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## The DEFACTO Field Trial: Methodology and Data Sets

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# The DEFACTO Field Trial: Methodology and Data Sets

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## Appendix A

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## **Appendix A: Pilot Study Materials**

Pilot Initial Interest Letter

Pilot Information Sheet

Pilot Consent Form

Pilot Questionnaire

Pilot Temperature Sensor Letter

Pilot Interview 1 Script

Pilot Interview 2 Script

Pilot Battery Replacement Letter

Pilot Battery Replacement Instructions

Pilot Temperature Sensor Reactivation Instructions

22<sup>nd</sup> January 2014

To [employee]

We are writing to invite you to take part in a unique study investigating how people use their heating systems. The study is called 'Go Digital' and there will be over 600 UK households taking part. Please read this information pack and if you think this is something you would like to take part in, simply return the enclosed consent forms to our team at Loughborough University.

As part of this study you will receive state of the art heating controls in your home (a package worth £250), which you get to keep after the study has finished. To take part, we need to receive your signed consent forms by 7<sup>th</sup> February 2014. We will then arrange a convenient time to come and speak to you about your current heating habits and conduct a survey of your home, before installing the new heating controls. All households who take part in our study will also receive up to £50 in high street vouchers as a token of our thanks.

We would love you to take part in this study and we hope to hear from you soon.

Please do not hesitate to contact us if you have any questions.

Yours sincerely,

[xxxxxx]

*Go Digital Team Member*

Tel: 01509 22xxxx

Email : godigital@lboro.ac.uk

*The information you provide in this study will be held securely by Loughborough University, no one will be identifiable in the results, your personal details will not be passed to other people or organisations. The research will be carried out in accordance with the data protection act and Loughborough University have strict ethics procedures to control how the research is carried out and used.*

Interested?



We would love to include you and your house in the study. If you would like to take part:

- 1) Please send back the enclosed consent forms for each member of your family using the stamped addressed envelope
- 2) We will then contact you to arrange a visit
- 3) A questionnaire will be given to you to complete either online or on paper.

We look forward to hearing from you.

If you have any more questions, please contact the team:

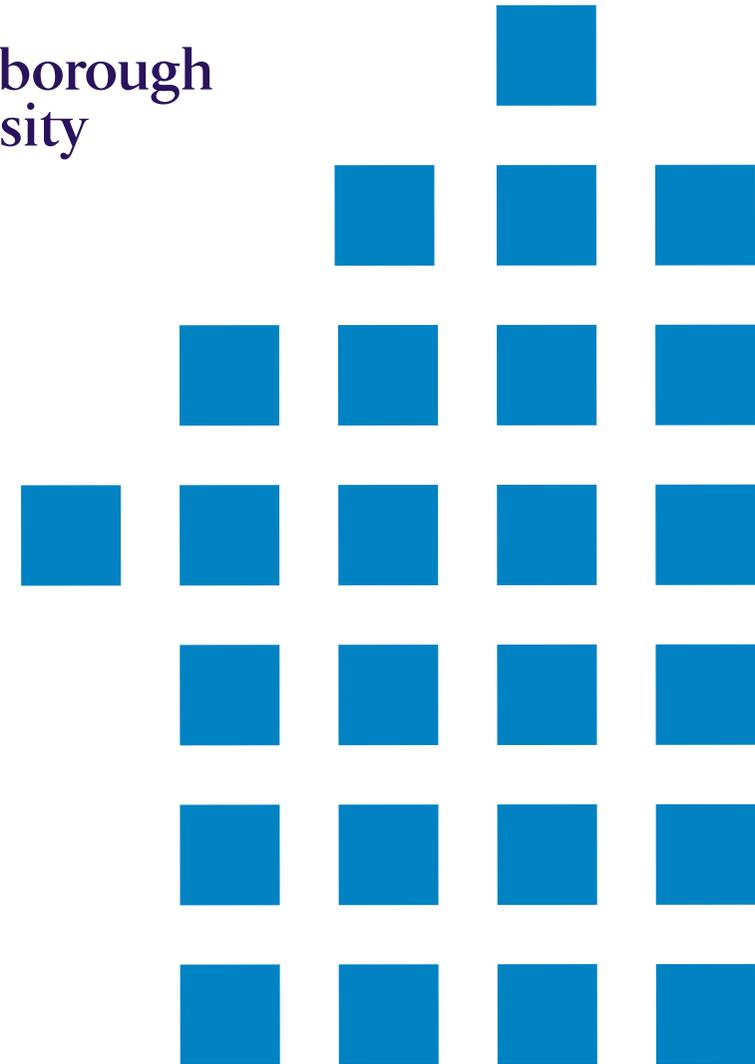
Email: [godigital@lboro.ac.uk](mailto:godigital@lboro.ac.uk)  
Telephone: **01509 22xxxx**

**Please note:** The team can only answer your queries relating to the Go Digital study, for any queries relating to your heating system, please contact your supplier.

If you are not happy with how the research was conducted, please contact the Mrs Zoe Stockdale, the Secretary for the University's Ethics Approvals (Human Participants) Sub-Committee:

Mrs Z Stockdale, Research Office, Rutland Building, Loughborough University, Loughborough, LE11 3TU. Email: [Z.C.Stockdale@lboro.ac.uk](mailto:Z.C.Stockdale@lboro.ac.uk)

The University also has a policy relating to Research Misconduct and Whistle Blowing which is available online at [www.lboro.ac.uk/admin/committees/ethical/Whistleblowing\(2\).htm](http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm)



go digital  
Invitation

# What is the 'Go Digital' study?

'Go Digital' is a Loughborough University research project. We are investigating the way different households use their heating systems. This knowledge will help us design better heating controls that can help save you energy and money.

Please join the **Go Digital** study and help us with this valuable work.

## What is in it for you?

Taking part in an academic research project can be interesting, as well as fun and informative. It is a chance for you to have your say and influence the future design of technology.

At the end of the study, we can provide you with personalised feedback. This will be based on the information we collect and may help you to reduce your energy bills.

You will also get to keep the thermostat and other heating controls that you have been given at no charge.

We would like to give you a token of thanks for taking part in this study, in the form of high street vouchers totalling up to £50. We will collect information about your energy use remotely, via your broadband connection. This means we won't keep disturbing you. The equipment will use no more than 500mb a month and less than £5 of electricity per year.



# Equipment

There will be some equipment installed into your house to help us measure your heating use. Some of it helps us to measure the temperature in your house whilst others measure the amount of gas and electricity you use.



**Temperature loggers:** These are small devices which are placed around your home (on shelves etc) to record temperature. We will use them to record before we install the equipment listed below.



**Temperature sensors:** These enable wireless monitoring of temperature and we would like to place a sensor in every room of your house. These sensors are required in addition to your thermostat and will need to be placed around the home (on shelves etc).



**Electricity meter:** This will measure the amount of electricity you use over the study period. An electrician will install it for you on the wall. It will not affect you, your electricity supply or your electricity bill.



**Gas meter:** This will measure the amount of gas you use over the study period and will be attached to your existing gas meter. It will not affect you, your gas supply, your gas bill or your telephone service.



**Gateway:** This is part of the advanced heating controls. It enables you to interact with your heating system over the internet. It also sends us your gas, electricity and temperature measurements. It needs to be connected to your broadband router.



# Information about tests



We may want to test the efficiency levels of your house at some point during the study. The following information gives details about the tests that might be carried out.

## Blower door test

A blower door test measures how airtight your house is, it will tell us how much cold air is coming into your house in the winter.

### What will happen?

During the test, a fan mounted into a frame is fitted to your front or back door. The fan sucks air out of the house, lowering the pressure inside. The test should take no longer than one hour and does not damage your house or door frame.

### What will you need to do?

Ensure all heated areas of the home can be accessed, including lofts and cellars (if heated). Make sure all external doors and windows can be closed and that all internal doors are open.



## Thermal image

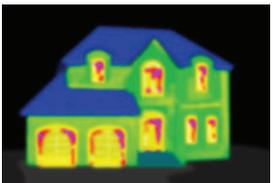
A thermal image shows the apparent temperature of the walls of your house. It helps us to understand how much heat is being lost through the walls in the winter.

### What will happen?

One of our researchers will use a thermal imaging camera to take pictures of the outside of your house (This only shows what heat loss is occurring through the walls of the building and can't see through the walls!).

### What will you need to do?

Nothing! This measurement will take a few minutes, you may just need to give the researcher access to the rear of your property.



# What would you have to do?



Timescales	Activity	How long will it take?
February/March 2014	1) You will be asked to complete a questionnaire either online or on paper	15 mins
	2) A survey of your home will be carried out, including measurements of room sizes	1 hour
	3) You will be asked to take part in an interview	1 hour
May 2014	4) New heating controls and measuring equipment will be installed into your home	1-2 hours
	4) You will be asked to take part in an interview	1 hour
May 2015	5) You will be asked to continue having your heat use monitored until May 2015, when the study will end.	

## Your safety



University researchers work hard to ensure the safety and confidentiality of those that give their time and effort to advance knowledge through research. This project is no different:

- All members of our research team hold enhanced DBS certificates (formally CRB)
- Participation in the study and all of its activities are voluntary and you can withdraw from the project at any time
- There are no risks to your personal safety from taking part in the study
- All of your information, personal details and data will be kept anonymous and confidential at all times
- We will not be able to access any of your private information, documents or emails via your internet connection
- We will not disclose any identifiable information about you, your family or your energy use to anyone outside the project team.

Further, detailed information relating to ethics has been included as a separate sheet in your information pack.

## Who are the Go Digital team?



The Go Digital team are all full time researchers employed by Loughborough University.



Becky is a researcher employed by Loughborough University & is working specifically on the Go Digital project. She & Ashley will be your main points of contact during the study and she is interested in all you have to say about your heating and your new controls.



Ashley is a PhD student at Loughborough University and the Go Digital study forms a large part of her work. Ashley, along with Becky, will be your main points of contact for the study.



Ehab is a researcher employed by Loughborough University & is working specifically on the Go Digital project. He is particularly interested in the equipment and monitoring aspects of the project and will come to your house to install some of the equipment.



Jackie is a researcher employed by Loughborough University & is working specifically on the Go Digital project. She will be analysing the data we get from your house, alongside all the other houses we are studying.

The Go Digital team can be contacted on: [godigital@lboro.ac.uk](mailto:godigital@lboro.ac.uk)

Please complete and send back

## Willingness to participate form for Under 18's contd.

The names and signatures listed below signify their willingness to participate and their parental/guardian consent for them to take part in the Go Digital study.

### Under 18 Participant 5

Name: .....  
Parent/Guardian name: .....  
Parent/Guardian signature: .....  
Date: .....

### Under 18 Participant 6

Name: .....  
Parent/Guardian name: .....  
Parent/Guardian signature: .....  
Date: .....

### Under 18 Participant 7

Name: .....  
Parent/Guardian name: .....  
Parent/Guardian signature: .....  
Date: .....

### Under 18 Participant 8

Name: .....  
Parent/Guardian name: .....  
Parent/Guardian signature: .....  
Date: .....



go digital

# Consent form: Part A

Please complete and send back

Please complete and send back

# Consent information for Adults

**This form should be completed after the invitation booklet has been read. Reading this form and completing the signature sheet shows that you agree to take part in the Go Digital study and that you agree to all listed statements.**

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethical Approvals (Human Participants) Sub-Committee.

I understand that I am under no obligation to take part in the study.

I understand that I have the right to withdraw from this study at any stage, without giving reason and without my home improvement or my legal rights being affected. I understand that, should I withdraw from the study, then any processed information collected to that point cannot be erased and that this information may still be used in project analysis. Personal information will be deleted, however.

I understand that all the information I provide will be treated in strict confidence and my identity will be kept anonymous and confidential.

## Measurements

I agree to having temperature data loggers placed in my home and to return the data loggers when requested.

I agree to having the air temperature monitored in each room of my home.

I agree to having a blower door test (to measure air tightness) and thermal imaging photography carried out on my property.

Please complete and send back

# Willingness to participate form for Under 18's

The names and signatures listed below signify their willingness to participate and their parental/guardian consent for them to take part in the Go Digital study.

contd. overleaf

## Under 18 Participant 1

Name: .....

Parent/Guardian name: .....

Parent/Guardian signature: .....

Date: .....

## Under 18 Participant 2

Name: .....

Parent/Guardian name: .....

Parent/Guardian signature: .....

Date: .....

## Under 18 Participant 3

Name: .....

Parent/Guardian name: .....

Parent/Guardian signature: .....

Date: .....

## Under 18 Participant 4

Name: .....

Parent/Guardian name: .....

Parent/Guardian signature: .....

Date: .....

Please complete and send back

# Consent form for Adults contd.

The names and signatures of the participants listed below signify their consent to take part in the Go Digital study.

## Adult Participant 7

Name: .....

Signature: .....

Date: .....

## Adult Participant 8

Name: .....

Signature: .....

Date: .....

## Adult Participant 9

Name: .....

Signature: .....

Date: .....

## Adult Participant 10

Name: .....

Signature: .....

Date: .....

Please complete and send back

# Consent information for Adults contd.

## Data

I understand that any data provided to the installation team as part of my refurbishment may be passed on to Loughborough University for use in the Go Digital study.

I agree that the information collected during the energy assessment and technical surveys of my home may be passed on to Loughborough University for use in the Go Digital study.

I understand that no information will be passed outside of the Go Digital project team (which includes those from Loughborough University and external collaborators).

I understand that my anonymised data will be archived for further analysis by other researchers at Loughborough University and possibly other Universities after the end of the Go Digital study.

I have read and understood the information sheet for the above project and this consent form. I have had the opportunity to ask questions about my participation.

I agree to participate in this study.

Please complete this form **[part A]** and send it back to us. Please keep the accompanying household information and consent booklet **[part B]** for your information.

Please complete and send back

# Household information

You should have already been asked these questions to assess your suitability for this study, but please help us by confirming your responses.

Do you own your home (outright or mortgaged)? **Yes / No**

Do you have a broadband internet connection? **Yes / No**

Do you currently have a fully functioning gas boiler? **Yes / No**

Do you currently have a standard boiler with a separate hot water tank? **Yes / No**

How many adults (18+) live in your home?

How many under 18's live in your home?

Home Address: .....  
.....  
.....

Telephone number: .....

Email address: .....

Preferred method of contact: Phone / email

Preferred time for telephone contact: 8am-12pm / 12-5pm / 5-8pm  
(Weekdays only) or other .....

Please complete and send back

# Consent form for Adults

The names and signatures of the participants listed below signify their consent to take part in the Go Digital study.

contd. overleaf

**[Please delete as appropriate]** I agree/disagree to photos of my home and members of my household being taken and I understand that these may be used for dissemination purposes.

## Adult Participant 1

Name: .....

Signature: .....

Date: .....

## Adult Participant 2

Name: .....

Signature: .....

Date: .....

## Adult Participant 3

Name: .....

Signature: .....

Date: .....

## Adult Participant 4

Name: .....

Signature: .....

Date: .....

# Consent information for younger people

Your family has chosen to take part in a study called 'Go Digital' being carried out by Loughborough University. This study wants to know how you keep your house warm and whether there are different technologies that can make that easier to do.

We will ask the adults in your house to answer some questions on a form and we will come and talk to the whole family. During these discussions we may want to ask you some questions, but if there is anything you don't want to answer – then that's OK!

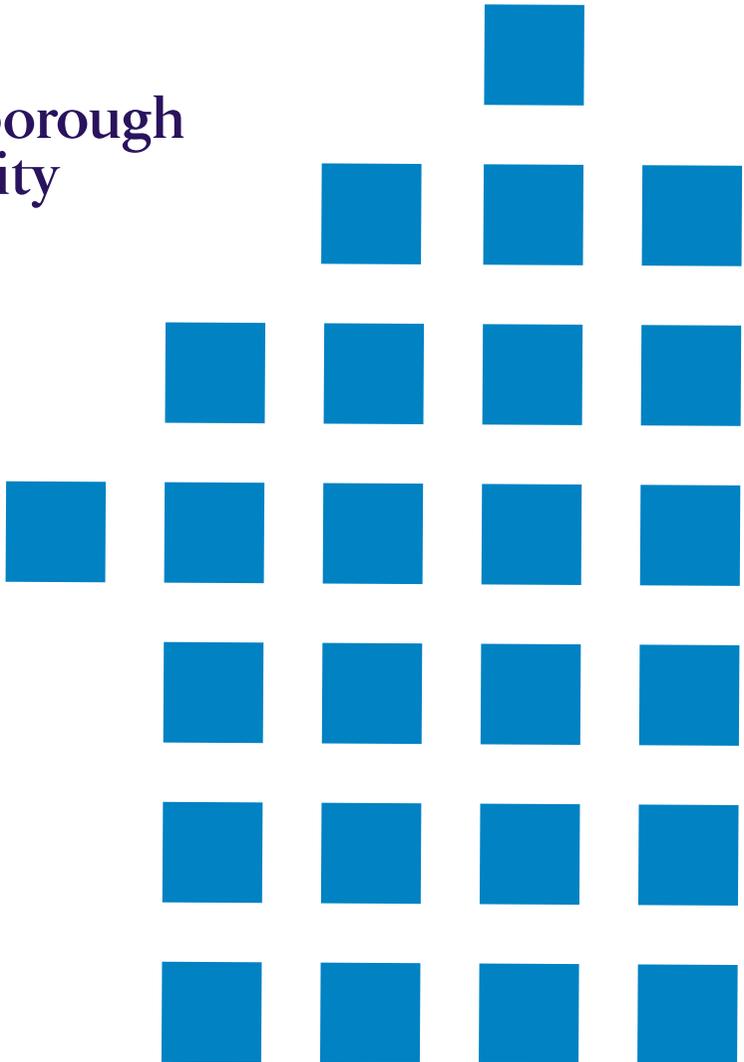
We will be putting some technologies into your house to measure how warm it is. It would be really helpful if you could leave these where they are. They are really quite boring and just monitor the room temperature.

You can say yes or no, its up to you whether you take part and there will be no negative consequences if you say no.

By saying you are willing to take part in the study, you are agreeing to all of the sentences listed below:

- I know what the 'Go Digital' study is about and I understand what taking part involves for me.
- I know that everything I tell you is private.
- I know that if you think I or others might not be safe, you will have to tell somebody.
- I am happy for you to write down/record what I say to you.
- I know that you will write a report that will include the things I tell you, but that no one will be able to work out who I am.
- I know that I do not have to answer all of the questions.
- I know that I can stop talking to you at any time and I know that no one will mind if I want to stop talking to you.

I am happy to take part in the 'Go Digital' study.

A decorative graphic consisting of a grid of blue squares of varying sizes, arranged in a pattern that tapers to the right. The squares are solid blue and vary in size, creating a sense of depth and movement.

go digital

Consent form: Part B

Please keep this information for your records

## Consent information for Adults

**Reading this form and completing the attached signature sheet shows that you agree to take part in the Go Digital study and that you agree to all listed statements.**

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethical Approvals (Human Participants) Sub-Committee.

I understand that I am under no obligation to take part in the study.

I understand that I have the right to withdraw from this study at any stage, without giving reason and without my home improvement or my legal rights being affected. I understand that, should I withdraw from the study, then any processed information collected to that point cannot be erased and that this information may still be used in project analysis. Personal information will be deleted, however.

I understand that all the information I provide will be treated in strict confidence and my identity will be kept anonymous and confidential.

### Measurements

I agree to having temperature data loggers placed in my home and to return the data loggers when requested.

I agree to having the air temperature monitored in each room of my home.

I agree to having a blower door test (to measure air tightness) and thermal imaging photography carried out on my property.

### Data

I understand that any data provided to the installation team as part of my refurbishment may be passed on to Loughborough University for use in the Go Digital study.

I agree that the information collected during the energy assessment and technical surveys of my home may be passed on to Loughborough University for use in the Go Digital study.

I understand that no information will be passed outside of the Go Digital project team (which includes those from Loughborough University and external collaborators).

I understand that my anonymised data will be archived for further analysis by other researchers at Loughborough University and possibly other Universities after the end of the Go Digital study.

I have read and understood the information sheet for the above project and this consent form. I have had the opportunity to ask questions about my participation.

**I agree to participate in this study.**

Please keep this part of the form **[part B]** for your records, but remember to post back the accompanying household information and consent booklet **[part A]**.

# Information sheet for under 14's.



# Child and young person's assent form



Your family have chosen to take part in a study called 'Do Digital' that is being carried out by Loughborough University.

We want to know how you keep your house warm and whether there are different technologies that can make that easier to do.

We will ask the adults in your house to answer some questions on a form and we may come and do an interview at your house with your whole family. During this interview we may want to ask you some questions. We would like you to talk to us as well and answer some questions, but if there is anything you don't want to answer – then that's ok!

We will be putting some technologies into your house to measure how warm it is. It would be really helpful if you could leave these where they are and not play with them. (We think your toys are probably much more exciting to play with!).

You can say yes or no, its up to you if you would like to take part.

My name is

\_\_\_\_\_  
[Child's name]

I know what the 'Go Digital' study is about.

I understand what taking part involves.

I know that everything I tell you is private.

I know that if you think I or others might not be safe, you will have to tell somebody.

I am happy for you to write down/record what I say to you.

I know that you will write a report that will include the things I tell you.

I know that I do not have to answer all of the questions.

I know that I can stop talking to you at any time.

I know that no one will mind if I want to stop talking to you.

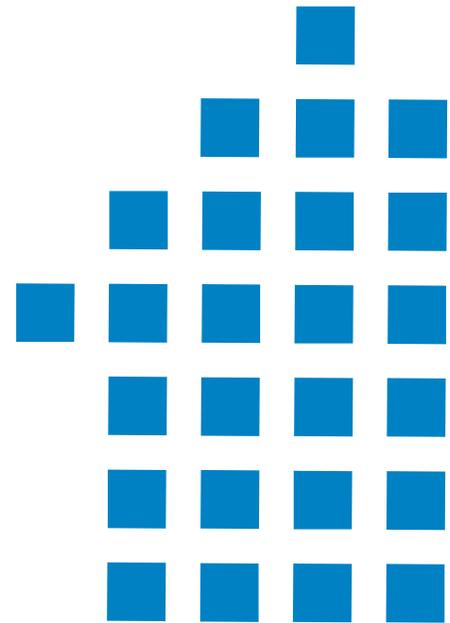
I am happy to take part in the 'Go Digital' study

\_\_\_\_\_  
[Child's name]

I [researcher name] confirm that I have told [child's name] about the research project and given them the information leaflet. To the best of my knowledge they have understood what I have told them and they are giving free consent.

\_\_\_\_\_  
[Researcher's name]

# go digital questionnaire



This questionnaire forms part of the Go Digital study which is a research study being conducted by Loughborough University. The study involves monitoring the way in which you use your heating and compares a range of different controls to see which are the easiest to use and which help you use your heating most efficiently.

This questionnaire will help us to understand more about your household in general and your energy use. We will then combine this information with the energy data we collect from your household. It includes 15 questions and should not take you more than 10 minutes to complete.

The information you provide in this survey will be held securely by Loughborough University, no one will be identifiable in the results and your personal details will not be passed to other people or organisations. The research is being carried out in accordance with the Data Protection Act and Loughborough University has strict ethics procedures to control how the research is carried out.

You can either fill in this questionnaire and give it back to us when we visit or you can fill it in online at: [www.survey.lboro.ac.uk/godigital](http://www.survey.lboro.ac.uk/godigital)

## 1. Property Ownership:

- Owned  1  
Owned (mortgaged)  2  
Part owned and part rented  3  
Privately rented  4  
I would rather not say  5  
Other (Please specify)  6
- 

## 2. How long have you lived in this property

\_\_\_\_\_ years \_\_\_\_\_ months

## 3. How many rooms does your property have?

*Note: Please **DO** count **ALL** other rooms, for example: Kitchens, living rooms, utility rooms, bedrooms, studies, conservatories. Please **DO NOT** count: Bathrooms, toilets, halls or landings or rooms that can only be used for storage such as cupboards*

\_\_\_\_\_ rooms

## 4. How many bedrooms does your property have?

*Note: Please **DO** count **ALL** rooms built or converted for use as bedrooms, even if they are not currently used as bedrooms*

\_\_\_\_\_ rooms

## 5. Do you or any member of your family have any long term physical ill-health or disability which affects how your household uses the heating or hot water?

- Yes  1  
No  2  
I would rather not say  5

If yes, please give details of how this affects the heating and hot water use:

---

---

## 6. What is your estimated household income?

Note: Please select your household income bracket EITHER per week OR per year

Per Week	OR	Per Year
<£290 <input type="checkbox"/> 1		<£15,000 <input type="checkbox"/> 11
£290 - £384 <input type="checkbox"/> 2		£15,000 - £19,999 <input type="checkbox"/> 12
£385 - £574 <input type="checkbox"/> 3		£20,000 - £29,999 <input type="checkbox"/> 13
£575 - £769 <input type="checkbox"/> 4		£30,000 - £39,999 <input type="checkbox"/> 14
£770 - £959 <input type="checkbox"/> 5		£40,000 - £49,999 <input type="checkbox"/> 15
£960 - £1,149 <input type="checkbox"/> 6		£50,000 - £59,999 <input type="checkbox"/> 16
£1150 - £1139 <input type="checkbox"/> 7		£60,000 - £69,999 <input type="checkbox"/> 17
£1340 - £1919 <input type="checkbox"/> 8		£70,000 - £99,999 <input type="checkbox"/> 18
£1920 - £2879 <input type="checkbox"/> 9		£100,000 - £149,999 <input type="checkbox"/> 19
£2880+ <input type="checkbox"/> 10		£150,000 + <input type="checkbox"/> 20
	I'd rather not say <input type="checkbox"/> 21	

## 7. Information about your Gas supply:

Please note: You may need to check your bill for this information:

**Projected cost of gas over the next 12 months**

From 24 Oct 2012 to 23 Oct 2013, you used 17505.11 kWh of gas. Using the same amount of gas over the next 12 months would cost you £894.92.

This may differ from your payment plan because we also look at elements such as normal weather patterns and existing balances when calculating your payment plan amount.

Period	Your tariff	Cost
24 Oct 13 - 22 Nov 13	Standard	£81.35
23 Nov 13 - 23 Oct 14	Standard	£813.57
		<b>£894.92</b>

**Gas charges**

Period	Previous reading	Latest reading	Gas units used	kWh rate	Charge
Meter number: G4A00498319901 Tariff: Blue+Price Promise February 2015					
14 Jun 13 - 30 Dec 13	14804	15237	433 = 4821 kWh <sup>1</sup>	x 3.771p =	£181.80
31 Dec 13 - 09 Jan 14	15237	15287	50 = 557 kWh <sup>1</sup>	x 3.771p =	£21.00
Standing charge (210 days @ 25.00p per day)					£52.50
<b>Total gas charges for this period</b>					<b>£255.30</b>

- a) What is your estimated annual gas cost? £ \_\_\_\_\_
- b) What is your estimated annual gas usage? \_\_\_\_\_ kWh / M<sup>3</sup> / Ft<sup>3</sup> [delete as appropriate]
- c) How do you normally pay for your gas consumption?
- Direct debit  1
- Prepayment meter  2
- On receipt of bill  3
- Payment card  4
- Other [please specify]  5 \_\_\_\_\_

## 8. Information about your electricity supply:

Please note: You may need to check your bill for this information

 **Electricity charges**

Period	Previous reading	Latest reading	Electricity units used	kWh rate	Charge
Meter number: D09W007926 Tariff: Blue+Price Promise February 2015					
06 Jun 13 - 30 Dec 13	51411	52488	1077 kWh	x 11.60p =	£124.93
	YOUR READ	ESTIMATED			
31 Dec 13 - 09 Jan 14	52488	52556	68 kWh	x 11.60p =	£7.89
	ESTIMATED YOUR READ				
Standing charge (218 days @ 18.00p per day)					£39.24
<b>Total electricity charges for this period</b>					<b>£172.06</b>

- a) What is your estimated annual electricity cost? £ \_\_\_\_\_
- b) What is your estimated annual electricity usage? \_\_\_\_\_ kWh / M<sup>3</sup> / Ft<sup>3</sup> [delete as appropriate]
- c) How do you normally pay for your electricity consumption?
- Direct debit  1
- Prepayment meter  2
- On receipt of bill  3
- Payment card  4
- Other [please specify]  5 \_\_\_\_\_

## 9. How many of the following appliances do you have AND use in your home?

Note: Please write the number in the space provided

	Number
Tumble drier	
Washing machine	
Combined washer dryer	
Gas oven	
Electric oven	
Dishwasher	
Microwave	
Secondary heaters (e.g. fan heater electric radiators)	
Open fire/log burner	
Immersion heater (in your hot water tank)	

## 10. How many of the following digital technologies do you have in your home?

Note: Please write the number in the space provided

	Number
Smart phone (e.g. iphone)	
Tablet (e.g. ipad, Google Nexus)	
Smart energy meter or digital room thermostat	

	Example	Person 1 (you)	Person 2	Person 3	Person 4	Person 5	Person 6
<b>Person's name</b> [optional]	<i>Sally</i>						
<b>Persons age in years</b> (if less than 1 year, please write 0)	<i>29</i>						
<b>Gender</b>							
Male (1)	1 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/>
Female (2)	2 <input checked="" type="checkbox"/>	2 <input type="checkbox"/>					
I'd rather not say (3)	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>
<b>Working status</b>							
Full time employed (1)	1 <input checked="" type="checkbox"/>	1 <input type="checkbox"/>					
Part time employed (2)	2 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/>
Unemployed (3)	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>
Retired (4)	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>
Child (under 18) not applicable (5)	5 <input type="checkbox"/>	5 <input type="checkbox"/>	5 <input type="checkbox"/>	5 <input type="checkbox"/>	5 <input type="checkbox"/>	5 <input type="checkbox"/>	5 <input type="checkbox"/>
Full time student: living at home (6)	6 <input type="checkbox"/>	6 <input type="checkbox"/>	6 <input type="checkbox"/>	6 <input type="checkbox"/>	6 <input type="checkbox"/>	6 <input type="checkbox"/>	6 <input type="checkbox"/>
Full time student: living away in term (7)	7 <input type="checkbox"/>	7 <input type="checkbox"/>	7 <input type="checkbox"/>	7 <input type="checkbox"/>	7 <input type="checkbox"/>	7 <input type="checkbox"/>	7 <input type="checkbox"/>
I would rather not say (8)	8 <input type="checkbox"/>	8 <input type="checkbox"/>	8 <input type="checkbox"/>	8 <input type="checkbox"/>	8 <input type="checkbox"/>	8 <input type="checkbox"/>	8 <input type="checkbox"/>
Other please specify below(9)	9 <input type="checkbox"/>	9 <input type="checkbox"/>	9 <input type="checkbox"/>	9 <input type="checkbox"/>	9 <input type="checkbox"/>	9 <input type="checkbox"/>	9 <input type="checkbox"/>
Details of other working status							

Ethnicity:							
White British (1)	1 <input type="checkbox"/>						
White Irish (2)	2 <input type="checkbox"/>						
Gypsy or Irish traveller (3)	3 <input type="checkbox"/>						
Other white background (4)	4 <input type="checkbox"/>						
White and Black Caribbean (5)	5 <input type="checkbox"/>						
White and Black African (6)	6 <input type="checkbox"/>						
White and Asian (7)	7 <input type="checkbox"/>						
Other multiple ethnic (8)	8 <input type="checkbox"/>						
Indian (9)	9 <input type="checkbox"/>						
Pakistani (10)	10 <input type="checkbox"/>						
Bangladeshi (11)	11 <input type="checkbox"/>						
Chinese (12)	12 <input type="checkbox"/>						
Other Asian background (13)	13 <input type="checkbox"/>						
African (14)	14 <input type="checkbox"/>						
Caribbean (15)	15 <input type="checkbox"/>						
Arab (16)	16 <input type="checkbox"/>						
Any other ethnic background (17)	17 <input type="checkbox"/>						
I'd rather not say (18)	18 <input type="checkbox"/>						

	Person 7	Person 8	Person 9	Person 10	Person 11	Person 12
<b>Person's name</b> [optional]						
<b>Persons age in years</b> (if less than 1 year, please write 0)						
<b>Gender</b>						
Male (1)	1 <input type="checkbox"/>					
Female (2)	2 <input type="checkbox"/>					
I'd rather not say (3)	3 <input type="checkbox"/>					
<b>Working status</b>						
Full time employed (1)	1 <input type="checkbox"/>					
Part time employed (2)	2 <input type="checkbox"/>					
Unemployed (3)	3 <input type="checkbox"/>					
Retired (4)	4 <input type="checkbox"/>					
Child (under 18) not applicable (5)	5 <input type="checkbox"/>					
Full time student: living at home (6)	6 <input type="checkbox"/>					
Full time student: living away in term (7)	7 <input type="checkbox"/>					
I would rather not say (8)	8 <input type="checkbox"/>					
Other please specify below(9)	9 <input type="checkbox"/>					
Details of other working status						

Ethnicity:						
White British (1)	1 <input type="checkbox"/>					
White Irish (2)	2 <input type="checkbox"/>					
Gypsy or Irish traveller (3)	3 <input type="checkbox"/>					
Other white background (4)	4 <input type="checkbox"/>					
White and Black Caribbean (5)	5 <input type="checkbox"/>					
White and Black African (6)	6 <input type="checkbox"/>					
White and Asian (7)	7 <input type="checkbox"/>					
Other multiple ethnic (8)	8 <input type="checkbox"/>					
Indian (9)	9 <input type="checkbox"/>					
Pakistani (10)	10 <input type="checkbox"/>					
Bangladeshi (11)	11 <input type="checkbox"/>					
Chinese (12)	12 <input type="checkbox"/>					
Other Asian background (13)	13 <input type="checkbox"/>					
African (14)	14 <input type="checkbox"/>					
Caribbean (15)	15 <input type="checkbox"/>					
Arab (16)	16 <input type="checkbox"/>					
Any other ethnic background (17)	17 <input type="checkbox"/>					
I'd rather not say (18)	18 <input type="checkbox"/>					

## **Your Details**

*Please fill in your details below. This will help us to identify you and your household. This information will be kept strictly confidential, will be used solely by Loughborough University and will not be passed onto any third parties*

Name of person filling form:

.....

Email address:

.....

Phone number:

.....

Postcode:

.....

### ***Thank you for filling in the Go Digital survey***

Your information will help us to understand more about the people taking part in the Go Digital survey and the way you use your heating system. If you have any questions in relation to this survey or the Go Digital study, please contact us:

Email: **godigital@lboro.ac.uk**

Tel: **01509 22xxxx**

Visit the website at: **www.godigitalresearch.com**

19<sup>th</sup> February 2014

Dear [participant name]

Thank you for agreeing to take part in the Go Digital study, we are pleased to welcome you as one of over 600 UK households who will take part in the study over the coming months.

We have arranged to come and visit you in your home on:

***Tuesday 4<sup>th</sup> March 2014 at 7.30pm***

If, for any reason, you need to alter this appointment, please email us at: [godigital@lboro.ac.uk](mailto:godigital@lboro.ac.uk) or call the participant hotline on 01509 22xxxx.

Before we come and visit you, we would like you to begin recording the temperature in your home, and the contents of this pack will help you to do that. Please read the ***temperature sensor instruction sheet*** enclosed and follow the advice given.

Thank you again for taking part in this study, please do not hesitate to contact us if you have any questions and we look forward to meeting you.

Yours sincerely,

[xxxx]

*Go Digital Team Member*

Tel: 01509 22xxxx

Email: [godigital@lboro.ac.uk](mailto:godigital@lboro.ac.uk)

*The information you provide in this study will be held securely by Loughborough University, no one will be identifiable in the results, your personal details will not be passed to other people or organisations. The research will be carried out in accordance with the Data Protection Act and Loughborough University has strict ethics procedures to control how the research is carried out.*

House Number:  
Date:

Pxx

.....  
Note taker: [xx]

Go Digital Household Interview

- 1) How do you tend to heat your house?
- 2) Are you able to heat your house to how you want it?
  - a. Why not?
- 3) In an ideal world, how would you heat your house?
  - a. Why don't you do that?
- 4) How often do you adjust something on your heating?
  - a. Less than once a day
  - b. Once a day
  - c. Twice a day
  - d. More than twice a day

.....  
.....

- 5) Do you have a?
  - a. Thermostat: Y/N
  - b. Programmer: Y/N
  - c. TRVs: Y/N

.....  
.....

- 6) Which of these do you mainly use to adjust your heating?
  - a. Is this on a daily/weekly basis or over the course of a year
  - b. Why do you use one method over another?

.....  
.....

- 7) How often to do you use each of the following to adjust your heating?
  - a. Thermostat
    - a. How do you use the thermostat to control your heating?
    - b. Who does this?
    - c. Do you have specific temperature(s) which you set the thermostat to? [Day/night/weekend]
    - d. What is the minimum temperature you set the thermostat to?

.....  
.....

b. Programmer

- a. How do you use the programmer to control your heating?
- b. What times does it go on/off?
- c. Who does this?

.....  
.....

c. TRVs

- a. Do you use all/some/none of the TRVs
- b. When do you use them? Why?
- c. Under what circumstances would you use the TRVs rather than the programmer or thermostat?

.....  
.....

8) Who in your household usually controls the heating?

- a. Do people within your household differ in opinion over the heating
- b. In what way?

.....  
.....

9) What do you do with your heating system when you go on holiday or away for a few days?

.....  
.....

10) How do you decide when to turn the heating off after the winter?

.....  
.....

11) Do you use any other ways of heating your house (apart from central heating)?

- a. Where?
- b. When? (all the time or just when the heating isn't on?)

c. What?

.....  
.....

12) Are there any room which you don't use? (Or use less)

a. Do you heat these rooms differently?

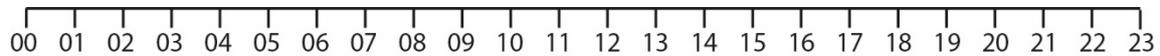
.....  
.....

13) Rank the following in terms of priority for heating within the home:

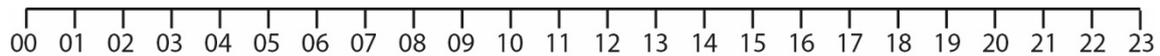
- Cost
- Comfort
- Health

.....  
.....

14) How would you draw your heating pattern routines?



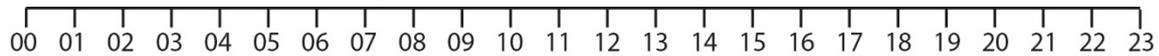
If hot water tank, draw hot water heating



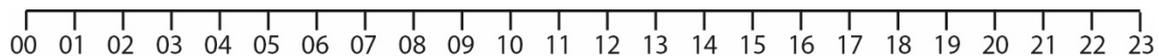
.....  
.....

15) What is the typical occupancy pattern in your household?

a. On a weekday



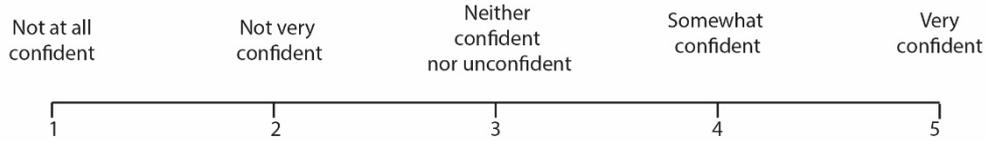
b. At a weekend



16) How well do you feel you know how to use:

a. Your thermostat?

[Participant looks at crib sheet and interviewer marks on sheet. Mark if participants have different answers]



b. Your programmer



c. Your TRVS



17) What is your opinion of the new types of thermostats and smart heating controls such as those you may have seen advertised on the TV?

.....  
.....

18) Do you use this kind of personal smart technology for anything else?  
a. What sort of thing? (e.g. Mobile banking, Interactive TV etc.)

.....  
.....

**Scenario task 1**

*I'm now going to give you a number of scenarios and after each one please explain the actions you would take and your reasons for this.*

- 1) You have been away for the weekend, you get home and the house is cold – what do you do?

.....  
.....

- 2) You're working at home for the day – you don't want to be cold, what would you do?

.....  
.....

- 3) You want part of your house to be cool and another part warm – how would you do that?

.....  
.....

- 4) The heating is on but it's warm outside, what would you do?

.....  
.....

**Scenario task 2**

*I am now going to ask you some questions relating specifically to the way your heating system works, please describe what you think happens when you take the following actions – using the magnets where applicable.”*

- 1) Firstly, can you explain the elements of your heating system so we can map them out

**Now can you describe how you would carry out the following tasks [and then explain how you think the system works]**

- 1) If you adjust the heating up to 22°C (through the thermostat)
- 2) If you turn the heating off (using the boiler controls)
- 3) If you want to increase the temperature in one room (through the TRV)
- 4) If the heating is on and you turn the shower on (What happens to the heating in this instance?)

**Questions**

- 15) Do you think the temperature of the thermostat has an effect on the speed at which the house heats up?

.....  
.....

- 16) Do you think the temperature of the radiators differs depending on the thermostat temperature?

.....  
.....

- 17) Do you think the output of the boiler differs at all depending on the thermostat temperature?

.....  
.....

- 18) Are there any other factors which you think affect the way in which your house heats up?

.....  
.....

19) Do you think it is most efficient to:

- a. Keep your heating on low all day
- b. Turn your heating on and off at different times throughout the day?
- c. Use your heating on a demand basis (i.e. when you feel cold)

.....

.....

.....

Is that how you heat your home?

.....

.....

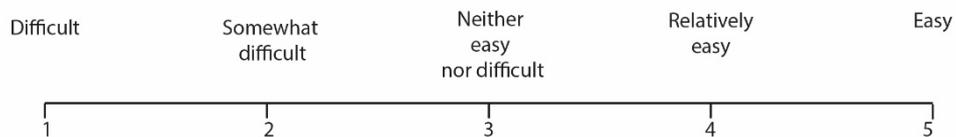
.....

**Scenario task 3 (filmed)**

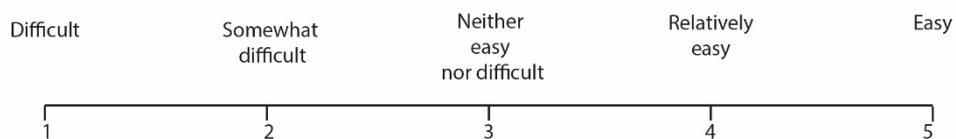
*I would now like you to show us how you would perform the following tasks with your heating system, I will film you completing the tasks, but only your hand and the system will be in the shot.*

1) Adjust your heating so that it is at 22°C in your home

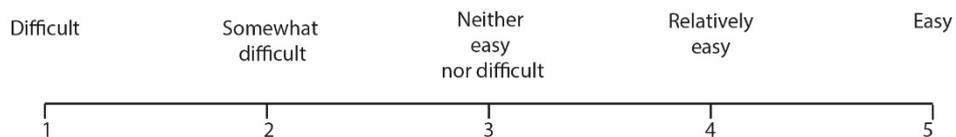
a. How easy was that task to perform?



2) Set the heating to come on between 6-8am and 7-9pm



3) Adjust your heating to ensure the temperature in the house doesn't drop below 15°C



**Questions**

- 20) Have you ever attempted to do something with your heating controller which you were not able to do?
- a. What?
  - b. Why weren't you able to do this?
  - c. Have you since been able to do this?

.....

.....

.....

**Meter readings**

Gas supplier: \_\_\_\_\_

Gas Meter reading: \_\_\_\_\_

Gas Meter Serial number: \_\_\_\_\_

Meter Point Reference Number [MPRN] \_\_\_\_\_

Photograph taken?

Electricity supplier: \_\_\_\_\_

Electricity Meter reading: \_\_\_\_\_

Electricity Meter Serial no.: \_\_\_\_\_

Photograph taken?

**Gas Meter signed consent**

**House map**

House map drawn?:

**Energy Bills**

Photographs of energy bills taken?:

**Photos of controls taken?**

**Data loggers**

Number of data loggers used:

Data logger positioned noted?

Number of i-buttons used:

**Survey**

Survey collected?:

## Go Digital Second Household Interview

*Firstly, thank you for allowing us to come and visit you again. This shouldn't take more than an hour, and similarly to the first visit we would like to ask you some questions and ask you to perform some tasks with your heating system. There are no right or wrong answers; we are just really interested in your thoughts.*

*We won't be able to give specific advice or instructions on the use of your system as the study is interested in seeing how people get on with the system and use it but all of your queries should be answered in the manual and if not, there is a helpline.*

*Firstly, I would like you to answer the first few questions on the installation of your new heating controls.*

1) How did you find the installation of the controls?

---

---

a. What were you told at installation by the installer?

---

---

b. Did the installer talk you through using the controls at all?

---

---

c. Is there anything else you have liked to have been told at the time of installation?

---

---

2) Did you play around with the controls much when you first had them installed?

---

---

3) Did you read the instruction manual when the controls were installed?

---

---

a. Was this useful?

---

---

b. Was there anything information which you couldn't find?

---

---

c. Do you have any general feedback on this instruction manual?

---

---

4) Following the installation of your new heating controls, do you think this will/has change the way you heat your home? (if so in what way?)

---

---

5) In the previous interview you suggested that you tend to adjust your heating by [ ] do you think your new controls will change the way you use your heating at all?

---

---

6) Has the new system changed who controls the heating? Or do you think it will when you start using your heating more?

---

---

7) Have you used the app to control your heating or hot water?

---

---

a. What did you use it for?

---

---

b. Who else has/hasn't used it?

---

---

c. How many people in your house have downloaded the app?

---

---

d. Do you find you are using this more than the controls?

---

---

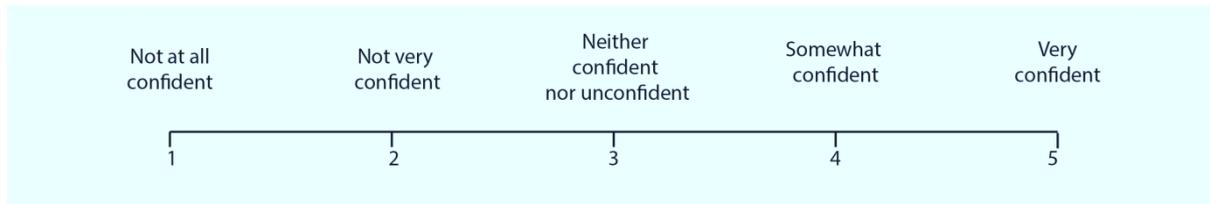
e. Do you feel it will make you more likely to adjust something on your heating?

---

---

8) How confident are you in the use of your new heating controls?

[Participant looks at crib sheet and interviewer marks on sheet. Mark if participants have different answers]



---

---

f. What would help to make you more confident?

---

---

9) Have you tried to do anything with the new heating controls which you were not able to do?

---

---

g. What was this?

---

---

h. Why weren't you able to do this?

---

---

i. Did you work out how to do it?

---

---

10) Are there any terms used in/on the controls that you don't understand or any pictures/buttons/icons which you find confusing?

j. How would you prefer them to be referred to?

11) In general, what do you think of the system as a physical product? Size, shape, ease of use etc.

12) Thinking back to when you were using your heating, did you ever put your heating on for a short time outside of the times you've set your heating to come on? What would you call this?

13) Could you define what the following terms mean to you?

k. Boost

l. Advance

---

---

m. Set-point

---

---

n. Frost protection

---

---

o. Auto

---

---

p. Economy

14) If HW – How do you find using the new controls for your hot water?

---

---

q. Did you have any issues setting up the schedule?

---

---

r. Did you change your schedule to how you had it previously?

---

---

s. Do you use the boost function, and if so how often?

---

---

15) You said in your previous interview that you used [ room/space ] less, do you think this will change at all with the new system?

---

---

16) You originally said that you were [ ] about this new type of technology, has your opinion changed at all now that you have had it installed?

---

---

t. What do you like about the new controls currently?

---

---

u. Do you have any concerns regarding the new controls for using your heating when it gets colder?

---

---

17) Have you used any other ways of heating your house over the summer months?

---

---

a. How often? (Less than once a day, once a day, twice a day, more?)

---

---

b. Where?

---

---

c. When? (all the time or just when the heating isn't on?)

---

---

d. What?

---

---

e. What was the reason for needing to heat the house?

---

---

18) With the new system, so you think it is more efficient to:

- a. Keep your heating on low all day
- b. Turn your heating on and off at different times throughout the day?
- c. Use your heating on a demand basis (i.e. when you feel cold)

---

---

19) Do you think the new system will make your heating use more efficient?

---

---

### Heating system map

*You will remember that in the last interview, we asked you to help us map out your heating system. We would now like to explore this in a little more detail.*

- v. Could you choose the elements of your new heating system from these magnets and arrange them on the board and name them
- w. Could you draw the links between the components and explain what your thought process is?
- x. Please can you describe (and draw on the diagram) what happens when:
  - i. You turn the thermostat temperature up (on the control)
  - ii. You use the app to adjust the temperature
  - iii. You adjust a TRV
  - iv. You use hot water

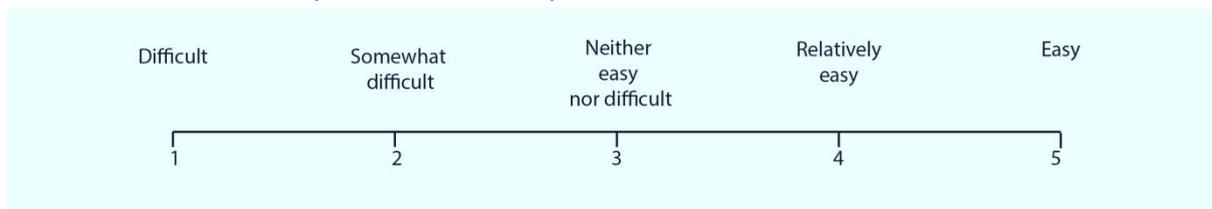
20) Have the new controls changed your understanding/perception of the way the heating system works?

---

---

*I would now like you to show us how you would perform the following tasks with your new heating controls, I will film you completing the tasks, but only your hand and the system will be in the shot.*

- 1) Adjust your heating so that it is at 22°C in your home
- a. How easy was that task to perform?



- 2) Set the heating to come on between 6-8am and 7-9pm



3) Adjust your heating to ensure the temperature in the house doesn't drop below 15°C



*That is all of the questions that we would like to ask you, what we would now like to do is:*

- *Have you had to move any of the sensors*
- *Check that you are willing to continue being part of this study which requires a further household activity and interview. These additional requirements are explained in the provided information sheet and you will be compensated for this extra involvement.*
- *Ask if you would be interested in/willing to have a Green Deal Assessment (worth up to £150)*

*That's about all for today, thank you so much again for taking part in the study and for allowing us to come to your house this evening.*

[22<sup>nd</sup> May 2014]

Dear [name]

Thank you for your ongoing support and involvement in the Go Digital study. Included in this envelope is a voucher for £25 to thank you for your involvement in the study so far.

Due to University policy, we require confirmation that you have received this voucher and therefore ask that you either fill in and return the slip included or that you email us at [godigital@lboro.ac.uk](mailto:godigital@lboro.ac.uk).

We have now finished measuring the temperature of your home with the small data loggers which we initially asked you to place around your home. Please can you return these in the stamped addressed envelope we provided when they were sent to you. The voucher confirmation slip can also be included in this envelope.

We have also noticed that the battery levels in your electricity meter are running low and would therefore ask that you could replace them with the batteries included in the letter. The meter requires 2 AA batteries and we have enclosed details of how these batteries can be replaced.

Thank you again for taking part in this study, please do not hesitate to contact us if you have any questions and we will be in touch in due course.

Yours sincerely,

[xxxx]

*Go Digital Team Member*

Tel: 01509 22xxxx

Email: [godigital@lboro.ac.uk](mailto:godigital@lboro.ac.uk)

*The information you provide in this study will be held securely by Loughborough University, no one will be identifiable in the results, your personal details will not be passed to other people or organisations. The research will be carried out in accordance with the Data Protection Act and Loughborough University has strict ethics procedures to control how the research is carried out.*

# How to change the batteries in your NorthQ electricity meter reader

1



You will find the reader attached to your main electricity meter

2



The batteries are located at the bottom of the meter reader

3



To open the battery cover, pinch the opening mechanism

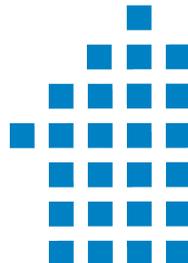
4



Remove the battery cover and replace the batteries (*ensuring they are replaced in the same direction*)

5

Replace the battery cover. Please make sure it closes properly to ensure the connection is secure.



# Re-activation of temperature sensor

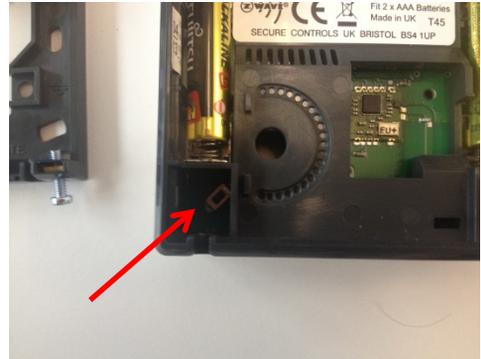
1- To disassemble the back plate of the sensor a screwdriver with a flat-end is needed.



2- After loosening the screws, the back plate can be removed.



3- At the lower left corner (while name plate is upright direction) a small compartment that includes the activation button. Press down that button for 5 sec while been instructed on phone.



4- Make sure the batteries are not loose and then close the back cover and tighten it with screws.

