Chapter 4

GREENING PRODUCTION AS CO-RESPONSIBILITY

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4.1 Introduction

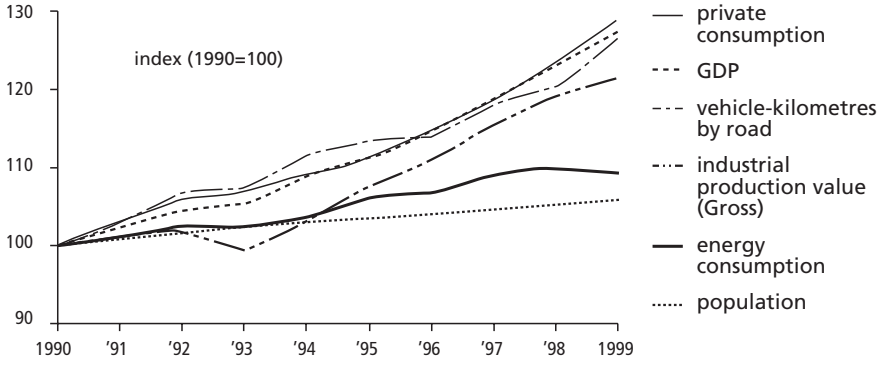
Reducing the environmental impact of production processes in industry is traditionally one of the main targets of environmental policy. The government's role in this field is realised within a field of tension of differing expectations in society. On the one hand the freedom of the market economy must be maintained where possible; the creative potential of entrepreneurs must be used to the full; businesses must be treated equally; and existing 'rights' must be respected. On the other hand, radical changes in production processes are constantly called for, changes which – in the existing financial and economic structures – can be at the expense of earnings and the continuity of individual firms.

Policy pursued in the Netherlands in the 1990s to improve the environmental performance of businesses has since then undergone radical change. This has meant that the relationships between the government, the market and civil society have also changed considerably. The main actors in this process of change state quite emphatically that this policy is starting to bear fruit, to such an extent that we can now speak of a 'silent revolution' (Ministry of Housing, Spatial Planning and the Environment & VNO-NCW *(Confederation of Netherlands Industry and Employers),* 1998).

This chapter sets out the trends we can observe in improving the environmental performance of businesses (the content) and in the societal process behind these improvements. We can see these trends as radical changes in the policy paradigm. With regard to the actual content, we detect

	industry's share in the total national emission		development in the total industrial emissions
	1990	1999	1990 - 1999
greenhouse gases	32%	33%	+ 9%
acidifying agents	19%	16%	- 43%
organic compounds:			
- CO	23%	22%	- 46%
- Benzene	9%	4%	- 77%
- Fluoranthene	55%	58%	- 39%
- Benzo(a)pyrene	54%	10%	- 93%
- Dioxin	4%	8%	- 88%
eutrophication (N-total)	20%	20%	+ 6%
eutrophication (P-total)	66%	40%	- 63%
waste produced	40%	36%	+ 3%
- recycled waste	45%	39%	+ 21%
- non-recycled waste	31%	27%	- 38%

Table 4.1 Industry's share in the total national environmental load, the Netherlands 1990-1999 and the development in industry's total (% of the total for several emissions) (National Institute of Public Health and the Environment, 2000)



Source: National Institute of Public Health and the Environment, 2000

Figure 4.1 Indicators of growth of production and consumption in the Netherlands

a shift from static and singular goal-driven policies to dynamic and inclusive goal-driven policies. With regard to the societal process we see a shift from the central regulating state, as the guardian of the general (environmental) interests, to extended co-responsibility.

Before moving on to discuss the developments behind the claimed effectiveness of this renewed policy paradigm we first take a look at the actual environmental load caused by manufacturers. The shifts in content are then discussed and an outline is given of the way in which the extended co-responsibility is shaped by using a mix of policy strategies. Subsequently, we look at the extent to which the new concepts have penetrated the practical situation, i.e. whether they really have had an effect on the performance of businesses. The chapter concludes with a reflection on the driving forces behind the aforementioned transitions.

4.2 The producer's share in environmental pollution

That businesses in such a highly industrialised country as the Netherlands make the greatest contribution to the environmental problem goes without saying. Industrial production is responsible for one fifth to half of the emissions in most environmental themes. With regard to several emissions a great improvement was achieved in the 1990s (see Table 4.1), often a relatively stronger improvement than in other segments of society (agriculture, consumers, generation of electricity and transport).

Compared with that in other European countries, Dutch industry is relatively energy-intensive, yet the share of some emissions in the total national emissions is relatively lower (e.g. SO_2 and NO_x) (European Environmental Agency, 2000). Conversely, the environmental load in the Netherlands is relatively high because it is concentrated in a small area.

However, these data regarding industry's contribution towards the environmental problems only present a limited picture of the environmental load connected with manufactured goods and the importance of a further reduction of that load. Three comments are appropriate in this respect:

- Firstly, the share of the production stage in the environmental load caused by products is relatively low. The environmental load resulting from the extraction of raw materials, the utilisation of products and their disposal (post-consumer stage) are not included in the figures.
- Secondly, while we see a downward trend in certain emissions, even in a growing economy, we still see a distinct rise in others. The continued economic growth and the relatively high growth percentages in the field of transport and consumer spending (see Figure 4.1) can cause a U-turn in the decrease achieved so far and subsequently amplify the

increases. In the past, when formulating the goals for emission reductions a continued growth was seldom anticipated, while relatively high growth figures have still been achieved recently (and probably will be in the near future too).

– Thirdly, part of the environmental load from western prosperity, or in this case Dutch prosperity, occurs elsewhere. Globalisation contributes towards a part of the environmental load being shifted to other stages of the life cycle or to other countries or continents (see for instance Wackernagel & Rees, 1996; Carley & Spapens 1998; Van Vuuren et al., 1999).

4.3 The paradigm shift in the content of environmental policies

Major changes can be observed in the way in which the environmental load caused by industry is seen and, in line with this, in the way in which the long-term goals for improving the environmental performance of manufacturers are underpinned. As we already commented in the introduction, these shifts can be referred to as a development from static and singular goal-driven policies to dynamic and inclusive goal-driven policies.

The first shift is on the level of individual businesses and their relevant production chains. Up to the 1990s firms were addressed mainly on a series of separate emissions. Emission requirements were drawn up for each type of emission; emissions which basically could be traced back to ecological quality requirements and technological and economic considerations regarding emission-reduction technologies (usually end-of-pipe technologies).

Since the 1990s, the environmental performance of businesses has been increasingly assessed on the basis of its place in the life cycles of products. Scientists have come up with methods such as pollution prevention, life cycle assessment, life cycle management and integrated chain management for the systematic improvement of environmental performance. In other words, the relationship between environmental load and the effects of improvement options in the entire life cycle, for all relevant types of environmental load, can be analysed and assessed.

The development and application of these methodologies has been stimulated enormously by the Dutch Government. Intensive cooperation has evolved between the foremost knowledge institutes, the major umbrella organisations in trade and industry, and a select group of companies (often internationally operating companies). The search for new technologies also plays a major role. Not only have the technologies that can be applied immediately in the here and now, but also demonstration projects have been

carried out. These should give rise to more faith in the possibilities for setting out a specific direction for the public and private efforts made in the field of technology development. This was the philosophy behind the *DTO,* the Sustainable Technology Development Project, a form of cooperation between the knowledge infrastructure, the government and industry's elite. Examples of far-reaching functional and system innovations have been outlined in the field of food, housing, mobility, chemicals and water, resulting in improvements in the eco-efficiency by a factor of 20 over a 50-year period (Bouwmeester & Jansen, 1997; Weaver et al., 2000). As a result of these – successful – demonstration projects, new initiatives have been started up focusing on radical technological innovations.

The second relevant shift relates to the level on which the collective environmental load generated by the individual firms is assessed. The essence of this shift is that long-term goals are no longer based on isolated national environmental problems, but are placed in a context of international justice.

Policy up to the 1990s was based on the aggregate of emissions in the different sectors in one's own country; used as the basis for reduction goals, usually with a time horizon of 10 to 20 years at most. Policy is also becoming more subjected to the influence of the so-called 'factor X discussion' (Reijnders, 1998). Publications in this field contain the message that an increasing level of prosperity *can* or *must* go hand in hand with a far-reaching reduction of the environmental load.

The currently dominant philosophy, in which the various approaches have been combined, can be described as a four-step route towards substantial improvement of product environmental performance (see Figure 4.2). Environmental management at the level of individual firms, resulting in an improvement in production processes, is the first step. The optimisation and redesign of existing products is the second. The greater part of environmental policy focuses on these two initial steps. The third step is to develop new forms of function fulfilment (e.g. e-mail instead of written letters). The fourth step consists of radical system innovations such as those illustrated in the sustainable technology development project.

On the one hand we are concerned here with arguments which – by making references to successes with pollution prevention, eco-design and system innovations – claim it is possible to achieve an eco-efficiency reduction by a factor of 4 or 10 in 25 years' time (Von Weiszäcker et al., 1997; Factor 10 Club, 1997). On the other hand, there are arguments which, on the basis of an analysis of the long-term growth expectations in terms of size of population and the level of prosperity in the whole world, come up with the normative stance that western economies must produce their consumption

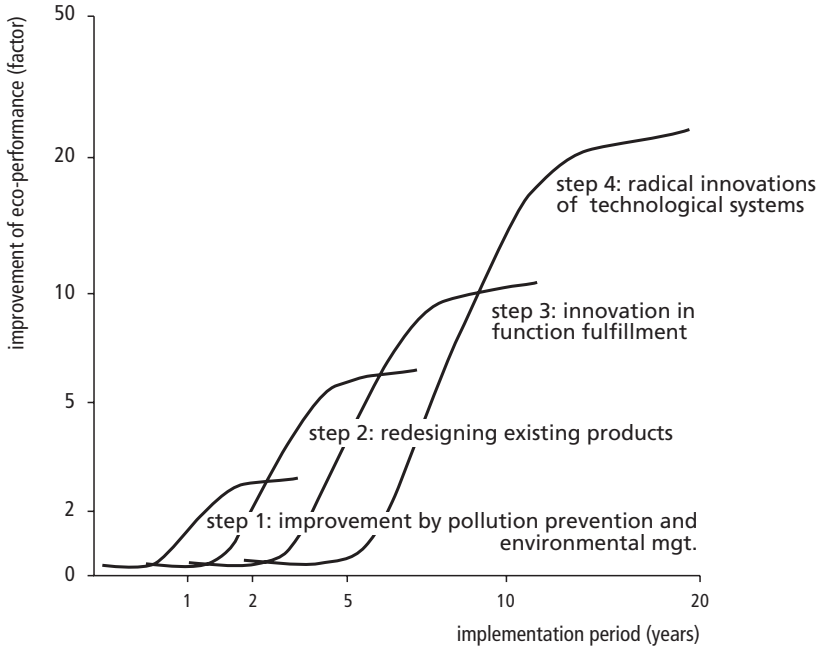


Figure 4.2 Four steps on the stairs of improvement of eco-performance

needs more efficiently in 50 years' time by a factor of 10, 25 or 40 (Weterings & Opschoor, 1994; Carley & Spapens, 1998; Raskin et al., 1998).

These discussions have had consequences for the environmental policy pursued in the Netherlands. The long-term goals have changed from:
- goals focusing on direct discharges;
- through goals formulated at the level of the total national emissions, linked to target groups;
- to ambitions formulated as an improvement of the (total) environmental performance per unit of product, taking into account the constant growth in level of prosperity.

The 'factor X discussion' also resounds in policy. The intention is to accomplish a fifty percent reduction in the total environmental load together with a doubling of the level of prosperity over the next 25 years. To achieve this so-called 'uncoupling' (between economic growth and environmental load) a great deal is expected in terms of new technological applications, the redesign of products and the use of renewable raw

materials (such as sustainable sources of energy). The Dutch Government is searching for new ways to achieve 'long-term transitions' (Ministry of Housing, Spatial Planning and the Environment, 2001).

4.4 A paradigm shift in the process of environmental policies

The paradigm shift in content has emerged alongside a paradigm shift in the process of environmental policies. The two cannot be seen as separate. Developments in terms of content have helped to make developments in the process of environmental policies possible, and vice versa. In the 1990s the relationship between the state, the market and civil society in the Netherlands underwent radical change: from central management by the state to extended co-responsibility.

In the early years of environmental policy the solution for industrial pollution was searched for in a system of permits and licences. Faith was then placed particularly in the juridical model of management. Economic instruments were also used (including levies on fuel and the discharge of effluent). This strategy of central management via coercion and incentives failed miserably. In response, a mix of three management strategies was developed. There is still an element of central management, but in a contemporary form. Interactive management, combined with an internalisation strategy, was also emphasised (see Chapter 3). In this connection we have also seen forms of self-management emerge over the past few years.

Strategy 1: Central management by means of coercion and incentives
Modernisation by means of:
- reinforcing and relieving the implementation system;
- streamlining procedures;
- making more use of general rules;
- new forms of flexible and compact permits;
- greening the tax system.

Strategy 2: Interactive management and internalisation
- Agreements drawn up with industries in the framework of:
  - policy on target groups;
  - policy focusing on improving energy efficiency;
  - policy focusing on prevention and the reuse of waste;
  - policy on chemicals.
- Stimulating environmental management in companies.
- Extended producer responsibility.
- The development of methodologies.
- Information transfer and capacity building.

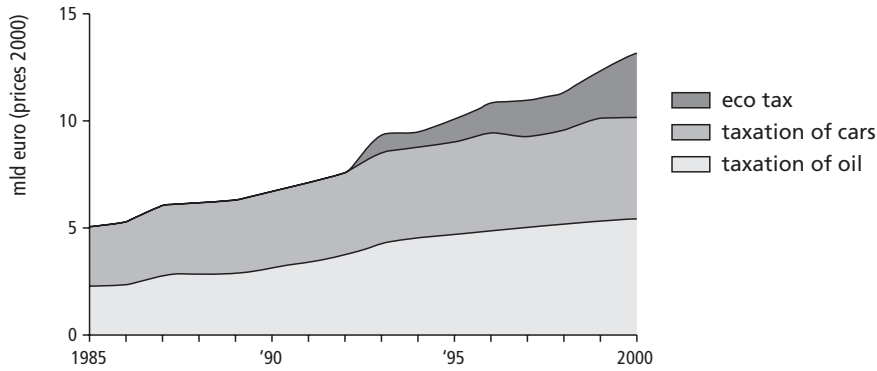
Strategy 3: Self-management
The stimulation of:
- privately formulated standards (ISO);
- recycling arrangements;
- entrance requirements for trade organisations;
- self-imposed environmental levies;
- responsible care;
- chain management;
- cooperation between manufacturers and consumers.

Strategy 1: Central management by means of coercion and incentives
Since the end of the 1980s work has been carried out on a more efficient juridical framework and on greening the tax system.

A more efficient juridical framework has been created by reinforcing the implementation system (more civil servants for the issue of permits and more inspectors) and the integration and streamlining of procedures in environmental laws. Moreover, an attempt has been made to relieve the implementation system by bringing a large number of businesses under the terms of general regulations, and thus businesses need now only 'report' instead of having to go through the permit procedure. In the 1990s, the administrative capacity for implementing environmental policy in both municipalities and provinces was more than doubled. Around 2000 it was said that there was sufficient implementation capacity, an adequate level of permits were being granted, and that an adequate number of inspections were being carried out.

The actual method of granting permits has also been changed. Whereas in many cases permits were drawn up as detailed voluminous documents, flexible permits are now granted under certain conditions. This is the case if a business is able to produce evidence that it has an appropriate (ISO 14000 approved) environmental management system in place. These permits set out the main lines only, the details being incorporated in the company's environmental plan and environmental programmes.

As we have already explained, in addition to the juridical instruments, economic instruments have always played a role in environmental policy. There is a significant trend underway in the direction of a green tax system. In 1993 a new law came into force in the Netherlands for a green system of taxation. For some time now tax has been levied on energy carriers and motor vehicles. Since then, green taxes have also been imposed on ground water and landfill waste, and work is under way on an expansion to include non-sustainable timber. The extent of environmental taxation is growing constantly (Figure 4.3) on the principle of 'impose tax on unwanted environmental pollution instead of essential labour and profits'. There is also a substantial increase in number and type of fiscal 'greening measures'. Examples are: making it an attractive proposition from a tax



Source: National Institute of Public Health and the Environment, 2000

Figure 4.3 Greening national taxes in the Netherlands

point of view to make green investments, take out green mortgages and invest in green investment funds. The increase in the tax burden from environmental taxes is compensated by lowering taxes on income and profits for businesses and citizens pro rata. This now means that the Netherlands is among the countries with the highest share of 'green' taxes in the total package of taxes in Europe (European Environmental Agency, 2000).

In 2000, the national government's green taxes brought a total of EUR 13.2 million into the treasury. The share of green taxes in the total tax proceeds in the period 1992-2000 increased from approximately 9% to 15% (National Institute of Public Health and the Environment, 2000). Yet these figures still fail to provide a complete picture of the 'greening' because end-of-life fees were introduced on a variety of consumer goods in the 1990s to finance their reuse. These fees are not included in the national estimate.

In addition to these 'traditional' economic instruments, new instruments were recently introduced such as incentives for the leaders in the field, cost balancing among firms and benchmarking. With regard to these instruments, policy instruments are no longer linked to the individual company but to the mutual dynamism among the companies within an industry.

Strategy 2: Interactive management and internalisation

In addition to central management by means of coercion and incentives, a second management strategy was developed in the 1980s. This strategy consists of consulting with trade and industry and encouraging 'internalisation'. In this context, consultation focuses on reaching

agreement on the goals of national environmental policy and on working them out in greater detail together with the relevant industries. Internalisation aims at making these goals the 'goals of the company concerned' and at ensuring that the way in which the companies are organised makes it possible to achieve these goals.

Several adjacent paths were taken in the consultations with the industries:

– the *target groups consultation;*
– the consultation dealing with 'waste streams' on *pollution prevention and reuse policy;*
– the *long-term agreements* with the industries on the subject of energy efficiency.

The long-term targets incorporated in the first National Environmental Policy Plan were elaborated upon and specified for 16 target groups in the target groups consultation (such as chemical industry, metal industry, paper industy, printing industry, etc.). The agreements in this respect were usually made by the industry's trade organisations and the various government authorities. In several cases, companies were themselves responsible for signing the agreements. In these agreements the trade organisations were given a key role in specifying the technical requirements and monitoring the results.

The approach taken with regard to about 30 waste streams differed on several points. NGOs also played a role in these consultative talks. In applying the principle of producer responsibility so-called 'recycling arrangements' were settled. This included new legislation introduced at the request of trade and industry, among other things establishing a legal end-of-life fee – either in the product price or otherwise – to be paid by the manufacturer or the consumer. One step further than had been taken in the target groups consultation was taken in its implementation: organisations being set up for the collection and re-processing of waste.

The approach taken in the consultations with about 30 industries on improving *energy efficiency* is different again. It differs from the target groups consultation because in the preparatory stage several model companies were first visited in order to establish which technical possibilities were available for the improvement of energy efficiency. The results were then taken as the basis on which to draw up goals for the industries and to then lay them down in agreements which were signed by the companies individually. Subsidies and tax facilities for research, consultation and investment contributions were introduced systematically in the preparatory work and subsequent implementation.

Drawing up agreements with trade organisations will have little effect if, when conducting their business, the members themselves fail to focus on

improving their own environmental performance. Running parallel with the consultations with the various industries, central government encouraged the introduction of 'in-firm environmental management systems' in companies in the 1990s. The roots of these management systems lie in the United States. All organisations ought to be structured in accordance with the ideal type of perfect management, the so-called Deming circle: *plan – do – check – react – plan.* This approach laid the foundation for an environmental management practice that also became the model for the introduction of in-firm environmental management systems here in the Netherlands. The organised elite of trade and industry played an encouraging role in this respect. In addition to the defensive character (preventing liability) it also assumed an offensive character in several large companies on the basis of practical experiences: systematically devoting attention to environmental aspects gives rise to financial savings: Pollution Prevention Pays (Huisingh et al., 1986; Dieleman & De Hoo, 1990; Schmidheiny, 1992).

The introduction of in-firm environmental management was encouraged by central government through an extensive programme of demonstration projects at branch of industry level, building up a network of consultants, developing modified forms of permit granting and initially by threatening to take coercive measures if the results were disappointing. Companies with a proper functioning environmental management system should subject themselves to checks in the form of external audits. The European Union introduced the EMAS regulation to this end and, since 1996, the international ISO 14001 standard has been used for the certification of environmental management systems. This standard stipulates specifically that all companies should work on the 'continuous improvement' of their environmental performance. Supervision has been privatised through a small number of accredited auditors and the cost of enforcement is therefore at the expense of the companies themselves.

Strategy 3: Self-management

The transition from the second to the third strategy is a gradual one. The third strategy implies stimulating self-activation among private organisations. Private parties ensure private regulation (within publicly established frameworks). Some remarkable examples of self-management have been seen over the past decade; many arising in response to government activities within the framework of the second strategy described above. One example is the trade association for companies engaged in the processing of chemical waste which, since the early 1990s, stipulated that a company must have an externally-audited environmental management system in place for it to be accepted into the association. This is of vital importance for companies given that clients may only do business with the members of this trade association.

The 'life-cycle settlements' resulting from the consultation on pollution prevention and reuse were also dealt with. The establishment of organisations such as 'Autorecycling Nederland' *(Car Recycling Holland),* for instance by those market parties involved in the reuse of wrecked cars, such as trade organisations for the car industry and car trade, is an example of how trade and industry generates new organisations for the purpose of achieving agreed upon goals. Collaboration with the government continues where necessary in this respect, for instance through the legal embedment of the end-of-life fee included in the purchase price of a new car (as is also the case in the purchase price of other consumer goods). Moreover, within the framework of the agreements on the reuse of car wreckages, reports must be submitted to the government on the progress achieved in realising the goals.

One radical form of self-management is seen in the ISO standards mentioned in the previous section; standards which continue to play an increasingly important role in environmental management. Originally, the definition of the requirements for environmental management systems were drawn up by the government (Ministry of Housing, Spatial Planning and the Environment, 1989). Because of the similarities with the quality management systems the government adopted the ISO standard for quality management systems as the standard in the 1990s. This was in response to demands made by the market. Meanwhile, the International Standardisation Organisation (ISO) had started work on the standard for environmental management systems, leading to the international series of standards, ISO 14000. Standards originating from ISO are a perfect form of self regulation. The role government plays in establishing the standard is, at most, the role of one of many interested parties. There is no control by parliament or any parliamentary contribution towards realising standards. Moreover, once a standard has been established, its application is through private channels. Verification as to whether products and organisations meet the requirements is carried out by authorised commercial management consultancies. However, the government does play a role at arm's length in different ways. On the one hand it creates the organisational framework by means of the legal embedment of the 'Nederlandse Normalisatie Instituut' (NNI) *(Netherlands Standardization Institute)* and the 'Raad voor Accreditatie' *(Dutch Council for Accreditation).* On the other hand, formal regulations and standards, and the goals formulated in government policy documents, are used as reference points in the analyses companies must make and must take into account in their policies in accordance with the various requirements specified in ISO 9000 and ISO 14000 standards (ISO, 2000; SCCM, 2000).

It is quite feasible that it is thanks to the private nature in particular that the ISO standards for quality management and environmental management have started to have a converging effect in communication on the

environment in the market (particularly in the relationships between companies, and possibly in the future more in the communication between manufacturer and consumer). This private regulation is starting to play a major role in the relationship between companies and the government too, especially in connection with the question whether a company is eligible for a flexible permit.

4.5 The shifting role of technology policy

The orientation towards the long-term task of achieving a substantial improvement in efficiency as to how we use our energy and materials (described in section 4.3) also brings technology policy into the picture. This was not dealt with in the strategies discussed above because of the fact that for some time now environmental technology policy has been evolving quite separately from environmental policy. The development of environmental technology at universities and the major national research institutes has received financial support, even from the early years of environmental policy. There has also been a large number of subsidy regulations in place over the years to support technology development and the introduction of new environmental technology.

Technology policy also focuses on the acceleration and success of market introduction. After the first breakthrough of a new technology on the market, further diffusion must be coaxed by way of regular policy focusing on the business community. It is then a case of quickly bringing an innovation up to the level of 'state-of-art technology'. This can be achieved by including an innovation on the list of technologies eligible for tax advantages, by including it in the manuals issued by the licensing authorities, and by using these innovations as the basis for agreements with industries. This 'process of effecting society' usually involves a certain amount of delay.

The growing level of understanding into how the innovation diffusion processes progress makes it quite clear that a policy geared towards technology push, by giving financial support to research and development alone, is not enough. Successful innovations involve close contact between innovators and users. In this context reference is made to reinforcing clusters and collaborating businesses (Jacobs, 1990, Roelandt et al., 1997; OECD, 1992). The barriers standing in the way of market introduction must also be eliminated (Cramer & Schot, 1990). All of this calls for the sound coordination of government's efforts in the various stages of the process of development, market introduction and wider diffusion.

To an increasing extent are attempts also made to activate 'innovation networks' on the basis of a long-term perspective by means of 'strategic conferences', 'taskforces' and 'chain consultation'. Technology foresight studies, used to identify promising technologies on the basis of the long-

term targets for sustainable development, also play a similar role (see National Institute of Public Health and the Environment, 1994; TNO & CPB, 1997. Stimulating innovation networks is done by granting subsidies to joint ventures, the producers of environmental technology and the intended users only. Examples of these subsidy programs in the Netherlands are the 'Economy, Ecology and Technology' program and the 'National Initiative for Sustainable Development' program. These programs focus on projects that are able to achieve a technological breakthrough in 5 to 20 years time or even longer, being orientated towards the 'factor X discussion' referred to in the foregoing.

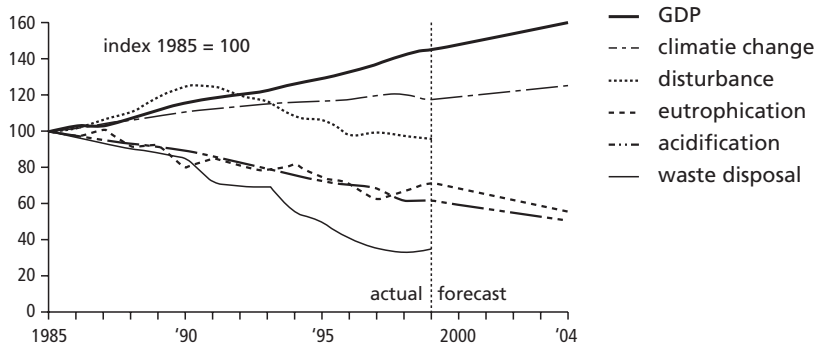
4.6 Shifting paradigm, bending curves?

The mix of management strategies discussed above was developed in the 1990s. In the introduction we already mentioned the consensus among the main actors regarding the success of the route taken. To what extent does this approach already lead to a dislocation in the trend of how Dutch society meets its material needs. Is there really a shift away from the trend? This question can be answered on the basis of physical science indicators and social science indicators. We will be brief in looking at the former and devote most of our time to look at the information concerning the extent to which changes arise – partly as a result of policy – in the social organisation of production, and whether this leads to the desired shift in practice.

Partly reduced emissions
Studies carried out by the National Institute of Public Health and the Environment (RIVM) show that over the past decade there has been a partial uncoupling (Figure 4.4). The current ongoing economic growth is accompanied with improvements in waste disposal and recycling, acidification and soil cleaning. There is hardly, if any, uncoupling in terms of climate change and disturbance (National Institute of Public Health and the Environment, 2000).

To obtain more insight into the societal changes concealed behind these scientific data we must take a look at the social science research carried out on this subject. To what extent have the three strategies – central management, interactive management and self-management – led to an improvement in environmental performance?

Whereas there is a large amount of research available in this field in the Netherlands, the research agenda itself tends to be open to fashions. Of note is that there has been very little research carried out into effects of the central management strategy by means of coercion and incentives on industry. Conversely, the strategy of interactive management and



Source: National Institute of Public Health and the Environment, 2000

Figure 4.4 Performance indicators of some environmental policy themes and GDP

internalisation has been given more attention. We shall discuss research into environmental management, voluntary agreements, self-management and product design.

Environmental management

The introduction of environmental management is recognised by many as a success. With a view to the original policy objective ('all the companies that caused the most pollution have an in-house environmental management system in place in 1996') it can be said that the success was partial, yet there is still an ongoing diffusion of environmental management systems. The number of businesses in which environmental management has become routine, or in which implementation of such a system is under way, has grown from 37% in 1997 to 49% in 1999 (see Figure 4.5; KMPG Milieu & NIPO, 1999: 24; KPMG Milieu & IVA, 1996). However, there are differences to be seen among the various branches of industry. The leading sectors are building materials, chemical, paper and foodstuffs (60-70% in the routine or implementation stage). Lagging behind is the building trade, road transport and electrical engineering (less than 45%).

While these figures are indicative of a high diffusion level of environmental management systems, the underlying data were obtained from surveys and give too little insight into the actual effects of environmental management systems on management. Conversely, other studies show a limited impact of environmental management systems on the day-to-day running of businesses. An important role is attributed to external influences on business strategy. If these are lacking, then

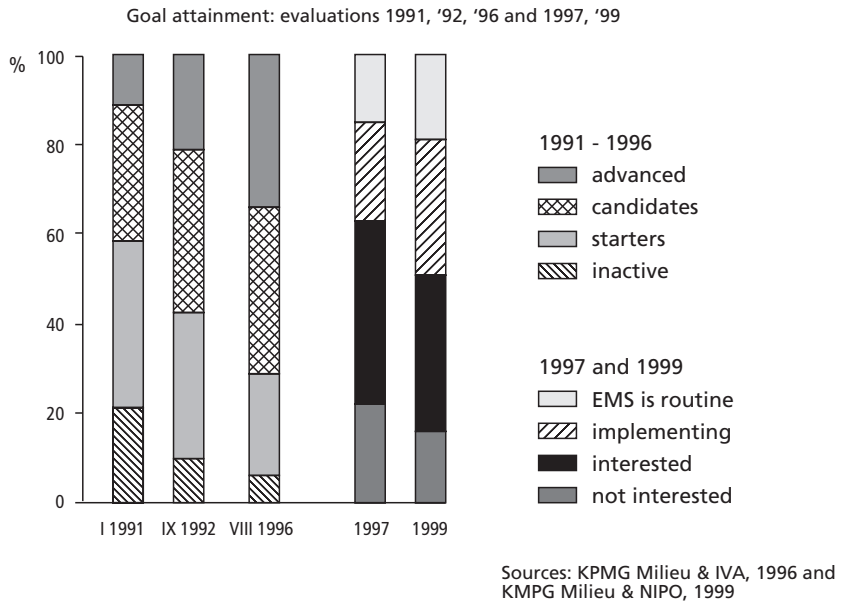


Figure 4.5 Implementing environmental management systems

businesses can easily engage in environmental management *pro forma* without this in-firm environmental policy really penetrating through to the company's policy (Bouma, 1995, p. 481, 520; Le Blansch, 1996, p. 287). Moreover, it is also observed that the external stimuli in the first half of the 1990s were very weak (De Groene, 1995). For instance it was noted that the environmental consultancy structure for businesses was highly fragmented and consequently lacked effect (EIM, 1994). Moreover, in the mid-1990s only 46% of the municipal authorities actively encouraged businesses to introduce environmental management systems. It is quite remarkable to see that some of these municipal authorities (38%) were not only passive in this respect, but also put up resistance against this national policy (De Bruijn & Lulofs, 1996, pp. 408-409). In response, central government is currently conducting demonstration projects to show businesses how to incorporate environmental policy into their own strategic company policy.

Voluntary agreements

Agreements with target groups on the subject of environmental policy, recycling and energy, play a pivotal role in the (second) strategy of interactive management. Policy focusing on the setting up of a return

logistics for waste streams is visibly paying off. For instance: figures published by the National Institute of Public Health and the Environment show that a radical shift was achieved in the methods used for processing during the period 1990-1999. The percentage of waste that is either reused or given a useful application has increased from approximately 50% in 1985 to 76% in 1999. The objective was 80% in 2000. The amount of waste dumped in that period was brought down from 28% to 10% (National Institute of Public Health and the Environment, 2000).

In 1998, central government and the employers co-published the book entitled 'De stille revolutie' *(The Silent Revolution)* in praise of their 'joint action to achieve a better environment'. In this book they state that of the 73 industrial emissions, the intended reductions for the year 2000 were achieved in 51 cases as early as 1996, that the targets for 2000 would be reached for 11 emissions, and that current policy was inadequately effective for 11 emissions only (Ministry of Housing, Spatial Planning and the Environment & VNO-NCW, 1998, pp. 160-161).

Glasbergen places successes such as these against the background of the discordant relationship between government and trade and industry in the previous periods and characterises the target groups consultation, and the role of the agreements therein, as a learning process for all concerned: government, trade and industry and the environmentalist movement. Agreements in this respect function as a focal point on the communal route that leads towards cooperative environmental management (Glasbergen, 1997; 1998a and b; 1999). This positive view is also seen in the evaluation study of the Long-term Agreements on energy efficiency. Despite the low price of energy, businesses are more highly motivated, have obtained a better insight, and much more serious thought is given to improving energy efficiency (Glasbergen, 1997).

Voluntary agreements with trade and industry are experienced more positively in the Netherlands than in many other countries because the approach taken in the Netherlands is less non-committal, monitoring and feedback is generally well-organised and firm links have been established with the other instruments (see also Environmental Law Network International, 1998; OECD, 1999).

Self-management

In section 4.4 we discussed the ISO standards as an example of self-management. The extent of this standard's application is probably the most absolute indicator of the level of environmental management internalisation, much better than the surveys on environmental management mentioned above. The recurrent intensive examinations carried out by the auditor are aimed specifically at finding out whether the organisation functions in accordance with the principles of the 'plan-do-check-act cycle' and 'continuous improvement'.

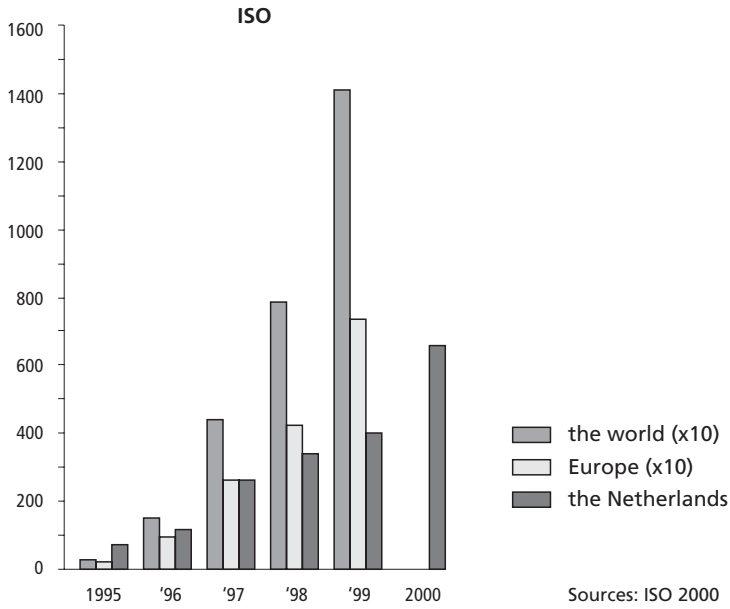


Figure 4.6 Developments in certification of environmental managmentsystems

While the ISO 14001 standard was introduced in the Netherlands in 1996, the expectation is that a similar growth will be seen for this as we saw for the diffusion of the certification of quality management (ISO 9000) (EIM, 1997, p.87). However, at the beginning of 2000 only about 650 businesses in the Netherlands were in possession of an ISO 14001 certificate (ISO, 2000). This means that the Netherlands is certainly not one of the leaders in this field. Almost fourteen thousand ISO 14001 certificates were granted world-wide at the beginning of 2000 (i.e. within a period of four years), half of which were in Europe. Businesses in the far east are also active in this respect. The sectors in which certification is the most successful are electrical and optical equipment, chemical, and the manufacture of transport equipment (ISO, 2000).

Product redesign

We saw in section 4.2 that to achieve radical environmental improvements a shift must be achieved from the improvement of individual parts of production processes to an integral environmental assessment of production chains and products (by using methods developed for integral chain management and environment-oriented product development, etc.).

To this end, it is essential that manufacturers join forces in, *inter alia,* the field of technology development and the further diffusion of environmental innovations. Research into 'cleaner manufacturing' provides insight into the sort of measures taken by manufacturers. Depending on the sort of measure concerned, in 1999 between 25 and 65% of all businesses state to have introduced specific measures over the previous two years. The emphasis is apparently on the use of base materials with a lower environmental impact, energy management and modified working methods. Prevention checks (26%) and environment-oriented product development (25%) have made less headway to date (KPMG Milieu & NIPO, 1999).

A similar picture emerges from a European study into the use of eco-design methods in trade and industry. One of the conclusions of this study is that even in those countries that led the way in the development of methodologies, including the Netherlands (Brezet, 1994; Brezet & Van Hemel, 1997), their use in practice remains limited to a select group of large, internationally operating companies (Tukker et al., 2000). It is quite possible that a relatively small group of businesses is emerging which is able to demonstrate the feasibility of far-reaching improvements in environmental performance. Nevertheless, this group fails to connect up with the other businesses where 'business as usual' prevails.

This conclusion is quite remarkable to say the least. There have been many win-win situations since the mid-eighties regarding the prevention of waste and emissions. Moreover, this message has been brought to the attention of trade and industry quite intensively since 1990 through pollution prevention demonstration projects and the establishment of provincial 'pollution prevention teams' (see e.g. Dieleman & De Hoo, 1991; Van Berkel, 1996). If the effect of this pleasant message is so difficult for this theme, what then is the situation regarding recent, more complex aspirations such as integral chain management (saying: "co-operate with your suppliers and clients") and environment-oriented product development (saying: "assess your product properly and conquer new markets")? Research conducted into the experiences in trial projects with product-oriented environmental management systems (as an integration of product policies in environmental management systems) also shows a distinction between a leading group of large, or conversely, small businesses (which have made improving environmental performance the core element of their business policy) and other businesses (Brezet et al., 2000). It had been observed before then that the successful effect of ecodesign advice in leading businesses, for instance, could be explained from the presence of an environmental management system and the willingness to innovate in the businesses concerned (Van Hemel, 1998, p. 232). Other research, however, shows potential breakthroughs among the

'followers': in 1999, 68% of all businesses planning to market new products say they will devote attention to the environmental aspects in the development process (KPMG Milieu & NIPO, 1999, p. 35).

Both the tendency towards interactive management and self-management, as well as the efforts to collaborate on technology development, calls for more intensive relationships. Businesses will need to work together with other parties in the market more often, parties such as suppliers, customers, trade organisations and knowledge institutes. This increasing level of collaboration among the market parties is not only seen in the Netherlands. International 'environment-conscious' employers' organisations, such as the World Business Council for Sustainable Development (WBCSD) and the Coalition for Environmentally Responsible Economies (CERES), play a significant role in the international widening of these developments. Much of the practical examples used in the discourses are drawn from these companies. This supports us in drawing the conclusion that an internationally-oriented business elite is to a large extent steering the development towards extended co-responsibility.

4.7 Reflection: co-responsibility sufficiently penetrated?

Considering the studies discussed above into the effects of the different management strategies, the reduction in environmental load that has been realised must be attributed mainly to the second strategy: interactive management and internalisation. This has resulted in records showing definite successes with a wide bandwidth. Regarding the paradigm shift in terms of content, for the time being we are only able to record any effects among a small group of leaders. It is expected that a further, substantial uncoupling of the growth in prosperity and the environmental load will be achieved in the future. The question is, however, what driving forces will be behind these processes of change.

Some theorists state that there is talk of a process of 'ecological modernisation', a process which in terms of impact would be comparable with the Enlightenment in the 16th century, the process of State Formation in the 17th and 18th centuries, the Industrialisation in the 18th and 19th centuries, and the Social Emancipation in the 20th century (Huber, 1991). While some take a more analytic-sociological perspective, often discourses on ecological modernisation tends to take a normative perspective. The subject under discussion is the changing relationship between the state, the market, science and technology and civil society (Huber, 1991; Mol, 1995; Jänicke, 1993). Some publications focus on the changing role of the state: from curative to preventive, from closed policy making to participatory, from dirigistic to contextually steering (Mol, 1997, p. 141). Others lay a

greater emphasis on the new dominant role of trade and industry. For instance, Mol (1995, p. 36, 58) (referring to Huber, 1991) states that modern science and technology, the economic actors and market mechanisms play a leading role in the process of ecological transformation, while the government, political and societal movements are becoming less of a driving force behind this transformation. The link Huber makes with the 'economic long-wave theory' gives ecological modernisation an almost unavoidable character, based on a nearly blind faith in the market forces and technology (see for instance Huber, 1991, p. 177).

Mol states quite rightly that, when formulated in this way, the epistemological problem arises of how to evaluate the value of a social theory that is so closely related to and derived from social practices and dominant ideas (Mol, 1995, p. 57). In the foregoing we have explained how the changes in terms of content and process were realised in close collaboration between the government, institutes of knowledge and a limited number of companies, labelled here as a business elite. While the role of organisations in civil society in these developments has been an alternating one, it was relatively modest.

The new cooperative relationships between state, market and knowledge institutes should not, however, be seen as a far too obvious guarantee for a successful 'ecologising of the economy' (cf. Huber, 1991 and Jänicke, 1993). The diffusion of new concepts and practices, such as life-cycle management, ecodesign and the like, are apparently for the time being not progressing as matter of course as the claimed ecological and economic gain would have us believe. A small group of leading companies do use them. Some dissemination can be observed among representing organisations and newly established players (like environmental consultancies, information transfer organisations and organisations in the field of life cycle cooperation and monitoring). Theses organisations even take their own stimulating role in this field. But these developments have simply passed by many 'run-of-the-mill' businesses.

It is quite possible that we are witnessing a partial greening of society, in which a well-organised internationally-oriented business elite is successful in conceptualising the intended transitions and thus making a strong impression on policy programmes. Simultaneously, for a large group of smaller, more nationally-operating businesses, this green entrepreneurship is too far away. However, societal processes of change will always be driven by a leading group of innovative actors. The risk involved here is that an ambitious long-term orientation gives too little consideration to the problems of the further diffusion of 'green entrepreneurship' to the wide segment of average businesses.

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