

EQUINOX



Trial two

Winter 2023/2004

national**grid**

nationalgrid.co.uk

EQUINOX Trial two overview

What is EQUINOX?

EQUINOX is a revolutionary money saving heat pump trial, brought to you by National Grid. By participating, you could earn up to £50 this winter (from November to March) by turning down your heating during peak evening hours.

EQUINOX explores how temporary changes to how we use heat pumps can help deliver a more flexible and future-proofed energy system. A more flexible grid system means more attractive tariffs, reduced expenditure on infrastructure and an improved way of looking at how we consume energy in our homes. EQUINOX aims to save consumers money by lowering energy bills and mitigating costly energy network upgrades, while contributing to a more resilient and equitable low-carbon energy system for everyone.

What is the purpose of the trial?

The UK government aims for 600,000 heat pumps to be installed annually from 2028. Heat pumps are key to decarbonise home heating because they use electricity, which can be produced from renewable sources, and can be almost four times more efficient than a conventional gas boiler. However, the expected widespread adoption of heat pumps plus other low-carbon technologies like electric vehicles will mean a higher demand for electricity than ever before.

This increase in electricity demand could exceed the capacity of the cables and wires that form the network today. While new infrastructure is being built to meet this increase, innovative solutions to manage electricity demand, especially during peak times, can help reduce the scale and cost to consumers of these network upgrades.

EQUINOX is trying to understand how to accomplish exactly that by incentivising changes to consumer behaviour with minimal disruption to daily routines and comfort. Heat pumps are an exciting technology option for this purpose as they warm a home more slowly and gently than boilers, typically allowing a home to stay warm for a while after the heating is turned down. Moving the time at which heat pumps are running may be a way to manage busy periods of electricity demand on the network.

How will the trial work?

The trial will consist of a series of 'EQUINOX events' over the winter, during which you will be asked to turn down your heat pump for a two-hour period in the evening. Because heat pumps warm a home more slowly and gently than boilers, you can put your heating on for a while before events to build up warmth and your home should stay cosy during the turn down event.

You can choose to opt out of each event, either before it starts or during the event if you change your mind. You will be part of either one of two groups: if you are part of the first group, you will be asked to turn down your heating, either manually or through an app. If you are part of the second group, you will be asked to allow control of your heating to a trusted third party during the evening, with the ability to override or opt out. You will also be asked to fill out a short (about 3 question) survey after each event to explain what you chose to do and whether you have any feedback.

How much will I be paid?

You can earn up to £50 during this trial. You will be paid based on how many units of electricity (kWh) you can reduce your heating-related demand by during EQUINOX events. We're specifically interested in how much electricity your heat pump uses, so you don't need to make any other changes during an event. You may be able to gain extra money by providing feedback throughout the trial through surveys, interviews, and focus groups.

What are the benefits of EQUINOX?

- **Savings:** By engaging throughout the trial, heat pump owners can save money through the billing schemes being trialled.
- **Promoting Sustainable Heating:** Reducing heat pump running costs can help to make heat pumps a more attractive proposition for homeowners, making it easier for people to replace their gas boiler with a more sustainable heat pump.
- **A More Dynamic Electricity Network:** As we move from gas heating to electric heating, and from petrol cars to electric vehicles, we will start using a lot more electricity. If this shift is not carefully managed, network operators may have to spend more money on equipment upgrades to account for the extra electricity demand. By finding ways to incentivise people to shift their heat pump usage whilst maintaining their comfort levels, EQUINOX will help us understand how to spread electricity usage for home heating across the day. This will create a more flexible electricity system, delaying or mitigating the need for costly cable expansions and network reinforcement, which are costly for everyone.

Who is delivering the project?

EQUINOX is led by National Grid (Electricity Distribution), in collaboration with Octopus Energy, Sero, ScottishPower, Passiv UK, SP Energy Networks, Welsh Government, West Midlands Combined Authority, National Energy Action, and Guidehouse.

How is the project funded?

EQUINOX is supported by Ofgem and funded through the regulator's Network Innovation Competition.

Frequently asked questions

When will trial two take place?

This trial is expected to run from November 2023 to March 2024.

What will I be asked to do during this trial?

The trial will consist of multiple two-hour periods called “EQUINOX events” across the winter where you will be asked to turn down your heating to provide flexibility to the grid. You may want to have your heating on before the event starts to make sure your home stays cosy, but you don’t need to make any other changes (no need to avoid your electric cooker).

This process will be slightly different depending on the trial group to which you are assigned. You might be asked to turn down your heating, either manually or through an app, or asked to allow control of your heat pump to a trusted third party during these two-hour periods (with the ability to override).

Will I need to do any additional tasks throughout the trial?

You will be asked to fill out a short questionnaire after each event to confirm if you participated and provide feedback. Customer experience and satisfaction will also be captured via short customer surveys, interviews, and focus groups to help us evaluate the trials throughout the trial period. Participation in these research activities is optional and will help us evaluate the trials.

Because we’re specifically interested in how much electricity your heat pump uses, you don’t need to make any other changes in your home during an EQUINOX event.

How would I be notified to shift my heat pump use?

You will receive a notification from your supplier asking you if you can manually shift your heat pump usage or asking for permission to allow control of your heat pump, for an upcoming two-hour period. The exact message will depend on the trial group to which you are assigned.

How far in advance will I be notified to shift my usage?

It depends! You could be notified either one day ahead of the event, the morning of the event, or two hours before the event. With prior consent, customers who opt-into providing control to a trusted third party, may also have no notice events. The notification period will vary throughout the trial to simulate different needs of the grid at different times. Payment amounts for participating in EQUINOX events will also vary based on notification time.

How many EQUINOX events will occur during the trial this winter?

Customers will be invited to participate in approximately 15-25 EQUINOX events between November 2023 and March 2024.

At what time will EQUINOX events take place?

EQUINOX events will take place for two-hours between 4-8 pm. This timeframe corresponds to evening peak electricity demand. The events will not always happen at the exact same time within that period.

How will EQUINOX event days be selected?

Event days will be selected primarily based on forecasted temperature so that we can understand shifting heat pump behaviour in different weather conditions. Selection is not necessarily aligned with live network demand as it would be in a future non-trial setting.

Will participating lower my energy bills?

The methods are designed to empower you to save money by changing your heating behaviour without sacrificing your comfort. The trial is designed to ensure that you will not be worse off than you were with your normal energy bills.

How much money can I expect to earn by participating?

We expect that customers will earn up to £50 for participating in the trial this winter, including project surveys. This amount may vary based on your normal heating behaviour.

How will I be paid for my participation in the trial?

You will be compensated based on how many units of electricity (kWh) you can reduce your heating related demand by during EQUINOX events. You may also be able to earn additional bill credits by providing feedback via surveys, interviews, and focus groups throughout the trial.

How many customers will participate in the trials?

This project aims to be the largest of its kind in the United Kingdom. During last year's trial we had almost 400 participants; this year we expect to have over 600 participants!

What data will you collect and how will it be utilised?

We will be collecting a variety of data throughout the trial including smart meter readings to understand how heat pumps impact household electricity usage, direct heat pump electricity usage (where this is possible to collect), your feedback on your experience in the trial and household demographic information to make sure benefits of heat pump flexibility can be fairly accessed by everyone. All data collected will be managed carefully in accordance with our privacy policies and in accordance with General Data Protection Regulation (GDPR).

Will it require anything new to be installed at my home?

The trial does not require anything new to be installed. We can conduct the trial based on the heating system already installed in your home.

However, select customers may be asked to have extra technology installed in their homes. This would provide you and the trial additional insights about your heat pump usage. This is not required, and customers can still participate even if they decline extra technology.

Will access to my property be required during this trial?

No, access to your property is not required. However, if you are a customer who opts in to having extra technology installed in their home (as mentioned in question 14) then access will be required.

What if I move house or change energy suppliers during the trial?

You will not be able to remain in the trial if you move house or change energy suppliers during the trial.

Do I need to turn down other items or just my heat pump?

We're interested specifically in the electricity that your heat pump uses, so you don't need to change anything else or avoid using your normal appliances during an EQUINOX event.

Should I turn off my heat pump or turn down my heating?

We recommend turning down your heating (i.e., turning down the thermostat) so that your heat pump doesn't kick on rather than turning it off completely. This is because we found in trial one that a full heat pump switch off leads to a large spike in electricity demand when the heat pump is turned back on.

During last year's trial some participants made use of apps and/or smart thermostats to turn down their heating, which allowed them to participate in EQUINOX events even if they were not at home. If you wish to consider this for the trial, there are lots of options available. However, it is not required to participate.

Do I need to change how I use my other low carbon technology during the trial?

We're interested in finding out how our EQUINOX events work for all kinds of households, including those already using other low carbon technologies like solar generation and home batteries.

The future energy network will include more households with these technologies, so your home can provide really valuable information for us if you stick to your usual routine, though you may find that your experience of the trial is a little different if you're used to using different sources of electricity at different times of day.

Advice for participation

Scheduling hot water

In order to maximise your participation in EQUINOX events, try not to empty your hot water tank just before the potential window for events (4-8pm) and set your hot water schedule to fill the tank in the afternoons.

Where possible, try to ensure your hot water schedule provides you a full tank of hot water ahead of the event window to avoid your heat pump needing to ramp up to refill it immediately after an event.

For customers on **Cosy Octopus**, we recommend pre-warming your water between one and four pm on event days. This will enable you to have hot water throughout EQUINOX events, while saving you money by using electricity during the cosy hours when electricity is cheapest on the tariff.

Using technology to control your heat pump

The most common reason for non-participation in trial one was that participants were not home to switch off or turn down their heat pump. However, this need not be the case. In many cases, it is possible to control your heat pump through a smart device.

If you are interested in using technology to control your heat pump or home's temperature settings, there are many products on the market that meet this need. Search for "smart thermostats" or "smart controllers for heat pumps" or ask your service provider or heat pump installer for recommendations.

Adopting one of these technologies might have an up-front cost for your household. Remember, this is not required to participate in the trial. You can always participate by turning down your thermostat or adjusting your heat pump manually. We just wanted to share what customers last year told us was helpful!

Results from trial one

Trial one by the numbers

- 386 customers participated in trial one
- 22 EQUINOX events over ten weeks

Impact on the network

- 386 customers provided 10.8MWh in energy use reduction across 22 events, with an average reduction of 1.43kWh per household per two-hour event.
- Collectively, this nearly 11MWh reduction is enough run 1400 washing machine cycles or run 19 refrigerators for a year!

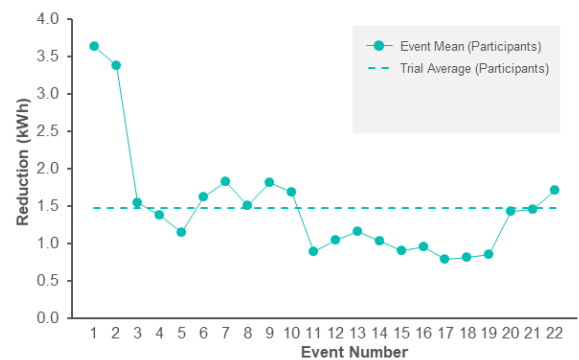


Figure 1: Event-by-event average household turndown between 5-7 pm

Participation

- On average, there was 82% participation across all EQUINOX events in trial one.
- This means that on average 316/386 households participated in each event.

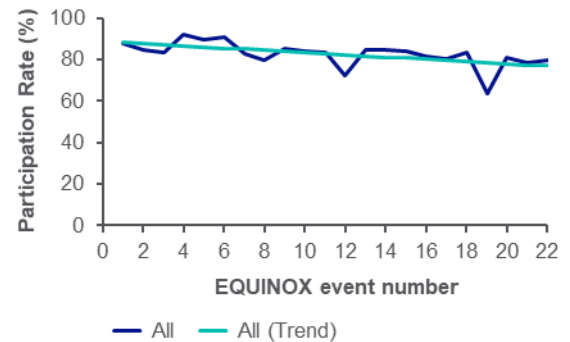


Figure 2: Trial one event-by-event participation rates

Customer satisfaction

- Most participants were satisfied with trial one.
- Over 90% of customers were “Extremely satisfied or moderately satisfied with EQUINOX. Less than 2% reported being dissatisfied.

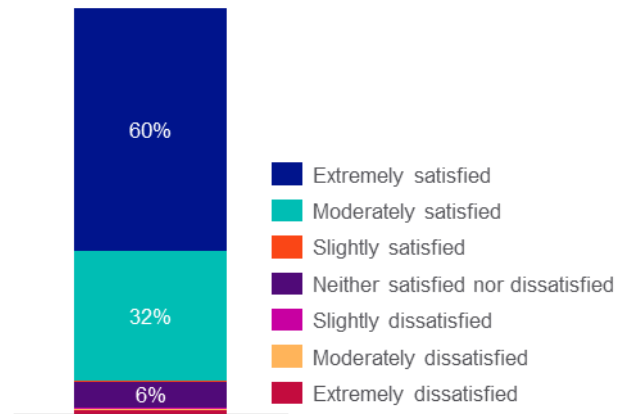


Figure 3: Participant survey response to “Overall, how satisfied are you with the overall EQUINOX trial so far?”

Customer comfort

- In general, participants in trial experienced limited or no discomfort at during EQUINOX events.
- 43% of participants reported events “Never” caused discomfort and only 5% reported that they “Always”, “Most of the time” or “About half the time’ caused discomfort.

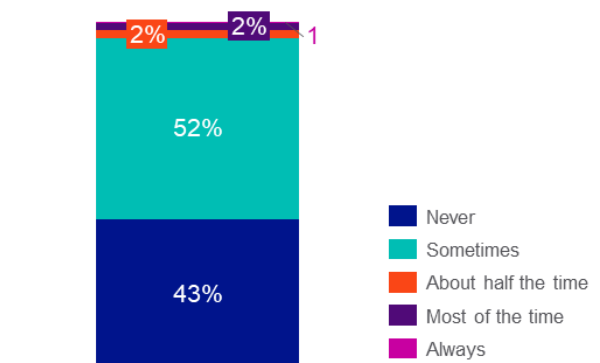


Figure 4: Participant survey response to “How frequently has participating in events caused any discomfort for you or someone else in your household?”

More trial one findings

If you are curious to learn more about the outcomes of trial one, check out the resources below.

- Watch a webinar on trial one findings here: <https://www.youtube.com/watch?v=nkygB4rkVoY>
- Download our trial one report here: <https://www.nationalgrid.co.uk/downloads-view-reciteme/639583>

Trial two key differences

While this year's trial is broadly similar to last year's trial one, those who participated in trial one may notice some key differences this year.

- **Event times:** Last year's events were always between 5-7pm. This year the event duration will still be two-hours, but it could be any consecutive two-hours between 4-8pm.
- **Notice periods:** Last year's events were communicated approximately 24-hours in advance of an event. This year, we are testing new things and the notification period will vary throughout the trial to simulate different needs of the grid. For example, you may be notified either one day ahead of the event, the morning of the event, or two hours before the event.
- **Payment:** Last year participants were paid a fixed amount regardless of the amount (kWh) of energy reduced by turning down your heat pump. This year, you will be paid based on the kWh of turndown provided by turning down your heat pump.

Links to additional resources

Managing energy bills

The energy crisis has significantly increased home energy costs. If you need support to your home feeling warm this winter, please check the resources below and speak to your energy supplier:

- [National Energy Action](https://www.nea.org.uk/get-help/resources/your-home-energy-help-checklist-national-energy-action-advice-leaflet/) – Financial help available & practical steps to keep your home feeling warmer this winter: <https://www.nea.org.uk/get-help/resources/your-home-energy-help-checklist-national-energy-action-advice-leaflet/>
- [GOV UK](https://www.gov.uk/government/news/energy-saving-tips-to-save-money) – Energy saving tips to save money: <https://www.gov.uk/government/news/energy-saving-tips-to-save-money>
- [Citizens Advice](https://www.citizensadvice.org.uk/consumer/energy/energy-supply/get-help-paying-your-bills/struggling-to-pay-your-energy-bills/) – Get help if you're behind on your energy bills: <https://www.citizensadvice.org.uk/consumer/energy/energy-supply/get-help-paying-your-bills/struggling-to-pay-your-energy-bills/>

Resources on operating heat pumps

We understand that heat pumps may be new for you. If you are still getting used to how to operate your heat pump, there are lots of resources to help!

You can find some useful resources on how to manage heat pumps below:

- [Home Energy Scotland](https://www.homeenergyscotland.org/heat-pumps/living-with-your-heat-pump/) – Living with your heat pump: <https://www.homeenergyscotland.org/heat-pumps/living-with-your-heat-pump/>
- [Energy Saving Trust](https://energysavingtrust.org.uk/advice/in-depth-guide-to-heat-pumps/) – In-depth guide to heat pumps: <https://energysavingtrust.org.uk/advice/in-depth-guide-to-heat-pumps/>

National Grid Electricity Distribution plc
Avonbank
Feeder Road
Bristol BS2 0TB
United Kingdom

nationalgrid.co.uk

October 2023