

# ↔ Freight Best Practice

## Tesco Sets the Pace on Low Carbon and Efficiency

Case Study



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# Introduction

As a large and influential retailer, Tesco has committed to putting social and environmental issues at the heart of its business. A key part of this has been setting some exacting targets to reduce emissions from its distribution operations, proving the company’s intent to set the pace within the industry when it comes to transport efficiency and low carbon activity.

Tesco has proved just how significantly the carbon footprint of an operation can be reduced through more efficient fleet management and its achievements have been recognised throughout the industry, most notably in the Motor Transport Awards 2008 where it won the Low Carbon & Efficiency Award, sponsored by Freight Best Practice.

This case study details Tesco’s award-winning achievements, showing how the retailer actually made its considerable savings and outlining its continuing work towards the twin goals of lower carbon emissions and greater operational efficiency.

# Tesco

## Company Overview

Tesco is one of the world’s leading international retailers and is involved in a wide variety of different markets and sectors. It employs over 450,000 people around the globe. With approximately 1,800 stores across the UK, distribution is a key area of operation for the company (see Table 1). As a result, its distribution activities offered great scope for possible improvement in terms of the company’s impact on the environment.

Table 1 Tesco’s Distribution: The Key Facts

Vehicles	2,000 tractors and rigids 4,500 trailers
Deliveries	Between 5.5 million and 7 million cases a day to approx 1,800 UK stores

“As a growing international business, we must set an example by measuring and reducing our greenhouse gas emissions.”

**Sir Terry Leahy, Chief Executive, Tesco**

# Sustainable Approach

## Operation Review and Carbon Footprint

### Corporate Responsibility

As a large company Tesco takes its corporate responsibility very seriously and, within this, its environmental impact is key. Therefore the company has altered its business model to make the reduction of carbon footprint a key performance indicator.

To achieve the environmental and efficiency improvements it wanted within the distribution network, a common goal was needed with environment at the very heart of the strategy. In 2006, Tesco launched its first annual Community Plan, a major step in building its commitment to the community and the company's own corporate responsibility and sustainability ambitions.

### The Challenge

In order to measure the environmental impact of its distribution activity as accurately as possible, Tesco decided that the most consistent measure for the operation would be CO<sub>2</sub> per case delivered, rather than just CO<sub>2</sub> per litre of fuel consumed (a 'case' is an itemised box of goods packaged for transportation purposes). In 2006, Tesco set itself the challenge of reducing the amount of CO<sub>2</sub> emitted in the distribution network per case delivered by 10% during 2007, and then 10% each year until 2011 leading to a 50% reduction overall.

The following section outlines the sustainable approach that Tesco adopted to achieve these targets and details the progress from its 2006 baseline.

In order to achieve its initial target for CO<sub>2</sub> reduction of 10%, Tesco first needed to know how much CO<sub>2</sub> was actually being emitted in order to establish the baseline level from which improvements could be made. A baseline figure was established using the formula in Table 2 below.

With this established baseline to work from, the first step towards achieving its goal was for Tesco to review and assess all its activities and the interfaces between the main operational areas, including:

- ➔ Primary distribution
- ➔ Planning and loading
- ➔ Methods of transportation
- ➔ Network efficiency
- ➔ Delivery to stores

After measuring every part of the transport operation, the company identified a number of opportunities in these areas that would have a positive impact upon the transport challenge and took these forward to form the basis of its new, sustainable approach.

The task was broken down into four key areas:

- ➔ Utilising existing assets
- ➔ Alternatives to road transport
- ➔ Reducing road miles
- ➔ Alternative fuels and technologies

# Utilising Existing Assets

## Tip

The quickest and simplest way of reducing CO2 emissions was to better utilise all existing assets. The initial

review showed that whilst Tesco were seen as leading edge in efficiency and trailer fill, there was still potential for further improvement to reduce CO2 emissions and miles travelled.

The company updated its warehouse management system, reweighing and remeasuring every product, and combined this with its transport planning system to maximise both cage and trailer fill.

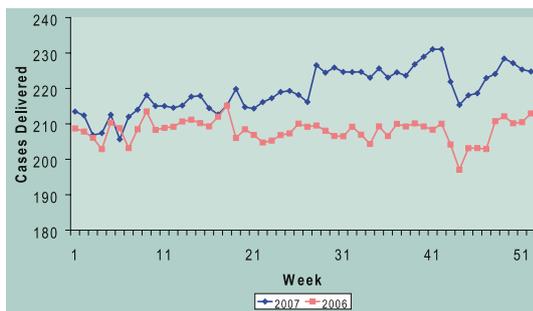
Standardising all settings within its transport planning tools nationally led to a significant reduction in wasted mileage between drops, as well as reduced turnaround time at stores and a reduced number of trips overall. Clear maintenance processes have been introduced to ensure that Tesco's systems are updated with relevant changes whenever they occur, ensuring a consistent approach going forward. Table 2 CO2 Calculation Model

Volume of Goods	/	Total Fuel Used, TESCO and 3rd Party Service Suppliers	=	Cases Delivered per Litre Fuel Used
Cases Delivered per Litre Fuel Used	/	2.63*	=	Cases Delivered per kg CO <sub>2</sub> Produced
1	/	Cases Delivered per kg CO <sub>2</sub> Produced	=	CO <sub>2</sub> Produced per Case Delivered

\* kg of CO2 produced for every litre of diesel burnt

Figure 1 shows, how using Cases Delivered per Driver Hour as a measure of efficiency, Tesco improved its results by 5.17% between 2006 and 2007:

Figure 1 Cases delivered per driver hour



## Alternatives to Road

Making the move to multimodal transport to reduce the number of vehicles on the road has reduced levels of CO2 emissions by over 2,750 tonnes per year

Tesco has replaced a significant number of road movements with train and barge journeys.

The Tesco train link between Daventry and Grangemouth saves 3.18 million road miles per year and reduces CO2 by 2,424 tonnes per year. The train carries 28 containers, with each one holding 48 cages. In total 1,344 cages are carried on the train which completes 10 trips each week.

The cages carried by the train were previously moved by 18 double-deck trailers. This amounted to a saving of 180 double-deck movements per week.

Table 3 compares the distance travelled and fuel consumption of the Tesco train with the double-deck trailers, demonstrating the savings made.

In addition to the train link, Tesco is making use of a barge link on the Manchester Ship Canal for wine distribution. The wine is delivered in bulk to the UK and taken to a bottling plant at Irlam, near Manchester. Previously it was delivered to various ports including Felixstowe and Liverpool and then taken by road to Irlam.

The wine is now brought into Liverpool and taken by barge to the bottling plant. This innovation has removed 263,000 miles from the road and reduced CO2 by 330 tonnes per year.

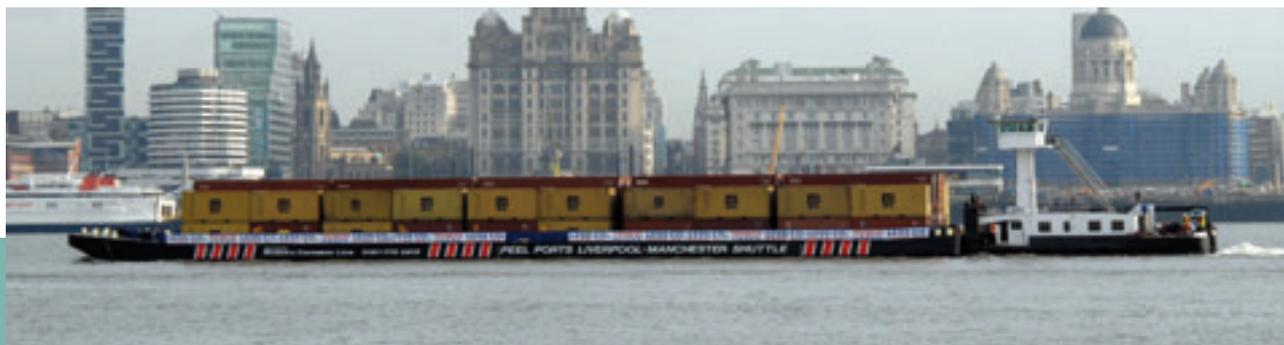


Table 3 Comparison Between the Tesco Train and Road Freight For CO2 Produced and Mileage Saved

	TESCO TRAIN	ROAD FREIGHT
<b>Distance (miles per annum)</b>	171,600	3,182,400
<b>Fuel (litres per annum)</b>	780,105	1,701,962
<b>CO<sub>2</sub> (tonnes per annum)</b>	2,052 (@ 2.63 kg per litre of fuel used)	4,476 (@ 2.63 kg per litre of fuel used)
<b>TOTAL ANNUAL SAVING OF CO<sub>2</sub> (TONNES)</b>	2,424	
<b>TOTAL ANNUAL ROAD MILEAGE SAVED</b>	3,182,400	

## Reducing Road Miles

Decreasing the number of vehicles on the road is another key mechanism for carbon reduction and apart from the multimodal measures outlined in section 3.3, Tesco has implemented a number of operational changes to its road operations to achieve this.

Among these has been a significant increase in the number of double-deck trailers used. A double-deck trailer typically carries 75 cages, compared to 45 in a conventional 13m unit. In 2007, Tesco increased the use of double-deck units by 7% from 191 to 205 trips per day, taking 759,000 miles off the road and saving 948 tonnes per year of CO<sub>2</sub>.

In addition to this the company also reduced the level of empty running by undertaking 55,432 supplier backloads in 2007. After delivering to a store, the vehicle calls into a Tesco supplier on the journey back to collect a load bound for the distribution centre. By saving the supplier an additional trip each time they effectively maximised vehicle efficiency. This saved 2.6 million miles from the road, equating to 3,590 tonnes of CO<sub>2</sub> from fuel saved. Suppliers' vehicles are also used to make Tesco store deliveries on their return trip which reduces empty running and therefore the overall number of vehicles required.

Three new distribution centres were also opened in 2007 at Livingston, Lichfield and Goole which replaced six smaller regional distribution centres. The larger distribution centres hold a greater range of product closer to the customer therefore reducing the amount of trunking between distribution centres. These changes to the distribution network saved 2.186 million miles and 2,951 tonnes of CO<sub>2</sub> a year resulting from fuel saved. Table 4 summarises the savings achieved through the use of all these measures.

## Livingston Distribution Centre

Tesco's new warehouse at Livingston, Scotland is the company's largest multi-temperature distribution centre. Its location was chosen for its excellent road and rail links and the facility offers some impressive environmental features, including:

- ➔ Collection of rainwater for washing food trays and vehicles, reducing mains water usage by 70%
- ➔ Bailing of all cardboard and plastic waste from Scottish operations for on-site recycling
- ➔ A high ratio of skylights to make the most of natural light, combined with the use of sensors that switch electric lights on only when necessary
- ➔ A reduced-height ceiling in the fresh food area to improve refrigeration efficiency
- ➔ Stockholding of some 6,500 more lines than usual, reducing the need to move stock around the country

Table 4 Annual savings in road miles and CO2 emissions through the use of double-deck trailers, backloading and distribution centre rationalisation.

	Double-Deck Trailers	Backloading	Distribution Centres
Total Annual Road Mileage Saved	759,000	2,600,000	2,186,860
Total Annual Saving Of Co2 (Tonnes)	948	3,590	2,951

## Alternative Fuels / Technology

90% of the Tesco fleet now operates on B50 biodiesel (a blend of fuel consisting of 50% biodiesel and 50% regular diesel). Additionally the company is actively working with vehicle and oil suppliers to help maximise the intervals between oil changes.

In addition to the use of biodiesel, Tesco is also evaluating the use of hybrid diesel-electric vehicles and gas-powered vehicles. This includes a compressed natural gas powered version of the Mercedes-Benz Econic which emits zero smoke and particulates.



## Conclusion

Using the variety of measures described above, Tesco successfully reduced its carbon footprint by 10.2% in 2007.

As one of the world's leading international retailers, Tesco has set the pace for environmentally friendly distribution. CO2 savings so far have made Tesco a worthy winner of the Motor Transport Awards. They are well on course to achieve their longer term goal of a 50% reduction of CO2 produced per case delivered by 2011

“It's fantastic recognition for the team at Tesco who have put a great deal of work in over the past 24 months to drive road miles and carbon out of our operation”

**Alex Laffey, Transport Director, Tesco**

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### *Performance MANAGEMENT*

#### **Performance Management for Efficient Road Freight Operations**

This guide explains the process of measuring performance effectively. It includes advice on how information is best collected and interpreted to allow informed decision making in order to achieve operational efficiency improvements.

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This guide provides advice and real life examples to help operators motivate their staff effectively and shows how to implement and manage change more successfully.

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- Tesco Sets the Pace on Low Carbon and Efficiency
- Engine Idling – Costs You Money and Gets You Nowhere!
- Operational Efficiency Brings Savings for Yearsley