

**final report**

Titel

**Sustainable Supply Chain**

**Management Revisited**

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Sustainable Supply Chain Management Revisited

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## Projecting sustainable development: the challenge

The almost boundless challenge facing all initiatives that in the broadest sense serve to deliver some contribution towards the introduction of sustainable development patterns into current resource consumption is primarily a methodological assignment. All too often a concrete improvement proposal that is inevitably located in somebody’s backyard is disqualified or derailed on the grounds that it lacks some pre-conceived sustainability attribute or fails to document an indicator value listed in a static set of sustainability indicators, of which there is indeed no shortage. What makes the real challenge and real choices so awesome is the vast number of interactions and interdependencies between the range of factors confronted by decision makers. The methodology outlined below is directed towards this target group and to creating a framework that makes sustainable decisions possible and rid the concept of sustainability of its esoteric exclusiveness.

The European Interreg North Sea project “enercoast” (2008-2012) was initiated on the assumption that a generic methodological approach can be generated that can facilitate progress in a range of bioenergy initiatives across Northern Europe. At the outset it was acknowledged that many such initiatives fail due to their purely technological focus and the neglect of market influences from outside of a narrowly defined stakeholder setting. Hence the development of an appropriate business tool focused on how new value chains can be projected and constructed in such a manner that can be transparently documented as sustainable and thereby attract the interest of diverse stakeholders needed for the uptake of the innovation in question.

The project initiative was based on a visionary concept of Sustainable Supply Chain Management (SSCM) first promoted by Seuring and Müller in 2006[[1]](#footnote-1). In revisiting the concept the measures taken in the project to develop an operational process perspective have been added.

## Classic Supply Chain Management and its limitations

Assembling new value chains has become a standard procedure in all streamlined business ventures directed not only to global markets but also regional markets characterized by options available to both business partners and consumers. The term Supply Chain Management can be traced back to an interview given by consultant Keith Oliver for the Financial Times in 1982; since the 1990’s it has gained the undisputed status of a standard business management tool.

According to Mentzer supply chains are “a set of three or more entities (organisations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and / or information from a source to a customer”. SCM means “the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole”[[2]](#footnote-2).

The traditional SCM focus is closely associated with logistics optimization in line with the “QSDFC” paradigm that scrutinizes cross-business functions in terms of quality, speed, dependability, flexibility and costs. Although complex by nature the featured relationships are made manageable via the deployment or, more accurately, enforcement of a single stakeholder perspective. Hence dominant supply chain stakeholders (such as car manufacturers) provide themselves with a technique for imposing precise contractual demands on (automotive component) suppliers[[3]](#footnote-3). The profit reaped by the dominant stakeholder is aptly attributed to successful supply chain management.

The attractiveness of the SCM approach for promoting our project objectives is based on the scope the business tool has to offer and its ability to handle complex interests and performance factors und sublimate these to the promotion of a declared objective. The shortcomings are equally apparent: the focus on a single stakeholder perspective is unsuited to designing sustainable supply chains, which need to consider disparate and even conflicting interests. Also, sustainable development criteria do not feature in the classic SCM business paradigms.

The task of putting SCM methodology on a sustainable footing has been made less formidable through more subtle and cooperative advances on the classic SCM model including developments in stakeholder theory and collaboration theory. The latter is based on the striving for “collaborative advantage” produced by “designing and managing a network of interdependent relationships developed and fostered through strategic collaboration”[[4]](#footnote-4). Although by no means a sustainable development credo, the refined network approach to SCM is more suited to engaging diverse stakeholders in delivering consensus-based energy solutions. In the same vein Kanter’s “strategic management perspective” targets collaborative advantage as a key objective in structuring supply chain relationships[[5]](#footnote-5).

## Inroads into “Sustainable Supply Chain Management”

The origins of the concept of Sustainable Supply Chain Management (SSCM) and the history of efforts to establish SSCM as a discipline in its own right can be traced with the help of literature reviews, particularly Seuring, Müller (2008)[[6]](#footnote-6), Gupta, Palsule-Desai (2011)[[7]](#footnote-7) and Gold (2010)[[8]](#footnote-8), whereby Gold’s review is especially relevant as it relates directly to bioenergy chains. Gupta and Palsule-Desai, on the other hand, are keen to regroup a range of undisputed environmental management techniques and models (LCA Life Cycle Analysis, EPR Extended Producer Responsibility, remanufacturing, CLSC closed loop supply chain management etc.) under the SSCM umbrella at the expense of blurring the contours of the immature concept. Also, their assumption “that firms take sustainability as a strategic priority” can hardly be rated as the most enticing invitation to energy stakeholders to enroll in a joint sustainable venture.

Gold’s review concludes with “specific strategies and success factors of how to manage effectively and efficiently bio-energy systems” noting that “Bio-energy chains have to reduce social and environmental challenges of their activities as well as utilisation rivalries as far as possible, while—where applicable—credibly communicating these efforts”. Such easily formulated prescriptions fall short of a strategy that integrates sustainable development factors into the bioenergy process design, which is central to the enercoast undertaking.

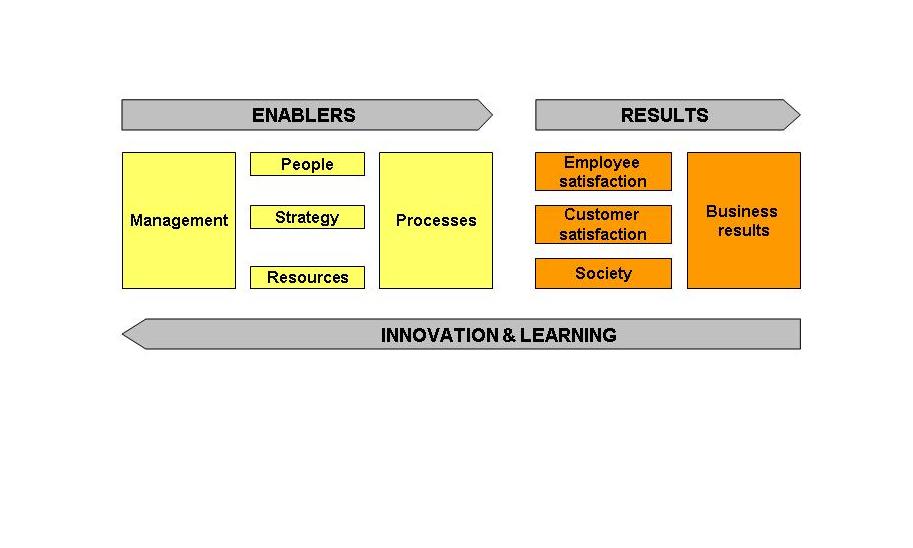
The current SSCM library comprises volumes of concept investigations and specifies a number of commendable attributes. However, the recommendations generated out of the cited reviews are void of any operational focus and therefore unsuited to shaping, let alone running a sustainable process. A merger between SSCM and process management is long overdue.

## Shaping an operational SSCM framework

The missing link detected above relates to the lack of process dynamics in the SSCM sub-discipline of supply chain management. Yet, process management is an equally well established business methodology as supply chain management. Within the framework of promoting the enercoast objectives it was quickly realized that a sustainable development dimension could not be infused into bioenergy supply chains as an add-on feature. Instead, such a component needs to be integrated into the processes in question or simply not feature at all.

Since the classic quality management standard ISO 9000 adopted a process approach as of the year 2000, a proven framework has been made available for including diverse quality objectives into operational processes. The inclusion of sustainable development considerations as quality priorities can serve not only to demystify the “sustainability” phenomenon; such an approach increases the chances of effective contributions by stakeholders whose professional interests lie outside of the mainstream sustainability community.

Guidance in shaping an operational SSCM framework for upgrading bioenergy supply chains was found in the EFQM model[[9]](#footnote-9), which depicts the scope for process optimisation as a product of the following interacting elements and factors:

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Both the differentiation and the interaction between results and enablers stress that improved performance is not achieved by redesigning a set of performance indicators (measurement tools) but by focusing on the enablers or drivers. Inspired by the EFQM approach the enercoast initiators adopted the following approach to initiating a range of bioenergy processes:

1. Define key generic bioenergy processes /process stages
2. Formulate targets for each process
3. Define enabling elements or drivers for each target
4. Select indicators for each enabler

These elements were embedded in the following generic framework:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Process stage** | **Targets** | **Enablers** | **Indicators** | **Indicator units** |
| 1. Materials supply |  |  |  |  |
| 2. Logistics |  |  |  |  |
| 3. Production |  |  |  |  |
| 4. Grid distribution |  |  |  |  |
| 5. Consumption |  |  |  |  |

The “enercoast matrix” that evolved out of such an approach offered substantial benefits in structuring the work on a number of diverse supply chains spread over five countries:

* Sustainable development targets could be set in step 2 and thereby shape all efforts to follow.
* No targets could be set without at the same time naming the enablers that could deliver them.
* Indicators ceased to enjoy a stand-alone status and were related directly to the defined targets, i.e. they merely reflect a posteriori to what extent the targets were met

The features highlighted above allow for a status quo analysis of the individual supply chains (SSCM Analysis) before and after project intervention based on the defined enablers. The selected interventions include a range of enabler-focused activities such as the delivery of a biomass inventory for a defined region, the facilitation of a municipal energy plan, experiments with new bioenergy crops and the building of a biogas grid linking suppliers and consumers of local bioenergy. In many cases the matrixes have grown to display a range of options packaged as business plans[[10]](#footnote-10) , which present real (investment) choices to stakeholders based on a transparent balancing of achievable and less achievable declared targets.

The decisive outcomes from this process approach to sustainable supply chain management relate to the selection of real supply chain options generated from work invested in the defined enabling functions, which in turn relate to pre-defined targets shared by the supply chain stakeholders. Irrespective of the investment decisions taken the approach offers two sets of key advantages: transparency and fallibility, neither of which is an add-on abstract attribute.

“Transparency” refers to the visible link between a proposed investment option and the business, environmental and social targets it is designed to achieve together with the means of achieving them. “Fallibility” is a key to project development in that “the best-laid schemes o’ mice an’ men”[[11]](#footnote-11) are all subject to revision as soon as more mice or men or women become involved and articulate their priorities. In matrix terms these do not deflate the existing set of interrelationships; they simply add to them and their complexity. The enercoast approach rejects the widespread recourse to simplistic reductionism that characterizes much of the “sustainability” debate and pays tribute to the fact that real and important decision-making is never easy. Qualified decision-making, on the other hand, can be communicated and thus fulfill a prerequisite for enrolling diverse stakeholders in the promotion of consensus initiatives that contribute to a sustainable development agenda.

1. Seuring and Müller (2006): Zum Entwicklungsstand des nachhaltigen Managements von Wertschöpfungsketten, UmweltWirtschaftsforum 14, Springer Verlag [↑](#footnote-ref-1)
2. Mentzer et al, (2001): Defining Supply Chain Management, Journal of Business Logistics, Vol 22, No. 2, 1-25 [↑](#footnote-ref-2)
3. The classic SCM approach can be witnessed in all sectors that reach such economies of scale that attract high-volume investment. The current reshaping of the wind industry from a regionalized energy initiative borne by energy farmers to a utility-dominated supply chain is a case in point, where the car manufacturers’ toolbox is re-used with a resulting and intended power shift from manufacturers to wind farm owner-operators. [↑](#footnote-ref-3)
4. Chen and Paulraj, 2004: Towards a theory of supply chain management: the constructs and measurements, Journal of Operations Management 22(2) [↑](#footnote-ref-4)
5. Kanter, R.M.(1994), Collaborative Advantage: the art of alliances, Harvard Business review 72(4): 96-108 [↑](#footnote-ref-5)
6. Seuring, Müller (2008), From a literature review to a conceptual framework for sustainable supply chain management, Journal of Cleaner Production 16(15): 1699-1710 [↑](#footnote-ref-6)
7. Gupta, Palsule-Desai (2011): Sustainable supply chain management: Review and research opportunities, IIMB Management Review, 23, 234 - 245 [↑](#footnote-ref-7)
8. Gold, Stefan, 2010: Bio-energy supply chains and stakeholders, *Mitigation and Adaption Strategies for Global Change*, Springer Science+Business Media [↑](#footnote-ref-8)
9. EFQM, formerly known as the European Foundation for Quality Management, goes back more than 20 years ago, when 14 CEOs joined forces in 1988 to develop a Management tool that would increase the competitiveness of European organisations. Supported by the European Commission in the European Quality Promotion Policy, the founding members created the EFQM Excellence Model, www.efqm.org. [↑](#footnote-ref-9)
10. The enercoast business plans, not the central focus of this paper, can be downloaded from the programme website: [www.enercoast.eu](http://www.enercoast.eu) [↑](#footnote-ref-10)
11. Robert Burns, “To a Mouse”, Poems chiefly in the Scottish dialect”, Kilmarnock, 1785 [↑](#footnote-ref-11)