

## **Governance of Eco-Efficiency in Japan**

### **An Institutional Approach**

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#### **1. Introduction**

It has often been said that environmental and economic goals can largely be harmonised via intelligent concepts and new technologies. Beyond myths and rhetoric, however, only a few concepts remain that seem to indicate a path towards sustainable development. Eco-efficiency can be regarded as one of these because it is attractive to businesses and offers various environmental benefits. If the concept offers solutions to ongoing problems, policy analysis ought to address to what extent well-known market deficits, such as external costs and information deficits, prevent business from following that direction. Eco-efficiency can hardly be expected to become a self-runner, even if it saves costs and entails tools for innovation. A demand for policies that foster eco-efficiency seems necessary.

Policies for eco-efficiency necessitate research on institutional capabilities. Building upon the work of North (1990, 1998) the argument laid down in this paper is that the institutional capabilities of each nation differ depending on its influence on the costs of processing information into know-how both in the arena of policy and business. Institutions shape the direction of technical progress as well as the speed by which a society adapts to new framework conditions. Eco-efficiency policies must therefore reflect these institutional capabilities. Ideally, low-cost policies options emerge that create markets and enhance cooperation. The argument will be illustrated with reference to Japanese policies of eco-efficiency. Japan can be regarded as an interesting example for three reasons:

- Its environmental policies began relatively early and have changed from cleaning-up towards integrated and precautionary measures (Imura 1997, Weidner 1996),
- Japanese institutions were able to achieve great economic success until the mid-nineties and are now in a period of redesign (Boltho/Corbett 2000, Lazonick 1999, Matsuba 2001), and

- Japanese institutions can be expected to draw upon other countries' experiences and to transform these into useful policies.

The paper is divided into three sections. The first introduces the concept of eco-efficiency and explains the demand for policies. The second examines how a nation's institutional capabilities influence knowledge generation towards new solutions that sell on the markets. The third section discusses contemporary Japanese policies with regard to waste and material flows. Our main thesis is that though promising attempts have been made despite the overall economic crisis, a better horizontal coordination within both administration and business is required.

## 2. Eco-Efficiency: Concept and Policies

Eco-efficiency may be defined as doing good business while improving the overall environmental performance of a firm or a product. The concept was introduced by the Business Council on Sustainable Development on the occasion of the Earth Summit in Rio in 1992 (Schmidheiny 1992) and has been spread by its successor organisation WBCSD (2001), OECD (1998), Commission of the European Communities (2001), World Bank (2000), United Nations (1999), and various other organisations. The concept of eco-efficiency assists companies in their quest for continuous minimisation of their use of resources. It encourages creative strategies of preventive management by integrating environmental considerations throughout the whole life cycle and promotes an active shift from a particular product to multi-use products and services. In doing so, it involves employees and creates tangible economic benefits.

The concept reflects a change in environmental management. Increasingly, the environment is being regarded as an opportunity for innovation, and not as a threat to a company. This shift is related to a parallel change in environmental policies from cleaning up towards integrated and precautionary measures. Whereas cleaning up and pollution control measures necessarily entail additional costs for companies, the new approach allows for cost reduction and innovation. Measures aiming at recycling of waste, saving energy and other natural resources reduce a company's existing costs. In addition, new markets emerge that are triggered by both regulation and companies' self-interest. Companies actively enhancing eco-efficiency are able to improve their product design, procurement, manufacturing processes, product maintenance, and their customer relationships.

Measures of eco-efficiency integrate life-cycle material flows, i.e. resource exploitation, its transformation into various substances and products,

and solid waste. A rationale for integrating material flows into environmental management and policy is threefold:

- (1) Environmental impact of materials matters either directly from landscape alterations or land use change, or indirectly from solid waste or emissions resulting from the extraction and use of materials,
- (2) Scarcity of natural resources is a case in point, in particular for non-renewable resources,
- (3) Only if material flows and energy inputs are measured, can resource productivity gains be expected.

A methodology for measuring material flows as one ingredient of eco-efficiency has been developed and tested for some industrialised countries (Bringezu/Schütz 2001, Matthews et al. 2000) as well as on the company level (Kuhndt/Liedtke 1999). Clearly, such a methodology still requires further research, it has its limitations as to what extent it covers overall environmental pressure (Hukkinen 2001, Moffatt et al. 2001). Nevertheless, material flows and the ensuing approach of "dematerialisation" are becoming an element, perhaps even a cornerstone, in strategies of companies and economies.

The concept of eco-efficiency and its underlying philosophy of dematerialisation open up new ways of looking at the full system costs and the value associated with products or services. In most companies, inefficiencies in the form of incompletely utilised materials, undiscovered energy saving potentials etc., are obvious. Process control for natural resources is often relatively poor. These system costs have traditionally been overlooked by environmental management, which focussed on pollution control. Thanks to the new approach, companies can minimise or even save factor-related costs at a profit (Kuhndt/Liedtke 1999, Porter / v. d. Linde 2000: 37).

In addition to such a shift of internal attention, managers rethink the issue of quality. Eco-efficiency implies that the overall quality of production processes, products and services increases. Companies now unleash the power of innovation and quality management to eliminate what were previously accepted as necessary by-products. Process-related innovations occur along the chain, e.g. substitution or reuse of production inputs, increases in process yields, careful monitoring and maintenance, and improvements in the product as a by-product of change. Product related benefits result from safer and durable products, high quality, new materials within products, and higher product resale. Additionally, elements of reuse, recyclability and durability are integrated, leading to better materials and a new product design.

New and additional types of eco-efficient services appear: producers, retailers and specialised companies now deal with reusing materials, prod-

uct elements and with operating heating and cooling systems generated by nearby sources. Financial services for high-quality goods offer opportunities for those reluctant to invest in high-priced goods (with lower running costs). Financial markets also pre-select supply options and may force producers to increase the lifetime of their goods. A third type of new service is related to information and communication. Companies and consumers have great interest in better information about eco-efficient innovations that help them to lower their costs. Leasing and sharing of goods used only for a limited time is assisted by communication systems offered by SMEs or larger companies.

In sum, eco-efficiency stimulates the cooperation within industry as well as between industry, services and the public sector. For economies, it means a new direction of technical progress, leading to an increase in the market shares for products which meet the criteria of low or zero emissions, low waste, zero toxic dispersion etc. Authors such as Weizsäcker, Lovins and Lovins (1997), Lovins, Lovins and Hawken (1999), and Schmidt-Bleek (2000)<sup>1</sup> suggest that economies will be able to increase their resource productivity by a factor of four or even ten via the dynamics of eco-efficient economies.

If profitable innovations follow from such a business concept, if improving resource productivity can offset compliance, production and transaction costs, the question arises whether regulation is necessary at all. Wouldn't companies explore these fascinating opportunities and follow the path of new markets? That is as if no big bills would be left on the sidewalk because someone else would have already picked them up. Indeed, some pioneering companies pursue eco-efficiency without or in advance of any regulation. Mechanisms of diffusion and imitation can be expected due to competition. But a general assumption that companies will grasp opportunities when faced with uncertainties, information deficits and unclear perspectives about trends would be too optimistic. In addition, eco-efficiency cannot ignore both negative and positive external costs associated with production patterns. Policies, therefore, have to address specific market failures in order to harness eco-efficiency.

A need for regulation towards eco-efficiency arises for the following reasons (Wuppertal Institute 2002; Porter / v.d. Linde 2000: 44):

- To create attention that motivates companies to innovate,
- To overcome market failures such as external costs, the provision of public goods, information and adaptation deficits,

<sup>1</sup> Ernst Ulrich von Weizsäcker and Friedrich Schmidt-Bleek, the founders of the Factor X concept, were honoured with the Japanese Takeda World Environment Award in 2001.

- To generate knowledge about likely resource inefficiencies and potential areas for improvements,
- To create and stabilise demand for environmental improvements,
- To level the playing field during transition periods between technological trajectories,
- To raise the likelihood of a new direction of technological progress,
- To ensure stricter measures in cases where the environment continues to deteriorate or new negative external costs occur.

Governance of eco-efficiency should primarily support business, and not restrict it. Fortunately, the success of former pollution control policies have relaxed the demand for strict measures. An innovation-friendly regulation can also draw upon mechanisms of self-regulation driven by competition and entrepreneurial spirit that are able to overcome some temporary market failures. Governments do not have to regulate minor deficits, but they will have to keep an eye on the speed and the direction of change, supported by increasing scientific evidence on environmental change and by computer-based scenario analysis. Specific forms of regulation will have to be developed which foster the dissemination of innovations and the development of new products and services. Market introduction, technology transfer, institutional design as well as science and education policies will have to play their role. Criteria for choosing between different options may include i) efficiency of instruments for different industries (e.g. SMEs) and the economy as a whole, ii) effectiveness as regards environmental targets, and iii) the adaptation flexibility, which is important in the case of unforeseeable events (Wuppertal Institute 2002).

Economic incentives can also be used to enable companies and markets to emerge without those constraints that have been associated with command and control instruments. In addition, a critical employment situation suggests not drawing the largest share of fiscal revenues from labour while resource use remains essentially free of charge. This line of argument has led almost all EU states to adopt some kind of eco-taxes since the late nineties (EEA 2000). The predominant aim is a moderate but steady increase in energy or resource prices. Such an increase leads to further innovations and cumulative effects. If designed together with other tax reductions, the overall effects on international competitiveness do not seem to be insupportable. There is both increasing theoretical and empirical evidence from economics (Oates 2001) that fiscal and regulatory competition resulting from unilateral action contributes to increasing economic efficiency without any dramatic effects. Ueta (1997) as well as Nakata and Lamont (2001) arrive at similar conclusions for the impact of carbon or energy taxes in Japan. In their recent

environmental performance review the OECD (2002:3) thus recommends that Japan should strengthen and extend the use of economic incentives.

But there is certainly no one-fits-all instrument that tackles all the regulatory needs as identified above. Moreover, regulatory policies will differ due to nationally specific innovation systems (Nelson 1993, Hill 1995) and market conditions. Markets for energy and material flows, for instance, differ significantly with regard to the natural monopoly situation in the electricity sector and the inherent decentralisation regarding materials. Differing conditions lead to case-by-case, market and country-specific analysis that prepares the ground for the diffusion of policies among jurisdictions. As the great French philosopher Montesquieu remarked, "Laws should be so appropriate to the people for whom they are made that it is very unlikely that the laws of one nation can suit another". Our point here is that eco-efficiency requires some political support, but those specific features will differ from country to country.

### 3. Institutional Capabilities: Methodology

Following North (1990, 1998) one can argue that the institutional structure of a society shapes the direction and the speed of innovation. More precisely, institutions exclude some options via law, whereas other options are associated with different transaction costs resulting from different kinds of institutions. Formal institutions include legal rules for markets and businesses, the social infrastructure for science and education, and legally binding standards. Informal institutions include the norms and value systems of a society that are also vital for demand creation and business culture.

Markets are embedded in a set of institutions, allowing them to allocate resources in the most efficient manner. The question for policy analysis is no longer "do institutions matter" but "which institutions matter and how does one acquire them". According to Rodrik (2000), there are five basic types of market supporting institutions: property rights, regulatory institutions, macroeconomic stabilisation, social insurance, and conflict management. A governance structure is needed to ensure that markets can work properly within the institutional frame. A market economy relies on a wide array of both market-based and political institutions that perform regulatory, stabilising, and legitimising functions. Once these institutions are accepted as a necessary element of economies, the traditional dichotomy between market and state or between *laissez-faire* and intervention loses more and more in importance. Both serve complementary functions that keep the system running. A well-performing market economy is a mixed composition of state and markets.

A major implication of this insight is that each institutional framework is unique. There is no "optimal" institutional framework, which can be applied in each country at each stage of economic development. Rather, there is a huge *institutional diversity*, resulting from different formal and informal mappings that are reflected in quite different modes of doing business and economic policy. The European way differs from the US way; both differ from that of the Japanese. Within Europe, there are differences between the Scandinavian states, the UK, Germany, and the Mediterranean states.

Our point about institutional diversity leads us to query the diffusion of policy. The following two simplifications illustrate diverging views on this subject. Is it possible to transfer an institution from one country to another like any good on world markets? This could be compared to importing a technological blueprint from any pioneer. Interestingly enough, research on technological change has revealed that such a blueprint does not seem to work in real economic life (Rosenberg 1994, Freeman 1998). Under the assumption of institutions being much closer to humans than technologies, the blueprint image of diffusion makes almost no sense. There is no manual entitled "how to acquire efficient institutions". Local culture and tacit knowledge remain important. Looking at other countries and drawing upon their experience would be useless because of their specificities. Institutions need to evolve locally, relying on specific experience and careful experiments.

It is obvious that both views exaggerate and do not capture real processes of institutional change in some countries, which are motivated by success stories in others. Our first conclusion for policy analysis refers back to institutional diversity: it has to be accepted as a matter of fact. Furthermore, institutional change has to be understood as an incremental process of gradual adaptation, comparing outside lessons with internal capabilities. Any outcome of change remains an individual outcome that generates new institutional features. In other words, processes of imitation and experimentation permanently renew institutional diversity. According to Metcalfe (2001: 579) "it is the combination of institutions for selection and development that gives to capitalism its undoubted potential to change itself from within (...)". Langlois and Robertson (1995, as regards business institutions), Dixit (2000), March (1999), North (1990, 1998), and Rodrik (2000) formulate similar views.

Comparing Japanese regulatory institutions to these findings, Hill (1995: 121ff) points to the uniqueness of informal institutions that have enabled MITI's success story of industrial policy. MITI's regulation of the Japanese economy relied upon consensus building rather than on formal rules with sanctions. The famous *administrative guidance* (*gyosei shido*) took the form of informal associations (with the soft sanction of being excluded) and committees including bureaucrats, researchers, and business

leaders. This system can hardly work in other institutional contexts, because of its strong roots in the so-called Tokugawa value system<sup>2</sup> that anchors attributes of group identification, collective responsibility, loyalty and filial piety, reciprocal obligations, harmony, honesty, and individual performance. Based upon these informal institutions, the Japanese market economy with its features of administrative guidance, cross-shareholdings, and self-organisation of production teams could evolve.

An economic perspective on these institutional features deals with transaction costs. In Japan, the transaction costs of achieving cooperation can be considered lower than in other countries. Firms are able to function with more decentralised management systems since the need for hierarchy and control is reduced. Long-term relationships and the lifetime employment system facilitate investments in specialisation. This means as far as transaction costs are concerned that these features can indeed be imitated by other countries, but at higher costs and with different outcomes. Costs of policy diffusion are mainly transaction costs of changing institutions. Once single institutions fit into an existing framework these costs can be assumed to be low. But any import of bulky institutions is in danger of running into doggedness and low absorptive capacities of existing institutions and is, thus, bound to raise transaction costs to a significant level. Economic actors are well experienced in articulating concerns, by-passing unattractive institutions and escaping from commitments that are regarded as disadvantageous. Dixit (2000) elaborates on such a transaction cost approach to economic policy making.

The notion of transaction costs ought to be extended in order to include knowledge generation (Wegner 1996, Metcalfe 2001). For the diffusion of policy innovations this can be regarded as a key since the national capacities for action largely depend upon the ability to transform knowledge generated elsewhere into a useful proposal for action. Uncertainties and incomplete information can be assumed to exist in policy making when it is a matter of adaptation of foreign institutions. What factors enhance the absorptive capacities of domestic policies? Rodrik (2000: 14) stresses participation in the sense of articulation and filtering different views. His main thesis is that *participation* would deliver high-quality growth because it produces stability, enables handling of exogenous shocks, and leads to fair distributional outcomes. Participation reminds us that institutions evolve over time, driven by individual action and problem-solving efforts. One might also refer to *experimentation* as stressed by Leonard-Barton (1995) on firms, North (1998)<sup>3</sup>,

<sup>2</sup> The Tokugawa shogunate ruled Japan from 1603 until the Meiji restoration in 1868.

<sup>3</sup> The terminology of North is slightly different. He refers to competition as well as to the interplay between organisations and institutions.



and March (1999). Experimentation means that action is taken despite remaining uncertainties. It furthermore assumes parallel efforts to deal with certain problems and that these experiments will be evaluated carefully in order to weigh up costs and benefits. Both factors, participation and experimentation in institutional design, lead to an on-and-off connection between markets and states (Hirschman 1994) insofar as both sides undertake action for improved economic performance and learn from one another. It should also be mentioned that experimentation might include some forms of institutional competition<sup>4</sup>, but only as a means for discovery and selection and not as an end in itself.

It is now possible to compare the analytical framework outlined here with the capacity approach to environmental policy as introduced by Jänicke (1997) and Kern et al. (2001). Jänicke describes a comprehensive model of policy explanation that diverges from isolated instruments ("instrument of the year"). By including structural framework conditions such as institutional and informational factors plus the situative context by which short-term variables are captured, this approach enables analysis of existing policies. Actors and strategies are considered endogenous factors for policies, whereas the structure of environmental problems predetermines the scope of any policy. Capacity, therefore, "defines the necessary structural conditions for successful environmental policy as well as the upper limit beyond which policy failure sets in even in case of skilful, highly motivated and situtively well-placed proponents" (Jänicke 1998: 9).

Such an approach clearly also strongly relies on comparative institutional analysis. Like our framework, it leads to case-by-case policy analysis and a permanent search for institutional improvements given that policies usually start with second-best options. Two drawbacks, however, seem important that might better be captured with the analytical framework described above. One drawback refers to businesses and economies. The capacity approach views business, economies and technologies as exogenous variables, leaving it up to future development to determine what specific action is taken. It compares regulation while largely disregarding businesses and market processes. This is not to say that businesses and market processes will necessarily remain outside, but at this stage the capacity model does not seem to adequately reflect both. In comparison, the analytical framework outlined above is based upon economic findings on market processes and institutional change. It allows for the inclusion of business reaction to environmental policy as well as for business action aiming at environmental innovation. The latter is indeed essential for eco-efficiency policies.

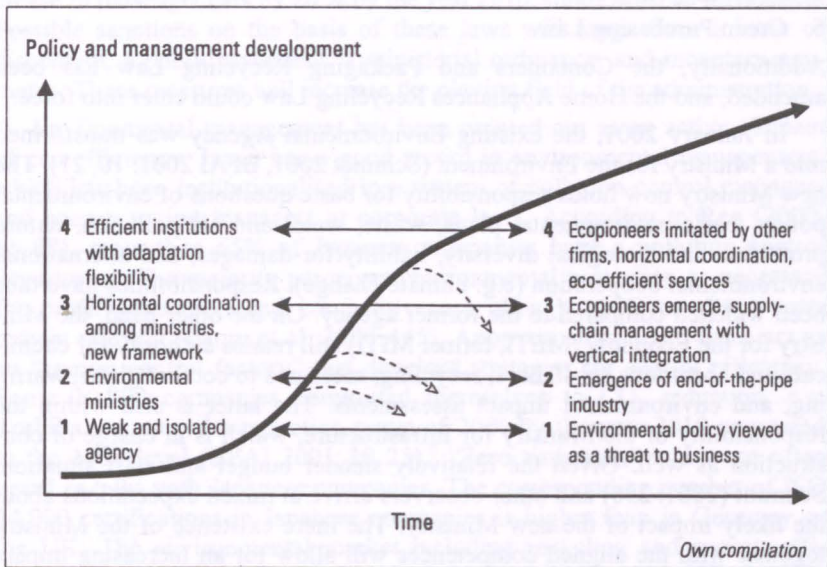
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<sup>4</sup> I do not deal with institutional competition here; for a balanced overview see v.d. Berg (2000) and Trachtman (2000).

A second drawback may be seen in the strong emphasis on political planning, which is not fully consistent with basic assumptions of uncertainties, information deficits and open market processes. When the focus is on the structure and scope of existing knowledge, there is scarcely a tool available that would allow research to analyse the generation and diffusion of knowledge. Here, our analytical framework emphasises diversity, participation, and experimentation, which are strongly bound to recent theories of institutional change. The two approaches would thus come to slightly different conclusions about environmental policies. Whereas Jänicke views capacity building largely within federal administrations and via integrated environmental planning, our analytical framework emphasises subsidiary principles of decentralisation, adaptation flexibility, and the wellsprings of technological change. Both approaches are indeed not contradictory, but complement one another and may have different strengths for different purposes. Yet, our framework seems superior for an analysis of eco-efficiency policies. Figure 1 below illustrates different stages of environmental policy and management development, taking into account that non-linear events and prevailing resistance may lead to some steps backward.

As regards policy analysis the following conclusions may be drawn:

- Institutions and institutional systems are a key to understanding and improving regulatory policies,
- Institutional diversity should be taken as a matter of fact, despite some views about "optimal institutions",
- Any institutional design should rely on participation and experimentation, taking into account that institutional change is overwhelmingly incremental,
- An analytical framework for governance of eco-efficiency should entail an endogenous business element,
- It should also be able to explain generation and diffusion of knowledge rather than merely analysing existing stocks,
- Research organisation for comparative analysis should include experts from both sides.

**Figure 1: Stages in Environmental Policy and Management Development**

#### 4. Japanese Approaches to Eco-Efficiency

Japan has a good reputation for having successfully tackled energy use and pollution in the 70s and 80s. The 90s saw a break in environmental policy mainly due to the economic crisis (Imura 1997, Ren 2000, Wallace 1995, Watanabe 1999, Weidner 1996). In the last few years, however, Japan has undertaken major steps to revitalise environmental policy towards eco-efficiency. A focus is on waste and recycling issues, which have been triggered by a shortage of landfill capacities and the necessity to import natural resources. The Japanese label for these activities is “3R” – reduction, reuse, recycle. The aim is a recycling-oriented society (*junkankata keizai*). This focus almost naturally coincides with eco-efficiency strategies as characterised above. The Japanese parliament passed the following laws in May 2000:

1. Basic Law for the Promotion of the Recycling-Oriented Society,
2. Waste Management Law,
3. Law for Promotion of Effective Utilisation of Resources,

4. Construction Materials Recycling Law,
5. Food Recycling Law
6. Green Purchasing Law.

Additionally, the Containers and Packaging Recycling Law has been amended, and the Home Appliances Recycling Law could enter into force.

In January 2001, the existing Environmental Agency was transformed into a Ministry for the Environment (Schmidt 2001, BFAI 2001: 10, 21). The new Ministry now holds responsibility for basic questions of environmental policy, basic environmental plans, waste, water and air pollution, nature protection and biological diversity, liability for damages, and international environmental cooperation (e.g. climate change). Responsibilities have thus been widened compared to the former agency. On the other hand, the Ministry for the Economy (METI, former MITI) still retains authority for chemicals and hazardous substances, recycling, measures to combat global warming, and environmental impact assessments. The latter is also within the responsibility of the Ministry for Infrastructure, which is in charge of construction as well. Given the relatively slender budget and staff situation, Schmidt (2001: 256) and other observers arrive at mixed expectations about the likely impact of the new Ministry. The mere existence of the Ministry together with the aligned competences will allow for an increasing impact on other policies, whereas other ministries (METI and Infrastructure) remain powerful and are likely to override the newcomer when conflicts arise. When analysing Japanese policies, these well-established ministries have also to be taken into account. Coordination among ministries, as underlined by Imura (1997: 82) and Ren (2000: 81), remains an important issue.

With regard to the various new environmental laws, the Basic Law for the Promotion of the Recycling-Oriented Society establishes for the first time a hierarchy from resource reduction to reuse, recycling, thermal recycling, and disposal. The government is committed to launching framework programmes for action to be undertaken by industry and private households every five years. Also, the extended producer responsibility is a new element of the law. More specific regulations are laid down in the Law for Promotion of Effective Utilisation of Resources. It encourages administrative guidance for designated products in industries that promote the use of recycled resources, improve the durability of products and their dismantling structure. The steel, paper, and car sectors as well as products like TVs, PCs, refrigerators, air conditioners, washing machines, copy machines, furniture, etc., have been the subject of such regulatory efforts, mainly by METI. Some products have to meet recycling quotas, but the majority of these measures still lack clear targets, as is also the case with other integrated sectoral plans (Foljanty-Jost 2000: 100, OECD 2002: 8). The renewed

“Energy Saving Law” of 1999, which establishes a “top runner system” for electric appliances and introduces incentives for an energy efficiency increase in passenger cars by 20 % by the year 2010, should also be mentioned. Possible sanctions on the basis of these laws will range from a letter of discontent, a public statement, a ministerial ordinance, and monetary payments. These measures will increase the playing field of the administration.

Environmental management has been pointed out as an active element of eco-efficiency. Japan has a good record in environmental management, which has been institutionalised in a system of pollution control managers and energy saving managers at corporate level. According to Ren (2000: 86, 88), more than 65% of Japanese companies have a pollution control department. The majority perceives environmental protection as necessary for profit generation and competitiveness, though concerns about costs remain relevant (Baum et al. 2000: 445). Approximately 3,500 firms act as an “energy control factory” that develops strategies for energy efficiency. Some 30,000 companies committed themselves to CO<sub>2</sub> reduction, e.g. Toshiba announced a reduction target of 20 % by the year 2010 compared to the 1990 level (BFAI 2001: 20, 23).<sup>5</sup> “Zero emissions” is a word often heard in talks with Japanese companies. The corresponding number of ISO 14,000 certifications in Japanese companies is higher than in Germany or the UK. The environmental market including recycling and energy efficiency is expected to grow by some 50 % from 2000–2010 (BFAI 2001: 31). Interestingly, however, many companies are not yet sure *why* they should expand their efforts and *how* innovation can be spurred via managerial tools. They request for a management perspective beyond ISO, i.e. towards eco-efficiency. Single pioneers plus consultant efforts may contribute to dissemination of such managerial tools. The Japanese business institutions of the joint-stock company facilitate supply-chain management and vertical integration among firms. Horizontal coordination among firms of different markets will require more laborious efforts. The existing eco-industrial park in Kitakyushu provides a first example of how such a better cooperation might be achieved (Bleischwitz/Schubert 2001).

Some actors advocate an economic vision of the Japanese economy that comes close to the Factor Four idea as proposed by Weizsäcker et al. (1997). Clean Japan Center, a semi-governmental organisation under METI, promotes the vision of the recycling-oriented society, following a report of the Industrial Structure Council in 1999 (Clean Japan Center 2000). In addition, it recommends further measures in certain areas. In April 2002, a new METI-committee on “Factor Eight” for improving resource productiv-

<sup>5</sup> See also Ott and Takeuchi (2000) for the Japanese-German dialogue on climate change policies.

ity starts its work under the chairmanship of Ryoichi Yamamoto who has already published reports on these matters (Yamamoto 2001). In a similar vein, Hiroshi Komiyama from Tokyo University and chairman of METI's Material Flows Committee, enlightened the participants of the Fourth Forum of the Collaboration Projects<sup>6</sup> in February 2002 with his "vision 2050". He pointed out thresholds of thermo physics that are still remote to technical change and, thus, allow for further improvements. According to Komiyama, the potential for "green productivity" with increases up to a factor ten can be considered enormous. Whether these voices will have an impact on Japanese policy remains to be seen. In our opinion, visions have been formulated that bear the potential of becoming implemented by both policies and businesses. Watanabe (1999: 729) and Yoshida (2002) likewise claim that there is high acceptance of eco-efficiency and Factor Four in Japanese industry.

Comparing policies in Europe with those of Japan indicates that basic principles of legislation and ensuing approaches have converged to a significant extent. Also, the visions touched on in the previous paragraph are relatively close to each other. When it comes to specific regulations, however, differences appear that are driven by domestic institutions. Administrative guidance is a particular feature of Japanese regulation. Regarding eco-efficiency, this approach may foster flexible solutions serving the needs of different businesses in different phases of market development. On the other hand, some of these efforts might expose Japan to WTO restrictions when foreign companies feel competitive disadvantages caused by intransparent regulation. One might also ask how new forms of administrative guidance encourage proactive measures by companies. This is an open question – Ren (2000: 92) offers a sceptical view on innovativeness of regulation in Japan, Watanabe (1999: 743) calls for a new initiative with a comprehensive approach by METI.

Participation is another case in point. Though the Basic Environment Law introduced in 1993 integrated public participation into policy making<sup>7</sup>, overall public participation seems relatively low. This corresponds to less

<sup>6</sup> A study programme by the Japanese Economic and Social Research Institute from 2000-2002, to which Wuppertal Institute contributed a study. In other studies, Kazuhiro Ueta from Kyoto University as well as researchers from Mitsubishi and Nomura Research Institute introduced different regional waste management schemes. Koichiro Agata and colleagues from Waseda University highlighted some new policy options. They focussed on local action in the area of the provision of public goods, specifically featuring local currencies called LEMS. These currencies are designed in a way that enables combining the respective advantages of markets and local institutions, involving of citizens, the unemployed as well as small and medium-sized enterprises.

<sup>7</sup> The Law on Disclosure of Information (entry into force 2001) should also be mentioned.

impact by parliament, local authorities and green NGOs on environmental policies compared to many European countries (BFAI 2001:22). In line with the above analysis of regulation needs and institutional change via participation, further improvements in public access and participation as well as promotion of environmental NGOs appear on the agenda for institutional reforms. OECD (2002: 9, 10) also suggests similar measures.

Assuming further regulation of eco-efficiency in Japan, active experimentation might become stronger than in previous years. Experiments rely on pioneering activities by some companies as well as on lower policy arenas. Simultaneous efforts by some regional governors and local communities will strive forward and thus make consensus-seeking activities with those lagging behind more difficult. Decentralisation of Japanese policy as foreseen by the government might favour pioneering activities which go beyond agreed standards. This may partly depart from traditions of harmonisation and consensus, but lower the transaction costs of identifying superior solutions in case of uncertainties and hence lower the compliance costs. It may lead to more federalist elements in Japan.

## **5. Conclusions**

Despite the overall economic crisis, Japanese policy has undertaken some major steps towards the governance of eco-efficiency in the last two years. The waste and resource-saving laws as well as the Basic Environment Law and information-related acts can now be considered among the most comprehensive in OECD countries. The Japanese government has thus ended the environmental stalemate of the nineties. With forward-looking visions of single actors and by pioneering industrial efforts, one may expect further progress in the coming years.

One critical element is the relationship between the new Environment Ministry (MoE) and METI, and other relevant ministries. There is no doubt that METI has outstanding expertise in eco-efficiency. Whether this coincides with MoE and efforts by industry remains, however, to be seen. If a struggle for competence and rivalry dominates, the outcome will not be productive. If, on the other hand, METI contributes to an improved coordination among ministries and balances different interests via innovation-oriented regulation, the outcome will be positive. The Cabinet Office, in charge of policy coordination, will certainly also play a role. Voluntary agreements, as one pillar of administrative guidance, should become more transparent and reliable, perhaps with more involvement from the public and NGOs. Also, a more important role for targets, economic incentives such as eco-

taxes, and a revision of subsidies seems reasonable. Interestingly enough, these conclusions refer to regulatory tools as such and not to a general transfer of competences to MoE.

The role of industry will remain vital for the success of eco-efficiency. Despite the overwhelming acceptance of ISO and environmental management in general, both managerial tools for innovation must be improved and the role of SMEs strengthened. The latter in particular is essential when one bears in mind the importance of vertical and horizontal coordination among firms for eco-efficiency. Supply-chain management can be expected to include eco-efficiency criteria relatively smoothly, but horizontal coordination that relies on communication and cross-sectoral exchange of knowledge seems pivotal and merits further efforts. Along this possible development, industry and society might become more important than administrations.

The Japanese economy will continue to serve as a laboratory for other Asian emerging economies. By absorbing European and other experience and transforming it into country-specific institutions, it might well play that role for eco-efficiency too. Europeans in turn might draw upon that knowledge for their domestic efforts. If the US remains reluctant to enforce environmental policies, the European-Japanese cooperation will gain in importance compared to previous years. Governance of eco-efficiency will thus continue to differ between countries, and these differences will fuel improvements in each country. As the analytical framework presented in our article underlines, these processes of improving institutions by mutual learning are crucial for better policies.

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## References

- Adriaanse, A.S.; Bringezu, S.; Hammond, A. et al. (1997): *Resource Flows: The Material Basis of Industrial Economies*, Washington, D.C. (World Resources Institute)
- Baum, H.-G.; Sakai, S.-I; Ueta, K. (2000): Umweltorientierung in japanischen und deutschen Unternehmen. In: *Zeitschrift für Angewandte Umweltforschung* 13, No. 3–4, pp. 437–456
- Berg, R. v. d. (2000): Regulatory Competition in Europe. In: *Kyklos* 53, pp. 435–466
- BFAI = Bundesagentur für Außenwirtschaft (2001): *Japan – Umweltreport 2000*, Köln
- Bleischwitz, R.; Schubert, U.-M. (2001): *Joint Environmental Management: A Look at the Business Institutions of Eco-Industrial Parks*. Contribution to the IHDP Conference in Berlin, December 2001 ([www.environmental-policy.de](http://www.environmental-policy.de))
- Boltho, A.; Corbett, J. (2000): The Assessment: Japan's Stagnation – Can Policy Revive the Economy? In: *Oxford Review of Economic Policy* 16, No. 2, pp. 1–17
- Bringezu, S.; Schütz, H. (2001): *Material Use Indicators for the European Union, 1980–1997*, Eurostat Working Paper 2/2001/B/2, Luxemburg (Eurostat)
- Clean Japan Center (2000): *Recycle-Oriented Society. Towards Sustainable Development*. Tokyo (Clean Japan Center)
- Commission of the European Communities CEC (2001): *A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development* (Commission's Proposal to the Gothenburg European Council), COM (2001) 264 final, Brussels, 15.5.2001
- Dixit, A.K. (2000): *The Making of Economic Policy. A Transaction-Cost Perspective*, Cambridge (MIT Press)
- EEA = European Environment Agency (2000): *Environmental Taxes: Recent Developments in Tools for Integration*, EEA Environmental Issue Series No. 18, Copenhagen (EEA)
- Foljanty-Jost, G. (2000): Japans Nationaler Umweltraahmenplan: Ende des umweltpolitischen Reformstaus? In: M. Jänicke, H. Jörgens (Eds.), *Umweltplanung im internationalen Vergleich. Strategien der Nachhaltigkeit*, Berlin (Springer), pp. 89–102
- Freeman, C. (1998): The Economics of Technical Change. In: D. Archibugie, J. Michie (Eds.), *Trade, Growth and Technical Change*, Cambridge (Cambridge University Press), pp. 16–54

- Hill, C.W.L. (1995): National Institutional Structures, Transaction Cost Economizing and Competitive Advantage: The Case of Japan. In: *Organization Science*, Vol. 6, pp.119–131
- Hirschman, A.O. (1994): The On-and-Off Connection Between Political and Economic Progress. In: *American Economic Review, Papers and Proceedings* 84, No. 2, pp. 342–348
- Hukkinen, J. (2001), Eco-Efficiency as Abandonment of Nature. In: *Ecological Economics* 38, pp. 311–315
- Imura, H. (1997): Japan. In: M. Jänicke, H. Weidner (Eds.), *National Environmental Policies. A Comparative Study of Capacity-Building*, Berlin et al. (Springer), pp. 73–88
- Jänicke, M. (1997): The Political System's Capacity for Environmental Policy. In: M. Jänicke, H. Weidner (Eds.), *National Environmental Policies. A Comparative Study of Capacity-Building*, Berlin et al. (Springer), pp. 1–24
- Kern, K.; Jörgens H.; Jänicke, M. (2001): *The Diffusion of Environmental Policy Innovations. A Contribution to the Globalisation of Environmental Policy*, Wissenschaftszentrum Berlin FS II 01-302
- Kuhndt, M.; Liedtke, C. (1999): "COMPASS – Companies' and Sectors' Path to Sustainability – The Methodology". Wuppertal Institute, Wuppertal Paper. Wuppertal
- Langlois, R.N.; Robertson, P.L. (1995): *Firms, Markets, and Economic Change: A Dynamic Theory of Business Institutions*, London (Routledge)
- Lazonick, W. (1999): The Japanese Economy and Corporate Reform: What Path to Sustainable Prosperity? In: *Industrial and Corporate Change* 8, No.4, pp. 607–633
- Leonard-Barton, D. (1995): *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*, Boston (Harvard Business School Press)
- Lovins, A.; Lovins, H.; Hawken, P. (1999): The Natural Capitalism. In: *Harvard Business Review*, May-June, pp. 145–198
- March, J.G. (1999): *The Pursuit of Organizational Intelligence*, Oxford (Blackwell)
- Matsuba, M. (2001): *The Contemporary Japanese Economy*, Tokyo et al. (Springer)
- Matthews, E., Amann, C.; Bringezu, S. et al. (2000): *The Weight of Nations – Material Outflows of Industrial Economies*, Washington D.C. (World Resources Institute)
- Metcalf, J.S. (2001): Institutions and Progress. In: *Industrial and Corporate Change* 10, No. 3, pp. 561–586
- Moffatt, I. et al. (2001): *Sustainable Prosperity: Measuring Resource Efficiency*, Report to EC Department of the Environment, University of Stirling

- Nakata, T.; Lamont, A. (2001): Analysis of the Impacts of Carbon Taxes on Energy Systems in Japan. In: *Energy Policy* 29, pp. 159–166
- Nelson, R. (Ed.) (1993): *National Innovations Systems: A Comparative Analysis*, New York/Oxford (Oxford University Press)
- North, D.C. (1990): A Transaction Cost Theory of Politics. In: *Journal of Theoretical Politics* 2, pp. 355–367
- North, D.C. (1998): Five Propositions about Institutional Change. In: Knight, J.; Sened, I. (Eds.), *Explaining Institutional Change*, Ann Arbor (University of Michigan Press), pp. 15–26
- Oates, W. (2001): *Fiscal and Regulatory Competition: Theory and Evidence*, Paper Prepared for the September 2001 Meeting of the Verein für Socialpolitik, Magdeburg
- OECD Policy Brief (1998): *Sustainable Development: A Renewed Effort by the OECD*, No. 8., Paris (OECD)
- OECD (2002): *Environmental Performance Review Japan: Conclusions and Recommendations*, Paris (OECD)
- Ott, H.; Takeuchi, T. (Eds.) (2000): *Towards Co-ordinated Climate Protection Strategies*, Wuppertal Institute Special No. 15, Wuppertal
- Porter, M.; Linde, C. v. d. (2000): Green and Competitive: Ending the Stalemate. In: E. v. d. Wubben (Ed.), *The Dynamics of the Eco-Efficient Economy*, Cheltenham (Edward Elgar), pp. 33–55
- Ren, Y. (2000): Japanese Approaches to Environmental Management: Structural and Institutional Features. In: *International Review for Environmental Strategies* 1, No. 1, pp. 79–96
- Rodrik, D. (2000): Institutions for High-Quality Growth: What they are and how to acquire them. In: *Studies in Comparative International Development* 35, No. 3, pp. 3–31
- Rosenberg, N. (1994): *Exploring the Black Box. Technology, Economics, and History*, Cambridge (Cambridge University Press)
- Schmidheiny, S. (Ed.) (1992): *Changing Course. A Global Perspective on Development and the Environment*, Cambridge (MIT Press)
- Schmidt, G. (2001): Auf dem Weg zur Kreislaufwirtschaft? Japans Umweltpolitik nach der Verwaltungsreform. In: M. Pohl, I. Wiecek (Eds.), *Japan 2000/2001. Politik und Wirtschaft*, Hamburg (Institut für Asienkunde), pp. 253–268
- Schmidt-Bleek, F. (2000): *Das MIPS Konzept. Weniger Naturverbrauch, mehr Lebensqualität durch Faktor Zehn*, München (Knaur Verlag)

- Trachtman, J.P. (2000): Regulatory Competition and Regulatory Jurisdiction. In: *Journal of International Economic Law* 3, pp. 331–348
- Ueta, K. (1997): An Economic Analysis for Designing Environmental Tax System, In: *Keizai Bunseki (Economic Analysis)*, No. 153
- United Nations (1999): *The Global Compact and the Environment* (<http://www.unglobalcompact.org>)
- Wallace, D. (1995): Japan. In: D. Wallace (Ed.), *Environmental Policy and Industrial Innovation. Strategies in Europe, the US and Japan*, London (Earthscan Publications), pp. 93–110
- Watanabe, C. (1999): Systems Option for Sustainable Development-Effect and Limit of the Ministry of International Trade and Industry's Efforts to Substitute Technology for Energy. In: *Research Policy* 28, pp. 719–749
- Wegner, G. (1996): *Wirtschaftspolitik zwischen Selbst- und Fremdsteuerung – ein neuer Ansatz*, Baden-Baden (Nomos)
- Weidner, H. (1996): *Basiselemente einer erfolgreichen Umweltpolitik. Eine Analyse und Evaluation der japanischen Umweltpolitik*, Berlin (Edition Sigma)
- Weizsäcker, E.U. v.; Lovins, A.; Lovins, H. (1997): *Factor Four: Doubling Wealth – Halving Resource Use*, London (Earthscan)
- World Bank (2000): *The World Bank Approach to the Environment*, Washington D.C. (World Bank)
- World Business Council for Sustainable Development (2000): *Eco-Efficiency Indicators and Reporting* (<http://wbcsd.org>), Geneva
- Wuppertal Institute (2002): *Review of Eco-Efficiency Concepts in Europe. Towards an Application of European-Based Policies on Material Flows and Energy to Japanese Sustainable Development Policies. Final Report to the Japanese Economic and Social Research Institute*, Wuppertal (to be published by Edward Elgar)
- Yamamoto, R. (2001): *Sustainable Company. Successful Business Models and Eco-Services in the Century of the Environment* (Japanese book), Tokyo (Tokyo University)
- Yoshida, F. (2002): *The Economics of Waste and Pollution Management in Japan*, Tokio et al. (Springer)