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An examination of a voluntary policy model to effect behavioral change and influence interactions and decision making in the freight sector

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ABSTRACT

Freight transportation is essential to maintaining commerce and economies in the United States and globally. However, freight transportation is known to have significant environmental and public health impacts. Harmful emissions of carbon dioxide, methane, hydrofluorocarbons, and black carbon increase the risk of global climate change. Emissions of nitrogen oxides and particulate matter contribute to serious public health risks including increased incidences of premature death, and increased severity of respiratory and cardiovascular illness. As trade is increasingly globalized and economies expand, harmful air emissions from goods movement are projected to increase at faster rates than all other sources of transport-related emissions. While mandatory rules such as advanced vehicle emission and fuel quality standards reduce emissions from new vehicles, the vast legacy fleet of heavy duty diesel vehicles present a challenge for policy makers around the world. This paper examines how a voluntary policy model, the U.S. Environmental Protection Agency's SmartWay Transport Partnership, fosters behavior change, facilitates strategic interactions and enables more informed decision-making in the freight sector to improve performance and reduce emissions. The effectiveness of this innovative model has generated international interest and led to program replication in other countries.

1. Introduction

Trade growth and an ever-expanding global economy are creating an unprecedented and seemingly endless demand for freight transport capacity and infrastructure. As a result, carbon emissions from freight transport are growing at a rapid rate. Between 1990 and 2013, U.S. greenhouse gas emissions from freight transport grew by more than 50%, an increase of almost 200 million metric tons (U.S. Environmental Protection Agency, 2015a, pp. 104–105).

Projections are that by 2050, carbon dioxide emissions from global freight will nearly quadruple, rising by a factor of 3.9, from an estimated 2.1 billion metric tons (2010) to 8.1 billion metric tons (OECD/ITF, 2015). At this rate of growth, freight emissions could account for more than one-half of all transportation related carbon emissions, exceeding emission levels from personal transportation sources for the first time (OECD/ITF, 2015).

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Until recently, however, the adverse, long-term impacts of global trade and commerce on growth in carbon emissions were largely ignored (Golicic et al., 2010, pp. 47–55).

As the world's nations seek to reduce the risk of global climate change and curb harmful air emissions, there is an urgent need to address the rapid growth in freight-related emissions using all extant policy approaches.

In the U.S. and throughout the world, trucks are the single largest source of greenhouse gases from freight, accounting for over half of all trade-related carbon emissions (Miller and Facanha, 2014; OECD/ITF, 2015; U.S. Energy Information Administration, 2015). The first U.S. regulations to reduce greenhouse gas emissions and improve efficiency from freight trucks were first published in 2011 and apply to 2014 and later model year trucks (Greenhouse Gas Emissions, 2011). These regulations are projected to reduce CO_2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the lifetime of 2014–2018 trucks. In 2016, the U.S. Environmental Protection Agency (EPA) along with the National Highway and Traffic Safety Administration (NHTSA) jointly issued a second set of standards, starting in 2018 for trailers and 2021 for trucks. The new standards will cut GHG emissions by approximately 1 billion metric tons and conserve approximately 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (Greenhouse Gas Emissions, 2016).

Even as the new standards phase-in, however, millions of older, less efficient heavy-duty vehicles remain in use in the United States. This legacy fleet will continue emitting high levels of greenhouse gases and emit other harmful air pollutants well into the future. Further, few nations have yet to establish similar standards to cut greenhouse gas emissions or stringent standards to lower other harmful air pollutants from freight trucks.

Consequently, while regulations will play a critical role by addressing new vehicles, there also is an urgent and growing need for complementary policy instruments to facilitate freight sustainability. This paper examines one instrument, a voluntary policy model initiated by the U.S. EPA, the SmartWay Transport Partnership. This program can be applied to legacy vehicles and newly-efficient vehicles to further reduce emissions.

To date, little research has been done to understand the influences that lead shippers and carriers to collaborate and adopt environmental transportation practices that reduce emissions and contribute to more sustainable supply chains (Nyabusore, 2015). In this study we will examine the role of the U.S. EPA's SmartWay Transport Partnership in facilitating such collaboration. Specifically, we will review the effect and influence of the SmartWay model on effecting behavior change and on influencing strategic interactions and decision making that result in more sustainable business practices and industry progress toward environmental goals. We will focus on three key freight sector participants: shippers (companies that use freight transportation services; represent freight demand); freight carriers (companies that provide these freight transportation services; represent supply side); and vehicle and equipment manufacturers (companies that provide transportation technologies to carriers and in some cases, to shippers).

2. Background

In 2004, EPA launched SmartWay Transport Partnership–a public-private initiative between freight shippers, carriers, logistics companies and other stakeholders, to voluntarily achieve improved fuel efficiency and reduce environmental impacts from freight transport. In the two years leading up to the program's release, EPA collaborated with key stakeholders from the trucking industry and shipping community to develop the program's structure and approaches. The concept for the SmartWay Transport Partnership was based on input from these freight industry leaders (U.S. EPA, 2004).

At that time, sustainability was an emerging concept in the corporate world. Where an awareness of sustainability existed, it typically did not extend to a shipper's transportation operations. Transportation management was focusing on cost, speed and timeliness of delivery, equipment availability and responsiveness to change (Holcomb et al., 2014). Moreover, research shows that shipper initiatives are largely driven by company policy and that shippers tend to push sustainability requirements onto the carriers that work for them (Wolmarans et al., 2014).

Shippers attempting to include transportation in their sustainability planning, however, soon ran into a roadblock–a lack of data about the environmental performance of their carrier base. Percent reduction of carbon emissions is one of the most commonly used reporting metrics for shippers, but there was no accepted, consistent method to assess, track and verify carrier environmental performance using carbon as a metric.

Carriers are motivated to adopt sustainable business practices that will make them more competitive and help reduce costs (Wolmarans et al., 2014). Thus, carriers were driven by a profit motive to be more sustainable–by reduced fuel use, which typically correlates directly to carbon emissions reductions and costs, and a potentially a larger, more satisfied market share. However, as shipper clients began to request environmental performance data from their carriers, trucking companies were confronted by a host of new, different, inconsistent or duplicative forms and surveys from multiple customers.

The lack of uniform assessment and reporting mechanisms, and an inability to validate carrier performance data based on a consistent metric, greatly reduced its value for either shippers or carriers, in helping to effect change or influence decisions. Carriers were further confounded by a lack of reliable data on either the financial return or emissions benefit they could expect when investing in the fuel-saving technologies and pollution control equipment available to them to help meet the shipper community's growing interest in transportation sustainability.

Notably, during the early to mid-2000s, original equipment manufacturers (OEMs) were focusing on building tractors to meet regulatory standards for criteria pollutants, specifically particulate matter and nitrogen oxides. EPA's legal authority to regulate greenhouse gas emissions and establish carbon standards was not established until December 2009 (Endangerment

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