

Managing a sustainable supply chain

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Abstract:

In response to environmental and social problems, it is necessary to design a sustainable supply chain, which will have to be managed so as to minimize its environmental footprint, more widely share development and reduce several risks. This management will have to take account of the whole chain. Upstream, this concerns suppliers and raw materials, and calls for ecodesign and the many tools that exist for assessing sustainability. Consumption and wastes must be limited at the level of production; and buildings, ecodesigned with regard to both energy and ergonomics. The management of people must also be redesigned. Downstream, thought must be given to transportation and products at the end of their life-cycles, but the logistics of all this must be taken into account when products are designed. Solutions exist (or are to be explored) that involve new forms of technology or take account of new societal values.

Earth Overshoot Day (EOD) has continually moved forward in the year: from 12 October 1991, to 1 August 2018.¹ The planet is living on credit. Population growth and unbridled consumption are not only ransacking the Earth but also producing too many wastes. To satisfy demand, supply chains are stretching out, and freight transportation is causing more pollution. Associated with this environmental cost is a social cost for all stakeholders along the supply chain. These remarks are a cause of concern. Nevertheless, several improvements are possible; and several paths, open for exploration. More and more firms are reckoning with these issues since they want to sustainably manage their supply chain.²

Before describing a sustainable supply chain, we should define supply chain management itself. It involves managing flows of finances, materials and information from the extraction or mining of the raw materials needed to make products to the end of products' life cycles. To manage these flows sustainably, attention must be paid to the three pillars of sustainability: economic, environmental and social.

When the economic and environmental pillars are taken into account, a supply chain can be said to be "green". A green supply chain implies managing the design of products, the selection and procurement of the materials needed, manufacturing processes, distribution (as well as the reverse logistics of returned products), the use of the product, and the end of its life cycle (JAEGLER 2016). Since the Kyoto Protocol in 1997, a major indicator of a green supply chain is the quantity of CO₂ equivalent emissions.³

¹ <https://www.wwf.fr/jourdudepassement>

² This article, including quotations from French sources, has been translated from French by Noal Mellott (Omaha Beach, France). The translation into English has, with the editor's approval, completed a few bibliographical references. All websites have been consulted in October 2019.

³ The French version of the Kyoto Protocol: <https://unfccc.int/resource/docs/convkp/kpfrench.pdf>. For the English version, see https://en.wikisource.org/wiki/Kyoto_Protocol.

For a supply chain to be sustainable, it also has to take the social pillar into account. Besides managing the flows of finances, materials and information, this involves cooperation among firms on the supply chain in view of sustainable development (with its three dimensions: economic, social and environmental) and in response to the requirements of stakeholders (wage-earners, shareholders, consumers, local populations...) (JAEGLER 2016). Research on this nascent topic has been pursued since the first decade of this century. I might mention the UN's Global Compact.⁴

Why a sustainable supply chain?

All three of the pillars (economic, environmental and social) of sustainability are indispensable. Though inseparable, they are sometimes contraires.

We easily understand why the economic pillar is fundamental. The firms along a supply chain must be durable and, therefore, profitable.

As for the environmental pillar, we can see it from two angles. The first is the supply chain's impact on the environment, whether this impact comes from transportation, manufacturing or the use of the manufactured products. The pollution that results should be controlled or, at least, better controlled. Special attention is to be paid to the carbon footprint, since the CO₂ equivalent indicator has become a worldwide benchmark. The second angle is the consumption of resources, whether renewable or not, during activities along the supply chain. An indicator here might be the water footprint, since water is crucial to the environment. Some countries, like South Africa, are already facing major water shortages.

As for the social pillar, it refers to a responsible supply chain for better sharing development. It yields many advantages: boosting a company's corporate image, upholding standards, attracting talents, etc. Development thus comes to be centered on people.

Another advantage of a sustainable supply chain is that it can help limit risks. Upstream along the supply chain are risks related to the providers of services and materials and, too, internal risks (e.g., psychosocial); and downstream are risks such as product recalls. These risks affect a firm's image in the eyes of its customers and future employees.⁵

How to make a supply chain sustainable?

Upstream on the supply chain

On the upper part of the supply chain are raw materials and their suppliers. The choice of a supplier has substantial effects: environmental (location, means of production), social (working conditions, local sources) and economic. An official label "sustainable supplier relations" exists in France; and mention might also be made of the international standard ISO 20400 on sustainable procurement.⁶ The major principles are: exchanges, in particular of good practices; sustainable procurement; and a long-term collaboration between a firm and its suppliers that reinforces and

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<https://www.diplomatie.gouv.fr/fr/politique-etrangere-de-la-france/diplomatie-economique-et-commerce-exterieur/peser-sur-le-cadre-d-e-regulation-europeen-et-international-dans-le-sens-de-nos/l-engagement-de-la-france-pour-la-responsabilite-sociale-des-entreprises/les-referentiels-internationaux-et-la-participation-de-la-france-a-leur/article/le-pacte-mondial-des-nations-unies-global-compact-initiation-au-reporting-extra>

⁵ <https://pour-un-reveil-ecologique.fr/index.php>

⁶ <https://www.iso.org/news/2016/08/Ref2105.html>

consolidates their relations. Among the indicators for assessing procurement sustainability proposed by Obsar (Observatoire des Achats Responsables) are: the signature of a charter; the amount of purchases from businesses that employ, for example, the long-term jobless; and the percentage of specifications relying on criteria related to corporate social responsibility.

The choice and uses of raw materials must be reviewed to change the business model and enter into a circular economy, which, inspired by natural ecosystems, creates virtuous cycles. The idea is to avoid wastes and reuse a product's raw materials for other purposes at the end of its life cycle, whence a circular economy. For this purpose, ecodesign is an indispensable means for managing raw materials, manufacturing processes and the end of the product's life cycle. According to a French standard on environmental management (NF 30-264), the intent is to *"systematically integrate environmental aspects from the phase of design and in the development of products (goods and services, systems) with the objective of an equivalent or better service while reducing negative environmental effects throughout the life cycle. This approach at the very start of the design phase tries to strike the best balance between environmental, social, technical and economic requirements in product design and development"*. Several standards exist about this, such as ISO 14062 on product design and development, ISO 13427-13432 on packaging and ISO 14040-14049 on life-cycle assessments.

The in-house supply chain

The internal supply chain refers to all of a firm's activities. Buildings are to be ecodesigned for consumers or for the well-being of the workforce. Manufacturing processes must reduce fewer wastes and consume less water and energy. Several tools have been made to analyze processes in a sustainable supply chain. The Supply Chain Council has created SCOR (Supply Chain Operations Reference) in 1996, and has recently added to it the environmental dimension: GreenSCOR, based on the product life cycle. Several indicators and good practices have been proposed. Other tools are ASLOG, EVALOG, Supply Chain Masters and the new reference for logistics based on corporate social responsibility from the Ministry of the Environmental Transition Solidarity.

Sustainable management also encompasses the management of the firm's workforce. To business as usual, it adds the idea of business as unusual, which refers to practices of sharing with stakeholders, the corporate image (based on reputation), ideas of trust and loyalty, and a vision of values and "missions" (JAEGLER & ROQUES 2017). Since people are in a quest for meaning, meaning must be given to work, both operationally and strategically. The feeling of belonging must be fostered through, for example, the "company's culture". Everyone must find their place in pursuit of a common, clearly defined goal. New managerial forms are taking shape, such as "liberated firms". In general, more responsibility and autonomy are to be let to wage-earners, the underlying postulate being that doers are the best decision-makers.

Downstream on the supply chain

Transportation causes nuisances: air pollution due to greenhouse gas emissions, sound pollution, congestion, accidents and so forth. Firms can choose local suppliers, but their customers are worldwide. Therefore, thought must be given to both long-haul transportation and the last mile of delivery. Last-mile logistics refers to the last link in the supply chain, for which there is no mass solution in downtown areas. For deliveries, urban alternative solutions exist: freight bikes, inland navigation (for cities crossed by waterways), drones, autonomous robots, vehicles that run on electricity or biofuels, and so forth. New models of distribution are also being adopted, such as short distribution channels, click-and-collect, pickup delivery, etc.

Once a product is delivered and used, a sustainable management of the supply chain means dealing with the end of the product's life cycle. The logistics of returns and recalls (flows from a destination downstream to stations upstream in the supply chain) is more complicated than that of flows downstream. Returns are erratic with regard to the quantity, location, state of materials, etc. This reverse logistics must abide by regulations about electronic wastes for example, and take account of customer satisfaction, maintenance and guarantees, and be familiar with the markets for second-hand goods and recycling. This reverse logistics might be closed (inside the firm) or openly involve other parties.

The future of sustainable supply chain management?

Technology and customer expectations are changing fast. As we know, many an occupation will soon no longer exist, but others will emerge, for instance in "garbology".

Artificial intelligence, robots, blockchains, and digitization force us to inquire into the place for human beings in future supply chains. Wage-earners will undergo ongoing training for maintaining their employability and for the sake of the firm's future. For the future supply chain, a question also arises about how these forms of technology will affect the environment. The accelerating trends in new technology are pushing energy consumption while customers are becoming ever more conscious of environmental problems.

References

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