



14th Global Conference on Sustainable Manufacturing, GCSM 3-5 October 2016, Stellenbosch, South Africa

## Creating value by sustainable manufacturing and supply chain management practices – a cross-country comparison

Juliana Kucht Campos<sup>a\*</sup>, Frank Straube<sup>a</sup>, Sebastian Wutke<sup>b</sup>,  
Patricia Alcântara Cardoso<sup>c</sup>

<sup>a</sup> Technische Universität Berlin (Technical University of Berlin). Strasse des 17. Juni 135, H90. Berlin, 10623 Germany

<sup>b</sup> International Transfer Center for Logistics (ITCL) GmbH. Alt-Moabit 73. Berlin, 10555 Germany

<sup>c</sup> Universidade Federal do Espírito Santo (Federal University of Espírito Santo). Av. Fernando Ferrari, 514. Vitória/ES, 29075-910 Brazil

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### Abstract

Research on the development of multinational companies towards a more sustainable business reveals country specific particularities in this process. In order to build a cross-country collaboration framework, sustainability reports of leading companies from developed and developing countries were analyzed and statistically significant differences identified. The framework contributes to comprehending the variables that influence supply chain and manufacturing performance, supporting the identification of opportunities for value creation through cross-country collaboration towards the development of sustainable innovations.

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Peer-review under responsibility of the organizing committee of the 14th Global Conference on Sustainable Manufacturing

*Keywords:* Sustainability; supply chain; manufacturing; practices; framework; value; country; Germany; Brazil

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### 1. Introduction and Context

Sustainable supply chain (SSC) management and sustainable manufacturing have received increased attention during the last years by companies and literature [1]. The need for changing the way people, companies, and governments behave is evident. Supply chain managers are being observed as catalysts for corporate transformation

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\* Corresponding author. Tel.: +49 030 31422877;  
E-mail address: [juliana.campos@ufjf.br](mailto:juliana.campos@ufjf.br)

[2] and customers as drivers towards more sustainable business practices of companies. Industry is one of the main source of greenhouse gas emissions and multinational enterprises have the power of promoting long-term and collaborative solutions that contribute to reducing emission from the entire supply chain. Due to particular characteristics and demands from regulations, market and customer [3], companies react differently. Previous researches found differences according to the industry [4] and country [5], [6], nevertheless studies about differences in practices implemented by developed and developing countries for further map of collaboration opportunities are still missing.

For the present research, companies from Germany and Brazil represent the two analyzed groups. Germany is internationally recognized as one of the leaders in sustainable development due to its investments in eco-efficient technologies, renewable energy and measures for achieving the emissions targets [7]. Companies are pressured by taxes and regulations to act more sustainable – e.g. European Union (EU)’s Renewable Energy Directive which aims to increase the share of renewable energy to 20 percent by 2020. Brazil is a leading emerging country in environmental challenges [6] and has been increasingly investing in deforestation control measures and reverse logistics processes and solutions [8]. The logic of studying initiatives implemented by companies from these two countries is that global problems such as climate change require worldwide collaboration in order to get the so-called relational rents: “a supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partners” [9]. Instead of just analyzing how multinational companies react regarding SSC initiatives, the present research goes beyond and presents a framework based on companies’ reality. In addition, by using a holistic model as research background, inter-multidisciplinary research is promoted with a global collaborative perspective.

## 2. Materials and Methods

In order to develop the proposed framework, the authors conducted a content analysis with 18 sustainability benchmarks, where text data is systematic classified and patterns identified [10]. The sample, displayed on table 1, consisted of large leading multinationals which are more likely to engage in SSCM [11], benchmarks in sustainable initiatives (listed in “The Newsweek Green Ranking” 2012 or 2014), from four different industries and with headquarters in either Germany or Brazil.

Table 1. Sample of companies

	Germany	Brazil
Consumer Goods	Bayer; Adidas; Beiersdorf; Henkel	BRF; Natura; Ambev; JBS
Basic Materials	Linde; BASF; Heidelberg Cement	Petrobras; Vale
Industrial Materials	Thyssenkrupp; Siemens	Gerdau
Retail	Metro	GPA

The coding scheme followed the framework for managing sustainable supply chain practices [12], which consists of three areas, seven dimensions, 21 categories and 92 types of practices. It starts with initiatives related to supplier relationship management (categories selection, assessment and collaboration), followed by those related to the internal supply chain management (governance, procurement, production, distribution and waste management dimensions) and finalizing in the target of all initiatives – customers.

The source of data was public available documents – annual and sustainability reports [3] from 2012 until 2015. These are powerful instruments to inform partners, investors and society about firm’s commitment level with sustainability, although it is difficult to determine whether described measures and initiatives are in fact implemented or just reported to appease stakeholders [13]. On the other hand, not all measures and set targets are published in the reports. For the quantitative statistical analysis, each of the database’s cells (92 practices x 32 firms) were coded 1 in case of at least one practice reported and 0 in case of absence of practices reported. The Fisher’s exact test was used to identify which types of practices were statistically significant different (p-value less than 0,05) between the countries.

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