

# Zero-carbon Ramsey, Cambridgeshire 2009



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# 1. Welcome to Ramsey, our first zero-carbon store

**We've built in some clever features which make the store zero-carbon.** The store is designed to use as little energy as possible. Any energy that we do need is generated on site from renewable fuel, and any excess energy is exported to the National Grid. This is just one part of our plan to become a zero-carbon business by 2050.

This store uses a mix of environmentally-friendly design, materials and technologies, including:

- ❖ Sustainably-sourced timber frames
- ❖ Roof lights and sun pipes that allow natural daylight into the sales floor and staff areas
- ❖ Energy efficient heating and air conditioning systems
- ❖ Rainwater collection to flush the toilets and run the carwash
- ❖ Combined Heat and Power (CHP) plant to generate electricity using renewable fuel
- ❖ Refrigerant gases in the fridges, heating, ventilation and air conditioning systems that have virtually no environmental impact
- ❖ The first LED-lit car park in the UK
- ❖ Solar-powered street lights and crossing beacons
- ❖ Energy-efficient equipment such as low energy bakery ovens
- ❖ Flooring tiles made from local materials

This booklet explains these and other features of this store. While it might seem the same as any other Tesco store, it is actually very different.

For more information about our Climate Change Programme, please visit our website at [www.tescopl.com](http://www.tescopl.com)

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## 2. In context: Carbon emissions

**Climate change is largely being driven by human activity.** In a nutshell, we are changing the mix of gases in the atmosphere, and this has meant that more of the sun's heat is being trapped. In turn, the earth is slowly heating up. This 'greenhouse effect' is leading to global changes e.g. more extreme weather.

**CO2 is the most important 'greenhouse gas'.** The level of CO2 in the air is changing fast, and it sticks around in the atmosphere for the longest period of time (more than 100 years). Cutting CO2 emissions is the best way to slow climate change.



In practice, this means the following things:

- ❖ Changing the way we use land e.g. for agriculture
- ❖ Burning less fuel for heat and transport
- ❖ Using less coal and oil to make electricity
- ❖ Reducing the need for electricity, heat and transport

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### 3. Environmental jargon explained

**There are a lot of climate change concepts that it is useful to know.** In this context, the three most important are "**carbon footprint**", "**zero-carbon**", and "**carbon-neutral**".

The "carbon footprint" of Tesco is a measure of how much carbon dioxide gas is emitted during everything that Tesco does. In other words, the CO<sub>2</sub> produced from how we transport things, all of our office systems, and our stores. It also includes the impact of other greenhouse gases like methane. Our ultimate goal is to bring our carbon footprint **down to zero**, i.e. "zero-carbon", although this doesn't mean that we will use no energy at all.

Instead, a zero-carbon store just satisfies all its energy needs from renewable sources. At Ramsey, this means:

- ❖ reducing the need for electricity and heat
- ❖ making as much of Ramsey's energy on-site as possible, using e.g. CHP
- ❖ making sure that Ramsey makes more electricity on-site than it takes from the electricity grid

Being "carbon-neutral" is slightly different. This means 'offsetting' the emissions of today by doing something to absorb carbon in future. One example is to plant trees, which will use carbon as they grow. However, because a company can be carbon-neutral while still emitting CO<sub>2</sub>, it is often seen as not really addressing the problem. "Zero-carbon" is a harder but better target.

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## 4. Our journey to a zero-carbon store

**In 2007, we set ourselves stretching, long-term targets to reduce our carbon footprint.** One of these was to ensure that all new stores, on average, emit 50% less carbon by 2020 compared to an equivalent store built in 2006.

We are making strong progress towards this target and over the past few years, we have built a series of environmental stores which have a carbon footprint much smaller than that of our stores built in 2006. In 2009, we achieved our biggest carbon reductions with the store at **Cheetham Hill** in Manchester and the store at **Ramsey**. The Cheetham Hill store opened in January and achieved a 70% carbon footprint reduction. At Ramsey we have gone even further, achieving the world's first zero-carbon supermarket.

This leaflet sets out the features we have incorporated to ensure that Ramsey has no overall carbon footprint in its operations. For each new store, we will include as many of these environmental features as we can so that **by 2020, the average new store is 50% lower carbon.**

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## 5. Generating our own energy

**We have done a great deal to reduce the amount of energy required to power the store, but some is still needed.**

To ensure we are getting that power in the most efficient way, we will generate our own electricity using a **Combined Heat and Power (CHP) plant**.

This technology is very energy efficient because the energy is generated on site and also because of the way it uses "waste" heat. Generating electricity usually creates heat as a by-product, but most of the time this heat is wasted and/or escapes. By installing mini-power stations in our stores and trapping the heat these create, we have an extra source of heat for creating hot water and warming our buildings. Any extra heat that we don't need can also be shared with the local community.

At Ramsey, we are running the CHP plant on biofuel from renewable sources e.g. vegetable oil. This helps reduce the carbon footprint of our store even further.



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## 6. Better ventilation

**We have designed this store to have mixed-mode ventilation, which allows us to have more efficient heating and air-conditioning.**

Tesco stores need to be kept at a steady temperature. This is to help the food stay fresh, meet minimum health standards and make sure that customers and staff are comfortable and have enough fresh air.

To achieve this, each store has its own "heating, ventilation and air conditioning" (HVAC) system. Basically, this is a set of pumps, pipes and fans that move air around the store and change its temperature as needed. If it is hot outside, the HVAC will heat the inside air less, and if it is cold outside it will heat it more. All of this uses energy.



**Vents on the roof** let warm air escape and cooler air enter the store in the summer. These need very little energy to operate and they help us use less air conditioning. We have also put a lobby at the entrance of Ramsey store and on all our new stores to reduce the heat loss from the front door.

All our work to improve the efficiency of our heating and ventilation systems significantly reduces the store's energy bill.

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## 7. Using wood instead of metal

**Ramsey will be our ninth timber-framed store. Using timber instead of steel significantly cuts the carbon associated with building the store.**

For every cubic meter of steel we replace with timber, we save almost a tonne of carbon because timber is less energy intensive to produce.

The timber that we used to build the frame of our Ramsey store comes from sustainable sources. As well as using a wooden frame, we have put sustainable timber walls with wood cladding on the outside. This alternative to metal creates less carbon and weathers well.

At the end of the store's life, the wood can be recycled to build another new store or used as a fuel source.



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## 8. Getting the **light** right



The store is lit as much as possible by daylight rather than electric lights, which saves energy and creates a more pleasant shopping environment.

Special windows in the roof **allow natural daylight to filter down to the sales floor**. We use lightweight panels filled with a gel that allows light through without over-heating the store. Additional windows on the side of the store also contribute to that natural light. In the offices at the back of our stores, we use mirrored tubes called sun pipes to reflect daylight into areas that wouldn't normally receive any.

We have a sophisticated system that **automatically dims individual lights** when the natural light increases. We also use timers to ensure that lights are not left on when they are not needed and have motion sensors on our lights in staff areas, ensuring that the lights only come on when there are people in the room. Wherever we need electric lighting, we try to make sure that the bulbs we use are as energy efficient as they can be.

In the car park and petrol station of Ramsey store, we have used **LED lights** which use less energy and last longer than normal bulbs. This is the first time in the UK that LED lighting has been used to light a car park.

We have also installed **solar powered street lights** and crossing beacons, reducing our use of electricity even further.

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## 9. Using less water

**As well as reducing our carbon footprint, we are also reducing and monitoring how much water we use in our stores.**

We are reducing our use of treated water from the mains supply by gathering rainwater to use for purposes such as flushing toilets and operating the car wash. We're also metering our water usage and check for water leakage and wastage.



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# 10. Rethinking refrigeration

**When we calculated our carbon footprint, we discovered a fifth of it came from gas we use to keep our fridges and freezers cold.**

Since then we have been investigating **better alternatives to these gases**. Many of the stores that we build from now on will have refrigeration systems that use special gases which do not add to global warming, unlike traditional fridge gases. Ramsey store is using these special refrigerants throughout its fridges and freezers in the store and petrol kiosk. We're also using hydrocarbon chillers as part of our heating, ventilation and air conditioning systems. As these chillers also use these refrigerants, we're reducing our environmental impact even further.

We've replaced the small heaters traditionally used to stop freezer doors from steaming up with a special film that requires no energy to keep the glass clear. We've also put **doors on the fridges** in store, which mean they don't have to work so hard to keep the food cool, saving even more energy.

At the back of our stores, we have added a second set of doors to our cold store rooms. These **"saloon" doors** help to cut down energy wastage when the main doors are open.

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# 11. Part of the community

**All of the environmental elements of this store help us to be a good neighbour, but there are lots of other things that we are doing as well.**

We are helping our customers reduce their carbon footprint by **making it easier to recycle**, giving them the information that they need to make green decisions and offering them great value environmentally-friendly products - such as reusable carrier bags and permanently half-price energy efficient light bulbs. Customers can also learn more by visiting [www.tesco.com/greenerliving](http://www.tesco.com/greenerliving)



We have used some **local manufacturers and suppliers** of materials in the construction of the store, such as the timber cladding, flooring, aggregate and windows. We have also included a special water channel by the car park which helps protect water quality. We've built a community centre as part of the development and have invited local schools to visit and run competitions for local school children.

Many of the construction staff and staff who work in the store are from the surrounding area. In fact, 80% of store staff are from within three miles of the site. This way we are supporting local employment and industry.

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## 12. Getting it **right** on site

When we build a new store, we use **sustainable construction methods** and ensure we minimise waste. We also segregate and recycle all unwanted timber, metal and packaging.

One of the ways we measure the overall environmental performance of our stores is through BREEAM (BRE Environmental Assessment Method). It considers every stage of the construction process including the design, materials, how a site is managed and the environmental impact of the final product.

Ramsey store has been independently assessed as “excellent” according to the BREEAM rating system.



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