4.0 Sustainability

The objective of this section is to define an action plan to make Pucklechurch Parish a more environmentally sustainable community; in other words, significantly reducing the carbon footprint of the people, homes, and businesses in the area over the next ten years.

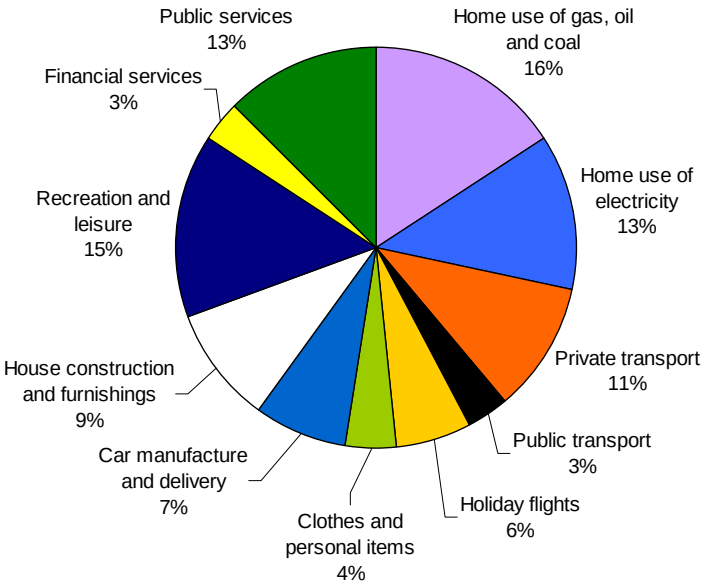
What is a carbon footprint? A good definition comes from the environmental firm Carbon Footprint Ltd[1]:

> A **carbon footprint** is a measure of the impact our activities have on the environment, and in particular climate change. It relates to the amount of greenhouse gases produced in our day-to-day lives through burning fossil fuels for electricity, heating, transportation, etc.

Our impact on the environment is measured in tonnes of carbon dioxide (CO_2). The average Briton generates between 8.5 and 13 tonnes of CO_2 per year (depending on whose numbers you use). Even using the lowest figure, the UK's per capita average is more than twice the worldwide average of 4 tonnes, though it is half that of the USA. The estimate for a sustainable level of CO_2 is 2 tonnes per person per year, given the current world population of 6.79 billion.

The biggest contributors to an individual's carbon footprint are the sources of energy used to run the home (electricity, gas, oil, coal add up to 29%) and transportation (private transport, public transport, holiday flights, and car manufacturing make up another 27%). However, many other individual actions and choices have a direct or indirect impact on carbon footprint, including diet, clothing, house type, and recreational activities.

Typical breakdown of CO^2 sources for a person in the developed world



The Kyoto Protocol is an international agreement with the objective of reducing greenhouse gases in an effort to prevent man-made climate change. It entered into force on 16 February 2005[2]. Britain signed the agreement and committed to reduce its greenhouse gas emissions, including CO_2, to 12.5% below 1990 levels by 2012. The Government's Climate Change Bill 2008 proposes an 80% reduction (from 1990 levels) in UK CO_2 emissions by 2050, with an intermediate goal of a 26% reduction by 2020[3]. The Government's plans for attaining these goals have been passed down to the local government level in the form of various mandates for energy use, recycling, reduction of landfill volume, transportation, etc.[4]

What does all this mean for Pucklechurch? It will influence the choices we have for energy and what type of power generation plants will be built and where. It will shape our transportation networks and determine the relative cost of public and private transport. It will affect waste collection services – what we must recycle and how much we can throw away. It should also encourage us to do our part to save the planet from the ravages of climate change.

This section of the Community Plan will address four areas in which Pucklechurch can take action to reduce its carbon footprint:
- Sustainable energy
- Sustainable transport
- Reduce, reuse, recycle
- Buying local

We will first look at the current situation with regard to sustainability topics and then establish a set of goals for the next ten years. Finally, we will propose an action plan to achieve those goals.

4.1 What Is Our Current Situation?

The Community Plan survey in 2007 asked a number of questions relevant to sustainability. The questions we'll draw upon for this section of the report concern the following topics:
- Energy use and production
- Transportation (buses, cycling, walking, car sharing)
- Waste management
- Allotments/farmers' market

There was also a question that asked whether respondents would be interested in joining a local group to promote environmental and sustainability actions within our community. More than 100 people said yes. An initial meeting was organised in October 2007, and a small group now known as the Pucklechurch Environmental Group (PEG) have been meeting ever since. It is this group that will take on the primary responsibility for setting goals and objectives, getting agreement from stakeholders (the community, Parish Council, South Glos and others), and monitoring progress.

Key Finding: **Q59**
- The Pucklechurch Environmental Group was established as a result of the Community Plan Survey. This group will take on the responsibility for much of the sustainability action plan.

4.1.1 Sustainable Energy

The information we have from the Community Plan questionnaires regarding sustainable energy is limited to the types of energy used in households and does not delve into how efficiently it is used. The household questionnaire asked residents about which forms of energy they currently use and what they intend to use in the future. The individual questionnaire assessed residents' attitudes about developing a local power generation plant based on sustainable technologies. No questions were asked, however, about energy-efficiency measures taken within the home. This leaves us with only half the picture for the current situation of sustainable energy in Pucklechurch.

4.1.1.1 Energy Use

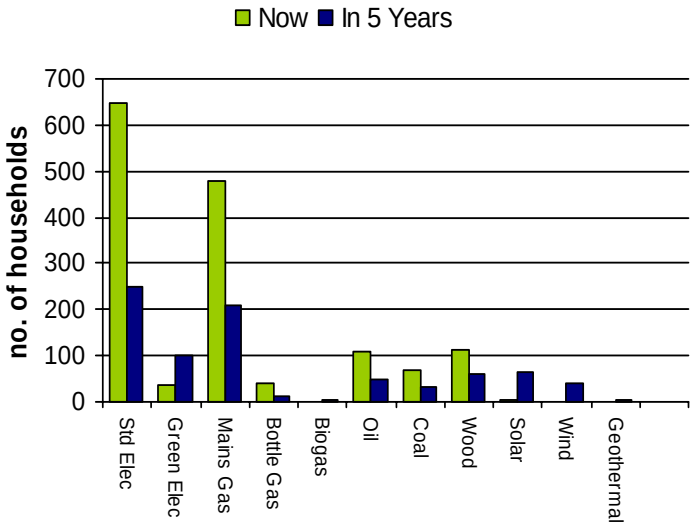
The Community Plan Household Questionnaire asked which forms of energy were being used in the household now and which the household intended to use in five years' time [H8]. The responses paint a picture of a typical British community in which usage of "green" forms of energy is low[5].

In the report on current energy use, only 5% of households (38) reported that they bought their electricity on a green tariff. A tiny fraction used other forms of "green" energy, including solar (3 households) and biogas (2 households). A far greater number of households (113 or 16%) currently use wood, which is also a zero-carbon fuel.

Fewer households answered the question about their intentions for future energy use (54%, compared to 96% for "now"). Despite the lower response numbers, the number of households that intended to use green forms of energy in five years' time increased dramatically. Numbers shown in the table below are the number of households out of the total of 715 Household Questionnaires returned.

	Now	In 5 Years
Electricity, green tariff	38	100
Solar power	3	63
Biogas	2	5
Wood	113	62
Wind power	0	40
Geothermal	0	5

The good news is, as the chart below shows, local households expect to use less of all forms of fossil fuels and more of all forms of renewable energy in five years' time.



In the space provided for "Other" responses, only a few suggestions were given: biomass, air source heat pump, and cosmic energy(!).

Key Findings: **H8**

- Only 5% of households buy “green” electricity now, but three times as many households expect to be on it in five years' time.
- Almost half the respondents did not answer the “in 5 years” question, which may indicate a lack of interest or a lack of information about energy alternatives.
- Local households expect to use less of all forms of fossil fuels and more of all forms of renewable energy in five years' time.

4.1.1.2 Energy Conservation

As noted earlier, no data was gathered in the Community Plan survey regarding the measures currently taken to conserve energy. The housing stock in the local area consists of a mixture of houses (mostly semi-detached) and bungalows, with a few flats. Their ages range from pre-1800 to the present day, but the vast majority were built between 1945 and 1970 – before building regulations required high levels of energy efficiency. Over the last 25 years, building regulations have placed far more emphasis on energy-efficiency measures in new properties, as well as remodelling and extensions[2].

The National Home Energy Rating Scheme (NHER) is a recognised method of calculating the energy efficiency of a home. On a scale of 0 to 10, a home scoring 0 would have very low levels of insulation and very high running costs and a home scoring 10 would be built with Scandinavian levels of insulation with a very efficient heating system and low running costs. The average score of a house in the UK is 4, and a house built to 1995 building regulations would score around 7. We can estimate that the Pucklechurch area, with its mix of pre-1995 houses, is just average in overall energy efficiency.

Housing consumes energy through the use of heating, cooking, lighting and appliances during the occupancy of the building ('energy in use') and through the manufacture, transport and disposal of the products and materials involved in construction ('embodied energy'). Over 90% of the energy consumed by housing is 'energy in use'. The typical breakdown of energy use in UK homes is:

- Space heating: 57%
- Water heating: 25%
- Lights and appliances: 13%
- Cooking: 5%

Key Finding:

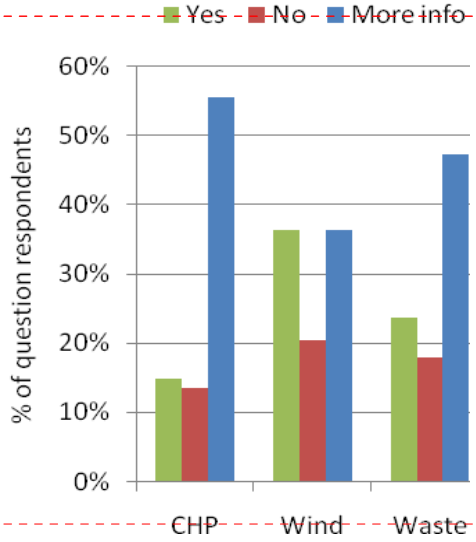
- Without actual data on the energy efficiency of local households, we will assume that our community is average for the UK. We will proceed on the basis that there is a lot that can be done to improve the energy efficiency of homes in our area.

4.1.1.3 Energy Production

The Community Plan Committee assessed residents' attitudes toward sustainable energy production by asking individuals whether they would support the building of a sustainable energy plant in the local area. Over 90% of respondents answered this question.

> Q58: If a suitable site could be found, would you be in favour of any of the following types of sustainable energy production plant being built locally to service all or some of the local community's energy needs?

Three forms of sustainable energy production were proposed: combined heating and power (CHP), wind turbines, and energy from waste. Notably, for each of these three technologies, more people were in favour of them than against. No explanation of these technologies was provided, and many people indicated they would need more information before deciding whether they were for or against these methods. This does indicate an open mind on the subject.



Wind turbines appear to be the most understood of the suggested power-generation technologies. However, of the 1,158 responding to Q58, 36% did say they would need more information before deciding. Well over a third of respondents supported the idea of local wind turbines – almost twice the number who said they were against them.

Combined heating and power was the least understood of energy generation methods, with over 55% of respondents needing more information about the technology. Generating energy from waste also had a high proportion of people (47%) who needed more information. Considering that we have a landfill site within our parish, generating energy from waste might be the easiest method of generating energy locally. A few other power-generation technologies were suggested in the "Other" section, including hydro, biomass, and nuclear (!).

Key Findings: **Q58**

- More people are in favour of having a sustainable energy plant of some type in the local area than are against it.
- Wind turbines are the best understood of the technologies and have the most support from local residents.
- The fact that we have a landfill site within the parish means we already have a viable source of renewable energy locally.
- Many people indicated an open mind on having a local sustainable power plant by ticking "would need more information".

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4.1.2 Sustainable Transport

Creating a more sustainable transport system in the local area equates to getting people to use their cars less. The Community Plan survey asked residents a number of questions relating to transportation, including driving, car-sharing, buses, cycling, and walking. The Traffic and Transportation section covers the infrastructure needed to make alternatives to the car easier to use. This section is concerned with local residents' attitudes to sustainable methods of transport.

4.1.2.1 Current Transport Situation

Some people in Pucklechurch are already choosing not to use cars to get to work or school. Of the 1,045 answering Q48, some 8% currently walk to work almost every day, and a total of 14% said they do this at least occasionally. A quarter of respondents reported that they walked or cycled to other destinations at least occasionally, and 70% said they walk or cycle in the local area for recreational purposes. Encouragingly, more than a third of respondents (38%) said that they currently walk or cycle for short local trips.

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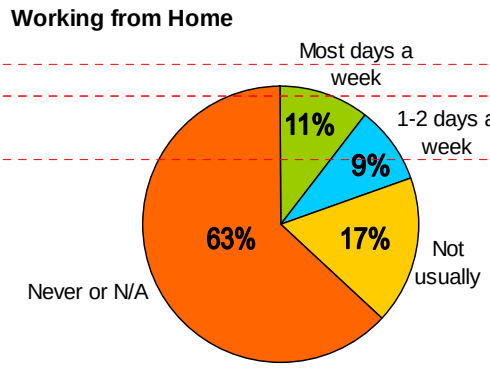
Car sharing [Q50] is currently used by 5% of those who answered the questionnaire. Forty people said they would be interested in car sharing, but unfortunately only two of these respondents had the same destination and schedule. Fully half of the respondents reported that they could not car share, presumably because they didn't work outside the village, worked from home, had a type of job where car sharing is not a viable option (e.g., health visitors, travelling sales, variable shift work), or simply did not like the idea or the commitment it involves.

One of the current national trends that helps reduce car use is working from home. In our area, 11% of the 741 responding to Q60 report working from home on a daily basis, while another 9% do so one or two days a week. When asked to predict what they would be doing in five years' time, the percentage of people saying they would work at home most days was unchanged, but the percentage of those who said they would work from home one or two days a week more than doubled.



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Unfortunately, the survey questions on bus use [Q44 & Q45] did not clearly differentiate local residents' current level of bus use from desired use but did gauge attitudes toward buses, as we shall see in the next section.

4.1.2.2 Influencing Behaviour Change

Prospects are good for making Pucklechurch more sustainable in terms of transportation if residents' responses to the Community Plan survey are accurate. Local people say they are willing to change their travel behaviour if certain changes are made to make walking, cycling and buses more attractive.

When asked what would encourage walking or cycling rather than using a car for short local trips [Q56], almost a third answered better routes and better pavements in the village and a fifth said that less traffic and better road crossings would help. Add these numbers to the third who say they walk now and you would have over half the village walking around! A significant number of people said that disabilities prevent them from walking or cycling to local destinations (14% in Q46; 9% in Q56).

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An additional survey question focused on cycle use both within and outside the village [Q47]:

- Over half of respondents said that safer routes within the village and safer routes connecting to other cycle paths would encourage them to cycle more.
- Almost half of the respondents also indicated that a less steep route to the Bristol-Bath cycle path would increase their use of bicycles.
- Less than 20% of respondents said that these improvements would have no effect on their bicycle use.

When it came to using buses, only 14% of survey respondents said “nothing would make buses attractive to me” [Q44]. A high proportion of respondents said they would be likely or highly likely to use buses more if:

- Routes went where they needed to go (64%)
- There was more frequent service (58%)
- Service was more reliable (56%)
- More readily available route and timetable information (48%)
- Return tickets were available at all times (45%)
- Fares were lower (44%)
- Bus routes linked to railway stations (40%)

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In summary, local residents indicate a willingness to walk more, cycle more, and take the bus more if routes and services were better.

Key Findings: **Q44, Q47, Q56**

- Local residents would be willing to walk more, cycle more, and take the bus more if routes and services were better.
- Over half of respondents said that safer routes within the village and safer routes connecting to other cycle paths would encourage them to cycle more.
- Almost half of the respondents indicated that a less steep route to the Bristol-Bath cycle path would increase their use of bicycles.

4.1.3 Reduce, Reuse, Recycle

Government and European regulations regarding the reduction of waste going into landfills have affected all parts of the United Kingdom. The EU Landfill Directive sets targets for the amount of municipal waste diverted to landfill set using 1995 as a baseline[6]. By 2010, we will have to reduce waste to 75% of that produced in 1995, by 2013 to 50%, and by 2020 to 35%. Counties have some discretion as to how they meet these targets, and South Gloucestershire Council (SGC) responded by introducing first recycling bins for glass, metal, and paper and later green wheelie bins for compostable garden waste and cardboard. The latest statistics (November 2007) from the Department for Environment, Food and Rural Affairs (DEFRA) show that South Gloucestershire recycles 40% of household waste, which is above average (but not spectacular) compared to other local authorities in England[7].

A measure of how local people feel about recycling can be gained from their answers to the survey question regarding their satisfaction with various aspects of South Gloucestershire's current waste management services, which including various recycling schemes [Q63]. SGC collects recycling – both the green bins for garden waste and the boxes and bags of glass/metal/paper/etc – every other week. Levels of satisfaction with these recycling collections are high, with around 75% of respondents being satisfied or very satisfied with the service.

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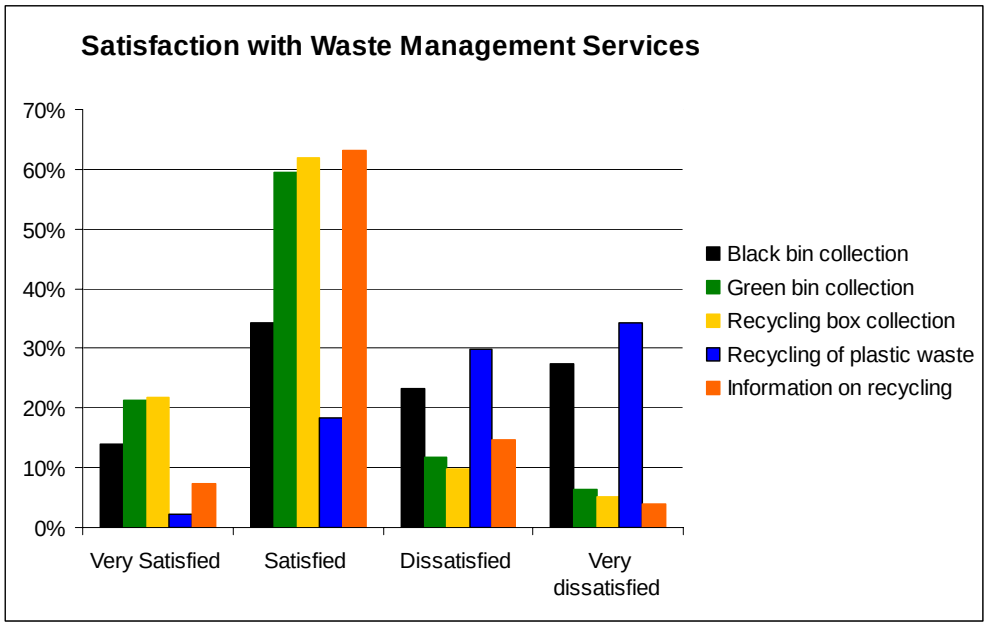
On the alternate weeks, the black wheelie bins with non-recyclable waste are collected. When collection of "regular" rubbish went from weekly to fortnightly, there was a public outcry. Satisfaction levels are still low, with just over half the respondents to this survey saying they are dissatisfied or very dissatisfied with the service.



Above percentages are of the number of respondents on each service [Q63].

South Gloucestershire has yet to provide kerbside collection of recyclable plastics, and this was the area of greatest dissatisfaction with local residents. Almost two-thirds of respondents were dissatisfied or very dissatisfied with the recycling of plastics; only 20% were satisfied, presumably being happy to take their plastics to a local recycling point or simply put them in with non-recyclable rubbish. One tangible action taken by the Pucklechurch Environmental Group as a result of these survey results has been to arrange for a plastic bottle recycling point at the Village Hall, courtesy of Ashfield YOI. This has proved extremely popular with villagers.

Although no survey question asked about food waste, a handful of respondents wrote in that they were dissatisfied with the provision for collecting food waste (i.e., that it is placed in the black bin destined for the landfill). These respondents are presumably unhappy that food waste is not collected with other compostable waste. South Gloucestershire does plan to begin collecting food waste when they build a new composting facility within the next one to two years.

In terms of reducing the amount of waste packaging, the local shops generally do not encourage customers to bring reusable bags or charge for plastic bags. We have no information on the proportion of local residents who choose to bring their own bags when shopping in the village or in supermarkets, but if the number of plastic bags that litter our area is an indication, many people still rely on bags supplied by the retailer.

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Another avenue for reducing waste is reusing goods instead of throwing them away. Anecdotal evidence suggests that the local tip (SGC's Sort It! centre) receives a large number of unwanted but perfectly usable items that end up in the landfill. There are several Freecycle groups nearby, including Bristol and Bath, dedicated to making one person's junk another's treasure, but we have no information on how often local people make use of their services. There is no similar Web-based service in the Pucklechurch area, though charity events such as the NSPCC auction, church and school fêtes, and Revel do perform somewhat the same service.

Key Finding: **Q63**

- Residents have embraced South Gloucestershire's recycling efforts and are keen to have kerbside collection of recyclable plastics.

Observation:

- There is scope to reduce the number of plastic bags given out by local shops.

4.1.4 Buying Local

Buying locally produced goods from local suppliers has a significant positive impact on a household's carbon footprint because the goods have travelled less distance from supplier to consumer. In the case of food, this distance is referred to as "food miles". The effect is not so positive if the local goods are sold by a huge corporate retailer that first sends the goods to its packing plant and then to its distribution centre before shipping them back to the local area, adding extra food miles and extra packaging along the way. The farther goods travel, the more non-renewable fossil fuel is used to bring them to market and the larger their carbon footprint.

DEFRA estimates that food haulage accounts for 25% of all HGV miles travelled in the UK[8]. In 2002, the transport of our food created 19 million tonnes of CO^2, 10 million tonnes of which is released in the UK. Furthermore, the growing use of air freight for food is a concern because it has the highest CO^2 emissions per tonne. Although air freighting of food accounted for only 1% of food miles in 2002, it produced 11% of the food transport CO^2 emissions.

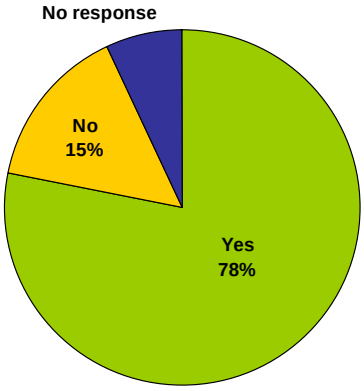
Buying local goods, especially fresh food and drink, is good for the planet because they generally come with less packaging and have racked up far fewer food miles. If the goods are organic as well as local, they have been produced by sustainable methods that are better for the environment, kinder to livestock, and produce foods that are healthier to eat. Seasonal, local produce is generally fresher and more nutritious. Of course, gardeners who grow their own food know this well, and home-grown produce typically has the lowest carbon footprint of all.

As a side benefit, buying local also contributes much more to the local economy than buying from a corporation whose profits go to executives and shareholders. Although supermarkets and other retail chains do provide some jobs (albeit relatively low-paying jobs) for local people, most of the jobs in their supply chains are elsewhere and many of the producers are in faraway countries. Buying local products – meats, fruits, vegetables, eggs, milk, beer, cider – creates jobs for local people who in turn spend their money in the community.

Pucklechurch Parish is fortunate in that its rural location provides an abundance of locally produced food and drink. Within a five-mile radius of Pucklechurch, one can find producers of fresh milk, eggs, pork, chicken, beef, lamb, soft fruits, apples, a wide range of vegetables, bread, and several real ales. Locally produced food and drink are sold within the parish at the bakery and its resident farm shop in Pucklechurch village, at St. Aldam's Farm Nursery, and at several local farms. Nearby there are also a number of farmers' markets, including Emerson's Green, Chipping Sodbury, and Cleeve Rugby Club, a WI-run Country Market in Doynton, and a number of farm shops.

The Community Plan individual survey asked residents whether they would make use of a farmers' market in Pucklechurch [Q65]. The vast majority (78%) said yes, though the question did not ask how often they would shop there nor how much their household would typically spend at a farmers' market.

Would you make use of a farmers' market in Pucklechurch?



Pucklechurch Parish does have 21 allotments, which are located on the north edge of the parish across the M4 motorway from Pucklechurch village. There is currently an official waiting list of six people. The Community Plan survey asked whether people would like an allotment [Q64], and 123 people – 10% of survey respondents – said that they would. This indicates a strong interest in "growing your own" among the local population.

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Another survey question [Q62] asked whether residents would like to offer excess produce from their garden or allotment to a local retail outlet or market – 18 people said yes. Add this to the small commercial suppliers, and there is a considerable supply of locally produced food.

Pucklechurch does have a directory that lists many local suppliers of goods (a few) and services (many). It has not been updated in two years, however, though another edition is planned for late 2009. This next edition should place a greater emphasis on sources of local produce.

Key Findings: **Q62, 63, 65**

- The majority of people in the village would make use of a farmers' market selling local produce.
- In Pucklechurch Parish, there is a strong interest amongst the population in growing their own food, and some local people produce enough that they would like to sell it locally.

4.2 What Does a Sustainable Future Look Like?

We believe the Parish of Pucklechurch to be average for Britain in its current level of (un)sustainability and the population's awareness of environmental issues. What could our community look like in ten years if we became significantly more sustainable? What would "reducing our carbon footprint" really entail?

The first big difference among local residents and businesspeople in the future sustainable Pucklechurch would be an **awareness** of the impact their choices have on the environment. Individuals, families, and businesses would understand that their actions – how they live, where they shop, what they eat, how they get to work or school – have consequences beyond the immediate satisfaction of a need or desire and that some options are more harmful to our environment than others.

The key to improving our community's level of sustainability, however, comes down to **action**: people changing their behaviour in ways that reduce their carbon footprint. In this section we'll again look at our four focus areas:

- Sustainable energy
- Sustainable transport
- Reduce, reuse, recycle
- Buying local

4.2.1 Sustainable Energy

Our goals for the future sustainable Pucklechurch include both a reduction in the amount of energy consumed in our community and an increase in the percentage of energy that comes from renewable sources.

Making individual homes and businesses more energy-efficient would have a big impact on our overall energy consumption. Making virtually all homes and business premises in the area more sustainable means making everyone aware of what measures they should take, what grants or tax breaks are available, and what benefits are achievable. Individuals and businesses would also have to take action to make improvements.

In terms of using "greener" energy, we hope to exceed by at least 10% the Government's target of getting 20% of energy from renewable sources by 2015. To help meet this goal, we would expect to have a local renewable energy plant within the parish, which might take the form of wind turbines, pellet burners, or energy production from waste at the local landfill.

4.2.2 Sustainable Transport

We envision our future community as a place that *invites* residents, local workers, and visitors to walk or cycle short distances and to take buses or trains for longer journeys, rather than drive. The goal is to get the majority of people to think of the car their *last* choice for transportation because the alternatives are comfortable, more convenient, and cheaper.

This future of sustainable transport in the Pucklechurch area will require improvements to the local infrastructure and transport services, which are dealt with in this Community Plan's Traffic and Transportation section. To encourage people to forgo their cars in favour of more sustainable methods of getting around, the Pucklechurch Environmental Group plans to raise awareness about the benefits of walking, cycling, and public transport.

4.2.3 Reduce, Reuse, Recycle

By 2010 South Gloucestershire should have met its EU target of reducing the amount of waste that goes to landfills by 25% of its 1995 level (50% by 2013). Within this timeframe, we should see South Gloucestershire implement kerbside collection of all recyclables, including plastics and compostable food waste. This will not be enough, however, to meet the target. It will also require households and businesses to generate less waste.

We would like to see Pucklechurch Parish become a model community for the "reduce, reuse, recycle" movement. The Pucklechurch Environmental Group aims to raise awareness and change people's behaviour regarding waste, so that they:

- Don't buy more than they need
- Choose products that come with less packaging
- Repair items rather than discarding and buying new
- Use home compost bins for garden waste
- Trade or donate useable items through programs like Freecycle, the Sofa Project, charities, or local "bring and take" days

The goal here is to exceed the EU targets and develop a community that actively endeavours to minimise waste and applauds efforts to reuse and recycle.

4.2.4 Buying Locally

Buying locally produced goods and services from local outlets improves a community's sustainability in environmental, economic, and social terms. It reduces our "food miles" and provides jobs and income for local people, thus keeping more of our money in the local economy. It also makes us more cohesive as a community when we do business with our neighbours.

We envision a community in which our local shops sell locally produced goods and where residents naturally think of buying local first. The Pucklechurch Environmental Group will raise awareness about the benefits of buying local and encourage people to "think small, think local".

The local area cannot, of course, supply all our needs, and we do not expect Pucklechurch to become a totally self-sufficient commune. However, our rural location means that there is a surprising selection of small producers within a five-mile radius. Extend that to thirty miles (the usual definition of "local" for these purposes) and we have a wide choice of high-quality foods, goods, and services produced by small, local companies rather than huge conglomerates that care little about the environment and less about our community. A website and a printed directory that provides details of local suppliers will help people "think local" and find local sources for goods and services of all kinds.

4.3 Action plan: How do we get there?

Action plan to come when approved by Parish Council

References

[1] Carbon Footprint Ltd., Worting House, Church Lane, Basingstoke, Hampshire RG23 8PX, www.carbonfootprint.com

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[4] Department for Business, Enterprise and Regulatory Reform (BERR), "UK Energy in Brief, July 2008", National Statistics, Publication URN 08/220

[5] Department for Business, Enterprise and Regulatory Reform (BERR), " Energy consumption in the United Kingdom: domestic data tables", July 2008, Publication URN 08/454

[6] Department for Environment, Food, and Rural Affairs (DEFRA), "Waste Strategy Annual Progress Report 2007/08", July 2008

[7] Department for Environment, Food, and Rural Affairs (DEFRA), "Municipal Waste Statistics - Local Authority Data", 22 November 2007

[8] Department for Environment, Food, and Rural Affairs (DEFRA), "The Validity of Food Miles as an Indicator of Sustainable Development: Final Report", July 2005, ED50254 Issue 7