected Hot Water Tanks

Heat Pumps

EV Chargers

Direct to Car

*Self-Consumption, Energy Efficiency and Fuel/Price Arbitrage*

System Balancing

Energy Trading

Infrastructure Costs

Commercial and Industrial Customers

*New Value Pools*

*Revenue generation from energy, balancing and reserve markets*

*Commodity and non-commodity cost saving in the energy bill*

# Different systems for different scenarios

## Electrification of heat means different things for different building, ownerships and occupants





Many factors impact the best path of electrification of heat in buildings. Some of the key considerations are:

- **Building ownership** (targets differ for homeowners, private and socially let properties)
- **Age of the property** (new buildings have much stricter targets)
- **Size of the property** (larger properties with larger heat-losses allow more investment through greater potential returns)
- **Insulation levels** ('fabric first' reduces the heat loss, and investment required, to electrify a building)
- **Current heating system** (an existing 'wet' distribution system may lend itself well to a heat pump)
- **Property location** (the proximity of a heat network, targets and regulations across the devolved governments)
- **Budget available** (carbon reduction costs money, and there is a range from 'compliant' to 'optimised')

We consider all of these when we produce a heating design, offering a range of suitable options including:

- Ambient loops for district heating
- Heat pumps for space and/or hot water
- HHR storage and panel heating

# Electrification options

## Your partner partner in the electrification of heat in buildings


**Heat pumps are the most powerful technology for delivering energy efficiency and carbon savings at scale, supported in ‘hard to heat pump’ properties by hybrid and direct acting electric solutions.**

# Thermal Storage – an essential element of the grid

## Storage heaters are already delivering grid balancing benefit across GB





- 1.4 million homes in GB are dependent on thermal storage heaters as their primary heating system.
- The total energy storage capacity available from these storage heaters is 56 GWh with a connected load of 7.7 GW.
- This is equivalent to six times the capacity of Dinorwig hydro station, GB's single largest energy storage facility.

# HHR Thermal Storage

**Like many other technologies, storage heating has evolved enormously since its introduction.**





High Heat Retention Storage Heaters are recognised in SAP and can now operate as thermal batteries, providing flexibility to the grid in exchange for discounted energy.

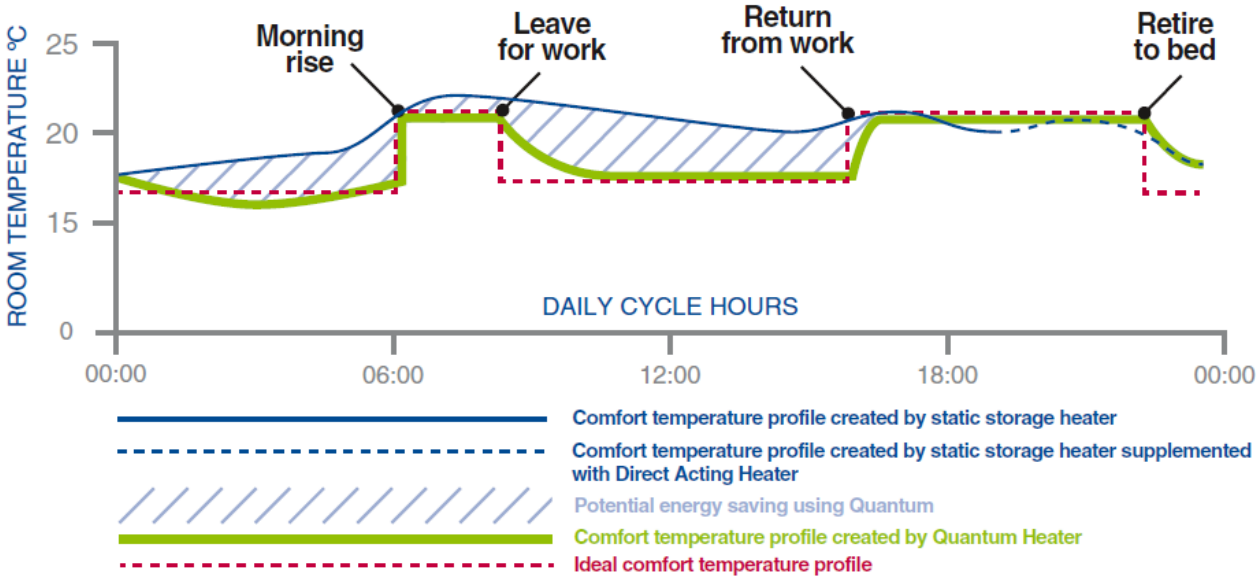
Their load-shifting capability pays their users as their flexibility supports electrification of other appliances and industries, such as renewable generation, heat pumps and EV rollout.

Over the years, their controls have been automated and simplified, making them easier for users to set up and interact with.

The core technology is well established, and now has many modern capabilities that many installers are not aware of when recommending replacement heating systems.

# How is HHR different

## Quantum 125 vs Conventional Static 24kWh Storage Heater & Direct Acting Heater



# The Dimplex Control Platform

# The Quantum Range

Ecodesign Compliant
www.lot20.co.uk

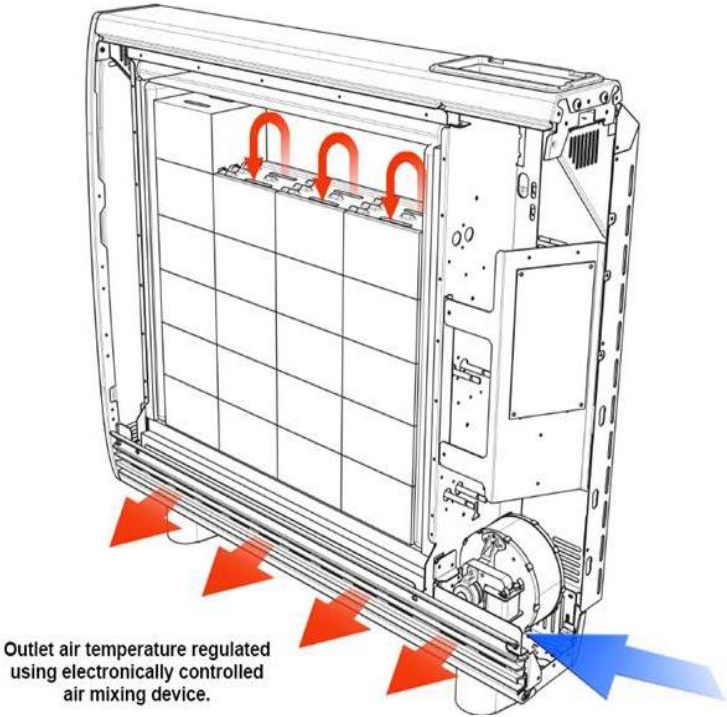
5 YEAR UK Manufacturer GUARANTEE (registration required)

IPX4 RATED

| Model | Input rating +5%/-10%(W) | Output rating (kW) | Boost mode rating (W) | Height (mm) | Width (mm) | Depth (mm) | Weight (kg) | Installed weight (kg) | Energy pack requirement |
|---|---|---|---|---|---|---|---|---|---|
| QM050RF | 1020 | 0.50 | 340 | 730 | 580 | 185 | 22.7 | 67 | 4 |
| QM070RF | 1560 | 0.70 | 520 | 730 | 703 | 185 | 26.1 | 91 | 6 |
| QM100RF | 2220 | 1.00 | 740 | 730 | 865 | 185 | 30 | 115 | 8 |
| QM125RF | 2760 | 1.25 | 920 | 730 | 1069 | 185 | 35.5 | 142 | 10 |
| QM150RF | 3300 | 1.50 | 1100 | 730 | 1069 | 185 | 38.5 | 165 | 12 |

# How it works

- Controls are set (Quantum has taken the required overnight charge).
- ‘Heating on’– Fan draws air into the Quantum.
- Air is pushed through the core.
- The air temperature is monitored by built in thermostat.
- Air is passed through the front grille of the product to heat the room quickly.
- Fan releases air from the core into the room until set temperature is reached or set time has elapsed.
- A direct element is available if required, but should only be used, if the heater has not taken a charge



# Product features and benefits

Ecodesign Compliant
www.lot20.co.uk

- Digitally controlled, Electronic Thermostat accurate to (±0.3°C)
- Timer modes: 7 Day Programmable User Timer, Out All Day, Home All Day and Away Mode. User adjustable from 7-30°C
- Graphical display with RGB backlight, tactile buttons and audio feedback
- Open window detection, Adaptive Start, Reporting Screens, Boost Mode & RF Module for Dimplex Control support
- Complies with Lot 20 of ERP Directive
- Meets criteria for SAP High Heat Retention Storage Heater
- Smartphone app controllable via the Dimplex Control system
- IPX4 & BEAB Approved for quality & safety, 2-year warranty - extending to 10 years upon online registration

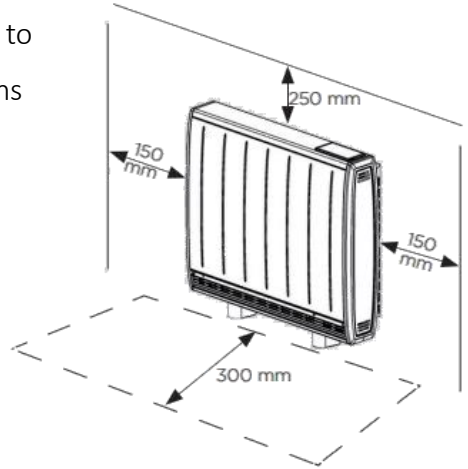
# Installation of Quantum

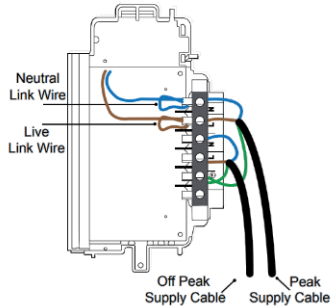
**Installations of new and upgrade HHR storage heaters are easily achieved by qualified installers**





- Sizing calculation – room dimensions and heat losses
- Correct placing - ensuring clearances and IP ratings are adhered to
- Secure fixing – feet and brackets must be fitted as per instructions
- Electrical connection – single vs dual supply and termination to 2 - 2.2Nm
- Energy cells – completing the thermal battery
- Warranty registration
- Commissioning of controls



# Modern control

## Storage heating control has come a long way in the last 50 years

- Automates the most effective use of off-peak energy
- Automatic, set-and-forget heating modes
- Dynamic storage capacity - automatically adjusts to user requirements
- Infinitely controllable electronic heat output to precisely match user lifestyle
- Incredibly quiet fan assisted heat output
- Easy to use controls with intuitive menus
- Large, backlit LCD screen
- Lots of online and manufacturer support
- Remote control, access and diagnostic possible with the Dimplex Control Hub

# The emergence of smart tariffs

**British Gas Dimplex Quantum tariff is one example of a smart tariff designed for domestic customers using Dimplex Quantum smart storage heaters.**

**9.9p/kWh off peak**

The tariff has a 7-hour night-rate window, 12:30am-07:30am daily, allowing the customer to charge their storage heaters with a cheaper rate.

Due to built-in Demand Side Response benefits and through allowing us to control heater charging, we're able to provide more competitive rates than current Economy 7 tariffs in the market.

*In addition to charging their storage heaters, customers can also take advantage of the cheaper night-time rate by shifting other household usage from day-rate to night-rate periods.*

# Reducing carbon, saving money

| Electricity Tariff<br>SVT/Cap Comparison | Dimplex Quantum Jun25 | Cap<br>(*MSE Averaged) | Estimated savings on Dimplex Jun25 (£/year)[3] |
|---|---|---|---|
| Day (p/kWh inc. VAT)[1] | 24.5 | 30.34 | |
| Night (p/kWh inc. VAT)[1] | 9.9 | 13.03 | |
| Estimated day consumption - medium usage (kWh/year)[2] | 2262 | 2262 | |
| Estimated day consumption - high usage (kWh/year)[2] | 3886 | 3886 | |
| Estimated day cost - medium usage (£/year)[3] | 554.19 | 686.29 | 132.10 |
| Estimated day cost - high usage (£/year)[3] | 952.07 | 1179.0124 | 226.94 |
| Estimated night consumption - medium usage (kWh/year)[2] | 1638 | 1638 | |
| Estimated night consumption - high usage (kWh/year)[2] | 2814 | 2814 | |
| Estimated night cost - medium usage (£/year)[3] | 162.16 | 213.43 | 51.27 |
| Estimated night cost - high usage (£/year)[3] | 278.59 | 366.66 | 88.08 |
| Standing charge (p/day)[1] | 58.81 | 59.72 | |
| Estimated standing charge (£/year) | 214.66 | 217.98 | 3.32 |
| Total Est. Annual Savings - medium usage (£) | | | **£186.69** |
| Total Est. Annual Savings - high usage (£) | | | **£318.34** |

1. Cap (MSE averaged) rates last updated April 2024 by Money Saving Expert, with rates averaged across regions for the eight largest suppliers. Dimplex Quantum Tariff day and standing charge rates averaged across regions. All rates quoted apply if paying by Direct Debit.

2. Estimated household consumption for electricity used during day and night periods based on Ofgem Typical Domestic Consumption Values for Profile Class 2 (October 2023 revision).

3. Estimated electricity costs and estimated savings are based on the above consumption assumptions using the Dimplex tariff rates and compared to the MSE Averaged Cap rates across suppliers.

# Trials, awards and the launch of a tariff

**Our partnership joined Midland Heart Housing Association in a bid to National Grid for a trial flexibility. The resulting tariff won 'Best Domestic Flexibility Proposition 2024' at Utility Week.**


Over 600 smart heaters were installed, providing 1MW of load which used the DSR principal explained earlier to solve grid issues and reward participants.

This successful trial proved the concept, and the British Gas Dimplex Quantum tariff was launched in October 2023.


# Benefits for all

**HRR storage heaters have significant benefits across different stakeholders.**

| Stakeholder | Benefits |
|---|---|
| Occupier | • Reduced bills<br>• Access to smart tariffs<br>• Better control, easy to use<br>• Maintenance-free |
| Building Owner | • Building compliance<br>• Improved EPC rating<br>• Funded options for capital cost support |
| Installer | • Easy to install and set up<br>• Manufacturer support – reduced callbacks<br>• Benefits to other stakeholders – great recommendation! |
| Grid | • Provides flexibility - maximised renewable energy use<br>• Supports heat pump and EV rollout - decarbonisation |

# Invested in the future of Scottish Housing


We can help:

- Find and secure funding for heat in buildings
- Provide a free heating design service
- Provide free training online and in-person
- Make the best choice for resident and building owners
- Engage with policymakers and inform our customers of potential impacts
- Sign up to the Dimplex Pro Installer Club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# Q&A

You can ask questions by typing them into the **questions** box of the control panel

**Panellists:**

| | |
|---|---|
| Rachel Comrie | Green Heat Installer Engagement Assistant Programme Manager, **Energy Saving Trust** |
| Shaun Hurworth | Marketing Director, **Dimplex** |
| David Patrick | Head of Specification Marketing, **Dimplex** |

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- Email updates and quarterly newsletter subscription: bit.ly/2PSatkL
- Website: https://energysavingtrust.org.uk/business/energy-efficiency/green-installer/
- Heat pump and insulation installer toolkits: https://greenheattoolkit.energysavingtrust.org.uk/

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# Thank you for attending