Christian Graf

Efficacy of ISO 14001 – a neo-institutional perspective

Please note:

Dear reader, this paper presents an ongoing PhD-project. For that reason the argumentation and the results are all preliminary. In order to improve the quality of paper and the PhD-project in general all comments and all kind of critique are highly appreciated by the author. So, do not hesitate to contact me if you have any question, comment or critique on this paper. Thank you very much in anticipation.

Abstract:

ISO 14001 is the dominant environmental management standard with more than 200,000 certified organizational units. It is an auditable process-based standard resting upon a "Plan-Do-Check-Act" (PDCA)-cycle and the demand for continual improvement. Despite the widespread diffusion of ISO 14001 its efficacy as a tool for corporate environmental management is challenged (Hertin et al. 2008, Nawrocka/Parker 2008). It is argued that ISO 14001 has only a minor impact on the environmental performance of companies.

In answer to this critique the paper shows that the efficacy of ISO 14001 can be enhanced by linking the standard with other ecological, performance-based standards, like for example the FSC in forestry. This result is derived from a case study analysis based on neo-institutional theory, especially focusing on the process of theorization (Strang/Meyer 1993, Tolbert/Zucker 1996, Greenwood et al. 2002). The criteria for assessing the efficacy of ISO 14001 are considered to be socially constructed in this approach. Moreover, in addition to technical demands for advancing ISO 14001, the paper also considers explicitly requirements concerning the legitimacy of ISO 14001. The approach of Djelic and Sahlin-Andersson (2006) on transnational governance explores empirical information on requirements related to the content of legitimate standards and the characteristics of a legitimate process of standardization.

The paper advances the work of Rasche (2010) and Dyllick (2007) who argue that stand-alone standards do not reflect the complexity and dynamics of a developing global governance.

Keywords:

ISO 14001, Environmental Management System, New Institutionalism, Standard

1. Introduction

ISO 14001 is the dominant environmental management standard with more than 200,000 certified organizational units. It is an auditable process-based standard resting upon a "Plan-Do-Check-Act" (PDCA)-cycle and the demand for continual improvement. Despite the widespread diffusion of ISO 14001 its efficacy as a tool for corporate environmental management is challenged (Hertin et al. 2008, Nawrocka/Parker 2008). It is argued that ISO 14001 has only a minor impact on the environmental performance of companies.

In answer to this critique the paper shows that the efficacy of ISO 14001 can be enhanced by linking the standard with other ecological, performance-based standards, like for example the FSC in forestry. This result is derived from a case study analysis based on neo-institutional theory, especially focusing on the process of theorization (Strang/Meyer 1993, Tolbert/Zucker 1996, Greenwood et al. 2002). The criteria for assessing the efficacy of ISO 14001 are considered to be socially constructed in this approach. Moreover, in addition to technical demands for advancing ISO 14001, the paper also considers explicitly requirements concerning the legitimacy of ISO 14001. The approach of Djelic and Sahlin-Andersson (2006) on transnational governance explores empirical information on requirements related to the content of legitimate standards and the characteristics of a legitimate process of standardization.

The paper advances the work of Rasche (2010) and Dyllick (2007) who argue that stand-alone standards do not reflect the complexity and dynamics of a developing global governance.

The paper is organized as follows: First, ISO 14001 and the research question are presented. Building on that new institutionalism and especially the concept of theorization as the theoretical framework are introduced. The third part of the paper consists of the case study analysis. Linking ISO 14001 with other more performance-based standards is discussed in the fourth part. The paper ends with a short conclusion.

2. ISO 14001

ISO 14001 is a standard for environmental management systems (EMS) published in 1996. With more than 200,000 organizations certified according to ISO 14001 in 2009 it is the worldwide dominant standard for environmental management (ISO, 2010).

ISO 14001 is characterized by three key features. First, the standard is based on a generic problem solving process consisting of four steps. These are “Plan”, “Do”, “Check” and “Act”. Such a process is called PDCA- or Deming-cycle. On the basis of an explicitly defined environmental policy an organization passes through that cycle and strives for improving its environmental performance in each iteration. This refers to the second key element of ISO 14001 – the demand for continual improvement.

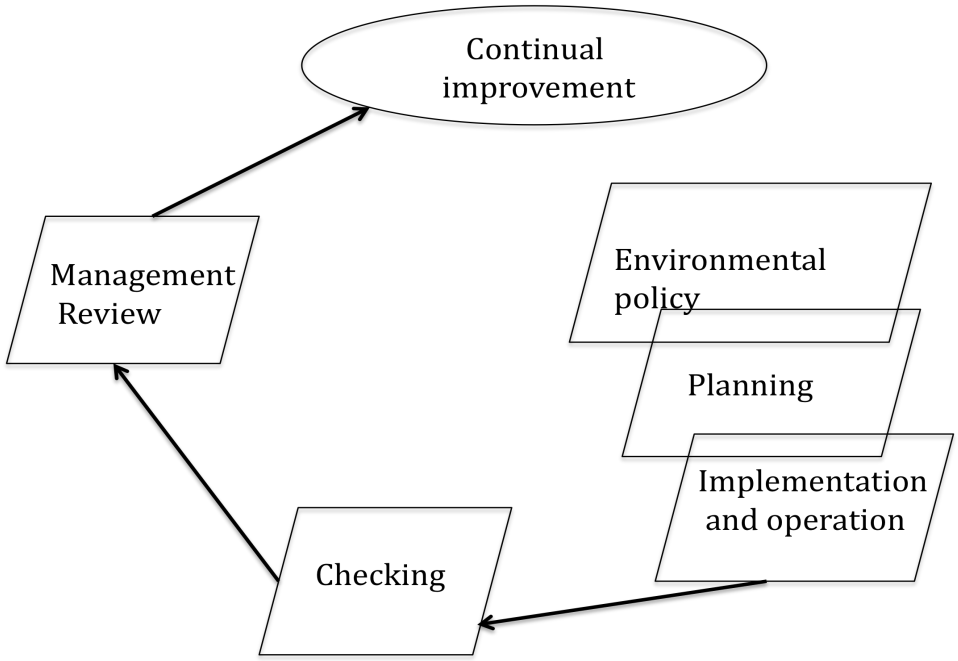

Fig. 1: Structure of ISO 14001

The third feature of ISO 14001 is its ability to be certified. An organization can achieve certification by demonstrating the implementation and use of the PDCA-cycle and by demonstrating continual improvement. ISO 14001 does not include certain levels of environmental performance or minimum requirements for fulfilling the demand for continual improvement (Gleckman and Krut, 1997; Hortensius and Barthel, 1997). As a consequence an ISO 14001-certificate does not provide evidence that an organization is really reducing its environmental impact. This is why in empirical research the efficacy of ISO 14001 is often critically assessed.

Current research on the efficacy of EMS (environmental management systems) in general and especially ISO 14001 delivers mixed results. The efficacy of ISO 14001 is challenged since it is argued that ISO 14001 does at best only have a minor impact on the ecological performance of organizations. Moreover, there exist methodological limitations, like the lack of relevant, comparable data, which are considered as a

limitation for assessing ISO 14001 (Arimura, Hibiki et al., 2008; Dyllick and Hamschmidt, 2000; Hertin, Berkhout et al., 2008; Nawrocka and Parker, 2009). Moreover, the efficacy of ISO 14001 is considered to be context-specific (Anton, Deltas et al., 2004; Sroufe, 2003).

In spite of these methodological challenges ISO 14001 is generally seen positive but with important limits concerning its efficacy. (Annandale, Morrison-Saunders et al., 2004; Dahlström, Howes et al., 2003; Gastl, 2005; Hamschmidt and Dyllick, 2001; Melnyk, Sroufe et al., 2003; Potoski and Prakash, 2005; Rennings, Ziegler et al., 2006; Russo, 2009; Welch, Rana et al., 2003; Ziegler and Seijas Nogareda, 2009; Zutshi and Sohal, 2004). It is not contested that ISO 14001 has an effect but the it is often considered insufficient. For that reason it is argued that ISO 14001 needs to be advanced (Ammenberg and Hjelm, 2003; Dyllick and Hamschmidt, 2000; Gastl, 2005; Könnölä and Unruh, 2007; McDonach and Yaneske, 2002; Müller-Christ, 2008; Schylander and Martinuzzi, 2007; Wagner, 2007; Watson and Emery, 2004). A clearly negative view on ISO 14001 is rare (Barla, 2007; Morrow and Rondinelli, 2002).

Considering the critical evaluation of the efficacy of ISO 14001 it seems to be important to elaborate possibilities for advancing the standard. This is the objective of this paper. To reach this goal the understanding of efficacy in the context of ISO 14001 needs to be improved since the reviewed literature does not deliver a definition of efficacy. Moreover, the standard itself does not provide any criteria for assessing the efficacy.

In the next section a framework for a better understanding of efficacy and for deriving proposals for advancing ISO 14001 is elaborated. As a theoretical perspective new institutionalism is applied.

3. New institutionalism – Theorization as a key element of institutional change

The quintessence of new institutionalism in sociology can be summarized as follows: Actors and organizations are influenced by institutions (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Zucker, 1977). Institutions can be defined as „shared rules and typifications that identify categories of social actors and their appropriate activities and relationships“ (Barley and Tolbert, 1997, p. 96).

New Institutionalism as developed in the 1970s und 1980s was mainly focused on how institutions affect organizations. Only after the critique by DiMaggio (1988) the role of

actors and of institutional change were addressed more actively. Research on processes of institutionalization and institutional change became more important in the 1990s and especially in recent years (Beckert, 1999; Campbell, 2004; Dacin, Goodstein et al., 2002; Holm, 1995; Kondra and Hinings, 1998; Leblebic, Salancik et al., 1991; Rao, Monin et al., 2003). Tolbert/Zucker (1996) and Greenwood et al. (2002) proposed two process models for studying the development and change of institutions. Especially Greenwood et al. emphasize the importance of the concept of theorization, as developed by Strang/Meyer (1993). Theorization consists of two key elements: First, a general organizational failing and an adequate solution need to be defined. Second, the proposed solution needs to be justified viz. legitimized.

With regard to ISO 14001 and the objective of the paper the concept of theorization seems to be highly relevant. The creation of an organizational failure and the formulation of an adequate solution delivers important information on the goals of ISO 14001. In this part of theorization it can be assessed what kind ecological challenges are addressed by ISO 14001 and how the standard delivers a solution to them. This analysis improves the understanding of efficacy of ISO 14001.

The justification viz. legitimization of ISO 14001 highlights institutional requirements for advancing ISO 14001. Moral legitimacy and especially structural legitimacy according to Suchman (1995) seem to be important for legitimizing ISO 14001. Structural legitimacy can be gained by adopting "*structural characteristics* (…) *locating an organization within a larger institutional ecology"* (Suchman, 1995, S. 581). As shown by Djelic/Sahlin-Andersson (2006a), Brunsson (2000) and Krücken/Drori (2010) there exist several requirements for legitimate regulation especially on a transnational or global level. Meyer and his colleagues (Krücken and Drori, 2010; Meyer, Drori et al., 2006; Meyer, 2007; Meyer, Boli et al., 1997; Meyer, Frank et al., 1997) showed empirically that scientization viz. gaining legitimacy by referring to scientific results and presenting science as "paradigmatic umbrella" for interpreting the world (Djelic and Sahlin-Andersson, 2006, p. 24) is very important. Scientization is strongly linked to marketization (Djelic, 2006b) and moral rationalization (Boli, 2006). Marketization means that markets are considered the superior mechanism for organizing economic and social transactions. This superiority is justified by scientific economics (Sahlin and Wedlin, 2008). Moral rationalization refers to the scientific evaluation of the virtuosity and the virtue of organizations. Such an objective assessment can be achieved by certifications, awards, etc. (Sahlin and Wedlin, 2008). Concerning ISO 14001

marketization and moral rationalization are assumed important for legitimizing the standard.

Whereas scientization, marketization and moral rationalization refer mainly to the content of regulation, there exist also requirements for designing a legitimate process for rule setting. Formal organization, demanding that rule setting takes place in an international organization, and democracy, demanding a democratic process for rule-setting, are key elements of a legitimate process (Ahrne and Brunsson, 2006; Mörth, 2006). Regarding ISO 14001 the requirements concerning the process are less important since the standard is already developed. The paper also seeks to discuss possibilities for advancing ISO 14001. In this context formal organization and democracy are important for the paper since advancing ISO 14001 needs to take place in a legitimate way.

In the next section the methodology and the preliminary results of the case study are presented.

4. Case Study Analysis

Methods and data

The theorization of ISO 14001 is analyzed with the help of a content analysis of trade journal articles from 1996 to 2010. Following the argumentation of Hofmann (1999) on issue fields trade journals can be seen as an stage for consultants, auditors, practitioners, academics and officials discussing and legitimizing ISO 14001. Altogether 279 trade journal articles were reviewed. They are mainly presenting the US-position, but also European, Asian und Australian perspectives are taken into account. Since September 2010 all articles were read and analyzed three times.

Organizational failing and goals of ISO 14001

In 130 articles information on the goals of ISO 14001 was found. altogether three different categories of goals were identified:

1. 48 articles argued that ISO 14001 seeks to provide a systematic process to organize the environmental management of an organization. This view on ISO 14001 is consistent with the text of ISO 14001 and ISO 19011 (auditing / certifying an EMS)

2. the second category was named “performance”. 44 articles argued that ISO 14001 seeks to realize a certain performance level in adopting organizations. This interpretation of ISO 14001 does not fit to the wording of ISO 14001 and the rules for auditors certifying an organization.
3. The third key goal is “contribution to sustainable development”. It was named only 28 times. Despite this it is considered as a key goal since sustainability became more important since 2004. This objective of ISO 14001 has a strong normative element since it refers to the generic, long-term idea of changing our way of producing and consuming in a more sustainable manner. This goal is also not covered by ISO 14001.

These results show that ISO 14001 is linked with three goals at which two goals are not covered by the rules of the standard. As a consequence ISO 14001 should be advanced in a way that permits the integration of performance levels and to establish the connection to sustainable development. Moreover, the standard should be capable to address different goals at the same time and to adjust to changing goals.

Justification of ISO 14001

Concerning marketization 119 relevant articles were identified. Key elements for legitimizing ISO 14001 are economic advantages, especially by reducing costs by efficiency gains. Reducing waste, water consumption and energy use are key elements to realize efficiency gains. Altogether 56 articles argued in this way. This argumentation fits well to the ISO 14001 as formulated in the standard. An internal process-based tool seems to fit well to goals like continually working on the reduction of waste or water and energy consumption. These goals provide economic advantages quickly and do not necessitate deep changes in the production system of an organization. As a consequence this kind of justification is complementary with the goal “process/system” but not with the goals “performance” and “contribution to sustainable development”. Moreover customer demand plays key role in justifying ISO 14001 (37 articles). Customers increasingly include ecological aspects in the choice of suppliers. Being certified ISO 14001 is considered as a precondition for entering a market by some companies.

These results demand that proposals for advancing ISO 14001 need to take the economic perspective into account. The integration of “performance” and of “sustainability”-issues in ISO 14001 needs be organized in a way that permits

organizations to realize economic advantages in using ISO 14001. Moreover, it should also be possible for customers to require ISO 14001 in the advanced form from their suppliers.

The role of moral rationalization in legitimizing ISO 14001 is addressed in 79 articles. The main results can be summarized as follows: ISO 14001 is used to assess an organizations environmental responsibility (35 articles) and also to assess an organization's ecological performance (18 articles). Certification is seen as a central instrument to demonstrate responsibility and performance to society. Furthermore, certification is also seen critical in 15 articles. The explanatory power of a certificate is often contested. This approach for legitimizing ISO 14001 is also only partly covered by the standard and its guidelines for a certification audit. As already mentioned above, ISO 14001 does not include performance elements. Furthermore, responsibility is only hardly linked to the goal "process/system" and not to "performance" and "sustainability". As a consequence to be legitimized in a consistent way ISO 14001 needs to be advanced in such a way that an objective certification is possible.

Requirements and challenges for advancing ISO 14001

Based on the analysis of the theorization of ISO 14001 the following conclusion can be drawn. The institution ISO 14001 is linked with several goals that are not all included in the wording of the standard and the guidelines for certification. Moreover, the justification mainly rests on marketization, especially cost savings and customer demand, and moral rationalization, especially certification of environmental responsibility and environmental performance. It was also demonstrated that the justification of ISO 14001 does only partly cover these arguments for legitimizing ISO 14001.

As a consequence ISO 14001 needs to be advanced. This demand refers to the technical part of the standard since ISO 14001 will be considered more effective if the goals which play a crucial part in the institutionalization of the standard are explicitly considered. Moreover, from an institutional perspective a consistent justification of ISO 14001 would enhance the standards legitimacy and thereby the viability of the standard.

Summing up ISO 14001 should

- include performance elements and sustainability as a normative goal,
- permit to deal with different, heterogeneous and changing goals,

- include economic advantages for adopting companies and permit customers to demand ISO 14001 easily,
- allow objective certification, respectively accountability and
- be advanced in a legitimate process (formal organization and democracy)

4. Cooperation of standards as a solution

It is proposed that the requirements for advancing ISO 14001 can be reached by boosting cooperations between ISO 14001 and standards containing performance goals or that provide guidelines specifying the contribution of the individual organization to sustainable development. Examples for such standards may be the Forest Stewardship Council (FSC), Leadership in Energy and Environmental Design (LEED) and to some degree also Responsible Care in chemical industry.

ISO 14001 explicitly includes the possibility that norms from other standards may be included into ISO 14001. This link could be taken as a starting point for advancing the standard. ISO 14001 needs to include the possibility to be implemented and certified in combination with other standards. Recent advancements of ISO 14001 were centered around the cooperation with ISO 9000 (quality) and OHSAS 18001 (occupational health and safety). These standards are similar to ISO 14001 in their approach but target different issues (see Fig. 2)

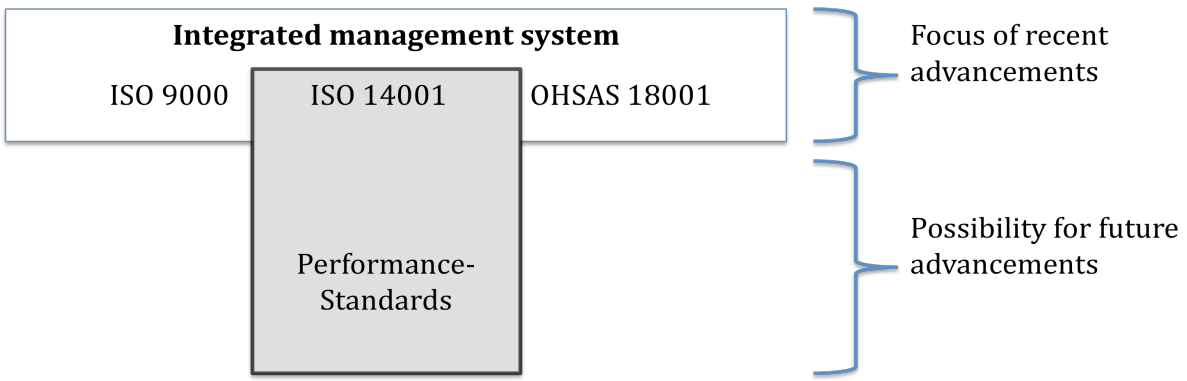

Fig. 2: Advancing ISO 14001

Linking ISO 14001 with other ecological standards permits to reach the technical requirements for advancing ISO 14001 well. First, performance criteria and guidelines for sustainable development can be integrated into ISO 14001. Including them in the environmental policy would give them the necessary importance within the ISO 14001 framework. Moreover, the cooperation between standards facilitates to deal with

different and changing goals since ISO 14001 does not always need to be changed profoundly when goals are changing. Furthermore, the cooperation with other standards facilitates pursuing different goals at same time. ISO 14001 can be understood as an umbrella standard which is providing a systematic process that can filled with different content.

Linking ISO 14001 with other standards may also lead to economic advantages. Many organizations are confronted with wide range of standards. The cooperation of standards may decrease the complexity that an organization needs to manage. Economies of scale may be realized by this. Moreover, more precise rules may deliver more incentives and more hints for adequate steps for reducing resource consumption. Cooperation with other standards may also improve the possibility to realize an objective certification. Performance criteria and guidelines for sustainable development may facilitate the work of auditors since more elaborate guidelines for assessing an organization are provided. The discretion of the individual organization and auditor is decreased which improves the information value of an certification in general.

Regarding the process of standardization, cooperation with other standards offers advantages. Standardization is a difficult process with many participating organizations, with heterogeneous strategic interests. Moreover, it is highly disputed if ISO 14001 should include performance levels and guidelines for sustainable development at all (Bell, 1997; Sheldon, 1997). Conflicts with national regulation and with technical standards developed by the International Organization for Standardization (ISO) shall be prevented. Advancing ISO 14001 by boosting cooperations with other standards reduces these difficulties.

5. Conclusion

The paper shows that ISO 14001 pursues several goals if the standard is considered as an institutional rule. This perspective permits a better understanding of the efficacy of ISO 14001. Furthermore, this perspective is usefull for discussing possibilities to advance ISO 14001. Linking ISO 14001 with other more performance-based ecological standards is one possibility to do so.

Still, this paper presents only preliminary results. The next steps involve a deeper analysis of the case study and the discussion of other possibilities to advance ISO 14001. Especially the role of networks will be emphasized.

Literature

Ahrne, G. and N. Brunsson (2006). Organizing the world. Transnational Governance: Institutional Dynamics of Regulation. M. L. Djelic and K. Sahlin-Andersson. Cambridge, Cambridge University Press**:** 74-94.

Ammenberg, J. and O. Hjelm (2003). "Tracing business and environmental effects of environmental management systems,Äîa study of networking small and medium-sized enterprises using a joint environmental management system." Business Strategy & the Environment (John Wiley & Sons, Inc) **12**(3): 163-174.

Annandale, D., A. Morrison-Saunders, et al. (2004). "The impact of voluntary environmental protection instruments on company environmental performance." Business Strategy & the Environment (John Wiley & Sons, Inc) **13**(1): 1-12.

Anton, W. R. Q., G. Deltas, et al. (2004). "Incentives for environmental self-regulation and implications for environmental performance." Journal of Environmental Economics & Management **48**(1): 632-654.

Arimura, T. H., A. Hibiki, et al. (2008). "Is a voluntary approach an effective environmental policy instrument?: A case for environmental management systems." Journal of Environmental Economics & Management **55**(3): 281-295.

Barla, P. (2007). "ISO 14001 certification and environmental performance in Quebec's pulp and paper industry." Journal of Environmental Economics & Management **53**(3): 291-306.

Barley, S. R. and P. S. Tolbert (1997). "Institutionalization and Structuration: Studying the Links Between Action and Institution." Organization Studies (Walter de Gruyter GmbH & Co. KG.) **18**(1): 93.

Beckert, J. (1999). "Agency, Entrepreneurs and Institutional Change.: The role of strategic choice and insitutionalized practices in organizations." Organization Studies **20**(5): 777-799.

Bell, C. L. (1997). The ISO 14001 Environmental Management Systems Standard - One American's View. ISO 14001 and beyond - environmental management systems in the real world. C. Sheldon. Sheffield, Greenleaf**:** 61-92.

Boli, J. (2006). The rationalization of virtue and virtuosity in world society. Transnational Governance: Institutional Dynamics of Regulation. M. L. Djelic and K. Sahlin-Andersson. Cambridge, Cambridge University Press**:** 95-118.

Brunsson, N. (2000). Organizations, Markets, and Standardization. A world of standards. N. Brunsson and B. Jacobsson. Oxford, Oxford University Press**:** 21-39.

Campbell, J. (2004). Institutional change and globalization. New Jersey, Princeton.

Dacin, M. T., J. Goodstein, et al. (2002). "INSTITUTIONAL THEORY AND INSTITUTIONAL CHANGE: INTRODUCTION TO THE SPECIAL RESEARCH FORUM." Academy of Management Journal **45**(1): 45-56.

Dahlström, K., C. Howes, et al. (2003). "Environmental management systems and company performance: assessing the case for extending risk-based regulation." European Environment: The Journal of European Environmental Policy (Wiley) **13**(4): 187-203.

DiMaggio, P. J. (1988). Interest and Agency in institutional theory. Institutional Patterns and Organizations: Culture and Environment. L. G. Zucker. Cambridge**:** 3-21.

DiMaggio, P. J. and W. W. Powell (1983). "THE IRON CAGE REVISITED: INSTITUTIONAL ISOMORPHISM AND COLLECTIVE RATIONALITY IN ORGANIZATIONAL FIELDS." American Sociological Review **48**(2): 147-160.

Djelic, M.-L. (2006a). Transnational governance: Institutional dynamics of regulation. Cambridge, Cambridge Univ. Press.
Djelic, M. L. (2006b). Marketization: From intelectual agenda to global policy making. Transnational Governance: Institutional Dynamics of Regulation. M. L. Djelic and K. Sahlin-Andersson. Cambridge, Cambridge University Press**:** 53-73
.
Djelic, M. L. and K. Sahlin-Andersson (2006). Introduction: A world of governance: The rise of transnational regulation. Transnational Governance: Institutional Dynamics of Regulation. M. L. Djelic and K. Sahlin-Andersson. Cambridge, Cambrigde University Press.
Dyllick, T. (2007). "Umweltmanagementsysteme - eine Bilanz." Umweltperspektiven(4): 1-3.
Dyllick, T. and J. Hamschmidt (2000). Wirksamkeit und Leistung von Umweltmanagementsystemen- Eine Untersuchung von ISO 14001-zertifizierten Unternehmen in der Schweiz. Zürich, VdF Hochschulverlag.
Gastl, R. (2005). Kontinuierliche Verbesserung im Umweltmanagement - Die KVP-Forderung der ISO 14001 in Theorie und Unternehmenspraxis Zürich, VdF Hochschulverlag.
Gleckman, H. and R. Krut (1997). Neither International nor Standard - The Limits of ISO 14001 as an Instrument of Global Corporate Environmental Management. ISO 14001 and beyond - environmental management systems in the real world. C. Sheldon, Greenleaf. **Sheffield:** 45-60.
Greenwood, R., C. R. Hinings, et al. (2002). "THEORIZING CHANGE: THE ROLE OF PROFESSIONAL ASSOCIATIONS IN THE TRANSFORMATION OF INSTITUTIONALIZED FIELDS." Academy of Management Journal **45**(1): 58-80.
Hamschmidt, J. and T. Dyllick (2001). "ISO 14001." Greener Management International(34): 43.
Hertin, J., F. Berkhout, et al. (2008). "Are EMS environmentally effective? The link between environmental management systems and environmental performance in European companies." Journal of Environmental Planning & Management **51**(2): 259-283.
Hoffman, A. J. (1999). "INSTITUTIONAL EVOLUTION AND CHANGE: ENVIRONMENTALISM AND THE U.S. CHEMICAL INDUSTRY." Academy of Management Journal **42**(4): 351-371.
Holm, P. (1995). "The Dynamics of Institutionalization: Transformation Processes in Norwegian Fisheries." Administrative Science Quarterly **40**(3): 398-422.
Hortensius, D. and M. Barthel (1997). Beyond ISO 14001: An introduction to the ISO 14000 series. ISO 14001 and beyond - environmental management systems in the real world
. C. Sheldon. Sheffield, Greenleaf**:** 19-44.
ISO (2010). ISO Survey 2009. I. O. f. Standardization. Genf.
Kondra, A. Z. and C. R. Hinings (1998). "Organizational diversity and change in institutional theory." Organization Studies (Walter de Gruyter GmbH & Co. KG.) **19**(5): 743.
Könnölä, T. and G. C. Unruh (2007). "Really changing the course: the limitations of environmental management systems for innovation." Business Strategy & the Environment (John Wiley & Sons, Inc) **16**(8): 525-537.
Krücken, G. and G. Drori (2010). World Society: The Writings of John W. Meyer. Oxford, Oxford University Press.

Leblebic, H., G. R. Salancik, et al. (1991). "Institutional Change and the Transformation of Interorganizational Fields: An Organizational History of the U.S. Radio Broadcasting Industry." Administrative Science Quarterly **36**(3): 333-363.
McDonach, K. and P. P. Yaneske (2002). "Environmental management systems and sustainable development." The Environmentalist **22**: 217-226.
Melnyk, S. A., R. P. Sroufe, et al. (2003). "Assessing the impact of environmental management systems on corporate and environmental performance." Journal of Operations Management **21**(3): 329.
Meyer, J., G. Drori, et al. (2006). World Society and the proliferation of Formal Organization Globalization and Organization - World Society and Organizational Change. G. Drori, J. Meyer and H. Hwang. New York, Oxford University Press**:** 25-49.
Meyer, J. W. (2007). "Globalization - Theory and Trends." International Journal of Comparative Sociology **48**(4): 261-273.
Meyer, J. W., J. Boli, et al. (1997). "World Society and the Nation-State." American Journal of Sociology **103**(1): 144.
Meyer, J. W., D. J. Frank, et al. (1997). "The Structuring of a world Environmental Regime, 1870-1990." International Organization **51**(4): 623-651.
Meyer, J. W. and B. Rowan (1977). "Institutionalized organizations: Formal structure as myth and ceremony." American Journal of Sociology **83**: 340-363.
Morrow, D. and D. Rondinelli (2002). "Adopting Corporate Environmental Management Systems: Motivations and Results of ISO 14001 and EMAS Certification." European Management Journal **20**(2): 159.
Mörth, U. (2006). Soft regulation and global democracy. Transnational Governance: Institutional Dynamics of Regulation. M. L. Djelic and K. Sahlin-Andersson. Cambridge, Cambridge University Press**:** 119-135.
Müller-Christ, G. H. (2008). Transfer von Umweltmanagementsystemen: Mit Unternehmensnetzwerken aus der Effizienzfalle. Berlin, Lit.
Nawrocka, D. and T. Parker (2009). "Finding the connection: environmental management systems and environmental performance." Journal of Cleaner Production **17**(6): 601-607.
Potoski, M. and A. Prakash (2005). "Covenants with weak swords: ISO 14001 and facilities' environmental performance." Journal of Policy Analysis & Management **24**(4): 745-769.
Rao, H., P. Monin, et al. (2003). "Institutional Change in Toque Ville: Nouvelle Cuisine as an Identity Movement in French Gastronomy." American Journal of Sociology **108**(4): 795-843.
Rasche, A. (2010). "Collaborative Governance 2.0." Corporate Governance **10**(4): 500-511.
Rennings, K., A. Ziegler, et al. (2006). "The influence of different characteristics of the EU environmental management and auditing scheme on technical environmental innovations and economic performance." Ecological Economics **57**(1): 45-59.
Russo, M. V. (2009). "Explaining the impact of ISO 14001 on emission performance: a dynamic capabilities perspective on process and learning." Business Strategy & the Environment (John Wiley & Sons, Inc) **18**(5): 307-319.
Sahlin, K. and L. Wedlin (2008). Circulating Ideas: Imitation, Translation and Editing. The SAGE handbook of organizational institutionalism. R. Greenwood, C. Oliver, S. Kerstin and R. Suddaby. Los Angeles, Sage Publ**.:** 218-242.

Schylander, E. and A. Martinuzzi (2007). "ISO 14001 An experiences, effects and future challenges: a national study in Austria." Business Strategy & the Environment (John Wiley & Sons, Inc) **16**(2): 133-147.
Sheldon, C. (1997). Introduction. ISO 14001 and beyond - environmental management systems in the real world. C. Sheldon. Sheffield, Greenleaf**:** 11-16.
Sroufe, R. (2003). "EFFECTS OF ENVIRONMENTAL MANAGEMENT SYSTEMS ON ENVIRONMENTAL MANAGEMENT PRACTICES AND OPERATIONS." Production & Operations Management **12**(3): 416-431.
Strang, D. and J. W. Meyer (1993). "Institutional conditions for diffusion." Theory and Society **22**(4): 487-511.
Suchman, M. C. (1995). "MANAGING LEGITIMACY: STRATEGIC AND INSTITUTIONAL APPROACHES." Academy of Management Review **20**(3): 571-610.
Tolbert, P. S. and L. G. Zucker (1996). The institutionalization of institutional theory. Handbook of organization studies. S. R. Clegg, C. Hardy and W. R. Nord. London**:** 175-190.
Wagner, M. (2007). "On the relationship between environmental management, environmental innovation and patenting: Evidence from German manufacturing firms." Research Policy **36**(10): 1587-1602.
Watson, M. and A. R. T. .Emery (2004). "Environmental management and auditing systems: The reality of environmental self-regulation." Managerial Auditing Journal **19**(7): 916-928.
Welch, E. W., A. Rana, et al. (2003). "The Promises and Pitfalls of ISO 14001 for Competitiveness and Sustainability." Greener Management International(44): 59-73.
Ziegler, A. and J. Seijas Nogareda (2009). "Environmental management systems and technological environmental innovations: Exploring the causal relationship." Research Policy **38**(5): 885-893.
Zucker, L. G. (1977). "THE ROLE OF INSTITUTIONALIZATION IN CULTURAL PERSISTENCE." American Sociological Review **42**(5): 726-743.
Zutshi, A. and A. Sohal (2004). "Environmental management system adoption by Australasian organisations: part 1: reasons, benefits and impediments." Technovation **24**(4): 335-357.

Contact

Christian Graf
Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Institute of Economics
Kochstr. 4 (17)
91054 Erlangen
Mail: christian.graf@wiwi.phil.uni-erlangen.de
Phone: +49 (0)9131/85 25814