



# NOVA

SCIENCE PUBLISHERS, INC.

## HURDLES TO GREENING THE SUPPLY-CHAIN

Edeltraud Guenther  
Anne-Karen Hueske

400 Oser Avenue, Suite 1600  
Hauppauge, N. Y. 11788-3619  
Phone (631) 231-7269  
Fax (631) 231-8175  
E-mail: [Main@novapublishers.com](mailto:Main@novapublishers.com)  
<http://www.novapublishers.com>

In: "Supply-Chain Management"

Editor: Regina M. Samson

ISBN: 978-1-61668-284-2 2011



The license for this PDF is unlimited except that no part of this digital document may be reproduced, stored in a retrieval system or transmitted commercially in any form or by any means. The publisher has taken reasonable care in the preparation of this digital document, but makes no expressed or implied warranty of any kind and assumes no responsibility for any errors or omissions. No liability is assumed for incidental or consequential damages in connection with or arising out of information contained herein. This digital document is sold with the clear understanding that the publisher is not engaged in rendering legal, medical or any other professional services.

## *Chapter 11*

# **HURDLES TO GREENING THE SUPPLY-CHAIN**

*Edeltraud Guenther and Anne-Karen Hueske*

Technische University Dresden, Germany

## **Abstract**

Companies face an increasing demand to be socially responsible not only within their own plants but throughout their whole supply-chain. Procurement is the gatekeeper for this process as these decisions determine what passes the thresholds of a company and, as a result, of what the input consists in the production process. Therefore, this chapter focuses on greening the purchasing process. Green practices are considered more and more in supply-chain management. However, when it comes to implementation, multiple hurdles are faced. Based on various empirical studies, we can conclude that green practices are more than adding some green criteria in the list for the purchasing decision. The whole purchasing process needs to be reconsidered. There is no universal strategy to overcome hurdles to green practices; instead, they need to be analyzed on the company level. Therefore, we have developed a self-evaluation tool based on theoretical consideration and enhanced it during several practical applications. This tool allows organizations from the private and the public sector to identify their hurdles on the way to green procurement. This tool surveys the actors of the procurement process by means of an online questionnaire which includes a hurdles catalogue. Based on these results, the hurdles are investigated. The organization receives a hurdle profile and a hurdle portfolio. The hurdle profile allows it to evaluate and rate the hurdles by their relevance for the organization. Furthermore, the hurdle portfolio allows the organization to identify strategies to overcome these hurdles. Summarizing, the hurdle analysis provides companies and public authorities with a tool to analyze what hampers the greening of the supply-chain and what steps to undertake to overcome these hurdles.

## **Introduction**

Increasing attention is paid to sustainable supply-chain management (Seuring and Müller, 2008). Consequently, green practices are considered more and more along the supply-chain. Procurement is the gatekeeper for greening the supply-chain because at this point the decisions are made about what passes the thresholds of a company. In this way the purchasing manager directly determines the input of the production process and thereby indirectly

influences the throughput and output of the company. We argue that greening procurement can improve the whole value chain (Günther and Scheibe, 2005). The first guidelines for green procurement were written three decades ago. Since the 1980s, a variety of public and private initiatives for practicing environmentally oriented management has sprung up all over the world (E. Guenther and Scheibe, 2006). Furthermore, there is a range of tools like life cycle costing (Hunkeler, Lichtenvort, and Rebitzer, 2008; Woodward, 1997) and life cycle assessment (see European Committee for Standardization, 2006a; European Committee for Standardization, 2006b) which assist procurement managers to include environmental aspects. However, the existence of instruments and tool was not enough to foster green procurement. At present, environmental aspects are not as widely integrated as they should be regarding their relevance due to resource shortages, for example oil, or increasing stakeholder pressure. Therefore, greening the supply-chain can be the essential step ahead of the competitors.

This chapter supports companies in their effort towards improving the supply-chain by more environmentally friendly procurement. We introduce the hurdle analysis which enables organizations to identify and evaluate factors which may hamper, decelerate or even block green procurement, so-called hurdles (barriers). Green procurement is one application of the hurdle analysis. However, the methodology can be used for different change situations in organizations, like, for instance, the application of innovative technologies.

In the next section, we describe how the hurdle analysis was developed, tested and improved during several research projects. The following section introduces the underlying theoretical considerations. We model the procurement procedure as a decision-making process and outline possible hurdles. Consequently, we introduce the methodology of the hurdle analysis. Concluding, we summarize the contribution of the hurdle analysis for greening the supply-chain.

## Development of the Method

Based on this preliminary theoretical work, the method of the hurdle analysis was developed, empirically tested and further improved during several projects (see *figure 1*).

The idea of hurdle analysis originated in the project RELIEF (Environmental relief potential of urban action on avoidance and detoxification of waste streams through green public procurement). Public procurement, in particular procurement decisions of municipalities, account for a weighty part of gross domestic products in industrialized countries. Starting from this potential influence, public procurement has great potential for initiating and supporting sustainable development. The state can act as a role model for the private sector. However, approaches taken so far did not have substantial impact on production processes and products (E. Guenther, 2003).

Consequently, within the scope of the project RELIEF, perceived hurdles to green public procurement were identified as important influence factors for decision makers. An exploratory study on hurdles to green procurement was conducted. Based on theoretical

studies done beforehand, a hurdles catalogue was developed and tested in six European municipalities (see figure 2).<sup>1</sup>



Figure 1. development of the hurdle analysis at the TU Dresden.

Regulatory Hurdles	Hurdles due to lack of instructions	Hurdles within the administration			Informational hurdles		Technological hurdles
		Economic hurdles	Organizational hurdles	Motivational hurdles			
	<ul style="list-style-type: none"> <li>Environmental aspects are not included in guidelines</li> <li>Low priority of green procurement</li> <li>No political support</li> <li>Failed to create incentives</li> </ul>	<ul style="list-style-type: none"> <li>Follow-up costs are not taken into account</li> <li>Prices of alternatives</li> <li>Budget</li> </ul>	<ul style="list-style-type: none"> <li>Organizational routine</li> <li>Dezentralization</li> <li>Many actors (when complex)</li> <li>Outsourcing</li> </ul>	<ul style="list-style-type: none"> <li>Individual routine</li> <li>Indifferent behaviour</li> <li>Workload</li> <li>Communication barriers</li> <li>Lack of incentives</li> </ul>	<ul style="list-style-type: none"> <li>Lack of information</li> <li>Scepticism and rejection of eco-orientation</li> <li>Doubts concerning alternatives</li> <li>Assessment of the environmental impacts</li> </ul>	<ul style="list-style-type: none"> <li>Lack of information</li> <li>Scepticism and rejection of eco-orientation</li> <li>Doubts concerning alternatives</li> </ul>	<ul style="list-style-type: none"> <li>Costs of using a technology</li> <li>Quality defects</li> <li>Lack of experience</li> <li>No alternatives to conventional products</li> </ul>
Legislature	Representatives of Politics			Procurer		Consumer	Market
	Authorities of Administration						<ul style="list-style-type: none"> <li>Market structure</li> </ul>

Figure 2. Hurdle catalogue.

Already the first analyses made clear that the development of a universally valid strategy for overcoming existing hurdles might be difficult because of widely different perceived

<sup>1</sup> For further information about the project please visit the project homepage [www.iclei.org/ecoprocure/relief/](http://www.iclei.org/ecoprocure/relief/) or

hurdles in the municipalities. Therefore, a standardized questionnaire and structured interviews were developed and tested with local authorities.

These experiences flow into the project NABES I (POTENTIALS OF SUSTAINABLE PROCUREMENT AND INSTRUMENTS FOR THE IMPLEMENTATION)<sup>2</sup> which investigated potentials of sustainable procurement and instruments for implementation. In this context the questionnaire was tested within another case studies like hurdle analyses for German municipalities. A further survey of three English municipalities was conducted in cooperation with GLOBAL TO LOCAL LTD.

Based on this hurdle analysis for public green procurement the method was modified and adapted to green procurement in the private sector. About 950 companies, the biggest 500 German companies as well as about 450 small and medium-sized enterprises, were surveyed during the project GEB (GREEN eBUSINESS - ASSESSMENT OF THE MARKET PENETRATION OF GREEN PRODUCTS BASED ON A HURDLE ANALYSIS).

The results of these projects confirmed the presumption that there exists no universally valid strategy to overcome hurdles. Therefore, we decided to develop a self-evaluation tool for hurdles to green public procurement which enables the organizations to derive individual strategies to tackle these hurdles (E. Guenther and Scheibe, 2006). The tool provides a description of the method, an online-questionnaire, and a guide for the results interpretation. After the questionnaire is filled the results are sent via email to the organization. At present, the tool is available for hurdles to green procurement in the public sector and in the private sector.<sup>3</sup> Currently, the hurdle analysis is integrated in a teaching tool for public purchasers in Germany. During this project the hurdle analysis was applied in the purchasing agency of the German Interior Ministry.

In addition, the hurdle analysis was adapted to assess several green innovation projects, for instance, Green Chemistry. Modifications of the hurdle catalogue for the implementation of Green Chemistry base on a workshop with representatives from academia, industry, regulations, and NGOs at the Harvard University (see Matus, Anastas, Clark, and Itameri-Kinter, 2007).

With the aim to foster exchange and cross-fertilization between hurdle researchers in various fields we organized a Professional Development Workshop at the annual meeting of Academy of Management in 2009. These contacts are the basis for the establishment of a hurdle research network.

In future, we continuously further develop the hurdle analysis based on the one hand on the practical experience during its application and on the other hand derived from theoretical consideration in conversation with the scientific community.

Having outlined the advancement of the hurdle analysis the next section provides the theoretical consideration which accompanied its development.

---

have a look at (E. Guenther, 2003).

2 For further information see Hurdle Analysis <http://www.tu-dresden.de/wwbwlb/forschung/en/homepage.htm>  
[www.tu-dresden.de/wwbwlb/forschung/laufende\\_projekte/nachhaltig\\_beschaffen/en/](http://www.tu-dresden.de/wwbwlb/forschung/laufende_projekte/nachhaltig_beschaffen/en/).

3 For conducting a hurdle analysis, please register [http://www.tu-dresden.de/wwbwlb/forschung/laufende\\_projekte/hemmnisse/en/homepage.htm](http://www.tu-dresden.de/wwbwlb/forschung/laufende_projekte/hemmnisse/en/homepage.htm).



## The Procurement Procedure as Decision-Making Process

Greening procurement means to imbed green practices in organizations which are highly complex systems. According to system theory, a system (S) consists of different elements (E), which are interlinked (see figure 3).

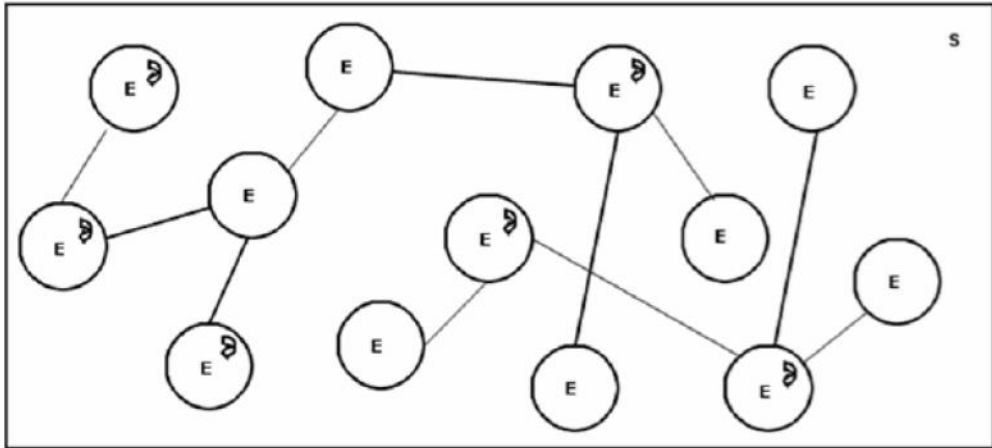


Figure 3. System. (Based on Luhmann, 2008).

Thus, hurdles can occur intra-elementary, between elements and within the system. Modeling the system provides an effective basis to analyze and structure these possible hurdles. Go green means more than including green criteria it means to investigate the decision process to assure that green practices are included in everyday decisions. This insight means for green procurement to reconsider the whole procurement process instead of just adding some green criteria to the list considered during procurement decision. Therefore we model the decision pyramid and the decision process.

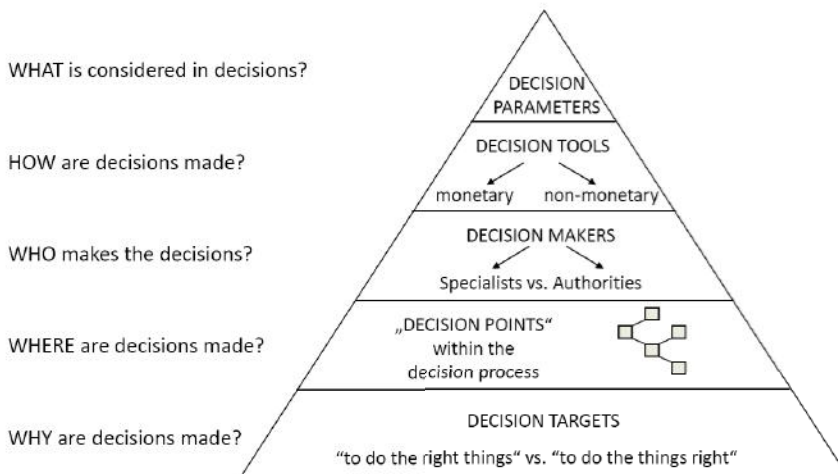


Figure 4. Decision pyramid.

The decision pyramid starts with analyzing the target. Therefore, targets are classified in strategic and operational targets<sup>4</sup>: Strategic targets ask for effectiveness: Are we doing the right things? For instance: Do we ask the right questions? Does our corporation acts social responsible within its entire supply-chain? Or a strategic question on a more detailed level is: Are we focusing on the right issues? Operational targets ask for efficiency: Are we doing things right? For instance: Are we providing the right answers? How do we evaluate the environmental impact of our procurement decision? Are there still capacities for improvement? Or an operational target on the more detailed level: Which life cycle assessment tool is most appropriate for our case? Asking these questions allows assessing hurdles and developing strategies to overcome them. Both, effectiveness and efficiency are starting points for decisions.

In the different steps of a decision-making process from the first identification of demand to the implementation and control different hierarchies (strategic and operational level), different functional units (for instance, finance, procurement, and environment department) and even other organizations (for instance, customers, suppliers, competitors) are involved. These actors with their abilities and willingness for green practices shape the "points of decision". For instance, the decision maker neither is nor qualified to assess alternatives via life cycle assessment nor he is not willing to learn how to use this tool.

Consequently, scrutinizing where and who decisions are made facilitates to identify the background of the decision: The different roles in hierarchies, functional units and organization of the acting people may be one possible source for disturbances. A specialist has other abilities and powers than an authority (Witte, 1977). Furthermore, each actor can face potential conflicts between his individual interests and the organizational decision (Shepard, 1967).

Even a motivated and qualified decision maker can be hampered by the appliance or non-appliance of tools in order to evaluate alternatives. Monetary instruments like life cycle costing might ignore harmful effects on the natural environment which can be included via life cycle assessment. Combining non-monetary and monetary as well as quantitative or qualitative tools provides a thorough decision basis for the actor.

Analyzing the decision pyramid shows that considering some green aspects as decision parameter is necessary but no sufficient condition in decision-making as only a limited set of alternatives is considered in the decision which could mean that green alternatives are already excluded before the decision parameters take effect. For instance, a supplier is not asked for a proposal because he was not on the list of the purchasing agent.

In addition to the analysis of the decision pyramid modeling the purchasing procedure as decision-making process (see figure 5) improves the understanding of the limits of the decision-making process. A decision can be defined as a process of different elements, like identifying a target, searching for alternatives, coming to a decision, implementing and controlling. Similar to the steps of the classical decision-making process the procurement process can be subdivided in demand management, market research, award and procurement assessment (see figure 5). Hurdles can occur within each element, between the elements of the process and within the system as a whole. Therefore, we investigate each step and provide examples of factors which can hamper, decelerate or even block green practices in supply-chain management, so called hurdles (barriers).

---

<sup>4</sup> Bea, F.X.; Dichtl, E.; Schweitzer, M. (2000), p. 112.



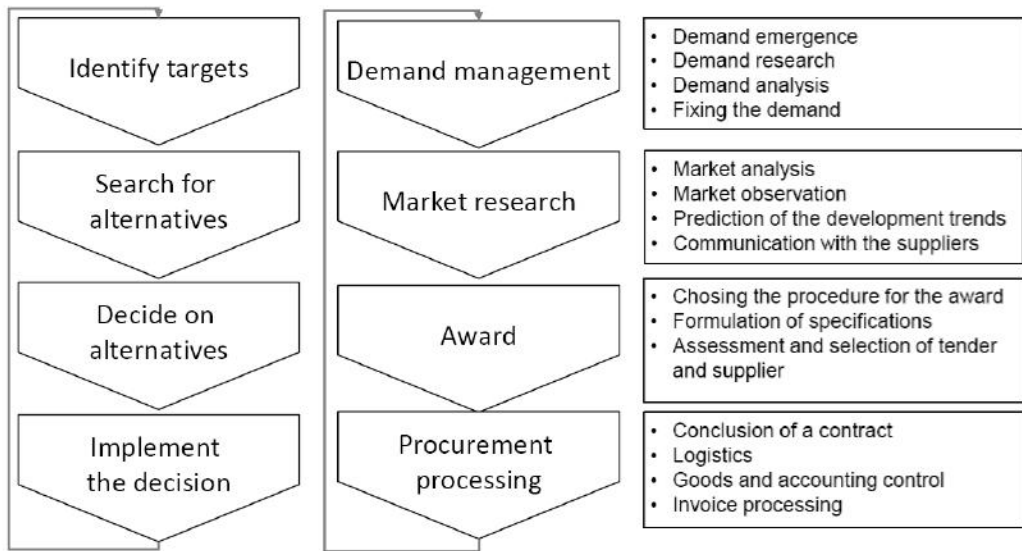


Figure 5. Decision-making process (Based on Bundesverband für Materialwirtschaft, Einkauf und Logistik e.V. (BME) in Zusammenarbeit mit Booz Allen Hamilton, 2000).

Similar to the decision pyramid every procurement decision starts with analyzing the target. The starting point of the decision process is that somebody is discovering a gap between the current situation and a desired situation. From this gap targets are derived. As the demand management is the first step of procurement each hurdle on this level can block the entire process. A very powerful hurdle would be the fact that nobody sees a necessity to integrate environmental aspects in procurement that means no gap is identified. Consequently, green practices are not aim of the organization and are not considered. However, deriving a green target is only a small step on the way to greening the supply-chain. Conflicting interests between the individual and organizational targets influence the whole decision-making process (see figure 6). To integrate this crucial element we integrate the agency theory (Jensen and Meckling, 1976) modeling the individual actors as agent and the organization as principal. Every actor is driven by its individual targets (such as safety, career or personal environmental motivation) which must not be aligned and can actually be in contrast to the organizational targets (Jensen and Meckling, 1976). For instance, individuals might resist to environmental-friendly practices due to prejudices or because they don't understand the sense of these additional efforts. On the other hand, every organization or company pursues organizational targets (such as satisfaction of customer needs for green products and services, financial strength etc.).

Organizational and individual targets need to be balanced to reach the desired situation, in our case, to satisfy the demand in an environmental-friendly way. Especially individual targets are often hidden. Therefore, they need to be identified. Also organizational targets have to be clearly stated and communicated, for instance, by using guidelines. Furthermore, environmental aspects have to be integrated in day-to-day practices to demonstrate that green supply-chain management is more than paying lip service or green washing. Therefore, the commitment of the top management is needed. Like the experience of a consultant illustrates:

At the beginning of a training session the superior entered the room and asked if the session will actually take an hour so that everyone can go back to work soon. He implicitly stated that this workshop has no value for him and thereby destroyed the motivation of his employees to take it seriously. Furthermore, there might be different point of views in the higher hierarchy. Consequently, the individuals are confused if it is rewarded or sanctioned to consider environmental aspects. Summarizing, lack of clear communication and lack of commitment or ambiguous behavior of the management are hurdles to introducing green practices to supply-chain management.

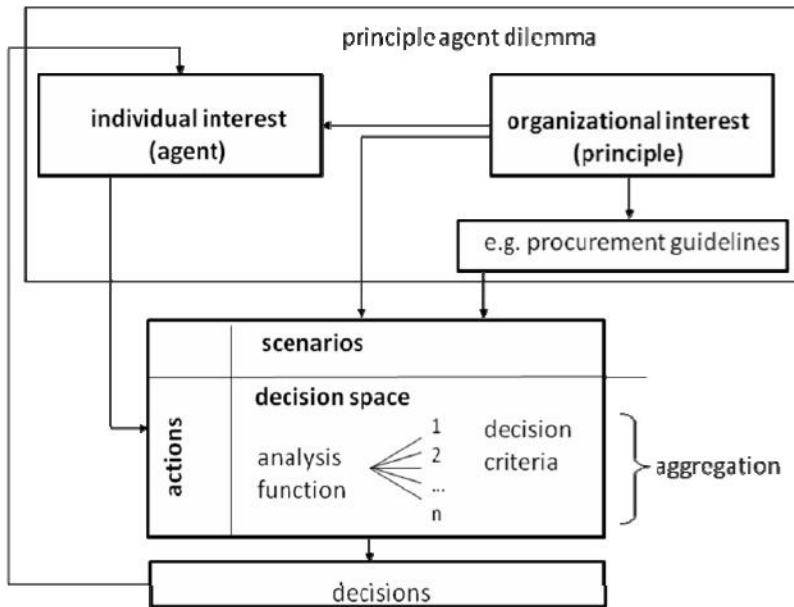


Figure 6. Hurdles in the decision-making process (Based on Bamberg, Coenenberg, and Krapp, 2008; Jensen and Meckling, 1976).

Having cleared these hurdles, having defined the green target, having fixed the demand for green products and services we turn towards the market and search for green alternatives. Framing the decision space by identifying possible options for actions and scenarios can be very time consuming, especially, if innovations have to be implemented (Brookfield, 1987). Information as well as creativity is essential for this step. The purchasing manager needs to be aware of the environmental relevance of the products and services. Furthermore, information and access to green alternatives is required. Complementary, the procurer needs to know profoundly the demand and be creative and open-minded on his search for the best alternatives. For instance, the question of mobility: The purchaser receives the order to buy a company car. Now the purchasing decision can be narrowed to compare different diesel cars or he can take into account a hybrid car. It might even be an alternative to analyze whether part of the companies' cars can be substituted by choosing videoconferencing to replace part of the meeting. Videoconferencing is a good alternative to individual mobility whenever the business partners have known each other for a while and the meetings can be clearly structured and prepared in advance. To conclude, for procurement decisions the user should

not only describe the product to procure, but also the functions it should fulfill. In addition to considering different scenarios the decision space might be constraint so that no environmental criteria could be included in the decision-making process. For instance, administrative procedures foresee already a big variety of criteria. Consequently, adding several green criteria gives little weight to environmental aspects compared to the whole bunch of criteria. Furthermore, the legal framework can be perceived as very restrictive which might advance the quick rejection of including environmental requirements in tenders. Therefore, the actors should be well trained and encouraged to make use of existing reach of play. For these reasons, it is important to reduce complexity and to systematically process information.

The next step in the process, the decision on alternatives is closely linked to its predecessor. As during the process of identifying alternatives a first evaluation which alternatives are taken into account takes place. There is not perfect choice of the best solution out of all possible alternatives as for a number of reasons only a limited set of alternatives is taken into account (Frey and Heggli, 1989), see for instance, routines, times pressure, cognitive failures etc. (T. Betsch, Fiedler, and Brinkmann, 1998; T. Betsch, Haberstroh, Glöckner, Haar, and Fiedler, 2001; Hammond, Keeney, and Raiffa, 2006). With the number of elements increases the complexity of the system and thereby escalates the occurrence of hurdles within the system.

The decision on alternatives is followed by its implementation. Therefore, steps has to be planned, routines defined, responsibilities assessed, financial resources and deadlines fixed. Furthermore, persons affected by the decision must be informed and motivated. During the implementation hurdles can occur like unclear responsibilities, lack of time, resources or qualified staff as well as resistance to change by the affected actors which might face conflicting interest between individual and organizational targets like in the first step of the decision-making process (Braganza, 2005; Robins and Judge, 2007; Swink, 2006).

Closing the circle the last step is to control the decision. Ideally, there are two directions of feedback: Effectiveness and efficiency of the decision have to be continuously checked. Complementary, experiences should be fed forward to continuously improve the decision-making process. Furthermore, the results of this last step can provide helpful information for similar decisions in the future. However, this process might be hampered by individual targets as well as actors might fear sanctions like loose of power or prestige for admitting mistakes (Watzka, 1989). Therefore, actors might avoid providing information which could potentially harm them (Seo, 2003).

Summarizing, the analysis of the process is fundamental for identifying hurdles and in this vein for the hurdle analysis which is described in the next section.

## **Design of the Hurdle Analysis**

The aim of the hurdle analysis is to identify and localize hurdles, to assess their relevance and to develop strategies to relieve them. The hurdle analysis consists of a sequence of steps (see figure 7) which starts with the analysis of the current situation and concludes with a concrete action plan for improvement.

- (1) What are the steps of the procurement decision?
- (2) Which actors are involved in the procurement process?
- (3) What are possible hurdles? Are there any specific issues in your organization?
- (4) What hurdles are perceived by the actors?
- (5) Are there different opinions in the organization?
- (6) What strategies can be chosen for the hurdles?
- (7) Who can share best practice or relieve the hurdles?
- (8) Which hurdles should be dealt with first?
- (9) What are the best actions to overcome these hurdles?

Figure 7. Guiding questions for the hurdle analysis.

- (1) What are the steps of the procurement decision?

First, the purchasing process has to be outlined by modeling the decision process and the decision pyramid. The results of this step frame the situation in the organization.

- (2) Which actors are involved in the procurement process?

Like every process in organizations, procurement is driven by actors. Every actor in every step of the procurement process can be a potential source of hurdles (Janis and Mann, 1979). The first step of the hurdle analysis is to ask who is involved in and who significantly influences the purchasing decision. From these actors the participants for the questioning should be chosen. The survey can either be effected along the procurement procedure or be limited to one step of the process. However, at least five people depending on the selected system boundaries of the survey should be questioned to provide reliable results for the company. These aspects should be considered when determining the participants of the hurdle analysis.

- (3) What are possible hurdles?

Are there any specific issues in your organization?

Having modeled the purchasing process and identified the actors involved raises the awareness for possible hurdles. Based on these results the questionnaire should be checked and if required adapted to the conditions in the organization.

- (4) What hurdles are perceived by the actors?

The chosen participants are asked to fill in a standardized online questionnaire to provide an overview of their perceptions of the hurdles in the purchasing process. The questionnaire for companies additionally gathers general facts like number of employees, turnover, and industry. Both questionnaires for private and public procurement ask for the function of the participant, the perceived influence on the implementation of green procurement, and the efforts other actors might take to improve green procurement. The main part of the questionnaire consists of the hurdle catalogue which comprises two dozen hurdle statements.

## (5) Are there different opinions in the organization?

Based on the results of the questionnaire the perceived hurdles are detected and analyzed from a birds eyes view on the organization. Therefore, the hurdles are classified based on the average of all responses for each hurdle statement and the spread of the answers. The results are visualized via hurdle profile and hurdle portfolio.

The hurdle profile ranks the hurdles according to their perceived relevance and displays the spread of the answers (see figure 8). It answers the following questions: What are the perceived hurdles? Which hurdles are relevant? Are the hurdles perceived homogenous?

The higher the average the higher is the relevance of the perceived hurdle. Consequently, overcoming strategies should take these hurdles into account. The hurdle profile points out first trends. The lower the spread the more all participants perceive a hurdle similarly. In contrast, reasons for high spreads should be investigated to draw conclusions for future actions.

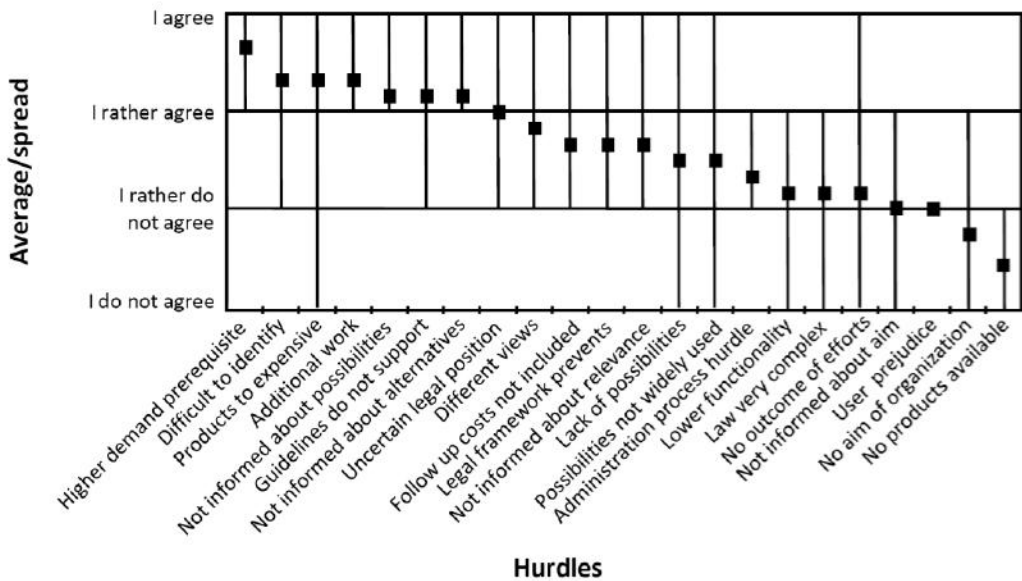


Figure 8. Hurdle profile.

The hurdle portfolio goes one step further and enables the organizations to classify the hurdles and derives strategies to overcome them (see figure 9).

Alike the hurdle profile the hurdle portfolio uses averages and spreads. Thereby, it displays the existence and the perception of hurdles. Depending on the results of the questionnaire four strategies can be derived: best practice sharing, decision analysis, problem analysis and selection.

Hurdles in the field of “best practice sharing” are less relevant as they are characterized by a low average and a low to medium spread. Hurdles in the origin of coordinates are perceived as non-existent which means they are successfully overcome or have never been relevant. Thus, the organization can be seen as role model for tackling these hurdles.



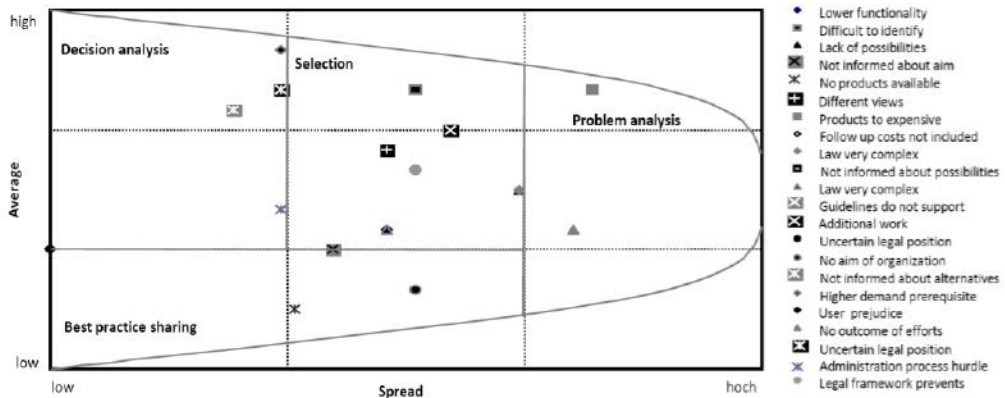


Figure 9. Hurdle portfolio.

#### (6) What strategies can be chosen for the hurdles?

However, the organization should identify the critical procedures to stick to these good practices and secure them with the help of knowledge management. A person should be made responsible to control and maintain the good practices to avoid that these hurdles become relevant in the future. If hurdles are classified into the category best practice sharing it can be assumed that the organization successfully implemented green procurement. For the sake of the environment the organization can share its best practices as role model. From the point of view of the individual-rationalist strategist it should keep them internally to benefit from this competitive advantage.

Medium to highly relevant hurdles which are perceived inhomogeneous are categorized to "problem analysis". The investigation focuses on reasons why this hurdle is perceived differently. These results show that routines and procedures to tackle hurdles exist. However, the actors judge them as only partly sufficient. Frequently, successful practices are not implemented consequentially or have been lost out of sight over time. Therefore, involved actors are consulted in group and individual talks as well as in workshops. The critical incident technique (Flanagan, 1954) provides insights in the different perception of the situation and which practices should be improved and reinforced.

"Decision analysis" is applied to those hurdles which are medium to highly relevant and perceived relatively homogeneously. These hurdles occur due to lack of implementation routines. The involved actors should be consulted about their day-to-day situation where they are confronted with this hurdles. Examining past failures can help to avoid them in the future. However, this investigation should include future planning by analyzing weaknesses and strength within the organization as well as threats and opportunities from outside stakeholders. Based on these results, the organization should decide, who, when, and where, supported by concrete financial support, will implement those approaches.

The category "selection" contains hurdles with medium to high relevance which are perceived differently. In contrary to the three strategies best practice sharing, decision analysis and problem analysis no generally applicable strategy can be recommended to tackle these hurdles as the reasons are not generalizable. Therefore, emphasis is placed on analyzing the roots of each hurdle. A workshop can help to clarify the situation by answering the following questions: Do best practices exist? How well known are they? To what degree are

they implemented? The concrete position of each hurdle in the hurdle portfolio can provide hints. The nearer a hurdle tends to be to one of the three former introduced strategies the more it might be advisable to follow its strategies.

(7) Who can share best practice or relieve the hurdles?

The strategies should be operationalized by matching hurdles to process and people.

(8) Which hurdles should be dealt with first?

Having evaluated the hurdles based on the hurdle profile and the hurdle portfolio there is a range of strategies to tackle them. As each organization is unique there is no general advice with which hurdle to begin with. The following guiding questions provide starting points to prioritize the hurdles appropriate to the organization and its situation:

- The journey is the reward: Go step by step along the procurement procedure: Start with the first hurdle in the decision process to come a bit closer to the target.
- Bigger is better (or here worse): Start with tackling the most relevant hurdle first.
- Harvest low hanging fruits: Start with the hurdle which is easiest and quickest to overcome.

Be aware that overcoming roadblock on one part of the highway is no guarantee for free drive for the whole journey. Consequently, overcoming one hurdle doesn't mean overcoming all hurdles. Take coherences and interdependencies into account. For instance, new green criteria like diesel particulate filter don't mean that additional funds for this technology are available or that the purchaser considers a greener technology like hybrid cars and alternative fuels.

(9) What are the best actions to overcome these hurdles?

After having decided which hurdle to deal with first actions to overcome this hurdle should be guided by the comparison of the standard situation and a critical incident for this hurdle. Therefore actors involved in this process are interviewed. This experience and results are incorporated in a workshop with actors who can relieve the hurdle or can share best practices. Aim of this workshop is to develop detailed plans to overcome the hurdle. It is essential to determine a person in charge of the relief measures and control the progress along a fixed deadline.

The implementation of the overcoming strategy should be controlled by a second hurdle analysis to prove its effectiveness. Repeating the check circle initiates continuous improvement towards green procurement and thereby green the supply-chain.

## Conclusion

The hurdle analysis provides the organization with an instrument to improve its supply-chain and establish a competitive advantage. The organization benefits from a detailed analysis of its processes adapted to its needs. In contrast to management fads, we do not recommend a new instrument or new guidelines. Instead we ask why existing ideas are not

realized. Therefore the organization and its processes are analyzed from the different perspectives. The actors with their experience and know-how are involved in the identification and evaluation of hurdles as well as in the process of developing and implementing strategies to overcome the hurdles. Furthermore, the hurdle analysis can be used as a control instrument to check the success of the strategy implementation. By this means, the hurdle analysis provides a thorough solution to drive supply-chain management towards green procurement.

## References

- Bamberg, G., Coenenberg, A. G., and Krapp, M. (2008). *Betriebswirtschaftliche Entscheidungslehre* (14. ed.). München: Franz Vahlen.
- Betsch, T., Fiedler, K., and Brinkmann, J. (1998). Behavioral routines in decision making: The effects of novelty in task presentation and time pressure on routine maintenance and deviation. *European Journal of Social Psychology*, **28**(6), 861-878. doi:10.1002/(SICI)1099-0992(1998110)28:6<861::AID-EJSP899>3.0.CO;2-D
- Betsch, T., Haberstroh, S., Glöckner, A., Haar, T., and Fiedler, K. (2001). The effects of routine strength on adaptation and information search in recurrent decision making. *Organizational Behavior and Human Decision Processes*, **84**(1), 23-53.
- Braganza, A. (2005). How organizations thrive with communities of purpose. *KM Review*, **7**(6), 6-7.
- Brookfield, S. D. (1987). *Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting*. San Francisco, CA US: Jossey-Bass.
- Bundesverband für Materialwirtschaft, Einkauf und Logistik e.V. (BME) in Zusammenarbeit mit Booz Allen Hamilton. (2000). *Chancen und Entwicklungen im Public Procurement*
- Environmental Management – Life Cycle Assessment – Principles and Framework (ISO 14040:2006); German and English Version EN ISO 14040:2006, (2006a).
- Environmental Management – Life Cycle Assessment – Requirements and Guidelines (ISO 14044:2006); German and English Version EN ISO 14044:2006, (2006b).
- Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, **51**(4), 327-358.
- Frey, B. S., and Heggli, B. (1989). An ipsative theory of business behaviour. *Journal of Economic Psychology*, **10**(1), 1-20. doi:10.1016/0167-4870(89)90054-8
- Guenther, E. (2003). Hurdles in green purchasing. method, findings and discussion of the hurdle analysis. In C. Erdmenger (Ed.), *Buying into the environment: Experience, opportunities and potential for eco-procurement* (pp. 30-50). Sheffield: Greenleaf Publishing.
- Guenther, E., and Scheibe, L. (2006). The hurdle analysis. A self-evaluation tool for municipalities to identify, analyse and overcome hurdles to green procurement. *Corporate Social Responsibility and Environmental Management*, **13**(2), 61-77.
- Günther, E., and Scheibe, L. (2005). The hurdle analysis as an instrument for improving environmental value chain management. *Progress in Industrial Ecology - an International Journal*, **2**(1), 107-131.
- Hammond, J. S., Keeney, R. L., and Raiffa, H. (2006). The hidden traps in decision making. *Harvard Business Review*, **84**(1), 118-126.
- Hunkeler, D., Lichtenvort, K., and Rebitzer, G. (Eds.). (2008). *Environmental life cycle costing*. Pensacola, Florida: CRC Press; SETAC.

- Janis, I. L., and Mann, L. P. (1979). *Decision making. A psychological analysis of conflict, choice, and commitment*. New York: Free Press.
- Jensen, M. C., and Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, **3**(4), 305-360.
- Luhmann, N. (2008). *Soziale Systeme* Suhrkamp.
- Matus, K. J. M., Anastas, P. T., Clark, W. C., and Itameri-Kinter, K. (2007). *Overcoming the challenges to the implementation of green chemistry* (CID Working Paper No. 155) Center for International Development at Havard University.
- Robins, S. P., and Judge, T. A. (2007). *Organizational behavior* (12th ed.). New Jersey: Pearson Prentice Hall.
- Seo, M. (2003). Overcoming emotional barriers, political obstacles, and control imperatives in the action-science approach to individual and organizational learning. *Academy of Management Learning \and Education*, **2**(1), 7-21.
- Seuring, S., and Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, **16**(15), 1699-1710.
- Shepard, H. A. (1967). Innovation-resisting and innovation-producing organizations. *Journal of Business*, **40**(4), 470-477.
- Swink, M. (2006). Building collaborative innovation capability. *Research Technology Management*, **49**(2), 37-47.
- Watzka, K. (1989). Personelle widerstände gegen Qualitätssicherungsmaßnahmen. *QZ Zeitschrift Für Industrielle Qualitätssicherung*, (89.01), 49-52.
- Witte, E. (1977). Power and innovation: A two-center theory. *International Studies of Management \and Organization*, **7**(1), 47-70.
- Woodward, D. G. (1997). Life cycle costing—Theory, information acquisition and application. *International Journal of Project Management*, **15**(6), 335-344. doi:DOI: 10.1016/S0263-7863(96)00089-0.