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Toyota Motor European (TME) Sustainable Logistics: An Example to Brazil

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Abstract

This paper analyzes the Toyota Motor European (TME) sustainable logistics as a concept can be used in Brazilian operations as part of supply chain strategies. Sustainable logistics targets eco-efficiency achieved by management of all processes in the chain that focuses on customer service level, which involves from raw materials to product delivery to customers through design, procurement, production, distribution, use, reuse and disposal, including aspects such as reduction of time and resources, costs and environmental impacts. The results show that Toyota's example means the improvement of Brazilian logistics operations in a business environment of rapid growth and changes, and makes possible a great reflection on business logistics practices in this country. Thus it is possible to conclude that sustainable logistics makes for easy pro-active monitoring of business management, which is key to achieving a high level of sustainable performance in logistic operations.

Keywords: Sustainable Logistics. Environment. Automakers. Toyota Motor European.

Introduction

This paper identifies the sustainable logistics as a concept can be used in companies to make own strategies of supply chain management in case of Toyota Motor European (TME).

To Hitchcock and Willard (2008),

Sustainability is a hot business trend and many organizations are pursuing it, in order to get reater success than others. Years ago, companies just could muddle al random Green efforts to earn a gold star in the marketplace. Now, however, as

stakeholders have become more sophisticated, it's importante to undertake a formal process for approaching sustainability.

In this sense the focus of present research, by adopting sustainable logistics as a process for planning and implementation of sustainability as part of business activities that involves production process and transport operation.

Sustainable logistics is eco-efficiency achieved by management of all links in the chain, so that all are aligned with customer service level, which involves from raw materials to delivery to client, through design, procurement, production, distribution, use, reuse and disposal, including aspects such as lead time reduction and resources, costs and environmental impacts.

The sustainability is same as sustainable development. The term "sustainable development" was established from the Blundtland on report "Our Common Future", created by the World Commission on Environment and Development, with the purpose of "harmony between socio-economic development with environmental conservation, by emphasising on preservation of natural ecosystems and genetic diversity for the use of natural resources (FRANCO, 2000, p.26).

In the dynamics of Our Common Future, sustainability concept is a process that drives resources exploitation, investments, technological and institutional changes in order to harmonize potential to increase present and future to meet human needs. Part of a systemic concept that includes environmental, technological, economic, cultural and political, whose practice is complicated by influence of factors such as unequal distribution of wealth, pollution, technology and lifestyles that undermine sustainability and need behavioral changes, which in turn requires the participation of all stakeholders, government, business, among others, for the implementation

of regional expansion. The companies keep up with continuous development requirements. Companies need to change their structures and procedures by adopting technologies for less pollute without cutting costs or increasing profits. There is only long-term investment necessary to stop acting under the rule of unbridled capitalism to adopt sustainable measures (ROMEIRO et al., 2001). Economic agents need to adopt strategic solutions to promote sustainability.

Sachs (1993) analyses environment with five dimensions of sustainability: social, economic, ecological, spatial and cultural. To Dyllick and Hokerts (2002) sustainability is a topic currently widely discussed in the economic growth perspective, social equity and environmental conservation. Economic development and care of the environment are compatible, interdependent and necessary. The high productivity, modern technology and economic development can and must coexist with a healthy environment.

This analysis perceives importance of create a plan to practice sustainability inside companies. The most important strategy is logistics process because includes all aspects involved in sustainable care, whose onset is definition of the strategy involves the production, operation, distribution and reaches final customer.

Thus, the study includes sustainable logistics and its approach in automakers in order to emphasises detailed contributions.

Conceptual review of Sustainable logistics

To Bloemhof and van Nunen (2005), sustainable logistics involves supply chain management that a rather new phenomenon in the Operations Management research field. In the design of Sustainable Supply Chains the increase of transparency across the chain is important and can be obtained through identification and traceability. Sustainable produces a change in

resource-areas and modes of transportation. This investment results in innovations and involves costs and profits. So, they present a framework based on product and process innovations that provides insights in the relevant research questions for integrating Environmental Management and SCM, as a way to obtain sustainability.

They introduce de eco-efficiency as a concept that considers the metrics about economics activity with environmental sustainable to atend the human needs and improvement in quality of life, reducing environmental impacts and the rate of consumption of natural resources, based on the environmental capacity of the planet (World Business Council for Sustainable Development, 2000). The eco-efficiency metrics (EM) are obtained in relationship between the indicator value of the product / service (V) and the environmental influence caused by the generation of use of the product or service (EI):

$$EM = EI/V$$

The product/service indicators are, for example, quantity produced, sales, prices and financial costs. The environmental influences indicators are the energy consumption are total energy consumption, greenhouse gases emissions and use natural resources.

Christopher (2006) understood that paradigms may be combined to enable highly competitive supply chains capable of winning in a volatile and cost-conscious environment.

The eco-efficiency is sustainable concept created by *World Business Council of Sustainable Development* (2009), a management philosophy to encourage the companies and supply chain to invest in environmental improvements that run in parallel, economic benefits.

It focuses on business opportunities and allows companies to become more responsible in the environmental, economic and social aspects, from innovation that results in growth and competitiveness.

Eco-efficiency combines with the logistics management of products and services at competitive prices that meet human needs, increased quality of life and reduce progressively the ecological impacts and the intensive use of resources throughout the life cycle of the product, consistent with the estimated absorption capacity of the environment.

Sustainable supply chain satisfy the present needs without compromising the capability of future generations to meet their own needs, to understand that sustainability is providing better quality of life for all, the present and future generations (WIRTENBERG; RUSSELL; LIPSKY, 2008).

Thus, supply chain management includes all processes of production, like operation, distribution, procurement, materials purchase, even as three R's: Recycle, Reduce, Reuse.

Sustainability is global and complex concept to understand for your extention, to refer a multidimensional practice couldn't be aplied for one activity or companie. Strategy based on sustainability requires simultaneously lower costs, increase consumer value and generate social benefits, about the Figure 1 (ORSATO, 2009).

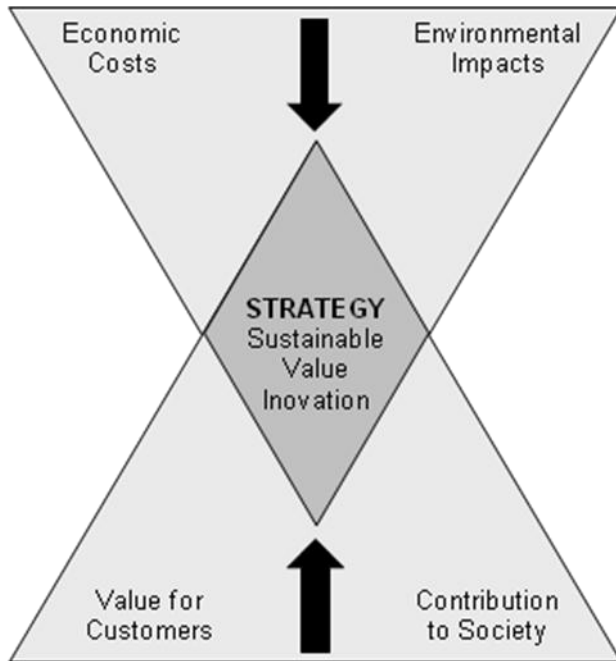


Figure 1. Sustainable Value Innovation Strategy

Source: Orsato (2008)

Thus sustainable logistics means a practice to contribute to define strategy from a value create, because requires account reduced consumption of raw materials and emission, transparency levels, social and environmental responsibility, development of new technologies and meet the needs of the market and the society in which it operates. This dynamic provides a set of activities in the supply chain and value.

Conforme Hitchcock e Willard (2008), it's a business tendency successfully to many companies and your implementation as the same to apply any initiative to change.

Also, features of the high economic, environmental and social expectations as main focuses, with the second aspects: cultural, technological, geographical, spatial, and political among others (SACHS, 2000).

The dimensions refer to supply chain and logistics, to establish connection with investment in sustainable technologies and processes, besides of cost and return in short, medium and long-term social impact and market perception, to return shareholders. The institutional dimension deals with dissemination of information related to sustainable activities that company develops its strategy.

The deficit on a sustainable logistics is shareholders and market lack of faith as to meaning and practice of sustainability, which influences like motivation in business strategy. The challenges related to implementation of sustainability are presented in Table 1.

A preventive approach to pollution problem, product management and clean technologies in order to include the whole company movement to sustainability is a goal that companies must achieve. However, without a strategic framework and logistical support to make sense, the impact of this concept can dissipate. A sustainability vision for an industry or a supply chain is like a road map for the future, showing how the products and services must grow up and what skills are needed to get there.

Major Challenges to Sustainability			
	Pollution	Depletion	Poverty
Developed economies	<ul style="list-style-type: none"> -greenhouse gases -use of toxic materials -contaminated sites 	<ul style="list-style-type: none"> -scarcity of materials -insufficient reuse and recycling 	<ul style="list-style-type: none"> -urban and minority unemployment
Emerging economies	<ul style="list-style-type: none"> -industrial emissions -contaminated water -lack of sewage treatment 	<ul style="list-style-type: none"> -overexploitation of renewable resources -overuse of water for irrigation 	<ul style="list-style-type: none"> -migration to cities -lack of skilled workers -income inequality
Survival economies	<ul style="list-style-type: none"> -dung and wood burning -lack of sanitation -ecosystem destruction due to development 	<ul style="list-style-type: none"> -deforestation -overgrazing -soil loss 	<ul style="list-style-type: none"> -population growth -low status of women -dislocation

Table 1. Major Challenges to Sustainability

Source: Hart (1997)

The sustainable strategy define theoretical framework to integration of responsibilities of companies in its global strategy, including procedures to formulation and implementation, as shown Figure 2.

In business strategy, a value system based on sustainability can offer logistics base, involving operational systems makes market demand satisfaction that determines eco-strategy, based on resource efficiency.

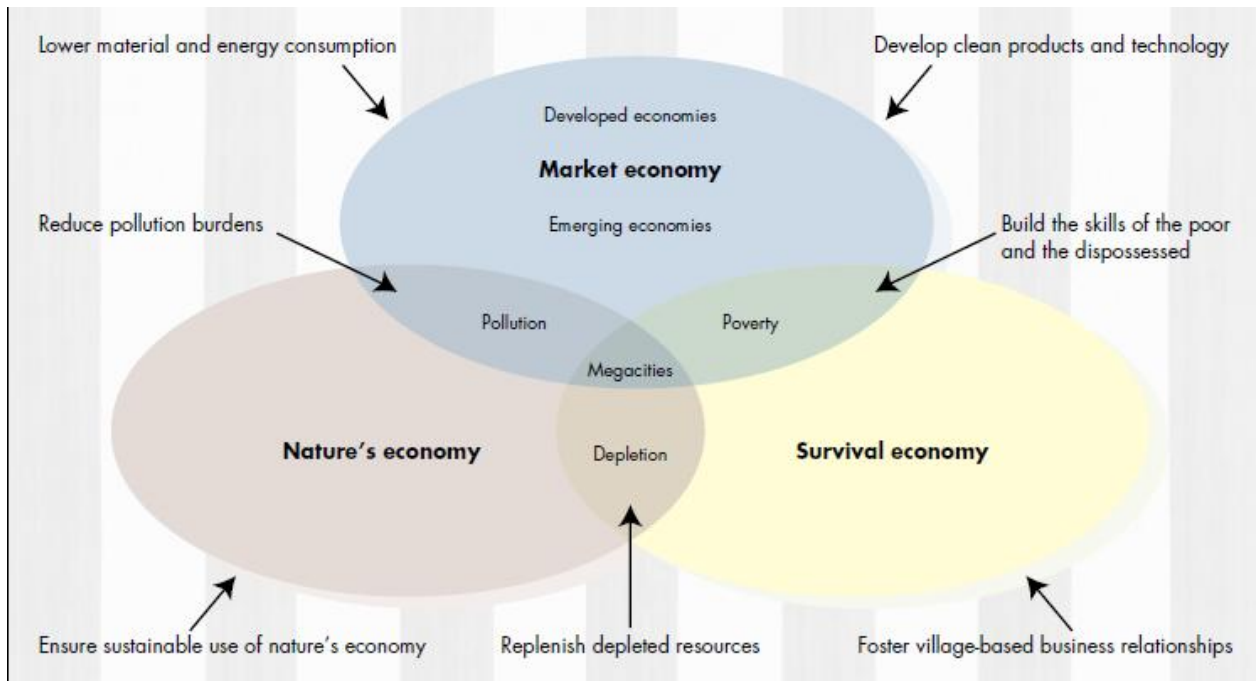


Figure 2. Building Sustainable Business Strategies

Source: Hart (1997)

The example of sustainability adoption in companies is Toyota Motor European. In your strategy, logistics is an area to promote big impact in chain performance, especially environmental. So, is a way to continuously monitor the operations efficiency and methods to ensure better solutions used at all times?

Toyota carefully studies all logistics options available in order to select the most efficient and environmentally-responsible methods. Deliveries and returns of parts are always organized to maximise the efficient use of logistics materials and resources. TME's logistics are divided into three separate operations, as figure 3.

- Sustainable Mobility – with the design and development of “greener, cleaner” technologies and vehicles, such as the new iQ;

- Sustainable Plants – all Toyota production sites achieved their original 2010 environmental targets three years ahead of schedule; Toyota has also announced plans for two Sustainable Plants, TMUK and TMMF.



Figure 3. Toyota’s Operations

Source: Toyota Motor European (2009)

Toyota’s approach can be divided into four main areas for improvement:

- Sustainable Logistics – Toyota reduced absolute CO₂ emissions across its vehicle logistics network in 2007 despite higher distribution volumes; and
- Sustainable Retailers – TME is introducing the concept of Sustainable Retailers to help Toyota retailers achieve industry-leading environmental performance.

Although Toyota for many years using this system, defines its mission as providing environmentally friendly products in line with measures to combat global warming, focusing on developing innovative technologies to automotive sector, converging on a new model of sustainability from mobility.

Sustainable Logistics increase operational efficiency and environmental sustainability in transport system and logistics. The proposal by Toyota as an example focuses on borders between new business opportunities and removing obstacles on sustainability and competitiveness. The knowledge developed by the company contributes pollutant emissions reduction of the transportation and logistics, without negative effects on economic efficiency and industry competitiveness.

This example shows potential opportunities for transport providers and operators to move towards a sustainable system, in this case with emphasis on cargo transportation, with influence on the entire logistics chain, considering the cooperation with transport quality demand, as society's role as a provider of infrastructure.

The challenges related to sustainability practice in sustainable logistics perspective can mean the creation and identification of practical strategies for promoting sustainability to market and company.

Decisions concerning the implementation of sustainable measures are possible. The life cycle evaluation is one of them can result in a joint effort to specific place in the supply chain, resulting in joint decision to change products / services design and logistics.

Besides, key dimensions to sustainability presents the current view of reducing cost, better company reputation and legitimacy, the future vision, innovation and repositioning chain. Logistics development needs to consider and deal with uncertainty as the key management process.

Oliveira and Antunes (2004) present a multi-objective model of environment-energy-economy based on the linear structure based on inter-industry production linkages. Their study aims to provide those responsible for making a comprehensive model for assessing

environmental burdens with respect to changes in economic activities compatible with the various measures. The authors use input-output analysis adjusted to environment and energy intersection. The focus of this research is decision, monitoring and control from the process perspective.

Gonzalez-Benito (2005) examines relationship between environmental proactivity and business performance in a sample of 186 companies. They concluded there is no single answer to the question of environmental proactivity positive effects in business and this relationship must be broken in the relationship more specific and concrete.

Environmental Management Practices are classified into three categories: (i) planning and organizational practices (Environmental Management System), (ii) communication practices (public image, ISO14001), and (iii) operating practices. Operational practices are classified into two groups: (iiia) practices related to product (designing environmentally friendly products), and (iiib) process related to practices (use of recyclable packaging, methods of cleaner transport systems, recycling, etc.).

Business performance is measured by financial, merchandising and operational performance (divided in costs, time, quality and flexibility). Multiple regression analysis is used to test relations between specific areas performance of business and environmental management. The authors conclude the achievement of operational objectives such as quality, reliability and volume flexibility can be improved with management of supply chain system with more reverse logistics and recycling.

Finally, Letmathe and Blakrishnan (2005) present some mathematical models to be used by companies to determine their optimal product mix and production quantities in different types of environmental constraints, and various types of production constraints.

Several environmental issues such as emission limits and restrictions may be marketable in methods of integrated production planning that currently only fall on the issue of resource constraints. These models can be directed to environmental issues and regulations proactively to a reactive form. Decisions are made from the perspective of product and the process.

Environmental Management

The management is the way to companies become sustainable and creates value to costumers. The Sachs approach to sustainability of three most important aspects: environment, economics and social, represents the practice plan in companies, to obtain costs and resources reduction, and competitiveness (TRIGUEIRO, 2003; ANDRADE, 1999).

To Tinoco and Kraemer (2004), companies are socially and environmentally highly relevant. Through a sustainable business practice, causing a change in values and orientation in their operating systems will be engaged to sustainable development idea and environmental preservation, with social responsibility.

Cunha, Freddo e Borger (2009) believe in contribution of environmental concern, when they say that for company have good environmental reputation strategy, risk é more easily to work, about the focus on environmental business risk.

Logistics costs

To Orsato (2009), will be necessary to think about costs and competitive to work on sustainable logistics. “At different degrees, all organizations pursue resource productivity. By optimizing the overall use of resources, such as the reduction of energy consumption and waste,

companies can also reduce the costs associated with them and, consequently, become more competitive”.

The sustainable performance logistics can be assessed by determining the results by total inventory cost that involves the aspects social, economic and environmental. It is necessary to decide on a broad level of strategies and techniques that would contribute to better production.

In logistics, the total cost associated with the inventory consists of the following (Stewart:

- opportunity cost consisting of warehousing capital and storage;
- cost associated with inventory as incoming stock level, work in progress;
- service costs, consisting of cost associated with stock management and insurance;
- cost held up as finished goods transit;
- risk costs, consisting of cost associated with pilferage, deterioration, damage;
- cost associated with scrap and rework;
- cost associated with shortage of inventory accounting for lost sales/lost production.

Therefore, measuring inventory at supply, production, distribution and scrap levels as well as accuracy of forecasting techniques, can provide an insight into the cost performance and reduce the lead-time in a supply chain.

Thus, each company needs to create on supply chain capabilities and resources to bring products and services to the market faster, at the lowest possible cost, with the appropriate product/service features, and the best overall value, from the search for sustainability.

Reducing the social cost in transport operations by sustainable logistics







A factor to be considered is the social and environmental cost of transport operation. Breaks down the implementation of measures to reduce the total social costs of cargo transport in

an extensive way as part of cost preferably logistical ally to the goals of less impact to society. The social costs are formed by six components, convertible into organizational objectives (SANTOS; AGUIAR, 2001, p.195):

- Contribution to the regional economy, state and national levels;
- Operational Efficiency (including traffic congestion);
- Security road;
- Environmental impact;
- Costs Community (especially the cost of road construction and maintenance);
- Urban Form.

Ogawa (2004) proposes the modal shift must have a scientific connotation facing environmental concern, with this approach Ogawa (2004) proposes a modal exchange with high emissions of CO₂ in the atmosphere by a transport that fewer hits the environment. Means acquire knowledge to user of the cargo transport to move the goods from trucks to trains and ships. This is because with greater transport capacities have lower CO₂ emissions per unit shipped. Ogawa (2004), simplifies a coaster that emits almost 20 times less CO₂ emissions compared to a small truck.

Table 2: CO₂ emission per unit shipped by the types of transport when a ton of cargo shipped to a kilometer

	Large Tunker	1
	Large containership	3
	Train	6
	Coast carrier	11
	Truck	49
	Small truck	226
	Aircraft	398

Source: Ogawa (2004).

The decrease in social costs and reduces CO₂ emissions are a step toward sustainability. In present study, it oftens by the total logistics chain, including production, operation, procurement, hub, and others aspects the part of supply chain.

Almeida (2002) considers that sustainable development is related to the population growth and this in too; affect the ability to deal with the environment and to meet basic needs. To deal with this issue of increased consumption, proposes broad policy reforms that would change the supply problems, with assistance and technology reorientation.

Understands the difficulty of adapting technology to environmental needs, but the solution is the risks management, which currently has not been used to guide the environmental decisions.

Finally, it proposes a change in perspective and attitude, both in developing countries as developed countries. In this sense, notes the need to harmonize the integration of economic and ecological factors in the legal systems and in the decision making process of countries around the world.

For Sachs (1993, p.71), the ecology development that can be achieved with new instruments should consider alternatives to the time of the marginal and divergent conventional paradigm for restructuring costs and activities, evaluating the impact to the environment.

Research Methodology

The present research is characterized as an exploratory case study where it searches to analyze mainly some variables related the modal shift theory. For Yin (1994) the case study is applied with objective to approach one description for reality definitive. The main characteristics in use is to question how and the reason of the facts, not being necessary as premise the control about the behavior of the event.

Gil (1999) complements that the case study shows appropriately to this type of empirical investigation is characterized for the deep and exhaustive study of an object, allowing one detailed knowledge. The case study is considered a type of qualitative analysis and what, second Laville and Dione (1999), is an investigation that allows to supply explanations in what it concerns straightly the respected case and to the elements that mark the context. The advantage of this strategy is the possibility of deepening it offers, because the resources are concentrated in the case endorsed. The method of the case study, many times, is placed as being more appropriate for exploratory research.

The case study was performed in Toyota Motor European. In order to take account of the objectives of the research, clarifies that the method of non-probability sampling by Gómez (2001) as the method in which the researcher chooses the sample which best suited to the study. Within this perspective, the data were collected from the leaders of the company in analysis in Brazil and documents by Toyota in Internet and so on. The sampling method non-probability is adequate

due to lack of information systematized of the market and the need to know better the environment. The technique of data collection was by documental research was also used, because it is a technique that prime by analysis of any material or knowledge that is susceptible to be used for consultation, study or test. The data were interpreted by means of content analysis supplied subsidies to achieve the objectives proposed.

Thus, the search is supported in methodological triangulation, as Alencar (1999) has constituted an attempt by the researcher to increase the confidence of the results, in view of the complexity of the phenomena that are the object of study of social research. The content analysis technique is used to codify and analyze the documents, then it doing descriptive explanatory statements on the literature composed of documents (BABBIE, 1999). In reality, it is an analysis and demonstration of the elements of content, with intention to clarify the different characteristics and extract its significance. The use of such analysis provides for three basic phases, second Godoy (1995) the pre-analysis – which can be identified as a stage of organization, which involving a first contact with the documents to be submitted to analysis; the holding of the material – stage of the researcher reads the documents selected, adopting a procedure for codification, classification and categorization; and the treatment of results – where the researcher used-if the raw data to make-them significant and valid, using the technical quality.

Data were analyzed collected in the company in study, by decision that invested in sustainable logistics, showing evidence of benefits that may be obtained with the adoption of this concept by means of content analysis.

Toyota Motor European Case Study

Toyota emphasis changes from adoption of tools such as Lean Thinking, especially in logistics processes. In terms of sustainable logistics, company focuses on greater flexibility in transport operations, specifically in Toyota Motor European, since the transportation sector is responsible for affecting the environment, being the main source of CO₂ emissions. To Orsato (2009), it's a smart and efficient strategy:

Eco-efficiency strategy can lead to breakthrough innovations and radical improvements in resource utilization. By applying Lean Thinking in operations management, wastes and by-products can eventually be converted into new sources of revenues. Finally – and more important – lower emissions of carbon dioxide (CO₂) via eco-efficient strategies are becoming increasingly lucrative, affecting the competitiveness of corporations in an unprecedented way. Solutions to global warming encompass new market mechanisms that will progressively reward eco-efficient strategies.

In this focus, is intelligent to companies develop new sustainable strategies that means changes and results to the company, by environment, social and economics benefits. Guided by a vision of sustainable mobility, which strikes a balance between economic growth and environmental protection, the company invests as follows (TOYOTA MOTOR EUROPEAN, 2009):

- Pioneering ground-breaking environmental Technologies such as hybrid (petrol/electric) and fuel cell (hydrogen) drive systems;
- Developing a wide range of vehicles powered by fuel efficient petrol and clean diesel engines;

- Reducing the environmental impact of all their operations;
- Minimizing the natural resources used in manufacture and maximizing recycling and reuse;
- Working with local communities to improve the quality of the environment.

The need for these investments is proven in recent research by the International Panel Climate Change (IPCC, 2009), as well as the sustainability report of Toyota Motor Europe, which shows that nearly a quarter of CO₂ emissions in the world comes from transportation activities, where it is found that eighty per cent of emissions come from cars.

Therefore, this company monitors the efficiency of their logistics operations and methods continually to ensure the best solutions are being used at all times to minimize such problems.

The Toyota' management believes that something must be done and that it is their responsibility to lead the industry's response to the environmental challenge. Through a combination of wide-ranging creative technologies, and in cooperation with key stakeholders – industry, government, nongovernmental organizations, partners and customers – already achieved a great deal, and their support aim to achieve much more. To this company, environmental sustainability is the single biggest challenge facing their industry and society this century, because the response affects not only products but every aspect of their business and every person in it (TOYOTA MOTOR EUROPEAN, 2009).

There is no tradition in logistics management development, but Toyota in Brazil has been participating operational tests performed on new processes, the multimodal transport system, as like the European example.

In Brazil, where there are several logistical bottlenecks due to infrastructure lack, the company adopted the practice to obtain multimodal logistics development, shifting the burden of

making the shift from road to rail - the performance goal is to minimize greenhouse gas impact - Stuffing Green Housing (GHS).

Brazil's Toyota, benchmarking with Toyota Motor European, is the pioneer automaker in South America that use service from rail logistics operators to obtain a sustainable logistics, to run tests in transport modes under multimodal transit, one of the corporations that seek greater flexibility in logistics operations, to maximize eco-efficient modes.

With the strategic use of an eco-efficient modes, such as the railroad, when associated with customs procedures for expeditious cargo movement, logistics development is complemented by the possibility of calculating the sustainable mobility, which is perceived as quantitative methods of mileage sum between the industrial automakers plants, with calculation of the supply chain magnitude to the sites for distribution of assembled vehicles.

The effectiveness of this proactively transport practice can create paradigms to establish performance indicators for lower mileage, obtain emission reduction by exploiting distance reduction involved in distribution process.

Thus, the sustainability strategy is a taxable event to calculate the distance industry and distribution channels, which are involved in operational logistics. The purpose is to analyze the market geographical position by calculating the resale shops for cars (finished goods), the local concentration of parts and other products involved in logistics processes.

Sustainable Logistics in Accessories Services

The distribution sector, of parts and accessories for retail services, can be controlled by regional and national distribution centers, but determination of replenishment occurs in Japan, as

well as supply the Toyota Motor Europe, which has its distribution center in Belgium, and may also benefit from local providers.

In 2004, Toyota began to quantify the collective data of CO₂ emissions to identify areas where it can make emission reductions. To share services and accessories logistics, such action resulted in improvements implementation in efficiency and capacity, route planning and transportation modes.

In five years, was creating in company the Environmental Action Plan aiming at reduction ten percent of CO₂ volume transported as compared to 2004. Based on the worst calculation, total absolute CO₂ transport emissions, which increased between 2006 and 2007 due to expansion of new warehouse distribution operations, the growth occurs in countries such as Ukraine, Algeria and Turkey, among others.

Later, emissions per transported volume were stabilized by Toyota Motor Europe by following efforts:

- Increased mega trailers use, which allowed to carry a larger volume by lorry;
- Change the route to rapid supply parts and components movements for Russia, and Belgium to Finland (year-round continuous flow);
- Reduction negotiated with the Germans an additional, re-organization (clustering) of line-haul and Milk-Run capacity, and new Czech distribution warehouse;
- Implementation of hail transport (truck replacement) between Hamina- Finland and St. Petersburg for the Russian route.

It can be possible by a new structure directed towards the sustainability achievement, knowledge and learning about the human systems. To Liker and Meier (2007), the Toyota Talent

is understood the nature of human systems and the non-perspective of self-sustaining, because it's not exists in logistics:

Managers who expect good processes to be self-sustaining are viewing they processes as purely technical and do not understand the nature of the human systems [...] unfortunately, humans are not like machines. They cannot be programmed to do the same repetitive task over and over with a minimum of preventive maintenance. They take lot of maintenance.

This perspective of Toyota shows the sustainable culture is recognized in companies and is the base of their concerns about the environmental and social resources. Thus, the structure created is necessary to support the change and receive the sustainable logistics approach.

The international infrastructure relevance and Sustainable Logistics

In international infrastructure by sustainability, the car type is one of the aspects that can be modifying to represents lower CO₂ emission, or even zero emission. To Toyota, oil is a limited resource and its use has a negative impact on the environment. This means that now is the time to start developing vehicles powered by alternative fuels such as biofuels, electricity or fuel cells. To create new vehicles based on energy sustainable, it's important building a proper structure to change of products concept. More than this, the sustainability is a good business.

Spiegel, Mc Arthur and Norton (2009) believe in energy shift and invests in new forms, as an advantaged business:

For businesses, the concerns about climate change will have major implications. If the prices of high-carbon fossil fuels like petroleum and coal rise to reflect their environmental impact – which will happen if global climate – change regulation is enacted – then the basic business models of some industries, such as the Power-generation industry, will change drastically. But all businesses will be significantly affected as higher prices spread across the world economy and lower-carbon alternatives become more competitive and more prevalent.

In this area, there is an international structure with potential to stimulate and speed the development. Toyota invested in technological innovations efforts by production of energy sources diversification, by fuel-efficient use, which is a sustainable mobility initiative.

For example, by initiatives to improve traffic flow based on advanced Intelligent Transportation System (ITS), beyond education initiatives to promote eco-driving practices. In other side, their first challenge was making possible to help Automobile Manufacturers, Japanese commerce association, to know and establish a voluntary commitment to achieve the level of CO₂ emissions of 140 g / km still in 2009. But, Will do it later when improving their machines efficiency, while seeking to expand its range of hybrid vehicles and then to introduce a greater number of smaller models with lower emissions, as the Figure 4.

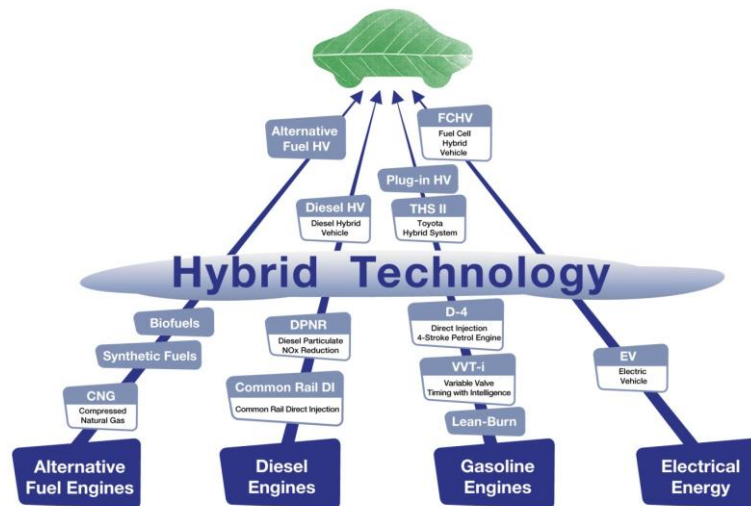


Figure 4. Toyota's Investment about hybrid Technology

Source: Toyota European Sustainability Report (2008)

The Toyota's Sustainability Report (2008) shows that to reduce the causes of harmful greenhouse gases, it is necessary to adopt globally accepted measures that go far beyond international initiatives such as the Kyoto Protocol. How sustainable logistics, the CO₂ emissions reduction throughout all links of vehicle life cycle is the main goal for Toyota Motor Europe.

The mission is scope of future prosperity by reducing emissions, which is possible by the innovative technologies introduction, development and dissemination and energy shift.

Conclusion

The sustainable logistics is philosophy business management that stays in comprehension of this is a complex concept, multidimensional, that can not be applied by a single corporate action and the creation of sustainable value requires that we take into account one of the drivers, either by reducing the consumption of raw materials and pollution, operate with broader levels of

transparency and accountability, development new technologies and meet the needs of those who are in the bottom of the pyramid of world income.

In this focuses, it means think the supply chain as a whole, not just parts of it, activities or only companies. Then, sustainable logistics is wider in different areas, such as:

- Manufacturing and distribution sustainable - environmentally friendly in order to preserve future generations;
- Recovery reverses the production disposable and helps to approach supply chain management.

Were presented recent literature that examine supply chains and reverse with a focus on people, planet and profit through multiple criteria in the formulation of problems?

A sustainability strategy should not only guide the activities development and skills, is also a form of business relationship with customers, vendors, suppliers, shareholders, politicians and stakeholders.

Companies must change the chain from the way customers think by creating preferences for products and services and all of these processes towards sustainability, and logistics have this function, by analysis of all aspects in chain.

By the example of Toyota Motor European (TME), sustainable logistics means the improvement performance of all logistics operations, in a business environment of rapid growth. This concept includes the supply chain management, production process, stakeholders, hubs. It's possible conclude that sustainable logistics makes it easy pro-active monitoring of the management of waste in processes, which are key to achieving a high level of sustainable performance in transport operations.

The transport operations have importance for the fuel emission reduction, especially CO₂, because it's an activity is becoming increasingly lucrative, affecting companies' competitiveness by eco-efficient strategies.

Thus, Toyota is a great example, to show that "what is" and "how do" sustainable logistics, in your production processes, that includes environment, economics and social costs and resources, involved by a work system care with nature, people, business and chain as a parts of one big system.

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