

REAP Petite Documentation

1 Introducing REAP Petite

REAP Petite is an online footprint calculator designed to help communities calculate their environmental impact and prioritise action to help reduce it. The web application uses a questionnaire approach to investigate households' expenditure on home energy, food, travel, shopping and activities and converts this spend to carbon and ecological footprints. The footprint of an individual, household and community average are calculated.

Footprint tools have previously been developed for businesses, schools, regional governments and local authorities. There are also a number of individual footprint calculators available on-line. Most of these online tools measure the direct emissions from heating and powering the home and transportation. REAP Petite measures an individual or a community's full environmental impact, including both direct impacts from fuel burning and indirect supply chain impacts from the production of goods and services which occur either in the UK or abroad. REAP Petite also allows participants to measure the effect of a number of footprint reducing pledges specific to the participant's unique input parameters.

REAP Petite was designed by the Stockholm Environment Institute (SEI) with help from a number of people and organisations (see Annex 1). REAP Petite started life in 2007 as an Excel spreadsheet, produced for Aberdeenshire Council who wanted to find the footprint of families attending two local schools. Aberdeenshire wanted to find out if the communities they were working with had a different footprint to the district council as a whole and needed a tool that could calculate 'community averages' which would then be fed into SEI's main consumption impact model REAP¹.

REAP Petite was then programmed as a standalone desktop application but demand for the tool was high and SEI wanted to make it more accessible to potential users. To meet demand from potential users and to improve access REAP Petite was turned into a web based application.

The desktop application has been used by:

- The New Economics Foundation collecting data from residents of Welsh Local Authorities.
- Action for Sustainable Living helping communities in Manchester pledge to reduce their footprint.
- 23 community groups as part of DECCs review of the Low Carbon Communities Challenge in England.
- Over 20 community groups as part of the Climate Challenge Fund in Scotland.
- Over 10 streets and schools in Lewes District Council.
- 3 neighbourhood groups, 2 schools and a Church in York City Council as part of the 'Green Neighbourhood Challenge' project².

¹ <http://sei-international.org/reap>

² <http://sei-international.org/publications?pid=1860>

2 Accounting for consumption emissions

The REAP methodology³ pioneers the use of sophisticated economic models linked to national environmental accounts to calculate the ecological, carbon and greenhouse gas footprints of products, industries, countries, local authorities and neighbourhoods.

Everything that we buy, use and consume has some environmental impact associated with it. For some activities, like turning on the heating to keep warm in the winter or driving a car, the impact is clear - fuel is being burnt and emissions are released. Less obvious considerations are the resources, land required and supply chain emissions incurred in the production of our food, goods and services. To account for the full environmental impact of residents and communities we need to be able to monitor everything that a person spends and does. Defra⁴ publish conversion factors for activities where there is direct impact from fuel burning and these are used where appropriate in the home energy and travel sectors of the tool.

The indirect supply chain impacts and conversion factors are calculated using Environmentally Extended Input Output Methodology. Input Output (IO) tables show the economic interactions between industries – for example, the tables show how the agricultural sector buys from manufacturing, services and other agricultural sectors. IO analysis was first used to show how all sectors must increase their supply if the demand for a single sector increased – for example, if demand for agriculture increased, the supply of manufacturing, services and agriculture must increase accordingly.

Environmental Accounts, produced by the Office of National Statistics, show the direct (fuel burning) emissions from each industrial sector. This information is combined with the IO tables to produce Environmentally Extended Input Output tables. This means that we can now show how much emissions may change if there is an increase in demand for a specific sector. This increase in emissions takes into account the direct emissions of the sector itself and all the increased emissions from the other sectors that are required in producing the output. This explains how we can assign an impact to an item of clothing. The manufacturing of clothing will have emissions associated some way along the supply chain in the purchase of energy to run the factory or the fuel burnt in driving the goods from factory to outlet.

The IO analysis is based upon a robust economic modelling technique and means that we can calculate a total impact for the final demand of any product. By dividing the impact by the total amount spent on this product we have an impact per pound spent conversion factor. These figures are used to determine the conversion factors used in REAP Petite to convert spends into environmental impacts. As technologies improve or we change where we import our products from, these conversion factors may change. SEI will update the conversion factors in REAP Petite as soon as they are available to ensure the tool remains relevant and as accurate as possible.

We are also able to show the impact of certain UK policy on the conversion factors. For example, if the UK meets renewable targets for electricity generation, this will reduce the carbon intensity of every product bought from the UK. The online calculator shows the impact of both the community's future pledges and the impact of pledges made by government and businesses.

³ <http://sei-international.org/publications?pid=1916>

⁴ <http://www.defra.gov.uk/environment/economy/business-efficiency/reporting/>

3 Assessing expenditure

Footprints are calculated by multiplying a household's expenditure on a product by a conversion factor that converts expenditure into global hectares of land or tonnes of carbon dioxide equivalence (see section 3 for methodology for conversion factor derivation). The questions in REAP Petite have been carefully designed to make filling in the tool as easy as possible whilst still providing an accurate picture of the varying impact found across the UK.

SEI uses geodemographic profiling data⁵ to predict average expenditure of different household types. We also know the combination of different household types found in each postcode district in the UK. This means we have an average expenditure on, for example, clothing or audio visual equipment in the area YO23. REAP petite asks the participant to compare their own household's expenditure with the average expenditure of households of a similar size in their postcode. The advantage of asking questions in this manner is that often people have little idea how much they really spend on, for example, beauty products in a month and are likely to under estimate. REAP Petite's default setting sets the expenditure to the average and the user can override this by saying they spend more or less than this amount.

4 Using REAP Petite

Getting started

You can use REAP Petite as a logged in or unlogged in user. Unlogged in users are not able to save their results, see the effect of footprint reducing pledges, start a community group or join a community group.

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REAP Petite

Find your carbon & ecological footprints

[Questions](#) | [Pledges](#) | [Groups](#)

Measure your current footprint, compare with others in your community, see how your results change over time, make pledges to work towards in future, and more...

Start the questionnaire

Average time to complete: 15 minutes

OR

Join now

Register with us to save results, make groups, pledges, and more...

REAP (Resources and Energy Analysis Programme) is a research area of the [Stockholm Environment Institute](#) set up to focus on Sustainable Consumption and Production.

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⁵ <http://www.experian.co.uk/business-strategies/mosaic-uk-2009.html>

Answering the questions

Most questions in REAP Petite are multiple choice but there are some which require you to type a number. You can see how far through the questionnaire you are by looking at the section you are in and the progress bar. In the example below, the user has reached page 4 of 4 in the shopping section.

**REAP Petite**

Questions Questions Pledges Groups

Details Power Food Travel **Shopping** Activities

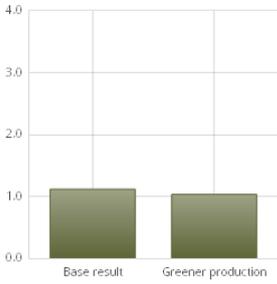
Shopping 4 of 4 Save your progress

In one year, what does your household spend on the following, compared to the average spend?

	Avg. Spend	Nothing	Less than this	About this amount	Up to double this amount	More than double this amount
Jewellery and watches	£86.49	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power tools	£32.67	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

< Back Skip to results Next >

Shopping results



Category	Value
Base result	1.11
Greener production	1.03

Carbon footprint (in tonnes CO₂e)

- 1.11 per person
- 1.03 per person ([greener production](#))

[Show ecological footprint](#)

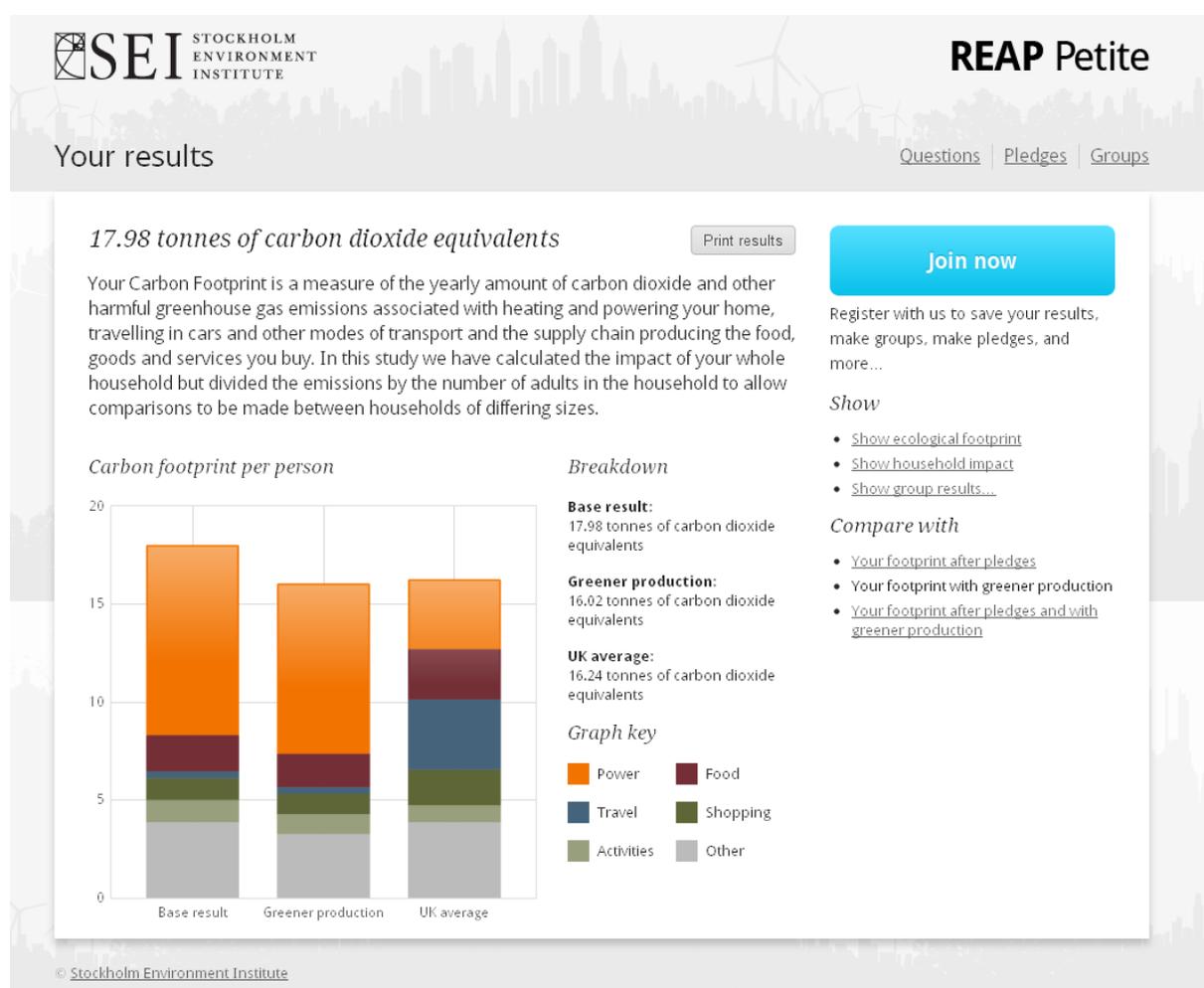
[Show household impact](#)

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Looking at results and making pledges

You can see your footprint for each section on the right hand side of the page (see screen shot in section above). The graph shows your current impact based on today's level of renewable energy and how the impact is lessened if the UK government achieves its targets for levels of renewable in 2020. This graph can be changed to show the ecological footprint or carbon footprint and the impact of the average individual in the household or the household as a whole.

Once you have filled in the initial questionnaire, you can view your overall results (see screen shot below). Total impact is broken down by the areas of power, travel, food, shopping, activities and other. 'Other' shows the impact of UK government spend shared equally by the UK population. This screen allows you to compare your impact with the UK average; your impact from a questionnaire answered at a different point in time; your impact after signing up to a number of footprint reducing pledges and your impact with the impact of the rest of your community.



You need to register with REAP Petite to be able to find out how your impact will lessen by acting on a number of pledges. Click on the 'Pledges' section and pledge what you will do in the future to lessen your impact. Based on the questionnaire responses, REAP petite also suggests ways in which an individual or the community might reduce their footprint through individual or collective action. These 'pledges' range from the straight forward (trying to reduce food waste) to the more costly and difficult (installing solar panels and giving up flying). The tool calculates the reduction in impact that acting on these pledges might achieve.

Power

Food

Travel

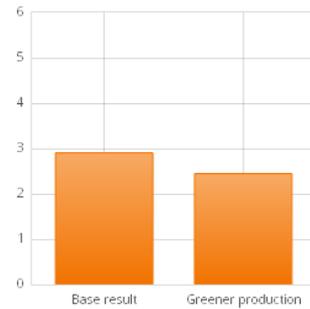
Shopping

Activities

Pledges let you record your intentions for the future and see the potential impact of your plans. You can return later to see how you've matched up to your expectations.

Pledge	I already do this	I will do this next year	I am unable to do this
Change my behaviour to use less energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Replace all my lights and appliances with energy efficient ones when needed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Switch to a green electricity tariff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make sure my home is well insulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Replace my boiler with a condensing one	<input checked="" type="radio"/>		
Generate my own power using solar energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generate my own power with a ground source heat pump	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Install a biomass boiler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Install a community combined heat and power system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Power results



Carbon footprint (in tonnes CO₂e)

- 2.90 per person
- 2.44 per person (greener production)

[Show ecological footprint](#)
[Show household impact](#)

[Back](#) [Next](#)

In the example above, the user is unable to select that they will install a condensing boiler as it has been pre-ticked. The user must have already mentioned they have a condensing boiler in the first part of the questionnaire.

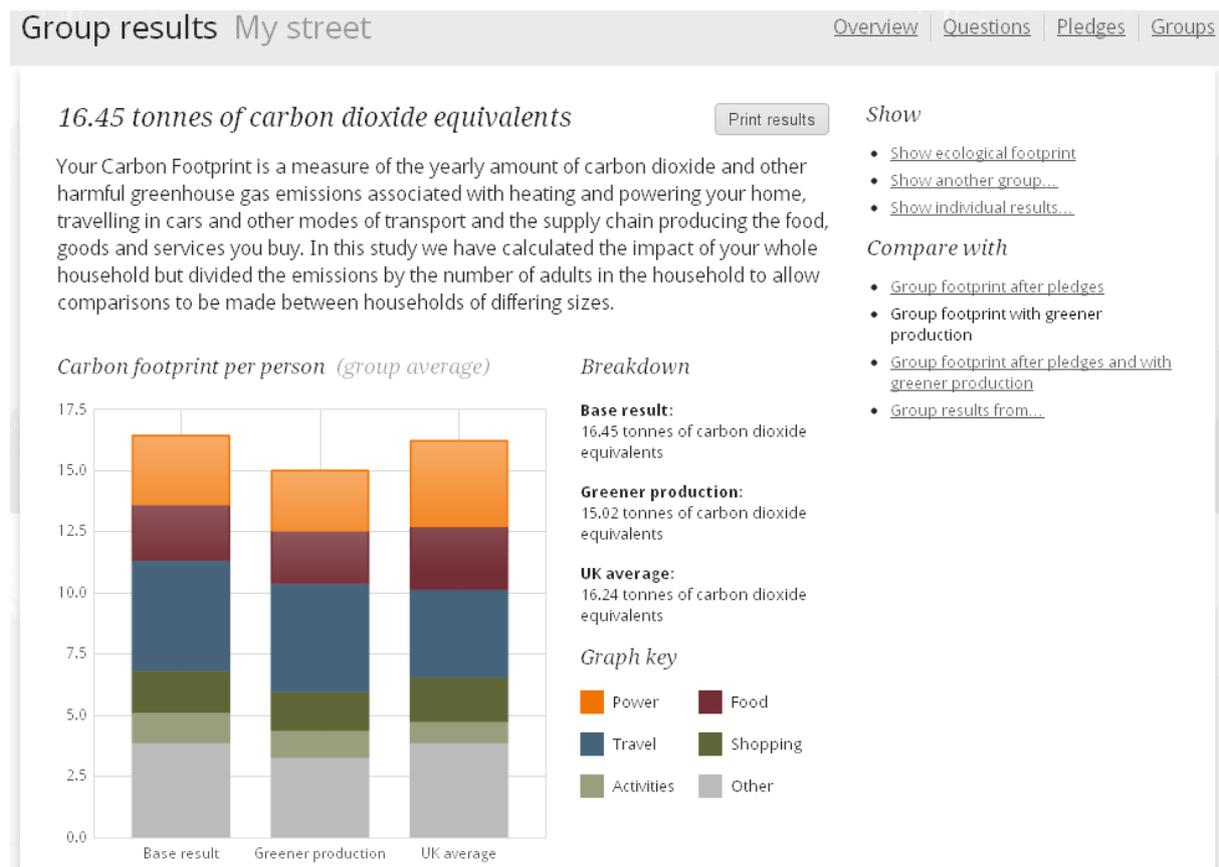
After filling in the pledges you can look at the results and see how your footprint would lessen.

See Annex 2 for the assumptions made in calculating the reductions for each pledge.

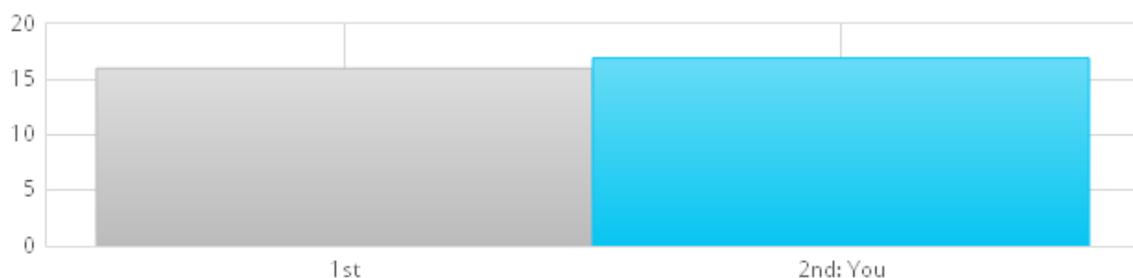
Managing groups

To join a group and compare your own impact with your group average you will also need to register with the site. You can 'join' an unlimited number of community groups, meaning that a household can contribute to the community footprint of their street, the local school or even a non geographically based community such as the Women's Institute. There is evidence that collective action is needed to enable behaviour change in communities encapsulated by the notion of 'I will if you will'⁶.

Once you have more than one member of your group, the results screen allows you to view the average impact of your group and see where you stand among your peers.



Your position 2nd of 2 members in this group



⁶ <http://www.sd-commission.org.uk/publications.php?id=367>

The overview screen allows you to see how many questionnaires you have completed. If you complete more than one questionnaire you can track your progress over time. You can also see what groups you belong to, start a group, leave a group or invite people to join groups.

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REAP Petite

Overview [Overview](#) [Questions](#) [Pledges](#) [Groups](#)

Questions & Pledges

[Start a new questionnaire](#)

1 questionnaire saved

- Created 5:33 p.m. on July 26, 2011 - [delete](#) | [questions](#) | [pledges](#) | [results](#)

Groups

[Start a new group](#)

1 group membership

- anne's group (1 member) - [leave group](#) | [send invites](#) | [view results](#)

Share on Facebook

[Like](#) Be the first of your friends to like this.

Share on Twitter

[Tweet](#) 0

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Spreading the word

You can 'like' Reap Petite on Facebook and share a link to the site on Twitter using the icons in the overview section.

5 How can REAP Petite results be used?

Communities can also use the tool for monitoring purposes by repeating the questionnaire each year.

The tool has a wide range of applications:

- Schools or voluntary groups might use the tool as part of their environmental management activities
- Results could help support campaigning, fund-raising, awareness raising and engaging with the local council
- Local government and charity groups may use the tool to support engagement with communities
- REAP Petite can also function to support the targeting of policies and to assess their importance.
- Monitor the steps an individual or community takes to reduce carbon emissions through the pledge function of the tool and through resurveying.
- Actual footprint improvement within a community can be measured by simply resurveying the community at a later time to see the impacts of change.

Annex 1: Acknowledgments

REAP Petite could not have been made without the help and support of the following individuals and organisations:

Name	Organisation
Saamah Abdallah	New Economics Foundation
David Aeron-Thomas	Forum for the Future
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Matthew Bird	Lewes Council
Christopher Birtles	Knowsley Council
Alan Brown	Linlithgow Climate Challenge
Tim Buchanan	GfK NOP
Nicholas Clark	Ore Valley Housing Association
Matt Chadwick	SEI
Tom Coates	West Sussex Council
Jonas Cromwell	Neilston Development Trust
Robin Curry	SGEHC
Elena Dawkins	SEI
Effie Dickson	Aberdeenshire Council
Bev Dimmock	Ecodyfi
Neil Donaldson	Big Green Tarbert
Phil Downing	Icaro Consulting
Katherine Duncan	Transition North Berwick
Amie Fulton	Sustainable Scotland Network
Greg Gaughan	Isotoma
Fiona Graham	Aberdeenshire Council
Steven Gray	Aberdeenshire Council
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Emma Margrett	Comrie
Anne Mason	SGEHC
Prithika Nair	Changeworks
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Alan Speedie	Alan Speedie Associates Ltd
Josh Steiner	Action for Sustainable Living
Sheena Stone	Towards Zero Carbon Bute
Matt Tarbit	Isotoma
George Tarvit	Keep Scotland Beautiful
Andy Theyers	Isotoma
David Thompson	Isotoma
Richard Toft	Pilsdon Community
Hamid van Koten	North Howe Transition Town
Brian Watson	Glendale Gateway Trust
Trevor Watson	Lewes Council
Tommy Weidmann	SEI (now CSIRO)
Chris West	SEI
Anne Winter	University of Stirling

Annex 2: Assumptions made in calculating the pledges

Power pledges	Assumptions (percentage reductions calculated from Energy Savings Trust data)
Change my behaviour to use less energy	Reduce KWh of electricity used for lighting and appliance by a maximum of 15% - depending on how this question was answered in the initial questionnaire
Replace all my lights and appliances with energy efficient ones when needed	Reduce KWh of electricity used for lighting and appliances by a maximum of 1.11% - depending on how this question was answered in the initial questionnaire
Switch to a green electricity tariff	Reduce KWh of electricity used for all purposes by 30% (this is the average proportion of renewable in the 4 main 'green electricity suppliers electricity mix) - depending on how this question was answered in the initial questionnaire
Make sure my home is well insulated	Reduce KWh used for heating by 29.36% to install thick loft insulation, 15.77% to insulate cavity walls, 35.18% to insulate external walls, 7.72% to install double glazing (depending on how this question was answered in the initial questionnaire). Reduce KWh of used for water heating by 7.83 to insulate boiler (depending on how this question was answered in the initial questionnaire).
Replace my boiler with a condensing one	Reduce KWh used for heating by 11.92% to install a condensing boiler (depending on how this question was answered in the initial questionnaire). Reduce KWh of used for water heating by 14.9% to install a condensing boiler (depending on how this question was answered in the initial questionnaire).
Generate my own power using solar energy	Reduce KWh used for hot water heating by 1706 KWh (depending on how this question was answered in the initial questionnaire). Reduce KWh used for electricity used for lighting and appliances by 1500 KWh (depending on how this question was answered in the initial questionnaire).
Generate my own power with a ground source heat pump	Reduce KWh used for heating by 7952 KWh (depending on how this question was answered in the initial questionnaire).
Install a biomass boiler	Reduce KWh used for heating by 1905 KWh (depending on how this question was answered in the initial questionnaire).
Install a community combined heat and power system	Reduce non electricity KWh by 25% and electricity KWh by 30% (depending on how this question was answered in the initial questionnaire).
Food pledges	Assumptions
Reduce the food that I waste	Reduce expenditure on all food categories by 20%
Increase the proportion of locally produced food in my diet	Alter proportion of spend on food from the UK to 100%
Eat a low meat diet	Alter proportion of meals containing meat to 3 per week
Get an allotment or join a community allotment scheme	Reduce expenditure on fruit and vegetables by 30%
Travel pledges	Assumptions
Give up driving distances of under 3 miles	17% of total distance travelled by car is for trips of under 3 miles (National Travel Survey 2006). Reduces this distance to zero.
Walk or cycle to my local shops rather than drive to the supermarket	13% of total distance travelled by car is for trips to the shops (National Travel Survey 2006). Reduces this distance to zero (also dependent on how the previous question was answered and takes into account the proportion of distances to shops that are under 3

	miles).
When cars are replaced, buy A-rated low emission cars	Change impact per mile per car to that of an A rated car
For medium to long distance journeys, take the train more often (for half my trips)(trips over 50 miles)	17% of total distance travelled by car is for trips of over 50 miles (National Travel Survey 2006). Reduces this distance by half and adds to train distance travelled
Give up a car and join a community car-sharing club	Reduces impacts of taxing, insuring and maintaining a car to zero. Increases occupancy of cars to 2.1 people per car
Give up making domestic flights	Reduces distance travelled by domestic aeroplanes to zero
Take my holidays in the UK rather than flying abroad	Reduces distance travelled by long and short haul international aeroplanes to zero
Shopping pledges	Assumptions
Reduce the amount of clothing I buy by buying good quality items that last	Reduces expenditure on 'Clothing' and 'Footwear' by 25%
Join the local library	Reduces expenditure on 'Newspapers and books' by 25%
Download music rather than buy CDs	Reduces quantity of CD bought by 50%
Reduce the need to replace electrical gadgets by buying good quality items that last	Reduces expenditure on cameras, MP3 Players, televisions, digital and satellite boxes, computers, hifis, DVD/Blue ray players and camcorders by 50%
Keep my mobile rather than replacing each year with the latest model	Reduces mobile phone expenditure by 50%
Use ebay and freecycle to do more of my shopping	Reduces expenditure on 'furniture and furnishings' by 25%
Community scheme to share tools, DIY equipment and baby clothes	Reduces expenditure on 'tools and equipment for house and garden' by 50%
Activities pledges	Assumptions
Keep fit by jogging rather than driving to the gym and using the facilities	Reduces expenditure on sports activities by 25%
Quit smoking	Reduces expenditure on tobacco to zero

Annex 3: Terms and conditions

Terms of Use

In submitting questionnaire data to REAP Petite you agree to the following terms of use:

Why is SEI at the University of York collecting data about you?

SEI is continually refining the REAP database and the information you provide may contribute to its ongoing research. SEI will only use personal data for the purpose of analysis to answer new scientific questions.

What will happen to the data I give SEI?

All data you provide through the REAP Petite web site will be collected and stored by SEI at the University of York in accordance with our privacy policy (please see <http://www.york.ac.uk/recordsmanagement/dpa/>) except where these terms and conditions have varied from that policy. We will only use the data you supply in the context of our ongoing research, unless you give your permission for other specified purposes. All REAP-Petite data that is passed on to scientists, academics or educators will have any personally identifying details (for example your name and email address) removed, unless you've given your permission for other specified purposes.

Will SEI ever pass on my email address?

When you register for REAP-Petite, we ask you to give us an email address. This helps us identify you. It also allows us to contact you, for the purposes of administering the site and our ongoing research, provided you have given us permission to do so.

We will never pass on your email address to anyone unless you give your permission for us to do so for specified purposes.

Who will be able to access my data?

The data that you submit may be passed on in anonymous form to SEI scientists involved in the sustainable consumption and production work at SEI. Other scientists may also request to see the anonymous data for research purposes. SEI will only pass on data in this instance once it has satisfied itself that:

- The data will be used to advance knowledge and that any findings will be made publicly available, for example in a peer-reviewed journal.
- The data will be used in a way that conforms to the same ethical standards as the original REAP-Petite research.
- The data will not be used for commercial purposes.

- Your results data will not be stored with your REAP-Petite Identity Account data. The results data will be held anonymously in a secure server accessible only by a small number of SEI staff.

By joining a 'group' in REAP Petite you give permission for members of that group to request and access your questionnaire data in anonymous form. Your name and/or email address associated with this data will only be passed on with your permission.

SEI will never pass your data on to market research companies, or use it within the University of York for any purpose other than administering the REAP-Petite website and our research.