Reducing CO₂ Emissions in Logistics Activities: Drivers and Barriers

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Abstract
This study examines aspects of CO₂ emissions reduction in logistics activities of a number of large UK companies. Data were collected from in-depth interviews with logistics managers of UK companies across different sectors. The research identified the main drivers and barriers for CO₂ reduction initiatives in these companies. It was also found that most CO₂ reduction initiatives are mainly operational and tactical in nature, and a major driver for companies to adopt CO₂ emission initiatives has been the link between emissions reduction and cost reduction.

Keywords: CO₂; emissions; reduction; initiatives

1. Introduction
The 1997 Kyoto Protocol agreement set targets for 37 industrialized countries and the European community for reducing greenhouse gas emissions [1]. Since then there has been an increasing public and government concern for the environment, and companies have been under mounting pressure to reduce the environmental impact of CO₂ generated by their activities, including logistics activities.

Emissions of CO₂ from logistics activities in the UK for 2004 were 34 million tonnes, about 6% of the total UK emissions [2]. Findings from Kahn Ribeiro and Kobayashi [3] and the World Economic Forum [4] are consistent with these UK findings, and show that total world emissions from the freight transport sector, at around 2,800 million tonnes of CO₂ per year, are between 6% and 8% of global emissions. This means that with the inclusion of warehousing and handling, logistics is likely to account for 10%-11% of the worldwide total [5].

In light of these facts, a wide variety of initiatives to reduce CO₂ emissions are being currently used or actively considered in UK logistics operations, especially by the larger firms which have the available resources and capability.

While there are some signs of development in the understanding of the firms’ responses towards environmental issues such as CO₂ emissions, there is little understanding of the individual logistics managers’ behaviour and perceptions, and their decision-making process [6]. This is surprising considering the importance and urgency of logistics in developing strategies for achieving lower emissions [7] [8]. Therefore, this research examines the initiatives currently being implemented in selected UK companies to reduce CO₂ emissions in their logistics activities, and the main drivers and barriers affecting the implementation of these initiatives.

2. Literature review
There have been an increasing number of studies that look at the environmental impacts of logistics activities. Topics stud-
ied included: CO₂ auditing [9]; environmental impacts of freight transport [10]; the environmental impact of warehousing and distribution [11]; reverse logistics and waste management [12]; and the environmental costs of logistics [13]. Specific practices that have an impact on CO₂ emissions include: the use of ‘green’ criteria to choose suppliers and transporters [14]; consolidation of shipments and selection of cleaner transport modes [15] [16][17]; the use of environmentally friendly packaging, recuperation of materials for reuse, and the disposal of waste [12].

Doherty and Hoyle [4] identify some of the more significant and commercially-feasible opportunities for the decarbonization of logistics and transport. These include the use of ‘clean’ vehicle technologies; de-speeding the supply chain; enabling low-carbon sourcing; optimized logistics networks; energy efficient logistics buildings; packaging design initiatives; training and communication; modal switches; reverse logistics; increased home delivery; and reducing congestion. These initiatives in combination, according to the authors, have the potential to reduce global logistics and freight transport emissions by 1,400 million tonnes of CO₂ in the medium term, i.e. 50% down from current levels.

3. Research methodology

Interviewing was judged as the method most likely to yield the information required for this research. In this technique, although the research pursues ‘a consistent line of inquiry’, the actual stream of questions in an interview is likely to be ‘fluid rather than rigid’ [18]. Throughout the interview process, the researcher has two main jobs – one is “to follow your line of inquiry …” and the other is “to ask your actual questions in an unbiased manner that also serves the needs of your line of inquiry” [19].

A key criterion for selecting the UK companies to interview was that they had significant logistics operations. A total of 18 logistics managers from 15 large UK companies were interviewed (1 retailer, 7 manufacturers, 3 logistics operators, 3 transport infrastructures, and 1 Hospitality Company) between October 2010 and November 2011. Each interview lasted about an hour. The interviews were semi-structured to allow interviewees to elaborate on issues that seemed to them particularly important.

4. Key findings

4.1 Drivers for implementing CO₂ reduction initiatives

An important area to explore was the factors that are influencing companies in their decisions for taking CO₂ reduction actions. The interviewees were asked therefore about the drivers of the change towards low CO₂ logistics operations. Answers from participants were very diverse, which was understandable as their companies were also diverse in nature. Nevertheless they agreed on one fundamental driver: CO₂ reduction is frequently linked with cost reduction. For this reason cost benefits were mentioned by all the interviewees as a driver for implementing CO₂ reduction initiatives, with some differences between the levels of importance they gave to this.

The other main driver highlighted by the majority of the interviewees was corporate social responsibility, which was engrained in the values and principles of most of the companies interviewed. But they suggested that any effort to reduce emissions in logistics had to balance financial, social and environmental factors, in order to guarantee the sustainability of their businesses. Other drivers mentioned
by a number of interviewees include: the influence of the end-customers, desire to improve public image, legislation, and increasing fuel prices.

4.2 Barriers to implementing CO₂ reduction initiatives

While there are drivers for companies to implement CO₂ reduction initiatives there are also barriers which delay the changes being carried out. It was noted that according to the nature of their business, companies face a wide variety of barriers, reflecting the differing function of logistics in their operations. Not surprisingly the most frequently mentioned barrier was the lack of resources. Many respondents mentioned that capital had been an issue, especially since the start of the economic crisis in 2008, and companies had prioritized investments in activities that added more value to their products. Three of the manufacturers indicated that because logistics is only a support function and not their core business, it had not received the same attention, and it had been difficult to channel additional resources to implement CO₂ reduction initiatives. Since logistics is not their biggest CO₂ emitter it had also been lower on their priority list for potential CO₂ reduction.

In additions to financial resources, time resources had also affected and delayed the implementation of CO₂ reduction initiatives in logistics. The interviewee at one manufacturer revealed that they are on a tight timescale and “sometimes... little things ... won’t get done, just because there just isn’t the time to actually do them”. Respondents at two other manufacturers also had similar statements and agreed that an important barrier is people’s time to actually make these changes in logistics happen.

Other barriers mentioned by several respondents include: the complexity of logistics responsibilities, unsettled technologies, belief in CO₂ emissions issues, commitment to meet customer services requirements, lack of control from the use of third party logistics, and lack of significant incentives from the government.

Despite of the barriers, one of the most frequent responses was that there were ‘no major barriers for implementing initiatives to reduce emissions in logistics’. This is an encouraging finding for those wishing to see CO₂ reductions continue to be taken forward. Almost a third of the respondents agreed that because all of these initiatives come together with logistics efficiency and cost benefits, everybody is on board from top management to the lower levels of management.

5. Conclusions

This paper reports the findings from an investigation to identify the drivers and barriers affecting the initiatives taken to reduce CO₂ from the logistics activities of a number of UK companies. Two key findings are: (1) there is a positive correlation between most CO₂ reduction initiatives and cost reduction, and this link has been a major driver for the adoption of CO₂ reduction in the companies investigated; and (2) a key barrier for the adoption of CO₂ reduction initiatives in logistics has been the lack of resources.

References


