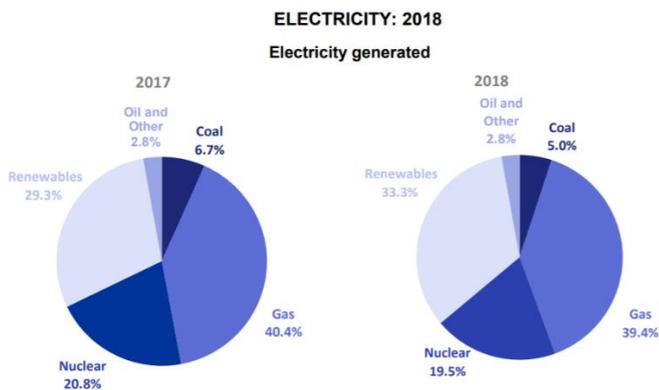




# Reducing our carbon footprint

At Suntrap we always strive to limit our carbon footprint and with our refurbishment we are in a position to make some big changes on **how much energy we use, how we use it and where it comes from.**

As with most domestic buildings in the UK, most of the energy we use at Suntrap is for heating, lighting and running electrical appliances. Of electricity generated in 2018 in this country, gas accounted for 39.4% with coal accounting for 5.0%. When burnt to produce electricity both of these fossil fuels generate carbon dioxide, the greenhouse gas which is the largest contributor to the climate emergency.



Dept Business, Energy & Industrial Strategy  
STATISTICAL PRESS RELEASE  
UK Energy Statistics, 2018 & Q4 2018  
Date: 28 March 2019

To reduce our carbon footprint at Suntrap we can:

- Reduce the amount of electricity we use
- Move towards renewable energy sources (such as solar and wind)
- When we need to use electricity do it as efficiently as possible

## Reducing our energy use

### Heating



Double glazed, draft free windows.

Before 2019 the main Victorian Suntrap building was old and poorly insulated, lots of heat leaked from windows and through the roof, meaning more energy was required to keep it warm.

#### What have we done?

New efficient double glazed windows have replaced the old single pane windows and the loft has been insulated to reduce heat loss. We will use much less energy to heat the newly refurbished building.



Insulation installed in the loft to reduce heat loss.

## Lighting

Before 2019 the lighting in the building was old and wasted energy by being inefficient and needed to be switched on and off manually.

### What have we done?

New LED lighting has been installed which is brighter, uses up to 80% less electricity and turns off automatically when rooms are not in use.

## Water

Providing clean safe water creates carbon emissions, as energy is needed to treat, pump and pipe it to our buildings. Before 2019 we often had to top up our garden ponds using a hose from a tap and many of the taps in the building were old and were sometimes left running by accident.

### What have we done?

A new water management plan has been built into the refurbishment. Rainwater is harvested from roofs, this zero carbon source of water can be used to keep our ponds full.

All of the toilets have been replaced with low volume cisterns using less water to flush and automatic taps prevent them being left on by mistake.

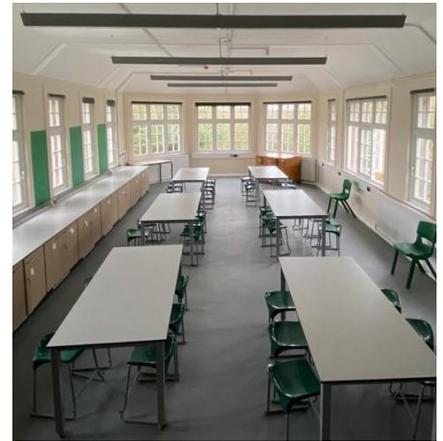
## Renewable electricity generation

Generating electricity from the sun (solar power) is renewable and does not emit carbon dioxide like burning fossil fuels.

### What have we done?

The vast roof of the Victorian building is now used to house two banks of photo voltaic solar panels. These take the solar energy from the sun and convert it into electricity which can be used inside the building.

These panels can generate a massive 18,762 KWh in a year! While the new camping lodge has solar panels of its own generating up to 13,000KWh in a year. With this technology, Suntrap will generate around 31,000 KWh of electricity through renewable means each year.



Low energy LED lighting throughout the building turns off automatically when rooms are not in use.



Photo voltaic solar panels on the roof of the main building take the solar energy from the sun and convert it into electricity which can be used inside the building.

To put that into perspective just 1KWH will boil a kettle enough times for 60 cups of tea, charge an iPhone 300 times or power 6 laptops for the average workday.

These solar panels we will save 7.2 tonnes of carbon dioxide going into the atmosphere compared to if the electricity had been generated from fossil fuels.

In 2018 in the UK renewables share of electricity generation increased to 33.3%, a record high. It is good to know that we will be making our own contribution to increasing that percentage even further over the next few years.

## Renewable heating and hot water generation

There are systems which can produce hot water for either washing or heating.

### What have we done?

The camping lodge does not have a boiler to produce hot water or for heating. Instead it has two sustainable systems to provide the hot water needed for showers and in the kitchen and to heat the building.

### Solar panels

On the roof are solar thermal panels which produce hot water from the sun – no boiler required! A saving of 10,000 KWh or 2.3 tonnes of carbon dioxide annually compared to a gas boiler.

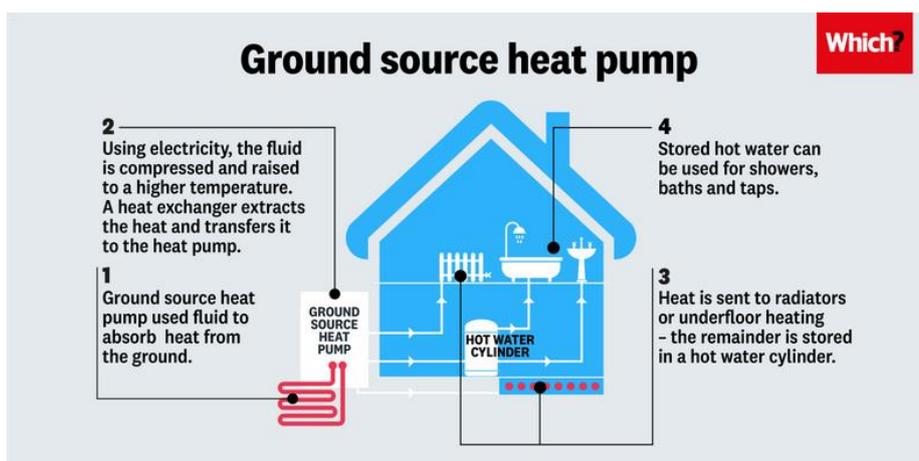
### Ground source heat pump

The camping lodge also is fitted with a ground source heat pump. This system harnesses natural heat from underground beneath our meadow.

A mixture of water and anti-freeze is pumped around the pipes looped underground and absorbs the naturally occurring heat stored in the ground. Back in the plant room in the lodge the water mixture is compressed to increase the liquid's temperature. The heated liquid then goes through a heat exchanger, which extracts the heat and transfers it to the heat pump. The heat is then transferred to our underfloor heating pipe system, which will keep us warm even on the coldest day.

The system needs electricity to run, but uses less electrical energy than the heat it produces. The pump performs the same role as a boiler in a central heating system. But it uses ambient heat from the ground, rather than burning fuel to generate heat.

Compared to a gas boiler ground source heat pumps reduce carbon dioxide emissions by up to 70%. If the electricity they use is produced from a renewable source such as the photo voltaic solar panels on the roof of our main building, then this type of system is produces no carbon emissions at all.



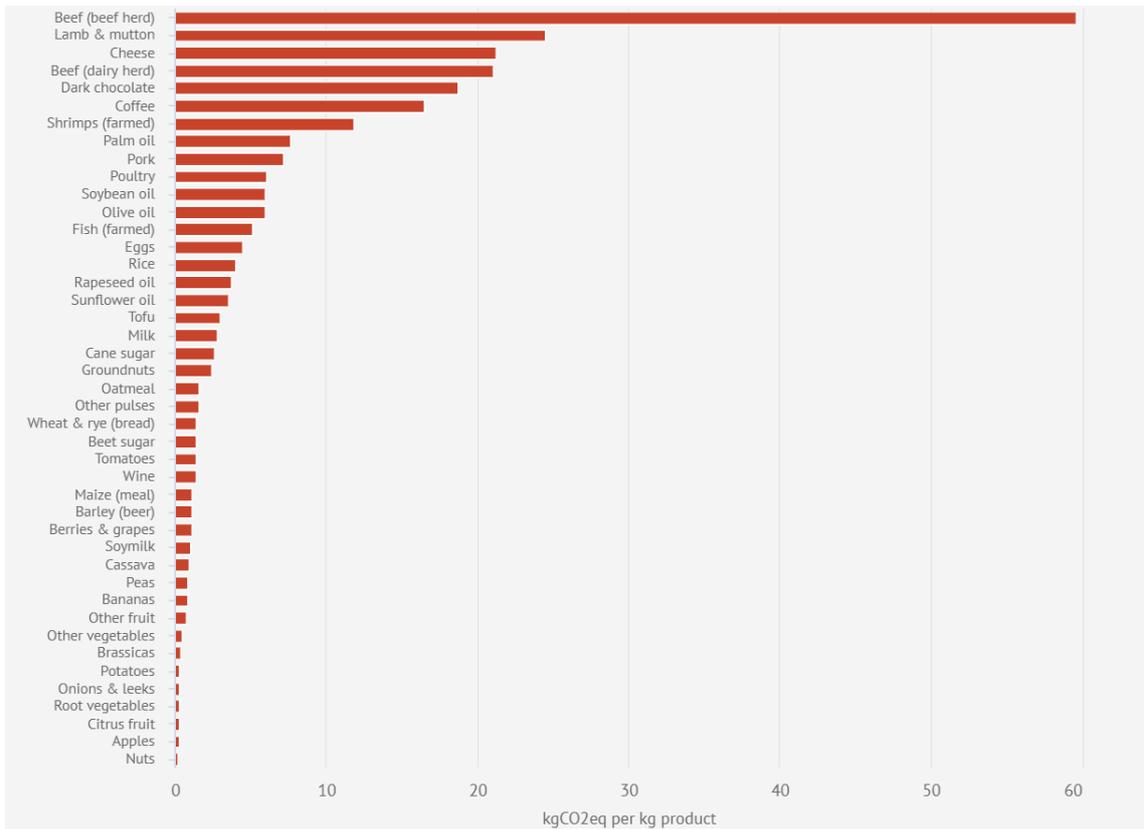
This graphic from <https://www.which.co.uk/> explains how the system works.

## The food we serve

Did you know that reducing the amount of meat you eat and using locally sourced food reduces your carbon footprint?

The amount of carbon released into the atmosphere from different types of food depends on the type of farming carried out to produce it; including the amount of land required for production, the farming process and the transportation required to get the food to market.

Animal based foods tend to have a larger carbon footprint



Graphic Greenhouse gas emissions per kilogram for different food groups.

Adapted from Dr Hannah Ritchie/Our World in Data (2020)

Data source: Poore & Nemecek (2018). Chart by Carbon Brief using Highcharts. <https://www.carbonbrief.org/>

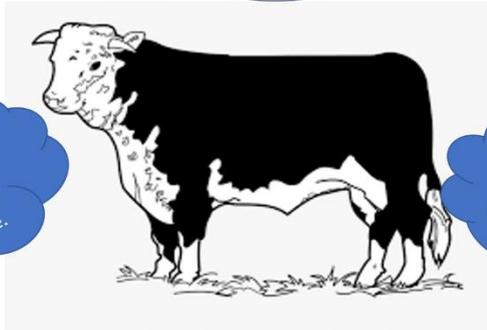
## Why has beef got such a large carbon footprint

**Green house gas emissions from beef production.**

Cutting down tropical forest to make areas for cattle to graze, causes the release of stores of carbon, further increasing the carbon footprint of beef from these areas.



Belch out methane, a greenhouse gas 28-34 times more powerful than carbon dioxide.



Fart out methane, a greenhouse gas 28-34 times more powerful than carbon dioxide.

Fertilizer used to help grass grow to feed cows; production leads to carbon dioxide and nitrous oxide (potent greenhouse gas) emissions.

Cows and sheep are “ruminants” – meaning that their stomachs contain specialised bacteria capable of digesting tough and fibrous material, such as grass. The digestive process causes the animals to belch out methane, a greenhouse gas that is around 28-34 times more powerful than CO2 over a 100-year period.

The chart shows that producing beef is more than twice as carbon intensive as producing lamb. One reason for this is that cows take longer to grow and reproduce, meaning the production of beef requires much more feed and land than other types of meat.

Cattle also need plenty of grass to feed on. Farmers often use nitrogen fertiliser on their fields to help it to grow. The production of the fertilizer uses energy releasing carbon dioxide into the atmosphere along with another potent greenhouse gas; nitrous oxide.

If beef is produced using land that was once tropical forest, such as in the Amazon, this is a major cause of deforestation. Cutting down tropical forest causes the release of long-held stores of carbon, further increasing the carbon footprint of beef from these areas.

Prof Walter Willett, a leading nutritionist at the public health school of Harvard University, said: *"Eating beef raised on grain produced in the Amazon is like coal-fuelled power plants – the worst thing you could possibly do."*

<https://www.carbonbrief.org/>

In comparison to meat and dairy, plant-based foods have much smaller carbon footprints. On average, emissions from plant-based foods are 10 to 50 times smaller than those from animal products.

<https://science.sciencemag.org/content/360/6392/987>

### **What have we done?**

All the food we offer to our residential visitors is locally sourced and vegetarian.

For those less familiar with a vegetarian diet we hope by eating this way for a few days it may encourage them (and their family) to cut the amount of meat they consume when they return home. And of course for those who prefer a vegan diet we will have options for you too.

