The Transnational Management of Hazardous Chemicals

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Introduction

Since the 1970s the number of environmental laws e.g. in the European Union (EU) has increased. Nonetheless an effective protection of the environment requires that societal actors assume responsibility and become active on this issue. In particular, corporations whose activities have an effect on the environment are brought to the fore, as is the case with those corporations that are involved in the production, trade, processing and application of chemicals. This is because, as chemical substances may have negative consequences for health and environment, it is necessary to handle them in a careful way. Harmful chemicals may cause environmental problems if they reach the ecosystem, e.g. via their use in consumer goods. Consequently, a safe management of chemicals is an important condition for a global protection of the environment. Against this background, this article concentrates on the corporation between the chemical industry – producers, distributors as well as consulting firms – and the automotive industry – car manufacturers and parts suppliers – which are linked by a value-added chain. Both industries are involved in the production of automobiles and have to deal with chemical substances. This value-chain section is not located in a single nation state, it even transcends the borders of trade-areas like the EU, and hence it could be regarded as a global production process.[1]

In the article at hand I will describe some common practices and cognitive structures in reference to the management or phasing out of hazardous chemicals that have emerged in the chemical and automotive industry.[2] Further, I will give

1 I would like to thank the editors as well as Martin Koch for helpful comments on an earlier draft of this article and Dörthe Hauschild and Tamara Brown for making the text more readable. The author bears responsibility for any shortcomings.

2 The empirical study is based on an analysis of documents as well as on interviews that were conducted with representatives of the automotive and chemical industry. The interviews were carried out together with Olaf Dilling in the context of the re-

some reasons for this emergence. Since the production process analysed reaches beyond the borders of nation-states, I regard these practices and cognitive structures as transnational. Of course, global business partners have to coordinate their behaviour in order to make the successful production and selling of goods possible; this includes the management of hazardous chemicals. Beyond this, I am interested in seeing if these transnational practices concerning the management of hazardous substances also add to the protection of health and environment.

This article is composed of three parts. First, I will give some examples of a transnational management of hazardous chemical substances appearing in the chemical and the automotive industry which illustrate the emergence of world society. Second, I will describe the extent to which these examples are indications of emerging and changing common practices and cognitive structures. Further, I will explain that these elements of a transnational management of chemicals can count as self-regulation. Then, I will give a short explanation for its emergence. Finally, I will conclude with the question of which other factors might explain the emergence of a transnational management of chemicals and in how far these factors contribute to the protection of health and environment.

The Transnational Management of Hazardous Chemicals in the Automotive Industry and the Chemical Industry

As denoted in the introduction, there are a lot of European laws concerning the protection of the environment. With reference to the regulation of chemicals, the European Economic Community adopted the first directive on classification, packaging and labeling of dangerous substances in 1967. Currently, chemicals are a field of activity of the European Unions' environmental policy. The directive on the management of end-of-life vehicles stipulates that vehicle manufacturers and material and equipment manufacturers must, among other things, endeavour to reduce the use of hazardous substances when designing vehicles and make sure that components of vehicles placed on the market after July 2003 do not contain mercury, hexavalent chromium, cadmium or lead (European Com-

search project "Transnational Governance and International Law" at the collaborative research center "Transformations of the State" (University of Bremen). The interviews were arranged with representatives of corporations belonging to the automotive and the chemical industry. All in all, ten interviews took place. Five interviews were conducted in the automotive industry (car producers and parts suppliers) and five interviews were conducted in the chemical industry (producers and distributors of chemicals, one chemical consulting firm). The interviews were interpreted according to qualitative-interpretive methods (Froschauer/Lueger 2003; Wernet 2000). Furthermore, environmental reports of corporations, corporation guidelines, management standards and similar documents were analysed. The sources are available from the author.

mission 2000). Further, the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment stipulates that from July 2006, new electrical and electronic equipment that are placed the market do not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) (European Commission 2002).

In the following section, I will demonstrate the efforts of corporations belonging to the chemical industry and the automotive industry relating to the management of hazardous chemical substances. Naturally, inter-organisational relations are most important for the survival of corporations that are involved in the production of manufactured goods because they are in need of the other firms' resources. This article pays attention not only to economic exchange relationships, but also to non-economic relations like communicative activities (cf. Jang 1997: 328p), e.g. the transfer of knowledge, which may move up and down the value chain. The corporations in the production chain that are analysed in this article are formally autonomous organisations that are connected to one another by material and immaterial exchange processes. The relationships between the corporations are formal, e.g. contracts between a supplier and a customer concerning the design of a product, as well as informal, e.g. rather loose arrangements between a customer and a supplier to improve a suppliers' performance if a ranking conducted by an automobile producer reveals undesired results.

International Material Data System/ Global Automotive Declarable Substance List

The development of the automotive industry's international material data system (IMDS), as well as the development of the global automotive declarable substance list are examples of a transnational management of chemical substances. The IMDS was developed by European and American car producers and came into operation in June 2000. Meanwhile, Asian automotive producers have attached themselves to this system. The IMDS, a voluntary industry-led initiative, files and administers all materials used in the automotive manufacturing chain and collects chemical information (Fisher 2005). It is the goal of this initiative to collect data on chemical substances that are a part of the automobiles produced. This system is intended to make it possible for car manufacturers and their suppliers to comply with the different national laws and private standards concerning hazardous substances and, last but not least, to make the recycling of automobiles easier. Suppliers have to produce these data, because they are constrained by law and/or by their customers' delivery conditions. On the one hand, this system is helpful to car producers: If a substance of concern is prohibited by law, a producer knows which of its suppliers uses this substance and can call on to him to remove the substance from his products (Johnson Controls 2001). On the other

hand, the suppliers, using the database, are able to monitor the substances used in their products. If a customer has any questions regarding the composition of the products' parts, the supplier is able to answer them. Nonetheless, suppliers initially protested against this system, because they were of the opinion that a data management system must allow them to protect their business know-how. In the initial approach to dealing with declarable substances, each car manufacturer developed individual lists of substances and as a result, suppliers had to consider multiple lists (Interview 2005).

After controversial discussions between the suppliers and the car producers, the international "Global Automotive Stakeholders Group" (GASG) was formed. It consists of automotive manufacturers and the suppliers of the automotive and chemical industry. It is the intention of this stakeholder group to simplify the communication and exchange of information in relation to the use of substances in parts of automobiles all along the production chain. The GASG developed the "Global Automotive Declarable Substance List" (GADSL). The GADSL, implemented in 2005, is a globally uniform list of declarable substances.[3] The decision to list a substance on the GADSL in based on clear criteria. A substance is listed if it is regulated, is projected to be regulated by a governmental agency, or if it is demonstrated – by testing under OECD guidelines – "that the substance may be associated with a significant hazard to human health and/or the environment, and its presence in a material or part in a vehicle may create a significant risk to human health and/or the environment" (GADSL). Accordingly, three so-called "reason codes" have been developed to explain to the participating firms why a substance was included in the GADSL. The first code means that a substance is "legally regulated". The second code "for assessment" indicates that a substance is expected to be regulated by government agencies, and "for information" denotes a substance:

> "tracked for information purposes only, upon the decision of the GASG Steering Committee. After discussion at the GASG Steering Committee and on *an exceptional basis*, [a car producer] may include an individual substance or family of substances on the list under this reason code" (ibid., italics in original).

It is anticipated that the GADSL will be a part of the standards of car producers, so the suppliers will have to consider only this list. According to official statements, the purpose of this standard is to "help the automotive industry to monitor the usage of these substances and to facilitate compliance with current

3 In April 2005, the GADSL replaced the "International List of Reportable Substances" (ILRS). Like the GADSL, it was the goal of the ILRS to summarise the different requirements of the car producers concerning the declaration of substances. In contrast to the GADSL, the ILRS was planned without the support of the automotive suppliers and the chemical industry.

and future regulations"[4] and to "help take into account customer requirements to ensure sustainable products"[5]. Furthermore, it is the intent of the GADSL

"to become the company specific list for the declaration of parts composition within the automotive industry. It provides a definitive list of substances requiring declaration with the target of minimising individual requirements and ensuring cost-effective management of declaration practice along the complex supply chain" (ibid.).

Empirical evidence shows a different picture. A global automotive manufacturer who is represented in the GASG steering committee has its own restricted substance management standard (RSMS). This standard is, according to the firms' portrayal, global and addresses all legislation on the restriction of substances as well as its own strategy that "may go beyond substance restrictions and bans in local markets." Compliance with this standard is part of the terms of doing business with this car producer. It is the responsibility of the tier-one suppliers to pass on this standard and all its requirements to the sub-tier suppliers. The RSMS exceeds the GADSL. Even after the implementation of the GADSL the RSMS standard is valid and will be updated. The automaker in question regards it as necessary to exceed the existing standards of chemical regulation regarding e.g. the passenger compartment. The suppliers anticipated this reaction of automotive manufacturers. A common standard was in their best interest, because it would have simplified the reporting processes. Complying with this global list would have meant that all laws and the automotive standards were observed. However, the suppliers are aware that they cannot guarantee that the car producers adhere to the common standard and do not demand additional ones. They appreciate that the global list was set up by the industry, because they believe that those actors have a better overview than law-making institutions. The automotive suppliers are of the opinion that the standards of the car producers that exceed the global list, the GADSL, are unwarranted (Interviews 2005).

Material Safety Data Sheets

In short, material safety data sheets contain safety information on the handling of hazardous substances. They provide essential information on chemicals in order to minimise health or environmental dangers (cf. Ronit 2000: 91).

In the 1970s, companies in different industries began to provide their own safety data sheets. For example, car producers and chemical distributors developed their own data sheets as they wanted to be informed by their suppliers on the chemical composition of products as well as on the adequate handling of haz-

4 http://www.model.mds.eds.de/html/data/imds_standard101_ilrs.pdf, October 17, 2005.

5 http://gadsl.org/files/2005_Ver_1.0.pdf, October 17, 2005.

ardous chemicals. In the 1980s, the German chemical industry association (VCI) and the German Association of the Automotive Industry (VDA) developed association-specific data sheets. According to a voluntary initiative of the industry, the safety data sheets were harmonised in Germany. At first, these harmonised safety data sheets were not coordinated with foreign data sheets. The situation changed with the European directive on safety data sheets. In the forefront of the directive, the Federation of German Industries (BDI) arranged for a committee of representatives of the VDA and the VCI to participate in the development of a harmonised European safety data sheet. The VDA-data sheet can be said to be the precursor of the forthcoming European data sheet. This can be explained by the fact that as the European Commission, preparing the directive on safety data sheets, was asking for adequate instruments, the VDA-safety-data sheet was widely-used (Interview 2005). The directive determines that any person established within the Community who is responsible for placing a dangerous substance or preparation on the market, whether manufacturer, importer or distributor, shall supply the recipient who is an industrial user of the substance or preparation with a safety data sheet (European Commission 1991).

The major difficulty with the data sheets is that information is often deficient or even lacking or that the wrong data sheet has been used. This can be explained by the fact that the design of safety data sheets is not similar in different regions. So, for example, an Asian corporation that wants to export a dangerous substance has to deal with different data sheets in the USA and in the European Union (EU). If information on chemical substances is lacking, a European corporation uses its personal contacts to its supplier outside of the EU to get the missing information in an informal way. In spite of these problems, safety data sheets are currently more accepted than at the beginning; the corporations' staff pay more attention to them. If they do not want to compile safety data sheets on their own, corporations may contact chemical consulting firms – which emerged in the 1980s – that compile data sheets e.g. under the provisions of the aforementioned directive (Interviews 2005).

Since the implementation of the directive on safety data sheets, the chemical and automotive industries have not been inactive. E.g. some representatives of automotive manufacturers and parts suppliers as well as a representative of a global chemical producer participated in a committee dealing with the development of an efficient electronic system to exchange European data sheets. Finally, a harmonised data format was designed to reduce the corporations' burdens. Before, the data sheet was transmitted in paper form. This was an administrative burden as the data is used for purposes such as compiling registers of hazardous chemicals or operating instructions.

In the 1990s, a globally harmonised system (GHS) for hazard communication was developed that includes a common approach on substance data sheets. Key participants in developing the system include various governments and some international organisations. Work on the GHS has been ongoing since the United

Nations' Conference on the Environment and Development in Rio de Janeiro (Silk 2003: 447).[6] In the case of safety data sheets, the harmonisation process was able to build on the previous efforts of the industry to standardise the approaches of the data sheets requirements. Thus, there was agreement on a sixteen section data sheet (Silk 2003: 451).[7]

Substitution Processes

A last example of an emerging industry-spanning management of chemical substances is the substitution of hazardous chemicals. In recent years, the automotive industry began to substitute other chemicals for methylene chloride, a harmful and presumably cancer-causing solvent. The European Union classifies this substance as ‚category 3', the category containing substances "that need attention due to their possible carcinogenic properties for humans" (Tukker/Simons 1999: 38). A global automotive producer started the replacement of this prevalent substance together with a leading global producer of chemicals. Since replacing of methylene chloride in repairing lacquers proved to be difficult, the car producer first tried to play down the hazardousness of the substance, but the cancer-causing effect of methylene chloride was discussed in public and so the car producer quickly searched for an adequate solution. The corporation contacted a global chemical producer who developed a less harmful repairing lacquer. As this solution proved to be effective, the chemical producer promoted it and offered the new lacquer to other producers of automobiles. Meanwhile, the substitution for methylene chloride in repairing lacquers proceeded in the automotive industry. In another case, a producer of lacquer developed a solvent-free lacquer and ceased the production of lacquers with solvents, so its customer, a global automotive manufacturer, had to purchase it (Interviews 2004, 2005).

Nonetheless, the car producers are critical on the substitution of substances. They are of the opinion that it might be more reasonable to deal with a hazardous, but well-known substance in a careful way than to use a substitute without knowing how to handle it properly. Of course, the substitution processes may fail. This was the case when a US car manufacturer demanded a product free of nitrosamines, a cancer-producing substance, from a supplier outside of the USA. The reason was that the US law prohibits this chemical substance. The supplier regarded this demand as unfair and announced a price increase for the demanded product. This caused the car producer to withdraw its demand.

6 According to an international agreement, "it is desirable to have as many countries as possible adopt the GHS by 2008" (Silk 2003: 451).

7 These sections include, among other things, information on ingredients; toxicological, ecological and transport information (Silk 2003: 451).

Transnational Practices and Cognitive Structures

The examples discussed above demonstrate that some common transnational practices have been established and changed in the automotive and chemical industry – corporations have developed new ways of acting or have changed the ways they act – and that a few changes in cognitive structures are observable. Views,[8] norms, values, interpretations or goals of corporations have changed.

First, the international material data system as well as the global automotive declarable substance list – which were invented by different industries and across nation-state boundaries – exemplify how new practices have emerged in relation to the management of chemicals. Also, some cognitive changes have become apparent in this context. For example, the automotive industry thought that a common initiative to collect data on chemical substances was necessary and realised this goal. There are some additional shared views and interpretations such as the recognition of the automotive and the chemical industry that it is necessary to cooperate and to produce a common standard, the GADSL. Thus, they shared and realised a common goal. Yet, the views concerning the benefits of the GADSL seem to differ among automotive producers and their suppliers. While the parts suppliers appreciated the list due to its capacity to make it less difficult to comply with laws and private standards, some car producers believed that their own standards were superior and should not be replaced by a common standard. Hence, it is questionable if the GADSL would guide the behaviour of all involved business partners. Second, the example of the material safety data sheets, illustrates that common practices concerning the handling of safety information on chemical substances emerged. The example shows that some common views and interpretations were established, such as the intention to be informed on the composition of products and their safe handling as well as the enhanced acceptance of safety data sheets in the industry. Requests of different industries for a harmonised European safety data sheet as well as the desire for an electronic exchange system are examples of common goals. Third, the example of the replacement of harmful chemicals demonstrates that practices and cognitive structures have changed. This is true insofar as corporations worked together across the boundaries of firms and industries to reduce environmental and health hazards. Referring to the substitution of methylene chloride with another substance, it is important that the substitute developed by chemical corporations and the automotive industry was diffused throughout the industry by a chemical producer so the whole industry was able to change its practices and benefited from it. Behind this, some cognitive changes are observable. The chemical and primarily the automotive industry turned out to be responsive to public concerns relating to environmental and health dangers. The substitution of chemicals described can be referred to as a re-

8 Views may relate to "beliefs about desired product attributes, market structures, appropriate ways of doing business, and the relative quality of member firms" (Porac et al. 2002: 593).

alised goal of corporations in the automotive and the chemical industry. Yet, the interpretations of the automotive manufacturers on the one hand and the interpretations of their suppliers on the other hand seem to be different as the example of the failed substitution process demonstrates. The automotive supplier was of the opinion that the demand of the car producer to phase out nitrosamines in the production of parts was just a strategic decision. Hence, he showed no understanding that this phase-out would be reasonable for environmental and health reasons. Finally, both the American car producer and its supplier were not willing to bear additional costs for a phase-out of nitrosamines voluntarily. It is an indication of changing patterns of thought that some corporations of the chemical as well as of the automotive industry argued that it might be reasonable to use a new, but unknown substance instead of a hazardous but well-known substance.

In the field of chemical regulation, "pure" self-regulation, i.e. strictly autonomous self-regulation, is rare because states or supranational organisations like the EU attempt to influence the firms' behaviour by setting environmental policy targets and/or by creating a framework designed to promote a particular behaviour of private actors (cf. Rehbinder 1997: 2). Even though there are some legal foundations, there are a number of possibilities for self-regulation in a broader sense[9] as the examples illustrated above show and which will be summarised in the following points. The cases of the IMDS and the GADSL show that corporations established data systems that facilitate compliance with different national laws and private standards; corporations are informed on new (foreign) laws and private standards as well as on new scientific evidence concerning the consequences for health and environment by means of the said system. Thus, they were in the position to react quickly to those changes. The case of the automotive producer representing the strategy of exceeding existing public standards of chemical regulation as well as the substitution of methylene chloride shows that corporations go beyond existing legal requirements if they think they are insufficient. Further, the car manufacturer monitored if its suppliers complied with his requirements and ensured that they actively participated in communicating these requirements throughout the value-chain. The example of the VDA-data sheet illustrates that corporations developed a material safety data sheet on their own initiative which was afterwards absorbed by law. Further, corporations man-

9 See the concept of Haufler who explains that self-regulation occurs "when those regulated – in this case, corporations – design and enforce the rules themselves. The rules that govern their behaviour are adopted voluntarily, either going beyond current regulatory requirements or establishing new standards in areas in which government rules or standards are lacking" (Haufler 2001: 8). Knill and Lehmkuhl differentiate between "regulated self-regulation" where both public and private actors own a "high level of governance capacity" and "private self-regulation", here the states' capacity to intervene is restricted and private self-regulation is dominant (Knill/Lehmkuhl 2002: 93p.). (For the possibilities of governments to induce corporate self-regulation see Ruhnka/Boerstler 1998; for the relevance of monitoring and sanctioning systems to sustain self-regulation see Ronit/Schneider 2000: 23p.)

aged to develop an electronic system for the exchange of European data sheets without being obliged to do so. In addition, the international approach to harmonising data sheets was based on previous industry efforts.

One reason for the emergence of a private management of hazardous chemical substances in the chemical industry and in the automotive industry is their intention to enhance and not to endanger their reputation. For several decades, chemical corporations have had a "very bad public image", because "[t]hey are seen as causing environmental hazards" (Ronit 2000: 84p.).[10] Especially after some momentous chemical accidents in the past, the public image of the chemical industry has deteriorated. Globally, the most well-known accident was the one in Bhopal (1984) – regarded as the worst accident in industrial history – where thousands of people died and thousands of others were injured when toxic chemicals were released into the atmosphere (Greenpeace 2004; Nathan/Kovoor-Misra 2002: 253).[11] The disaster caused widespread consumer protest against the chemical manufacturer responsible (Kollman/Prakash 2001: 401), and the chemical industry reacted by establishing a global program to ensure the responsible treatment of chemicals (cf. Nathan/Kovoor-Misra 2002: 250). This world-wide, voluntary initiative of the chemical industry ("Responsible Care"), challenges chemical companies "to improve all aspects of performance which relate to protection of health, safety and environment"(Druckrey 1998: 981).[12] The self-portrayals of corporations belonging to the automotive industry, concerning their attitudes towards the protection of the environment are similar to those of the chemical industry. On their web sites, the automotive producers and their suppliers point to their intention to protect human health and the global environment and to their commitment to the concept of sustainable development. A reason for the commitment to sustainable development, as pointed out by one of the global car producers, is that the corporation wants to maintain and expand its societal acceptance. Even though there have been no environmental or health scandals in the automotive industry (cf. Bolli 2000: 55), the discussion of the risks of substances like polyvinyl chloride (PVC), brominated flame retardants (BFRs) and phthalates also concerns the automotive industry as these substances are in their products.[13]

10 For the struggle of the chemical industry with its bad reputation since the 1960s see also Ronit/Schneider 2000: 19.

11 The gas explosion in the Indian city of Bhopal is regarded as the worst accident in industrial history. According to Greenpeace, in the first days after the incident 8.000 people died. Since then, more than 20.000 people have died from the direct or indirect consequences of the catastrophe (Greenpeace 2004).

12 One aspect of "Responsible Care" is product stewardship. E.g. chemical distributors pledge themselves to offer only products that can be transported, used and disposed safely according to current knowledge.

13 A recent study of an Austrian environmental protection organisation analysed the contaminant loads in new cars. According to the study, 98 chemicals pollute the air of passenger compartments, among others, the phthalate DEHP, a potentially carcinogenic plasticiser, was detected (Global 2000, 2005).

Another reason for the establishment of a transnational management of chemicals is so-called lead firms.[14] Consequently, the IMDS was initiated by global car manufacturers that built up communication channels among some of the members of the value chain in question. As the example of the substitution of methylene chloride by safer substances reveals, an automotive producer appeared to act as a "pioneer" and thus contributed to changing practices and ideas in the automotive and chemical industry. Last but not least, the car manufacturers produced changes in the value chain through their demands to be informed by their suppliers on the composition of parts and their lists of restricted substances – they were able to dictate to their suppliers the kind of chemical substances they do not want to have in the delivered products. This is because the suppliers depend on their orders. On the other hand the producers depend to a certain degree on their suppliers' willingness to cooperate. This is the case if a car producer depends on a special supplier and can not afford to switch to another one. Suppliers of parts hesitate to exchange information with their customers because they are afraid of revealing sensitive information on the composition of substances and hence to endanger their competitive position.

Conclusion

Above, two reasons were given as an explanation for the emergence of a transnational management of hazardous chemical substances: the interest of the chemical and the automotive industry in having a good reputation and the existence of lead firms that initiated changes concerning the management of chemicals. Of course, there are some other reasons that might explain why corporations engage in the responsible transnational management of chemicals: a careful handling of chemicals reduces risks and contributes to a smooth production; the increased skepticism of the firms' employees who have to handle chemical substances and thus the risk of a lawsuit; the awareness that consumption patters have changed and that the demand for ecologically suitable products has risen. On the other hand, it might be the case that corporations are responsive to societal signals on what is an acceptable behaviour and what is not and that they recognised the environmental consequences of their practices and accordingly have changed their patterns of behaviour to contribute to the protection of the environment (cf. Rehbinder 1997: 2; Ronit/Schneider 2000: 22). To evaluate if economic interests or values and norms explain the emergence of the transnational management of

14 According to Gereffi, lead firms "can be located upstream or downstream from manufacturing […], or they can be involved in the supply of critical components […]. What distinguishes lead firms from their followers or subordinates is that they control access to major resources (such as product design, new technologies, brand names, or consumer demand) that generate the most profitable return in the industry" (Gereffi 2001: 1622).

chemicals – or if the truth lies somewhere inbetween – is beyond the scope of this article.

Nonetheless, the changing and emerging practices concerning the management of hazardous substances show that the self-regulation of private actors may have some positive effects for the environment and/or for human health. If hazardous substances are known or even avoided, not only the employees of corporations involved in the manufacturing of cars but also consumers will be protected against health risks. Finally, the disposal or recycling of automobiles will be less complicated and more environmental-friendly. In some other cases, empirical examples reveal that self-regulation is useful for the efficient coordination of production processes, but the environmental benefits are questionable. Hence, it may be beneficial for suppliers that it is difficult for car manufacturers to exceed the GADSL; however it may prove to be unfavourable for environmental reasons. This raises the question of whether or not thinking has changed in favour of an enhanced awareness of environmental aspects. One should not take it for granted that the American car manufacturer asked its supplier for a nitrosamine-free part merely because the American law requires a phase-out of nitrosamines. It is by all means possible that the demand was based on environmental considerations as well. But the fact that the car producer was not willing to accept higher prices seems to challenge this.

However, against the background of vanishing borders and the fact that the resources of nation-states are limited, multinational corporations may choose to solve environmental problems by designing and establishing adequate rules and procedures among themselves. Here, their specialised knowledge, financial and management potential as well as their transnational organisational structures (cf. Messner/Nuscheler 2003: 16p; Cutler et al. 1999: 4p) may hopefully be conducive. The empirical cases have shown that corporations identified realms where self-regulation in relation to the transnational management of chemical substances was feasible and necessary and hence created corresponding arrangements. At the same time, it also became apparent that – as e.g. the cases of the IMDS and GADSL showed – it is difficult for practices and ideas to diffuse across the boundaries of industries. Further research will be necessary to determine which factors complicate the diffusion of practices and ideas in transnational value chains.

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