The Hurdles Analysis as an instrument for improving sustainable stewardship

Results of an empirical study of hurdles to green procurement of German industry

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Abstract

Regarding an integrated stewardship of resources, the management of procurement processes can be one important driver. For 25 years efforts to integrate environmental aspects in procurement decisions have been made by legislation or procurement initiatives. Nevertheless the results are moderate. Therefore, just integrating other sustainability issues, like social or generational aspects in procurement decisions, would not promise more success. Moreover, factors capable to hamper, decelerate or even block the integration of sustainability issues in procurement decisions – so-called hurdles – should be analysed first.

This conclusion motivated an empirical study to record the current perception of hurdles. The questionnaire based survey was conducted in 883 German companies, including the 500 biggest companies and the medium-sized companies that are members of the “German Association of Materials Management, Purchasing, and Logistics (AMMPL)”. In order to determine existing hurdles, 24 theory based questions from several areas (legislation, company objectives, knowledge of products and services, costs, motivation) were asked in an explorative design to firstly, compare the perception of hurdles by different actors, secondly, analyse the correlation of company size and hurdles perception, thirdly, focus on the impact of the industry on the perception of hurdles. To give some results, the study identified hurdles that are perceived significantly higher than others. Moreover, the perception of hurdles differs between the industries, but also within one industry. Finally, medium-sized companies feel more uncertainties, regarding legislation or miss supportive guidelines.

For a continuous integration of stewardship issues in procurement decisions the authors suggest the consequent and offensive reduction of the identified hurdles to further legislation or information campaigns initiatives. New sustainability issues should be integrated in procurement decision by considering probable hurdles.

Keywords
Environmental responsibility
Hurdles Analysis
Decision analysis
Integration of environmental aspects
Organisational development
Green procurement
Introduction

The requirement to integrate environmental aspects in business and entrepreneurial decisions is increasing. Choices made by the organisations, esp. companies, often have far reaching effects and even unknown consequences on the environment so that more and more environmental aspects become urgent for the decisions of companies. Especially regarding already existing shortages and pressures connected with the usage of specific resources (as e.g. oil) and increasing requirements of stakeholders, the integration of environmental aspects gains importance as “stakeholders interested in environmental reporting are placing increasing pressure on companies to be environmentally responsible.”1 Therefore new strategies for managing all these requirements are demanded for. The better organisations do in this task the more they accepted their environmental responsibility – or environmental stewardship – by considering and implementing environmental and social aspects into organisation’s decision processes.

Environmental responsibility – also environmental stewardship – is the responsibility of environmental quality shared by all those whose actions effect the environment. Besides "stewardship" terms like "sustainability" or "environmental responsibility" are used more commonly to capture many of the same concepts. Therefore the term “environmental responsibility” was chosen for this research paper. The idea of sustainable responsibility consists of two parts, the social and the environmental part. The social part of it means that organisations are responsible to their people, which includes all stakeholders.2 They are responsible for the actions of people working with the company as well as for actions that effect people in and outside it. Social responsibility is about holding organization accountable for its effect on the people around it. The second part of sustainable responsibility can be seen as the idea that a company has even more responsibility to the environment and the world around it than an individual. Companies by nature act on a far larger scale than an individual could. Thus, their environmental impacts generally are far greater and have much farther reaching impacts than an individual consumer could. Therefore the pressure on companies to manage their environmental impacts positively is increasing. There are great efforts especially in the European Union towards useful legislative pressure, support as well as guidance to make companies consider their environmental aspects and therewith take their responsibility.3

To cope with these requirements companies can have different positions:4

- Compliant position (companies just fulfil legal requirements)
- Informed position (companies fulfil legal requirements but keep informed about coming changes in this area)

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• Market-driven position (Companies combine legal compliance with voluntary environmental action as long as the market pays for it)
• Competitive advantage position (Companies following this strategy try to change the market by introducing advanced environmental technology and hope to become market leader)
• Sustainability position (Companies with this strategy try to live up to their whole responsibility – economically, environmentally and socially)

Assuming to take its environmental responsibility to be the long-term aim of every company strategies to initiate a continuous improvement of the company’s position up to the sustainable one have to be developed. Thus procurement can be considered an important factor to either get such a development started (i.e. from a compliant position) or to improve it (e.g. to come from a market-driven position to the competitive advantage or even to the sustainable position) as the management of procurement processes towards more green procurement can be seen as a good possibility for improving the integration of environmental aspects into company’s decisions and therewith to cope with its responsibility.

1 **Procurement as Gate-keeper**

Procurement opens up an important possibility for integrating environmental aspects into all processes and all units of a company and hence for reduction of environmental pressure caused by business actions. This can be explained with the change of the term “procurement” over the last 50 years. In the past the procurement department was understood only as the operational purchase unit of a company. This changed to a more holistic point of view that includes the planning, the accomplishment and the control of all supplying processes of a company. Nowadays procurement is seen as an important functional unit as it provides all other processes and all other units with the required goods and services by managing and coordinating the whole process with all its stakeholders and their requirements. It is therefore linked to all parts of the company and decisions made in the procurement phase influence the whole company. It influences the production processes, the product itself and the effects arising in and after the usage phase of the products. It furthermore affects even those units not directly related to the production process by providing them with needed products and services as well (e.g. computers, lightning, food, etc.). Beyond that procurement depends on other decisions – like R&D – as well and has to influence them proactively to achieve a broader scope for action. Arising from that procurement can be seen as a gate-keeper for greening deci-

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6 As are following the value chain of Porter: Inbound and Outbound Logistics, Operations (Manufacturing), Marketing and Sales, After-Sale Service, Porter, M. E. (1990), p. 41
7 “I define supply management as all processes of supplying the company with direct and indirect materials, services, rights, and machinery and equipment from sources external to the organisation, aimed at contributing to the achievement of sustainable competitive advantage. This definition includes strategic and operational activities.”, Kaufmann, L. (2002), pp 3-33
sions in companies and therewith increasing a company’s environmental responsibility. For this reason efforts toward greening procurement decisions shall be focussed on in this paper.

2 The empirical study

2.1 Motivation

As procurement with its function as gate-keeper within an organisation is so important to positively influence the environmental aspects it is not amazing that efforts from varying groups to integrate such aspects into company’s decisions have been existing for more than 25 years. Some examples may outline this:

- The German Umweltbundesamt has published a handbook on „environmental friendly procurement“ ever since 1987. To cope with current requirements all content was integrated in the internet platform www.beschaffung-info.de.

- Other European countries, especially the Scandinavian countries and Austria, as well as non-European Countries like Canada or Japan try to support efforts in the area of green procurement via Internet or Best Practice Sharing.

- The European Union provides organisations with different agreements, interpreting information, directives, regulations and other activities as for example Eco-labels. Furthermore a handbook „Buying green!“ and the „Environmental Database“ can be used. And if there is precedence in green procurement like „Concordia Bus Finland“ the Court of Justice of the European Communities decisively offers judgement that guides further actions.

- International organisations like the International Council for Local Environmental Initiatives (ICLEI) or GRIP – Foundation for Sustainable Production and Consumption support green procurement by initiatives and guidelines.

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9 THE GREEN LANE (2002).
11 FEDERAL MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND WATER MANAGEMENT ET AL. (Austria) (ed.).
12 Within the EU projekt RELIEF (Environmental Relief Potential of Urban Action on Avoidance and Detoxification of Waste Streams through Green Public Procurement) Austria, Sweden and Denmark were farthest developed in the area of green procurement and therewith had a leading role to part their knowledge with „beginners“ in this area like Hungary, ERDMENGER, C. (ed.) (2003) as well as INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES (ICLEI) (2003).
20 European Court of Justice (ed.) (2202).
21 International Council for Local Environmental Initiatives (ICLEI).
In spite of all these efforts environmental aspects are not as widely integrated in organisation’s decisions as supposed neither in public nor in private organisations. This realisation motivated the development of the Hurdles Analysis Method as a tool to identify and analyse reasons – so called hurdles – to greening procurement decisions.

2.2 The Search for Reasons – the Hurdles Analysis

The idea of the Hurdles Analysis Method was developed by Technische Universität Dresden (TU Dresden) within a European research project – the RELIEF project – which was conducted together with partners from all over Europe. Within this project a first questionnaire on hurdles to green public procurement was developed and tested with the participating European cities. Afterwards the experiences so far collected with the Hurdles Analysis Method were refined in further projects within the public sector. Based on the main result that there is no possibility to identify a set of core hurdles relevant for all organisations the strategy had to be changed. TU Dresden started to give organisations guidance while they accomplish a Hurdles Analysis on their own. A self-evaluation tool was developed and installed on the website that provided organisations with a procedure how to accomplish a hurdles analysis and identify the relevant hurdles to green procurement themselves. Therefore a guideline on the methodology of the hurdles analysis self-evaluation tool is given. Furthermore an online questionnaire, that the members of an organisation could fill in and a document which offers the results of the questioning together with short interpretation of the results belong to the methodology. Since 2004 the hurdles analysis experienced a further adaptation as it should be used not only for public organisations but also for private ones which lead to the study whose results shall be presented in this article.

As figure 2 shows the study to be presented in this paper was based on the hurdles analysis method. This survey should identify reasons for the not satisfactory integration of green products and services in procurement decisions of companies in Germany although the positive effects of such an early integration in company’s decisions should be known regarding all those initiatives and supports mentioned above.

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23 Some partners were: International Council for Local Environmental Initiatives (ICLEI), Institut für Finanzwissenschaft und Infrastrukturpolitik of the Technische Universität Wien, Institute for Environmental Studies of the Vrije Universiteit, Amsterdam, dk-TEKNIK ENERGY & ENVIRONMENT, Interuniversitäres Forschungszentrum für Technik, Arbeit und Kultur (IFZ), Center for Environmental Studies (CES), municipalities of different European cities, for further information see www.tu-dresden.de/wwbwlbu/forschung/abgeschlossene_projekte/relief/, www.iclei.org/ecoprocura/relief/.

24 Potentials of a Sustainable Procurement and Instruments for Implementation (NaBesI) (www.tu-dresden.de/wwbwlbu/forschung/abgeschlossene_projekte/nachhaltig_beschaffen/en) as well as in a questioning in co-operation with Global to Local Ltd.
2.3 The Design of the Study

The study presented in the following was conducted with the biggest 500 German Companies as well as all medium sized companies of the German Association of Material Management, Purchasing and Logistics (AMMPL). It focused on the identification and analysis of hurdles to green procurement in companies in different areas:

Firstly, it should be clarified whether hurdles to green procurement are related to the actors within the procurement process and

secondly, whether they differ because of the company size and

thirdly, whether the industry a company belongs to influences the perception of hurdles of its employees.

To get an overview of the personal perspectives and the perception of the actors in the company’s procurement process and the existing hurdles within it, a standardized questionnaire was used. This questionnaire had to be filled in at least by two participants (procurement and environment) in each company. To generate results in the areas explained above the study on the one hand focussed on perception of hurdles as only perception influences decisions because individuals base their actions on experience and perception. On the other hand different points of view (efforts and influence) and different actors (procurement and environment) were covered by the questioning to answer all research questions that arose out of this for the survey. Therefore the questionnaire consisted of three main parts:

1. A general part with questions on number of employees, turnover and industry,
2. Questions on the procurement process as a multi-actor process to get knowledge about:
   - the function of the participant,
   - the perceived influence on the implementation of green procurement,
   - the efforts other actors within the company might take to improve green procurement,
3. Questions to assess the perceived relevance of potential hurdles summarized in a hurdles catalogue.

A short theoretical description of the questionnaire’s content shall be given in the following paragraphs.

2.3.1 The hurdles catalogue

The hurdles catalogue is the main part of the hurdles analysis method. The existence of hurdles in decision processes – like the procurement process – has been known for a long time and the topic became an important field of scientific research. That led to a

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multitude of approaches dealing with the description and explanation of different types of hurdles. From the variety of available approaches the approach of the Bases of Power by French/Raven and based on that the Theory of Promotors founded by Witte and enhanced by Hauschildt/Gemünden respectively were chosen as suitable basis for the development of the hurdles analysis, because both together were found to cover a broader field of types of hurdles since most of the other theories only focus on but one type of hurdles. Hence both theories combined allowed the authors to generate as many potential hurdles as possible. The following hurdles statements were derived based on the two theories together with all participants so far involved in a hurdles analysis:

**table 1: hurdles catalogue structured by content**

These hurdles statements were to answer by different actors (the procurement department and the environmental department) as every actor [figure 2] on every step of the decision process can be a potential source of hurdles, and may hamper, decelerate, even block green procurement on the one hand or may support, encourage and promote it on the other hand.

### 2.3.2 The actors focus

Procurement can be seen as a special decision process and there are different groups and/or persons (internal as well as external) acting within each step of this decision process – the so-called stakeholders. Regarding the greening of procurement processes as target the following groups or persons are assumed to be able to affect or be affected by green procurement decisions.

Internally:

- the **Procurement Department** because of choosing the products and services according to the requirements of the stakeholders and their attitude,
- the **Internal User** who uses the products and services and therefore is affected by procurement decisions (Operations, Administration etc.),
- the **Finance Department** by setting cost limits and/or profitability requirements for new machinery etc.,

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27 Types of hurdles investigated were information, communication, power, motivation, knowledge, willingness etc.
30 Hauschildt, J.; Gemünden, H. G. (1999). The authors identified barriers (hurdles) as hampering and difficult but something that can be overcome/dealt with. Furthermore they found a “barrier of will” and a “barrier of capability” as possible causes that lead to the blocking of innovations.
• the *Environmental Department* that provides information and advice concerning environmentally friendly products and services and

• other internal *Stakeholders* e.g. by setting technical requirements for new products or services that they develop (R&D, Operations, etc.).

Each internal actor in a procurement decision belongs to a functional area of the company. These areas generally consist of an operational and a strategic, i.e. management, level. On the operational level specialists – “promoters by know-how” – act. They are persons who can actively and intensively encourage an innovation process by means of object specific knowledge. Management executives – “promoters by power” – working on the strategic level, are persons who promote innovation processes by means of their hierarchic power actively and intensively.32

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31 Only users could belong to different functional areas.

high influence on procurement decisions but do not take so much effort to greening them?

2.3.3 Size focus
To clarify whether the company size influences the perception of hurdles two different types of companies were included into the survey:

- First of all the study comprised the biggest 500 companies of Germany\textsuperscript{33} and
- Secondly the medium sized companies of the AMMPL\textsuperscript{34}

Based on this selection the following research question should be answered by the survey:

Does the number of hurdles perceived as relevant increases with increasing company size?

2.3.4 Industry focus
As the companies chosen to the study belonged to different industries it seemed naturally to include another train of though and therewith another perspective on the perception of hurdles in the analysis. The authors were interested in the two interesting questions:

Do hurdles exist that are generally perceived as low or high by all industries?

Does the number of hurdles perceived as relevant differ from industry to industry because of i.e. specific knowledge or different external pressures?

| Table 2: Industries comprised in the study |

In the following chapters the results of the survey regarding the outlined research questions are presented. But first of all a small overview on the database of the empirical study is given to certify the reliability of the presented results.

3 Results\textsuperscript{35}

3.1 Return of the study
The study was designed as a written survey. Therefore 883 companies were asked to fill in the questionnaire on hurdles to green procurement. As the authors wanted to picture differences between actors groups as well each company was provided with two ques-

\textsuperscript{33} The assortment followed Schmaucke, E. (2003)
\textsuperscript{34} The assortment in this area followed the EU-Commission (2003), which defines medium sized companies as companies with 50 to 250 employees and less than 50 Mio Euro annual turnover.
\textsuperscript{35} Further detailed results can be found in Guenther, E.; Scheibe, L. (2005), pp.12.
tionnaires to be filled in by the procurement department on the one hand and the environmental department on the other hand. Furthermore an electronic version was held online that just in case other interested groups within a company exist they could fill in the questionnaire as well.

The rate of return for the whole study adjusted at 13.5 % out of all companies. Thereof 2.9 % of the companies indicated various reasons for not taking part in the survey, about 10.5 % sent back analysable questionnaires. It became obvious that the return of the biggest 500 German companies was with 18.9 % much higher than that of the medium sized companies with 7.4 %. Regarding the research questions further distributions of the answers are of interest which shall be presented in the following figures.

\[ \text{figure 3: distribution of answers regarding the actors groups} \]

figure 3 visualizes the different answer profiles for the actors groups procurement and environment whereas figure 4 displays the segmentation of answers regarding the industry.

\[ \text{figure 4: distribution of answers regarding the industries} \]

In the next section of the paper concrete results of the empirical study concerning the above sketched research questions will be presented. First of all an overview on the differences between the actors shall be given.

3.2 Actors

The descriptive result to the first research question whether different actors groups might see different hurdles is presented in figure 5. As can be seen easily the differences are not as significant as the authors assumed beforehand. There are only four hurdles which the environmental departments perceive higher than the procurers. These are: “obstructed by process”, “no green alternatives available”, “follow-up costs not included”, “no aim of organisation”. In one case – “to expensive” – the procurement department perceives a higher hurdle relevance.

\[ \text{figure 5: comparison of perceived hurdles relevance regarding the included actors groups} \]

A statistical T-Test proved the hurdles “obstructed by process”, “no green alternatives available”, “follow-up costs not included” to be significantly different, which coincides with the descriptive findings.

**H₀,₁: the perception of hurdles is independent from the position of the responding person (procurer or environmental department)**

<table>
<thead>
<tr>
<th>table 3: Comparison of the hurdles perceived by the procurer and the environmental department – T-Test</th>
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The T-Tests show that for those three hurdles the equity of means is rejected for “obstructed by process” and “no green alternatives available” on a significance level of \( \alpha=0.05 \) and for the hurdle “follow-up costs not included” on a significance level of \( \alpha=0.10 \). For all other hurdles there are no significant differences. It is interesting that for the three cases the environmental department sees the higher hurdle.

Summarising it can be stated for this research question that the differences between the actors were not as high as assumed. For three hurdles a significant difference could be proved. For those the conclusion might be drawn, that there is a need for education to reach a common information base. The other two hurdle’s divergence can only be deduced from the descriptive figure. Hence it can be stated that it’s not so much the actors determining the so-far core-recognition of the Hurdles Analysis that there does not exist a hurdles set valid for all organisations.³⁷

The second aspect of the examination of the actors within the study was the question whether actors groups exist that dispose of influence on procurement decisions but do not strive for greening such decisions. figure 6 provides the descriptive outcome to this question. The participants had the feeling that clearly the environmental department takes the highest efforts to reach the objective of greening procurement decisions. Unfortunately they do not have enough influence to do so on their own. For all other actors groups the influence was higher ranked than their efforts but the effort’s curve echoed the form of the influence’s. Thereby the highest influence was fixed to the procurement department.

<table>
<thead>
<tr>
<th>figure 6: comparison of influence and efforts for all actors groups</th>
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To test this statement, a paired t-test was conducted. Therefore the means of the perception of the influence of the procurers on procurement decisions were compared with the perception of the influence of all the other departments.

**Hypothesis H₀,₂: The influence of the procurement department is equal to the influence of all the other departments.**

³⁷ This statement has already been introduced in the paragraph on the development of the Hurdles Analysis, pp. 6.
The t-Tests for the influence did show the following results:

\textit{table 4: Influence of the procurement department compared to the other departments}

The difference of the means between the procurers and all the other departments is always positive and significantly different ($\alpha<0.0001$). The conclusion can be drawn that the procurers have the highest influence on the procurement decisions.

The same t-tests were conducted for the perception of the efforts of the environmental department compared to the efforts of all the other departments.

\textit{Hypothese H$_{0,3}$: The efforts of the environmental department are equal to the efforts of all the other departments.}

\textit{table 5: Efforts of the environmental department compared to all the other departments (H$_{0,3}$)}

The difference of the means between the environmental department and all the other departments is always positive and significantly different ($\alpha<0.0001$). It can be concluded that the environmental departments takes the highest efforts to integrate environmental aspects in procurement decisions.

Hence the statistical assessment proved the descriptive one as the procurement has the highest influence on procurement decisions and the environmental department takes the greatest efforts. To conclude, the procurers should be motivated to increase their efforts for environmental procurement, whereas the influence of the environmental department should be anchored.

3.3 Size

The next research question of the empirical study tried to figure out whether the company size influences the perception of hurdles. The assumption was that bigger companies might face higher hurdles to green procurement because of their more complex structure and connected therewith asymmetric distribution of information within it. But the results of the descriptive analysis could not prove the assumption. In fact the results lined out that the medium sized companies tend to perceive higher relevance for the following hurdles: “uncertain legal position”, “guidelines do not support”, “follow-up costs not included” and “no aim of organisation”. This may be explained by smaller personal capacities of these companies as they often cannot pay extra staff to e.g. solve legal questions or create understandable guidelines. Employees with other functions have to answer all these demands as well.

\textit{figure 7: comparison of perceived hurdles relevance regarding the companies size}
In order to identify the significance of the assessments, for each relationship between hurdle and company size a contingency test was conducted, all in all 25 tests. The groups were classified as described above in the two groups: the biggest 500 and the medium-sized companies.

*Hypothesis $H_{0.4}$: The perception of the hurdles of environmental procurement is independent from the size of the company.*

*Table 6: Interrelation between hurdle and company size ($H_{0.4}$)*

This result reflects the results of the descriptive analysis concerning the higher hurdle perception of the medium-sized companies. For the hurdles “uncertain legal position”, “guidelines do not support”, “follow-up costs not included”, “no aim of the organisation” and “user prejudices” the null hypothesis can be rejected.

The reason might be in all these cases there is – as already mentioned – a lack of capacity inducing legal and financial inflexibility to some extend but also a lack of aim can be considered. But regarding the experiences of a number of projects with small and medium sized companies the integration of environmental aspects in organisation’s decisions becomes more and more important for them as amongst others their customers – mostly bigger companies – require certificates of their environmental management more often. Therefore the idea will be embedded in company strategies sooner or later. Nevertheless the differences between both perceptions were not as high as assumed. Therefore it’s not the company size which inhibits the deduction of the generally valid hurdles set either.

3.4 Industry

At last the article shall focus on different questions combining hurdles to green procurement and the industries included in the survey. Therefore two aspects were assessed within the study. Firstly whether hurdles exist that are perceived as low/high by all industries and secondly whether industries could be identified that perceive all hurdles low/high.

3.4.1 Hurdles perception over all industries

1. Hurdles perceived as high for all industry in general

The analysis of the empirical study showed that there are in fact hurdles which all participating industries perceived as especially high. As example for this paper “no cost savings” was chosen as it was the hurdle with the highest perceived relevance (see figure 8). In general it could be found that all cost hurdles were perceived as higher than others which indicates that in this area either information on current prices is missing – in case the prices are almost equal – or the market actually could
or would not provide the companies with greener alternatives and services to acceptable prices.

There was only one other hurdle – additional work – perceived higher than the rest by almost all industries. Only companies belonging to ‘energy, gas and water supply’ saw almost no hurdle here because maybe in this market green product and service alternatives are completely integrated already so that the identification and procurement of green products and services in general seems to those companies almost without difficulties.

2. Hurdles perceived as low for all industry in general

In the area of hurdles that all industries see as low especially the hurdle “efforts not useful” could be identified (figure 9). The result indicates that there is a willingness to integrate environmental aspects in company’s decisions. This is supported by the result of perception of hurdles regarding the aim as they are not so high as well. These findings can be seen as a good starting point to manage such highly relevant hurdles like the cost hurdles better in future until they could be relieved altogether.

3. Hurdles perceived as varying between industries

For all other hurdles not mentioned yet the findings of the study vary largely from industry to industry. As an example may stand the figure for the hurdle “not informed about legal framework” which shows impressively the wide spreading of perception (figure 10). These differing results can be explained with the specific environments of each industry which the companies belong to. I.e. for the cited hurdle the legal framework for “energy, gas and water supply” is very clear, strict and environmentally oriented – often caused by EU directives and a very clear and uniform definition of the market. Whereas for “wholesale, trade and repair” the legal framework presents a relevant hurdle. The reasons can be seen in very different or non existent regulations each depending from the product or service varying widely within this very inhomogeneous market.

Not every other analysed hurdle was as differentiated as the hurdle presented in figure 10. But it became clear that the next step in assessment has to be the analysis
of the industries themselves to find out whether the so far generated results could be further improved by an analysis of each industry and the answer to the question whether the hurdles within an industry were seen identically or not.

3.4.2 Differences in hurdles perception between the industries

As for the single hurdles in the paragraphs before the presentation of the results shall start with a look at industries that see hurdles to green procurement higher than the others followed by those who see very low hurdles to conclude with industries having a very distinct perception on the hurdles.

1. Generally high perception of hurdles within industries

It is especially true for “wholesale and retail trade, repair of motor vehicles, motorcycles, personal and household goods”. The companies in this industry perceive mostly higher hurdles than the other industries. An explanation for this might be the diversity of this industry as lots of different companies are combined in this sector. Furthermore there are not so many regulations for this industry, either, giving support by settling the basic conditions to act in. This is emphasized by looking at the results for the single hurdles. It can be seen that as highest hurdles pose “increase of costs”, “uncertain legal framework” and “no cost savings”. Further cost and legal hurdles follow shortly after which confirms the conclusion that firstly regulations are perceived as possibly missing. Secondly the question arises whether green product and service alternatives are really more cost intensive than the conventional which should be clarified for this industry.

2. Generally low perception of hurdles within industries

As figure 12 shows vividly the hurdles perception of the “electricity, gas and water supply” industry is significantly lower than the before presented. As it is the cost hurdles are identified as the most relevant ones, which can be explained with the fact that in this market green products are perceived as available but nonetheless cost intensive. The lowest hurdle is “not informed about legal framework” which indicates that for this industry more regulation is given, which on the other side causes a bit of confusion as the hurdles “uncertain legal framework” and “legal framework prevents” indicate. But in comparison to “wholesale, retail trade and repair of motor vehicles, motorcycles, personal and household goods” these hurdles are perceived less relevant. This indicates that the legal framework is almost clear and extensive and can be seen as a helpful and encouraging guide.
3. Widely varying perception of hurdles within one industry

The last result generated of the survey was the conclusion that there are industries in which almost every hurdle is seen differently by each participating company. The most extreme diversity presented the “manufacture of machinery and equipment not elsewhere classified” as every single hurdles statement is seen as ‘existing’ and ‘non-existing’ except the one hurdle “missing information about alternatives”. Besides this result it is obvious that this industry sees a lot of relevant hurdles too – the values are almost similarly high as such of “wholesale, retail trade, repair of motor vehicles, motorcycles, personal and household goods”. Though the hurdles perception in general is relatively high the broad spread leads to the conclusion that this industry consists of companies with very different state of the arts regarding green procurement as for every hurdle at least one company exists that relieved this hurdles (e.g. because of requirements from their customers) and one that feels it completely. A second conclusion is that the industry is as manifold as the “trade and repair” industry but with much more different experiences than this, which could be of interest in improving the whole industries environmental performance as knowledge how to overcome specific hurdles is available already. The highest hurdle for this industry is a cost hurdles as well, which proves the relevance attached to this hurdle.

4 Lessons learned from the hurdles analysis for environmental responsibility

Definitely hurdles to green procurement exist! But it is neither the actors nor the size of a company displaying the greatest differences between the perceived hurdles relevance. As the last paragraphs lined out mostly the affiliation of a company to a specific industry determines the hurdles perception. If there are hurdles seen almost identically by all industries others are perceived completely different. As there are industries with a lower hurdles perception there are others with very high relevant hurdles as well. So the industry could be identified as the parameter determining the hurdles perception.

What can be learned from the empirical study for environmental stewardship?

The aim should be to enhance the environmental strategy of a company to move on from a lower form of environmental stewardship (as e.g. on the compliant or informed position) to a higher. Therefore the following things could be learned out of the study:

1. use the hurdles analysis method and its self-evaluation tool to identify the state of the art of hurdles to green procurement
2. train the staff to avoid perception of different hurdles as shown in “actors” and “size” paragraph
3. be aware of the industry the company belongs to as industry specific hurdles might exist
4. learn from other companies of the industry to use advanced knowledge
5. learn from companies from Best-Practice industries (like electricity, gas and water supply) and adopt strategies for overcoming hurdles

If some of these lessons learned can be implemented in the procurement process the awareness of companies responsibility is raised and a development of the companies position in environmental stewardship to higher levels (top-level: sustainable position) initiated.
References


<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>Idea of the Hurdles Analysis Method</td>
</tr>
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</table>
| 2000   | Methodical preliminary work  
Development of the first questionnaire as well as the first hurdles catalogue for public organisations |
| 2001   | Application of the Hurdles Analysis within the RELIEF cities  
Application of the case study questioning within the Project NaBesI |
| 2002   | Analysis and data interpretation  
Further application of the method in English municipalities in cooperation with Global to Local Ltd. As well as computing and analysis of the results  
First methodical considerations on a self-evaluation tool |
| 2003   | First implementation of the self-evaluation as online-questionnaire  
efforts to integrate the self-evaluation within the Procura+ Campaign of ICLEI fail |
| 2004   | Methodical development of the Hurdles Analysis as well as adoption of the method to private organisations needs  
Application of a hurdles analysis for about 900 medium sized and big German companies |
| 2005/2006 | Implementation of an upgraded version of the self-evaluation online-tool, applicable for both – public and private organisations, that consists of an online questionnaire, a description of the method of the Hurdles Analysis and its cycle as well as a short interpretation guide for the results of the analysis |

*figure 1*
Market setting standards

controls

Being influenced

Further internal Stakeholders

Users (internal)

Finance

Environment

Procurement influences

figure 2
The biggest 500 German Companies
(97 analysable questionnaire)

- Procurement: 56%
- Environment: 36%
- Others: 6%

Medium sized Companies of AMMPL
(37 analysable questionnaire)

- Procurement: 62%
- Environment: 19%
- Others: 19%

Complete Survey
(134 analysable questionnaire)

- Procurement: 57%
- Environment: 33%
- Others: 10%

**figure 3**
figure 4
Comparison by actors

- efforts not useful
- obstacles by process
- green alternatives not own
- not informed about the aim
- not informed about possibilities
- lower functionality
- not informed about the relevance
- no guidelines or support
- initiatives not encouraged
- no green alternative available
- scope missing
- follow-up costs not included
- missing information about alternatives
- user or prejudices
- unclear legal position
- too expensive
- additional work
- difficult to identify
- increase of costs
- no cost savings

figure 5
Figure 6: Influence vs. Effort for different actors.

- Legislation: High influence, average effort.
- Market: Low influence, average effort.
- Customers: Rather high influence, low effort.
- Procurement: High influence, average effort.
- Users (internal): Low influence, rather high effort.
- Finance: High influence, average effort.
- Environment: Low influence, average effort.
- Further int stakeholders: High influence, average effort.
Comparison by company size

Average

I agree
I rather agree
I rather do not agree
I do not agree

efforts not useful
lower functionality
costs not known
lower functionality
not informed about the aim
obstructions by process
not informed about possibilities
no aim of organisation
not informed about the relevance
no green alternatives available
follow-up costs not included
user prejudices
uncertain legal position
increased work
increase of costs
no cost savings

Medium sized companies
The biggest 500

figure 7
I do not agree

I rather do not agree

I rather agree

I agree

Figure 8
I do not agree

I rather not agree

I rather agree

I agree

figure 9
I do not agree

I rather do not agree

I rather agree

I agree

Construction

Manufacture of electrical and optical equipment

Wholesale, trade; repair

Manufacture of machinery

Gas and water supply

Manufacture of metal industries

Electricity, gas and water supply

Manufacture of chemicals

Manufacture of rubber and plastic products

not informed about legal framework

Manufacture of transport equipment

figure 10
Hurdles Profile

I agree
I rather agree
I rather do not agree
I do not agree

Hurdles

figure 11
Hurdles Profile

I agree
I rather agree
I rather do not agree
I do not agree

- no cost savings
- increase of costs
- difficult to identify
- too expensive
- no green alternatives available
- missing information about alternatives
- obstacles by process
- initiatives not encouraged
- no aim of organisation
- lower functionality
- green alternatives not known
- guidelines do not support
- possibilities not widely used
- not informed about the relevance
- efforts not useful
- not informed about the aim
- not informed about possibilities
- not informed about legal framework

Hurdles

figure 12
Hurdles Profile

- no cost savings
- too expensive
- increase of costs
- additional work
- follow-up costs not included
- difficult to identify
- guidelines do not support
- initiatives not encouraged
- missing information about alternatives
- scope missing
- no aim of organisation
- user prejudices
- legal framework prevents
- no green alternatives available
- uncertain legal position
- possibilities not widely used
- not informed about legal framework
- not informed about the aim
- not informed about possibilities
- green alternatives not known
- not informed about the relevance
- obstructions by process
- lower functionality
- efforts not useful

Average

I do not agree: 
- no cost savings
- too expensive
- increase of costs
- additional work
- follow-up costs not included
- difficult to identify
- guidelines do not support
- initiatives not encouraged
- missing information about alternatives
- scope missing
- no aim of organisation
- user prejudices
- legal framework prevents
- no green alternatives available
- uncertain legal position
- possibilities not widely used
- not informed about legal framework
- not informed about the aim
- not informed about possibilities
- green alternatives not known
- not informed about the relevance
- obstructions by process
- lower functionality
- efforts not useful

I rather agree: 
- no cost savings
- too expensive
- increase of costs
- additional work
- follow-up costs not included
- difficult to identify
- guidelines do not support
- initiatives not encouraged
- missing information about alternatives
- scope missing
- no aim of organisation
- user prejudices
- legal framework prevents
- no green alternatives available
- uncertain legal position
- possibilities not widely used
- not informed about legal framework
- not informed about the aim
- not informed about possibilities
- green alternatives not known
- not informed about the relevance
- obstructions by process
- lower functionality
- efforts not useful

I agree: 
- no cost savings
- too expensive
- increase of costs
- additional work
- follow-up costs not included
- difficult to identify
- guidelines do not support
- initiatives not encouraged
- missing information about alternatives
- scope missing
- no aim of organisation
- user prejudices
- legal framework prevents
- no green alternatives available
- uncertain legal position
- possibilities not widely used
- not informed about legal framework
- not informed about the aim
- not informed about possibilities
- green alternatives not known
- not informed about the relevance
- obstructions by process
- lower functionality
- efforts not useful
There are uncertainties concerning the legal position of green procurement (e.g. because of complexity). The existing legal framework supports green procurement. I am informed about the relevant legal framework for green procurement. Efforts for green procurement are useful. Green procurement is one of the aims of my organisation. I am sufficiently informed about the aim of green procurement. I am informed about green product and service alternatives. There are sufficient green product and service alternatives available within the procurement market. Information (criteria, prices, services) concerning green product and service alternatives are available. It is difficult to identify green product and service alternatives within the procurement market. Green procurement causes additional work. Green procurement opens up opportunities for cost savings. Green procurement causes cost increases. Follow-up costs (e.g. energy or disposal costs) cannot be included in procurement decisions. Green products and services are too expensive. It is possible to procure green product and service alternatives within a given cost scope. Green products and services have a lower functionality compared to conventional products. Many users have prejudices concerning green product and service alternatives. Given possibilities to include environmental criteria in the procurement process are widely used in my organisation. The procurement guidelines of my organisation support green procurement. Green procurement is obstructed by the administration processes (e.g. due to spread competences). Initiatives of employees who want to procure green are supported. I am informed about the possibilities of green procurement. I am informed about the environmental relevance of procured product and service alternatives.

<table>
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<tr>
<th>hurdles</th>
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<th>hurdles classification</th>
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<td>knowledge and identification of green</td>
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<td>products and services</td>
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<td>within the procurement market.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>within a given cost scope.</td>
<td></td>
<td></td>
</tr>
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<td>Many users have prejudices concerning green product and service</td>
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<td>alternatives.</td>
<td>possibilities not widely used</td>
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<td>due to spread competences).</td>
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<td>Initiatives of employees who want to procure green are supported.</td>
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*table 1*
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<tr>
<th>Category</th>
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<tbody>
<tr>
<td>Agriculture, hunting and forestry</td>
<td>MANUFACTURE OF BASIC METALS AND FABRICATED METAL PRODUCTS</td>
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<tr>
<td>Construction</td>
<td>MANUFACTURE OF CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES</td>
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<tr>
<td>Education</td>
<td>MANUFACTURE OF COKE, REFINE PETROLEUM PRODUCTS AND NUCLEAR FUEL</td>
</tr>
<tr>
<td>Electricity, gas and water supply</td>
<td>MANUFACTURE OF ELECTRICAL AND OPTICAL EQUIPMENT</td>
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<tr>
<td>Extra-territorial organisations and bodies</td>
<td>MINING AND QUARRYING, EXCEPT OF ENERGY PRODUCING MATERIALS</td>
</tr>
<tr>
<td>Financial intermediation</td>
<td>MINING AND QUARRYING OF ENERGY PRODUCING MATERIALS</td>
</tr>
<tr>
<td>Fishing</td>
<td>OTHER COMMUNITY, SOCIAL AND PERSONAL SERVICE ACTIVITIES</td>
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<td>Health and social work</td>
<td>PRIVATE HOUSEHOLDS WITH EMPLOYED PERSONS</td>
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<td>Hotels and restaurants</td>
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<td></td>
<td>WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES, MOTORCYCLES AND PERSONAL AND HOUSEHOLD GOODS</td>
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*Table 2*
<table>
<thead>
<tr>
<th></th>
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<td>equal variances</td>
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<tr>
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<td>equal variances</td>
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<td>unequal variances</td>
<td>0.195</td>
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<tr>
<td>guidelines do not support</td>
<td>equal variances</td>
<td>1.662</td>
</tr>
<tr>
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Notes: (Nₐ=77; Nᵤ=46) and (Nₐ=75; Nᵤ=46) indicate the sample sizes for each category.
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<th>Condition</th>
<th>Equal Variances</th>
<th>Unequal Variances</th>
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<td>Lower functionality</td>
<td>0.021, 0.886</td>
<td>0.186, 96.715</td>
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<tr>
<td></td>
<td>0.082, 0.774</td>
<td>1.517, 120.000</td>
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<tr>
<td>Too expensive</td>
<td>0.582, 0.447</td>
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<tr>
<td></td>
<td>-0.776, 90.635</td>
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*Table 3*
<table>
<thead>
<tr>
<th>paired differences</th>
<th>mean</th>
<th>standard deviation</th>
<th>T</th>
<th>df</th>
<th>N</th>
<th>significance (two-sided)</th>
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<tbody>
<tr>
<td>pair 1 influence procurer – influence law</td>
<td>1.33333333</td>
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<td>120</td>
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**Table 4**

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<th>df</th>
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<tbody>
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<td>1.0832E-23</td>
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**Table 5**
<table>
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<tr>
<th>Level</th>
<th>Valid Cases</th>
<th>Chi-Square</th>
<th>Level of Significance</th>
<th>Null Hypothesis</th>
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<tbody>
<tr>
<td>Green alternatives not known</td>
<td>126</td>
<td>4.429</td>
<td>0.219</td>
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<td>No green alternatives available</td>
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<td>Efforts not useful</td>
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<td>2.617</td>
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<tr>
<td>Possibilities not widely used</td>
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<td>3.808</td>
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<tr>
<td>Uncertain legal position</td>
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<td>4.128</td>
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<td>No cost savings</td>
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<td>3.782</td>
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<td>Difficult to identify</td>
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<td>Legal framework prevents</td>
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<td>0.080</td>
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<td>Increase of costs</td>
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*Table 6*